The end of the Mill;
A Forensic Interpretation of Swany White and Reconstruction of a Local Brewery

The end of the mill; A Forensic Interpretation of Swany White and Reconstruction of a Local Brewery

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

By

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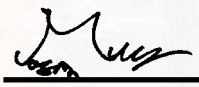
Student Signature  Date May 9 2016

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Statement of Intent

Thesis Abstract

The End of Mills; A Forensic Interpretation of Swany White and Reconstruction of a Local Brewery addresses the question, "How can the loss of the last Century old flour mill in Minnesota be commemorated?" For an architectural design exploration, the building type best suited for this celebration is one that has a strong connect to how grain processing and milling industry contributed to rural economic development in the state of Minnesota. The beer brewing trend across the US has contributed to a renaissance of the importance of local products. Across the state, local breweries have become what local flour milling once was, increasingly reflecting a local sense of community and pride in industry.

Keywords

- Freeport
- Flour Mill
- Brewery
- Ruins
- Revival

Problem Statement

How can the historic site of mill in central Minnesota be revived to benefit a small community?

Typology

Most breweries in the state of Minnesota only sell beer in a taproom and do not have a working kitchen, what makes a brewpub different is this addition of a kitchen and dining spaces. This opens up the usability of the building to a much wide variety of users; a family out for a weekday dinner, colleagues out for a drink after work on a Friday, or the amateur beer maker that wants to tour the facility.

Project Justification

This project is justified by the growing popularity in the state for local craft beer and the lack of a brewery in the area. It follows the slow progression of new breweries spreading North West from the Twin Cities. Freeport, Minnesota is a small town along Interstate 94 which has a strong pride in its local products. The proposed location is on the site where the Swany White Flour Mill burned down 5 years ago, all that remains is the furnace smokestack.

Thesis Proposal

Narrative Proposal

When a culturally significant and historic building is lost or destroyed in a community some of what is lost is reversible, while other aspects are not. This thesis explores a specific community's sense of loss when the material culture of industrial heritage is destroyed and works to find out how to restore cultural awareness of irreplaceable industrial heritage. By looking at a historic building after its destruction, a forensic, autopsy-like narrative can be created. Examining the tangible legacy, literal and theoretical elements of the building can start to show what is able to replace that building.

In the case of Swany White flour, what was lost and needs to be replaced is the communities' passion for locally produced goods. While the loss of the century old two story brick building was tragic, the loss of locally milled flour was equally impactful on the community. The Thelen family who owned the mill through three generations have continued to mill the same way throughout those generations. They have never found the need to grow or expand, when questioned their response was "It's nothing I'm getting rich at, but I'm not complaining. I'm Surviving" (Keillor, 2001) Since the construction of the new more modern flour mill at a neighboring site replaced that loss of flour in the community and the Thelen's continue to survive, but there is still a void. While that void is more physical in the sense that it is a blank lot, it has shown the passion Freeport has for its locally produced goods. The void is also the loss of the Thelen's 90 year old process to mill flour.

With this in mind and after examining other communities with a similar passion, it is apparent that that the passion that Freeport has is only matched by the brewing community. This proposal only became stronger when the process of flour milling was compared next to brewing, the similarities between the two are so apparent that it could be argued that beer making has become as important to the state as flour milling was 100 years ago. While the process has also modernized, it still is very similar, like milling flour, to how it was done 100 years ago.

User/Client Description

Staff

The staff that will occupy the building will consist of only a few people. It is common in breweries for the staff to do multiple tasks throughout the day. While they may be brewing beer in the morning, the same person can be giving tours in the afternoon and bartending at night. More specialized staff will include cooks, serving staff and a brewmaster.

Visitors

Visitors will come to the Freeport Brewery at a variety of time and for different reasons throughout the day. Lunches and dinner times will be popular for visitors to come in for a meal throughout the week, while on weekends the taproom will be busier with local residents throughout the day and into the night. It is common for at least one tour to be given during the week and this will be a time to educate visitors more about the building and process of brewing. Also, due to its location along interstate 94, it may be become a popular meeting spot between St. Cloud and Alexandria or just a convenient place to stop and stretch. Fans of the product may even travel across the state to see where it is made and see the brewery and taproom.

Community

Freeport is a unique community that has a great pride for its self. Charlie's Café has become a landmark in the state regardless of the size of the town that it sits in. This is a high goal to strive for, but as Freeport has shown they have the potential. The community has shown with Charlie's Café and Swany White that it fully supports the small businesses in the town, and nothing less is expected for the Freeport Brewery. The communities pride in its product is the most important thing they can give to Freeport.

