A GLIMPSE

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

By

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for the Degree of
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Thesis Committee Chair

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Ashland

Great Lakes & Industrial Mining Pier & Shipping Exhibit

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Abstract

This thesis project, 'A GLIMPSE', examines the question, how does the configuration and organization of elements in a space influence the engagements of its participants? The typology for examination of this problem is a history museum located in Ashland, Wisconsin, on the shore of Lake Superior. The Theoretical Premise/Unifying Idea that guides the research is, "by using elements both designed and in nature we can engage and evoke responses in a foreseen manner." The Project Justification is, "Instead of relying solely on the usage of signage and advice from others to navigate and perceive
architecture, the use of visual cues, created from natural and built elements, will influence the actions and engagement of each visitor."

The narrative describes the driving concept of the project, and asks "what causes us to react to these elements in such a predictable way?" The client for this project will be the state of Wisconsin, with everyone considered a user. The major elements included in the 310,935 square foot museum include: lobby/ commons area, exhibit halls, theater, café, gift shop, meeting areas, offices lease space, and museum storage. The project emphasis "will be placed on the use of natural and built elements to create sensual cues, whereas to influence its participants in or order to fashion an environment where senses are the main guiding factor". Research for the project will be done in the areas of project typology, historical context, site analysis, and programmatic equirements, and will be documented in a thesis book which will be preserved in the architectural library and in the institutional repository.

Key Words

Visual Cues, Configuration, Influence, Foreseen manner

Problem Statement

How does the configuration and organization of elements in a space influence the engagements of its participants?

Statement of Intent

Typology:
History museum

Claim:
Architecture is capable of influencing the actions of each of its visitors by using carefully contrived elements to present visual cues in order to invoke psychological response and engagement.

Premise:
Architecture has a significant influence in the way people act. Spatial configurations, materials, and lighting all influence what we do in a space.

The environment in which people deliberately locate themselves has an overwhelming influence on their actions.

Visitors often rely solely on signage or advice in order to move throughout a structure. They do not get the chance to truly view the expressions and quality of the design.

Theoretical Premise/Unifying Idea:
Design has a significant influence on one's actions. By using elements both designed and in nature we can engage and evoke responses in a foreseen manner.

Justification:
Instead of relying solely on the usage of signage and advice from others to navigate and perceive architecture, the use of visual cues created from natural and built elements will influence the actions and engagement of each visitor

Project Narrative

With the examination of the question, "how does the configuration and organization of elements in a space influence the engagements of its participants," I will be exploring how visual cues placed in architecture can be used to influence its audience. There are many important things to look at, such as the project participants, influencing factors, and how to use architecture to create reactions.

People as a whole are very interesting. Individually we are all extremely different, but together we are very predictable and easy to influence. The thought of using the environment, in which an individual willingly engages themselves in, to influence their reactions and experiences, is something that I have considered for some time. I have many times gone into a building and seen others interacting with the elements. They use raised areas and window sills as seats, they follow a single line that is created with the tile on the floor. They, and myself as well, are drawn to certain features which evoke a sense of feeling or curiosity. What causes us to react to these elements in such a predictable way? Why do I want to know where the line on the floor leads to? What draws me to the window sill to see if I can sit on it?

By opening our senses to the elements which we are surrounded by, we allow ourselves to be led to a greater experience. The influences of our actions are usually subtle. They don't scream at you to go this way, or do this here. They let you decide whether or not it is worth paying attention to. For example, I found myself at a diner eating lunch one day. After observing a young child swiftly take the gum from his mouth and stick it to the bottom of the table, I found myself looking under my table in wonderment of how many other times this simple impulsive action has taken place. From me looking under the table, curiosity was then formed by the waiter at the next table over. When he reached my table, he asked me what I was looking for. My response then caused the waiter to look under empty tables as he walked to the kitchen. It is subtle things which influence our actions. If I wouldn't have seen the child, I wouldn't have looked under the table, and the waiter would have never even given it a thought.

I think architecture is like the child with the gum. It can bring things to your attention to evoke an action, like me looking under the table. Given elements can tell you to sit by simply presenting a raised platform. It will give you a place to stick your gum by leaving spaces hidden from direct view. Elements in architecture can influence the way we experience the space by creating indirect hints. It is important for us to remember however, just how different everyone is. Some of the visual clues may be overlooked or considered unimportant.

By using a museum on the shore of Lake Superior as a basis for my project, I will be able to further explore elements and their influences on the participants, in both the natural and built form. This exploration will thus be the major element in my project.

User/Client Description

Client/Owner:
The city of Ashland, Wisconsin, will be the owner and client of the project

Users:
Everyone- The museum is to be open to any willing individual or group no matter their age, sex, race, culture, physical restrictions, or economic standing.

Usage:
The museum is to be open to the public Tuesday through Sunday, 10am to 7pm.

Major Project Elements

Lobby/Commons area- used for sale of admission tickets, information, group gatherings, and socialization

Exhibit Halls- exhibits collections for education and participation

Theater- used for education

Cafe- for the visitors

Gift Shop- for the visitors

Coat Room- for visitors' convenience

Meeting Areas- used for public meetings

Offices- for administration

Site Information: Macro to Micro

Region:
Ashland is located in the mid-eastern portion of the United States, in the northern portion of Wisconsin

City:
Ashland is located on the south shore of Lake Superior near the head of Chequamegon Bay, approximately 60 miles from Duluth, Minnesota. According to the city of Ashland's website, the city is known as "Lake Superior's Hometown" and has a current population of 8,795.

Site:
The site is part of the Waterfront Development plan, and is located on the historic Soo Line Ore Dock. It is bounded to the south by Lake Shore Drive West and by Lake Superior to the north, east, and west.

Access to the site is granted by car via Lake Shore Drive West, by foot or bike via the pedestrian trail which runs along the south side of the site, or by boat via Lake Superior.

Major landmarks and views from the site:
Lake Superior/Chequamegon Bay
Ashland Breakwater Lighthouse
Chequamegon Forrest
City of Ashland Wisconsin

Importance:
Ashland Wisconsin is a small, ethnically diverse community with a population of around 8,795. It is located in the mid-eastern region of the US, along the south shore of beautiful Lake Superior, roughly 60 miles from Duluth, Minnesota. The site will prove to be a good choice for my project, as it provides numerous amounts of sensual elements including Lake Superior, Chequamegon Forest, and Apostle Island National Lakeshore.

Image courtesy of Google Earth

Image courtesy of Google Earth

Project Emphasis

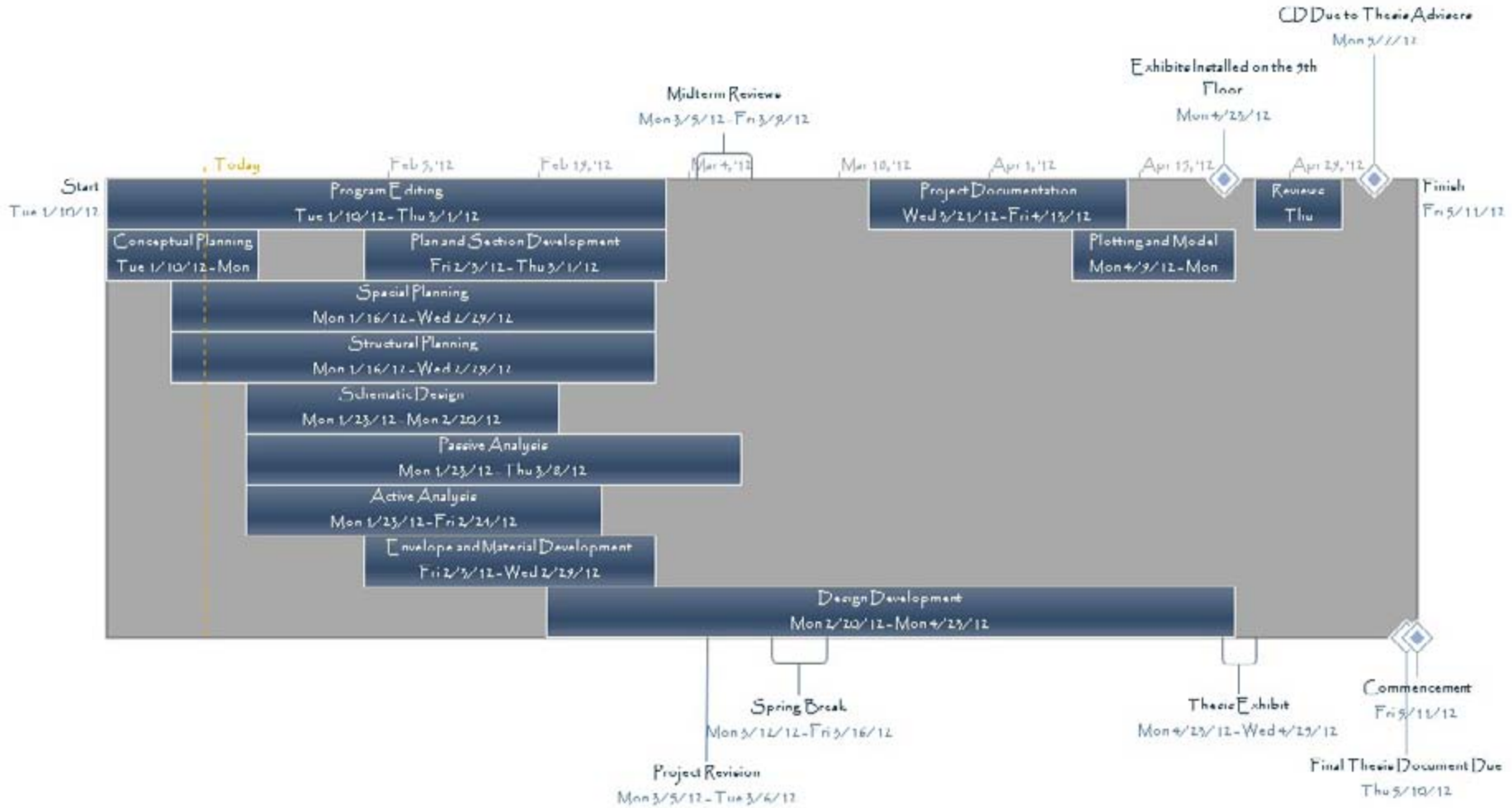
Emphasis will be placed on the use of natural and built elements to create sensual cues used to influence its participants in or order to fashion an environment where senses are the main guiding factor

Plan for Proceeding

Research will be conducted in the areas of the unifying idea, project typology, historical context, site analysis, and programmatic requirements using the mixed method approach. Qualitative and quantitative data will be collected employing the concurrent transformative strategy as directed by the unifying idea.

The design process will be documented utilizing sketches, photography, digital drawings, and physical models on a weekly basis. The final product will be organized into a thesis book and placed in the architectural library and institutional repository to be used as a reference to future scholars.

Schedule


CD Due to Thesis Advisors
Mon 5/7/12
Exhibits Installed on the 5th Floor
Mon 4/23/12
Midterm Reviews
Mon 3/5/12 - Fri 3/9/12
Today
Feb 5, '12
Feb 19, '12
Mar 4, '12
Mar 18, '12
Apr 1, '12
Apr 15, '12
Apr 29, '12
Start
Tue 1/10/12
Program Editing
Tue 1/10/12 - Thu 3/1/12
Project Documentation
Wed 3/21/12 - Fri 4/13/12
Review
Thu
Finish
Fri 5/11/12
Conceptual Planning
Tue 1/10/12 - Mon
Plan and Section Development
Fri 2/3/12 - Thu 3/1/12
Plotting and Model
Mon 4/9/12 - Mon
Special Planning
Mon 1/16/12 - Wed 2/29/12
Structural Planning
Mon 1/16/12 - Wed 2/29/12
Schematic Design
Mon 1/23/12 - Mon 2/20/12
Passive Analysis
Mon 1/23/12 - Thu 3/8/12
Active Analysis
Mon 1/23/12 - Fri 2/24/12
Envelope and Material Development
Fri 2/3/12 - Wed 2/29/12
Design Development
Mon 2/20/12 - Mon 4/23/12
Spring Break
Mon 3/12/12 - Fri 3/16/12
Thesis Exhibit
Mon 4/23/12 - Wed 4/25/12
Commencement
Fri 5/11/12
Project Revision
Mon 3/5/12 - Tue 3/6/12
Final Thesis Document Due
Thu 5/10/12

Previous Studio Experience

Second Year Studio:

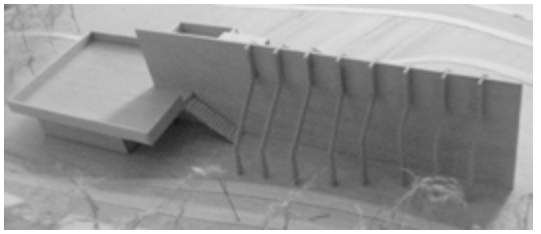
Fall 2008- Stephen Wischer
- Teahouse
- Boathouse

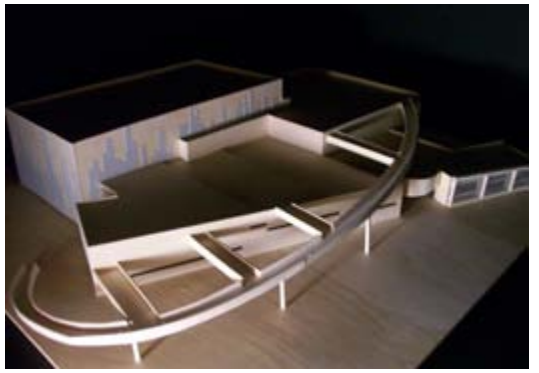
Spring 2009- Meghan Duda
- Music interpretation
- Dance Studio
- Prizker Project
- Dwelling

Third Year Studio:

Fall 2009- Steven Martens
- Eau Claire Airport
- Inuit School

Spring 2010- David Crutchfield/Mike Christenson
- Austin Preforming Arts Center
- Iliterations
- Regent Biker Bar





Fourth Year Studio:

Fall 2010- Bakr Mourad Aly Ahmed
Mixed-use High Rise

Spring 2011- Don Faulkner
Marvin Windows Competition
City Planning: Williston, Stanely, Tioga

Fifth Year Studio:

Fall 2011- Cindy Urness
Minnesota Experimental City:
Transportation Terminal

"The best places and spaces are rich with integrated attributes that foster orientation, understanding, and self-guiding"
(Calori, Chris 2007)

Signage

Some of the first use of signs dates back to the Paleolithic age, around 18,000 BC. The use of these signs was not only for communicating, but also ritualistic and spiritual acts. Cave paintings would be an example of this kind of signage. They depicted and told stories about nature by the use of symbolism.

Though not all early signs were ritualistic, some were merely the outcome of law. In 1393 England's King Richard II passed a law stating that all alehouses must post a sign where it could be seen by the public. The signs were not to promote their establishments to the passing community, but instead to identify themselves to the official ale tasters. The custom caught on and turned into a creative way to promote one's business. The alehouses started to use different symbols and images to depict one pub from another.

The earliest directional signs were used by the Romans. Columns, with Roman numerals, would be placed along roadways in order to inform those traveling down the road the distance to Rome. With the automobile becoming more and more popular, directional signs became ever more important, not only to inform the traveler of travel distances, but also for the safety of the traveler.

With the 1908 International Road Congress which took place in Rome, a standard format was laid down for basic road signs. The signs were then either carved into or painted on wood planks. Now, basic road signs are made from strong metals or aluminum.

Kinds of signage

Identification Signs:
Signs which are used to identify the destination of place in an environment. They confirm that 'you have arrived'

Directional signs:
Signs which direct people to various destinations within a given environment. These are also known as way-finding signs.

Warning signs:
Signs which alert people of hazards or safety procedures within an environment.

Regulatory and prohibitory signs:
Signs which regulate people's behavior within an environment. 'NO SMOKING'

Operational signs:
Signs which inform people about the environment's use and operations. These are also considered to be directory signs.

Honorific signs:
Confer honor on people associated with an environment. These are also known as donor signs.

Interpretive signs:
Helps interpret meaning of an environment or place within an environment. This includes: history, geography, inhabitants, artifacts. These are also known as commemorative plaques of events.

"While proliferation of signs solves immediate problems, often the real problem is the place itself. It has been designed without important passive way finding qualities." (Calori, Chris 2007)

The primary function of signage, in our time, is no longer to distinguish pubs, but more importantly it is to help people find their way through an environment. Whether it is a smaller-scaled environment such as a doctor's office or an airport, or a larger environment, such as finding your way from Minneapolis to Chicago or to any other city in the US, signs are there to guide us. As you drive down any road, you will see sign after sign after sign. There is an extreme over-abundance. While some are there for your protection and to help you find your way, others like the no passing signs, are a waste, and a good example of the over-use of signs. On any given road in the US, there are dashed and solid lines painted down the middle of the road. Those are symbols which tell you whether or not it is legal and safe to pass at a given section of road. Adding a sign alongside the road every time the lines change is unreasonable.

Signage within an environment is also used to help people form a mental map of the site. The cleaner and simpler the layout, the clearer the mental map is formed. With the creation of these maps, we are engaging the public in the design and giving them the power to guide themselves through the environment, thus creating a completely different and deeper experience than for those who are subjected to a complicated environment where they have to completely rely on maps and signs in order to navigate their way.

If you were to walk into a building which was on a linear axis, and everything was within view from the main corridor, one could create a mental map rather easily, with minimal use of signs. On the other hand, if you were in a building that had numerous wings which disbanded from one another, the map would be harder to form, and the used of signage would be relied on more heavily.

"The signage program is like using a band-aid to patch together a rather large wound" (Calori, Chris 2007)

"We must extend our best effort to employ our creative talents, skills, and knowledge in making the world a better place."
(Calori,Chris 2007)

Although signage can be a very useful thing in some situations, many times it is relied upon much more than the natural senses. We design complicated environments and think that we can guide people around it by simply placing a sign at every corner, instead of taking the time to create an environment which requires mental engagement and attention. Instead of turning firsthand to the use of signage, we as designers should extend our efforts to use our creative talents and knowledge in order to create clearer environments which requires more engagement from its visitors.

By using different design techniques, environments can be more easily navigated and engaged without the overabundance of signage. By creating landmarks such as gateways, portals, or gathering points, visitors can begin to create reference points which they can direct themselves from, and go back to 'restart' if necessary.

By adding additional elements to the landmarks, the designer can create paths which draw visitors in. Visual cues, such as a light at the end of a dark tunnel or window at the end of a long hallway, will entice those walking down the path.

Other elements which could be used to evoke guests include creating a line of sight to an important destination or object, creating objects which help the visitors maintain their orientation, creating intuitive entrance locations, and using lights and sounds. By using the human body as a measuring tool you can use distances, angles, lower or higher ceilings, smaller or larger opening and passage ways, and many other environmental cues to engage and encourage the use of a particular passageway.

Lake Superior

Lake Superior is the head of the great lakes. It irrigates Lake Huron, Lake Michigan, Lake Erie, and Lake Ontario. With the equivalent amount of water to all of the other four great lakes plus three additional Eries, Lake Superior is truly the biggest of the great lakes.

Lake Superior contains 10% of the world's fresh water and is the clearest of the great lakes. On a clear day with unruffled water, you can see a white object at a depth of 120'. Lake Superior is described to be the 'most oligotrophic lake in the world', meaning that the lake receives very little nutrients from its watershed. This affects the plant growth and productivity of the lake.

Lake Superior consists of 3 quadrillion gallons of water (3,000,000,000,000,000), which is enough to flood all of North America and South America with one foot of water. In order to replenish the water which supplies 29% of Lake Huron and Michigan at a rate of 75,000 cubic feet per second, the lake collects water from precipitation, direct runoff, and from any one of the 300 streams and rivers which empty into the massive lake.

Lake Superior has so much water that it would take 6.462 quadrillion (6,462,000,000,000,000) cups of Tang mixture in order to flavor it. In order to counter act the dilution from in-flowing streams and rivers, 95,800,000,00 more cups of the mixture would have to be added to the lake daily.

Lake Superior is the largest lake, by surface area, in the world. The lake has an impressive surface area of 31,700 square miles, and has a shoreline of 2,726 miles, or roughly the distance from Duluth Minnesota to Miami Florida. The deepest point in the lake is 1,300 feet deep, and is located 40 miles off the shore of Munising, Michigan. The Shoal, the dramatic depth change from 1,000 feet to 20 feet in just three miles, is said to be the cause of many disappeared vessels.

Formation

Before the presence of Lake Superior, the landscape was completely different. The horizon was lined with imposing mountain ranges and active volcanoes which spread throughout the region. One billion years ago, the volcanoes opened up and began to violently expel molten lava to great expanses. Molten basalt flowed freely from the mouths of the ferocious volcanoes for over 22 million years, until the force fueling the massive eruptions came to a halt. The land was volatile and unpredictable.

Not long after the volcanic eruptions ceased, the unstable ground beneath began to collapse under the substantial weight of the basalt, causing the volcano to fall inward on itself. As the land sank, sand and mud were collected and pulled along with the crumbling landscape. Rivers and streams began to deposit more sand, creating what are now the Apostle Islands and Bayfield Peninsula.

For a short period after the volcanic activity and the collapsing of the land, warm tropical seas flooded the area. These waters deposited large quantities of sandstone which is visible today in Pictured Rocks National Lakeshore in Michigan. After the seas subsided, the region became subject to massive erosion for about 250 million years, until the land once again became stable.

Two million years ago, the region was repeatedly covered with vast expanses of glacial ice anywhere from 1,000 to 10,000 feet thick. One re-advance completely filled the Lake Superior basin with ice. At the time a rapid retreat of the ice formed Glacial Lake Duluth, Lake Superior, Lake Huron, and Lake Michigan. Once formed, the lakes were connected as one and drained through Des Plains River to the Mississippi.

Approximately 10,000 years ago, the St. Lawrence River valley lowered. This resulted in the dramatic lowering of Lake Superior and Lake Michigan. Crustal rebound gradually raided the St. Lawrence outlet of the great lakes, giving the great lakes their current outline.

Weather

Lake Superior has a major effect on the weather of the region around it. The temperatures around the lake are regulated by the lake itself, making summers cooler, and winters warmer. In the summer, the lake acts like a massive solar collector. The lake stores the energy so that by winter the lake averages temperatures 30 degrees warmer than that of its surrounding watershed.

In the winter, Lake Superior generates what is called lake effect snow. It is an effect where cool winds move across large bodies of water, which increases their energy and moisture. Once the winds get to land, the contained moisture cools and crystalizes, and is then deposited over the region. The lake effect snow usually penetrates inland as narrow fingers reaching up to 30 miles from the lake.

With areas further inland seeing the most of the snow effects, the towns which are right off-shore see reduced amounts of snow in comparison. Duluth may only see an average of 55 inches of snow in a year, whereas the Keweenaw Peninsula averages 200 inches of snow.

Winter is not the only time in which the lake has an effect on the region. In the summer the lake reduces thunderstorms and severe weather. With a layer of stable air, or 'marine layer,' over the lake, damaging winds and tornadoes are repelled or significantly reduced. In the fall, the lake brings what is called northeasters. These are gale force winds and rains which occur when a low pressure system passes over the lake. In many instances, these northeasters seem to occur suddenly, and were the cause of most of the 350 shipwrecks on Lake Superior.

Animals

Lake Superior islands and peninsulas are homes to many different animal species. For an animal to gain residency on one of the islands, they would have to have flown, swam, or crossed the lake in the winter months when the ice was strong enough to support them. As for the peninsulas, a funneling effect has taken place. Species which survive on the peninsulas found the entrance with relative ease, but had a hard time finding the same path to the main land.

Because of the lake's expansive size, birds seem to be reluctant to fly over the open lake, causing a similar funneling effect with birds of the region. During migration, birds such as hawks and some songbirds, which travel by day, follow the peninsulas out into the lake, and hop from island to island, until the outer-most island. The birds either have to turn around and make their way back, or stay on the island. During the spring and fall, the Apostle Islands are alive with hawks and songbirds in the middle of the annual 'U-turn'.

Jobs

During the 1800 and 1900's Lake Superior was an immensely busy place. Between the mining, logging, shipping, and fishing, everyone had a job of some sort. Miners were working just about around the clock extracting iron ore, sliver, and other metals and transporting them to ports located on Lake Superior. Once the ores and materials arrived at the ports, they were loading into ships so they could make their journey on Lake Superior in order to make it to market or to manufacturing.

Along the same times as mining, logging was also a major industry in the area. Logs would be cut and placed in the rivers to make their way to sawmills. Many of the logs found their way into Lake Superior where you can, even today, see remains washed up onto the shores.

Lake Superior is home to upwards of 80 different fish species, which brings in jobs for fisherman. Throughout the last two centuries, Lake Superior has been severely over fished, resulting in only 5% of the high-valued fish species the lake once had still surviving.

Lake sturgeon is the largest and longest-living fish in Lake Superior. They can get up to 9 feet long and 400 pounds, and live up to 150 years.

Research Summary

With all of the research that I conducted for my thesis, I found that my theoretical premise/unifying idea is actually rather viable. With the information and experience that I have collected from both books and supplementary sources, such as existing built environments and from others around me sharing their understandings, I have become even more eager to see what the final outcome of the project is going to be.

Looking at the signage research, I found that there are many different kinds of signs, with many different reasons for their usage. When the signs were first being introduced, there was a definite purpose and need for them; however, I think that over time the purpose which the signs once assumed has become clouded and misleading. The use of signs has become overabundant and mishandled, which I think has led to poor design work, or vice versa.

When looking at the different kinds of signage, there are some which cannot or should not be cleared from design. Signs which depict warnings and dangers of and environment, regulatory and prohibitory signs with regulate behavior, and honorific signs which bestow honor to those associated with an environment. Though I don't think that these signs should be completely taken away from a design, as the others should, they should be given much greater thought then what they currently are. There are better ways to show the information, than to glue a piece of plastic up to the wall. Information could be illustrated in other mediums such as flooring, wall coverings, or the like.

With the signs that we presently place in environments, we are overloading ourselves with information. As before, I used the example of the "no passing" signs which you find on any given road in the US. I find that to be an over-load on the senses. Not only are you trying to concentrate on the road and all of the hazards which come with it, you are also trying to read every road sign which is passed, thus taking attention off of the road. Why are there signs being put up to tell us something in which the painted lines on the road were already informing us of? It is an information overload and an extreme abundance of information.

The research that I did on Lake Superior was not only very interesting but also rather important to my project. My project, being located on the dock which protrudes into the lake, has to take the site into high consideration.

Lake Superior is a place with has a great history. Evidence of its antiquity can be seen everywhere, from its rugged shores and waterline to every mature town which resides on its banks. The presence of the lake has affected many lives and brought many memories whether of good times or of hard times. Many memories of Lake Superior's prosperous history have begun to fade with the passing of time. You can no longer see newly-sawn logs floating on the lake, large fishing boats are scarce, and magnificent dock superstructures are now crumbling to pieces or have been demolished.

With everything Lake Superior has given, whether it is food, jobs, transportation, the beautiful shoreline which exists today, or any one the numerous manifestations which have arisen from the mist, preservation of these thriving times should be a manner of importance to many.

Milwaukee Art Museum, Milwaukee Wisconsin

Case Report

Santiago Calatrava's Milwaukee Art Museum is located in Milwaukee Wisconsin. It was designed in 1994 as an entry for a design completion for a new entrance to the existing museum. Calatrava's 142,050 square foot Quadracci Pavilion was to contain mainly public spaces including a reception hall, auditorium, café, gift shop, parking, and a 10,000 square foot flexible space reserved for temporary exhibitions.

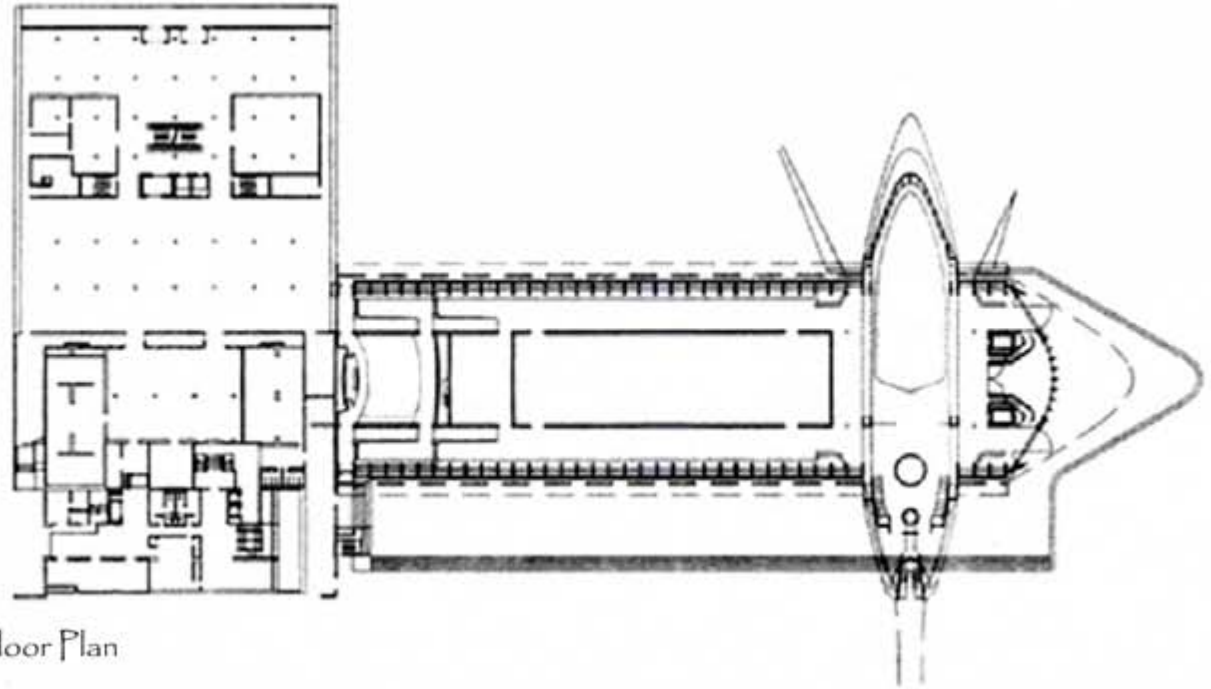
Once inside the museum, you are instantly engulfed in the entire phenomenon which is Windhover Hall. This grand entrance is said to be Calatrava's own post-modern interpretation of a Gothic cathedral, equipped with flying buttresses, pointed arches, ribbed vaults, and a central nave topped with a 90 foot high glass roof. If this spectacular feature doesn't leave you awe-struck, the Burke Brise Soleil are sure to. The most distinguishing feature of the building, the Burke Brise Soleil, or the 'wings' of the
building, was designed as a movable sunscreen. They are made out of 72 fins ranging from 26'-105' and spanning 217'. The fins are equipped with sensors which monitor wind speeds and directions. If a wind speeds exceed 23 miles per hour for more than three continuous seconds, the wings will automatically start to close in order to prevent any damage which might occur from excessive wind speeds.

Before the Quadracci Pavilion was added to the initial structure, which was designed my Eero Saarinen and David Kahler, the museum was created to be a 'hidden' building, built into an embankment along the lake shore. The embankment gave the 'hidden' museum a direct connection with the lake and purposefully left out any visual connections to the city which laid behind it. The Quadracci Pavilion addition was designed in a completely different fashion. The new addition was placed so that there would be a direct connection with downtown O'Donnell Park. With this new direct connection to the city of Milwaukee, which the original building tried so hard to hide from, the 'hidden' building out of hiding and was provided at brand new identity, exactly what Santiago Calatrava wanted to achieve.

