



Ore Dock No. 1 | Industrial | Reuse | Culture | Community |

“Ore Dock No. 1 / Industrial / Reuse / Culture / Community”

By: Collin Scott Johnson

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

In Partial Fulfilment of the Requirements for the Degree of
Masters in Architecture.

Steve C. Martens; Architect
Professor of Architecture
Thesis Primary Adviser

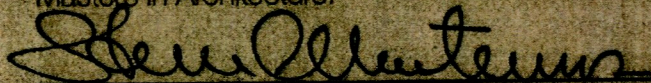
Ganapathy Mahalingham; Ph.D
Professor of Architecture
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5/5/2016



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Dedicated To My Family
Grandparents, And All Those Who Have Supported And Inspired Me.

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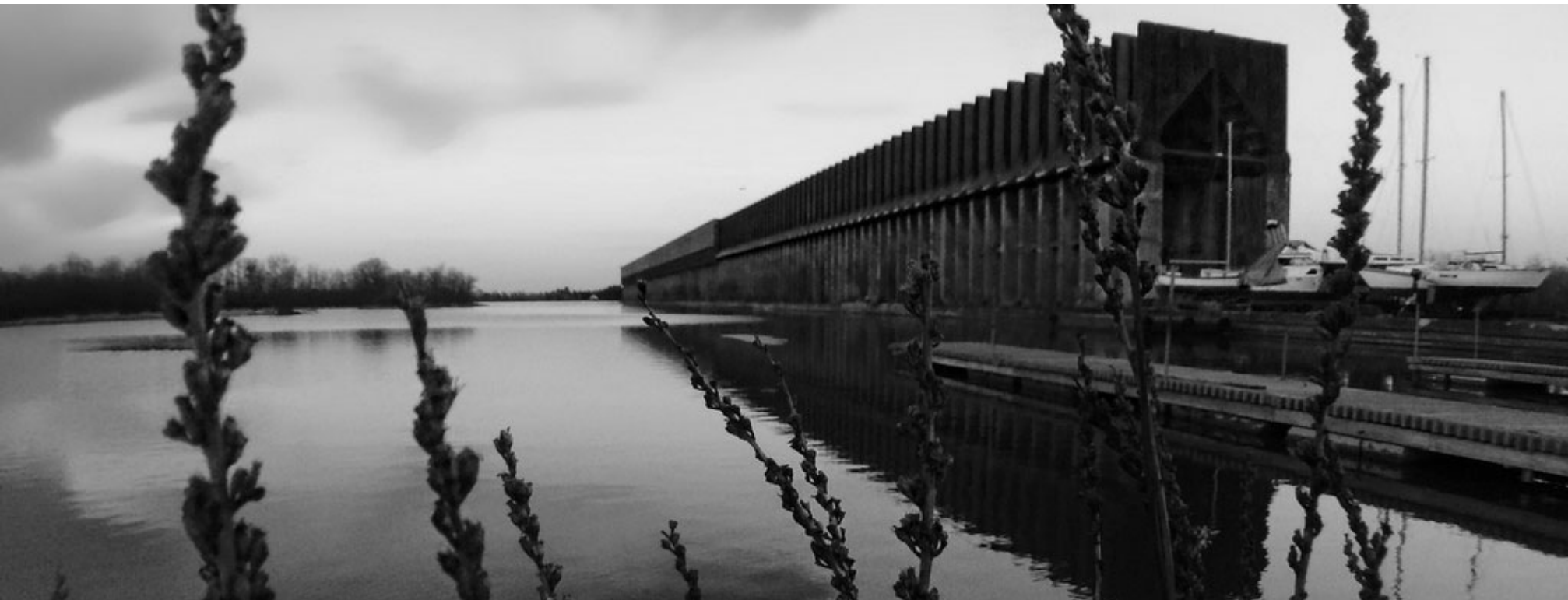
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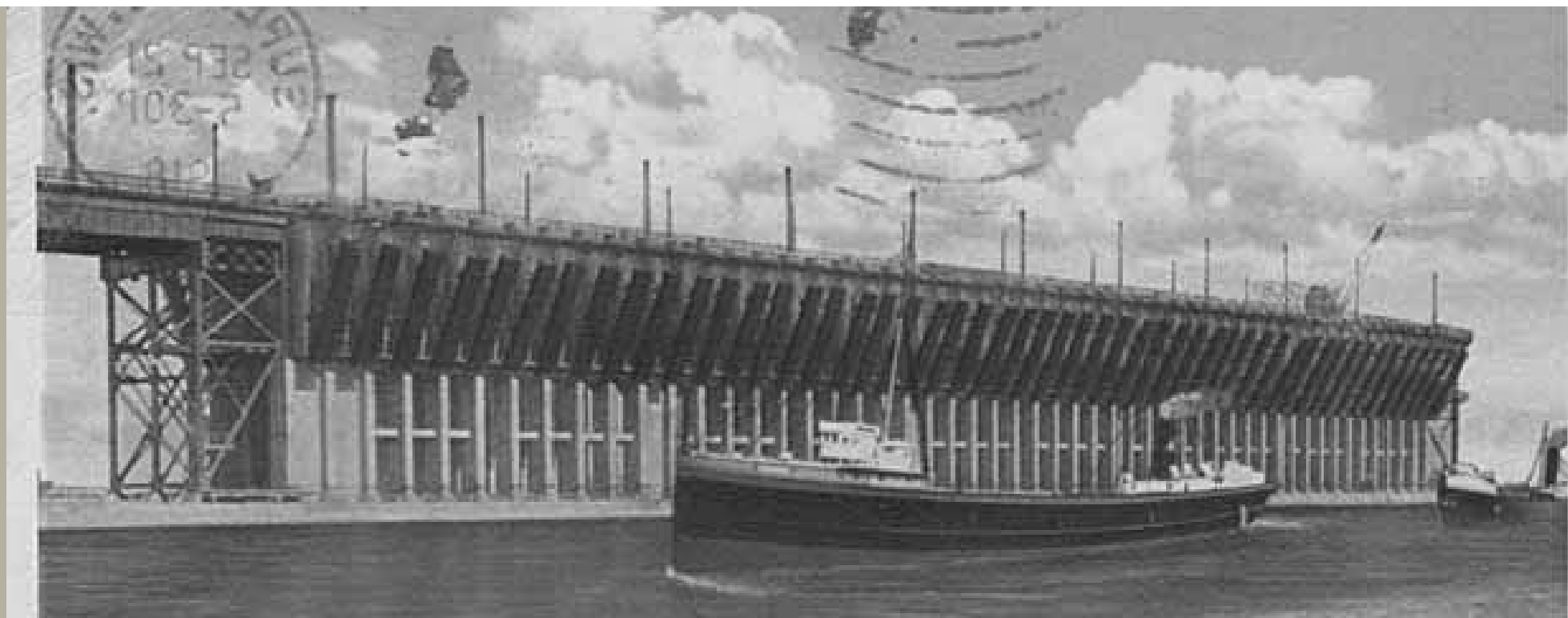
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Thesis Abstract

Industry and commerce is what defines communities, and can either grow or be the downfall of cities across the globe. When industry wanes or diminishes, it often leaves behind its infrastructure, or architecture. These landmarks of economy have value and opportunity, but are often demolished or abandoned. Architecture is a profession that capitalizes on value and opportunity. Ore Dock No. 1 focuses on how communities can take opportunities of abandoned industrial infrastructure and repurpose it to tell the story of its culture, community and history. By telling the story of industry, architecture can preserve the character of communities and create a space to celebrate and learn about its past and future.

Project Title : Ore Dock No. 1

Typology : Great Lakes Shipping & Mining Museum & Cultural Center

Site Location : Superior, Wisconsin

Size (sq/ft) : 154,500 sq./ft.

Narrative

Introduction

By addressing this project as an adaptive reuse of existing infrastructure you begin to see the effects that hopefully a project such as this will have on a community and the general patrons of the public. A project like this will hopefully carry with it a multitude of positive effects in the realms of social, cultural, economic, and historical factors. The scopes of these effects are as follows:

Social Premise

Socially architecture can connect us to one another, by creating spaces for discussion, debate, listening or meeting. This project will encompass all of those aspects of our daily social lives. This architectural space will be a place for families and friends to meet, eat and explore the regions history. It will be a place where people from the local, national and maybe even international scene will intermingle and connect. In a time where we are so connected to a screen, this place will give viewers a chance to look up from technology and actually see artifacts, working machinery and media from both a historical and cultural place in time. It will answer questions of where we have come from as a people, and also hopefully beg the question as to where we are going.

Narrative Continued...

Cultural Premise

Many of these structures have been left abandoned or else torn down to make way for new projects and buildings. By preserving this piece of history we not only seek to preserve the building itself but also preserve the story of generations of laborers and workers. For nearly half a century this was a place that people built their lives around. They punched a clock, in snow and heat and earned a living. The work that was done here carried a nation through a world war and built cars, appliances, and various other consumables. Culturally it reflects a region in these two states, and it shows what built their towns, homes and communities. By reusing the built versus tearing it down it creates a cathedral dedicated to this culture that the steel industry forged in this region and tells the stories of these people who dedicated, and even in some instances gave their lives to the mines, ships or railways in the iron industry.

Economic Premise

The economic opportunities addressed in this project are immense. This structure represents material, man-hours, engineering and money. If not reused these resources are inexcusably wasted. By creating a new institution out of this opportunity you breathe a new life into it. You can create jobs; generate revenue from local visitors or tourists. You can generate media in the forms of movies, lectures or books. And you can collect, study and investigate artifacts and stories of the past. By doing the project in an environmentally sustainable manner you can keep working costs down or even be able to generate energy that can later be sold. By seeing the opportunity instead of the burden of this project you can create a destination for both people and resources. That's what this project hopes to do for instances like it in other areas.

Narrative Continued...

Historical Premise

This building will stand as an eye opening approach for historical and adaptive reuse, and how thinking out of the box as far as what can be used or converted into a usable building. By showing that this can be adapted it will raise awareness to other designers as to the opportunities of adaptive reuse. It doesn't necessarily mean that adaptive reuse needs to be looked at as a former warehouse being turned into a mixed-use building.



Project Typology

Great Lakes Shipping & Mining Museum & Cultural Center

Museum

[myoo-zee-uh m]

noun

-a building in which objects of historical, scientific, artistic, or cultural interest are stored and exhibited.

This building typology not only serves as a museum but also as a cultural center. A learning center for the public and for students willing to listen to the stories of their community and their history. It is a flexible space for lectures, events, food and drink, and also lounging.



Case Study One

Kraanspoor / OTH Architecten

Typology: Office Building

Location: Amsterdam, Netherlands

Size: 134,549 sq./ft.

Keywords: Industrial, Reuse, Dock, Conversion

Program: Open Office Space, Circulation, Lobby,
Restrooms, Utility Space



Research

Kraanspoor, which translated to English means “crane way” is a reuse project closely related to Ore Dock No. 1 an industrial structure no longer in use that sat dormant. Much like the rest of the case studies you will continue to read about in this book, it shows that a new life can be granted to these forgotten structures. It shows that history can be preserved while updating uses and reprogramming existing infrastructure. Much like the ore dock the crane way has a very narrow linear progression, which in some cases could be seen as a challenge. The existing structure dictates the form of the newly built form.

What makes this case study unlike the others is that the site is so closely related to the ore docks, the fact that it sits on a pier outside of Amsterdam overlooking a harbor is a really unique feature to this project. Also, this building is built on top of the existing structure whereas the other projects either convert existing interior space or like the Mill City example that you will see is built around the ruins of the existing structure.



INDUSTRIAL

Environmental

Environmentally this project can be seen as a relatively energy efficient solution. The inherent energy saved by re using the old structure as a foundation is immense. The new portion of the building itself was built to be lightweight due to the limits of the structural loads on the crane way so it is mostly made up of steel and glass. To offset the solar gain to the offices, the designers made a type of louvered shade device that it employs on the façade of the office building. Also its development along the waterfront paves the way for infill opportunities on the sites nearby reducing the need for urban sprawl. The also employs a heating system which draws water from the wharf and pumps it through the building in an energy efficient manner. The glass façade is a double glass system consisting of an outer layer of glass louvers, and an inner system of floor to ceiling glass panels with wood frames. The glass also was fritted with charcoal grey dots to reduce glare and solar gain. Users of the building report that the sunlight is not a problem, but the temperature can vary greatly from zone to zone.

Social

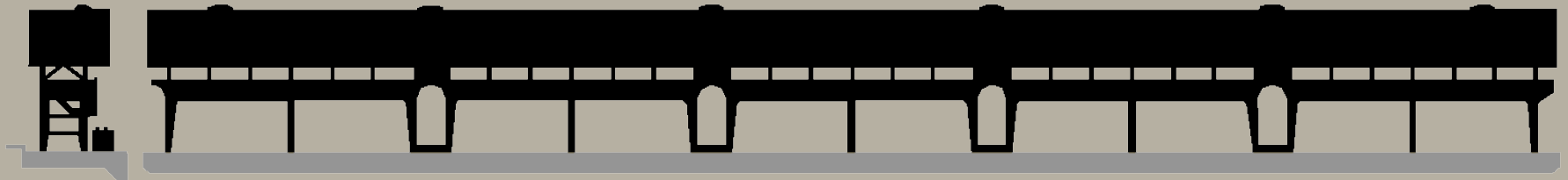
Socially like many other adaptive reuse projects, Kraanspoor promotes a working environment, which I imagine would be quite pleasant. The office overlooks the natural landscape of the wharf giving workers views of the incoming and outgoing ships. Also, this project demonstrates a social responsibility that we as a profession must be responsible for the built environment. That responsibility cannot only be limited to buildings of the future, but must also be about the buildings of the past. Our obligation to the environment, and the people must be one that does not focus on consumption, but rather innovative ways to use the built environment, which already exists. This benefits not only environment, but history, culture, society and many times economy.

Cultural

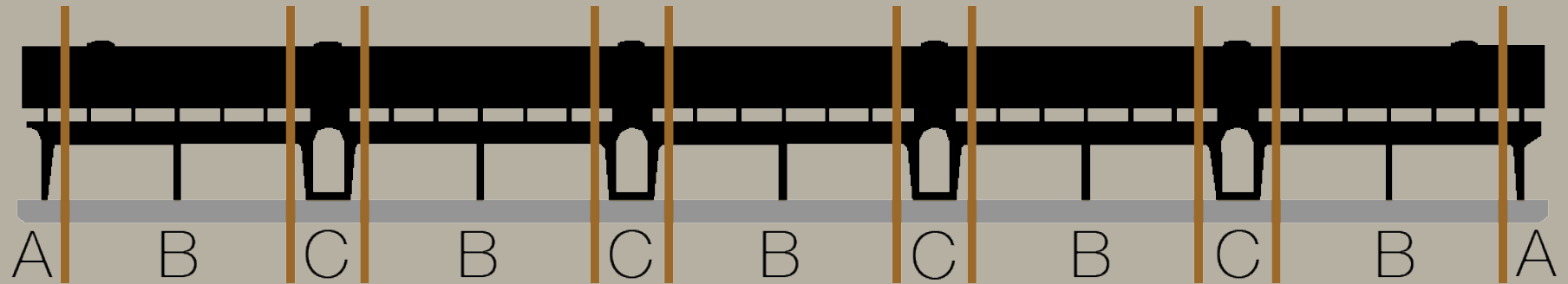
From a cultural standpoint this project is a symbol of the historic nature of the shipping industry in Amsterdam. It is now preserved, and its life cycle lengthened due to its reuse as a modern office space. It tells the story of the city and its industry from its inception as an industrial or “blue collar” workforce to its evolving professional workforce. But it tells it in a way in which it pays homage to its past and acknowledges its roots as a shipping culture. In the 17th century Amsterdam was the wealthiest city in the world due to its shipping industry, and this project celebrates that history and retains an architectural vocabulary that might otherwise be lost to modern society. Overall this project shines a light onto the rich history of the maritime culture in the city of Amsterdam. Over a thousand luxury ships were built at this site while the crane acted in the task of a ship line assembly process.



Analysis



Form



Patterning



Structure



Steel

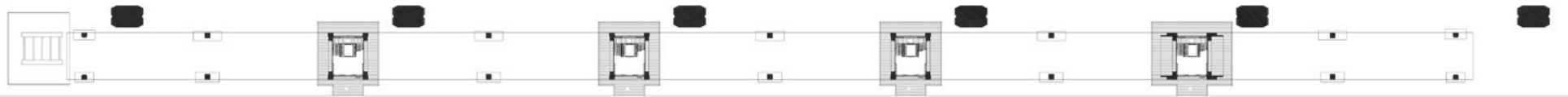


Concrete

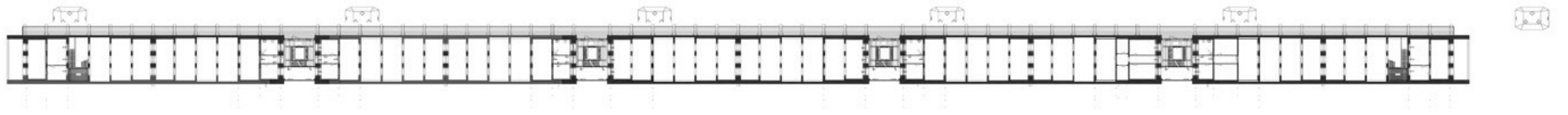
Context



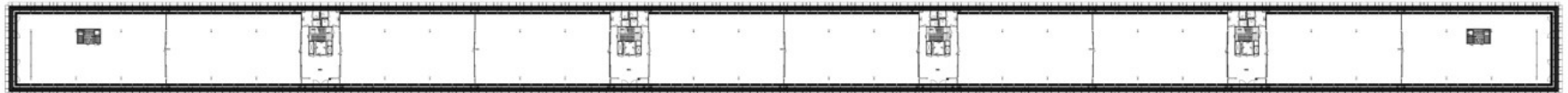
Plan



Ground Floor

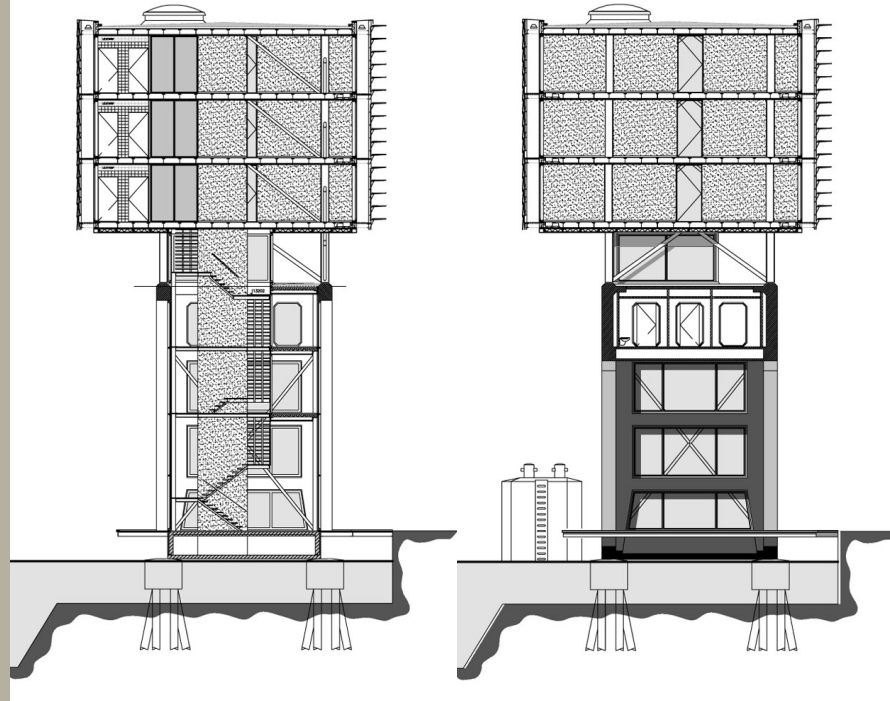


2nd Floor



4th / 5th / 6th Floor

Section



Program Floors (4,5,6)



Open Office Space Circulation Lobby/Entry

Program Floor (3)



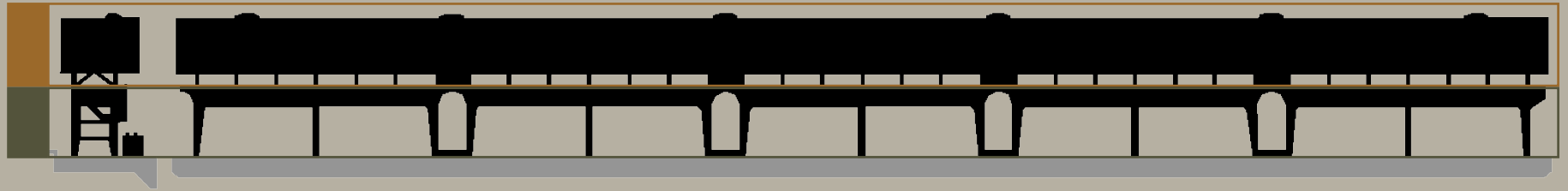
Archive/Storage Circulation Lobby/Entry

Program Floor (2,1)



Circulation

- New Construction
- Existing



Conclusion

This study shows the importance of adaptive reuse, and shows that it can be used in situations where an adaptive reuse project isn't the most apparent solution, but nonetheless a successful solution. It shows an innovative way to think about adaptive reuse, and how we treat existing built structures. Much like the ore dock, a structures history can be preserved, and be useful. A culture that may be abandoned doesn't have to be destroyed. I think what Kraanspoor demonstrates is that the ore dock and other structures like the ore dock aren't shackled to a future of demolition, but with a little creative thinking and innovation they can be used in a more respectful manner. Overall this study solidifies the idea and importance of reuse in architecture, and other building professions.