Major Project Elements

Each space in Freeport Brewing is both functional to the needs of the brewery, but also a celebration of both processes of milling and brewing. While this a new building it still offers the constant reminded to what was once here. The separation between private and public spaces allows for the brewery to function during the week, but also can be opened up to the public for tours.

Spaces specific to brewing

- Bottling
- Brewkettle
- Control Room
- Grain Storage
- Mash
- Primary Fermenter
- Secondary Fermenter
- Water Purification

Public Spaces

- Beer Hall
- Event Space
- Kitchen
- Patio
- Restaurant
- Toilets

Site

Located in central Minnesota, Freeport, is about an hour and a half north of the Twin Cities. The town is located directly off interstate 94, and is near Lake Maria State Park. Most people will recognize the town because of Charlie's Café, a small café that is always full of locals enjoying a cup of coffee or eating a slice of pizza made from Swany White's local flour. The previous mill was located right off of the exit from 94 and has a very close proximity to the interstate. Currently the site has the new Swany White Flour mill, built it 2014 it is a small two story metal building. This is a sharp contrast to what once sat on the site. Next to this new building the original smoke stack from the mill remains. The charred brick stack is a constant reminder of the fire. The site is split by a small road that accesses the existing flour mill. On the north of the site is the historic *Lake Wobegon Trail*, a paved biking and hiking trail that goes through the state starting in St. Joseph MN going north.


Winkler
Quetico Provincial Park
Thunder Bay
Fargo
Duluth
Minnesota
Saint Cloud
Minneapolis
Wausau
Eau Claire
Wisconsin
Brookings
Rochester
La Crosse
Sioux Falls


Alexandria
Glenwood
Sartell
Sauk Rapids
Saint Joseph
Saint Cloud


LAKE WOBEGON REGIONAL TRAIL
Freeport

Figure 1

Figure 2

Project Emphasis

With the adaptive reuse attracting more architects to save dilapidated buildings, why does our commitment to preserving the heritage of material culture have to stop there. Instead of a focus on the building and its physical history, I chose to focus on buildings cultural significance. The emphasis on a building's impact on the community rather than its physical properties offers a more theoretical study of the building. It allows for the essence to be extracted even though the building may be gone.

Plan for Proceeding

Research Direction

16 weeks of research will be conducted on the effect of cultural impact of the destruction of monuments and buildings over varying times and from all around the world. Two specific designs will be chosen, one from Washington DC and the other from Philadelphia. These locations have been chosen due to their rich culture combined with their history of destruction.

An examination will be conducted about what cultural aspects are lost through their destruction. These aspects will be listed as either reversible or non-reversible. The next step involves the design of spaces that will do their best to reverse any and all losses. This will be more than the simple rebuilding of the buildings, but rather focusing on rebuilding the culture. This research will be presented as a journal article as a clear process for how to proceed with this type of design challenge. It will result in a formulaic like outcome where the known can be taken through a process of steps to see the best way to approach the project.

More research will be target towards the below ideas, while currently there is an understanding, more research needs to be done before moving on to design. The next step will involve receiving feedback on how the previous three designs succeeded and failed to restore what was lost. With this experience, it will help to work more efficiently towards a final design for Freeport, MN. An examination of Freeport and the cultural significance of the mill will be followed by a design to restore the community. (Groat & Wang, 2013)

Schedule

12 step process

Analyze/Inspiration (January 2016)

1) Concisely state what the design opportunity calls upon the designer to do.
2) Become familiar with background conditions and architectural expression of heritage.
3) Declare vision see the idea that unifies.

Synthesize (February 2016)

4) Diagram alternative site responses.
5) Firm up spatial arrangement in the form of a process building.
6) Look for organizing patterns; “Spatial Structure”.

Refine (March 2016)

7) Volume, massing; structural pattern.
8) Compose for beauty; elevations/ section studies, character sketches.
9) Test constructability, systems, material expression.

Spring semester mid-term review

Communicate (April 2016)

10) Telling the story of community renewal and pride in industry.
11) Graphic techniques for packaging.
12) Presentation/sharing/emphasis.