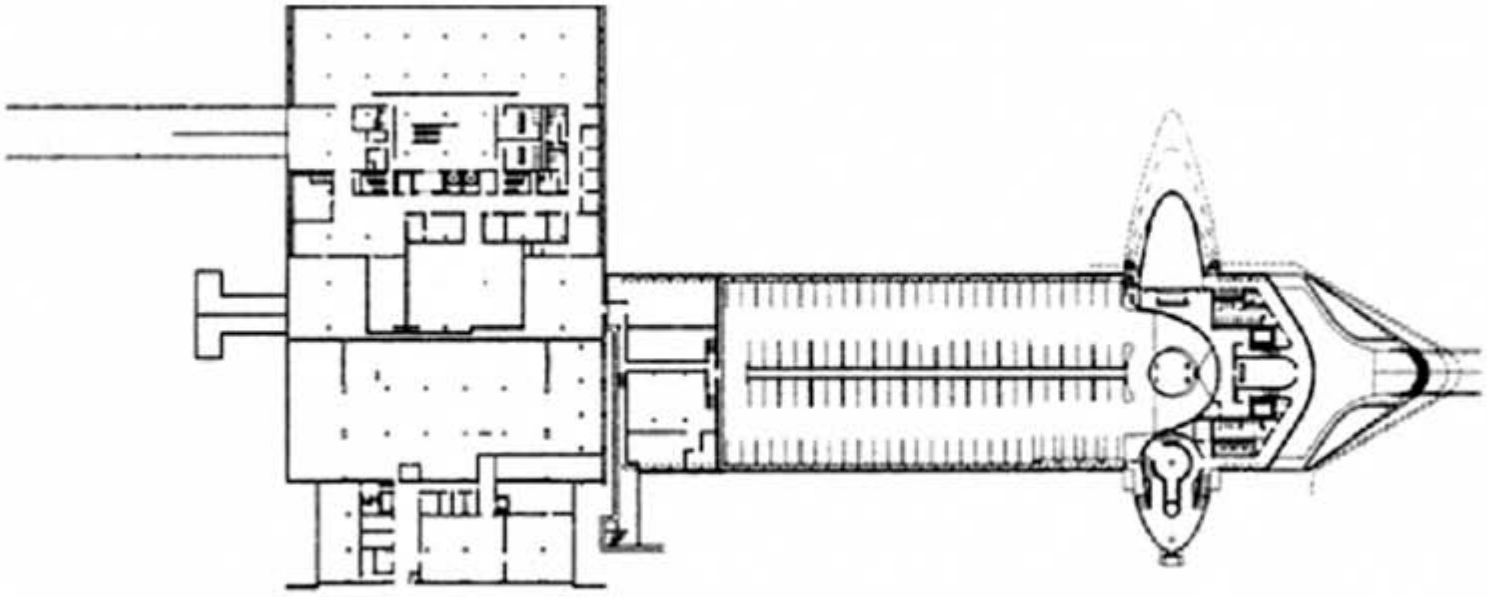
Calatrava took many aspects into consideration while designing the pavilion. He used many organic forms which he then paired with mechanical innovations. These hybrid paired organic forms were inspired by elements which he found directly related to the site, from birds on the site, sailboats on the water, and waves which came crashing to the shore. With intrinsic forms and structurally innovative plans, Santiago Calatrava not only creates a visually stunning design but also an icon recognized throughout the country. Calatrava states that "Rather than just add something to the existing buildings, I also wanted to add something to the lake front. I have therefore worked to infuse the building with a certain sensitivity to the culture of the lake. The boats, the sails, and the always changing landscape."
When comparing Santiago Calatrava's Quadracci Pavilion at the Milwaukee Art Museum with Renzo Piano's Building Workshop: NEMO, and James Stirling and Michael Wilford's Neue Staatsgalerie, I found that there were quite a few similarities. The most obvious similarity being that they are all museums designed by foreign architects, Spanish (Calatrava) British (Stirling/Wilford) and Italian (Piano). From the three case studies, the Quadracci Pavilion and NEMO had the most similarities. Both of these prow-like designs take inspiration from the waterfronts and the cities in which they resided. Besides the shape and connections they both have with their sites, both of the projects require great engineering feats in order to achieve the identities which both of these buildings possess.

Though NEMO seems to be the study which is the closest to the Quadracci Pavilion, Neue Staatsgalerie also has some important similarities as well. There are many great buildings which are the result of design competitions, and the Pavilion and Neue Staatsgalerie are no exceptions. Both of the designs were the winning products of design competitions held. Not only that, I think that they are two of the most recognizable museums.

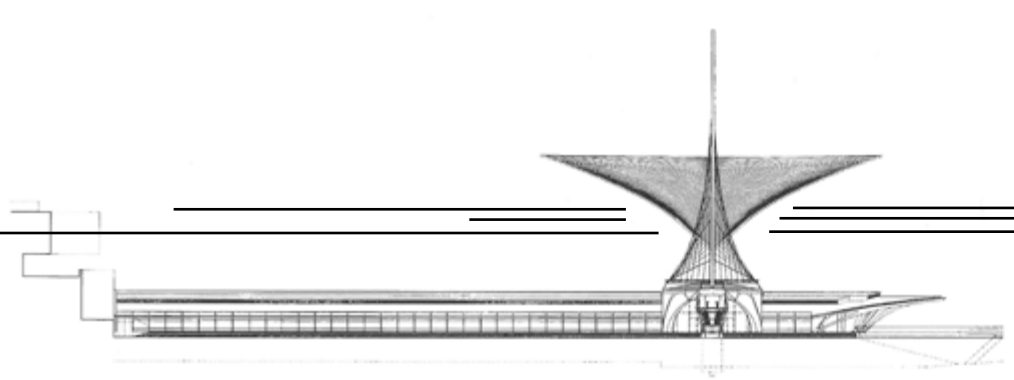
What makes the Milwaukee Art Museum stand out from all of the others that I have looked at is the strong visual elements, which the building is focused around. If it wasn't for the massive 90 foot atrium and the Burke Brise Soleil, I don't think that the museum would be anywhere near what it is today. It is an icon which I think will never be out-done or replaced.