Case Study Two

Public Library and Music School / Donaire Arquitectos

Typology: Public Library/Music School

Location: Calle, Bogotá, Cundinamarca, Colombia

Size: 18,568 sq./ft.

Keywords: Factory, Reuse, Public Space, Community

Program: Library, Classroom, Reception, Utility



Research

This project like all of the other case studies included in this research is an adaptive reuse project. It combines a mix of older existing structure and new construction. Like the Kraanspoor it has a very direct and linear progression made up of a series of structural bays. While its not industrial infrastructure, it is however an industrial typology. Like the others this project tells the story of an industry though it may or may not play into the historic culture of the surrounding culture. What I think is important about this case study is the fact that an industrial use building can be transformed into a healthy environment for gathering a community.

This project is a former winery warehouse turned into a public library, and music school. The project unlike the other two case studies is a building that is entirely open to the public and general community. It shows how adaptive reuse can effect and connect communities in a positive fashion. One thing that stands out about this case study is the fact that the newly built environment in this project is an entirely separate aspect added onto the side of the older existing structure. This project is mainly a load bearing masonry construction building without the addition to any sort of steel or concrete reinforcement.

Environmental

The library and music school is a fairly simple building in a climate that is drastically different from that here in Fargo. The building has been retrofitted with newer operating windows. The building also employs a natural ventilation system located in the gable ends of the building, allowing the breezes to naturally vent the interior. It appears that a large portion of the building is un-insulated including the masonry walls and the roof system, which may or may not be the best approach depending on location. While it may not be the poster child for green design technology, as always there is the inherent environmental factors that come along with adaptive reuse, such as: cuts in labor, less usage of material, costs cut from demolition and transportation.

Social

Socially, this projects response is probably the most impactful as a totally public space. It is open to the community, and is a healthy environment for learning, discussion and art. The social opportunities created by this project are immense. It gives people the ability to enjoy various media in a well-designed building in an economic manner. The project promotes reuse and shows the community what can be done with its forgotten or abandoned spaces. It promotes healthy activities; music, reading and writing are some of the oldest and most popular forms of art in the world. In a time where we are bombarded by screens, and technology being able to go to a place and sit and create music, or read an actual book is a luxury. This space gives people that opportunity and tools to make that a reality. It is a space for the people and a design that brings people together as a community. Our jobs as designers are to ensure the health and safety of our clients and the public and to be able to say that ethically we made decisions that have or will benefit the greater good of the people that we have served and this building demonstrates those principals to the people of Calle.

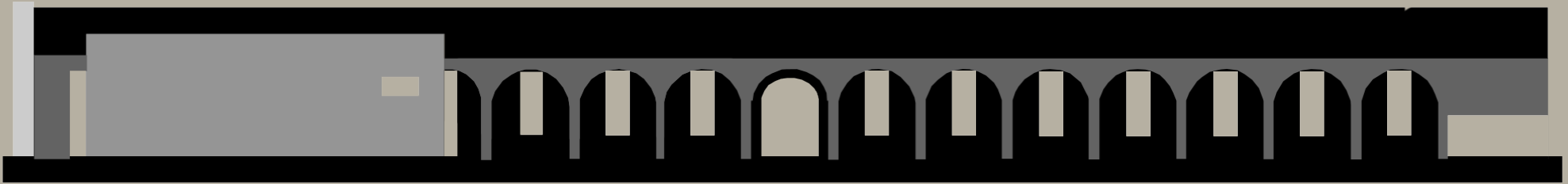
Cultural

The cultural response of this design is quite rich. The building retains a lot of its older character preserving the history behind this structure but it mixes it with modern elements through the design of the windows, and the addition added on to incorporate class spaces. The traditional elements are even incorporated into the modern extension of the building via the vented openings that existed in the gable ends of the older building. The colors chosen in the library are vibrant and warm reflecting the Colombian heritage. Also the clay tile roof was left intact and speaks a lot about the architectural vernacular for the region. The second floor looks down onto the main level library space which leaves the full expanse of the warehouse open up to the exposed wood rafters giving you a sense of what the entire space felt like when it first started out as a warehouse for the winery.

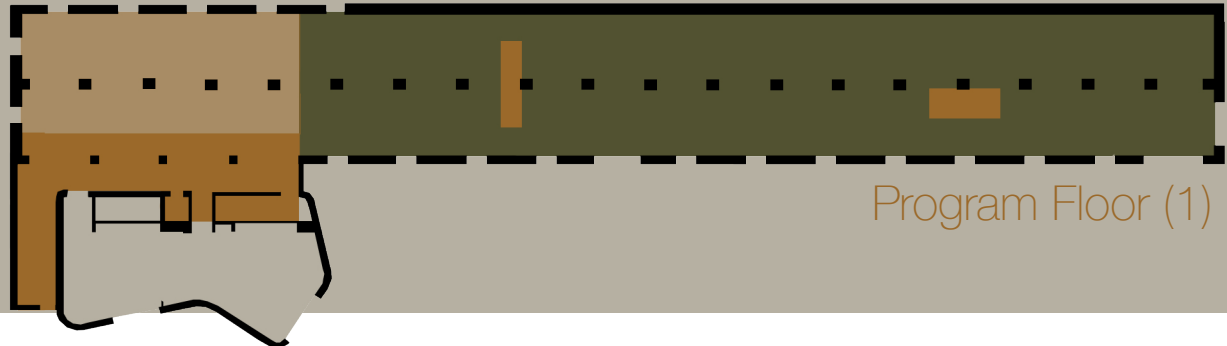
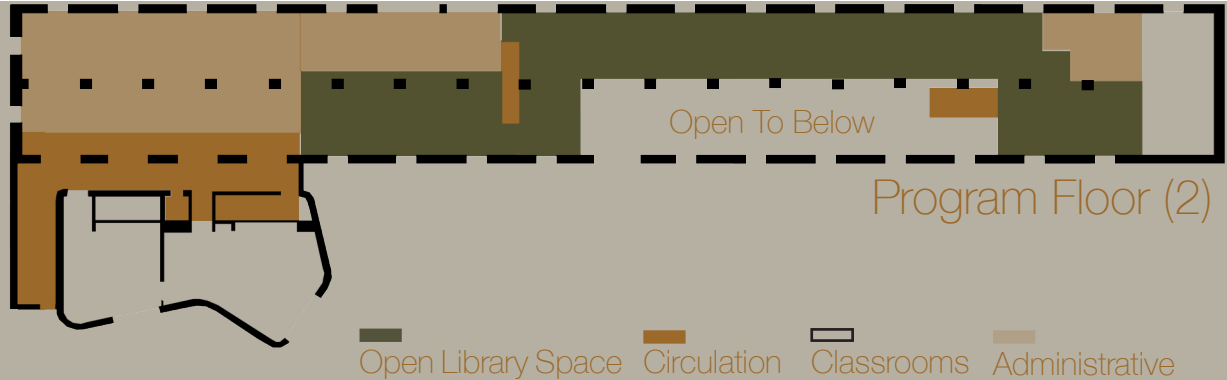


Analysis

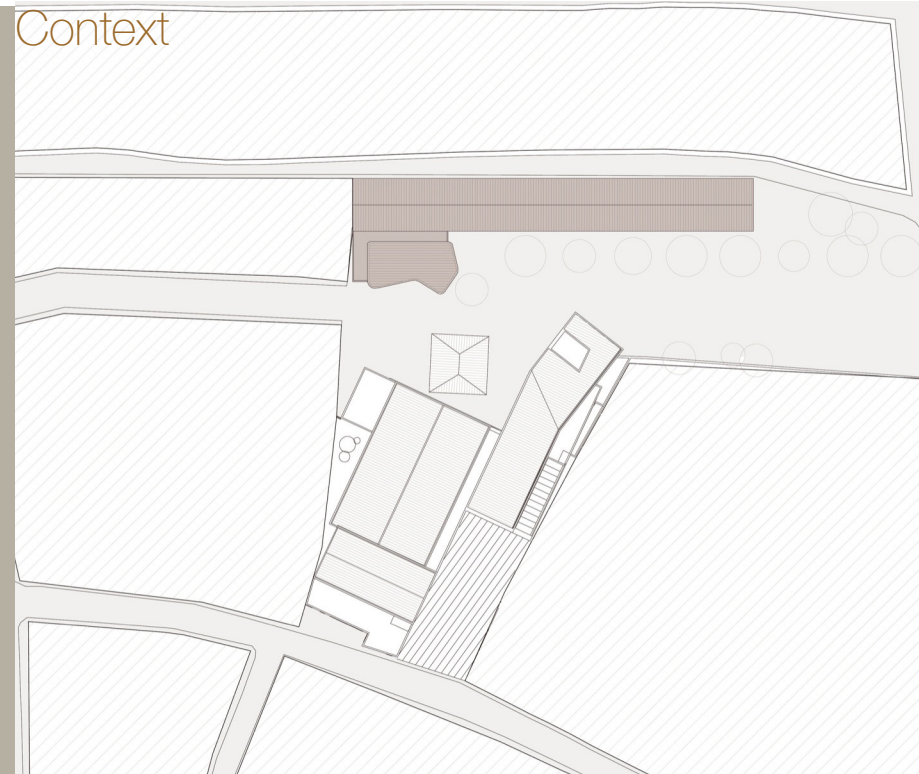
Form



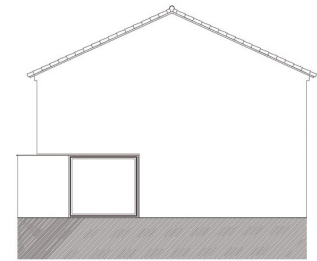
■ New Construction
■ Existing



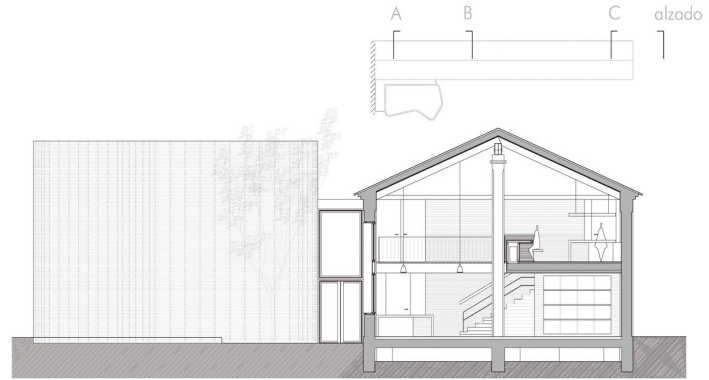
Context



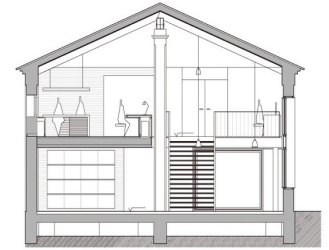
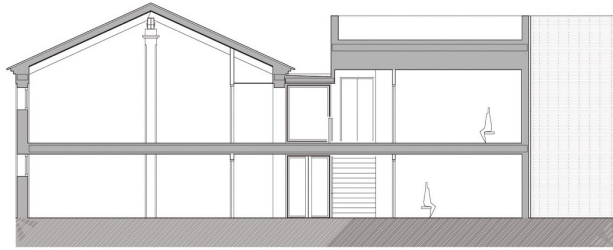
Section



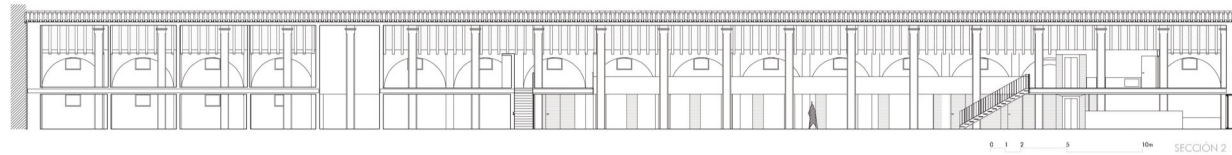
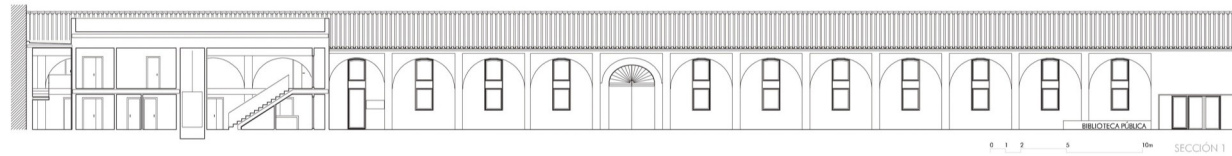
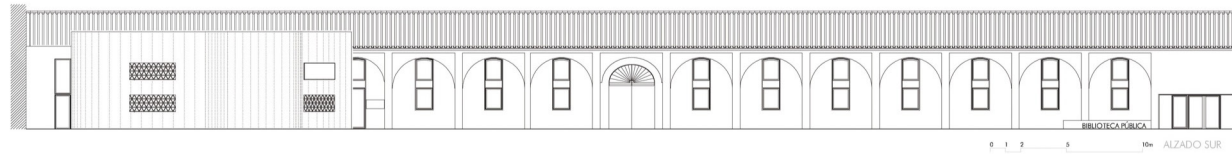
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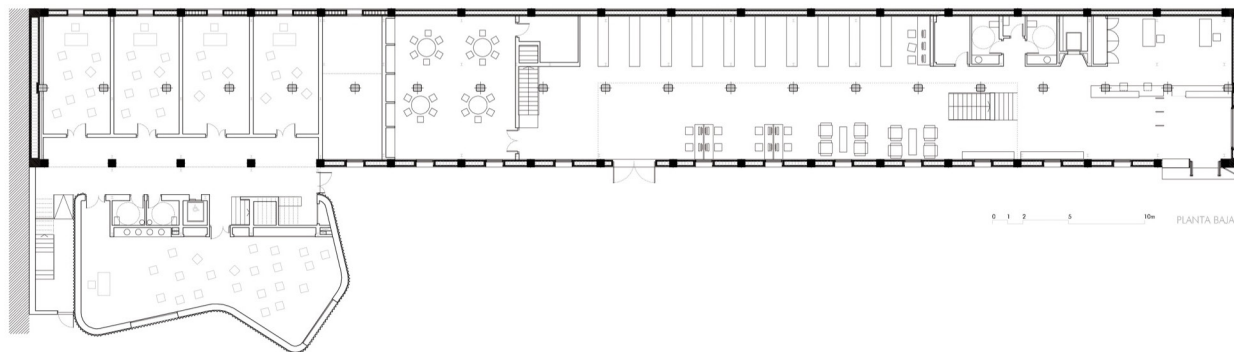
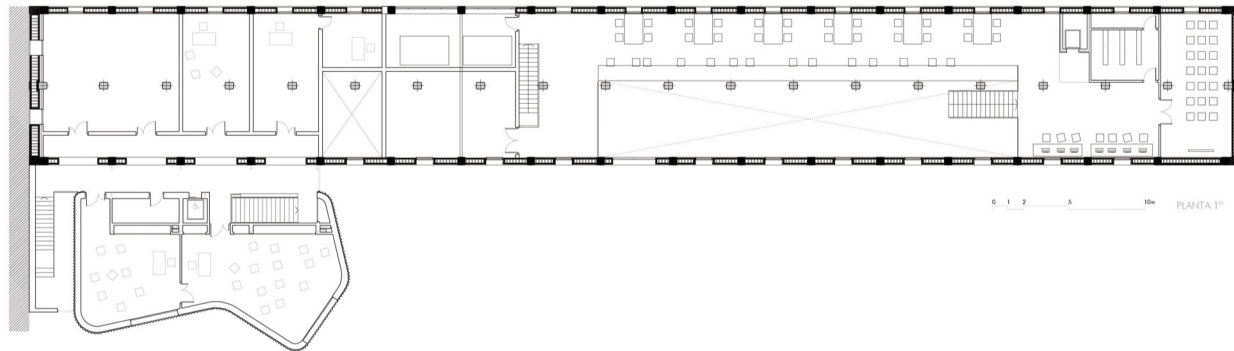
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Elevation



Plan



Conclusion

Overall this case study stresses the importance of community space, and the design professions responsibility to take part in the building of safe and healthy environments for communities. This also shows that adaptive reuse projects in their nature are great candidates for these projects, no only to provide space, but to tell the story of a certain culture or industry. The significance of this building isn't necessarily the fact that its designed well or showcased on a web site, but instead because of its openness and accessibility to the community that it serves, and that's something that this thesis intends to draw upon.



Case Study Three

Mill City Museum / MSR Architects

Typology: Museum / Event Center / Office

Location: Minneapolis, Minnesota, United States

Size: 125,000 sq./ft.

Keywords: Industrial, Reuse, Public Space, Community, Local

Program: Gallery Space, Observation, Office, Lobby, Circulation



Research

This project is also an adaptive reuse project adding to the trend from the following case studies. This is a local project by MSR architects in Minneapolis. This project much like the Kraanspoor project is a direct reflection of the industrial history of its context. Both Minneapolis and Amsterdam were built around industries in which these pieces of infrastructure took part in. Like both of the following projects the Mill City Museum is an industrial use building that was left abandoned for many years and later was saved and put to a new use, with a new program.

What makes the Mill City Museum so different and significant is that the ruins of a Pillsbury flourmill, which was built in the 1870's, surround the building. The mill was taken out of production in 1965, and then experienced a devastating fire in 1991, which nearly destroyed the entire building. In this case study the new building is built entirely around the ruins of the existing older structure. Another distinctive feature of this project is that it is essentially a steel building built within a masonry and wood framed existing building.



Environmental

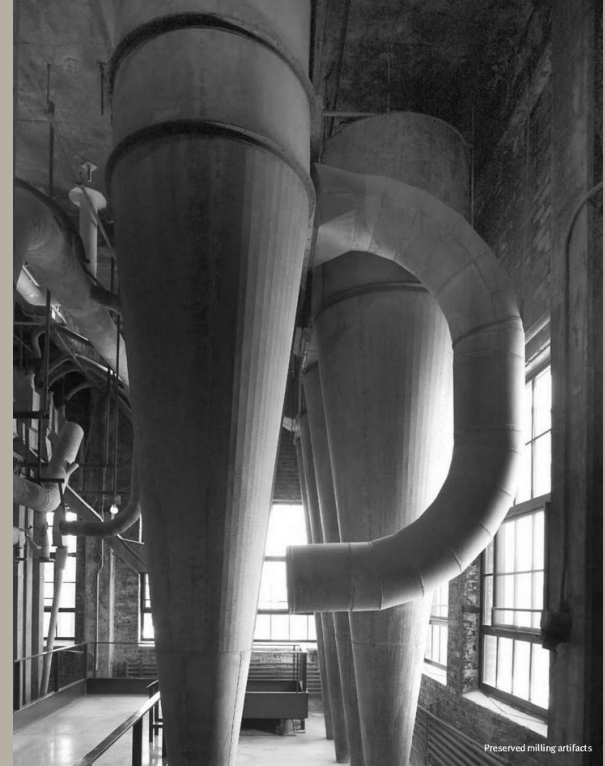
The Mill City Museum much like the other projects showcased in this case study implements use of existing infrastructure in a given city. It promotes reuse and recycling of materials and structures already built displacing the need to use even more material. In its addition built environment the museum puts to use lightweight steel and concrete structural systems and uses the southwest façade of the older remaining building. Overlooking the river is a glass façade system made up of insulated glass panels, parts of which are either etched or frosted to reduce the glare of the sun, and solar gains. The building, much like the greater Minneapolis/St. Paul metro celebrates outdoors space, the museum has both an outdoor observation deck and the popular “ruin garden” which features the ruins of the mills northeast facades. The building is mixed use, which promotes a good downtown density, and is also a successful urban infill project.