Time Allocation

Proposal:		**25%**	**Completed: Dec. 14, 2015**
o	Abstract	25%	
o	Project Justification	25%	
o	Case Studies	50%	
Program:		**25%**	**Completed: Dec. 14, 2015**
o	Historic Context		30%
o	Site Analysis	30%	
o	Case Studies	15%	
o	Space Programming	25%	
Design:			**35% Completed: Apr. 1, 2015**
o	Existing Site Modeling	5%	
o	Space Programming	5%	
o	3D Space programming	10%	
o	Floor Plan Development	20%	
o	Material selection	10%	
o	Mechanical Proposal	5%	
o	Electrical Proposal	5%	
o	Structural Proposal	5%	
o	Building Detailing	20%	
o	Project Revisions	15%	
Production:			**15% Completed: May. 9, 2015**
o	Site Physical Model	5%	
o	Site BIM Model	10%	
o	Building Physical Model	10%	
o	Building BIM Model	45%	
o	Presentation	20%	
o	Thesis Book	20%	

Research Direction

Project Typology

Brewpub/ Destination Brewery

Historical Context

The effect that Swany White Flour had on the community

What was lost when the one hundred year flour mill burned down?

Of what was lost what can be restored?

Site Analysis

How can the site near I94 be used as an advantage?

How to reuse the remaining chimney from the burned down mill?

Programmatic Requirements

The difference between public and private spaces and how to separate.

Design Methodology

Digital Analysis

Through the study of past photos and current photos an existing essence of the Swany White Flour mill will be created in order to study what was lost by its destruction and what can be revived.

Mixed Method

Quantitative Data

Statistical data will be used based off of averages to help design the proposed Brewery. Equipment footprint and volumes will be calculated and designed around to make increase efficiency.

Qualitative Data

Site visits and analysis will take place over the next 6 months, Interviews from the community will take place in order to quantify the impact the mill has on the community.

Documenting the Design Process

While software will be primarily used for the design and process hand sketching and model building will help solve day to day design problems. These will all be documented throughout the process, and even though they may not be used for the final presentation they will be used when necessary to show the process of design.

Design Software

Autodesk 2016

- Revit
- AutoCAD

Presentation Software

Adobe CS6

- Illustrator
- Indesign
- Photoshop
- Lightroom
- Premiere

Lumion 3D 6.3

Thesis Program

Theoretical Research

Over the last decade, there has been a sharp increase in the amount of construction that involves taking an old, dilapidated building and restoring it into something new. This draw to adaptive reuse continues to keep architects busy, and is a strong candidate for the style that will define this time period in architectural history. This is due to the convenient timing of both the availability of buildings to be restored, and also the publics, or clients, attraction to this type of architecture.

The availability of buildings to be restored has reached a peak due to multiple factors. First, the materials that were used to build buildings back in the early 20th century, like today consist of both very durable materials but also materials that are of lesser quality. For example, the brick that was used on buildings 100 years ago remains a durable material today even after 100 years of exposure to the elements. The wood in these buildings is less consistent and depends on the condition the building was held in throughout its life. While wood that has been exposed to the elements will rarely last that long, if it remained protected it can continue to be used. The material that has advanced the most since these buildings were first built has been glass. The quality of glass has increased so much that the use of single pane plate glass is a rarity today.

Looking at the lifecycle of these materials around the 100 year mark is where, without consistent repairs, they start to break down and need to be repaired. This is the result of new construction methods and an increase in building in the early 20th century. This massive collection of well-built buildings are starting to fail, so the best option is to reuse them.

While the reuse of these buildings has a lot of positive impacts such as the promotion of reuse rather than building new, or the increase market for architects, there are also negative impacts. The most apparent is caused by the popularity this building type has gained. The gentrification of our cities is impacted by the increase in these reuses. While there are other factors impacting gentrification, every brick warehouse that is converted into apartment lofts is another drop in the bucket. This shift to cities has affected the poorer classes because of their rent increasing for these newfound valuable properties. Another negative impact, is that these buildings are notorious for being very energy inefficient. Through our advances in building technology our wall systems are much more efficient than the standard brick wall construction used 100 years ago. While reuse in itself is good for the environment, each building should be closely studied to see the effects on the building over its renewed life on the environment. While adaptive reuse may be sustainable up front, it may in fact be less sustainable over the life of the project, once hazardous materials are removed (Lead, Asbestos), and the building can match new buildings energy standards. There becomes a grey ethical line drawn for each adaptive reuse project. While issues like sustainability can be easily overcome through good design and a strong budget, is that the right choice for the clients' money.

Through the examination of the interaction we have with ruins, Robert Harbison questions why humans are drawn to ruins, while we remain suspicious of the smooth and continuous. In his book Ruins and Fragments, Harbison examines literature, architecture and other art forms, to examine their fascination with ruins. Maybe this fascination with adaptive reuse is also affected by the human being's natural inclination towards ruins. Ruins are the physical reminisce of a past event, while they are physical in nature, they are also very theoretical in nature. Ruins can be examined, not by what is physically there, but what was culturally lost. (Harbison, 2015)

Results from Theoretical Premise and Unifying Idea Research

While similar, building into ruins offers a different insight that adaptive reuse cannot offer. The integration of ruins in a project helps to create historical significance. A very literal example is the Tribune Tower in downtown Chicago. At the base of the tower are many different stones cast into the side of the building. Ruins are taken from their original location and placed here as a new part of this building. It acts almost as a museum for this collection of ruins to be exhibited to the public.