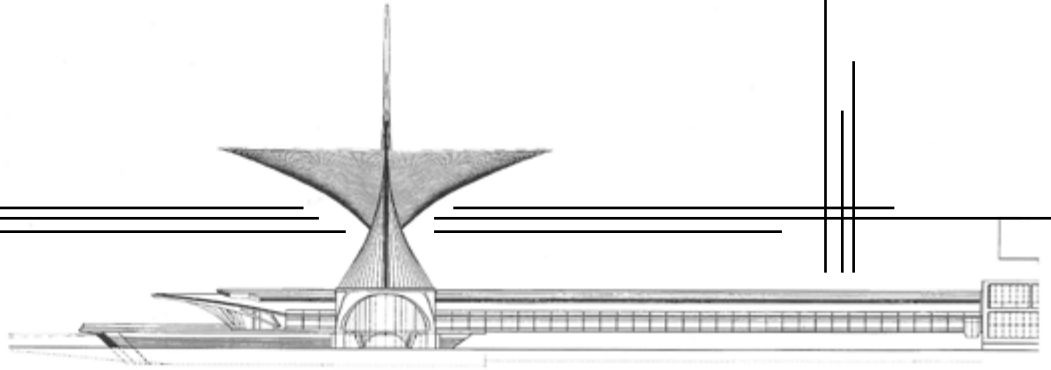
Ground Floor Plan



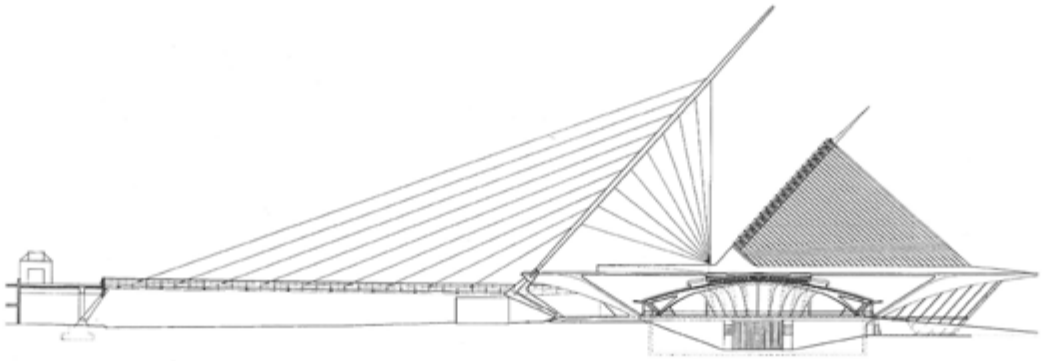
Basement Floor Plan



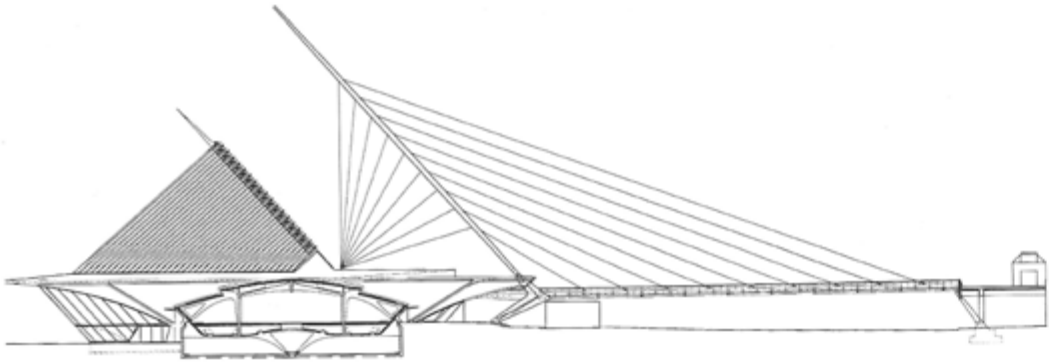
West Elevation



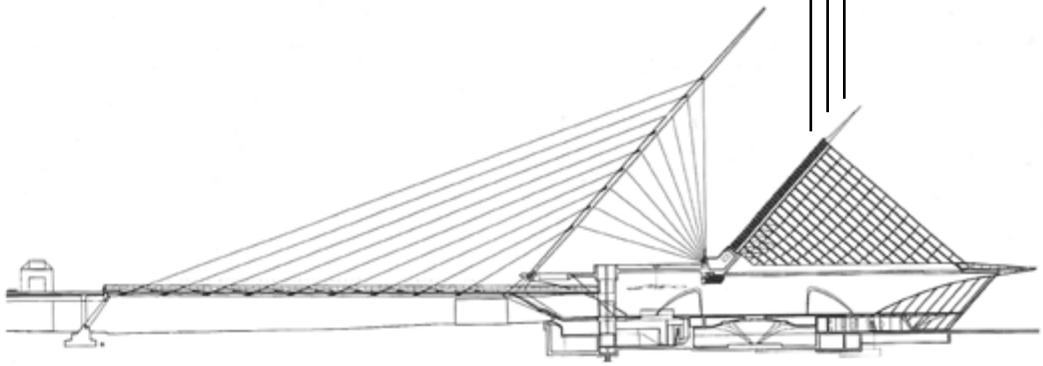
East Elevation



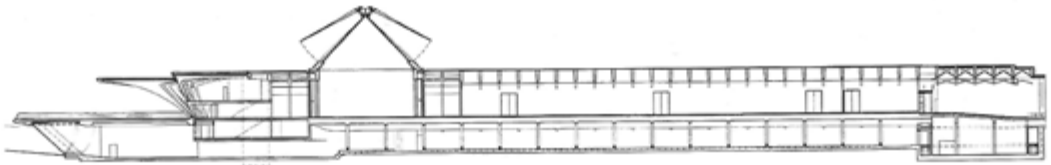
South Elevation



Section Through Exhibit Hall

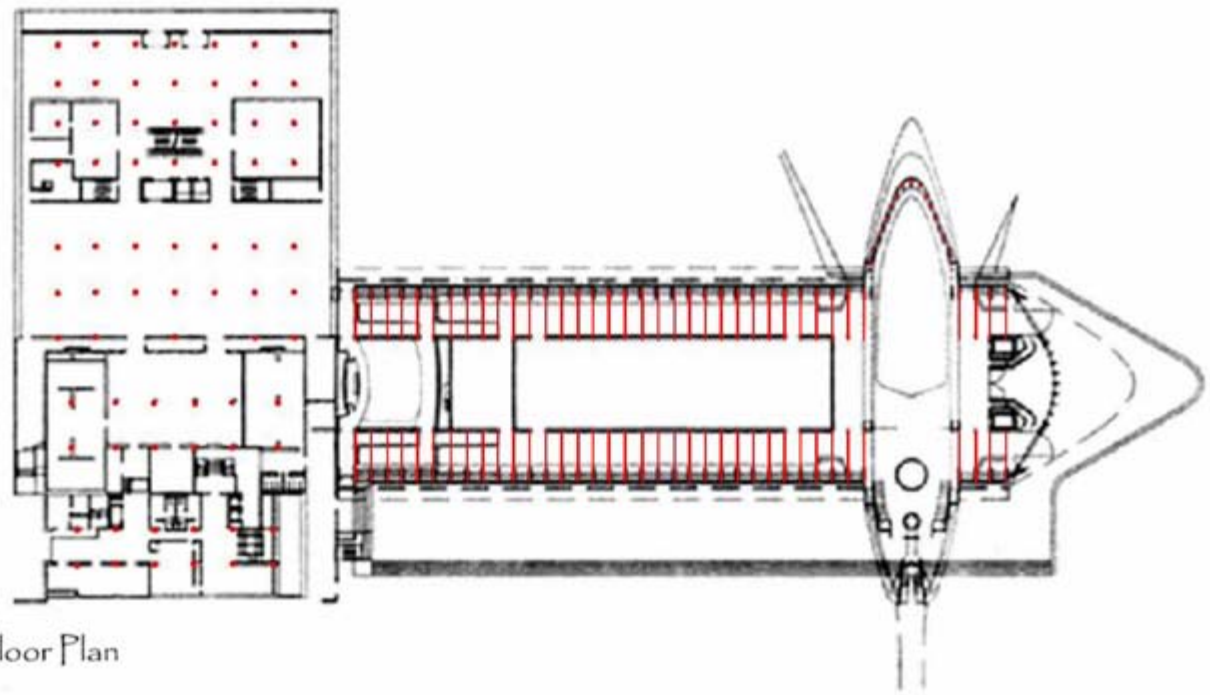


Section Through Reception Pavilion

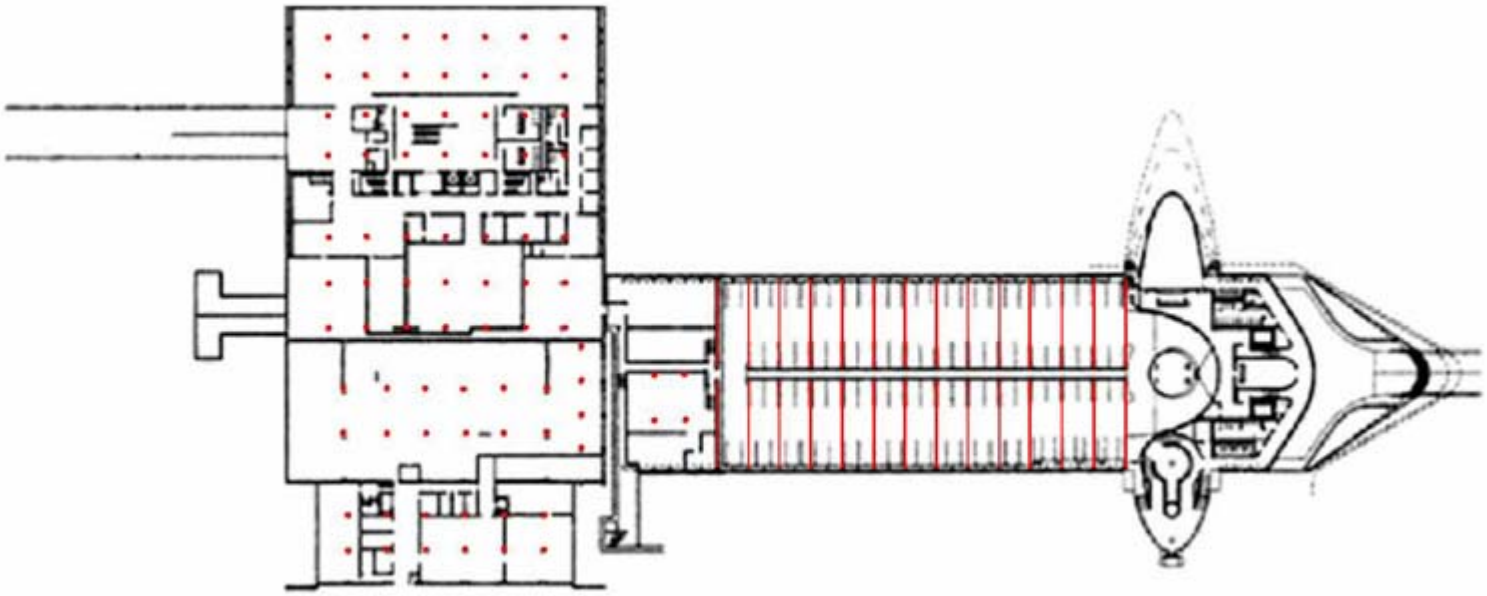


Longitudinal Section

Structure

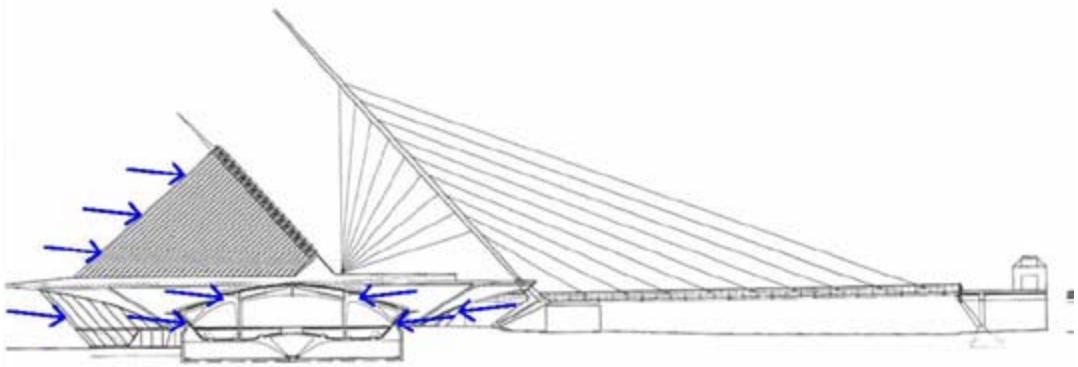


Ground Floor Plan

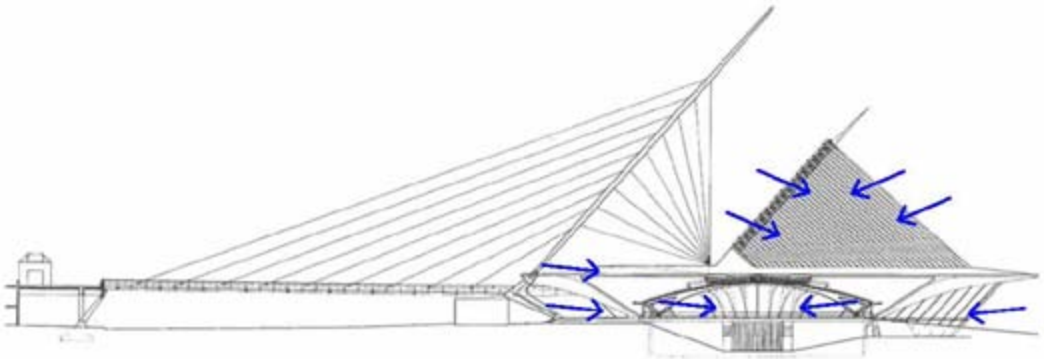


Basement Floor Plan

Natural Light

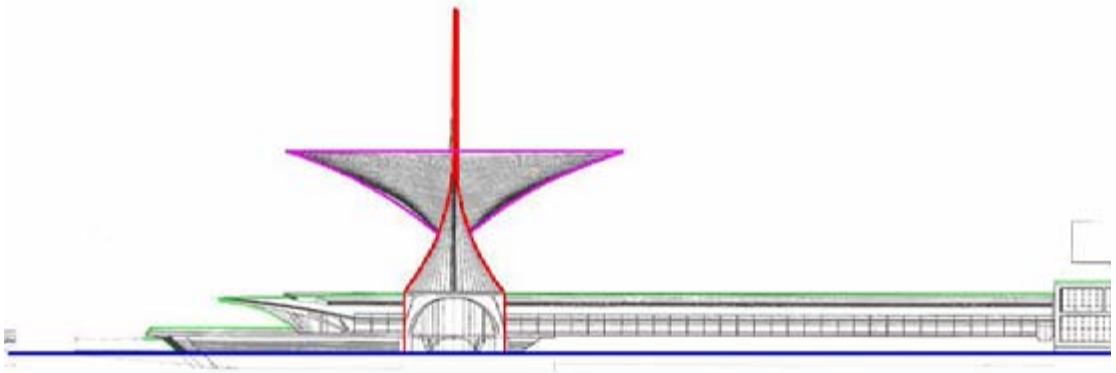


Section Through Exhibit Hall

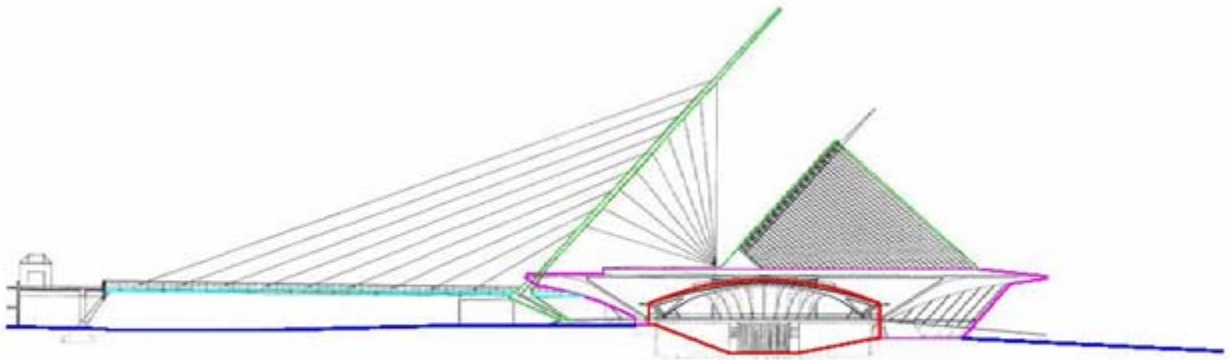


South Elevation

Massing

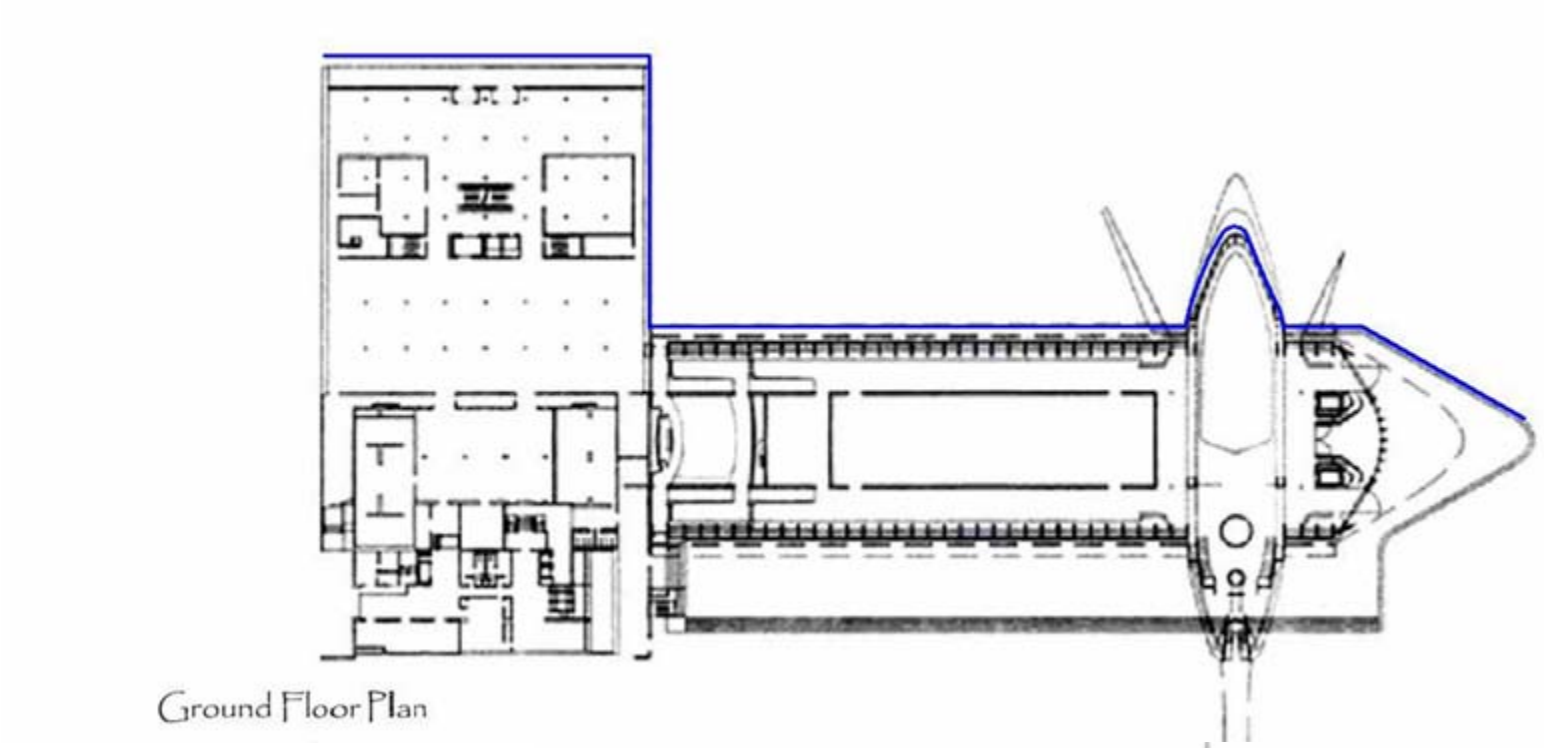


East Elevation



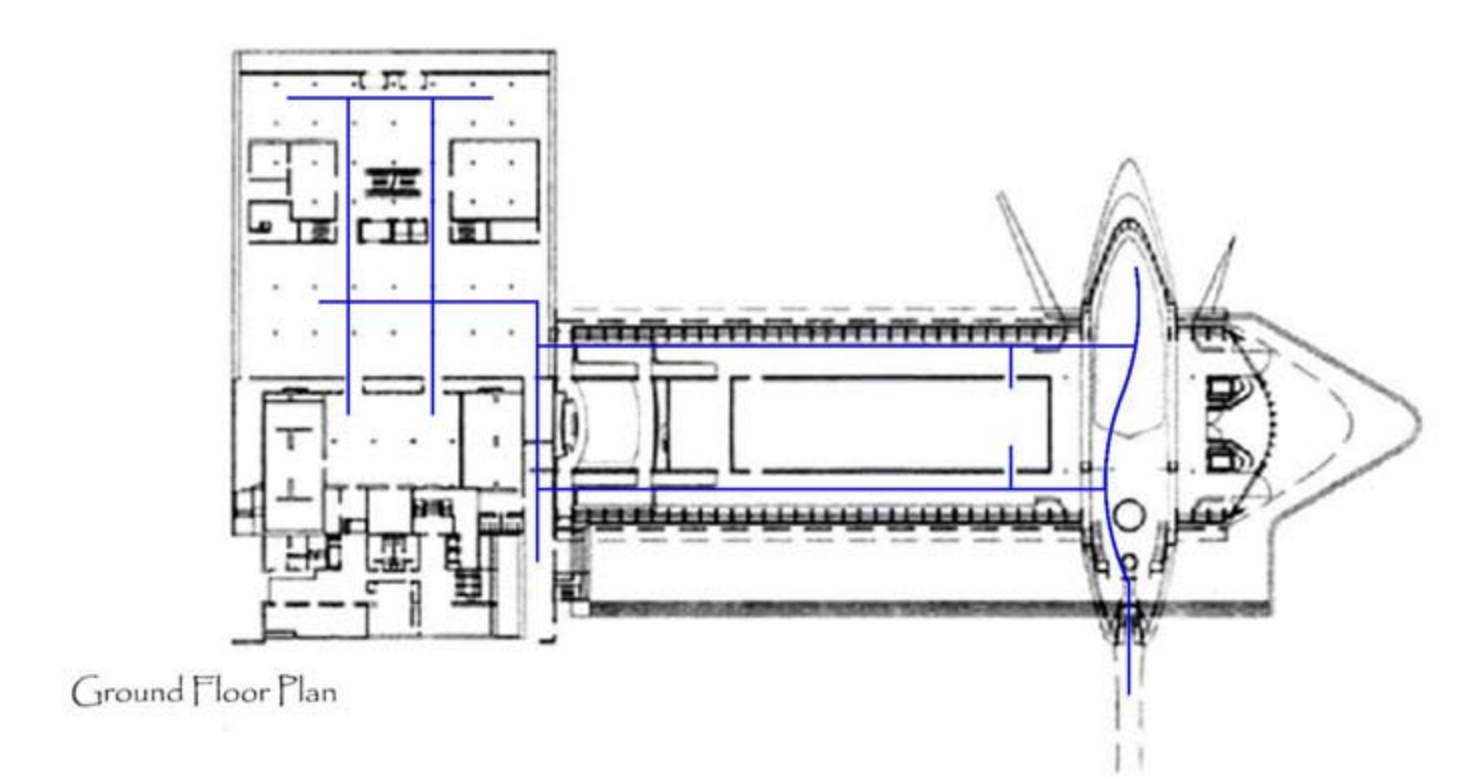
South Elevation

Plan to Section/Elevation

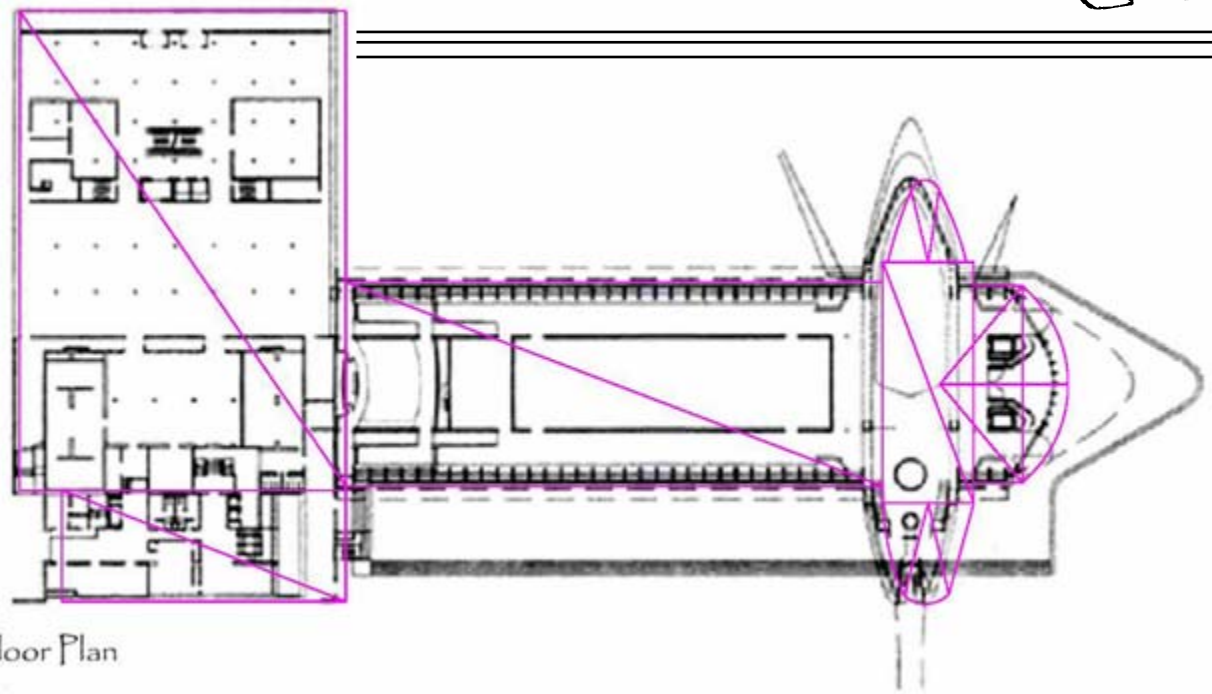


Ground Floor Plan

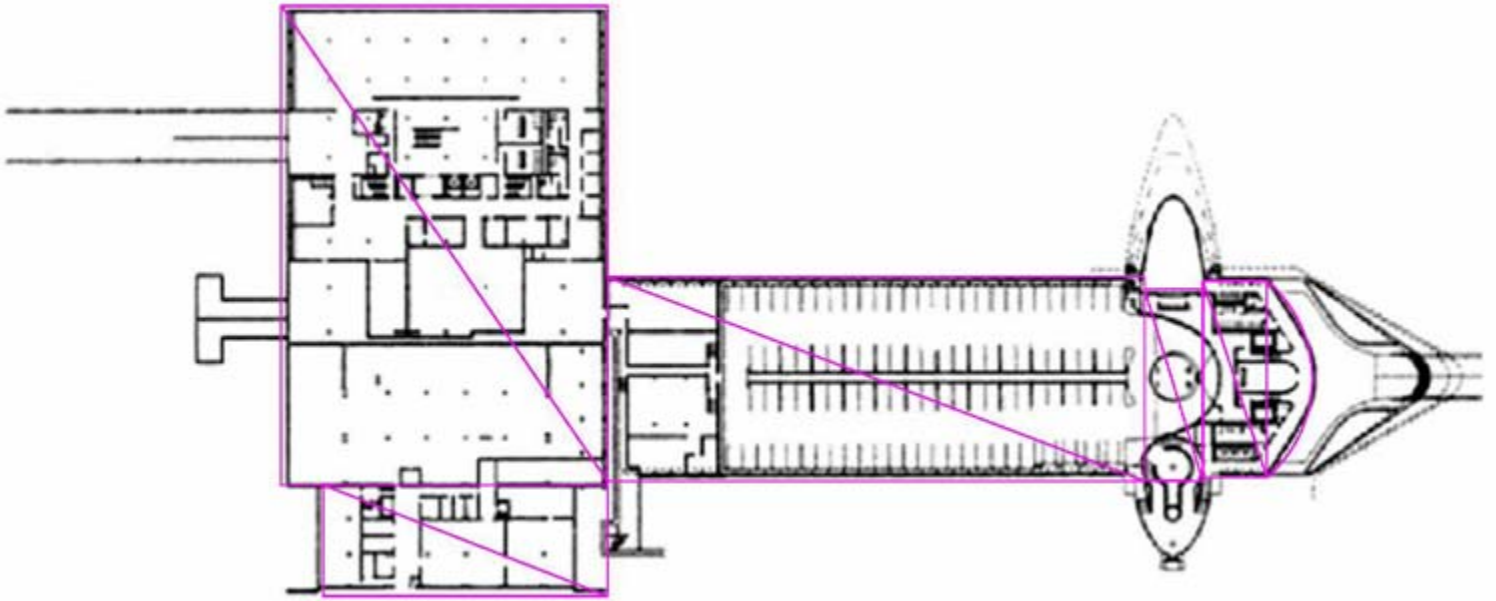
Circulation



Ground Floor Plan

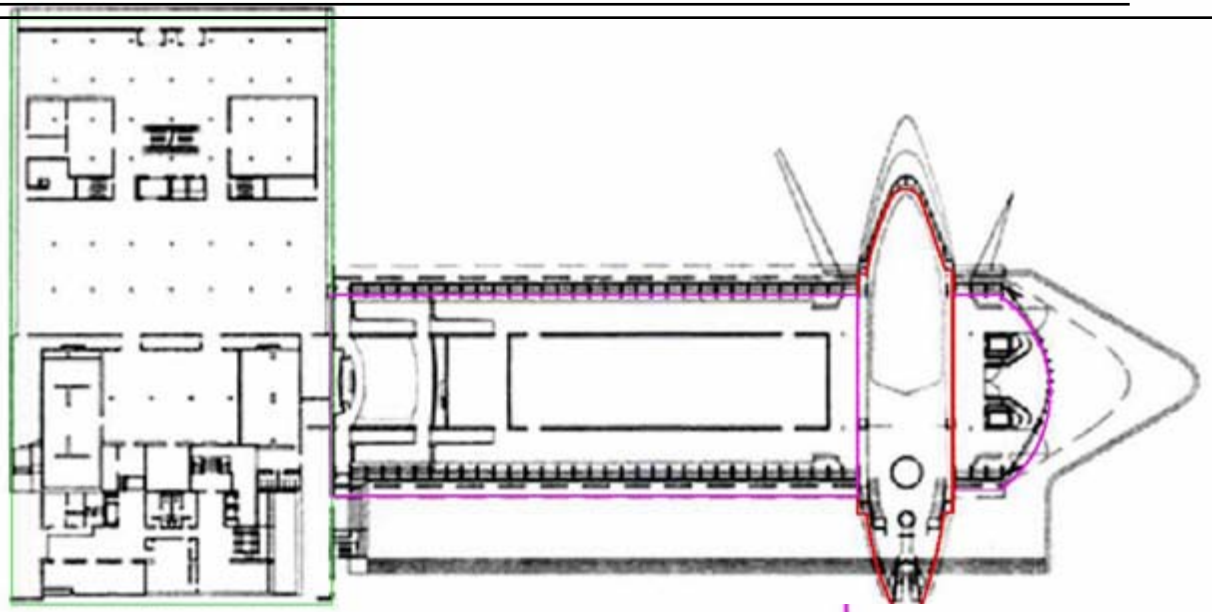


Ground Floor Plan

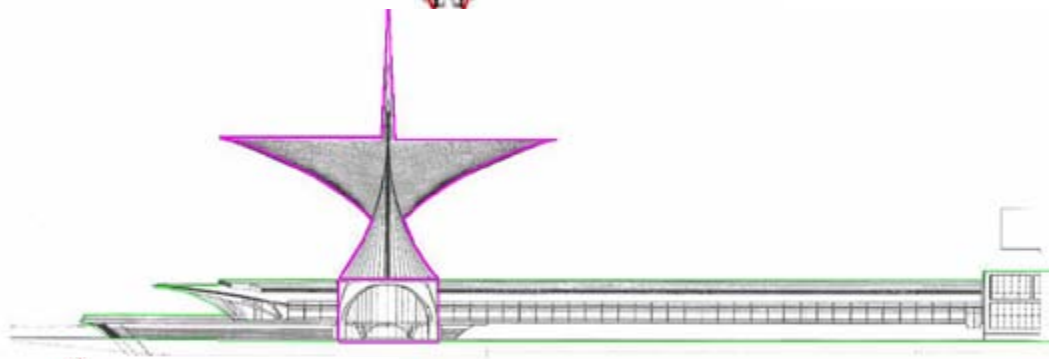


Basement Floor Plan

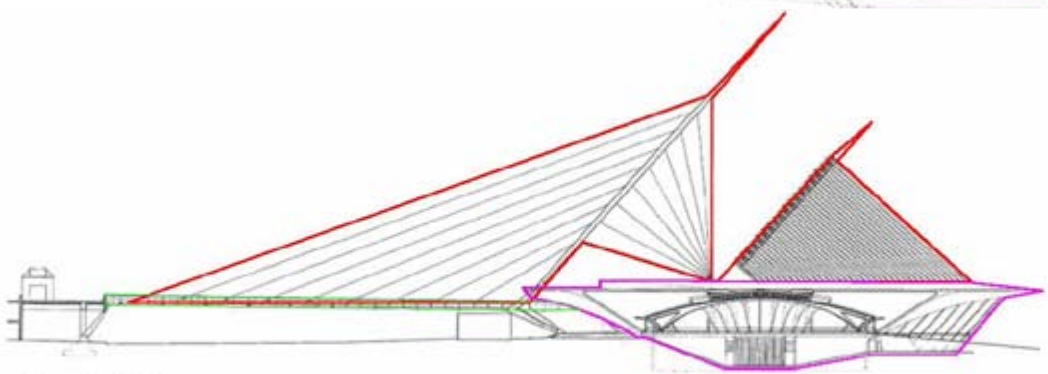
Hierarchy



Ground Floor Plan

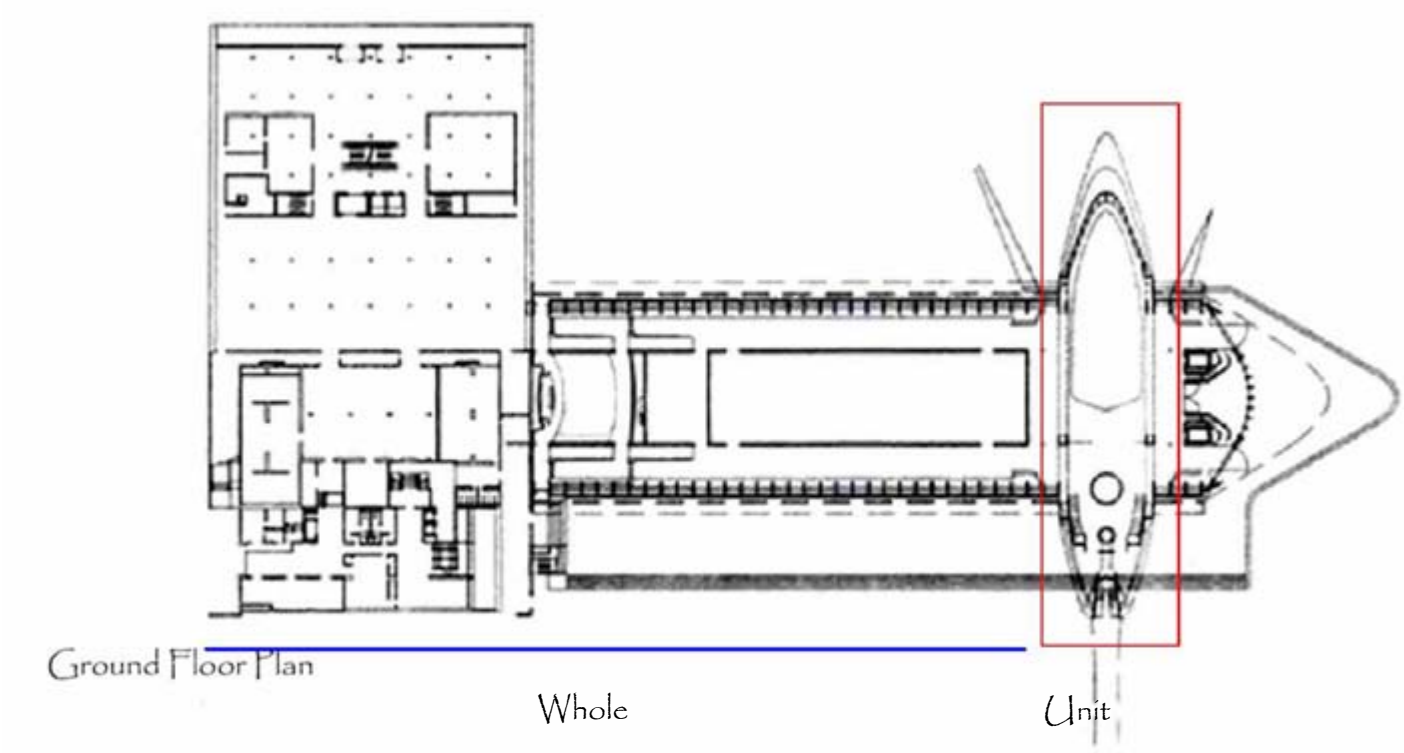


East Elevation



South Elevation

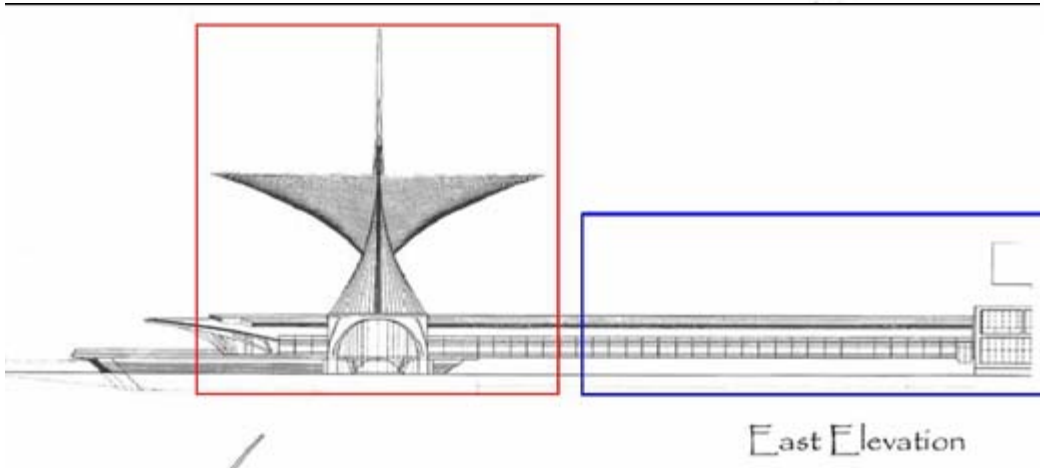
Unit to Whole



Ground Floor Plan

Whole

Unit

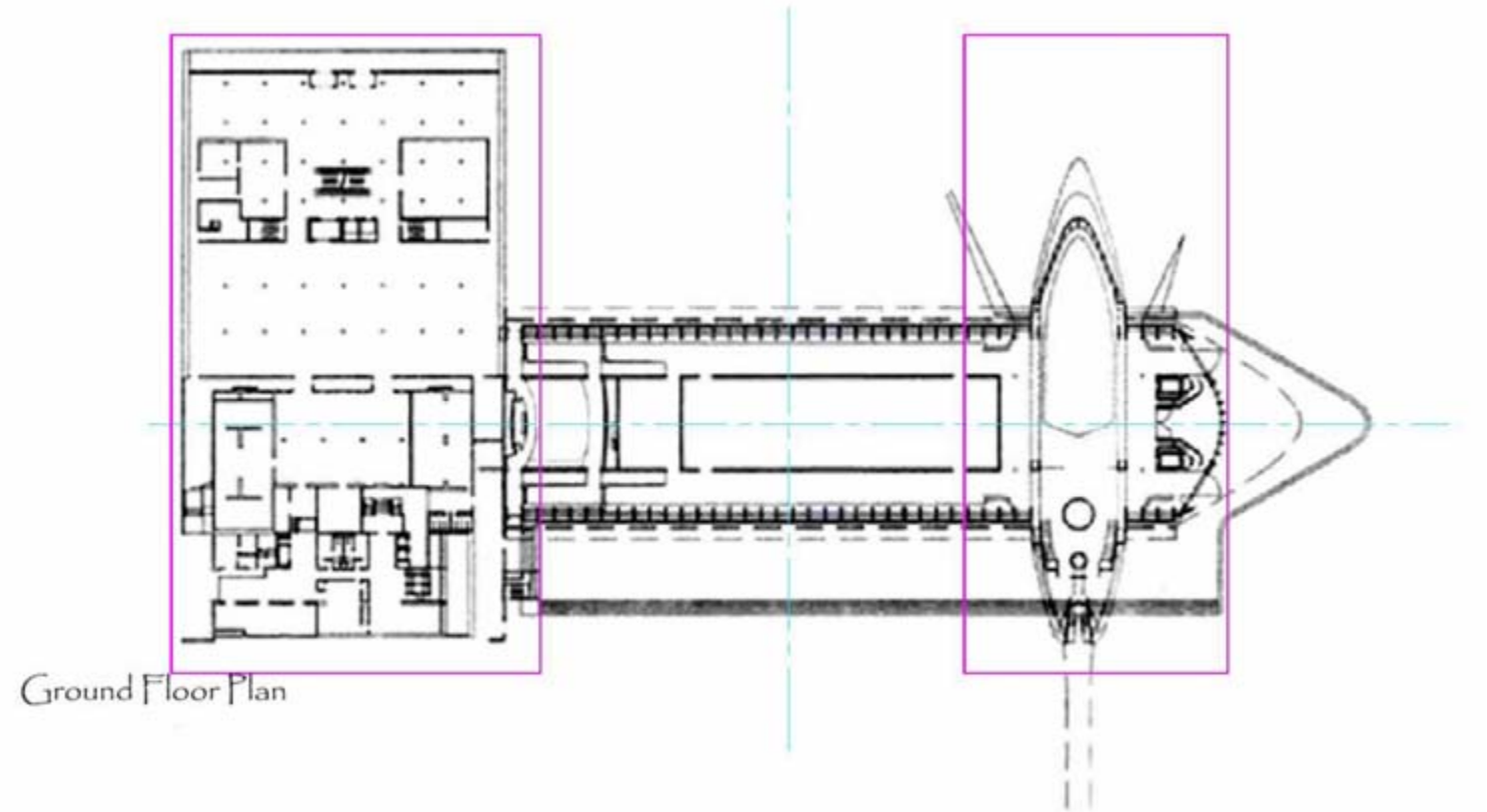


East Elevation

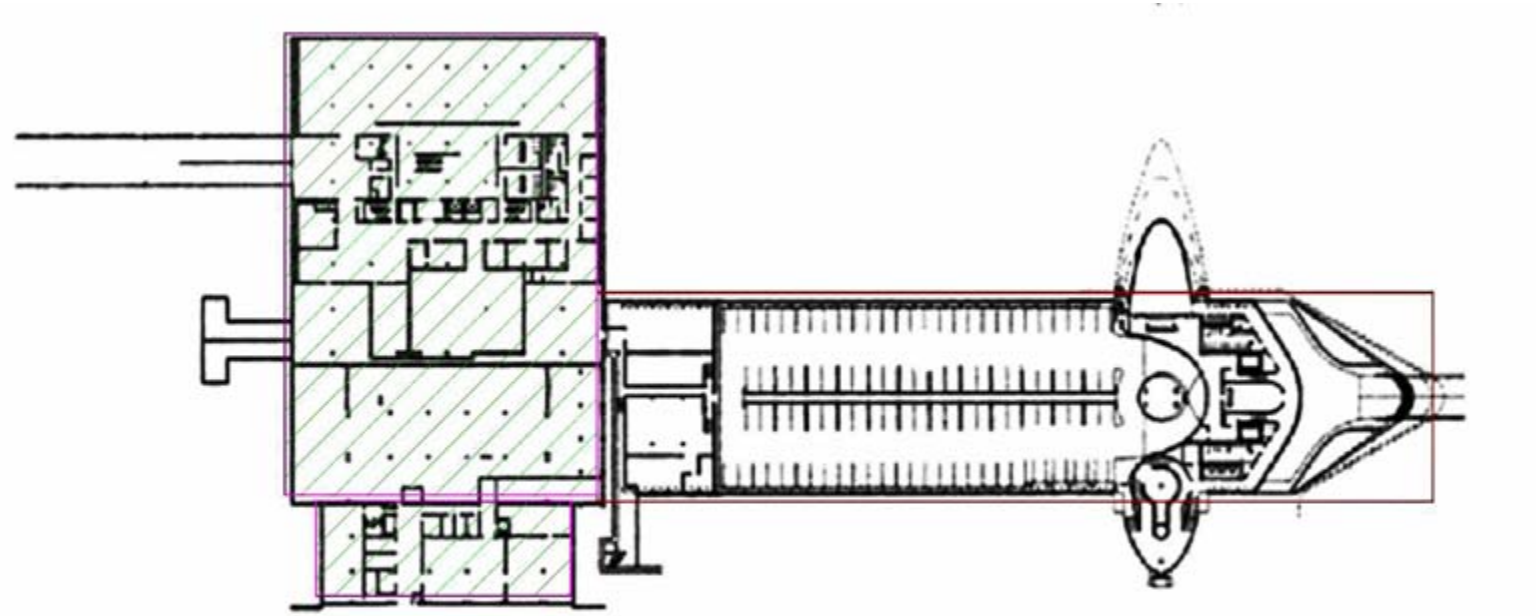
Unit

Whole

Symmetry to Balance



Ground Floor Plan



Basement Floor Plan

Neue Staatsgalerie, Stuttgart, Germany

Case Report

Neue Staatsgalerie, designed by James Stirling and Michael Wilford, is located in Stuttgart, Germany, as part of a museum complex. The Staatsgalerie consists of three different buildings which appropriately reflect the different concepts of the functions of museum architecture. The first building is the Alte Staatsgalerie, designed by Gottlob Georg von Barth, first opened in 1843 as the city museum for visual arts. It was a three-winged building which was originally home to the Royal Art Academy. After thirty-eight years, the building was enlarged with two new wings designed by Albert von Bok.

The second building of the Staatsgalerie is the Neue Staatsgalerie designed by James Stirling and Michael Wilford, which is the building I researched. Plans for the Neue Staatsgalerie were developed in 1961-1967 and again in 1974 as part of a city planning competition. The building was constructed in 1970 and was opened to the public in 1984. This museum is the most visited museum in Germany with around 800 works present in the permanent collection and around 400,000 prints, drawings, and photographs within the special collections.

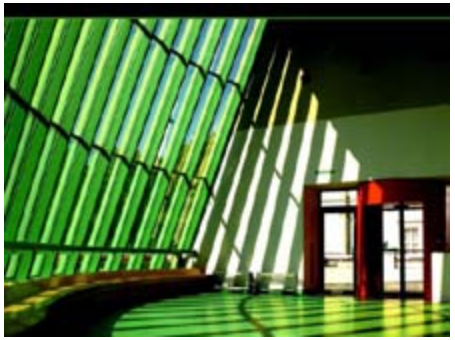
The third Staatsgalerie building is a five story addition to the Alte Staatsgalerie, designed by Basle architects Winfrid and Katharina Steib. The addition houses the library, study centers, offices, restoration workshops and the department of prints, drawings, and photographs.