Social

Socially the museums spaces adapt very well to use, the bottom three levels are exhibit spaces, followed by the upper five floors, which are occupied by office space. The museum space, which is primarily public, is a great attraction for the mill district and visitors can enjoy learning about the heyday of the milling industry along Minnesota’s Mississippi River. The flexibility of the spaces within the project is one of the best features of the building. The offices are laid out in an open manner, which allows renters to lie out their own spaces or lends itself to one large open area. The public spaces are also extremely flexible; they can host a wide array of events including, business parties, fundraisers, or dinner functions. The outdoor ruin space is a popular attraction for wedding ceremonies and parties as well. The museum is also located close to other downtown attractions such as the Guthrie theatre, the Stone Arch Bridge and the Vikings Stadium, so it’s also a very walk able area..

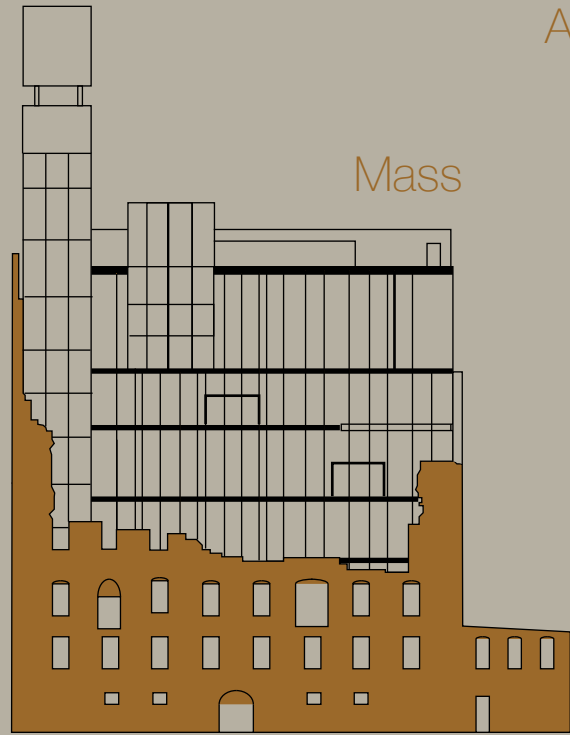
Cultural

Culturally this building is very significant, when built in the 1870's it was the largest flourmill in the world. The buildings inception was sparked by the fact that Minneapolis was one of the biggest players in the manufacturing of flour due to its location situated on the Mississippi River. The river was crucial to the mill due to its use of the river to power the mills grinding technology. The mills along the river added greatly to the development of Minneapolis as a whole. The factory was closed in 1965 due to age and dwindling production and the building was put on the National Register of Historic Places in 1983. After the fire in 1991 the building was left derelict until the early 2000's when MSR was commissioned by the Minnesota Historical Society to retrofit the ruins into a museum. They left as much of the ruins as intact as they could while preserving the safety of the public. In turn the building was saved and a piece of history was preserved in the form of a great building.

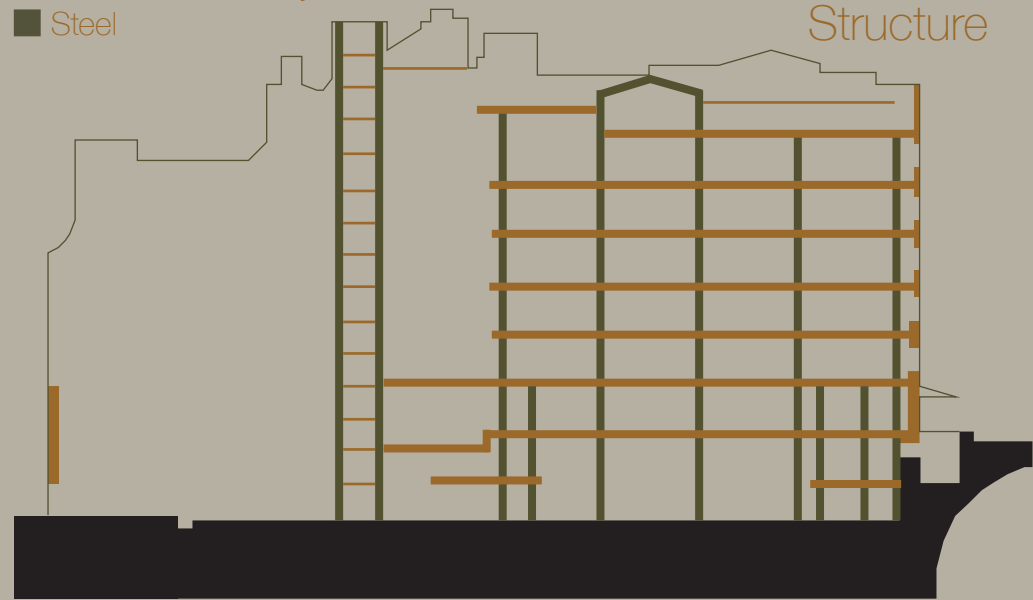


Preserved milling artifacts

Analysis



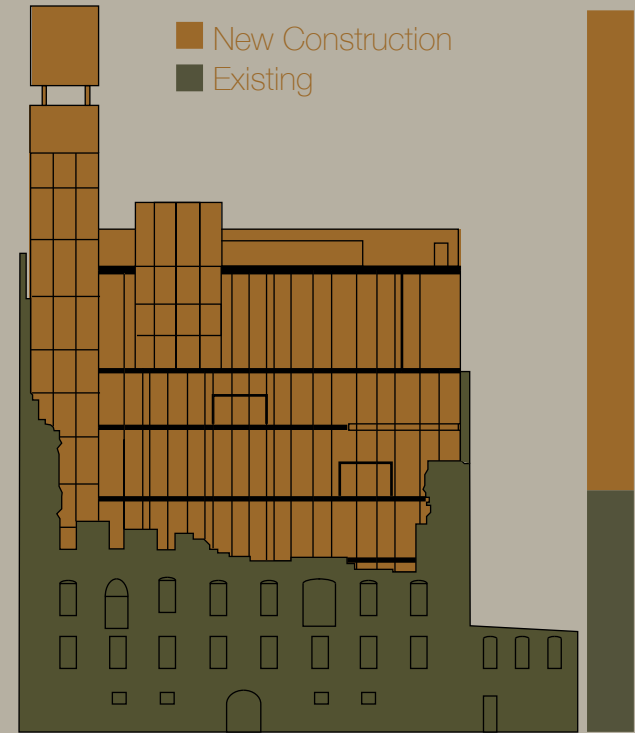
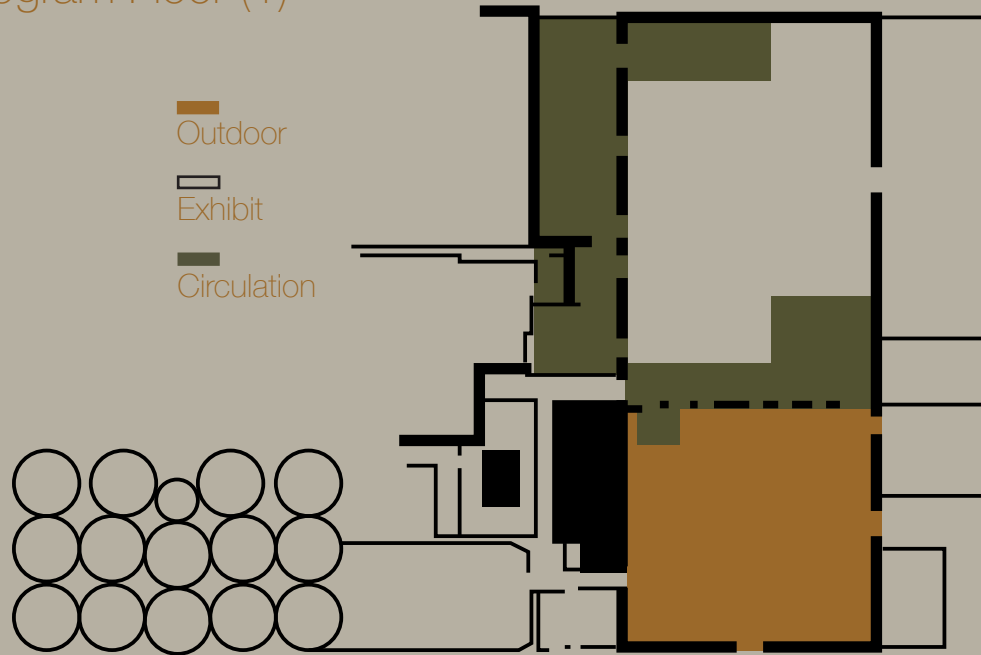
- Concrete / Masonry
- Steel



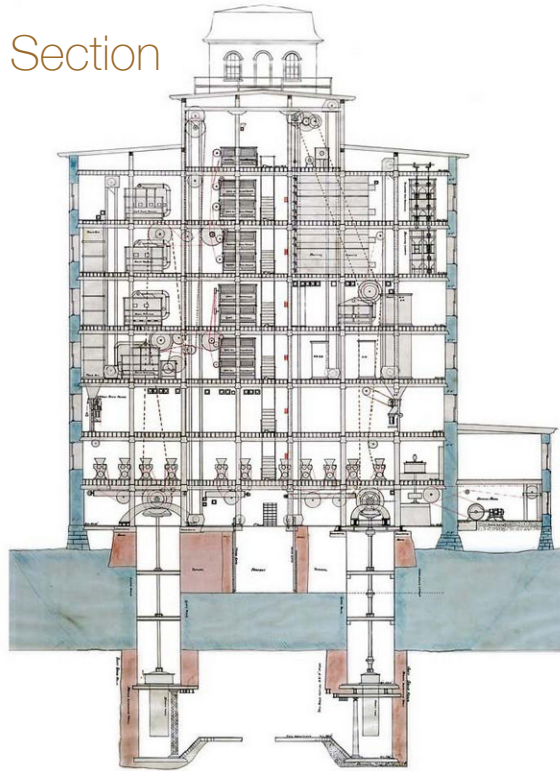
Program Section



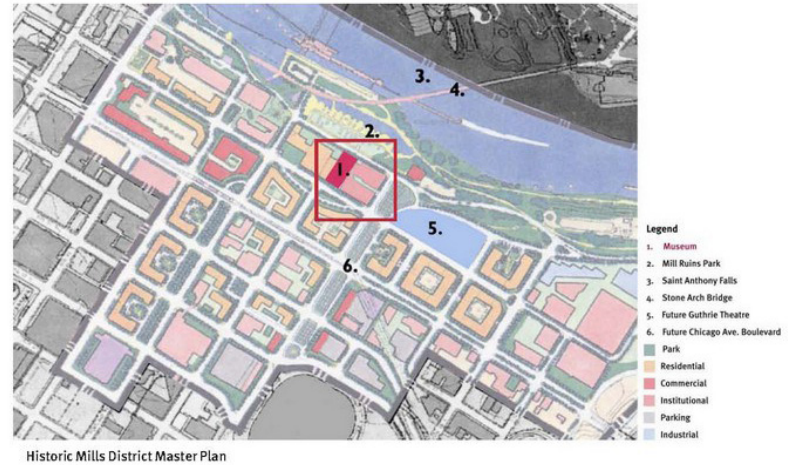
Program Floor (1)



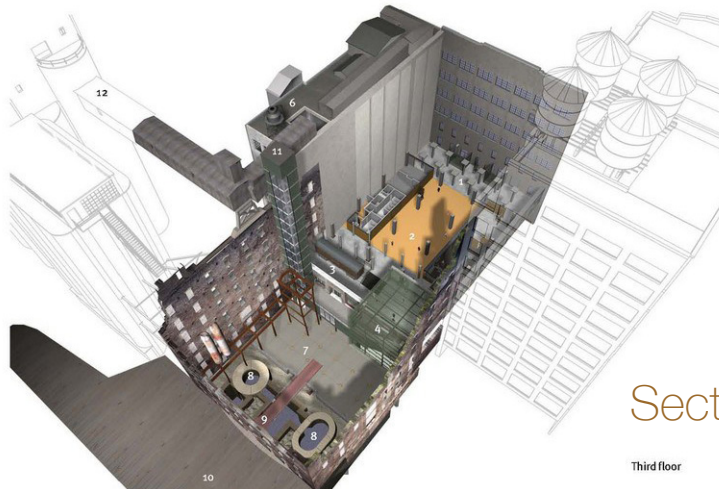
Old Section



Context



- 1 City side entry
- 2 Lobby
- 3 Rail Corridor entry
- 4 Stair to exhibit gallery, Ruin Courtyard, and river
- 5 Exhibit gallery
- 6 Flour Tower (history theater in an elevator)
- 7 Ruin Courtyard
- 8 Turbine pits
- 9 River side entry
- 10 Recreated wood plank road
- 11 Express elevator to observation deck
- 12 Museum expansion potential in Head House



Section Perspectives

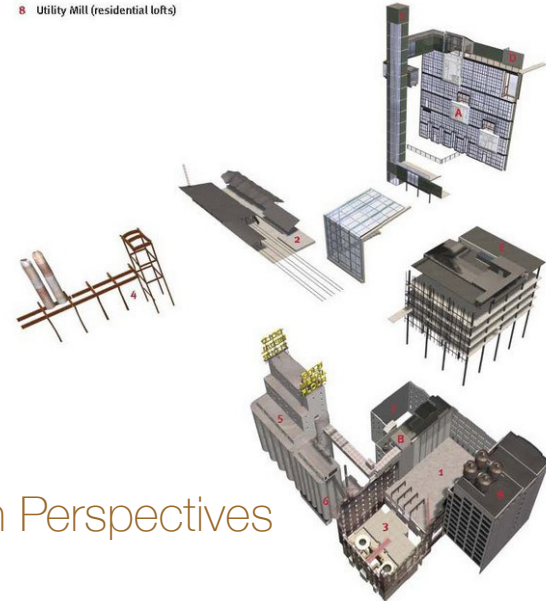
Third floor

OLD

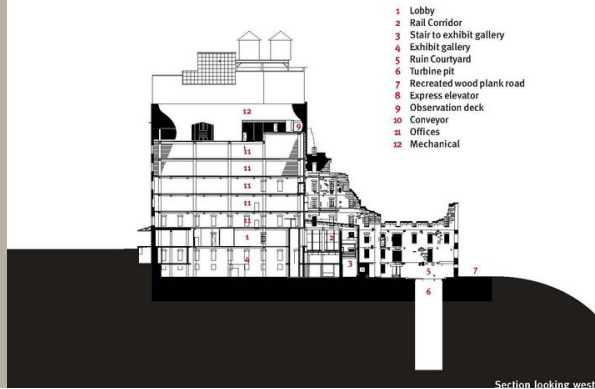
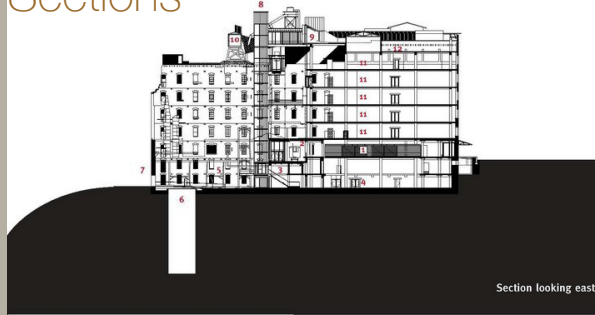
- 1 Museum (lower three floors)
- 2 Rail Corridor
- 3 Ruin Courtyard
- 4 Flour bin armature
- 5 Head House (potential museum expansion)
- 6 Silos (energy distribution/chilled water storage)
- 7 Humboldt Mill (museum offices)
- 8 Utility Mill (residential lofts)

NEW

- A Facade with 1898 section drawing of mill
- B Flour Tower (history theater in an elevator)
- C Express elevator to observation deck
- D Observation deck (ninth floor)
- E Offices (five floors above museum)

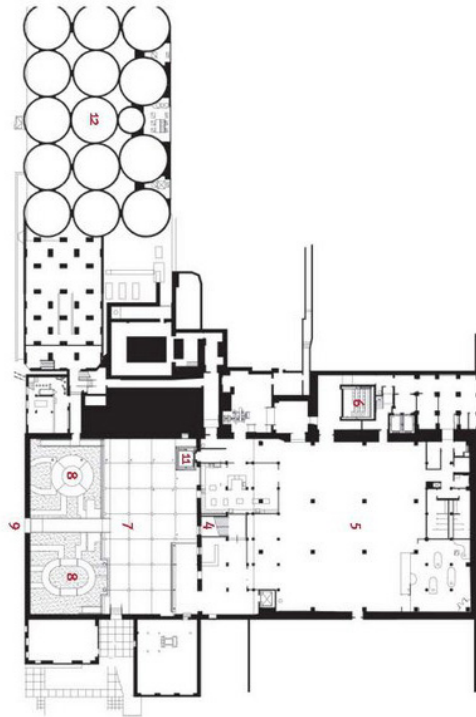


Sections

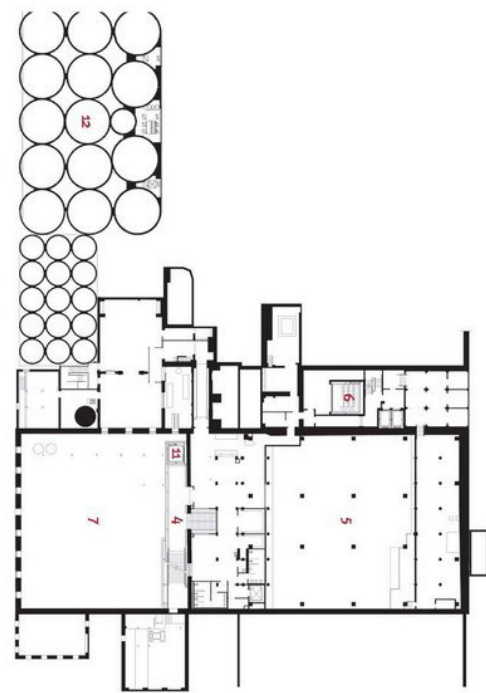


- 1 Lobby
- 2 Rail Corridor
- 3 Stair to exhibit gallery
- 4 Exhibit gallery
- 5 Ruin Courtyard
- 6 Turbine pit
- 7 Recreated wood plank road
- 8 Express elevator
- 9 Observation deck
- 10 Conveyor
- 11 Offices
- 12 Mechanical

Floor Plan (1)



Floor Plan (2)



Conclusion

The Mill City Museum demonstrates that our industrial heritage is a story worth preserving whether it is the flourmills of Minneapolis or the mining industry on the north shore. Architecture can be the vehicle that connects the past to the present and immerses its dwellers into a time and place that they may not have been able to experience for themselves. The ore dock sets out to do the same task and hopefully in a manner that is just as successful as the Mill City project. To be able to preserve a living collection of the mining industry in that region would be a great asset to the people from there and visiting there both in the present time and for the future generations.



Series + Typological Summary

The case studies examined in this series was put together as a cohesive unit of adaptive reuse projects from a broad spectrum of use, location and existing structures. These projects not only were related to the scope of work intended for the ore dock in Superior, Wisconsin, but were also related to it in the intention of the use of the space. They all were chosen because of their effects on their surrounding communities, the historical nature of the existing structures that were being used and also the overall design quality. After close study and consideration of each project the unifying idea and theoretical premise of this thesis project was strongly supported.

The analysis done on these projects covered the scope of: existing versus new building composition, overall mass and form, programming, and structure of the buildings. These analyses were intended to inform this thesis project moving forward in the realms of how to go about altering or adding to an existing structure with historical or cultural importance. When attempting to convert these old buildings it is of importance that the existing features not be perverted in any way, and remain respectful to the “soul” of the building.