When new architecture comes into contact with a ruin, there are three different routes a designer can take. While the initial decision is quite simple, each route has its complexities.

The first option is to rebuild the ruin, filling in the gaps to create the initial artifact again, but combining the ruins with new replacements. An example of this would be the Acropolis in Athens, Greece. The Parthenon is undergoing reconstruction to be built exactly how it once was. The combination of the old stone and the new stone offers a juxtaposition that helps to frame the overall artifact, but the stones are also different enough in color that it is easy to spot which are original and which are new. This offers the option for visitors to see what it once was like when it was first built 2,500 years ago.

The next option on how to approach ruins is to remove the ruins, while still memorializing them. This requires more context on how what once was there affected the surroundings and what of that is worth restoring. An example of this would be the ruins of the World Trade Towers after the 9/11 attacks. While there is that image that most American can picture of fire fighters raising the flag among the rubble of the towers, what was going to be built there next had to capture that essence of that photo and to memorialize the tragic event. While One World Trade center stands today, it is not on the spot of the previous towers, instead there are two reflecting pools that match the foot print of where towers 1 and 2 once stood. These pools offer a similar impact that the ruins had, by emphasizing the huge scale of both buildings and the loss of life inflicted it creates a very powerful space to be in.

The final option is to leave the ruins as they are and to build around them. While this could easily be confused as adaptive reuse, because they share similar traits, this is specific to ruins rather than forgotten buildings. While there is no clear distinction between the two, and example of this option would be Mill City Museum in Minneapolis, MN. The remaining walls of a flour mill on the Mississippi are used alongside more modern collections of glass and steel to create a unique experience. While the original flour mill is replaced with a museum, the essence still remains due to the ruins that are intertwined between the modern architecture. This transparency of the addition only helps to reiterate the ruins as they are visible from almost every part of the building. This offers a unique approach rather than rebuilding a replica because it offers a closer look to the actual ruins rather than disguising them. (Feldman, 2014)

Typology research

Milling in Minnesota

The milling of grains is man's oldest continually practiced industry; what started as the grinding of grains between teeth thousands of years ago can be followed to today where it is a closely regulated industry that efficiently removes the unwanted portion of grains. This efficiency was a constant strive for man and is a key factor in what drove the evolution of milling. Over millings history of 70 thousand years, it has been an industry that was advanced by some of the smartest inventors of their time.

Before looking at the history of Mills in Minnesota, a location where all books about milling end up, it is important to first identify its European roots. While the history of milling in the West compared to the East can be followed back and forth in the 1800s up until then it was primarily a European principle. Stones used to crush grains were primarily used in France and these very precise stones were then exported throughout the world. Similar to the French's ability to produce the perfect stone for milling, the Dutch were the primary producers of the screens used to sort the pure endosperm from the unwanted middlings. These two simple inventions were the start of a fast transforming industry of flour milling in the 18th century. (Lockwood, 1952)

The early flour milling of the United States started on the east coast, in early American cities with easy access to shipping ports for the required equipment needed to mill in this new world. While the equipment had to be brought to the country, what the United States had to offer were its huge expanses of land that was prime for the growing of crops. This fertile land was one of three key aspects that brought flour milling to Minnesota. The other two were new forms of transportation being created to expand the country to the west and the creation of large scale milling facilities. Up until this point, around 1823, flour milling was primarily a small operation where local flour was ground in the local mill to be sold to the community. The rise of the steam boat offered the opportunity to transport large quantities of both raw grain, and process flour. This transformation due to transportation however, is soon outdone by the expansion of railroads west.

From the first steam boat reaching St Anthony Falls, in what now is Minneapolis, in 1823 it took 70 years for the cities of Minneapolis and St Paul to grow to the size in which they produced the most flour in the world. This quick growth is due to both the expansion of the Erie cannel and the first rails coming to Minnesota. The first rails to come to Minnesota were connecting Baltimore with the largest flour mill in the state at that time, Ellicott's Mill. While transportation had a huge role in the growth of the milling industry, what had an equally important role was the land around these developing cities and the variety of wheat that could be grown there. Unlike most wheat in the country, the Midwest's primary wheat strain, a hard spring wheat, was a much higher quality than the rest of the nation. This higher quality flour was sold for double the price of other softer wheat grown in the east.