When creating the plans for the Neue Staatsgalerie portion of the museum, Stirling wanted to keep emphasis on elements present in classic museum architecture, such as the rotundas, gables, and entablature, or classical temple construction. Inspiration for the design came in part from the temple of Hatshepsut at Der el-Bahari, the Acropolis in Athens, and the Altes Museum in Berlin. Along with encouragement from these buildings, Stirling also wanted to reflect the original three winged design of the Alte Staatsgalerie, while at the same making the building an aesthetically complete work of its own. The most prominent feature in Stirling's design is the central circular space located in the center of the axial plan. The circular atrium, reminiscent of the Pantheon in Rome, is an outdoor enclosed space, which Stirling described as a 'room-like non space", which allows visitors to stroll through the building and enjoy the sculpture garden which is housed there.

http://dome.mit.edu/handle/1721.3/22917

http://designology.tk/die-neue-staatsgalerie-stuttgart-james-stirling-1982/

Another feature which James Stirling integrated in the design is identifiers which help guide the guests to points of circulation. These identifiers, such as the pink and blue hand railings, are present throughout the entire building.

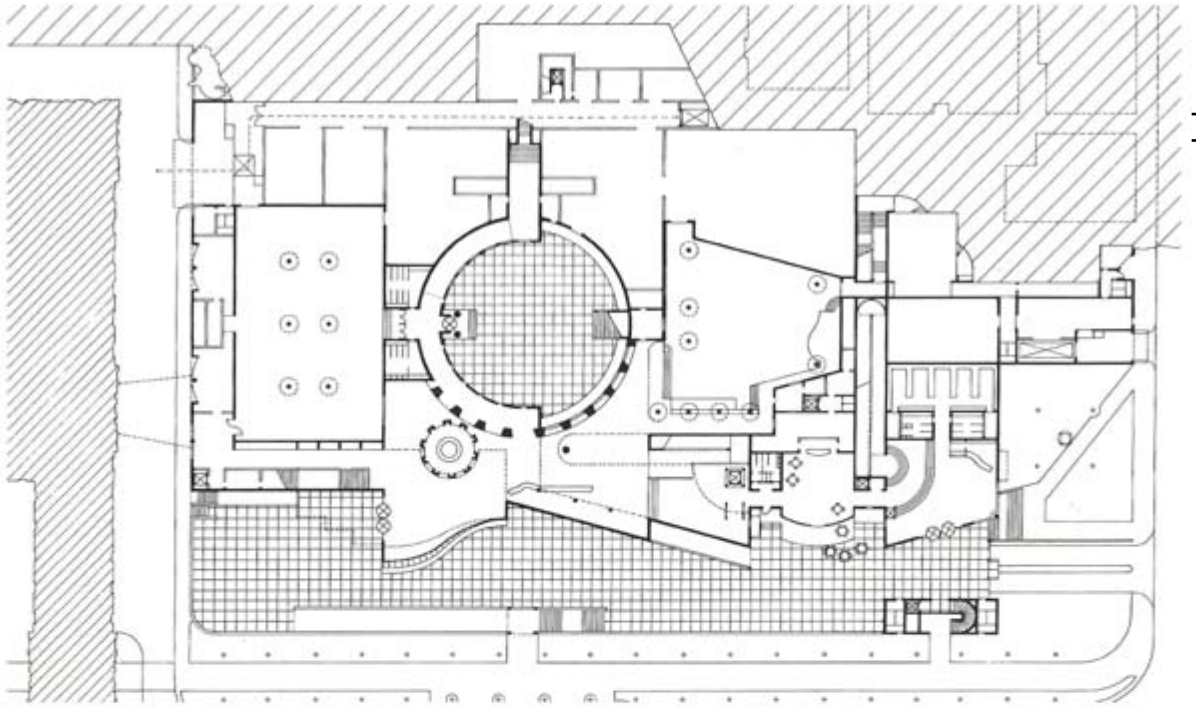


http://view.stern.de/de/picture/Stuttgart-Eingangsbereich-Staatsgalerie-Linien--Licht--Schatten-1602057.html

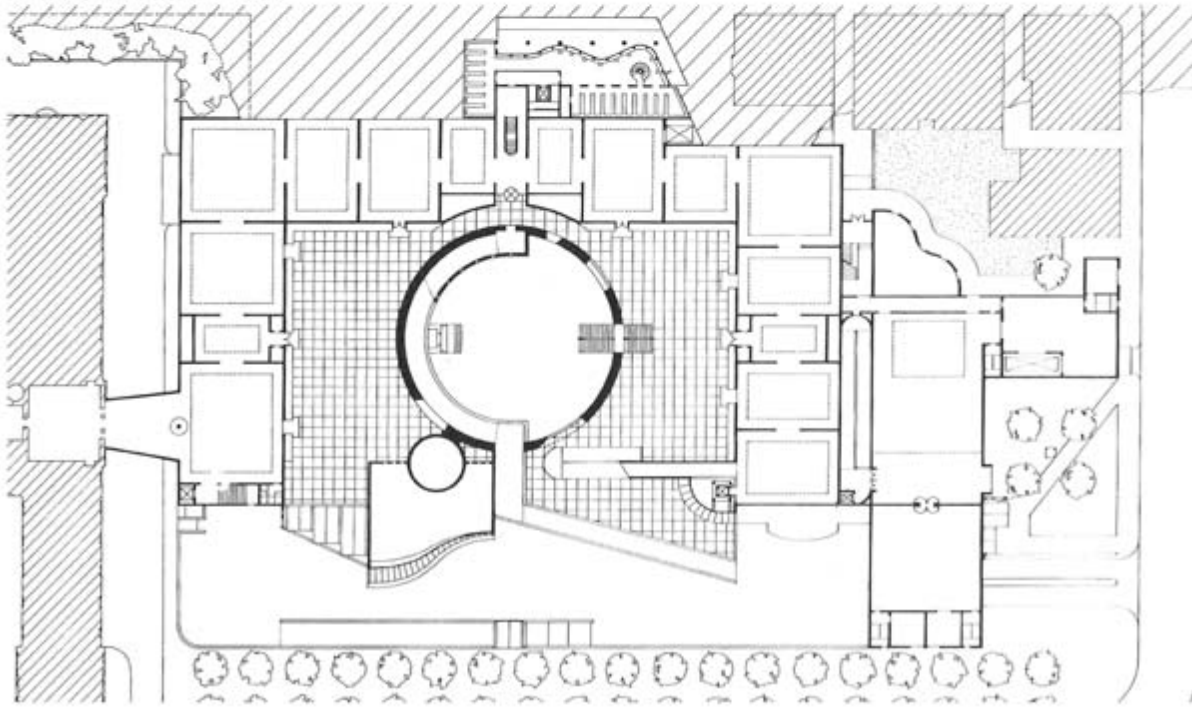
When comparing James Stirling and Michael Wilford's Neue Staatsgalerie in Stuttgart, Germany, with Renzo Piano's Building Workshop: NEMO, and Santiago Calatrava's Quadracci Pavilion, I found that there were a few similarities. All three of the museums have a very strong key element to their designs. In Stirling's Neue Staatsgalerie, the central circular 'room-like non space' along with the undulating curtain wall are the major components. In Calatrava's addition to the Milwaukee Art Museum, the key element is the 90 foot atrium and the Burke Brise Soleil which is attached to it. As for Renzo Piano's NEMO, I think that the thing which makes this building stand out is how it is built on top of the IJ tunnel, and is completely surrounded by water. Without these key distinguishing elements in the buildings designs, they would not be as iconic or memorable as they are today.

http://www.quondam.com/31/3164.htm

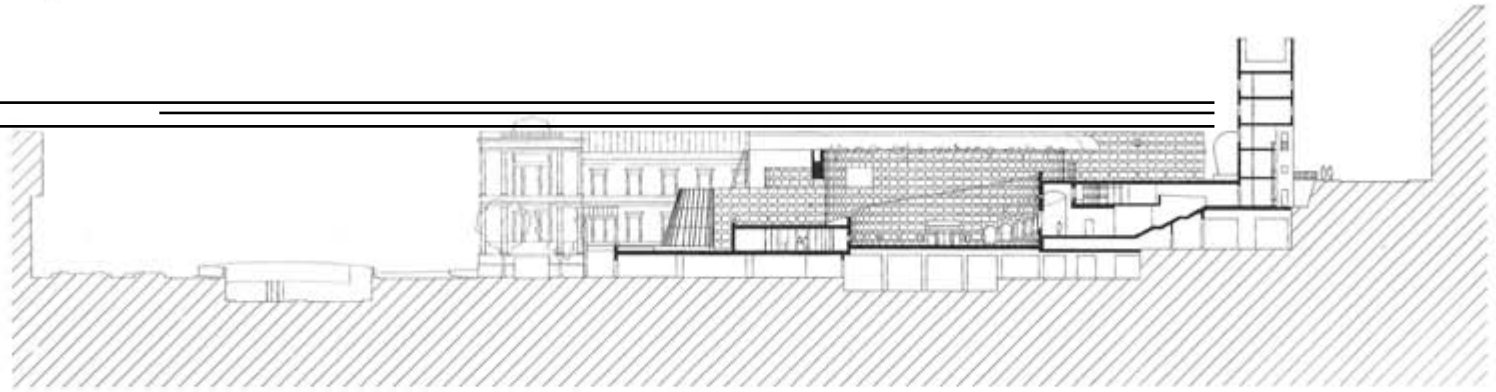
Other similarities in the projects include the use of natural lighting within both Stirling's and Calatrava's designs. Stirling's museum design contains numerous skylights and windows to let lighting in, whereas Calatrava's pavilion design includes an atrium 90 feet tall which floods the space with natural light. The small punched windows and light well which Piano centered the design for NEMO around does not let in nearly as much natural lighting as the other two, however, the indirect lighting gives the spaces a much more unique feeling.