The common characteristics of these projects are that all of them in their own way go about honoring the history of the site. They draw inspiration from the existing history through design, use or display of each of their own characters. They all tell the story of a former life that each of these buildings has lived, from a crane way to a winery, and to the ruins of a grandiose flourmill. They teach about the past and they celebrate it in the present. All of these projects set a benchmark for the proposal of this thesis, which is to celebrate and display the heritage of the mining industry through architecture and space.

Series + Typological Summary Continued...

The uncommon characteristics among these three studies are the way in which they go about designing around the history of the place. In the instance of the crane way the existing infrastructure is used as a foundation for the new. Almost as a metaphor for the past being the foundation for the future. In the instance of the wine warehouse, the designers built inside of the existing building but also added on the it, they went about it with a modern approach but tied it together with the use of the gable venting patterns. Finally the Mill City Museum took the approach almost as an archeologist would go about excavating a site; carefully tip toeing around the ruins and lightly building within the confines.

These three approaches with conceptual design are a piece of knowledge to draw upon when thinking about the theoretical premise and unifying idea behind this project. Each approach is very deliberate and carefully done, but which fits with the existing nature of the ore dock? This is one of the things that I will have to flesh out going forward with this process, but the studies done have pointed out different ways in which to go about answering that question.

The sites affected two of these design much more than it did the third. The two most affected by site were the crane way and the flourmill. The crane way had a very rigid linear layout and vertical chutes in which to travel from ground to topside. The designers celebrated both of those aspects by retaining that linear quality, and by using the vertical chutes for transport up into the modern office spaces. The fire drastically affected the flourmill in 1991. If that fire hadn't destroyed the building that adaptive reuse project would have looked entirely different. But again the designers celebrated that aspect and carried it over successfully into their final product.

Series + Typological Summary Continued...

Each project had its own unique way to go about space, function and construction. The crane way as stated above was very linear in nature; it had to be lightweight due to its foundation, so that brought forward a very open and airy floor plan. The construction issues faced were that of weight, due to the maximum capacity of the crane way, and the method of assembling which led to a more modular type of design. The winery was the smallest of these projects and because of that you see the addition of a more organic and modern form for added square footage. I imagine the technical issues faced on that project were retaining the original characteristics while still creating a functional floor plan. The way they went about it was to add a second floor within the warehouse space but leaving it open for a good portion of the main space. The flourmill had a more clear cut program, and also spatial relationship due to the fact that it was basically a new building built around the shell of an older building. With that came more technical issues though, which were how to go about shoring up the older ruins while maintaining safety for the public, how to preserve as much of the older structure, and how to incorporate that into the new spaces of the project.

Series + Typological Summary - Design Lessons

The case studies influence the adaptation of the ore dock in a number of ways. The Kraanspoor illustrated a creative use of the circulation towers as the main circulation for the office space, that is one way that I think could adapt well to the ore dock. It also showed a successful use when it came to mixing a heavy industrial elements with a light modern modular element, I think that those two contrasting elements worked well together and its one way that I think the ore dock could be enclosed. One thing that I don't think I will use from this case study is the choice to build on top of the ore dock like they did with the crane way. I think that a public outdoor space would be a much better use for that space in the case of the ore dock.

The design of the Colombian library and music school is one that I chose due to its successful use of existing interior spaces. The original warehouse was a big open space with exposed wood rafters and they left it open while still being able to divide up the rest of the spaces into functional areas. That is a tactic that I will have to employ in the ore dock and since it's a large monumental structure I still want to be able to take advantage of that cathedral like space. Another thing that was successful about the library that I would like to carry over to the ore dock was the attention to detail the architects had in carrying over the triangle window details into the newer modern addition to the existing building. I think if I could hone in on some of the more interesting details of the ore dock and include them in elements of the new design it would make for a more cohesive and successful addition.

Series + Typological Summary Continued...

The Mill City Museum was an interesting case study because it actually involved the ruins of an existing building. The spaces that they created with that building were very inspiring to me. The exhibition spaces were well lit, and spacious with an open and flexible floor plan. The use of outdoor spaces was what intrigued me the most, its something that I am definitely planning to utilize in my design plan with the site being located close to Superior Bay, and recreational trails I think that a well executed outdoor space would really be an asset to the overall plan. Another aspect that I liked from the Mill City case study was the fact that they kept the grain silos that fed the mill. I think that it's a great and beautiful piece of infrastructure that also adds to the industrial feel of the project.



Major Project Elements

Gallery Space

A space that provides the public with the opportunity to view exhibits, artifacts, and media pertaining to the historical significance that the role of mining and great lakes shipping has played in the development and growth of the Duluth, Superior area communities as well as the region of the Minnesotan iron range.

Classrooms

Flexible spaces that provide for various sized groups or classes to allow for presentations, lectures, and demonstrations. Equipped with state of the art presentation technology, projectors, and sound. These rooms will be able to allow classes, public and private groups the ability to hear and learn about industry in the North Shore.

Reception + Great Hall

The first space that welcomes you into the experience, staffed with curators and receptionists. This space includes a reception desk, ticket counter, and waiting area for guests.

Major Project Elements Continued...

Circulation

Private and public corridors that allow access to both secure, and public rooms it allows for persons and or objects to be moved from space to space and must allow for larger industrial sized objects to be installed or removed from gallery spaces or class spaces. Includes service entry, public entry, also public and private restrooms.

Administration Offices + Staff Work Space

A space allowing for staff and directors of the museum and cultural center to schedule, set up, and manage the logistics of the day-to-day operation of the building. Includes staff break room, locker rooms and workspace. Must allow for a healthy and proactive working environment.

Exhibition Storage + Archives

A controlled environment that will allow for the storage or arrival of various objects, artifacts or documents. It must allow for historically sensitive, and environmentally sensitive materials to be stored in a safe and respectful matter. Must allow for objects or artifacts of various sizes and manners.

Major Project Elements Continued...

Cafeteria

Allows for food services as well as eating space both inside and out. Will serve private and public parties (such as field trips, corporate functions, ect...) Includes service and prep spaces, food counter, cleaning and sanitary spaces, also food storage and receiving.

Memorial + Mausoleum

A reflective space that will pay tribute to the tragic losses occurred in the mining and shipping industry, overlooking lake superior. Will include lists of shipwrecks, victims, and family members of the victims. Also, will offer the service of storage of remains in the form of an urn or other vessels to members of the shipping and mining industry and one family member.

Viewing Deck + Rooftop Park

A sustainable outdoor space that utilizes what was formerly the loading deck. Provides guests with an excellent view of lake superior, an outdoor space for picnics and concerts. The viewing deck is the steel substructure at the very end of the dock towards the lake. This space must meet all accessibility and safety standards and will be accessed only seasonally.

Major Project Elements Continued...

Gift Shop + Store

Provides guests with souvenirs, learning materials and memorabilia. Includes cash register, drink and food coolers, and display areas. Located in a public and easily accessible area in the building.

Site Development

With direct access to the shore of Superior Bay the site shall address the shoreline and water in a respectful and low impact manner. Water run off and retention must be handled properly. Vegetation must be of native origins and the site must deal with the access of the public boat access adjacent to the site. The site shall be as much of a learning experience as the museum itself. The site must also take into account the Osaugie Trail a recreational biking walking and running trail that is nearby the site.

User/Client Description

The Staff

Total : 15 – 20 People

Time : Everyday

Description : From curators, to cooks, and custodians, these people will oversee the daily functions of the building. They will work in the building day to day and the main focus will be to create a space in which they will enjoy working and serving the guests.

Needs : Workspace, lockers, a break room, parking, storage space for tool/materials, technology

Considerations : healthy working environment, accessibility for elderly employees, logistical efficiency

User/Client Description Continued...

Community Members

Total: 150 – 300 People

Time: Everyday

Description: Community members will include school children, public guests, or people from the surrounding area who worked or studied in the industry and are willing to teach, volunteer or lecture on their past experiences. The museum will switch exhibitions to keep even to most regular visitor engaged and interested.

Needs: engaging spaces, enjoyable scenery, comfort, various media or ways to consume information, space for lounging and conversation, green space.

Considerations: accessibility for all types of people, educational environment, visual stimulation, access to lake views, access to trails, roads and parking, healthy environment

User/Client Description Continued...

Tourists

Total: 150 – 200

Time: Everyday (Weekdays + Holidays)

Description: Visitors from both locally and nationally, usually will come to the museum for day trips, or picnics. Will visit the cafeteria, and gift shop, and exhibits. They may come for special lectures or concerts. Will travel there in many different modes of transportation.

Needs: lockers, dining, open space for picnics both indoor/outdoor, engaging activities, accessibility from all areas.

Considerations: access from bike trail, lake or roadways, parking, accessibility, family friendly environment, ease of location.





The Project Emphasis

1: Adaptive Reuse

An architect's main aim is to see opportunity that others may not consider. Being able to successfully and efficiently convert Ore Dock No.1 into a space that is, in all four seasons comfortable and enjoyable is the main objective. Enclosing the main volume of the dock will need to be achieved in a creative and environmentally minded manner. By exploring this item successfully, it would set a precedent to other communities on how to adapt structures to prolong the life of a built environment.

2: Cultural Preservation

Architectural works have an iconology that extends beyond the use of a certain building. By preserving this structure it preserves a time and place in this region that tells a story of what the north shores of Minnesota and Wisconsin founded on. By paying homage to the workers, builders and founders of these docks, ships and mines it ensures that their hard work and legacy never die.

The Project Emphasis Continued...

3: Sustainable Building Practices

The iron mining industry takes a toll on the environment. By exploring sustainable design, this symbol of an industry that relies on exploiting the earth's resources can give back and become a symbol of sustainable practices. By employing sustainable strategies such as: solar, water collection, native landscaping and passive design solutions, the project will become more economically feasible as well as environmentally friendly.

4: Community Learning + Connection

By providing a space for education and recreation the project hopes to be a center for the surrounding communities to learn, whether it be by field trips, or personal visits, also it shall become a place for community members to connect by enjoying concerts, programs, or presentations. Designed to be flexible in both interior and exterior the possibilities for functions are endless. By being accessible to all, and traveled to from various modes of transportation. It will be a building for the people.

Academic Goals

Technical Skill Advancement + Graphic Layout Skills + Work Hard + Do The Story Justice

What I really hope to do is create a project unlike very many within the past couple of years. I want to study the culture that surrounds this topic and dive into the history of these people and tell their story. The building has to reflect and carry that narrative, so that when people from other parts of the state or nation visit it they could leave carrying a knowledge about an industry and a people that they may have known very little or even nothing about. I want to do that through the design work and the written work on the project. I would really like to dive into the detail aspects of this project and strengthen my knowledge with AutoCAD and the technical details of this project. I feel that I have a good grasp on the rendering aspect of my academic portfolio and to add to the more technical side of things I believe it will really give me a strong portfolio when looking for a career. I want to also work on my layouts for the booklets and my boards, I have always felt that my I could be more creative when it comes to my layouts so I will be looking to strengthen that aspect, and how I plan to do that is by giving myself more time to work on those and not pushing them off until the last minute. I would really like to at least be in the running for the McKenzie Award at the end of the year, and I think that I have a project that can put me there. It will just be a matter of allowing myself the time to do the project justice. My academic career here at North Dakota State University has been longer than most and in some ways it has hindered me and in some ways it has helped me, but what I want to do is leave this university with a final project that I can be happy with and despite whether I achieve all my goals or not, I at least want to be able to say I tried my hardest.

Personal Goals

Try New Things + Show Design Principals + Have Fun + Persevere

The personal aspects of my goals are really close to me. I was supposed to graduate two years ago and failed to do so. So, this project and this year is really about finishing what I started, and its about perseverance and determination. I could've walked away from my work here in the architecture program but decided that I didn't want to, and dropping out wasn't an option for me. So I want to have fun doing this project and I really want to plan ahead and be disciplined when it comes to the work that will be due. I would like to try some different methods of rendering, modeling and displaying that I haven't done before to really broaden my horizons in the aspects of architecture. I also want to accept criticism, learn from it and if necessary question it and stand up for my design principals. Many times I have seen people change things in a project just because someone questioned them on a design decision, and it becomes a project that is driven solely on criticism and not on design. So what I really want to do is let my personality and my design thoughts shine through on this project and see where it ends up. The topic and typology of this project is one that interests me and I think that I can do it justice. Also I want to further my understanding of this story, this process and this profession.

Professional Goals

Design For Community + Show Process Of Work + Show Interests + Resourcefulness

Our entire purpose in our academic career is to be able to graduate and move into the workforce with a knowledge that will help us succeed. So what I want to be able to show potential employers with this project is that I have the ability to design with a community or a client in the forefront of my ideas. This project has to be about the community and the people it represents and I think in a lot of ways every project is about satisfying a certain sect of people. I also want to show the professional world how I work and how my process works, so I want to be able to document that aspect of this journey. The professional goals I have not only include my future profession, but also my professional journey so far. So I want to show my previous work experiences in this project and show how my time working in the building industry has influenced me so far. Most of all I want to show employers a little bit of my interests that I have in communities, history, resourcefulness and the built environment. This project I will try to use as a testament to all of those things.

Plan For Proceeding

Research Direction

The basis of this thesis relies upon research done on a number of topics. This research will outline the important aspects of the subject of this building and shed light onto the final design solutions that will be implemented. The scope of the research should touch on a number of important topics. The first being the use of architecture in cultural preservation, story telling, and community. To get a better understanding of this a number of resources will be called upon, including the case studies in this book. Also the buildings use is an important factor in its success as a project. The typology of museums, and cultural centers is an important one in the sense that they have to be accommodating and open, yet intimate and authentic. The experience of the space is also important, it has to be engaging and raise questions or thoughts on its content. So an investigation of how museums and cultural spaces are approached in the architectural profession is of great importance to the forward movement of this project. The historical research that will go into this project will be immense; one of the highlights of the project is its ability to tell the story of the Iron Range, its workers, and its transportation across the expanse of the Great Lakes. The research will inspire the design, and its exhibits. The history of the place will be a defining factor in the creation of its spaces and program. On the more technical side of research the site will have a series of analyses done in order to incorporate the environmental aspects of this design in an efficient manner. Sun patterns, wind, temperatures and many other factors will be looked at to ensure that this building is as environmentally friendly as it is culturally attractive.

Plan For Proceeding

Design Methodology

The method of collecting data to inform the design solutions will be based upon a mixture of both quantitative and qualitative data sources. The subject of this project relies both on the emotional and poetic aspects of the story laid out by the context, and also the given facts about the site, industrial context and the preexisting conditions that come along with an adaptive reuse project.

Qualitative

Archival Accounts- The stories of the people who played a part in the rise and fall of the iron industry's heydays will be studied and taken into account while creating a design solution. From written accounts, to images and stories, all of these references will play an important role in conveying the spirit of the project through design. This could result in material choices, spatial layout or exhibition material throughout the project.

Observation- Site observations will be crucial to the analysis of outdoor spaces, environmental systems and layout. These will be conducted in person, through photographs and through schematic designs and analysis. Observations will also lend toward material choice, access to the site and also views and vistas. The context of the site and existing building will be observed and the poetics of the space of the ore dock must be handled in a manner that shows its unique character and story of the place.

Plan For Proceeding

Design Methodology Continued...

Imagery- Photo record of the mining and shipping culture will determine the “feel” of the final design solution. While maintaining a safe environment, the project should capture the grit of daily life in the industry and convey that through architecture.

Qualitative

Statistical Data Sets- Mining and shipping data will be used in the design process of this project and will be reflected in the substance and story of the building. Tonnage reports, and transportation records will also be used in this same manner. The historical data regarding the rail industry, its mergers and acquisitions play a role in the culture as well as the affect other mines and mining processes.

Scientific Data- Data drawn from measurements will be used to determine environmental factors such as sunlight, lighting requirements, heat loss and other various climate affects. These will be used to determine the best solutions possible, to ensure that this building is viewed as an asset to the community. Also all structural and mechanical data will be researched to determine how to maximize the best usage of systems. Various computer systems will be used to record these findings such as, Revit, Sketchup, and obtained charts and diagrams pulled from various media.

Design Documentation

This project will be documented throughout its entirety through mostly the use of computer files, models and hand drawn images. These iterations will be accessible through the North Dakota State University Institutional Repository, and also through personal storage. All models, original hand drawings and sketch models will be stored at my place of choosing and are not to be taken without permission. The final presentation will be broken up into the following components:

Final Board Presentation: which will be made up of selected images and documents both hand drawn and computer generated, that are inherently important to convey the project to the public without oral assistance

Presentation: made up of a mix of both computer media and oral representation that will be presented to the judges and public at the end of spring semester 2016. Questions and criticism will be addressed directly from me.

Project Book: which will outline the project from its first stages of inception, through the research and programming stages, to the design process and finally the finished project. This will include both technical and rough process data collected along the way.

Model: a physical model will be constructed to give both a visual accuracy of the proposed design. The model will also serve as an artifact that represents the design in both feel and quality.

The documentation of this design will be archived at the completion of each stage of design: proposal, research, programming, schematic design and final production.

Work Schedule

Task	Start Date	Days	End Date	Task	Start Date	Days	End Date
Physical Site Model	12/20	7	12/27	Plot Boards	4/27	2	4/29
Computer Site Model	12/28	7	1/4	Install Project	4/28	1	4/28
Spatial Analysis	1/13	6	1/19	Thesis Review	5/2	1	5/2
Site/Passive Analysis	1/19	4	1/25	Submit Thesis	5/9	1	5/9
Interior Spatial Analysis	1/26	12	2/7	Update Portfolio	5/10	1	5/10
Structural Planning	2/7	5	2/12	Graduation			
Envelope Analysis	2/12	3	2/15				
Materials	2/16	3	2/19				
Section Analysis	2/20	3	2/23				
Design Analysis	2/24	4	2/28				
Site Design	3/1	5	3/7				
Midterms	3/7	4	3/11				
Redline Corrections	3/12	5	3/17				
Rendering	3/18	10	3/28				
Display Building	3/29	10	4/8				
Presentation Layout	4/9	11	4/20				
Physical Model	4/11	12	4/23				
Repository Submission	4/23	1	4/23				
Publish Thesis Book	4/24	2	4/26				



NORTHERN PACIFIC ORE DOCK

Ore Dock No. 1 | Program |

“The iron ore poured as the years passed the door
The drag lines an’ the shovels they was a-humming
‘Till one day my brother failed to come home
The same as my father before him...”

“So the mining gates locked, and the red iron rotted
And the room smelled heavy from drinking
Where the sad, silent song made the hour twice as long
As I waited for the sun to go sinking...”

- Bob Dylan, North Country Blues

Research

The research involved in this project covered a range of topics, from social, to historical, preservation, economic and cultural. The information uncovered in my searches answered a lot of questions about the existing framework of this project, as well as the approach to moving forward with further design processes. The research that I conducted was specifically chosen to inform myself in how one can create a building that captures a culture, industry, and history throughout a certain era, and translates that into a physical space. Not only does this design have to “check” all of those boxes, but it also has to do so in the form of historical preservation and adaptive reuse, and do it in a way that is ethically responsible. I drew on several sources for my research including, NRHP preservation briefs, *The Rise and Fall of Infrastructures: Dynamics of Evolution and Technological Change in Transport*, *Encyclopedia of U.S. Labor and Working-class History*, and the works of Bernd and Hilla Becher.

NRHP preservation brief defining a historic vernacular landscape – “A landscape that evolved through use by the people whose activities or occupancy shaped that landscape. Through social or cultural attitudes of an individual, family or a community, the landscape reflects the physical, biological, and cultural character of those everyday lives. Function plays a significant role in vernacular landscapes. They can be a single property such as a farm or a collection of properties such as a district of historic farms along a river valley. Examples include rural villages, industrial complexes, and agricultural landscapes.” Being that this site is located directly on Superior Bay the landscape is a large part of the overall design of this project. When approaching the landscape it must convey a natural aesthetic with native plants, trees and ground cover. The building will also feature a green roof in some form or another that people

Research Continued...

will be able to walk along, much like the Highline project in New York City. This will also have views of Hog Island to the Northwest and the mouth of Nemadji River to the Southeast, so blending the building and its site into its natural surroundings is an important part of the design strategy. Another site consideration in this project will be how to address the views of the lake itself. Will the view be hidden from inside the building and then revealed at certain points throughout the building or will the building be made up of mostly glass to keep those views throughout?