While this expansion of transportation from the east coast to the Midwest was occurring there was a similar very fast advancements of how flour was milled. What started out as simply grinding the flour with rock had become a very precise science by the 1900s. Minnesota was one of the first states where roller mills were used to gradually break down the wheat into smaller and smaller sizes. Because of this Minnesota attracted many people to the state to engineer new systems to mill flour. The two primary problems that were constantly being improved upon were the efficiency of grinding the grains, and the management of flour dust. Due to

the proximity of St. Anthony Falls many mills used power from the falls to grind the grain, and while the efficiency of grinding grew better over time it saw less impactful advances than dust management did.

The start of dust management was first called upon by flour mill workers due to their suitability to lung conditions that were later termed, Miller's Lung. The need for a solution to this problem was only exacerbated with the introduction of new machines that would occasionally produce a spark large enough to explode an entire mill due the concentration of flour dust in the air. During the 1870s and 1880s there were many explosions in mills throughout the world killing hundreds of flour workers. One explosion occurred in the Washburn A Mill in Minneapolis, the largest mill in the world at the time, in 1878. The explosion killed 22 people and destroyed five more nearby mills due to the resulting fires, reducing the Minneapolis milling capacity by one third. These explosions led to an awareness for the importance of finding a way to collect the dust.

The first dust collection devices were simply large fans that helped to push the dust outside of the building, but these fans, like many there machines in the building were susceptible to sparks that would ignite the building. The solution many mills during the 1900s came to were the creation of an additional floor on top of the building that would house equipment that would purify the air. Air was sucked into this space by fans and then sent through hundreds of funnel like sheets that drew the dust out of the air before sending it back down into the building. Due to its seclusion from the rest of the building it helped to reduce the amount of explosions caused, but it continued to be a concern for flour workers. (Storck, 1952)

Historical context of Swany White Flour Mill

Swany white joined the milling the industry during a time where many of the difficult problems in milling had been solved which offered the opportunity for more affordable smaller mills. Swany white started in 1898 with a simple set of equipment to mill the local grains for the community. Started by the Thelen family the mill was run by steam until the 1960s. It is only fitting that in 2008 the mill burned down to the ignition of flour dust in the air, a reminded that no matter how far milling has come, it remains limited by some of its oldest dangers. (Keillor, 2001)

Brewing in Minnesota

Brewing in Minnesota goes back to before Minnesota became a state. When Minnesota was grated state hood, there were already been thirty breweries within the state. Not long after, between 1862-1863 thirty more had opened. While the first breweries used horse wagons to transport their product, it wasn't until rails were expanded across the state that the beer industry took off. In every major rail town there was a brewery, and while they were often very similar beers each brewery had a very proud heritage in its local community.

The early growth of beer in Minnesota was due to two key nationalities that were settling the area. The Bohemians and Germans were the dominate owners of many of the breweries and produced a product very similar to their homeland. Lagers, which differ from ales in that it they require cooler temperatures and are bottom fermenting, were the preferred beer of the Midwest due to the immigrants. Due to the need for cooler temperatures for fermenting a key necessity for early breweries were for access to caves to store the beer in as a way to keep it cold. The Twin cities' high bluffs along the Mississippi offered many of these types of caves which helped beer producers grow larger, while other breweries in the state were limited by their terrain.

In the early 1900s Minnesota had been viewed as the middle ground for the temperance movement. With the Dakotas, and Montana to the west with Yankee Presbyterians fighting for prohibition and on the east was Wisconsin and Michigan with Irish, and Germans immigrants with their many breweries. In fact it had never been legal to drink in the state of North Dakota. Minnesota was split, until the United States went to war with Germany, and Germany's immigrants were negatively viewed, along with their drink, pushing the state to side with the temperance movement. However, even after the outlaw of alcohol in 1919 many brewers in the state continued to produce. Most brewed versions of beer that lacked alcohol, but these were not popular, others converted into other industries, and occasionally a few secretly brewed beer with alcohol. Over ten years later when prohibition failed and alcohol was set to become legal again, only a few brewers in the state remained and they could not produce beer fast enough.

This rise and fall of breweries continued throughout the state's history. During WWI, even before prohibition, beer production was stunted because of a lack of grains to produce, due to the war effort needs. However in contrast, in WWII beer production rose. The country declared that beer was needed for soldiers and would often create contracts with Minnesota brewers to produce beer, with lower alcohol content, specifically for the military. Even brewers who were drafted and sent to Europe would occasionally be tasked to start brewers in European counties to produce beer for the soldiers abroad.