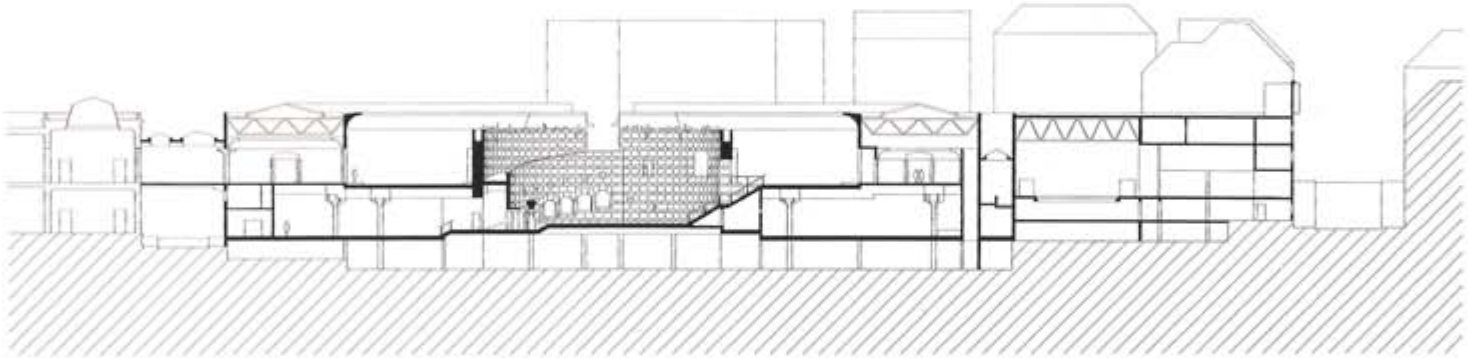
Ground Floor Plan



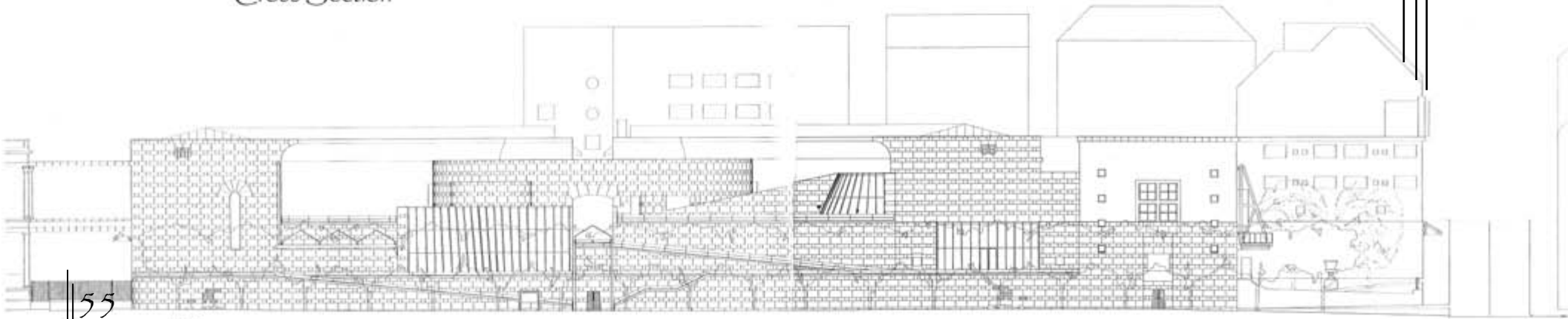
First Floor Plan



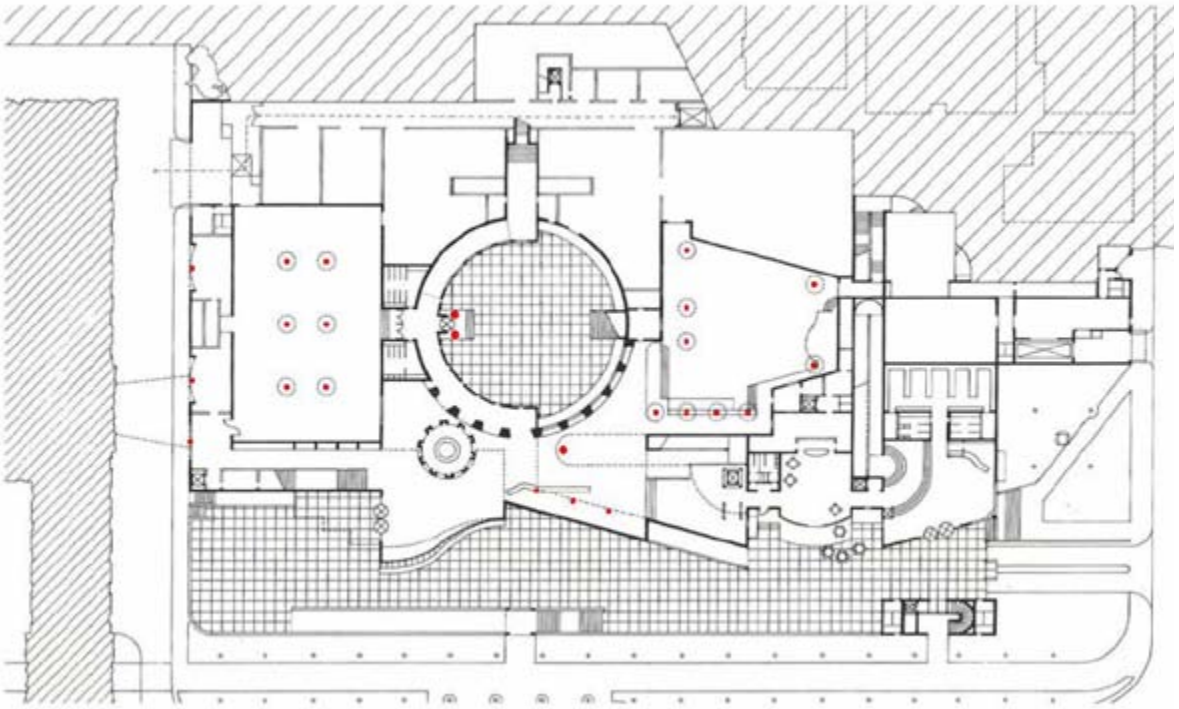
Longitudinal Section



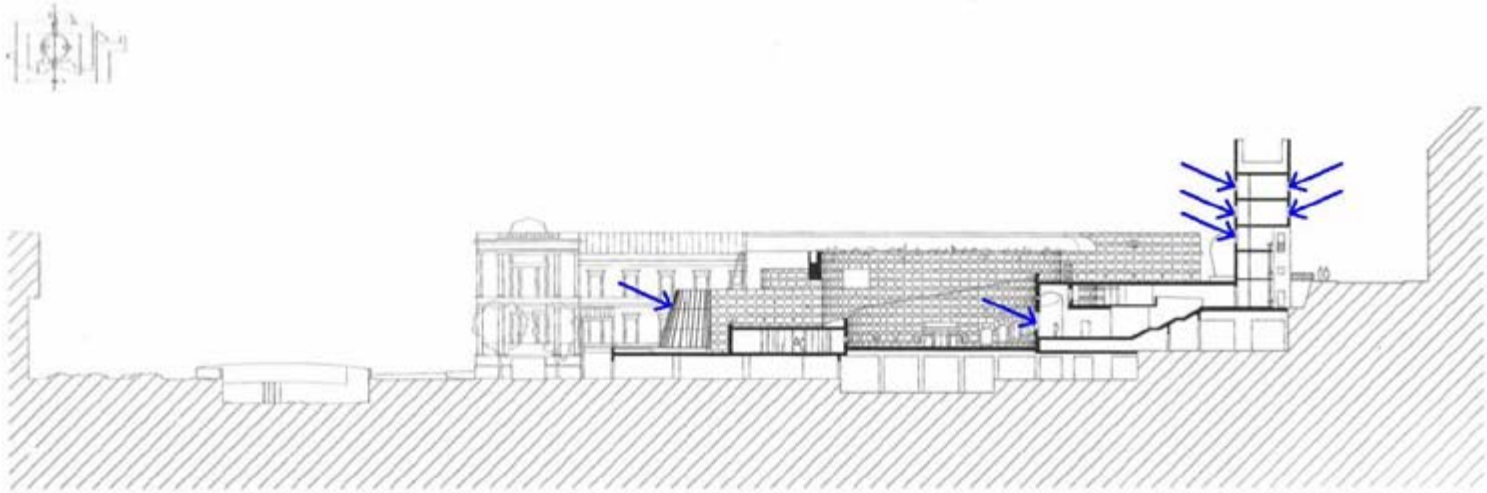
Cross Section



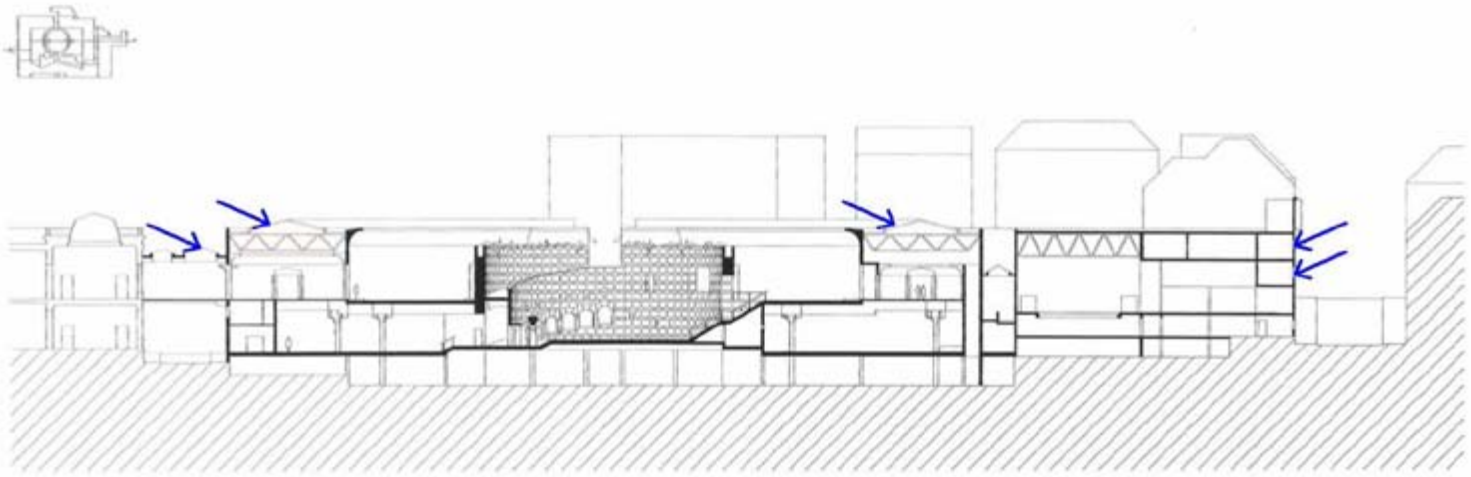
Entrance Elevation



Ground Floor Plan

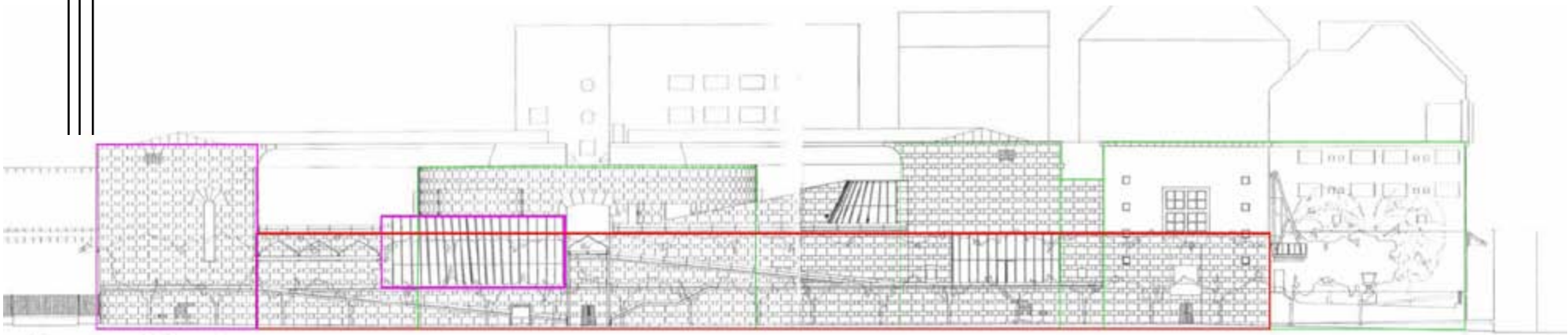


Longitudinal Section

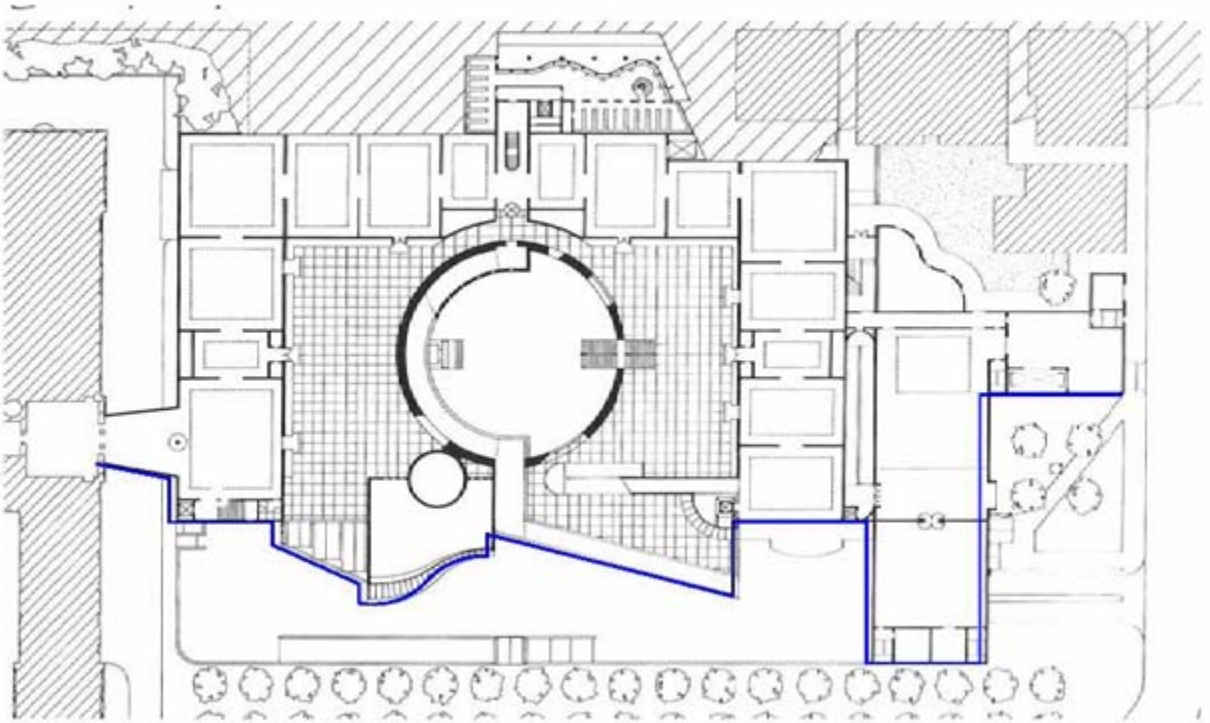


Cross Section

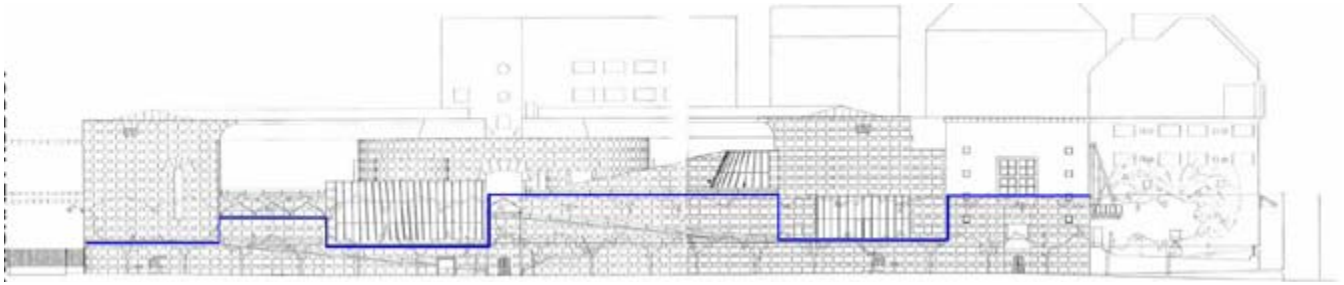
Massing



Entrance Elevation

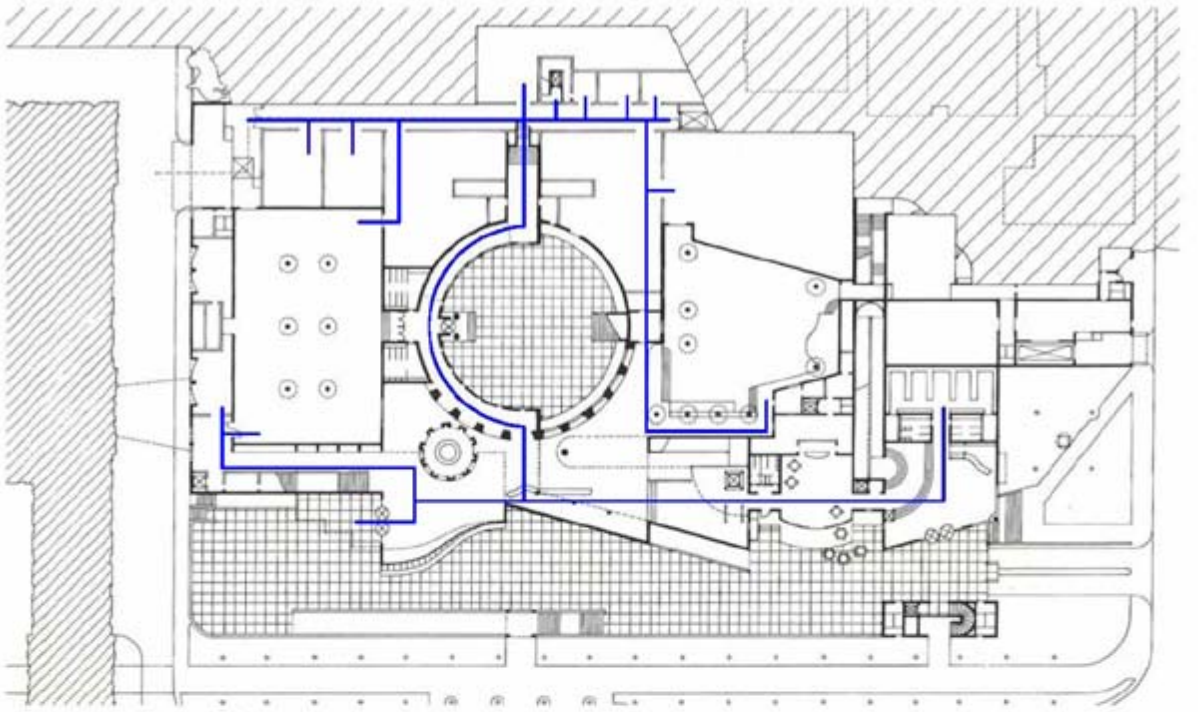


First Floor Plan

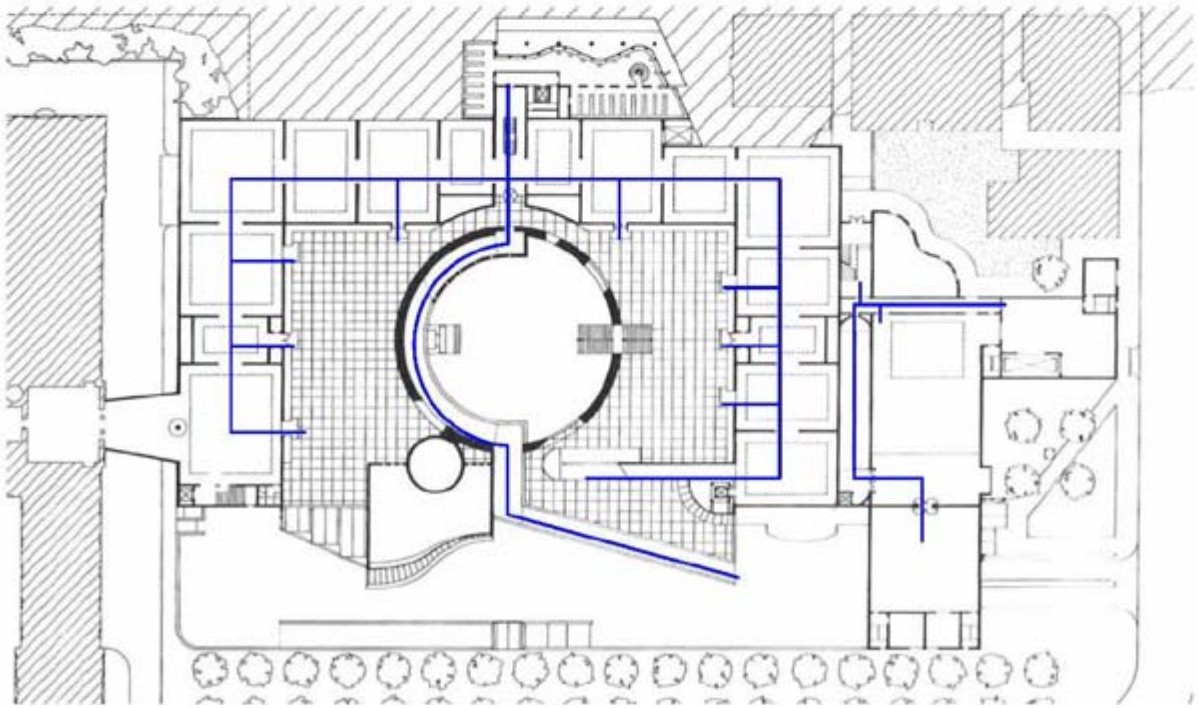


Entrance Elevation

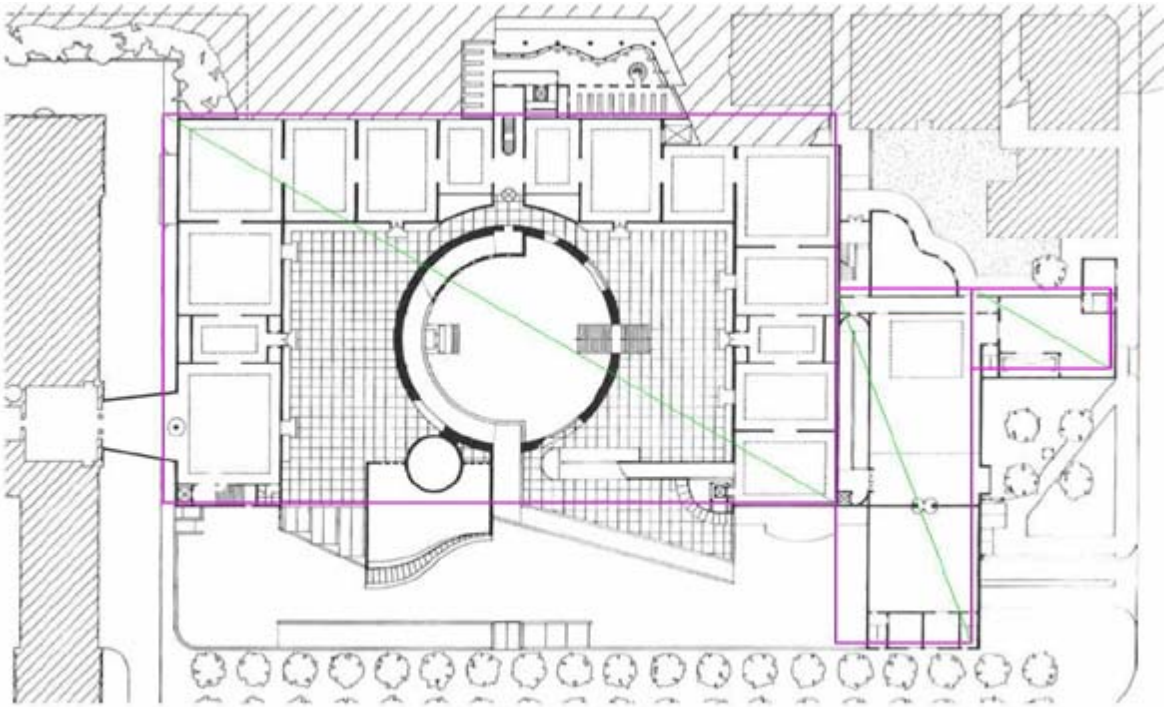
Circulation



Ground Floor Plan

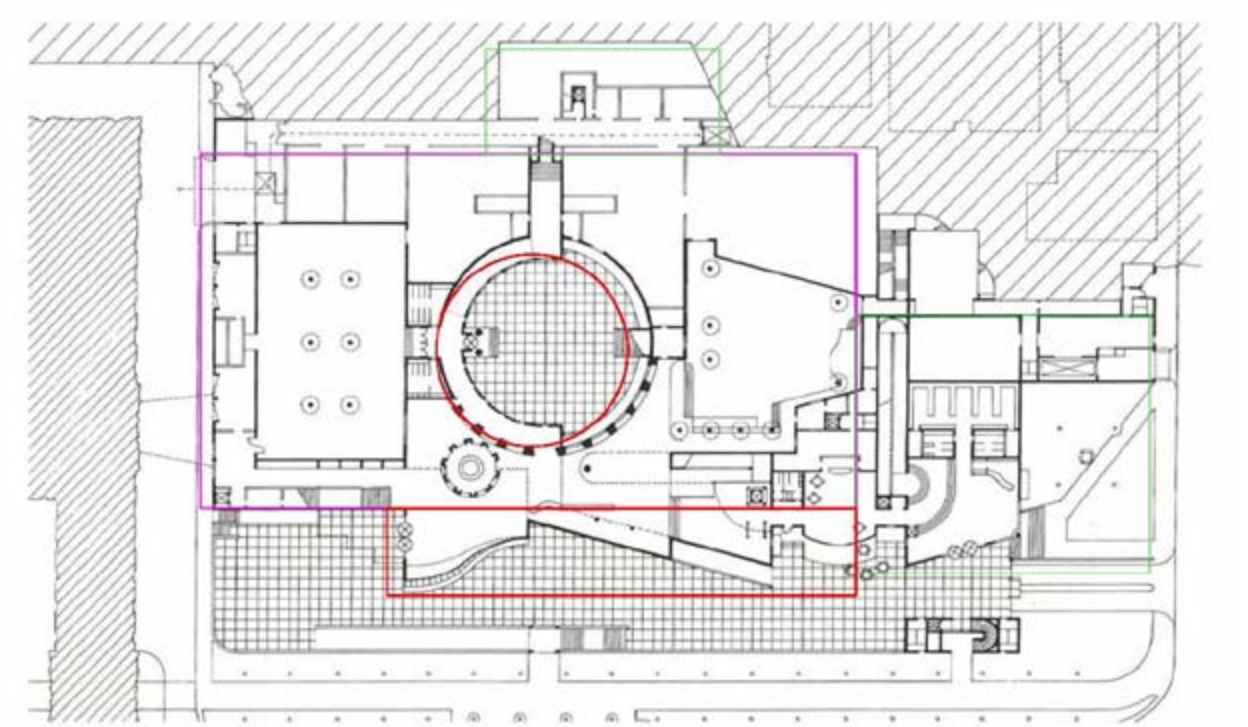


First Floor Plan

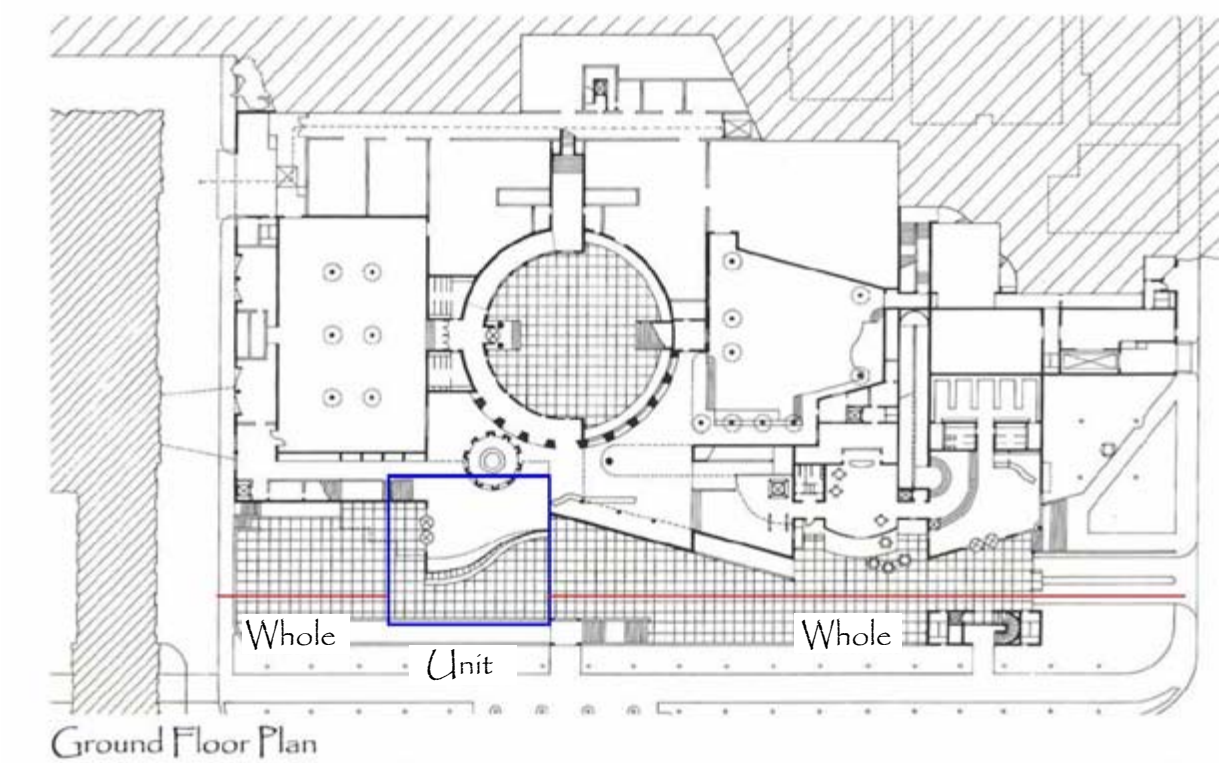


First Floor Plan

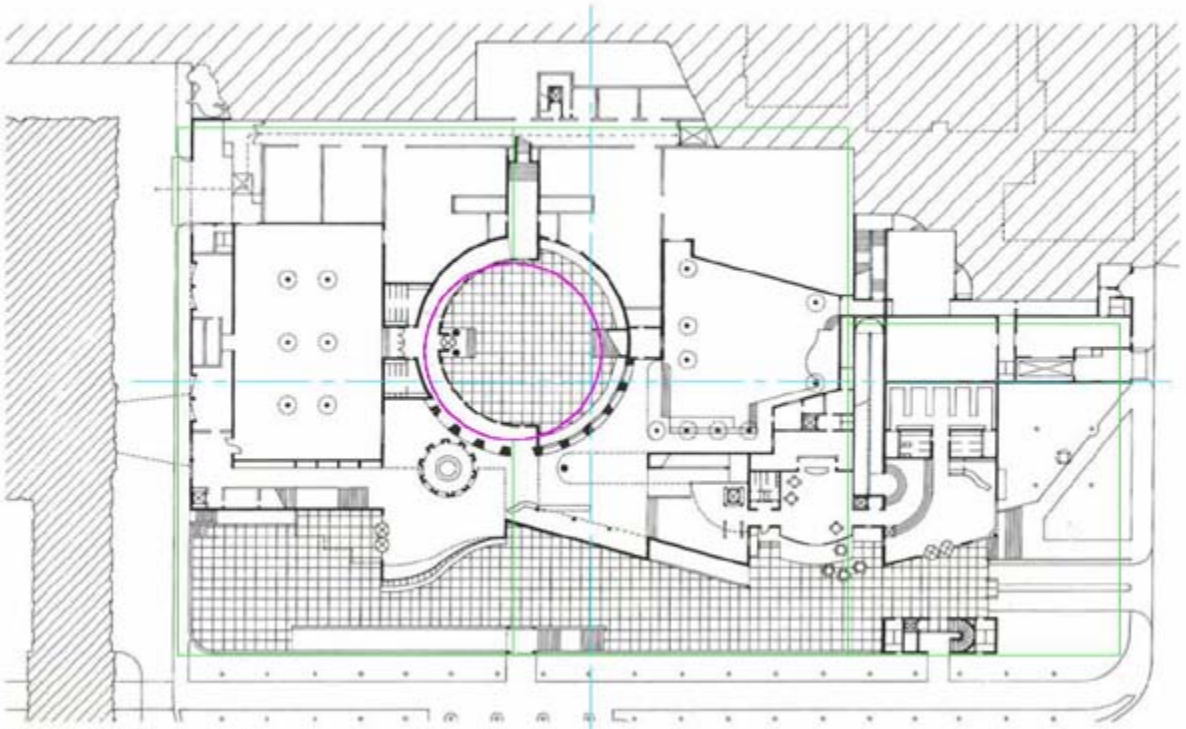
Hierarchy



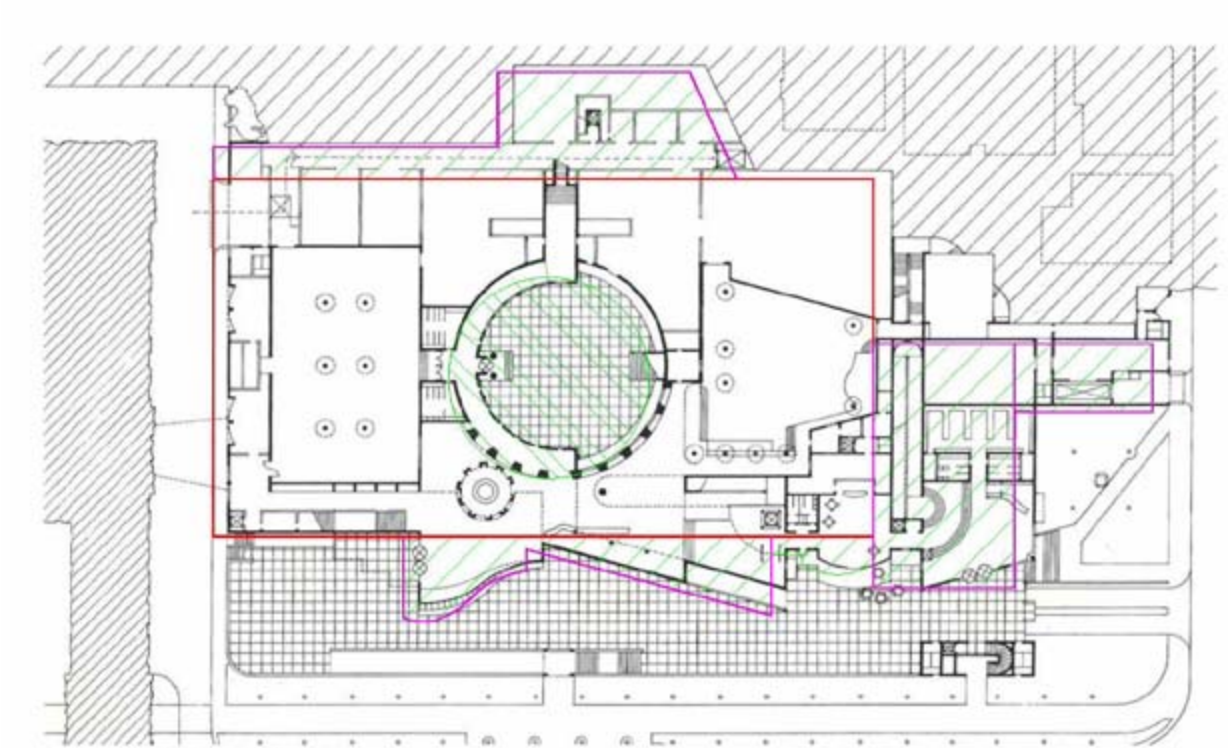
Ground Floor Plan


Whole
Unit
Whole
Ground Floor Plan

Symmetry to Balance



Ground Floor Plan



Ground Floor Plan

Renzo Piano Building Workshop: New Metropolis

Amsterdam, The Netherlands

Case Report

NEMO, New Metropolis Science and Technology Museum, was designed by Renzo Piano and is located in the center of Amsterdam next to Amsterdam Central Station and Maritime Museum. This roughly 10,000 square meter museum, was opened in 1997 by Queen Beatrix, and includes exhibits, theatre performances, films, workshops, demonstrations, restaurants, and a rooftop piazza which is the only spot in Amsterdam which is high enough to see over street level.

The design of the building is in direct response to the difficult site in which it resides. NEMO is built on only a small portion of land and on top of the IJ tunnel which connects Amsterdam with Amsterdam-Noord. With very little of the building being on land, most of the building protrudes over the water. and with its given shape which resembles the bow of a ship. The building seems to float on top of the water. With water almost completely surrounding the museum, the resemblance of the copper façade with the green shade of the water is unmistakable. Piano stated about the design of the museum: 'the building does not pretend to belong to the city, but wholly belongs to the docks. It does not lean, but 'floats' over the tunnel's entrance... The building establishes a gradual transition from the scale of the historic centre of Amsterdam to the openness of the harbor." The building seems to act as if it were pulling away from the impenetrable city. Access into the building is gained by ascending a stepped walkway which rises up to meet the building on the piazza, or by a water entrance where one would arrive by water taxi.

While designing NEMO, Piano deliberately made great expanses of the building's interior and exterior blank, in the expectation that the visitors would be more influenced by the exhibits which were housed there, than the 'visual gymnastics'. There are very few windows disrupting the vast blankness of the exterior façade, and those which are there are set flush with the wall, as to allow the copper cladding to continue over the top of them without disturbance. With having such few windows penetrating the building to bring in natural light, Piano orientated the design around light wells which brought in diffused light to the interior spaces.

http://www.urbanity.es/2008/nemo-amsterdam-renzo-piano/

http://www.urbanity.es/2008/nemo-amsterdam-renzo-piano/

http://www.urbanity.es/2008/nemo-amsterdam-renzo-piano/

linsky.com/buildings/nemo/index.htm

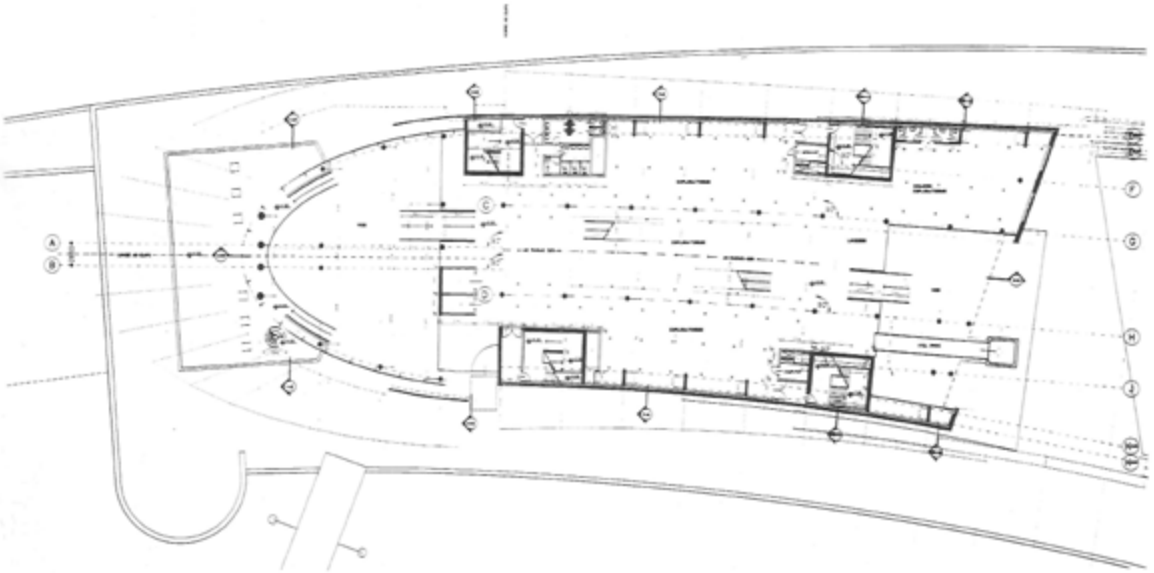
http://blog.amsterdamapartments.com/rooftop-terraces-2/

http://isamsterdam.blogspot.com/

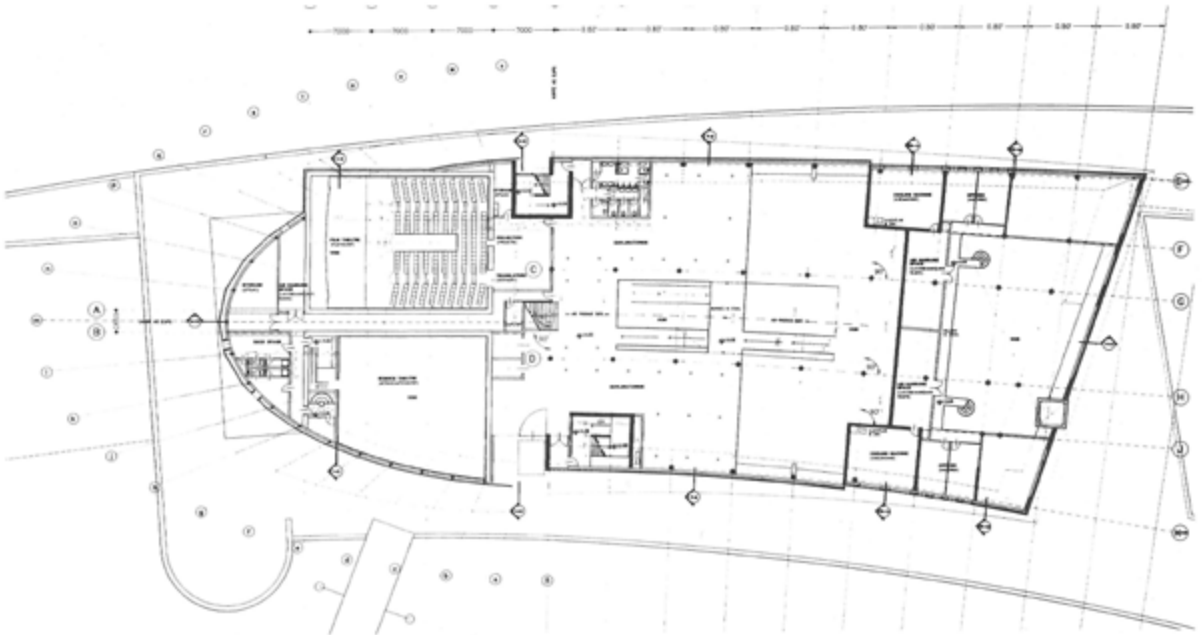
One major aspect of the building was the amount of attention needed on the structure of the building. How would one begin to build over an impenetrable void which resided under the building? The answer was to use a light-weight steel form that would be supported by a heavily reinforced concrete slab, which would then transfer all of the weight onto submerged piles located on both sides of the tunnel.

When looking at the previous case studies, Calatrava's Milwaukee Art Museum and Stirling's Neue Staatsgalerie, there were again some similarities. Many of them carry on from the first case study, such as all of the examples being museums and were designed by foreign architects, but there are also some different similarities. While studying the plans of the three buildings I found that NEMO and the Milwaukee Art Museum shared a few common characteristics. Both buildings were at first glance rather symmetric in layout, with of course a few additions to the forms. Along with the symmetric layout, both Calatrava's and Piano's buildings circulation patterns were closely related. Circulation within interior spaces was mostly along a linear axis varying slightly with the sequence of spaces. The linear movement in the two buildings is completely different compared to Stirling's Neue Staatsgalerie, which has a more traditional u-shaped configuration.

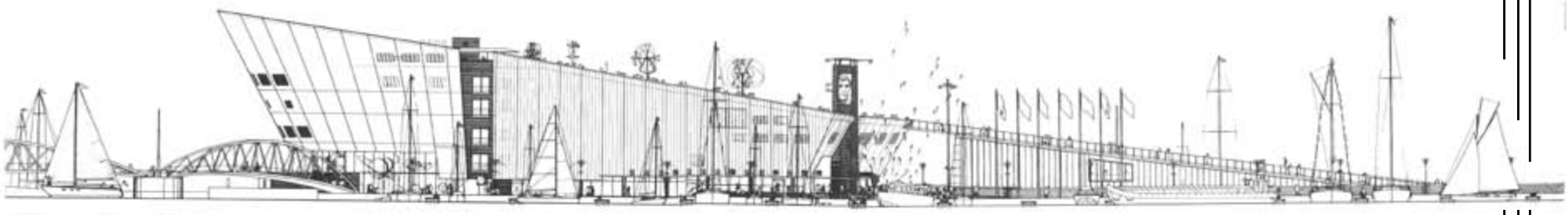
Other similarities within the projects include the prominent prow like form found in both Calatrava's and Piano's designs and the mimic or relationship with water elements. NEMO does not only have similarities to Milwaukee Art Museum,but to Neue Staatsgalerie as well, with the integration of pronounced outdoor spaces and accessibility.