The industrial character of this building is what draws most people to it and inspires a viewer's curiosity. So maintaining that character and adding to it in a responsible way will be crucial to a successful conversion of this building. The NRHP preservation brief on maintaining industrial character states: "The first thing that must be considered when planning to rehabilitate an industrial building is that the proposed new use must be compatible with its historic character to meet Standard 1 of the Secretary of the Interior's Standards for Rehabilitation." Meaning that the Ore Docks use as a cultural center based around the mining and shipping industry in the great lakes reflects its past life. The brief also cites retention of historic character, preservation of distinctive features, finishes, and craftsmanship as some of the important aspects of maintaining original character of industrial reuse projects. What does this mean for the ore dock? It informs decisions based on materiality, layout and details. The ore dock is mainly constructed of three elements: wood, steel, and concrete a material palette that will surely translate into the final design proposal of this project. Another distinctive feature of this structure is the strong linear presence of the structure, moving forward to the design process I think it would be in its best interest to maintain

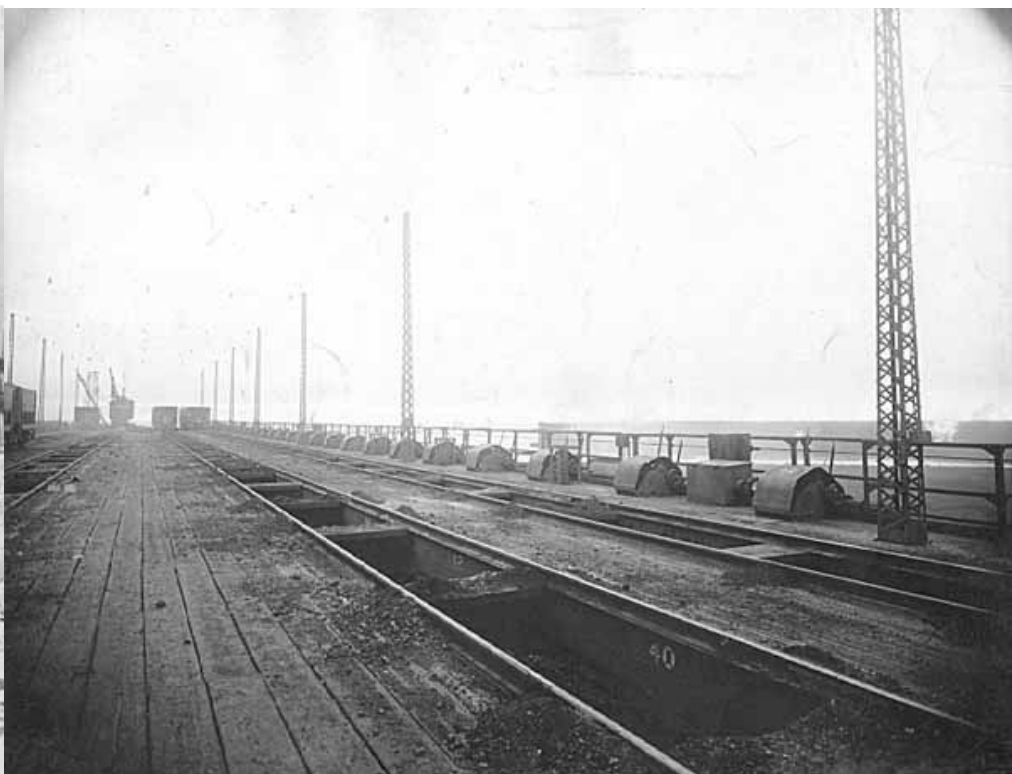
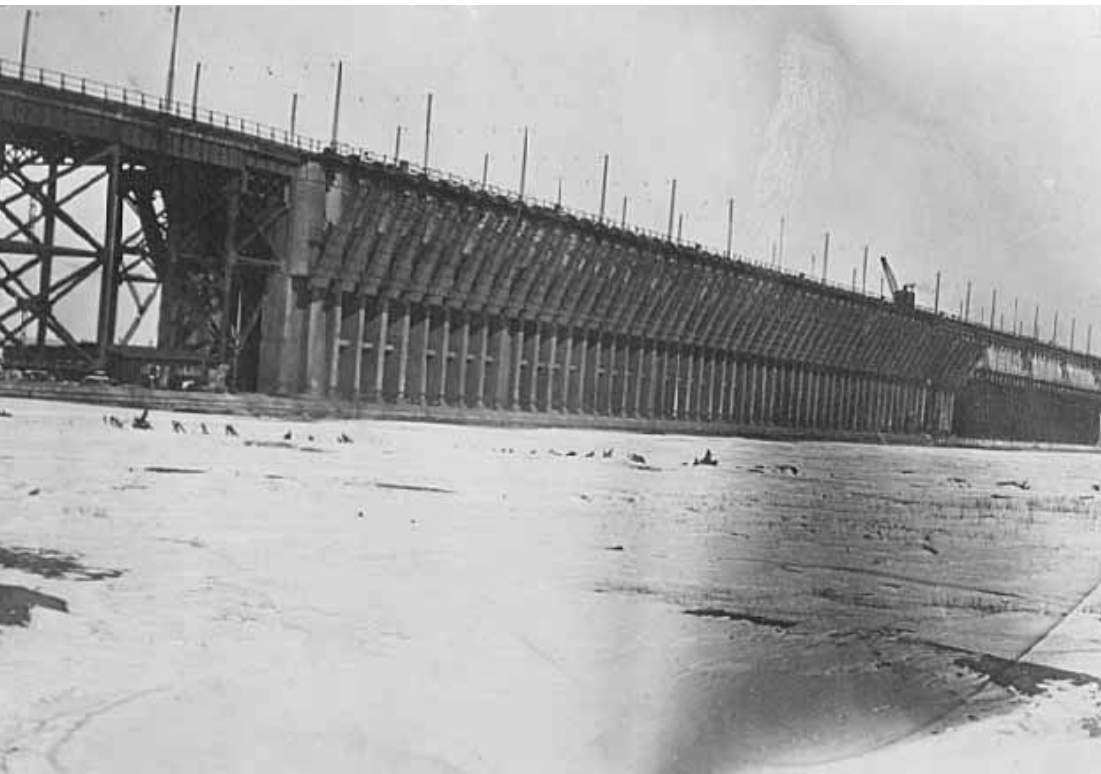
Research Continued...

this form. With the linear nature of its layout it may present a number of challenges when it comes to laying out spaces but its essential to the character of its space. The height of the interior space is striking in its expanse; the space feels like an industrial cathedral so that is another feature I would like to maintain.

The rise and fall of industrial buildings in America is a story that stretches all the way across the country. Many of these buildings are torn down and the sites are redeveloped. This structure was engineered in a way that its probably one of the most immobile, intimidating structures of its day or even present day, but its life was much shorter than what it was originally built for. This was a product of its time and a product of economy. When it was built railways and shipping lanes were the fastest and cheapest modes of transportation for large bulk goods, *The Rise And Fall Of Infrastructure* states "The first infrastructure system to overcome some of the deficiencies in the transport system of the pre-industrial age was the natural system of inland waterways; the waterways were greatly improved, and integrated into a high capacity transport network by the construction of canals." In regards to shipping at the turn of the century, and in regards to the rail industry it states "The economic effects of the railways have, indeed, been substantial despite the fact that railways do not qualify as the principal and single driving force of 19th century economic expansion. Railways were so successful that by the end of the 19th century they accounted for close to 90 percent of all passenger-km travelled and about 70 percent of all ton-km transported." But these technological innovations of their time gave way to new means of transport, and by the 1950's they had already peaked and started the rocky slope downward. Even the book states that automobiles, and trucks soon challenged railways.

Research Continued...

Though they might still be used in transport they are not nearly as common. Much like modes of transportation buildings tend to go in and out of style, for example when urban renewal took place in the 70's planner thought they were doing everyone a favor by tearing down older building to make place for new shiny ones. The ore dock is another example of this, it's a dinosaur from days gone by. It was a victim of economics, bottom lines and liabilities. It still stands though. The ore dock should wear this as a badge of honor, so with my design process my aim is going to be to not restore the dock but to preserve it in its current state. The iron staining on the concrete, the rust and broken concrete, as long as it's structurally sound should be maintained in order to tell the story of its life and to set a scene for its place in modern history. Anything that's added to the structure as well will be done so in a way that it will patina or wear in a certain way to blend in with the rest of the dock itself.

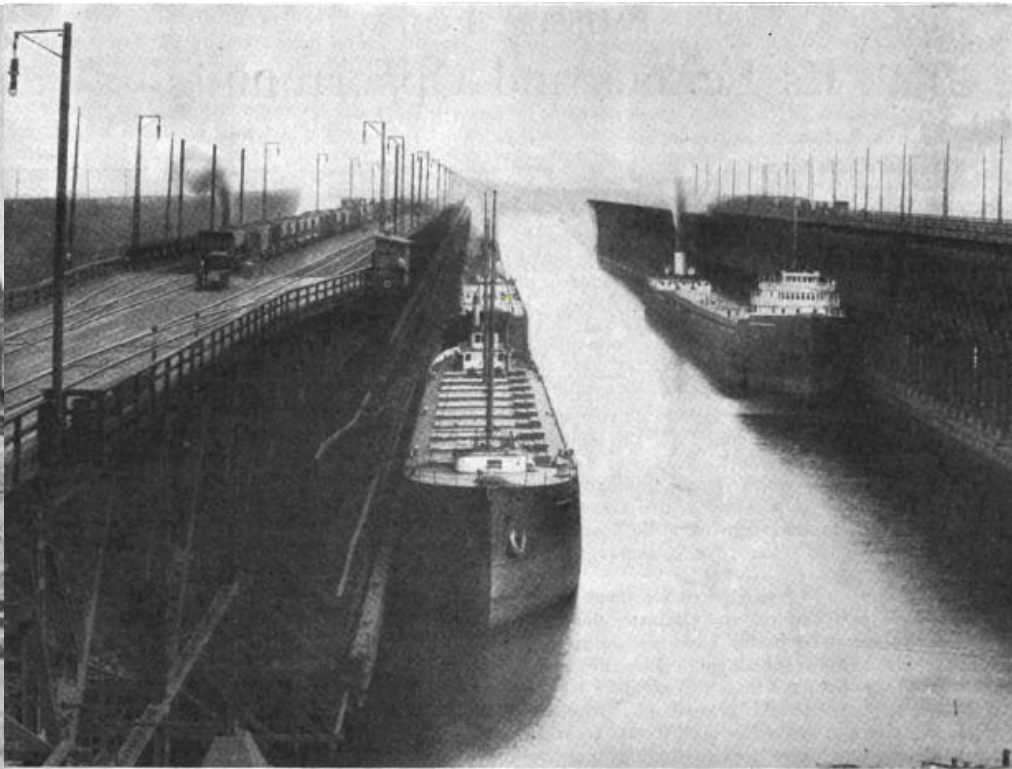
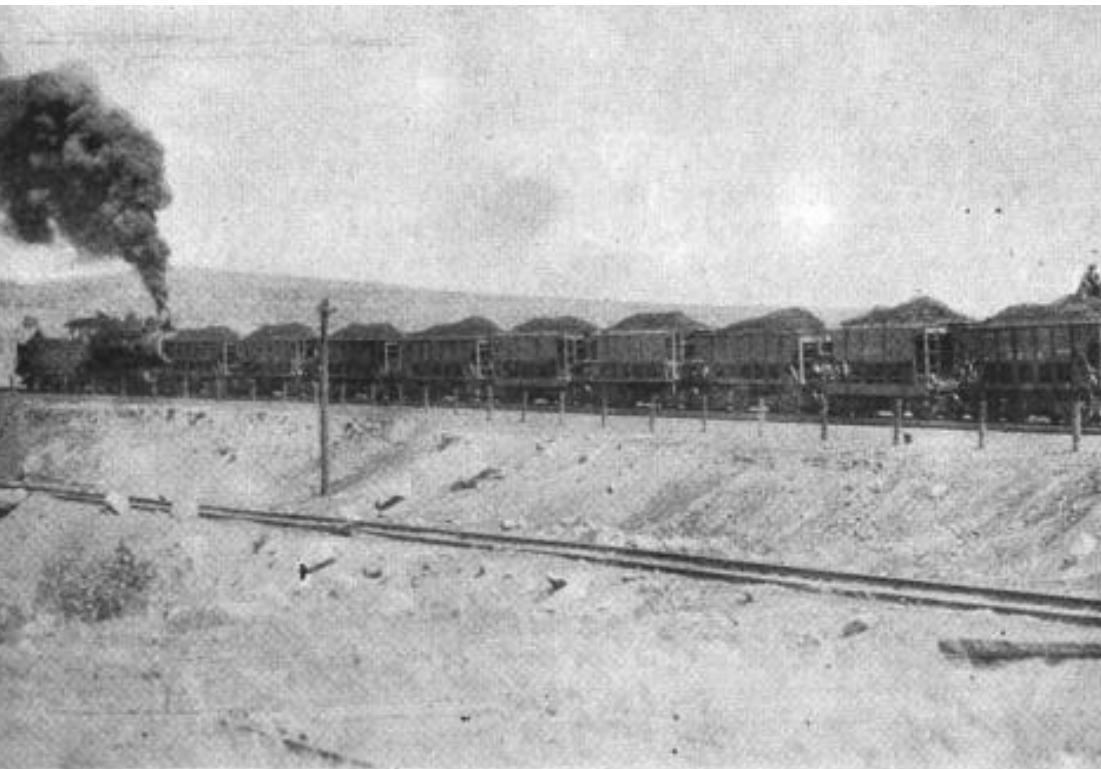


Project Justification

This project is important in the sense that to know whom we are going into the future, we have to look at who we were in the past. As a society we have to look at what has brought us to where we are today, and this is important because we can look at the things we have done that were innovative and positive, but we can also look at the ugly destructive things that we have done as a society. This project might have a little bit of both of those elements, in one hand the iron industry transformed the landscape of manufacturing in the United States, it carried us through two world wars and created the idea of the American dream. It also had a boomtown effect on many small communities on the iron ranges of Minnesota, and after ore prices fell or supply dwindled the jobs, income and industry left. To preserve this history and create a place where learning, community and thought can be created is an important aspect of what this project is about. Personally this project is an exploration of the adaptive reuse typology, I want to look at unusual structures and try to find a new use or new life for them, and I think that by demonstrating that it can be done, more structures will be saved and not hauled off to the landfill. This thesis project was originally a new construction project, but while searching for a site I stumbled upon this amazing structure.

Project Justification Continued...

In that moment I saw something that you cant necessarily see in many other places. That to me was an exploration in itself, this massive concrete behemoth was just lying out into the lake and I was immediately taken aback by it. If this dock or other like it are all torn down, that experience will be taken away from generations to come and that would be a loss to the story of these communities. This project will showcase a number of things that I have learned in my career as a student at NDSU. It will utilize the principals of designing spaces that have a social implication, in the fact that they must be accessible healthy environments for people of all ages, social backgrounds and levels of learning. It will showcase my ability to work within an existing infrastructure and adapt that space a usable and safe environment. It will also test me in the sense that I will be taking on a project that will have to be done in an ethical and contextually responsible manner. By that I mean that it will have to celebrate this buildings past and the design will have to put the existing framework of this building in the forefront.



Social, Cultural, + Historical Context

Social & Physical Context

This project joins a movement of adaptive reuse projects that have been done throughout the history of the profession. This project specifically shares a lot of the qualities exhibited in the case studies that are shown in the thesis proposal book. Historically, architects have always tried to find a way to be economically and materially efficient, and this project is very much an exploration that expands on those ideas. Also, this country has economically changed in the past half century from a country that is based on a manufacturing industry to a country that has moved more into the realm of a services industry. Every year there are less and less trade and blue collar jobs, and historically this dying era marks an end in one of the most industrious periods ever experienced on earth. This ore dock symbolizes the beginning processes of everything from Andrew Carnegie's Bessemer process to Henry Ford's revolutionary assembly line methods. So this adaptive reuse project straddles the line between reuse and also preservation.

Social, Cultural, + Historical Context Continued...

Superior Wisconsin

The earliest history of mining in the superior region dates back to 3,500 BCE. They were known as “mound builders” due to their construction of large earthen mounds for ceremonial and religious purposes. At approximately the time after the last glaciers were receding they moved into the region and would mine copper, which they would use for the manufacturing of weapons, tools and other ornaments. They would later give way to Native American tribes such as the Iroquois, and finally the Ojibwa and Chippewa. Europeans arrived in the early 1600's and the areas first trading posts were established, these posts dealt mainly in fur trade. These posts also served as the beginning of a long history of trade and transport, which spurred the cities development. In the early 19th century wealthy businessmen from Chicago and the Twin Cities laid plots for what would become the city of Superior. They were banking on the economic success of the shipping lanes of the Great Lakes, and the nearby iron ranges. The first railway to enter the area was the Northern Pacific in the mid 1800's; the railway would later serve the ore dock that sits on the project site. This spurred industrial development in West Superior, which housed a steel plant, and many other grain, coal and lumber businesses. Between the cities of Duluth and Superior the transportation industry is by far the largest employer, in 2004 they shipped a record amount of goods, which grossed over 41.4 million metric tons of cargo.

Social, Cultural, + Historical Context Continued...

Iron Range

Background

In the 1800's prospects of gold deposits brought droves of speculators to the northeast region of Minnesota that would later become known as the Iron Range, they would later find that there were no real profitable deposits of gold in the area. But, the discover of iron ore deposits led a wealthy Pennsylvanian to buy up large parcels of land in the area and soon after Charlemagne Tower established the Minnesota Iron Company. The first shipments of ore would come from this company's "Soudan" mine (located in the Vermillion Range) around 1884 and was transported on a regional railway named the Duluth & Iron Range Railway to the ports of Duluth and Superior for shipment. At the turn of the century the Merritt brothers of Duluth opened the Mountain Iron Mine, which broke ground on what would later become the largest ore deposit in the region. The last range to open was the Cuyuna Range; this range transported its material across the Northern Pacific railway and deposited it at the ore dock featured in this project. The mines had large deposits of the rare metal manganese and the mines provided 90% of this raw material for the United States during World War I. The Iron Ranges peak output took place during the years of 1900 to 1980. During this time the Iron Range provided approximately 60% of the nations total ore output. More than 338 million tons of ore was produced to serve the nations need for ore during World War II.

Social, Cultural, + Historical Context Continued...

Iron Range

People

The Iron Range region of Minnesota was one of the most diverse regions in the entire state largely due to the amount of labor that the iron mines provided. In 1885 there were less than 5,000 people living on the Iron Range, and by 1920 the population rapidly grew to over a hundred thousand. The immigrants were largely from Southern and Eastern Europe, the largest of this group being from Finnish descent. Life on the range was hard and the work was even harder, many of the mines practiced a contract labor system, which paid the workers based off of how much ore was extracted. This system was often corrupt and workers would bribe officials to be placed into mines where the ore was easier to extract. Like many boomtowns the cost of living was quite high and to save money workers often lived in shantytowns, which later would make up the towns that exist on the range today. To overcome prejudices many of the ethnic groups would form ethnic institutions, which sprang up, in the form of bars, trade halls or clubs. There were two major strikes at the mines the first being in 1907 after 200 union workers were laid off. It lasted about one month from June to July, and was for the most part peaceful except for one riot. The second occurred in 1916 when 40 workers walked off the job; unlike the earlier one this strike was marred by violence and repression. Guards and police officers intimidated the workers, union leaders were jailed and pressure was put on merchants who extended lines of credit to the workers. The strike resulted in some changes but for the most part was considered unsuccessful.



Social, Cultural, + Historical Context Continued...

Northern Pacific Ore Dock

The history behind this structure is timeline that dates back to 1912, when the first third of the dock was built totaling a length of 684 feet long. The first phase of the ore dock contained 102 pockets with a capacity of 35,700 tons of iron ore, which was mainly taken from the Cuyuna Range. The construction of the first third of the dock contained 13,500 cubic yards of concrete. The original construction team broke down as follows:

Supervisor –

J.W Bell – assistant engineer of Northern Pacific Railway

Designers –

H.E Stevens – Bridge Designer (trestle approach)

Max Toltz – Toltz Engineering, St. Paul, MN (Dock)

Steel Work –

The American Bridge Co. (Fabricators)

Pittsburgh Construction Co. (Assembly)

Social, Cultural, + Historical Context Continued...