After the war the state saw a time of a great decline in the brewers across the state. With increasing transportation ease, the largest breweries were able to grow larger faster, causing for less demand for small local breweries. As Schmidt, Grain Belt and Hamms grew larger and larger almost every other brewer in the state closed by 1970. However this decline resulted in the opening of a new style of brewery in the 80s. Summit Brewing opened in St. Paul in 1986 with an entirely new type of beer. It was uncommon in the area to have Ales rather than Lagers. Light lagers were the only beer in the state until Summit introduced the first Ales to Minnesota. Along with summit, James Page brewing opened in the state in the 80s and was producing an entirely new type of beer to the region.

These new brewers often would import their equipment from foreign countries such as Germany, or Dominican Republic. In fact, Summit was the first brewery since 1930 to build a new facility specifically for

brewing rather than refurbishing an old space, which helps to show the popularity of this new beer at the time. Toward the end of the 80s, was the first introduction of the idea of a brewpub, a location that both brewed beer but also served food. These brewpub were the start of the microbrew industry that today has exploded across the state.

Throughout the history of the state, there has been over 300 breweries, more than the Dakota and Montana combined. The rise and fall of beer production across the state had many factors to influence, and had always been continually rising and falling. From Wars, to prohibition, to its immigrants Minnesota has always done a good job to keep up with the demand for beer. Minnesota had a few key factors to offer which helped this, first in the early years the geography and access to cool caves made the brewers pre-artificial refrigeration possible. Also, the easy access to fresh water helped aid this growth throughout beers history. These two combined with the large German population made for breweries to easily spring up across the state when the demand was high. (Hoverson, 2007)

Similarities between the two

There are many similarities between flour milling in the state and brewing in the state that span from physical characteristics to the impact they had, to how they came to be. First, both flour and beer were dominated and were known by the country of origin the immigrants that ran the facilities were from. For flour it was dominated by the French and Canadian, Beer was the Germans and Czechs. Each of these groups used their knowledge from the homeland to make a product that was superior to others and was often very heavily supported by others with the same nationality. Flour and Beer while consumed by everyone were an important aspect of pride for each nationality.

The next similarity was how important transportation was to each industry. Both were limited based on their transportation. While flour got its start from steamboats and river ways, beer capitalized on the rail system. The same rail system that was first brought to Minnesota due to its flour production. Without flour in the state first, beer would have never had the chance to grow as big as it did. The location of the rails decided which cities would thrive and what would be forgotten. Wherever there was a major depot there were mills and breweries nearby. (Bergeron & Maiullari-Pontois, 2000)

Physical similarities between the two should also be looked at. Both were transported in wood barrels, brewing kept this method for a lot longer than milling did however. The marketing of a brand was also a common similarity and promoted the local over the import. Both were produced in facilities that required a very high attention to detail and required intense feats of engineering. Due to the time period both were starting there was a heavy attention to efficiency. This draw for efficiency however different in many ways between the two, they share the simple idea of using gravity to increase productivity. Both flour mills and breweries were tall and used their height to help in the production process. Both sets of equipment spanned from floor to floor offering buildings with smaller footprints but higher elevations. Due to these large buildings housing complicated equipment, fires were constantly a fear for both industries. Fires were capable of destroying entire facilities, and often the associated company would go with it. Similar to this, both industries stared with many small buildings throughout the state, over time, the choice was made to grow or to close. The result was a shift from many small buildings to a few large industries. Where their history separates if that brewing has returned to this idea of many small microbreweries throughout the state. (Hind, 1940)

How the comparison can influence architecture

Looking at the physical characteristics of both mills and breweries it is obvious the important of elevation and section to design. The spaces in a brewery inspired by flour mill need to be designed with the building section in mind. Similar to how they were once built, spaces must interact from floor to floor rather than in a horizontal manner. Design priority should be given to section rather than floor plan. Even through modern breweries have moved away from the need for height, there is still the opportunity to combine both the new and the old and design with height, while still taking advantage of modern methods.

Looking more at the history of both and their influences it the importance of rail and water travel are also aspects that can be drawn from for designing. The sheer power of rail travel offers itself as an important theme that a building must present. Also, what the rail road expansion represent should be present in the design. The rail road connected the west to the east and represents the essence of the industrial revolution and the growth of the nation. This strive for expansion and industrial progression can influence design in a way that respects the past and its impact, while also using the latest modern advances.