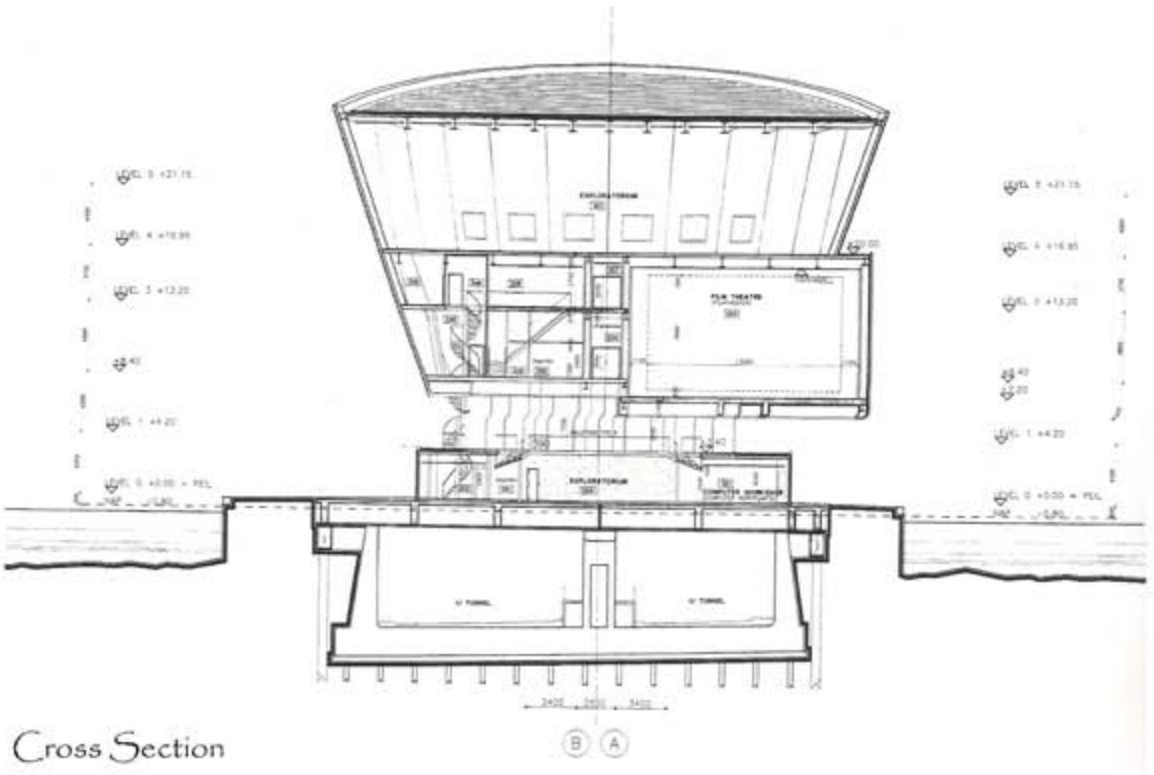
First Floor Plan



Third Floor Plan

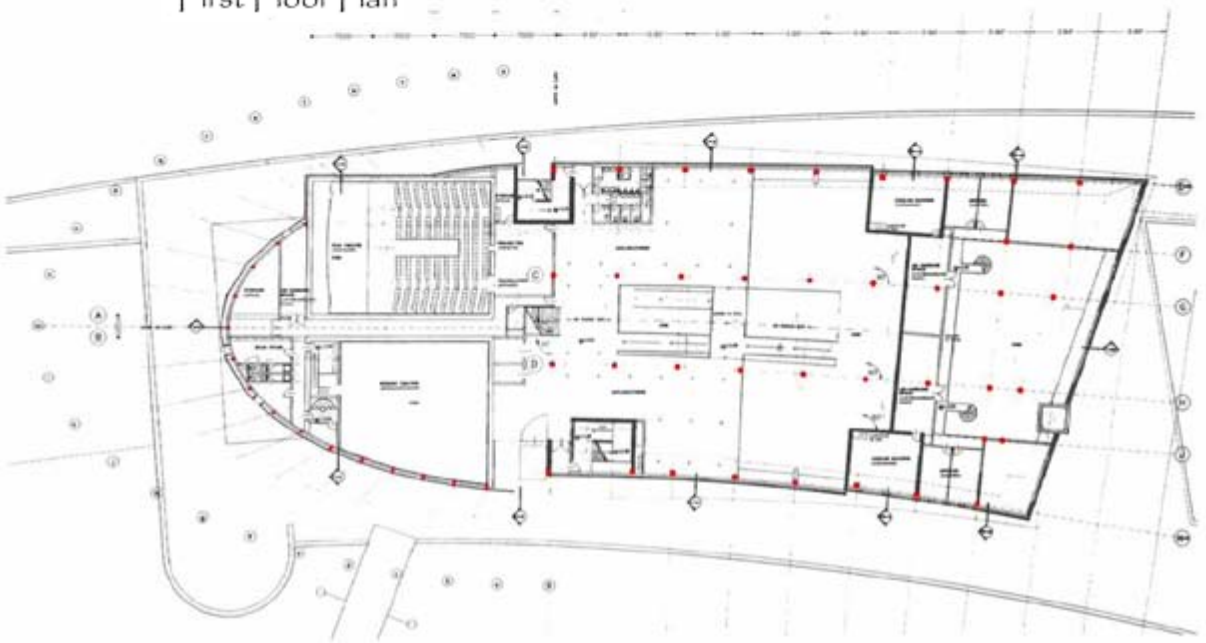


West Elevation

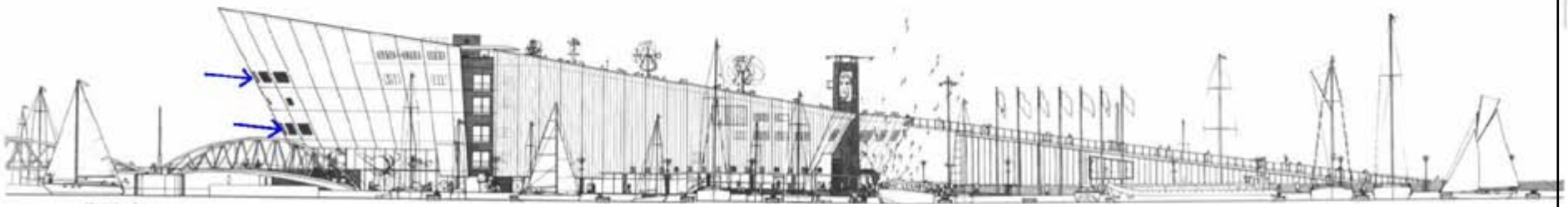


Cross Section

First Floor Plan



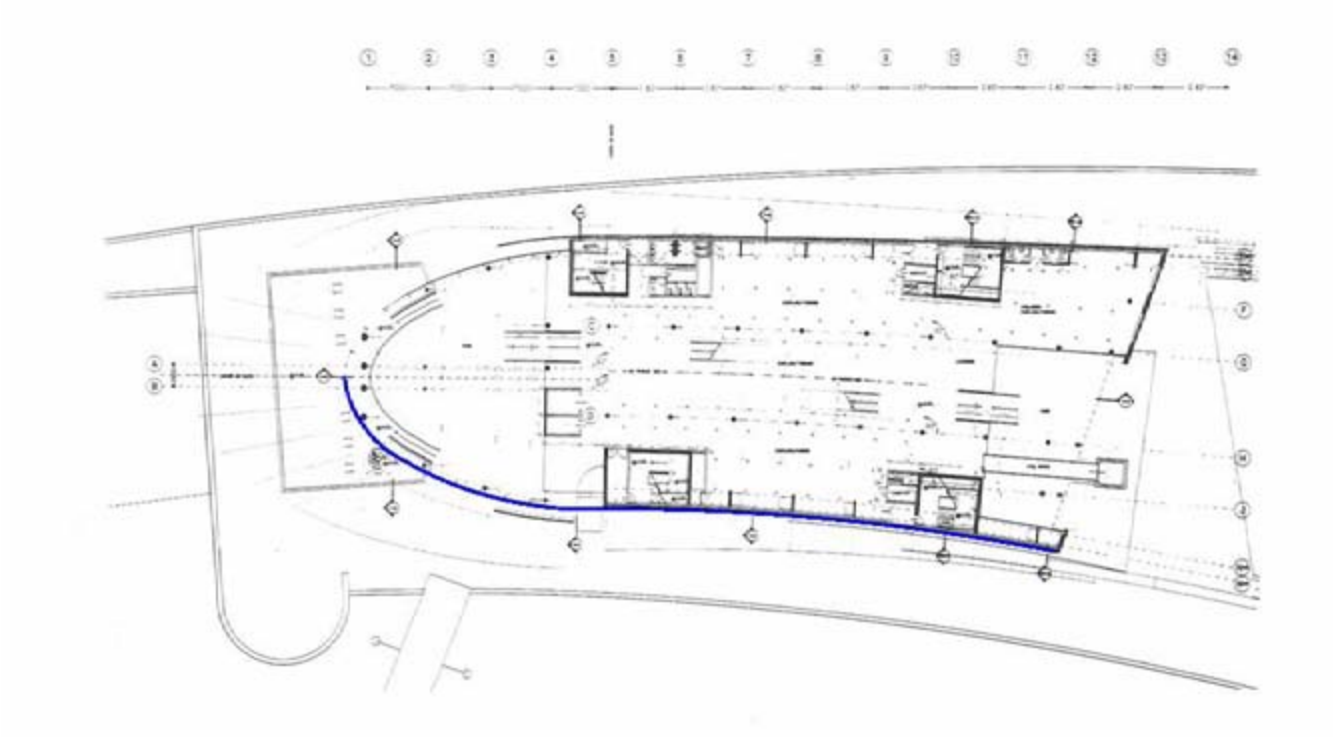
Third Floor Plan



West Elevation

Massing

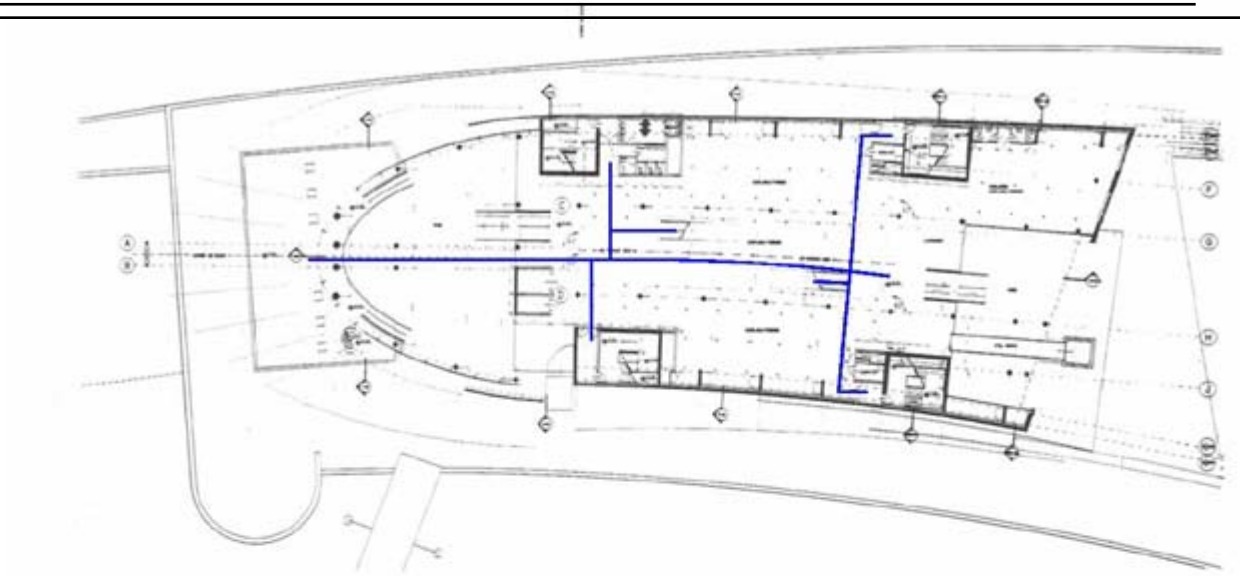
West Elevation



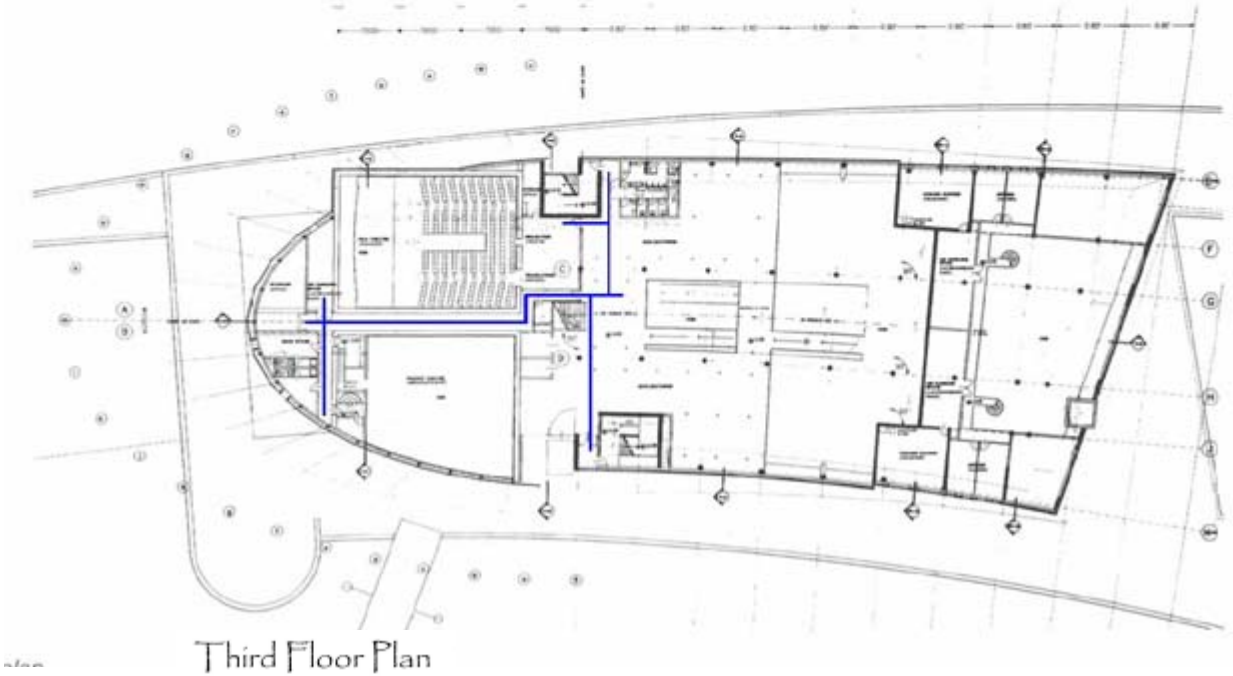
First Floor Plan

West Elevation

Circulation



First Floor Plan

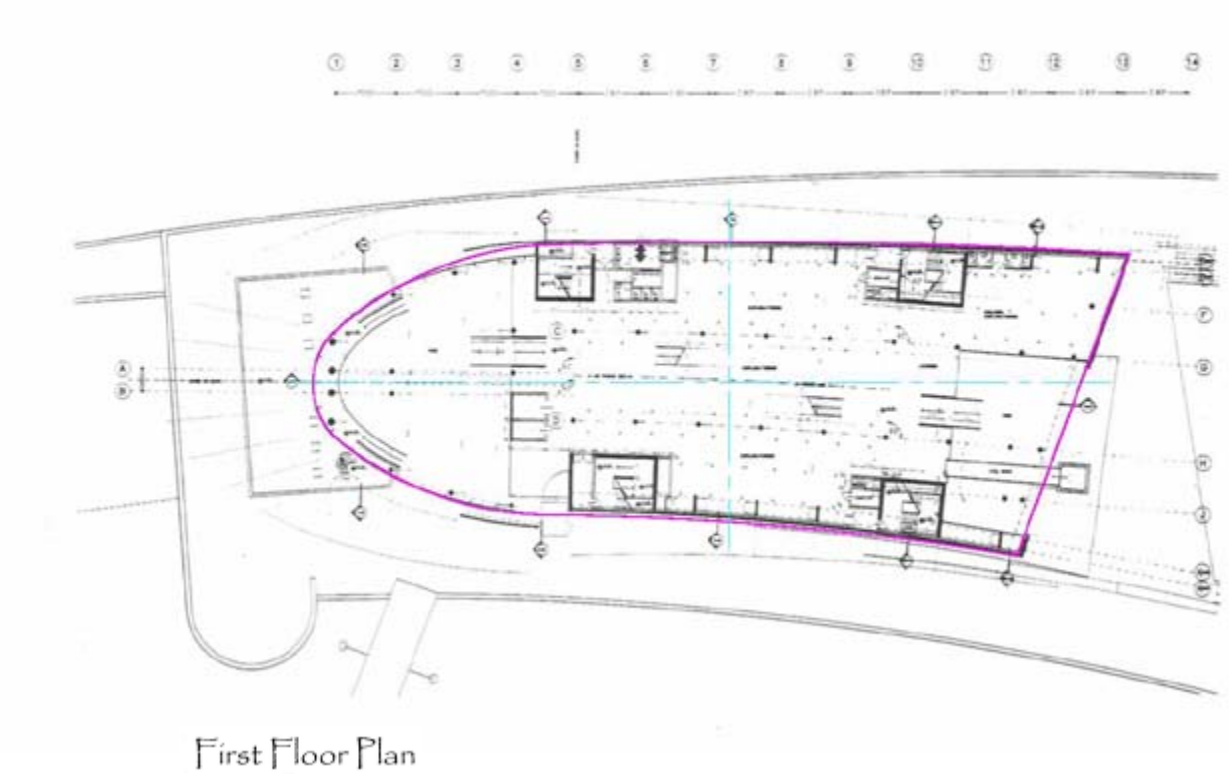


Third Floor Plan

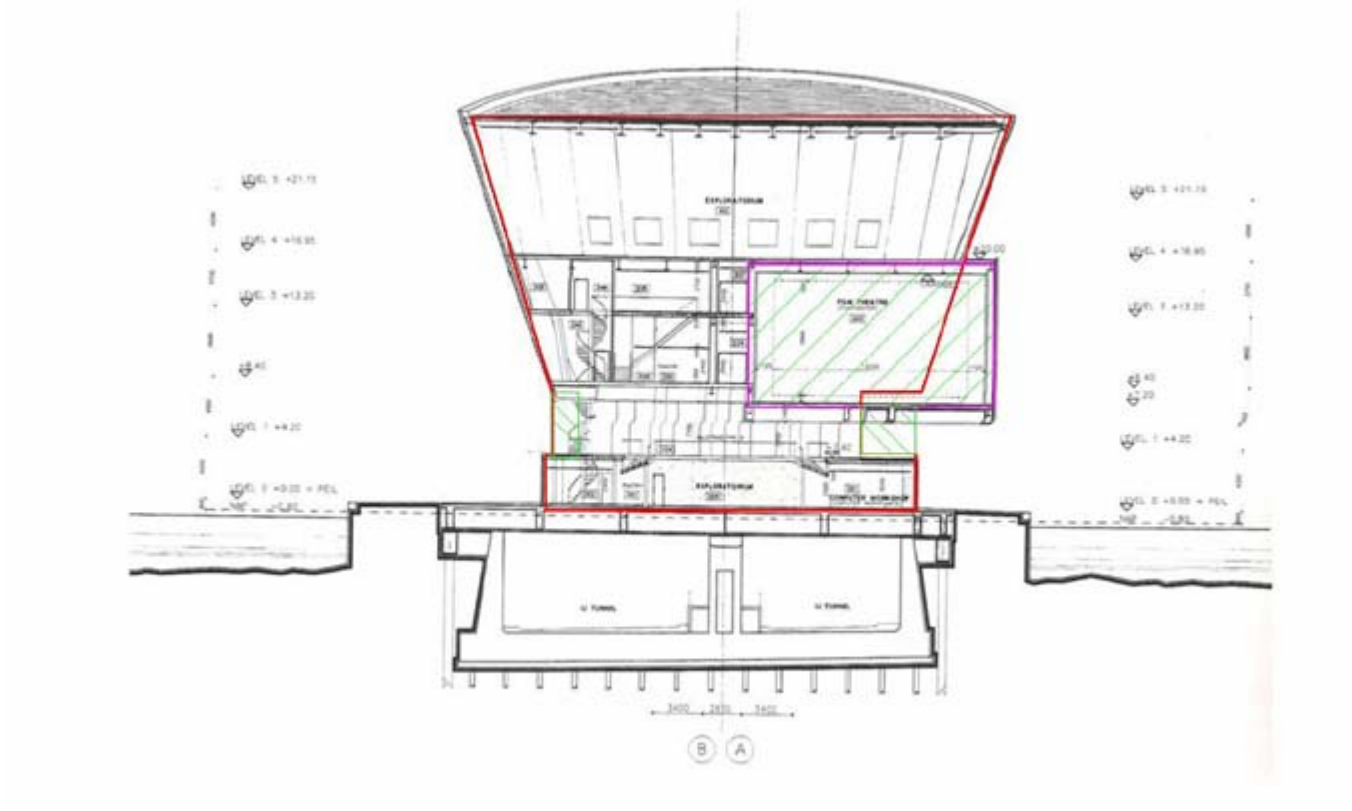
First Floor Plan

West Elevation

Symmetry to Balance



First Floor Plan



Case Study Summery

The case studies which were examined include the Milwaukee Art Museum located in Milwaukee, Illinois, designed by Santiago Calatrava; Neue Staatsgalerie located in Stuttgart, Germany, designed by James Stirling and Michael Wilford; and NEMO, the New Metropolis Science and Technology Museum, located in Amsterdam, The Netherlands, designed by Renzo Piano. In addition to the three museums I also explored an additional project, Kraanspoor, an office building located in Amsterdam, designed by Trude Hooykaas.

All of these building studies helped me verify my theoretical premise/unifying idea even more than I could have hoped. My theoretical premise states that design has a significant influence on one's actions, and that by using elements both designed and in nature we can engage and evoke responses in a foreseen manner. My justification also states that instead of relying solely on the usage of signage and advice from others to navigate and perceive architecture, the use of visual cues, created from natural and built elements, will influence the actions and engagement of each visitor.

Santiago Calatrava's Milwaukee Art Museum uses a relatively simple layout of the floor plan, making it easy to navigate on one's own. All public spaces are related directly with one another making the need for signage minimal. Along with the simple layout, there is also the use of natural elements which draws visitors in. The 90 foot glass atrium is definitely something which evokes responses in a foreseen manner. As soon as you walk into the Art Museum, you are faced with this intimidating space which overlooks the water. As when I was there, you are pulled into the space by pure intrigue. Once in the atrium you are then presented with a choice of pathways, which also engage you by the immaculate, exposed concrete structures.

http://dome.mit.edu/handle/1721.3/22917

http://www.urbanity.es/2008/nemo-amsterdam-renzo-piano/

http://view.stern.de/de/picture/Stuttgart-Eingangsbereich-Staatsgalerie-Linien--Licht--Schatten-1602057.html

http://isamsterdam.blogspot.com/

Although James Stirling and Michael Wilford's Neue Staatsgalerie museum didn't have the simplest enfilade layout, it did however possess some every important aspects which the other studies did not. Integrated in Stirling and Wilford's design were visual signifiers, or cues if you will. With the use of colored railings running along the major circulation paths, on the exterior, visitors are able to see the exact path in which they will be traveling in order to reach their destination. This is a very subtle yet effective way to escort visitors unconsciously along their journeys.

Even though there were a few distinct similarities with the previous two case studies, Renzo Piano's NEMO was almost completely on a different playing field. With the design being on very little land and on top of the IJ tunnel, it related to my project and site considerably. As with my site, there had to be a direct connection to the site and to the limiting conditions which were obviously present. Though I imagine that the site was a major concern in the design, there are also some elements which relate to my theoretical premise. In the two other museums which I looked at, it was the addition of elements which influenced the actions of the visitors; however, in this museum, it is the subtraction of elements. Piano deliberately used blank walls in order to focus the attention of the visitors to the exhibits which were to be housed within, instead of concentrating of the visual 'gymnastics' of the building itself.

The additional study which I looked at, Kraanspoor, helped me visualize the potential of my site along with my theoretical premise. There are so many different possibilities and limitations that I cannot be scared to explore them as much as possible. The only thing that can hold me back is myself.

Characteristics

	Santiago Calatrava Milwaukee Art Museum	James Stirling & Michael Wilford Neue Staatsgalerie	Renzo Piano NEMO
Museum	X	X	X
Foreign architect	X	X	X
Prow-Like form	X		X
Engineering feats	X		X
Product of design competition	X	X	
Strong visual element	X	X	X
Natural direct lighting	X	X	
Natural indirect lighting			X
Symmetric layout	X		X
Linear circulation	X		X
U-shaped circulation		X	
Strong connection with site	X	X	X
Water elements	X		X
Significant exterior space		X	X
Iconic design	X	X	X
Addition to previous construction	X	X	
Movable elements	X		
'Room-like non space'		X	
Identifiers		X	
Blank influencing elements			X

Goals

Professional

It seems that architecture has taken a turn in the wrong direction. With the use of computers and drag-and-drop icons generically representing every last surface of a building to the grass on the site, it is easy to see why there seems to be less and less thought seen in design. We add components out of digital libraries because they look cool. It doesn't matter if they respond to the site or respond to anything. Once our unresponsive design is finished and so utterly complicated that you need a map in order to navigate through just to use the restroom, we turn to signs as a way to cover up our laziness. Instead of taking the time to make a quality design, we disregard people, site, and everything which affects the building. The goal of my thesis is to completely restore the importance of the site and elements around it: to stop using band-aids to cover up bad decisions made. My project is completely based on using environmental factors and cues in order to create an environment which visitors will get to experience for themselves, instead of having to be told where to go by maps or signs.

Academic

There are many things which you learn in school, and many which you don't. You not only learn from your teachers, but also yourself, your peers, and your predecessors. What I hope my thesis will accomplish is to help those, like myself now, who are trying to explore their own thoughts and processes to find something meaningful to themselves.

I have found myself trying to just wing something together in order to satisfy the instructor and the requirements of the class. There was little thought to it. There was no personal satisfaction in some of my work at all. Now that I have the freedom to explore what I think is interesting and important, I have found that my work has become more meaningful, not only in the designs which I create but also personally.

My hope is that others will see my project as inspiration for them. Even if you feel that you have lost your way, there is always something to look forward to. You just have to be patient. You will find what inspires you once more.

Personal

My thesis is not only something which will help my successors in their research, but hopefully it will help them look at design in a different light. I hope that they see what I do, and that to be a true architect, you have to design with passion and meaning. Putting something in a building because it looks cool doesn't mean that it has a purpose. It is the experience of architecture which makes it worthwhile.

My goal for my thesis is not only to help my successors with their research and understanding, but also to prove to those who have doubted me in the past that I can transcend beyond what they believed I could. With every project and 'challenge' which I have overcome, I have grown not only smarter, but stronger as well.

The 'challenges' which I have faced here at NDSU have tested me in more ways than could be imagined. They literally pulled me to the limits of my work and my professional composure. With brutal criticism and inexorable judgments, my professional career had been more than merely a simple test, it has become a chastisement.

It is coming time for judgment. I hope to show everyone who has doubted me that I can indeed aspire to great heights. That I am more than just someone who looked down while taking all of the disrespectful, degrading, deceitful, things they had to say. I can and I have surpassed what was said to be the impossible for me.

Historical Narrative

Ashland

Around the same time in which Christopher Columbus was arriving in the New World, visitors began to arrive at Chequamegon Bay. These visitors, the Ojibwe Indians, came across land which they accurately called Sha-ga-waun-il-ong. Roughly translated it has many meanings: the 'lowlands', the 'needle', 'region of shallow water', or where 'there are large extended breakers'. Either one of these meanings describes Chequamegon Bay rather adequately.

The Ojibwe Indians greeted many visitors to the Chequamegon Bay, the earliest being European explorers around 1618. Others visitors to the Bay included missionaries, fur traders, and slightly more recently 'Yankees'. The land was platted and development started. The area began to see railroads, shipping, logging, mining, and other industries start to flood the land.

The city of Ashland is located on the Southshore of Lake Superior near the head of Chequamegon Bay, approximately 60 miles east south east of Duluth Minnesota. Because of the city's location on the bay, the city is known as "Lake Superior's Home Town". The city is a small, ethnically diverse community with a lot to offer. Once you are there and get to explore the town, you get a sense that the town is different from any other which you have been to. As you walk down the street, you are greeted by just about everyone you see. There are no frowns or disregarding gestures. Everyone knows everyone, and if they don't know you, they will.

The city of Ashland covers 13.7 square miles, 13.4 square miles covering land and .7 square miles covering water. The population of the city in 2010 was 8,695, with the population density in the town being 643.3 people per square mile. The population is comprised of 3,513 households and 2,027 different families.

Images courtesy of City of Ashland

Mining and logging

In 1888, iron ore became the dominant trade around the Great Lakes area. In many cases transportation of the ore was more difficult than the mining of it. The Gogebic Iron Range, which later connected to port in Ashland, was one of the main difficult ranges to transport from. Along with the rough terrain there were almost no roads or trails on which to safely transport the ore to Ashland. The ore had to be moved to Ontonagon Michigan where it was loaded onto smaller boats which went down the shore to Ashland, where the ore would then be sent off on larger ships.

When the weather got too bad for normal transportation, the ore was then loaded onto sleds so the miners could pull them to Ontonagon. This was a very slow process. The miners could only handle around 3,000 pounds on the sleds, with only enough time to make one trip per day.

Seeing the potential in the Gogebic Range, competition for the region was intense. At one time there were 11 rail lines competing to put in tracks from the range directly to Ashland. In 1877 lines were finally completed by Wisconsin Central, which were later bought by Soo Line in 1904.

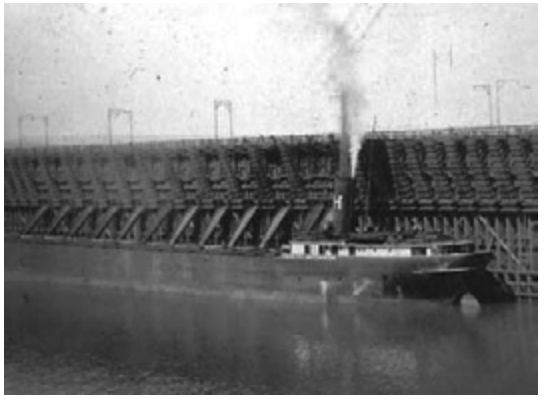
Once the ore no longer needed to be transported to Ontonagon, but had its own direct lines connecting the range to Ashland, there was no place for the trains to unload the ore onto the ships. As a temporary solution to the problem, iron ore had to be stockpiled along the lines, while the first ore dock was being constructed. Once the dock was constructed, the ore was loaded back into the ore cars which were then driven right onto the dock. The ore from the cars was dumped into concrete bins where it waited for ships to arrive. Once the ships were alongside the dock, metal chutes would then be lowered and the ore which was stored in the bins would pour into the ship's hold, where it would then make its way to market or to production sites.

With large quantities of iron ore being shipped out of Ashland, development there was at an all-time high, even surpassing that of Duluth, Minnesota, and Superior, Wisconsin, for many years. Ashland was the second busiest port on the Great Lakes, just behind Chicago in the mining industry until 1951, when mining in Minnesota accounted for nearly 82% of the US production. Once mining turned focus to Minnesota, Duluth, Minnesota and Superior, Wisconsin, surpassed Ashland in importance in the industry, until the 1980s when mining began to dramatically decline. The decline was partially due to foreign importation and the minimizing of the ore in the ranges.

Before the construction of the Soo Locks in 1855, many of the early mines depended on local forges for smelting the iron ore before bring it to market. At one point, there were more than 25 localized furnaces working to forge the ore. By 1882, 27 years after the Soo Locks were opened, there was only 7 furnaces still being used. In order to fuel these furnaces for smelting the ore, massive amounts of charcoal was needed. With the charcoal being made from local hardwood, this helped the logging industry gain even more steam. Almost 20,000 acres of surrounding hardwood were cut down and converted to charcoal in order to fuel the furnaces.

Lumber was another major industry in the Great Lakes area from 1880-1924. Lumber was needed for a wide variety of things including homes, ships, roadways, industries, and growing towns. Besides using it for their forging furnaces, mining companies needed lumber for buildings and shoring up mine shafts.

Timber was cut for Lake Superior's shore as early as 1850 but mainly from 1880-1900. The land was being clear-cut by 'high grading', or by taking the best and most valuable resources first until they are depleted, then taking the next best, and so on down the line. Pines would fall first, then pulpwood trees, tamarack, white spuce, and so on until nothing was left.



Images courtesy of City of Ashland

http://www.johnsonlake.org/iblog/B399895310/C1042258412/E1478714458/index.html

The logging industry utilized streams in order to easily move the logs to the mills. Streams were channeled and anything that was in the way of the logs moving down the stream was removed and discarded. Beaver dams were removed. Noncompliant boulders, rapids, and waterfalls were dynamited into submission.

The devastation of logging took and is still taking its toll. The forests are left bare. Any replanting is done only for fast-growing pulpwood and chipboard species, thus holding the forests in a perpetual state of unnatural and low value immaturity. The species are no longer diverse and the soil doesn't hold the nutrition it once did. The stubble which is now stands where the lush forests were once prosperous is at a risk for fire. The wildfires which were spawned created destruction for miles. Russell McKee wrote: "These wildfires sometimes burned for months, often darkening the skies as far away as Detroit (Michigan), four hundred miles to the south."

The fires leave deep scars which cannot be easily healed and the earth blackened. Fires not only devastated the countryside and the remains of what used to be abundant forests, they also tore through towns as well. One such fire swept through the iron ore town (which was previously talked about) of Ontonagon. A brush fire raced out of a swamp and ignited a massive pile of lumber. The burning lumber blew all over the town spreading the contagious flames to homes and other buildings. Nearly 75% of the town was left in rubble with only one death. Duluth on the other hand was not as lucky. In 1918, fire reigned down the waterfront of Duluth and other small towns in the vicinity, killing 400 people who were trapped by the blaze.

Though pure dismay at the destruction of the waterways and the fisheries has pushed lumber transportation out of the water and onto the roads and railways, other destruction is still taking place as we speak. Forests are still being clear cut. Small strips of tress or 'beauty strips' are being contained along roadsides and public stretches so that the devastation can stay hidden from site. Along just about every shore on Lake Superior you can see remnants of the transportation of the lumber. Anywhere from small fragments to full-sized logs are being washed up onto shore.

The Ore Dock

At the peak of the mining boom, Ashland was home to three ore docks. The first dock was built in 1884-1885, eight years after the first rail line connected Ashland with the Gogebic Iron Range. The dock was 1,405 feet long 46 feet wide and 40 feet above Lake Superior. The dock had four tracks leading onto it with the capacity of 25,000 tons. It took 7,000 wood piles to support the dock and the massive load it would carry with the trains and the ore. The dock used to sit next to the current ore dock, which is my site. You can still see the evidence of the dock's existence by the piles which were left behind during demolition.

The second dock was constructed in 1888 and surrendered to a fire in 1924. In 1948, the dock was demolished just like the first dock, leaving only one dock left.

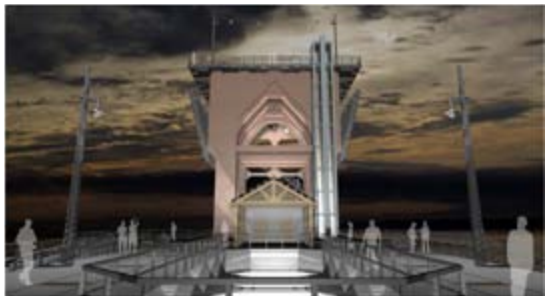
The third dock, which still stands today, and is my current site for thesis was built in 1915. The dock was originally 900 feet long and had the capacity of 52,000 tons of ore. In 1925, the dock was added onto which gives it its present size of 1,800 feet long 75 feet wide and 80 feet above Lake Superior. The dock's capacity increased to 110,000 tons of iron ore. The ore dock has 30 concrete storage bins or 'pockets' underneath the rails.

During World War II, nearly 6,000,000 tons of iron ore were shipped from the Soo Line dock.

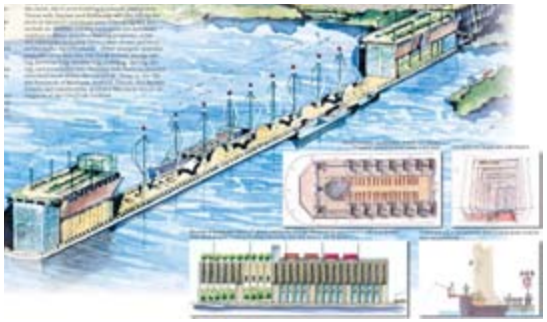
In order for the trains to get their loaded cars to and from the top of the dock to unload their ore, they had to travel up a long wooden trestle which brought them up the 80 feet above the water. The wooden trestle was demolished in September of 2006. The only remnants left of the wooden structure lies in a pile, inside a fenced off area around the base of the dock.

The steel and concrete structure has been in a state of disuse since 1965, when the last shipment of ore passed its way through the chutes of the dock. There has been a lot of talk about demolishing the old dock, with thoughts that it is a structural hazard. After reading the structural reports on the dock, I personally don't see that it is a hazard. There are some aspects which are in need of attention, but mainly the dock is still capable of withstanding the elements, as it has for almost 100 years.

Images courtesy of City of Ashland



Westbrook Engineers



JJR

LHB

Images courtesy of City of Ashland

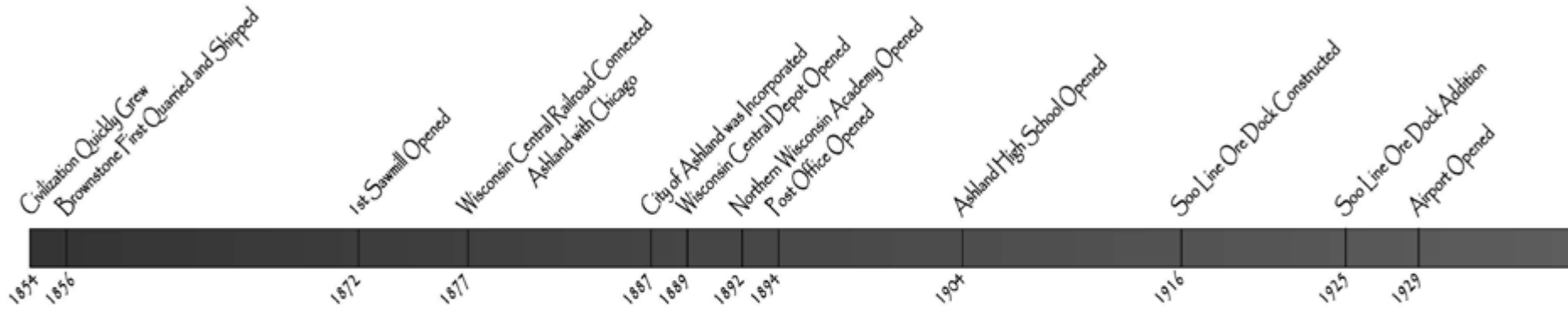
The ore dock is currently part of Ashland's waterfront development plan. The goal for the entire plan is to create a tourist destination on the south shore of Lake Superior, along with providing recreational and cultural facilities to better access the lake, and to broaden the employment and better the tax rate. The focus for the historic Soo Line ore dock is to 'create tourist destination with regional draw that celebrates Ashland's industrial past and Lake Superior's national importance.' The city wants to develop a Great Lakes shipping and mining interpretive center with the linkage of an ore freighter or research vessel to the center. The reconstruction of part of the wooded trestle is also of great importance to the plan for the dock.

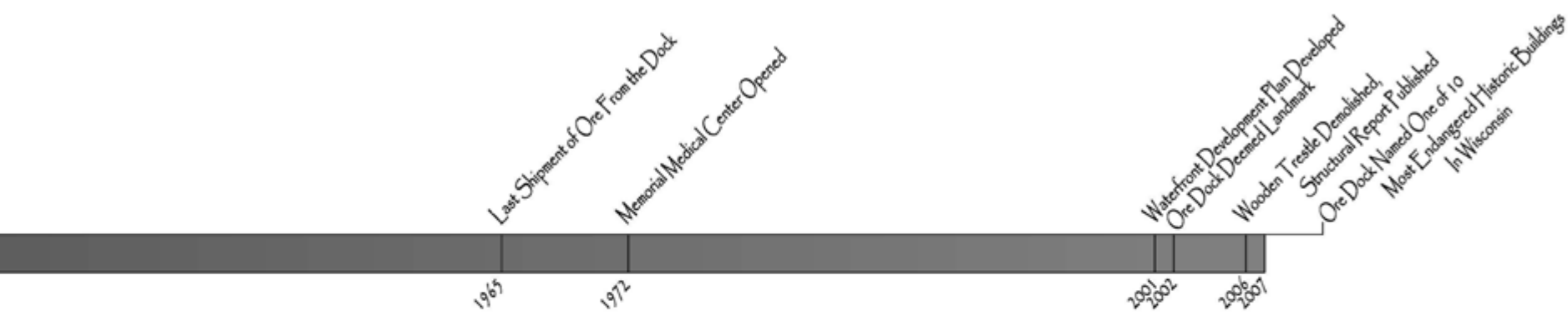
There has been a lot interest in the old dock. In 2007 the ore dock was named one of the 10 most endangered historic buildings in Wisconsin. Currently, Canadian National Railway, the current owner of the ore dock, possesses a demolition permit for the dock, and has already hired Veit Specialty Contracting and Waste Management out of Minnesota for the job. The city of Ashland has taken many steps in order to keep the structure, including holding a competition for the reuse, redesign of the ore dock. The city has held off demolition of the ore dock for the last couple of years, in hopes that Canadian National will accept their plan for redesign. Even though the main structure is still standing, demolition has taken place on the wooden trestle which rose up to the top of the dock.

Firms which were hired for the dock's redesign includes Westbrook Associated Engineers LLC & JJR, LLC, who also conducted the structural report of the dock, S.E.H., LLC., & Walsh Bishop, and LHB Engineers and Architects. The city liked Westbrook's design the best.

Not only is the structure a landmark in Ashland, it also represents the mascot for the school sports teams, The Ashland Oredockers. With all of the support of the community and those who have seen and admire the ore dock, I hope that it stands in the horizon for many more years to come.

Historical Time Line




Last Shipment of Ore From the Dock
Memorial Medical Center Opened
Waterfront Development Plan Developed
Ore Dock Deemed Landmark
Wooden Trestle Demolished,
Structural Report Published
Ore Dock Named One of 10
Most Endangered Historic Buildings
In Wisconsin
1965
1972
2001
2002
2006
2007

Site Narrative

When approached with the challenge of finding a site for my project, I was really unsure of where to even start. There are so many great places, and not so great places, which could benefit from my thoughts and designs. I told just about everyone I knew what my project was about, and asked them what they thought would be a good site. I got a list just about spanning the globe. Without wanting to miss a possibility, I researched a little about every place which was suggested. Nothing was catching my eye, or even beckoning a second glance, until I got to the suggestion of Ashland, Wisconsin. The person who suggested that I find a site there was someone who moved there from my hometown and thought the world of the town.

After looking at all of the possibilities within the town, and looking at the town's website, I stumbled upon a development plan for the lake-front, which at one time included the Ore Dock as part of the planning. I knew at once that this was the site that I wanted to use for my project. However, I do have to admit that I didn't fully realize what it was that I was getting into, using the dock as my site.

Once having chosen my site, I couldn't wait to drive down there to see it. The only downfall that I could find was the 6+ hours of drive time on secondary roads that it would take in order to visit the site.

The journey was a wonderful one, despite the fact that your butt gets excessively numb. We got to drive past hundreds of lakes and through many small towns. We saw the wildlife scurry, or saunter depending on the animal, across the road in front of us. The world seemed to move at a slower pace, like 5 miles under the speed limit the whole way, and everything was calmer

Once I finally arrived in Ashland, I was spellbound by the beauty of not only the lake but of the town as well. It was so picturesque that it seemed like it was out of a dream. The main street was still booming with all the little "ma and pa" shops. There were people walking down the street, resting on the benches, and just enjoying what the town had to offer.

After meeting up with my personal tour guide, the one who suggested the town to me, at his house, I discovered that he didn't just live close to my site, it was basically in his back yard. I gazed in wonderment at the structure. It was more intimidating than I first imagined. As we made our way toward the dock I began to notice a few things. First off, there was no way to get up there, no tracks leading to the top platform. Later I discovered that this amazingly beautiful structure was marked for demolition, however, the whole town (except my tour guide) was fighting to keep the structure. Not only is it beautiful, it is a landmark.

Walking along the bank of Lake Superior, you could make out footprints in the sand of others who had just recently made their way along the same path that I was venturing down. Leaves and small twigs were spread sporadically along the path making the path hard to detect in some areas. After a bit of walking, we approached a fence which was supposed to be there to block pedestrians from the demolition area, and naturally I went right around it to get a better look.

As I got closer and closer to the structure, the more intimidated and excited I got. Though the structure isn't in the most pristine condition, it is still marvelous. Every single ore chute and light pole was still in its original place. It was almost like they had stopped shipping from the dock yesterday. If I could have gotten any closer I would have loved to have climbed the stairs onto the top to see both the condition of the deck, and the view of the city. However I didn't want to risk falling into one of the chutes and getting rescued by the National Guard like one man did.

As you looked down the center of the dock, the rhythm of the concrete structure was enchanting and almost cathedral like. If there was a time in my life that I felt about the size of an ant, that would have been the time. I made my way off to the side of the dock where I could then start to see some of the wooden piles which have been holding the heavy concrete structure up for almost a hundred years. They were in immaculate condition compared to the structure which they supported. You just can't find workmanship like that nowadays.

Looking down into the water I could see the shadow a minnows gracefully swimming around the piles of the dock, which they have more than grown accustomed to, and also seek for protection from bigger predators and the like. Watching prudently from above were numerous seagulls and other varieties of birds, just waiting for the perfect moment to snatch up one of the small minnows. Not only is this structure a benefit to the landscape, but it is home to many different animals.

After seeing the Ore Dock from just about every possible angle, I found myself exceptionally happy with my choice of the site. My only concern is that the dock is much too big of an asset to the town, to see it get demolished in the coming years. I hope that there is a way to save the Ashland Ore Dock, so that future generations can too marvel at its beauty, as I did.

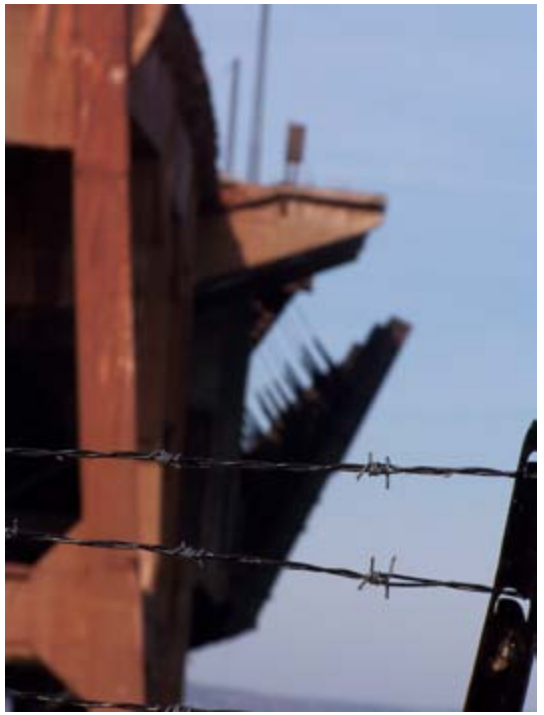
Qualitative Aspects

Views or vistas

In every direction from the site there are spectacular views to enjoy.
North of the dock is Bayfield, Wisconsin, and Lake Superior.
South is the beautify city of Ashland, Wisconsin.
East you have a direct view of the Breakwater Lighthouse and the Apostle Islands.
West of the site you can see Chequamegon Forest and miles of rolling countryside.