Substructure-
Siems & Carey, St. Paul, MN

Concrete-
E.S Johnson & Co., St. Paul, MN

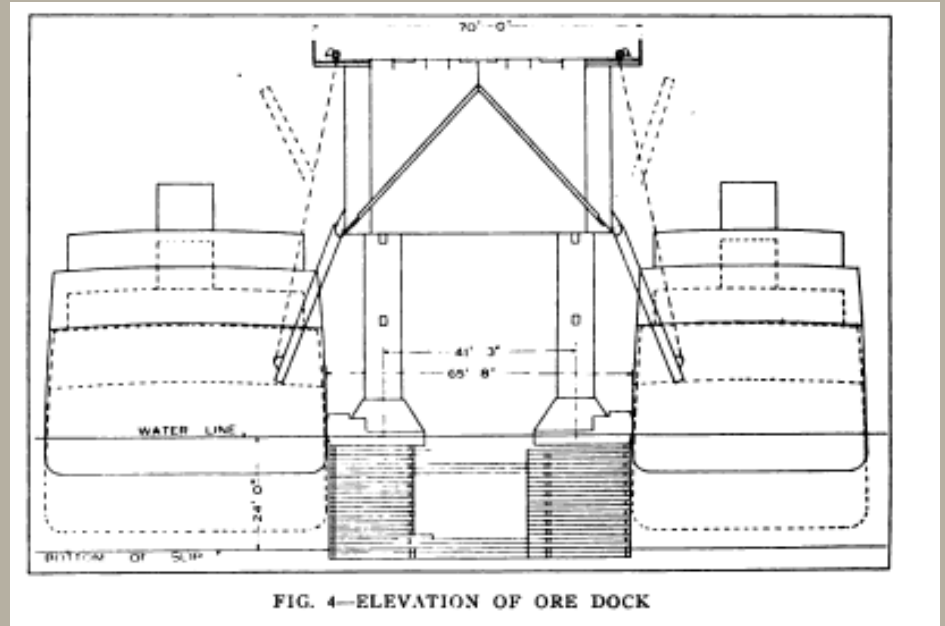


FIG. 4—ELEVATION OF ORE DOCK

Social, Cultural, + Historical Context Continued...

Northern Pacific Ore Dock

There were three fatalities during the construction process when a crane operator had a sudden heart attack and drove the crane off the end of the dock taking two other workers with him. Once finished the first load of iron ore loaded on this dock took place on August 24th, 1913 and the ship was the E.N Saunders, a steamer that took a load of 6,700 tons of Crow Wing Ore, from the Mille Lacs Cuyuna mine. The dock was expanded both in 1917 and 1925 to its final length of 1,860 feet long. The capacity of the ore dock at its final length was 108,500 tons of iron ore. In 1928 the Soo Line met an agreement with Northern Pacific to load out their Cuyuna Range iron ore at the Northern Pacific dock. In 1930 Soo Line abandoned their operations at the Cuyuna Range and, Northern Pacific absorbed what was left. The dock was taken out of operation after the Burlington Northern & Northern Pacific merger in the mid to late sixties and the dock was fully shut down by 1970. The Cuyuna Range would be mined for 14 more years until 1984 when it was no longer economical to mine from that range due to the depth of the ore deposits.

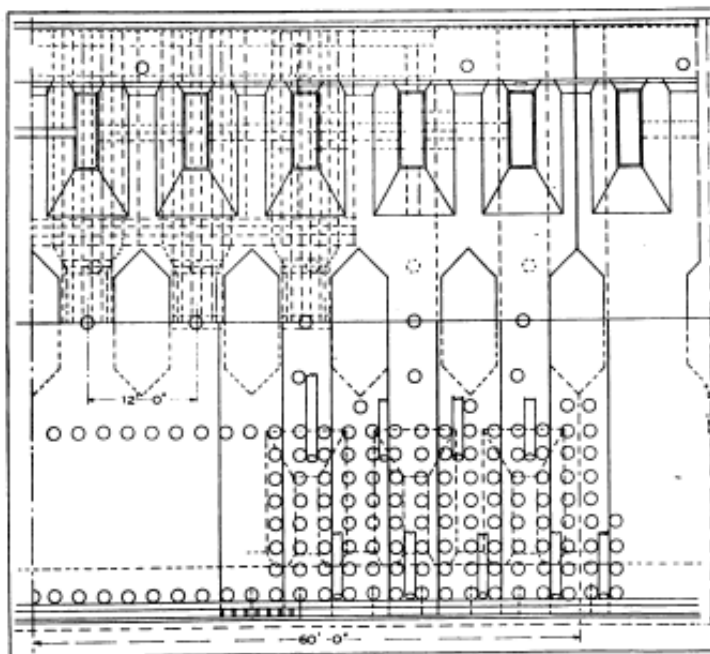
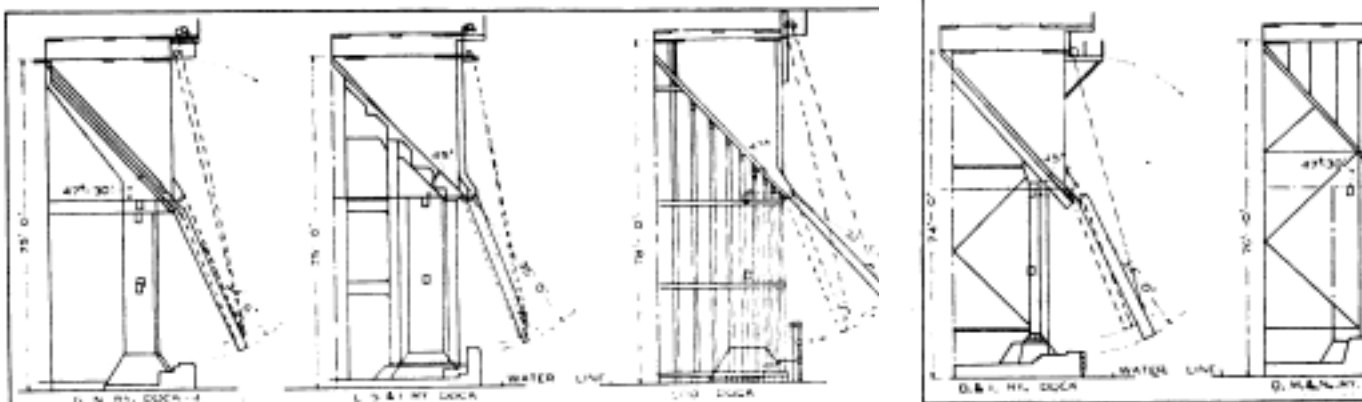
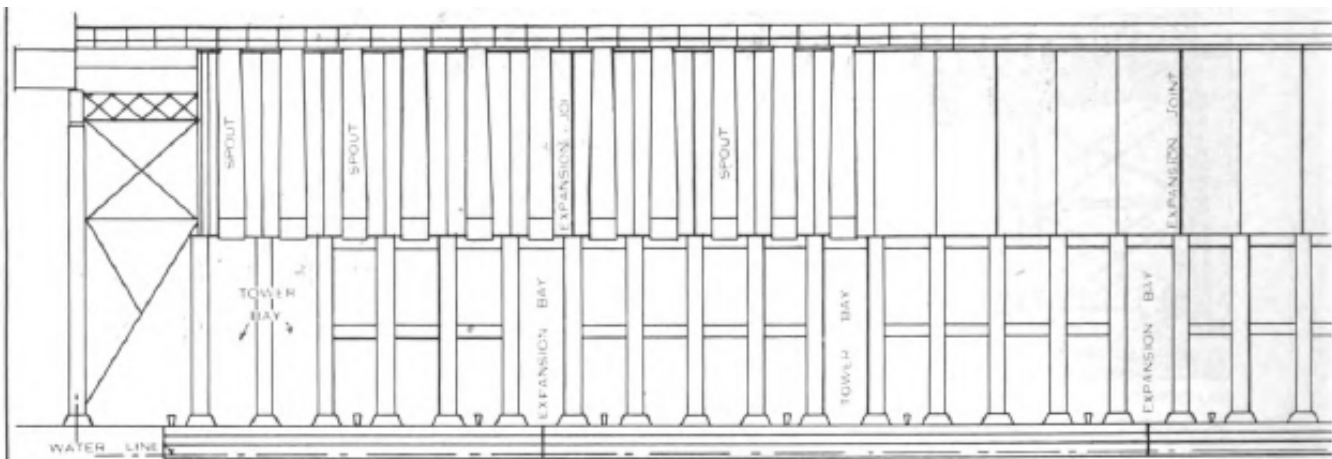


FIG. 6—FOUNDATION PLAN OF NORTHERN PACIFIC ORE DOCK



Site Analysis

Introduction

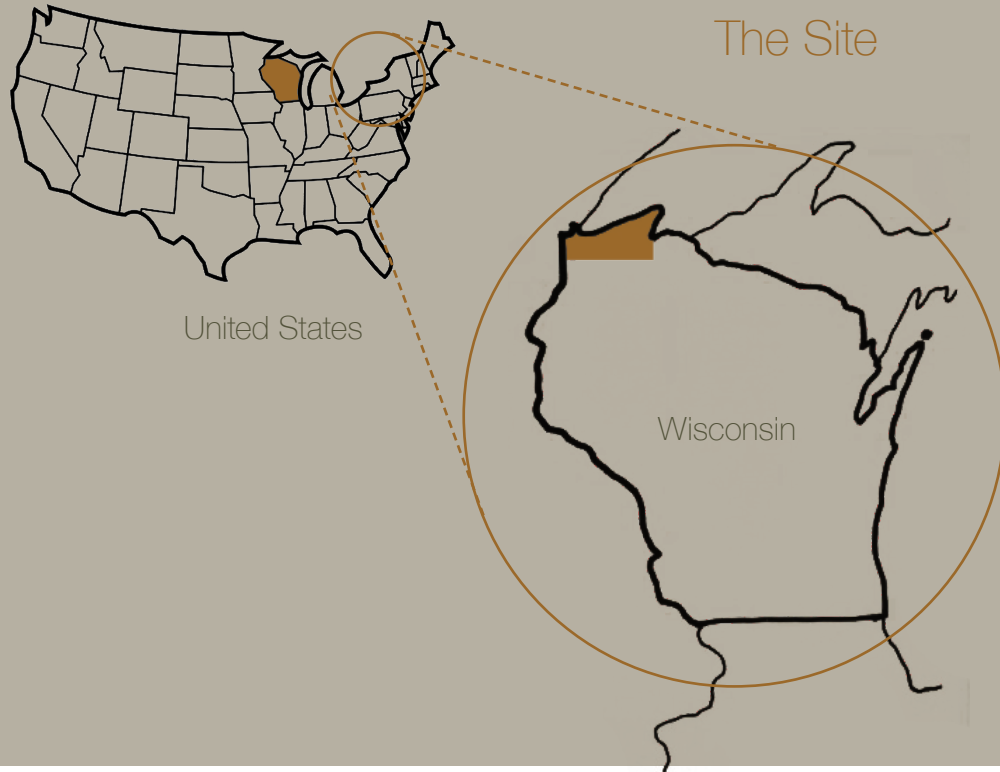


Qualitative Aspects

The landscape of the site is one that is very pleasant to be on. The views of the lake are the main focal point of the area and its usually buzzing with boats, snowmobiles and offers great views of the shipping traffic. The site has a mix of native grasses, deciduous trees and some conifers. The color palette of the site was a really interesting aspect for me. It was a mix of deep greens, brownish oranges against the deep blues and whites of the sky. The interesting thing about the colors is how well the rust and rust stained concrete of the ore dock fits into that landscape. The ore dock itself is very visually intriguing it draws a lot of attention from people who are from out of the area and aren't used to seeing infrastructure such as this. The size of the ore dock is the biggest point of interest; it is such a big structure. When people describe the feeling of the great cathedrals in the world, it reminds me of my feelings visiting this place. It's a sense of awe and amazement, the height draws the eye upward and the length of the space and the rigid linearity is amazing. The dock is made up of mostly concrete and steel with a large steel deck on the end of the dock that overlooks the lake, this point in my opinion would make a great observation deck.

Qualitative Aspects Continued...

The seasons greatly affect the site, since it is so open to the elements the views change with the seasons. In the summer the site is breezy, the sounds of the highway are drowned out by the waves on the lake and the leaves rustling on the trees. In winter the site is blanketed with snow, the bay freezes over the views are open and the great expanse of the frozen bay are peaceful. The dock stands out against the white snow and that contrast makes it very picturesque. The design being proposed will play on that contrast, and I want to be able to work with the color palette meaning I want the materials to reflect what was there originally with a lot of steel, concrete and maybe some wood to bring some warmth into the spaces. The site design will feature a lot of the plants that currently surround the building and I want to introduce some longer grasses to give movement and background noise. The views I want to be unhindered so that when people move throughout the space they will be able to see the water, lake and landscape. I also want to play with the idea of introducing iron ore into the concrete maybe to act as an aggregate I think that would be interesting in the form of walkways and would give that look of rust stained concrete. Overall the building's design is going to be blended into the landscape as much as possible.



Site Info

This site was chosen due to the location of this ore dock, it originally had a railroad line that connected it to the Cuyuna Iron Ore Range. The site is situated along the Superior Bay which connects to Lake Superior, situated between Hog Island and the outlet of the Nemadji River, and just West of Burlington Northern's Allouez Ore Docks. It offers a wonderful view of the bay as well as access to the interstate and Osaugie Recreation Trail.

- 1 Site
- 2 Interstate 53
- 3 Osaugie Trail
- 4 Hog Island
- 5 Residential
- 6 Public Access
- 7 Nemadji River





Base Map Legend

 Ore Dock

 Site Boundary

 Wetlands

 Marina

 Water/Sewer

 Superior Bay







Traffic Legend

- Low Traffic (City Street)
- High Traffic (Highway)
- Pedestrian Pathway





Soils Legend

-  2030
-  405A
-  92F
-  5A
-  274D
-  262B

2030 - Udorthents, cut or fill, and similar soils

Extent: 0 to 100 percent of the unit

Depth to restrictive feature: Very deep (more than 60 inches)

Flooding: None

Ponding: None

General definition: This component consists of areas where the original silty, loamy, or clayey soil profile has been altered by the addition or removal of more than about a foot of soil material. Roads, landscaped areas, and steep slopes may be included.

Udipsamments, cut or fill, and similar soils

Extent: 0 to 100 percent of the unit

Depth to restrictive feature: Very deep (more than 60 inches)

Flooding: None

Ponding: None

General definition: This component consists of areas where the original sandy soil profile has been altered by the addition or removal of more than about a foot of soil material. Roads, landscaped areas, and steep slopes may be included.

405A - Lupton and similar soils

Slope range: 0 to 1 percent

Texture of the surface layer: Muck

Depth to restrictive feature: Very deep (more than 60 inches)

Drainage class: Very poorly drained

Parent material: Herbaceous and woody organic material more than 51 inches thick

Wet zone: At the surface all year

Months in which ponding does not occur: January, February, July, August, September, October, December

Deepest ponding: 0.5 foot (March, April, May, June, November) Available water capacity to a depth of 60 inches: 23.9 inches Content of organic matter in the upper 10 inches: 55.0 percent Typical profile:

Oa—0 to 65 inches; muck

92F—Udorthents, ravines and escarpments, 25 to 60 percent slopes

Udorthents, ravines and escarpments, and similar soils

Extent: 70 to 100 percent of the unit

Slope range: 25 to 60 percent

Depth to restrictive feature: Very deep (more than 60 inches)

Flooding: None

Ponding: None

General definition: This map unit consists of deep, steep, well drained to excessively drained soils on ravines and on adjacent Lake Superior shoreline escarpments near the mouths of streams. Some areas are freshly undercut by streams or waves and have slumped. The soils typically are stratified loamy, sandy, and clayey materials. Water seeps from some strata. Ravine bottoms include streams or rivers and alluvial deposits and some bedrock outcrops. At the base of some of the adjacent shoreline escarpments, between stream mouths, bedrock and narrow beach deposits are included.

5A—Arnheim mucky silt loam, 0 to 1 percent slopes, frequently floodedzz

Arnheim and similar soils

Slope range: 0 to 1 percent

Texture of the surface layer: Mucky silt loam

Depth to restrictive feature: Very deep (more than 60 inches) Drainage class: Poorly drained

Lowest frequency of flooding (if it occurs): Rare (January, February, July, August, December)

Highest frequency of flooding: Frequent (April, May)

Shallowest depth to wet zone: At the surface (April, May, November)

Deepest depth to wet zone: 2.5 feet (February, August)

Months in which ponding does not occur: January, February, March, June, July, August, September, October, December

Deepest ponding: 0.5 foot (April, May, November)

profile:

A—0 to 5 inches; mucky silt loam

Cg—5 to 10 inches; silt loam

C1—10 to 15 inches; very fine sandy loam

C2—15 to 24 inches; silt loam

C3—24 to 60 inches; stratified loamy fine sand to fine sandy loam to very fine sandy loam

274D—Miskoaki clay loam, 12 to 25 percent slopes Component Description

Miskoaki and similar soils

Extent: 90 to 100 percent of the unit

Geomorphic setting: Till plains

Slope range: 12 to 25 percent

Texture of the surface layer: Clay loam

Depth to restrictive feature: Very deep (more than 60 inches) Drainage class: Well drained

Parent material: Clayey till

Flooding: None

Depth to wet zone: More than 6.7 feet all year

Ponding: None

Available water capacity to a depth of 60 inches: 6.6 inches Content of organic matter in the upper 10 inches: 2.8 percent Typical profile:
A—0 to 4 inches; clay loam E/B—4 to 10 inches; silt loam Bt—10 to 25 inches; clay Btk—25 to 53 inches; clay BC—53 to 80 inches;
clay

262B—Amnicon-Cuttre complex, 0 to 4 percent slopes Component Description

Amnicon and similar soils

Extent: 40 to 60 percent of the unit

Geomorphic setting: Till plains

Slope range: 0 to 4 percent

Texture of the surface layer: Silty clay loam

Depth to restrictive feature: Very deep (more than 60 inches) Drainage class: Moderately well drained

Parent material: Clayey till

Flooding: None

Shallowest depth to wet zone: 1.0 foot (April, May, November)

Deepest depth to wet zone: More than 6.7 feet (January, February, March, June, July,

August, September, October, December) Ponding: None

Available water capacity to a depth of 60 inches: 6.3 inches Content of organic matter in the upper 10 inches: 1.6 percent Typical profile:

A—0 to 2 inches; silty clay loam E—2 to 5 inches; silty clay loam E/B—5 to 10 inches; silty clay loam B/E—10 to 16 inches; clay

Bt—16 to 24 inches; clay Btk—24 to 43 inches; clay C—43 to 67 inches; clay

Wind Map Legend

Summer Winds

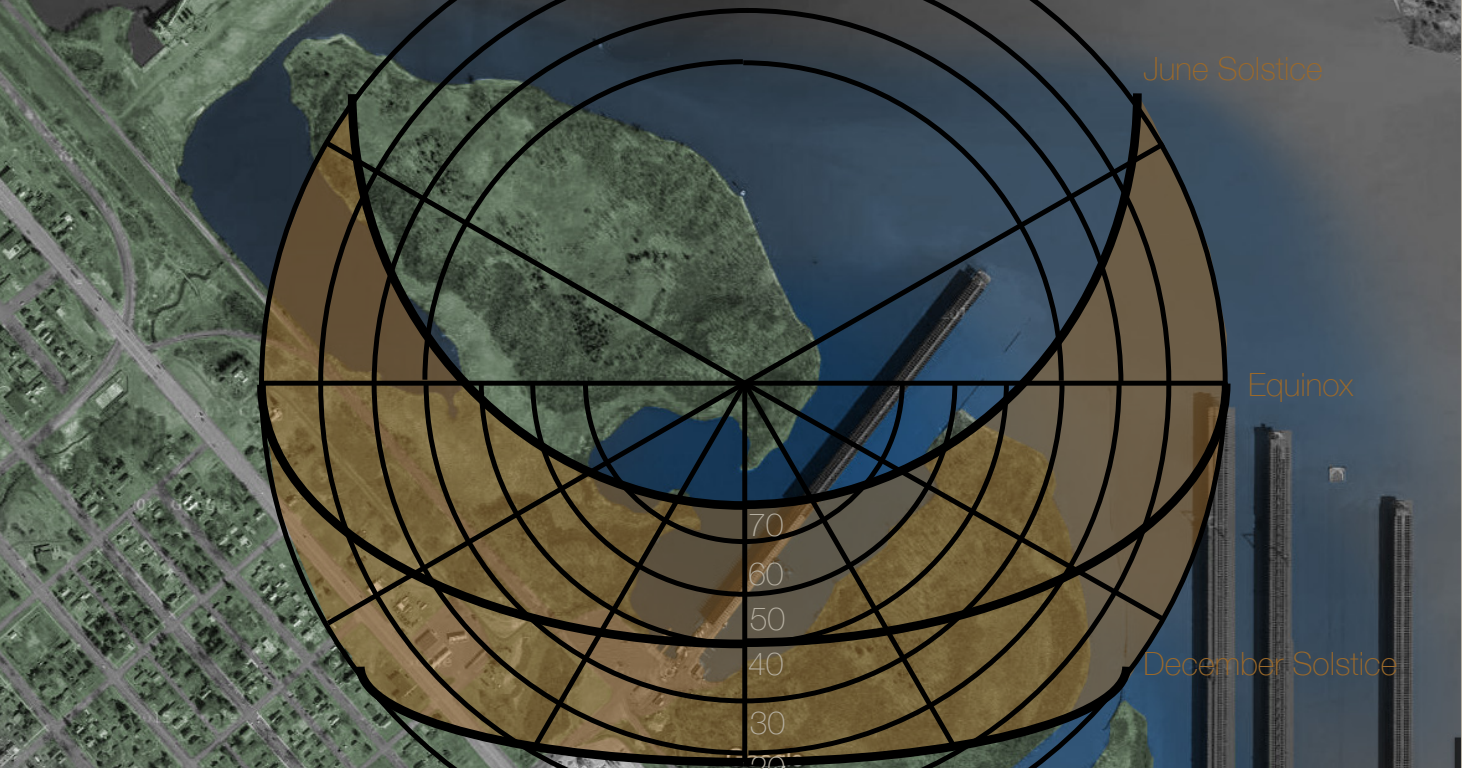
Winter Winds)