Goals

Academic

Academically, this thesis should be used to help guide future students through the chaotic process that is the formation of an architecture thesis. Similar to how the author used previous students work to draw inspiration and guidance from, this thesis hopes to offer a similar guidance. One thing that may be left out of the rest of the thesis that the Author would like to touch upon is the importance of enjoying the thesis process. This thesis sets an example for what can result when the worry of academia's judgments are ignored, if only slightly, and the author is free to pursue an actively engaging topic rather than overly academic one.

Professional

Thought the process of this thesis there has been a continuous thought if the business of opening a brewpub in Freeport is financially viable. Professionally the goal is to increase awareness to the impact that buildings may have on a community along with the importance of local communities. In a world that continues to grow closer and closer it is all too easy to forget about the local community. This work hopes to prove the importance of eating, drinking, building and giving locally.

Personal

It is the author's firm belief that every iteration is better than the last, especially due to what was learned in the times between iterations. Each project in school is another iteration, so the latest project is always the best project, not because of the physical project, but because of the addition of knowledge in every aspect. The personal goals of this thesis are simply, the advancement of that knowledge base. To learn more about the importance of community and use that information on every future project.

Case Studies & Typology Research

Up and Coming

Lucid Brewing; Clarity in Thinking, Excellence in Drinking (10,000 BBL produced per year)

Located in Minnetonka, Minnesota Lucid Brewery is relatively new. They started brewing in 2010, through a coop brewing system, where everything needed to brew is shared between multiple brewers. They have recently announced that due to their growth that they will be moving from a brewery and sample room to the addition of a taproom. This addition will allow them to sell glasses of beer at the brewery, instead of the samples they are limited to now.

This is the smallest brewery I have toured and offers a unique view in what a very new brewery needs, along with their ideas for future growth. They are located in a small warehouse with a small space set aside for a bar to sample beer. Currently they only bottle beer and have no intention of canning beer anytime soon. They do use their space very efficiently, and are surprising popular for their odd location and lack of a public space. It offers an interesting view into how little is needed to please the beer loving community. They also started as a brewery coop sharing their equipment. This offers a good connection to the community and is an affordable way for a brewery to start. (Lucid Brewing, 2015)

Key Elements: **Production Size, Simplicity, Importance of Taproom**

Figure 3

Figure 4

Analysis

Lucid Brewery is the least designed out of the six case studies. Due to its location in a warehouse it was designed to brew beer and nothing else. The entrance is through the loading dock where there is a small space, about 20' x 20' for visitors to try the beer. The rest of the space is a mess of stainless steel tanks and a small bottling station. There is no separation between the visitor area and the brewery which means the brewery must be closed to visitors when it is brewing. The site offers a small space in the parking lot where visitors can play yard games, but like the rest of the building it seems like an afterthought rather than a design decision. This is not a surprise however, due to the fact that the brewery was retrofitted to fit into a warehouse space.

Growing Fast

Excelsior Brewing Company (10,000 BBL produced per year)

Located in the small town of Excelsior on Lake Minnetonka, Excelsior Brewery started small, and has been struggling to keep up to the demand. Buying out a small shop in downtown excelsior they had to buy the rest of the building quickly after due to their fast growth. Even now they are looking to open a facility specifically for brewing and keep the existing building for small batches and a taproom on the lake.

This is probably the brewery I visit most often, even though I struggle to find a beer from them that I like. I go for the fun social space rather than their beer. This is the most active brewery I have been to, live music is often there and it always seems to be busy. This shows that there is a lot more to a brewery than just the beer. The feel and location of the building are just as important, if not more. The design of the building, it was a very simple remodel of an existing building. (Excelsior Brewing Co., 2015)

Key Elements: **Production Size, Social**

Figure 5

Figure 6

Analysis

This brewery similar to Lucid is rather early on in their history which often means there is very little design involved in it. Once again, a building that was purchased and then retrofitted to fit brewing equipment. As you walk in there is a large open space consisting of tables and a small stage. Beyond that is the bar which is large, but rarely used due the lack of seating around it. Because drinks are only served at the bar, there is often a lot of confusion on where to order and long lines result. Beyond the bar is small walkway to an outdoor space. This space is one of the best of the building due to its connection to downtown excelsior, however it is often very full and may not be clear that it is a public space to new occupants due to its location behind the bar. Beyond that is the brewery equipment, there is a good separation here between the equipment and the rest of the bar. This is achieved by the larger Brite beer tanks as the closes equipment to the bar. Behind that is the equipment that is more actively used, so that basic operations can take place while the bar is open. At the far back of the bar is the bottling station and a loading garage, keeping all the back of house operations out of site from the guests.