Built features

Within the area of the Ore Dock, there are multiple buildings which are placed somewhat sporadically, until you get a few blocks away from the structure. Most of the buildings consist of single-family dwellings, with a few small restaurants such as Dairy Queen and Little Caesar's Pizza. On the dock itself, there are no longer any buildings, however during its prime there was a toilet/ locker room, which consisted of two stalls, one urinal, two showers, and numerous lockers for the workers; a blacksmith shop; and a small warming house.



Light quality

Sitting directly on the lake, the Soo Line Ore Dock has a tremendous quality to it. There in not a portion of the site which is under-lit or shaded by another structure. The light reflects off of the water with reflections of the waves. At night you can see the lights from Ashland and the city of Bayfield.

Vegetation

Under regular operation/condition the ore dock would not normally be a viable resource for the growth of vegetation, however, seeing that the dock has been sitting unused and has fallen into a state of deterioration, some vegetation has found the current environment suitable for growth. Vegetation such as moss and wild grasses have taken hold to the decaying planks of the top deck, and to small build ups of dirt and settlement. Nearly 100% of the deck is covered with vegetation. Not only on the top, but also along the base of the dock, emerging up from cracks in the concrete is a plethora of grass, brush, and small tress.

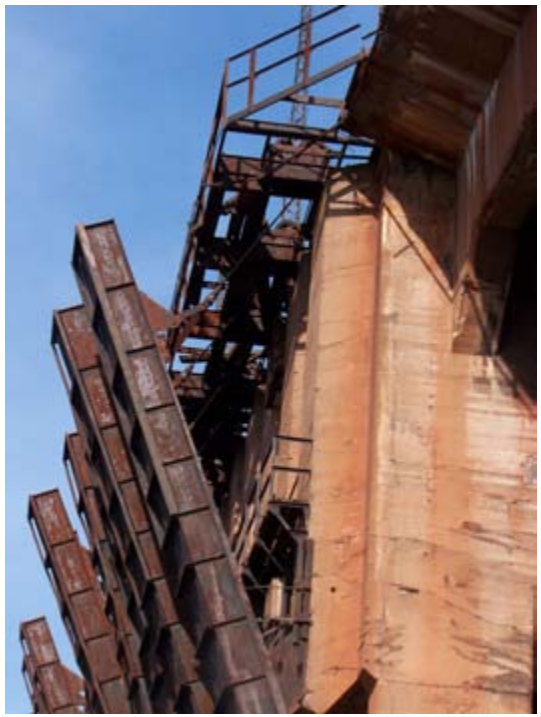
The growth along the shore of the dock consists of wild brush, grasses and small trees such as birch and popple. In the summertime, the site is consumed by lush greens with erratic shades of reds. In the fall through spring, the lush greens are replaced with numerous shades of reds, browns, yellows, and oranges. It is not only the leaves which are this beautiful mixture of color, but the variety of brush and wild plants also create an entanglement of color themselves.

Distress

Seeing as the dock has been unused since 1965, there is some obvious distress on the structure. As from the structure reports which were conducted by Westbrook Associated Engineers, Inc in May of 2006, it states that the majority of timber piles in the 1915 portion of the dock are still engaged with the concrete base and in very good condition. With continual deterioration of the concrete base, there will be loss of engagement between the piles and the base, and will lead to accelerated deterioration of the piles near the top. Currently 25% of the outer row and 10% of the next inner row of piles is not fully engages with the base. If the timber piles can remain in a loaded state and protected from environmental impacts, Westbrook Engineers predict that the timber piles can remain effective for another 75 to 100 years, the value being based on the concrete base material.

The piles under the 1925 portion of the dock were shown to be in very good condition with no signs of deterioration, with the concrete base being of better quality than the 1915 portion and still nearly all still intact. If deterioration of the concrete base is left unchecked, like the 1915 portion, the piles under the 1925 portion are likely to deteriorate as well. Again, if the timber piles remain in a loaded state and protected from environmental impacts, the piles should remain effective for another 100 to 150 years.

With the condition of the underwater timber structures being in rather good condition, the concrete portion of the structure is of a different story. The 1915 portion consists of 80 supporting concrete bents. The majority of the bents in this portion are considered fair to satisfactory with less than 10% being in poor condition. The 1925 portion consists of 71 supporting concrete bents. All of the bents in this portion are considered satisfactory to good condition.



The concrete transitions T1-T4 on the side of the shore are in very poor condition. If there are no actions taken soon, the permanency of this portion of the structure will be greatly limited

Looking at the deck and the topside of the dock, the concrete ore bins, deck supports, and concrete and timber decking are all in fair to satisfactory condition. The outer walkways are in very poor condition with most of them having already failed. The accessories of the dock such as the steel chutes, stairways, handrails, and chute access are in critical condition and are in danger of becoming dislodged from the structure.

The dock can support its own dead load for many year to come, however it cannot carry fully-loaded train and rails cars as it was intended to.

Other distress on the site includes a fenced-off portion of property which was the site for demolishing the trestle. This area shows signs of trees and vegetation being uprooted or trampled by machinery used in the demolition process.

There is also a superfund site which is located to the west of the site a few blocks. Though this is not directly associated with my site, it is very important to be aware of it. The superfund site is comprised of several properties owned by Xcel Energy, Canadian National Railroad, and the City of Ashland. Contaminants were found on this site in sediment, ground water, and soil. When testing a buried ravine, there was tar, oil, metals, and other waste materials which contaminated the site.

Water

With my site being a structure which is built right into Lake Superior, there is definitely an abundance of fresh water around the site. Though the water around the site was once polluted by the ore which was being shipped from the site, the water surrounding the site is amazingly clear. On sunny, calm days, one can see a white object in the lake 120 feet down into the water.

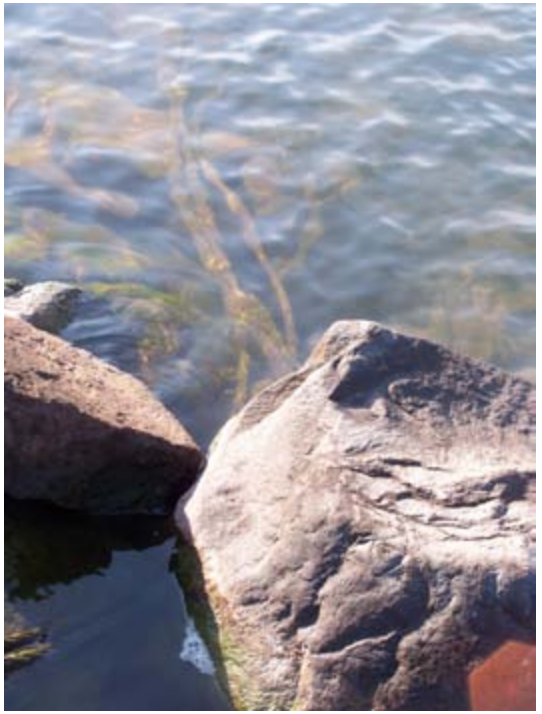
Wind

Lake Superior is known for generating winds called 'northeasters' or very strong winds and rain. Can product winds in excess of 40-55mph. Northeasters usually occur in the fall, and are the cause of most of the shipwrecks in Lake Superior, including the Edmund Fitzgerald.

Human characteristics

The site is an 1,800 foot man-made structure which was built in 1915. It was originally used to transfer ore mined in the Gogebic range onto ships which would then transfer the ore where ever it was needed. The dock was used to transport iron ore until 1965. If it wasn't for human intervention on the site, the ore dock would not be in existence today.

Though the ore dock is in itself a sign of human intervention, there is work being done in order to bring the site back to what it was before the construction of the dock. Demolition has already taken place on the wooded trestle structure leading from the ground up to the structure. When I was at the site, the only sign that the trestle structure was ever there was a pile of wood scraps which were left over from demolition.



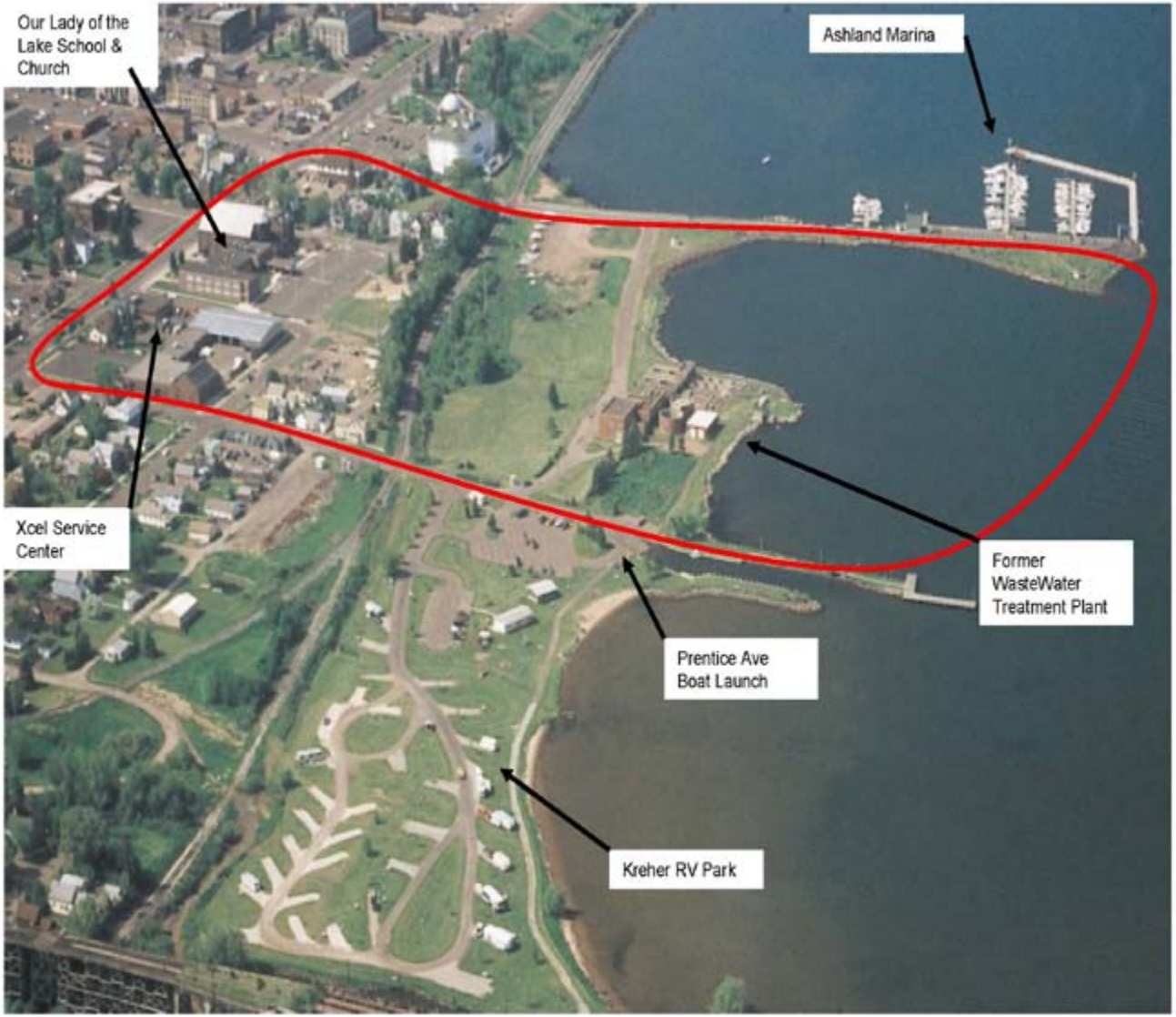


Image courtesy of City of Ashland

Soils

Original Image courtesy of City of Ashland

2030- Udothents and Udisamments, cut or fill

Depth to restrictive feature: more than 80”
Depth to water table: more that 80”
Frequency of flooding: none
Frequency of ponding: none

580B- Sanborg and Badriver complex, 0-6% slope

Drainage class: moderately well drained
Depth to water table: about 12”
Frequency of flooding: none
Frequency of ponding: none
Calcium carbonate: 20% max
Available water capacity: moderate about 7.4”

Profile
0-9” Silt loam
9-17” Silty clay loam
17-35” Clay
35-80” Silty clay

480B- Portwig and Herbster complex, 0-6% slope

Drainage class: moderately well drained
Depth to water table: about 12”

Profile
0-9” Silt loam
9-51” Clay
51-80” Stratified very fine sand to silt

97F- Udorthents, Ravines, Escarpments, 25-60% slope

Vehicular Traffic

Original Image courtesy of City of Ashland

Around the site is residential housing. There is not an abundance of vehicular traffic in that area. However, four blocks south of the structure is Highway 2, which has very heavy vehicular movement.

Pedestrian Traffic

There is a walking path (dark red line) running along the lake shore. The path is now closed where it had passed under the wooden trestle for the ore dock. The path is now diverted (blue line) onto North Stuntz Ave to Water Street, and back onto the original walking path.

Other pedestrian traffic includes sidewalks and trails through private property (light red)

Original Image courtesy of City of Ashland

Utilities

Image courtesy of City of Ashland

Topographical Survey

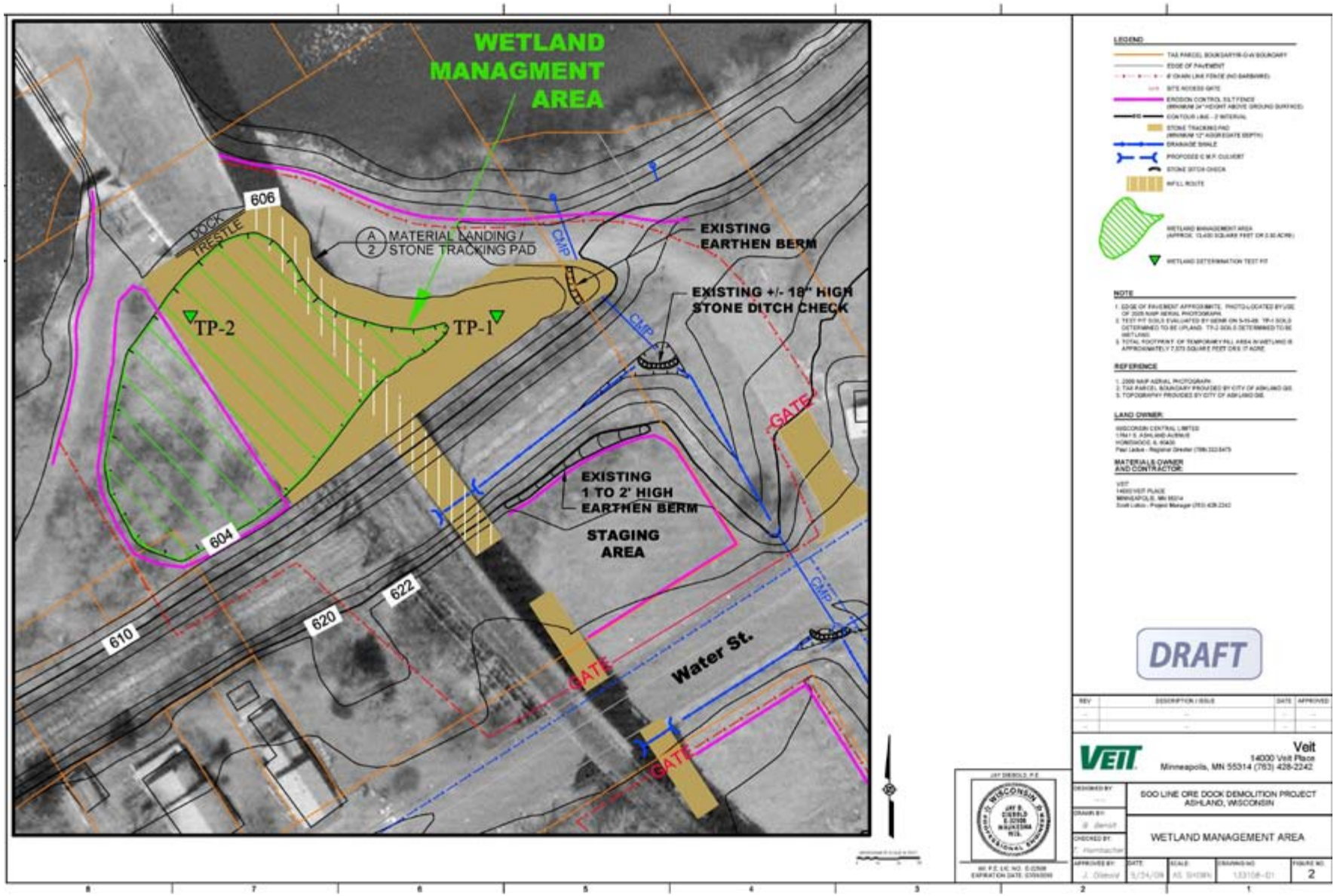


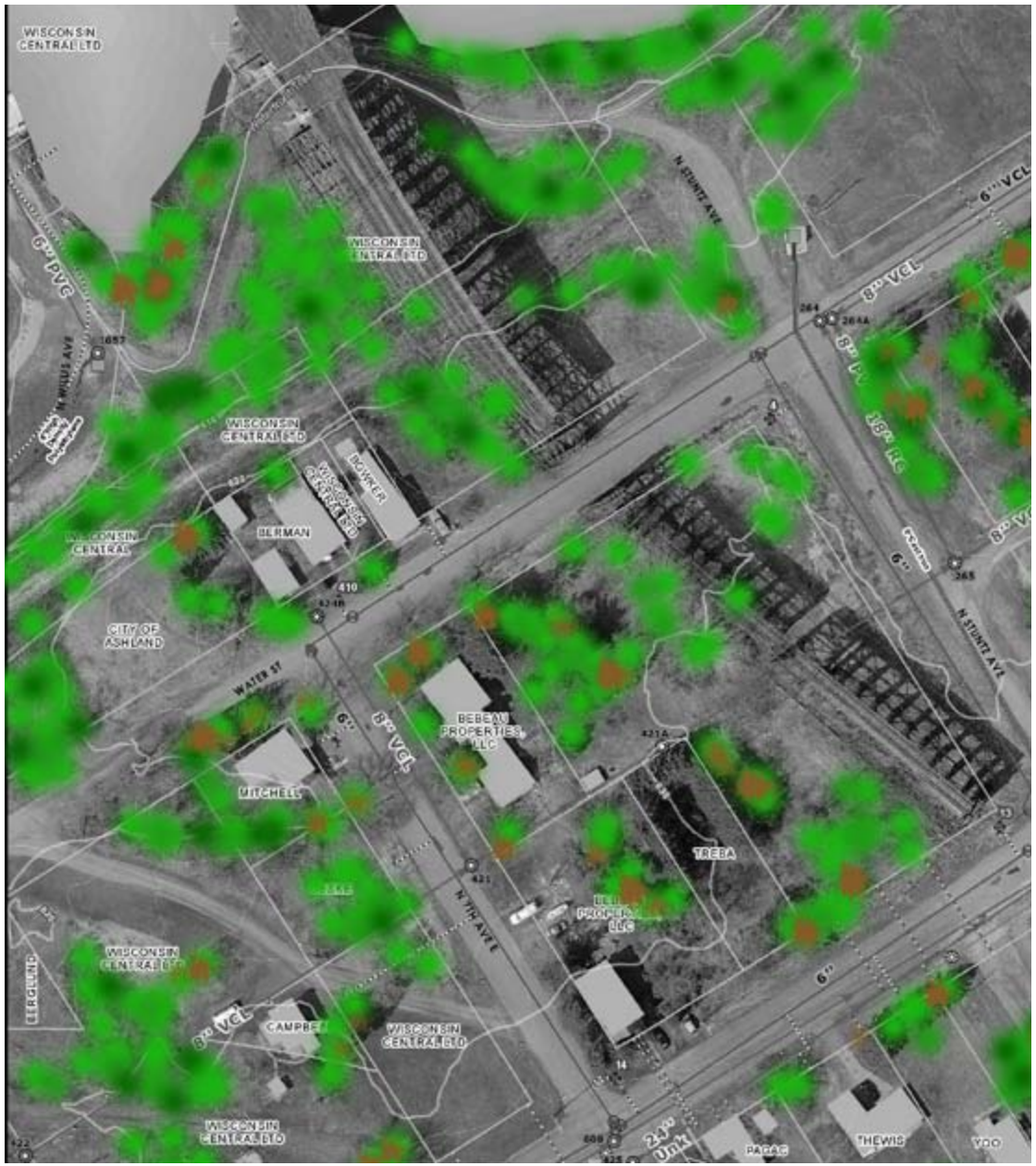
Image courtesy of City of Ashland

Legal Lines/Parcels and Water Features

Image courtesy of City of Ashland

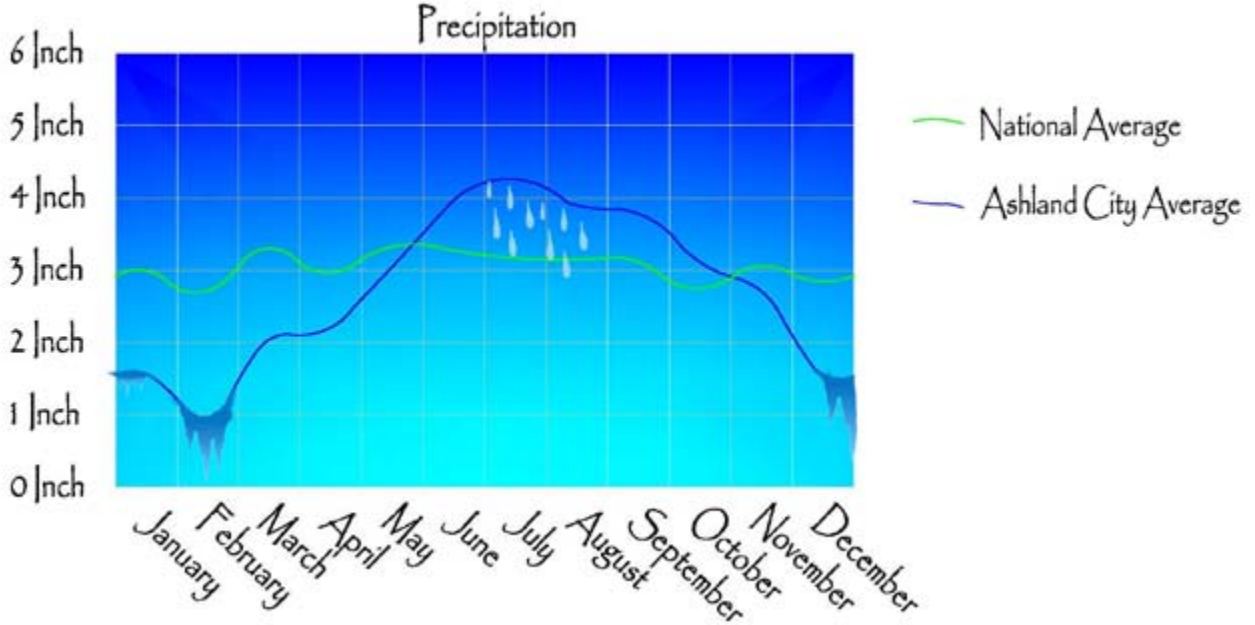
Vegetation Cover with Large Tree Locations

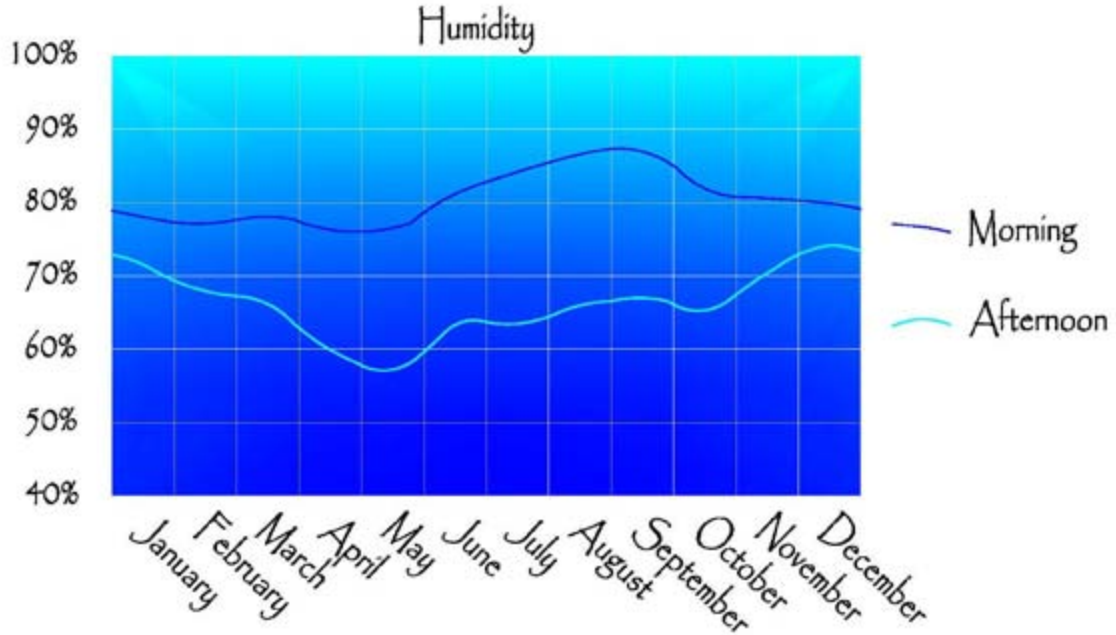
Along the site is a large variety of vegetation, including brush, wild grasses, and small trees. There are very few large species of trees next to the site, however, there are some sporadically located on personal properties adjacent to the site.

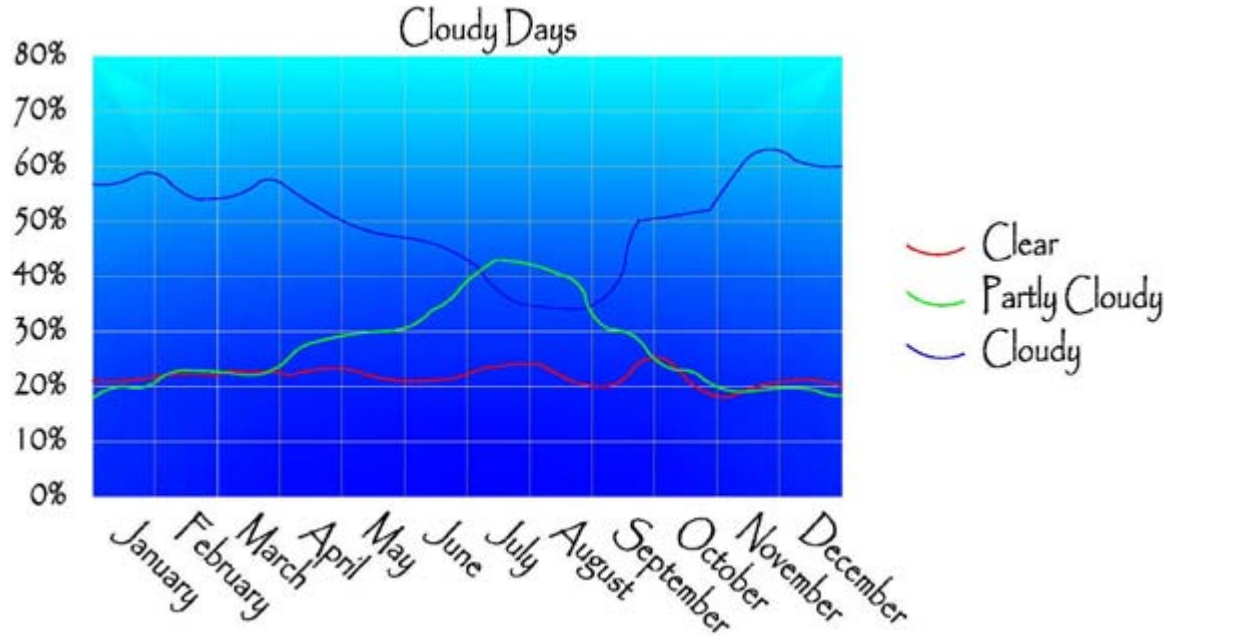


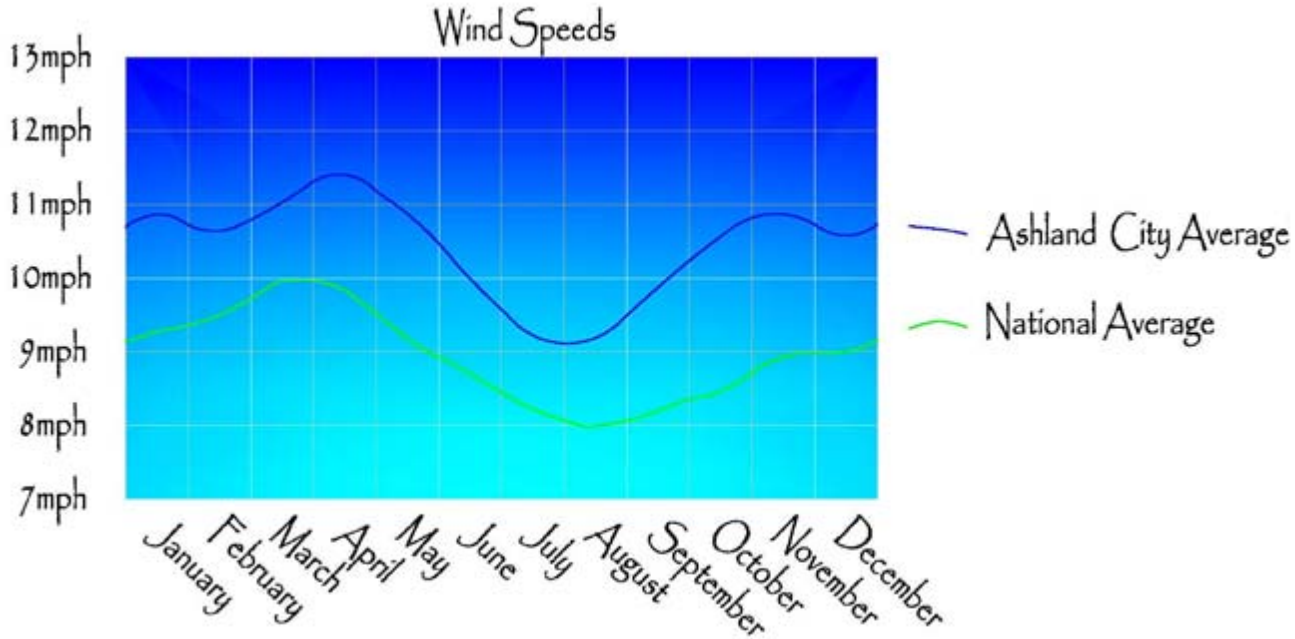
Original Image courtesy of City of Ashland