Month	Average Speed	Prevailing Wind
Jan	10.5	WNW-11.5
Feb	10.4	WNW-12.0
Mar	11.3	NW-13.0
Apr	11.4	S-11.4
May	10.1	S-10.4
Jun	9.2	S-9.7
Jul	8.1	S-9.2
Aug	7.8	S-9.1
Sep	8.6	S-9.8
Oct	9.7	S-10.4
Nov	10.8	S-10.7
Dec	10.4	WNW-11.0
Annual	9.8	S-12.4

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Ave. Temp°F	13.2	19.0	30.1	43.2	55.5	64.5	69.1	66.9	58.1	46.7	32.4	19.0	43.1
Precip (in)	1.22	1.00	1.96	2.86	3.37	4.02	4.07	4.27	3.74	2.50	2.29	1.34	32.63
Snow (in)	14.0	8.6	8.5	2.9	0.2	0.0	0.0	0.0	0.0	0.5	6.0	11.9	52.4
Heating Degree Days*	1504	1210	1012	611	292	79	20	42	166	502	895	1326	7657
Cooling Degree Days*	0	0	0	0	29	101	193	155	29	2	0	0	509

Sun Map



June Solstice

Equinox

December Solstice

70
60
50
40
30
20

Water

Allouez Bay

Allouez Bay is part of the St. Louis River, which has specific fish consumption advisories for mercury and PCBs. Our sediment data evaluation does not support a specific listing for Allouez Bay on the basis of contaminated sediment, but sediment contamination is a source of impairment for the St. Louis River.

In the 2010 impaired waters assessment, the listing for the St. Louis River was broadened to include Allouez Bay and St. Louis Bay. The separate listings for Allouez Bay and St. Louis Bay were added in the past based on best professional judgment, with little or no data to confirm or support those listings. In the 2010 assessment, contaminated sediment data was evaluated, which included several stations in Allouez Bay. Contaminants in the sediment do not exceed probable effect concentrations, which means that the sediments are not likely toxic to the benthic community in Allouez Bay. Fish tissue data, however, confirms the presence of toxins in the St. Louis River system (of which Allouez Bay is a part) and there are specific mercury and PCB fish consumption advisories for the St. Louis River. In light of this information, the specific listing for Allouez Bay has been modified, and the listing for the St. Louis River Area of Concern has been broadened to include Allouez Bay.

(St. Louis and Lower Nemadji River Watershed Plan 2010)



Water

Hog Island Inlet

Hog Island was contaminated with metals and PAHs from activities associated with the Murphy Oil Refinery in Superior. In 2005 and 2006, the area was remediated using funds from the Great Lake Legacy Act and from Murphy Oil. In 2007, a plan was developed to restore habitat at the site. Douglas County has adopted some of the actions in the plan, and has been implementing those actions with funding from the National Oceanic and Atmospheric Administration in 2009 and 2010 and will continue work at the site in 2011.

(St. Louis and Lower Nemadji River Watershed Plan 2010)



3D Overview

North View





3D Overview
East View

3D Overview

South View





3D Overview
West View

Contour Map

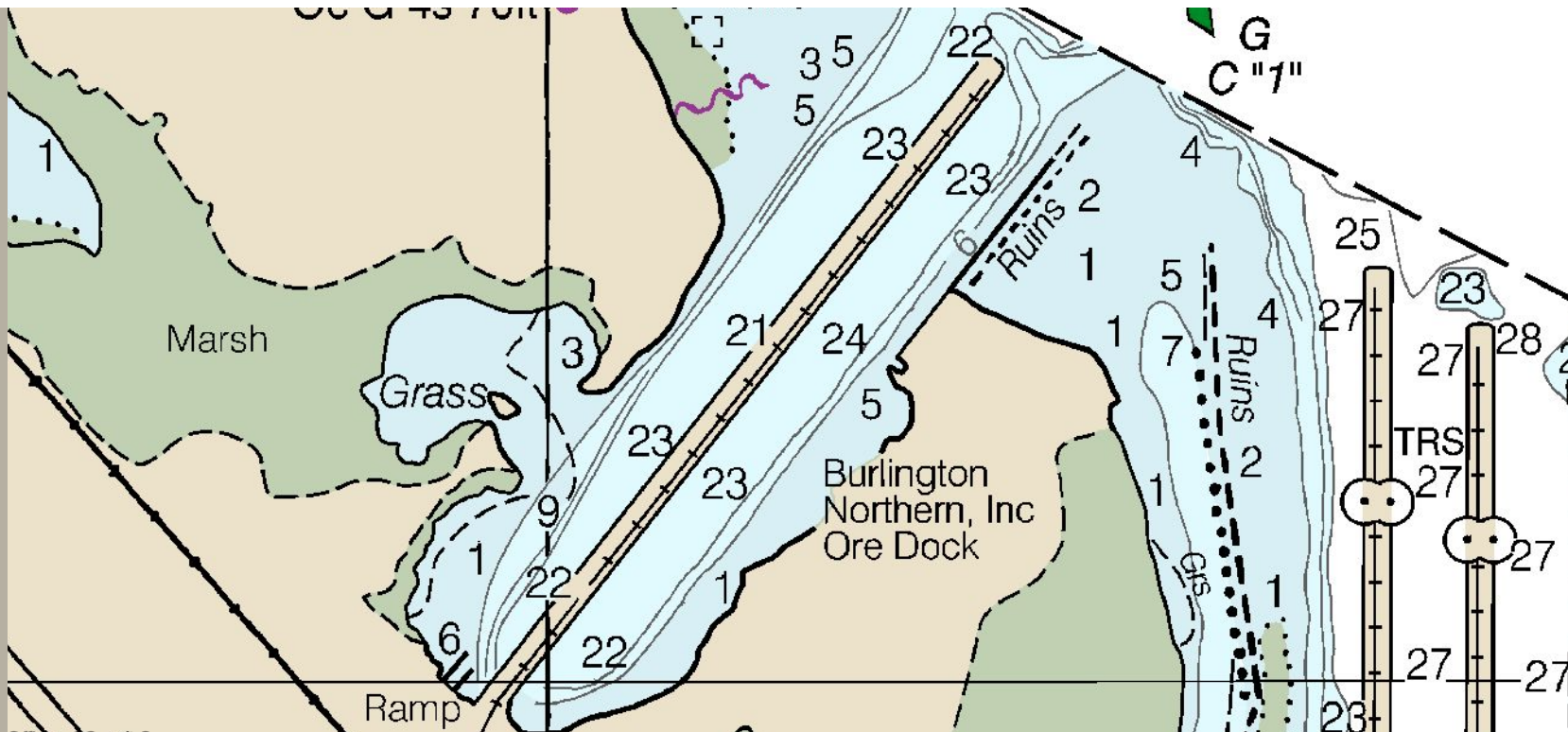
Contour Interval = 10'



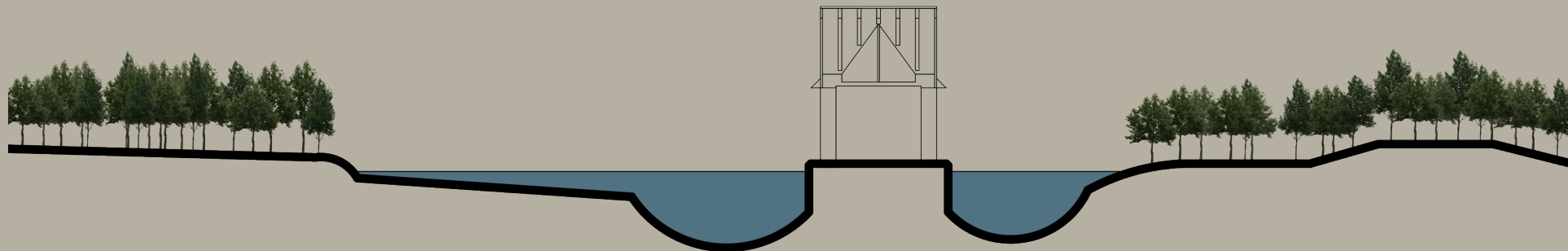


Contour Map
Contour Interval = 5'

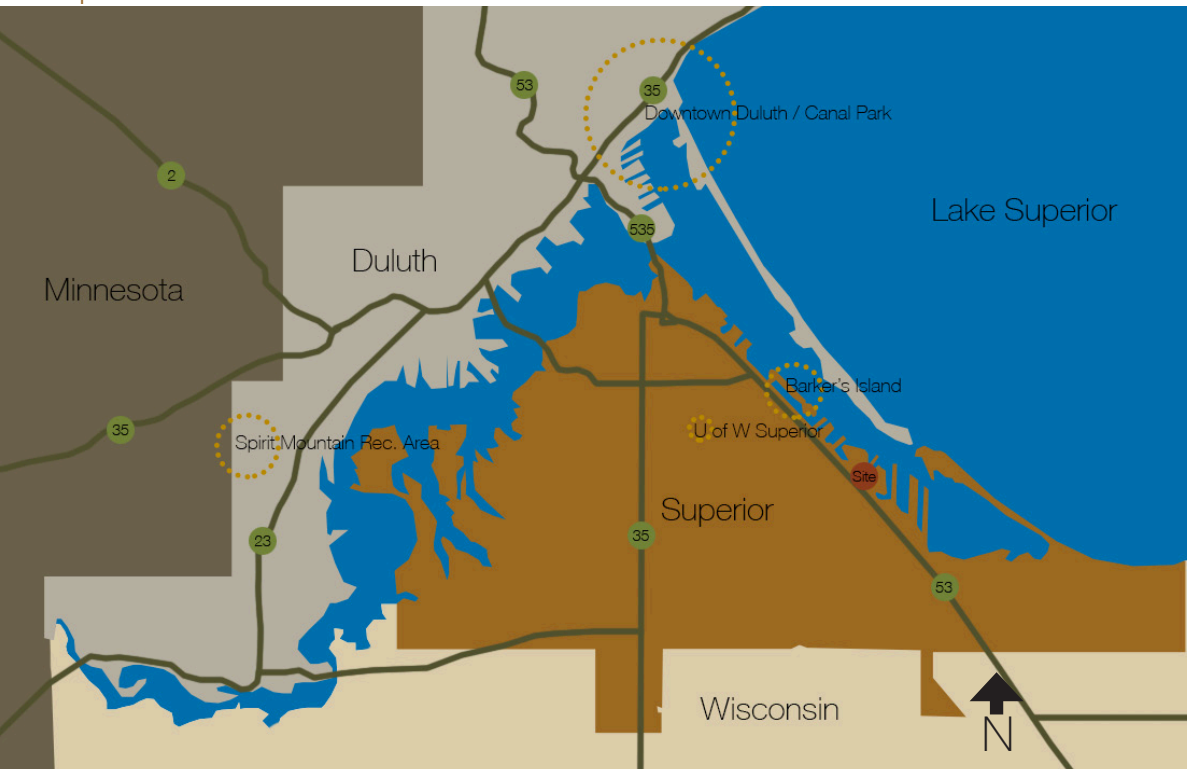
Lake Contours



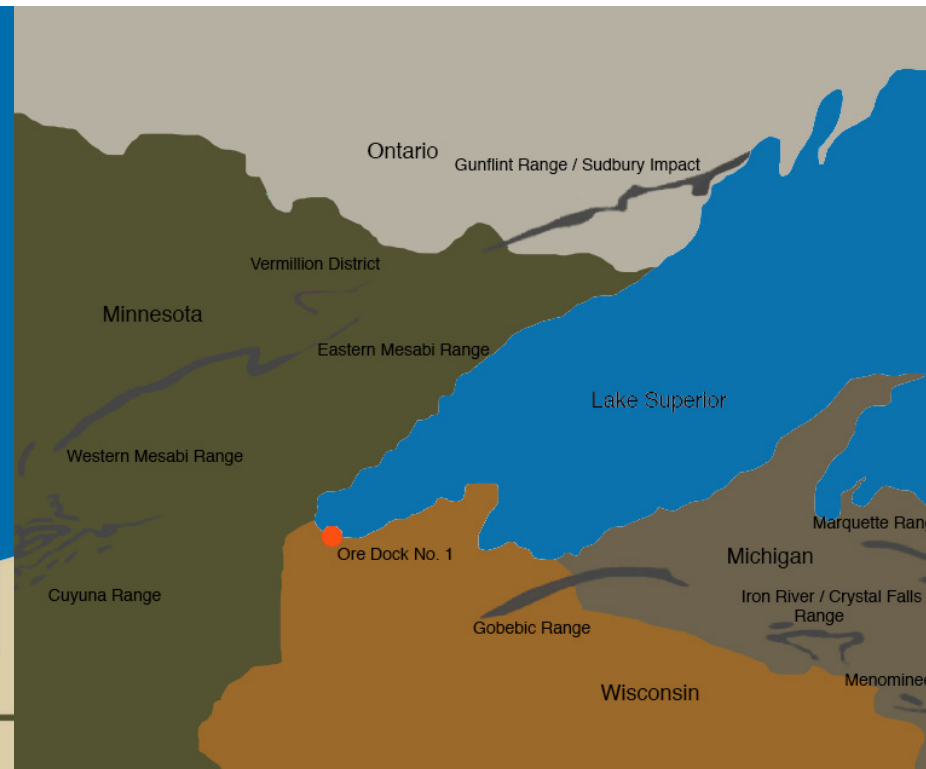
Site Section



Maps Of Interest



Main Roadways + Landmarks
124



Major Iron Deposits

Views



Approach View



View Looking Toward Superior Bay

View Looking Toward Allouez Ore Docks



View Looking Toward West Superior Bay

View Looking Toward Edge of Bay



View Looking Toward Hog Island

Human Characteristics

The site had been used for about 70 years as a transport site for iron ore. Trains would pull onto the dock the iron ore would be stored in hopper cars and from there it would be dumped onto trains. After the site closed in the late 70's the site sat vacant for many years. In its recent history the new owner has since started a marina on the site and it acts as a boat launch onto Superior Bay. The site still gets a lot of traffic via the marina, and also from the recreational path that runs through the site. The path is a popular biking and running trail, which is a great asset to the idea for the ore dock.

Distress

The site for the most part is in pretty good shape, it does show some signs of erosion on the banks of the bay. The water is murky and mud colored but it may just be due to sediments and the high iron content in the nearby soil. The areas around the site are pretty built up. There is a nearby gas station just off the highway that you pass on the way to the site. To the east you have views of the abandoned Allouez ore docks, which is visually very interesting. The trees and vegetation on the site are in pretty good condition; it's a mostly natural site so there are some downed trees, but nothing out of the ordinary. Overall the plant life on the site is in good condition.

Program

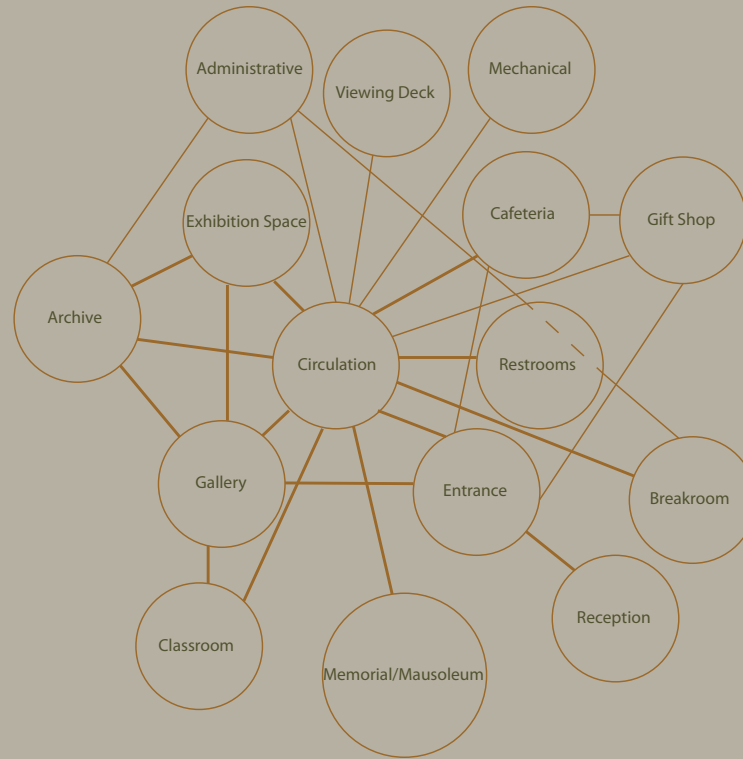
Interaction Matrix

	Cafeteria	Memorial/Mausoleum	Viewing Deck	Gift Shop	Exhibition Space	Archive	Administrative Office	Circulation	Reception Space	Entrance	Gallery	Restrooms	Classrooms	Mechanical	Break Room
Cafeteria	Essential	Desirable	Desirable	Essential	Not Needed	Not Needed	Not Needed	Essential	Not Needed	Not Needed	Not Needed	Essential	Not Needed	Not Needed	Not Needed
Memorial/Mausoleum	Desirable	Essential	Not Needed	Desirable	Not Needed	Not Needed	Not Needed	Essential	Desirable	Desirable	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed
Viewing Deck	Not Needed	Not Needed	Essential	Not Needed	Not Needed	Not Needed	Not Needed	Essential	Desirable	Desirable	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed
Gift Shop	Essential	Desirable	Desirable	Essential	Not Needed	Not Needed	Not Needed	Essential	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed
Exhibition Space	Not Needed	Not Needed	Not Needed	Not Needed	Essential	Essential	Not Needed	Essential	Not Needed	Not Needed	Essential	Not Needed	Not Needed	Not Needed	Not Needed
Archive	Desirable	Desirable	Desirable	Desirable	Not Needed	Essential	Essential	Essential	Desirable	Desirable	Essential	Desirable	Desirable	Desirable	Not Needed
Administrative Office	Desirable	Desirable	Desirable	Desirable	Not Needed	Essential	Essential	Essential	Desirable	Desirable	Essential	Not Needed	Not Needed	Not Needed	Essential
Circulation	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential
Reception Space	Not Needed	Desirable	Desirable	Not Needed	Not Needed	Desirable	Desirable	Essential	Essential	Essential	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed
Entrance	Not Needed	Desirable	Desirable	Not Needed	Not Needed	Desirable	Desirable	Essential	Essential	Essential	Not Needed	Not Needed	Desirable	Desirable	Desirable
Gallery	Not Needed	Not Needed	Not Needed	Not Needed	Essential	Essential	Essential	Essential	Not Needed	Not Needed	Essential	Not Needed	Not Needed	Not Needed	Not Needed
Restrooms	Essential	Not Needed	Desirable	Not Needed	Not Needed	Desirable	Not Needed	Essential	Not Needed	Not Needed	Essential	Essential	Not Needed	Not Needed	Not Needed
Classrooms	Desirable	Desirable	Desirable	Desirable	Not Needed	Desirable	Not Needed	Essential	Not Needed	Desirable	Not Needed	Essential	Essential	Not Needed	Not Needed
Mechanical	Desirable	Desirable	Desirable	Desirable	Desirable	Desirable	Desirable	Essential	Desirable	Desirable	Desirable	Desirable	Desirable	Essential	Not Needed
Break Room	Not Needed	Desirable	Desirable	Not Needed	Desirable	Not Needed	Essential	Essential	Desirable	Desirable	Desirable	Desirable	Desirable	Desirable	Essential

Private + Private Spaces



Bubble Diagram



Program Square Footage

Space	Square Feet
Entrance/Lobby =	3,090
Reception =	225
Viewing Deck =	1,030
Gallery =	6,000
Exhibition Space =	40,000
Gift Shop =	1,000
Cafeteria =	2,000
Circulation (4%) =	3,832
Classrooms =	5,000
Restrooms (3) =	1,350
Memorial/Mausoleum =	5,150
Administrative =	300
Breakroom =	400
Archive =	10,000
Mechanical (10%) =	9,579
Program Square Feet =	88,956
Extra Space =	6,834
Total Square Feet =	95,790

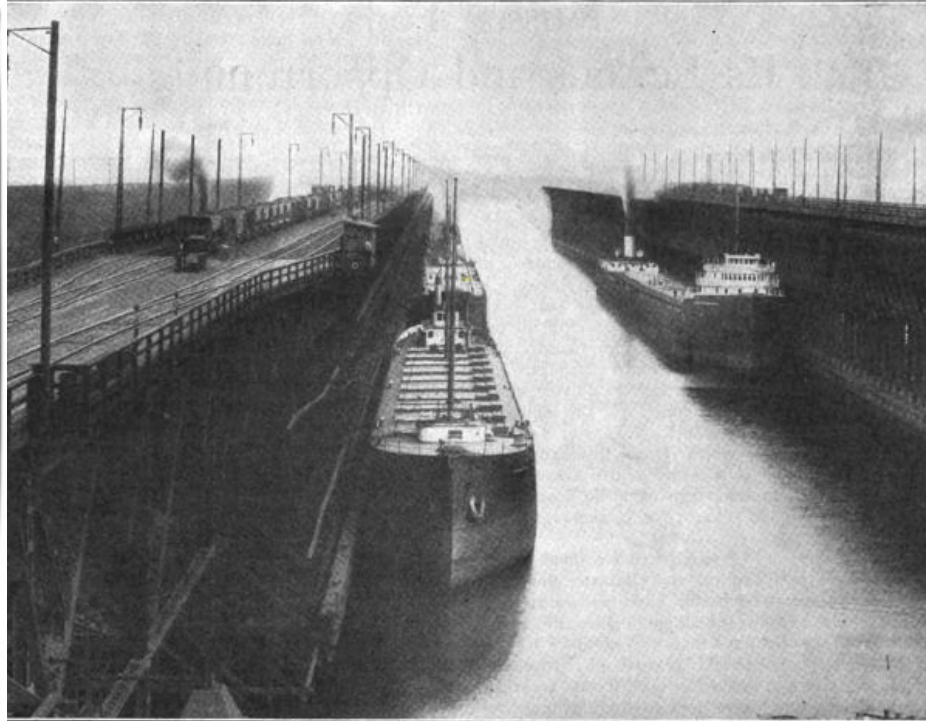
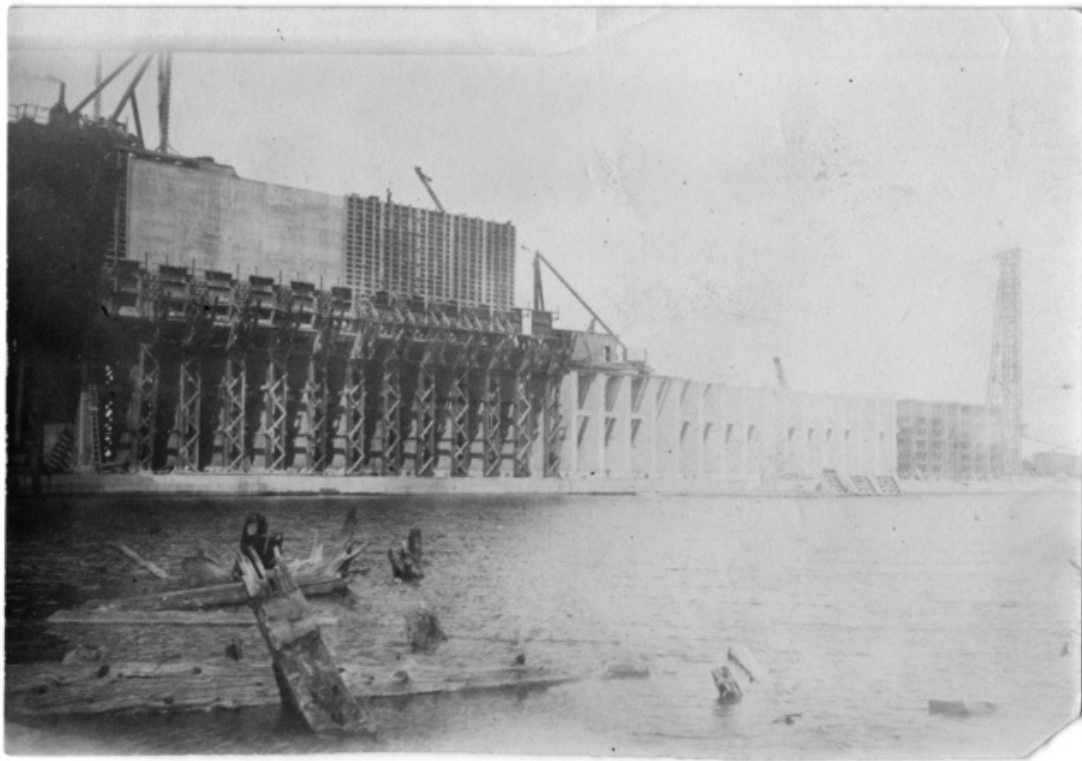
Preliminary Budget

Price per square foot of a museum was researched via The Department Of The Interior. The price ranges from 297 - 434 dollars per square foot. I took the average of the two and came up with 365.50 dollars per square foot.

$$(365.5) (95,790) = 35,011,245 \text{ Total}$$

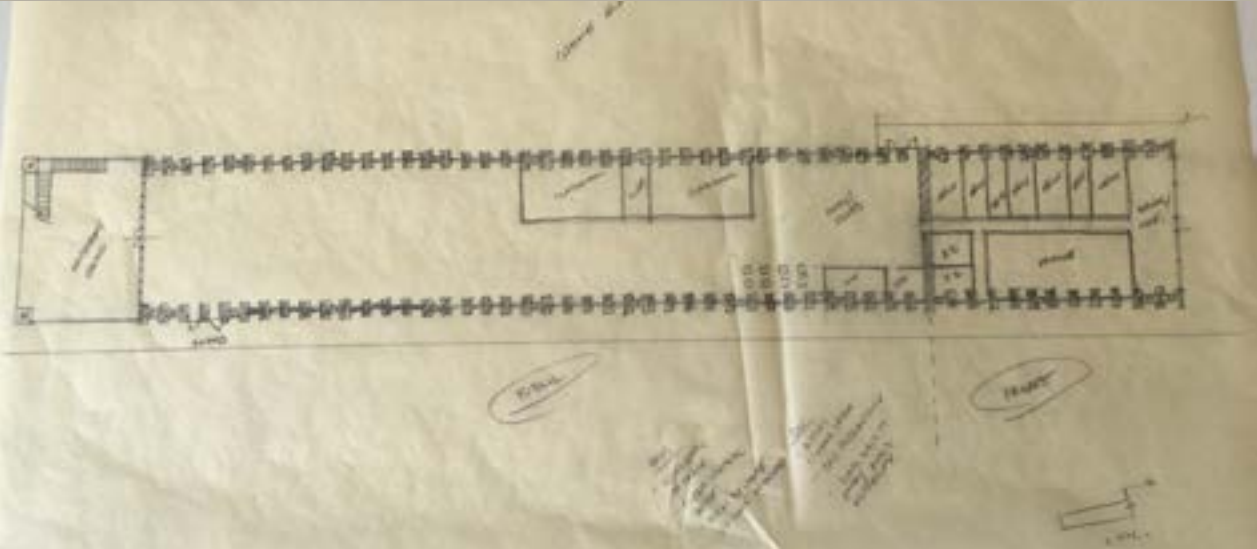
Program Summary

The program included in this book is a working program and will probably be tweaked and changed throughout the course of the design process, however these are good approximations. The square footage of this building can be quite daunting but the museum's exhibits are as large as the structure itself, exhibits need to include things like machinery, rail cars, and other large artifacts to tell the story of this place and era. Also the building has to be able to handle large field trips, large groups of tourists and archival space. The floor plan will also be open and flexible to accommodate a variety of activities that extend beyond just museum functions. These activities include, funeral for the mausoleum space, wedding parties, business conferences, meetings and other community events. The extra 6,000 square feet are just going to be left out for now in case of changes in the original programs.

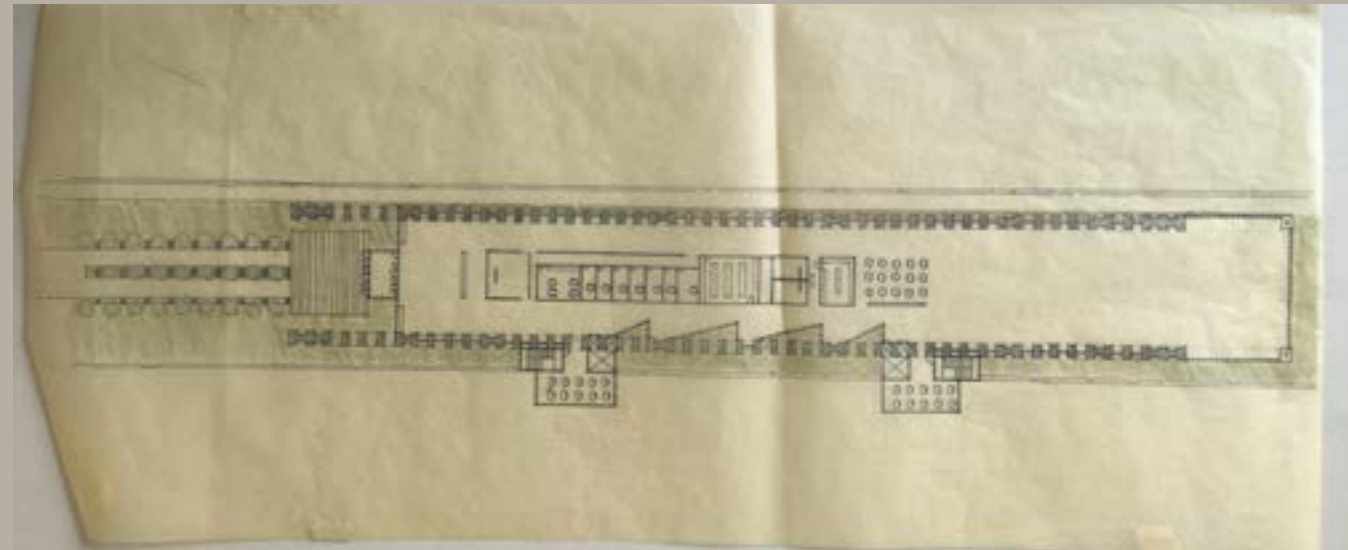


LOADING IRON ORE AT NO. 4 AND NO. 5 DOCKS OF THE DULUTH, MISSABE & NORTHERN RAILWAY COMPANY

Process Work



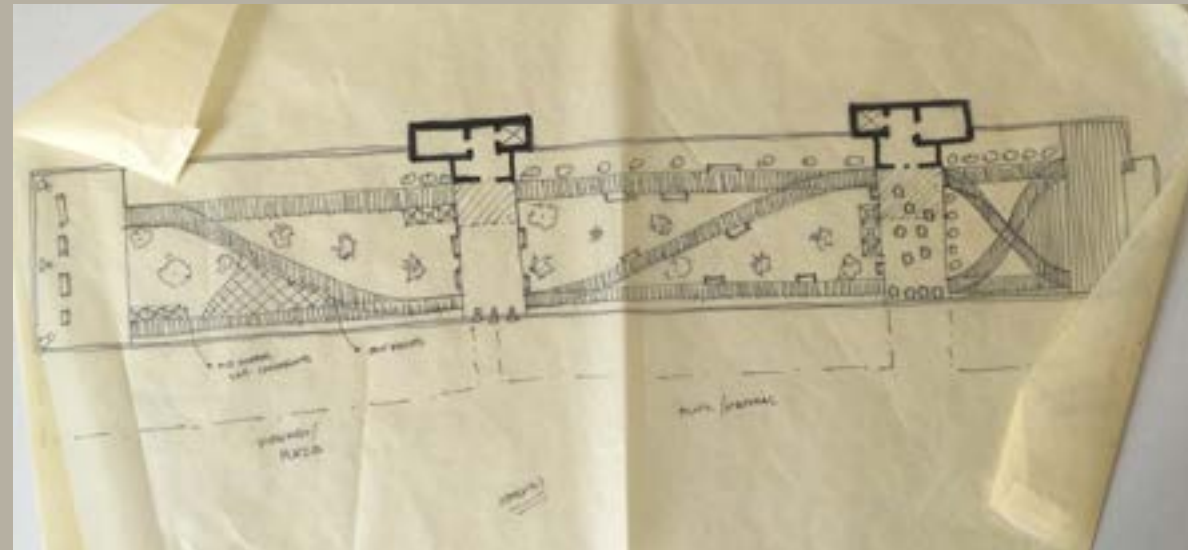
Process Work



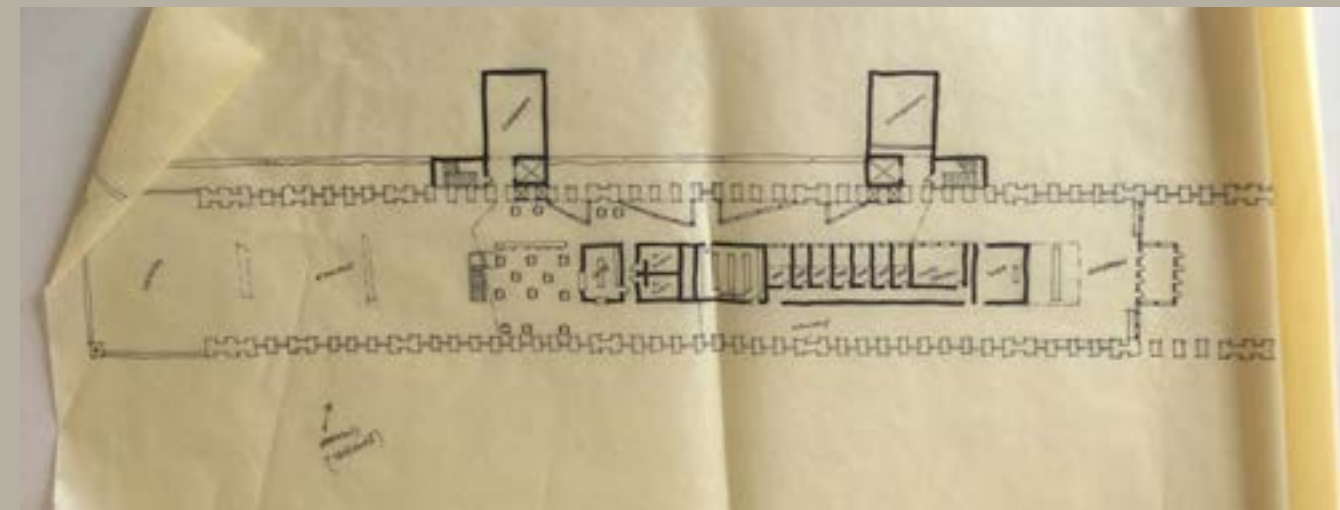
Process Work



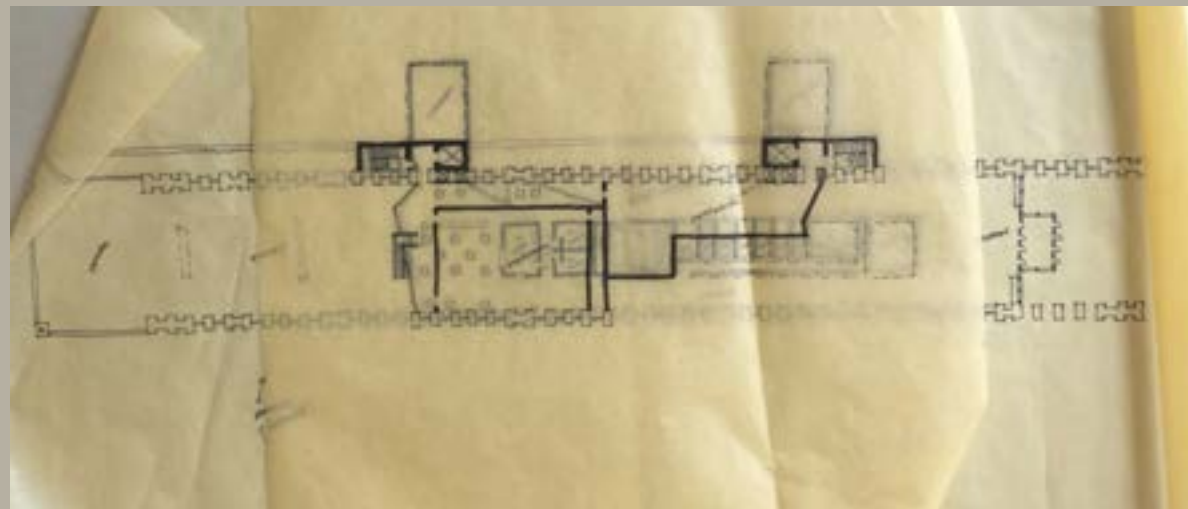
Process Work



Process Work



Process Work



Design Solution



View From Superior Bay



Design Solution



Rooftop Park



Gallery Space

Design Solution



Entry / Reception



Circulation Towers

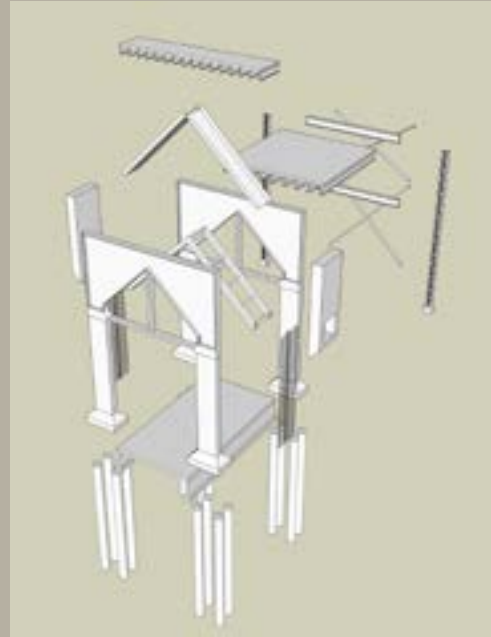


Galley Cafe

Classroom Space



The Superior Room



Exploded Structure



Bandshell



Section Perspective



Entry To Ore Dock

Design Solution

Outdoor Lookout



Final Thesis Boards



Final Display

Previous Studio Experience

2nd Year:	Fall 2010 - Spring 2011 -	Joan Vorderbruggen - Minneapolis Rowing Club, Commercial Daryl Booker - Montessori School, Academic + Dwelling Residential
3rd Year:	Fall 2011- Spring 2012-	Regin Schwaen - Zombie Competition, Theoretical + Artist in Residence, Residential Rhett Fiskness - Visual Arts School U of Mary, Academic + Presidential Library, Civic
4th Year:	Fall 2012- Spring 2013-	Don Faulkner - Highrise San Francisco, Mixed Use Don Faulkner - Ghana Campus, Academic
5th Year:	Fall 2015- Spring 2016-	Regin Schwaen - Wood Highrise Competition, Mixed Use Steve Martens - Thesis Adaptive Reuse

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Hometown: Detroit Lakes, Minnesota

"North Dakota State University has been a place that I have called home for the past 5 years, and I really have enjoyed my time here learning, growing and transitioning into a world where I hope to do good things, both in and out of the realm of architecture."

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The End