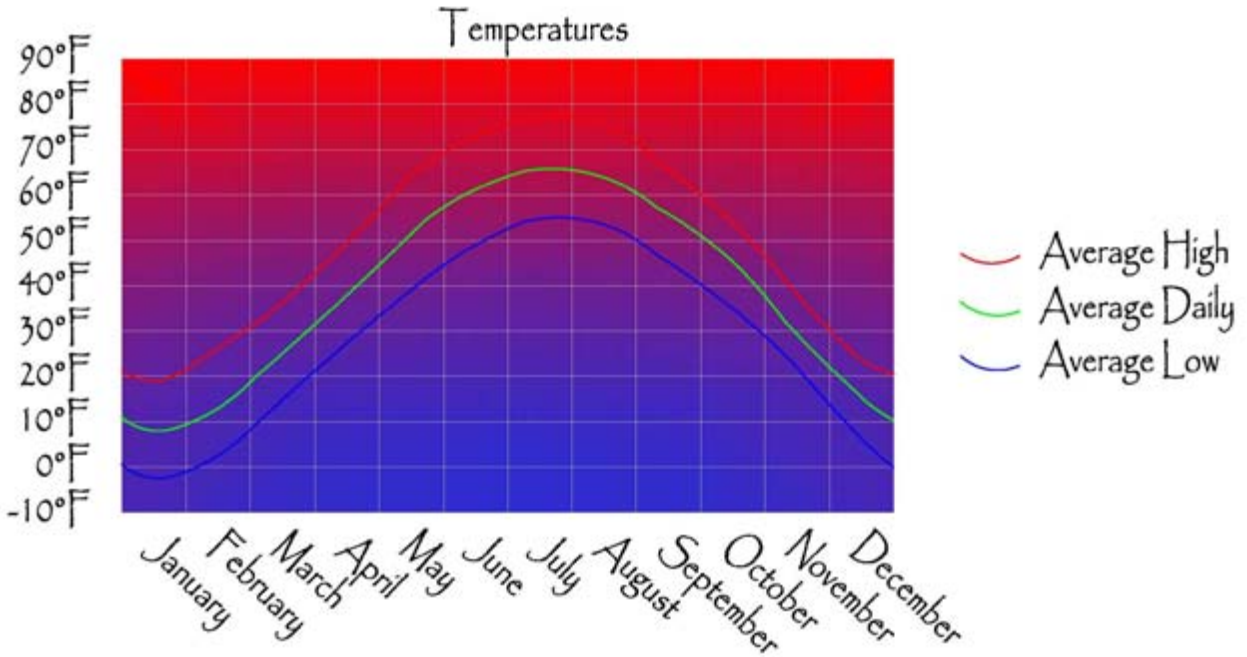
Climate Data



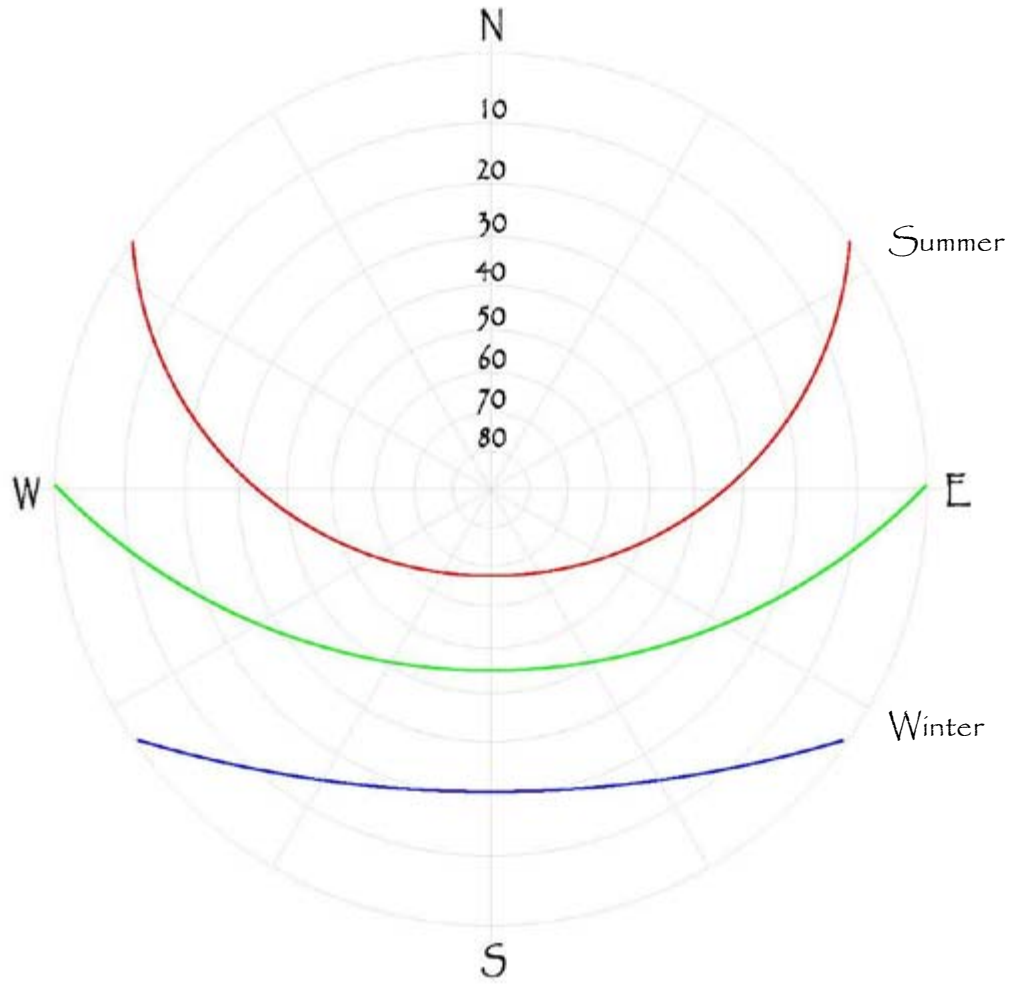



Cloudy Days
80%
70%
60%
50%
40%
30%
20%
10%
0%
January
February
March
April
May
June
July
August
September
October
November
December
Clear
Partly Cloudy
Cloudy


Wind Speeds
13mph
12mph
11mph
10mph
9mph
8mph
7mph
January
February
March
April
May
June
July
August
September
October
November
December
Ashland City Average
National Average


Temperatures
90°F
80°F
70°F
60°F
50°F
40°F
30°F
20°F
10°F
0°F
-10°F
January
February
March
April
May
June
July
August
September
October
November
December
Average High
Average Daily
Average Low

Sun Path



Wind and Noise

Wind Direction/
Lake Effect Winds

Noise

- Ships
- Autos

Original Image courtesy of City of Ashland

Topography

Original Image courtesy of City of Ashland

Programmatic Requirements

Exterior Spaces

- Parking
- Garden/Park

Public Spaces

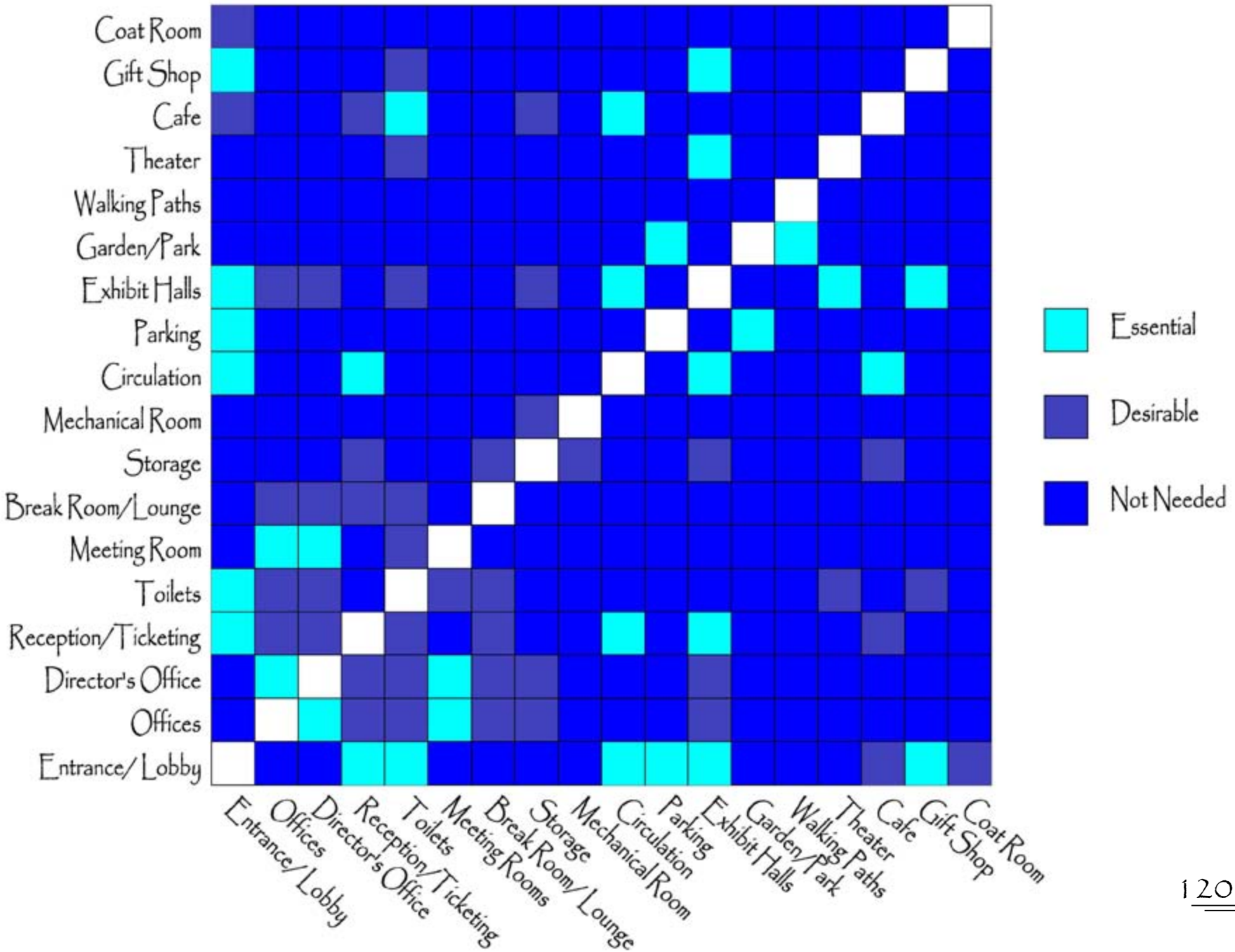
Entrance/ Lobby	SF 800
Reception/Ticketing	SF 250
Exhibition Halls	SF 15000
Theater	SF 800
Café	SF 800
Gift Shop	SF 800
Restrooms	SF 600
Coat room	SF 100

Private Spaces

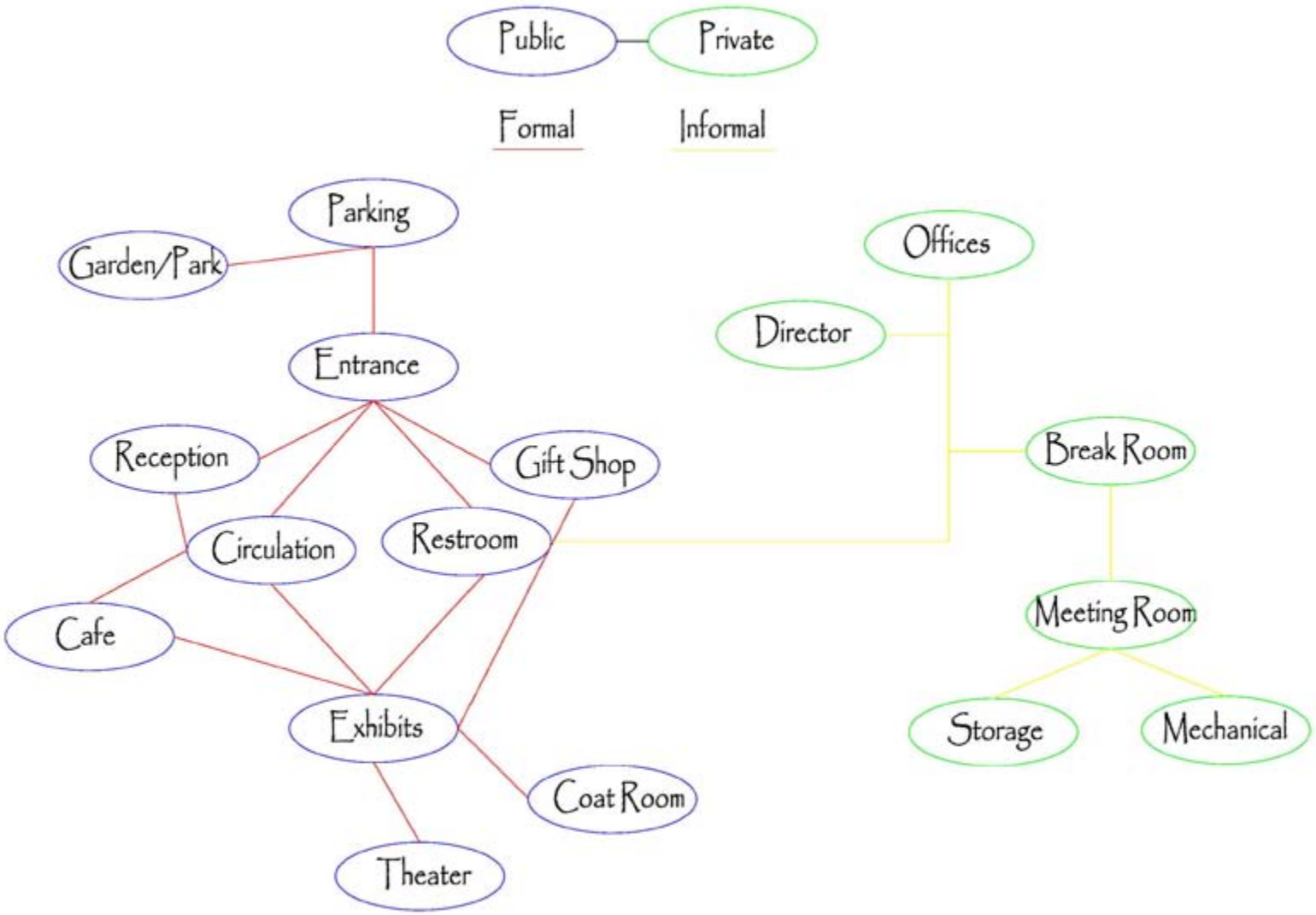
Offices	SF 500
Director's Office	SF 144
Break Room/Lounge	SF 150
Meeting Room	SF 200
Storage	SF 7500
Mechanical Room	SF 800

Total	SF 28444

Interaction Matrix

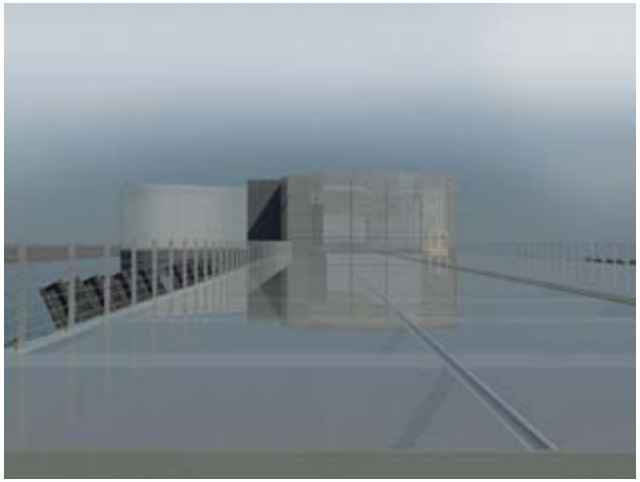


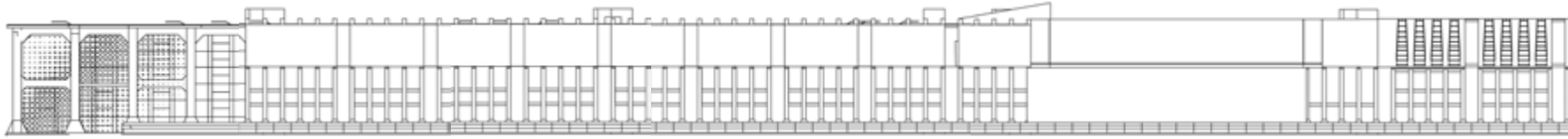
Interaction Net



Ashland G

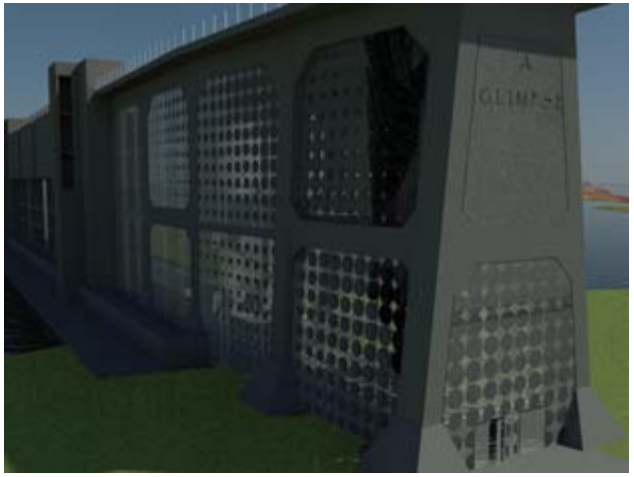
Theoretical Premise: Design has a significant influence on one's actions. By using elements both designed and in nature we can engage and evoke responses in a foreseen manner.

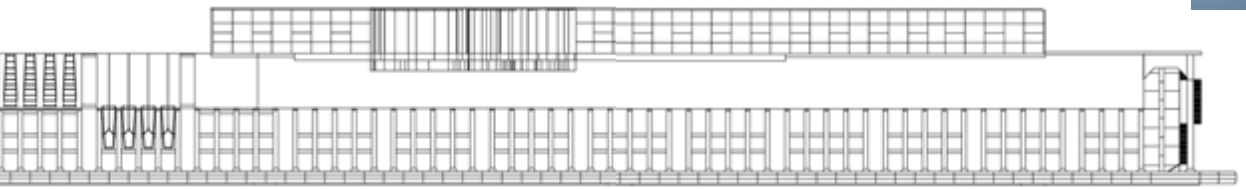


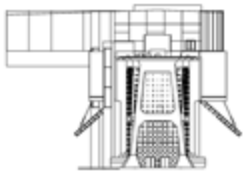


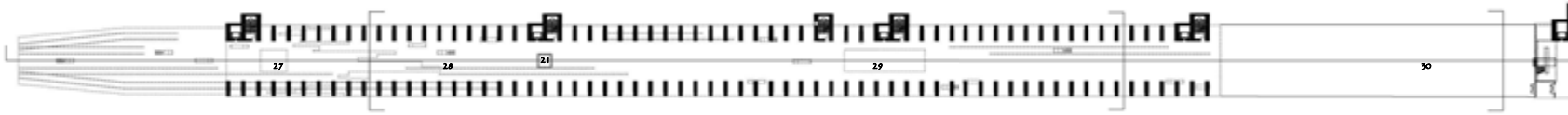
Great Lakes Industrial Mining Pier & Shipping Exhibits

The focus of the project is to create a museum by exploring the deep symbolism which is present in every facet of the site, and apply it to a design which guides its visitors with experiences instead of signage.



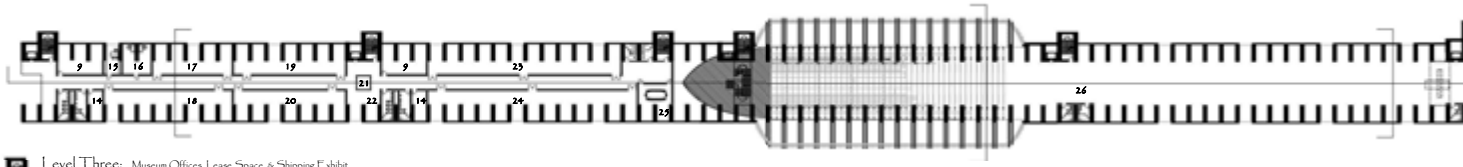


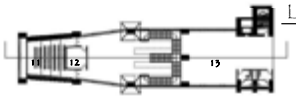




Level Four: Exterior Viewing Park & Great Lakes Exhibit

Scale: 1/32"=1'-0"



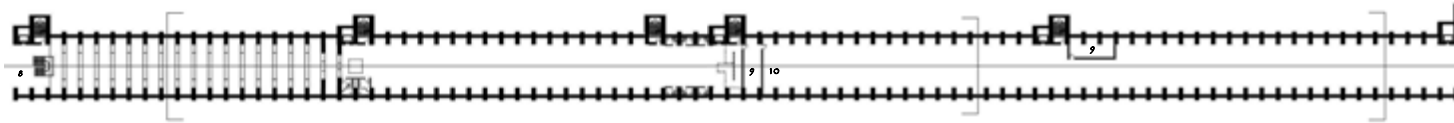


Level Three: Museum Offices, Lease Space, & Shipping Exhibit

Scale: 1/32"=1'-0"

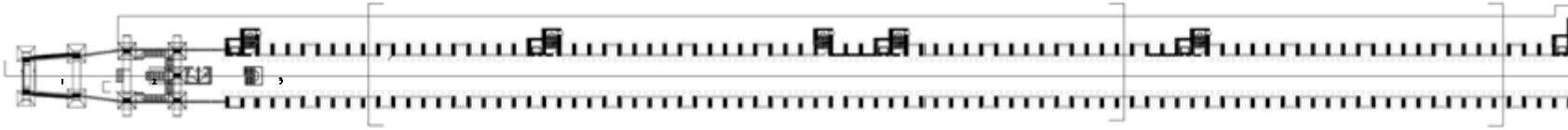
Level Two: Museum Theater & Gift Shop

Scale: 1/32"=1'-0"



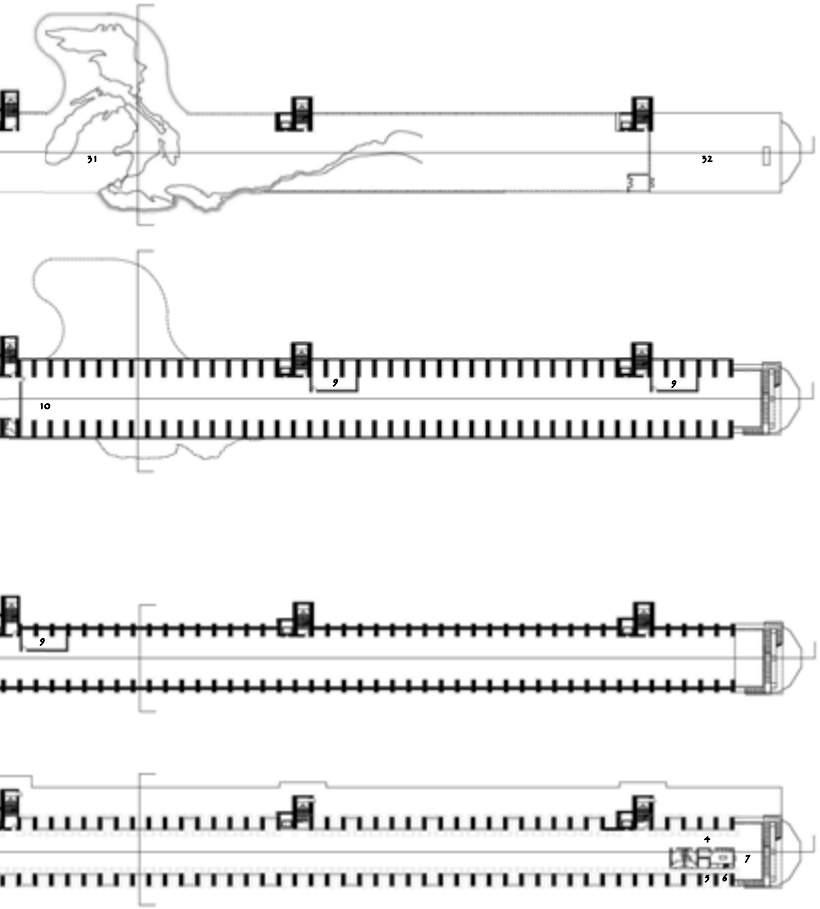
Level Two: Mining Exhibit & Museum Storage

Scale: 1/32"=1'-0"



Level One: Lobby, Circulation Corridor, Cafe

Scale: 1/32"=1'-0"



The site is locate on an ore dock in Ashland Wisconsin. It is a massive concrete structure which, in its prime, saw hundreds of thousands of pounds of iron ore pass through its chutes and into ships for transportation. After mining declined there was no longer a need for the structure, so it was left abandoned. For the last 47 years the dock has stood proudly in the Chequamegon Bay, telling its story to anyone who would stop and listen.

The city of Ashland is currently trying to acquire the dock in effort to save the historic landmark from demolition.

1- Lobby
2- Ticketing
3- Circulation Corridor
4- Cooler
5- Pantry
6- Kitchen
7- Cafe
8- Mining Exhibit

9- Mechanical Room
10- Museum Storage
11- Theater
12- Projector Room
13- Gift Shop
14- Custodial Room
15- Director's Office
16- Operations Office

17- Rental Suite 1
18- Rental Suite 2
19- Rental Suite 3
20- Rental Suite 4
21- Vertical 'Shaft'
22- Shared Space/Break Room
23- Rental Suite 5
24- Rental Suite 6

25- Conference Room
26- Shipping Exhibit
27- Glass Floor Panel
28- Exterior Viewing Park
29- Skylight
30- Glass Walk
31- Great Lakes Exhibit
32- Great Lakes Overview

Site Plan

1- Lobby defines a large gathering space and provides destination foreshadowing.

2- Circulation Corridor able to move large amounts of people horizontally through the museum without disrupting the flow of the exhibits

3- Mining Exhibit creates a shaft mine using the repetitive nature of the original concrete structure. Remnants of raw iron ore, old mining tools, and equipment depicts the beginning journey of both the exploitation of ore and the creation of the historic dock.

4- Rental Space gathers other businesses from the community to help support museum operations.

5- Rest Stop located at every level change and intermediately in each exhibit. The repetitiveness reduces visitor disorientation and provides an area to rest as needed.

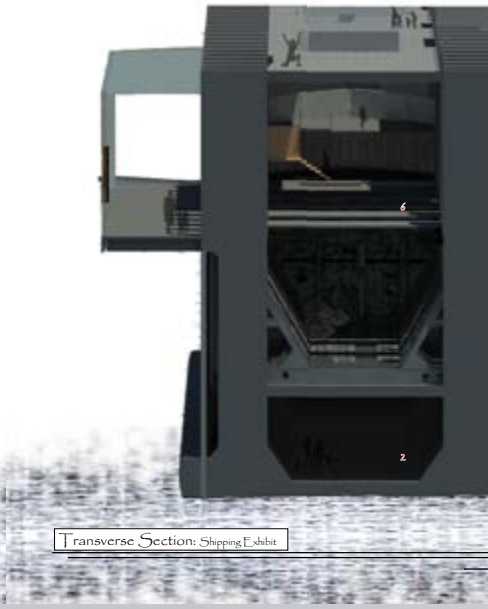
6- Shipping Exhibit shows how the large quantities of ore were transported on the Great Lakes for processing. The dissipating ship, modeled after the Edmund Fitzgerald, enables a view of the repetitive structure of the ship and its cargo hold.

7- Museum Storage space for storage and preservation of museum artifacts and exhibits.

8- Ore Bins shows how the dock stored and loaded the ore into the holds of the ships. The glass walkway on the deck of the dock let you look down into the bins and exhibit, while symbolic ore (water) runs down the chutes and into Lake Superior.

9- Great Lakes Exhibit provides an interactive exhibit of the Great Lakes while cantilevered 80' above the lake. Encompasses the journey and the history of the dock from how and why it was created, to what it is now. It bestows a sense of the magnitude in which the dock was once a part of.

Transverse Section: Mining Exhibit



Transverse Section: Shipping Exhibit

Longitudinal Section

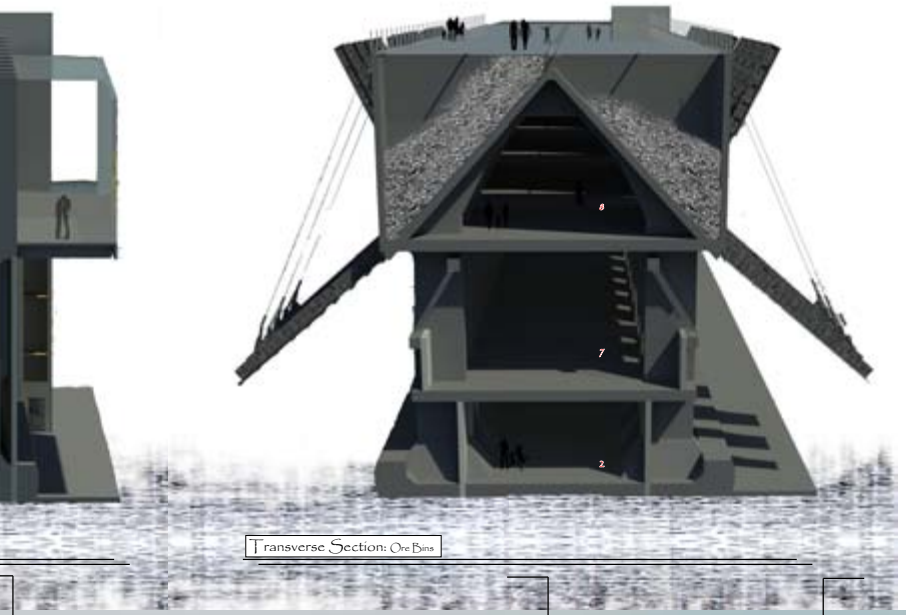
Arch 772 Design Thesis
Spring Semester 2012

Megan Nelson
Professor Mark Barnhouse

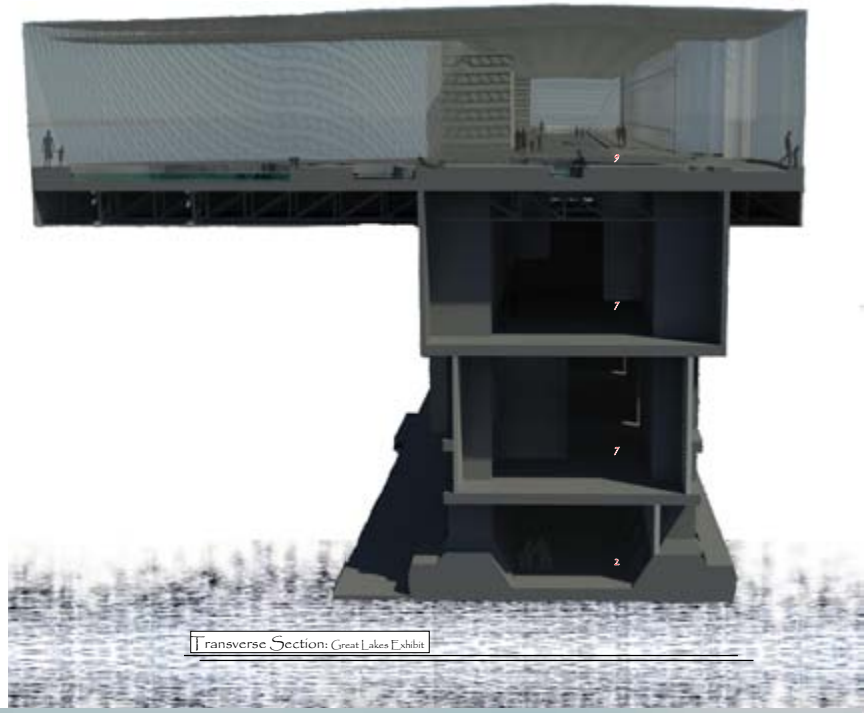
AutoCad Architecture 2012
AutoDesk 3ds Max 2012

Adobe CS5

InDesign Photoshop



Transverse Section: Ore Bins



Transverse Section: Great Lakes Exhibit

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