Success in a Small Town

Castle Danger Brewery; *Dangerously Good Ales* (7,000 BBL produced per year)

Started in a town of 30 people, Castle Danger Brewery proves even in a small town in Northern Minnesota, Breweries can be sustained. While it offers a very simple approach to a brewery it still is a very popular stop for people passing through. The brewery recently moved to Two Harbors MN, but even then it still gets a surprising amount of customers.

While the all the beer is brewed on site, it is rarely seen by the occupants. Instead of displaying the equipment like many breweries do, they chose to have it hidden in the back. That being said, they still offer tours of their facilities. With seating for 100 people, it lacks the social feel, something many other breweries capitalize on. Because of its popularity in the summers it is surprising that it does not offer a more dynamic outdoor space, currently it is just a small deck and patio. I visited like most people do, just passing through two harbors. Their lack of a kitchen meant that I came here for a beer, but then went across the street to a pub to grab lunch. (Castle Danger Brewing, 2015)

Key Elements: **Town Size, Destination Brewery**

Figure 7

Figure 8

Analysis

Castle danger brewery is unique between the six because it does not display its equipment like the others. All the brewing happens in a space behind the bar which makes the space feel much more like a bar than a brewery. It has a large amount of bar seating and tables, which makes it odd that it does not have a kitchen to serve food. Taking advantage of the Twin Harbors landscape there is a huge deck space that wraps the building allowing for plenty of outdoor space for sitting as well. Because of the lack of visible equipment though, it doesn't feel like a brewery and instead like a Northern Minnesota cabin bar.

First in its region

Rhombus Guys Brewing Company; *Don't Be Square* (3,000 BBL produced per year)

Built in an old opera house in downtown Grand Forks, The Rhombus Guys Brewery is an example of an existing popular chain branching out into a brewing. This is important because unlike most startups, Rhombus guys had a lot more money to put into its brewery and is experienced with the restaurant side of the industry. While this is not the first brewery in the state, it is one of the first of its kind. With a state with strict bar laws it is difficult to offer a bar setting that is also family friendly. Also, the majority of the breweries in the state do not serve food, not only does this serve food, but it serves some food from a popular North Dakota chain.

Designed by a local firm, JLG Architects worked with rhombus guys to design their first brewpub. The 125 year old opera house was transformed into a 4,000 sf bar and restaurant. While there is equipment on the main floor, the majority of it is placed in the basement. This is the only case study that I have not visited yet. However it is also the case study that I have the most exposure to the design process. While working at JLG Architects I had the experience to be briefly involved in the design. (Rhombus Guys Brewing Company, 2015)

Key Elements: **Size, Social, Brewpub, Historic Reuse, Architect Involved**

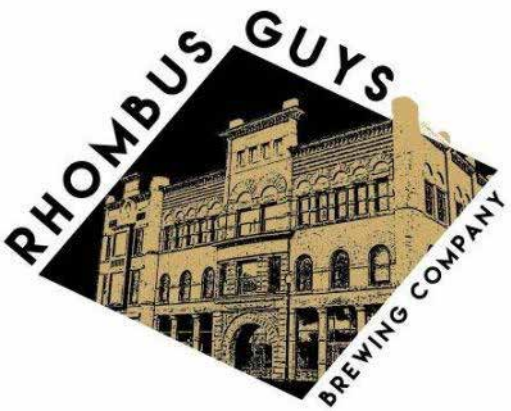


Figure 9

Figure 10

Analysis

Rhombus guys provides an appropriate balance between bar, restaurant and brewery. As you walk into the opera house building it is apparent that is all three of those. While there is plenty of seating for a meal with a group, there is also the easy of stopping in for a quick meal or drink at the bar. The space is framed well by the brewery equipment behind glass. Once again, like the others due to this it is difficult to brew beer while the building is occupied. What makes this unique is the separation it offers between bar and restaurant. As you enter there is a very clear separation between the two as you are presented with the option of going left into the family friendly restaurant or right to the bar. This is a unique design solution presented by the strict North Dakota bar laws.

New Standard of Design

Surly Brewing Co.; *Get Surly* (28,000 BBL produced per year)

When surly was less than ten years old they asked HGA to design them a new brewery. HGA took it one step further and promised them a destination brewery that would attach people for its design, food, and beer. Their new brewery, downtown Minneapolis, offers all types of spaces for its occupants to enjoy beer. From the traditional beer hall inside, to the patio and lawn, beer and food are served throughout. With a much nicer restaurant and venue on the second floor there are always a wide variety of people visiting.

Surly is unique because they built a new brewery rather than using an existing building. That helped to allow for a unique design where everything fits very well. Their landscape design throughout is also something worth studying. The classic German bier hall is very apparent throughout the design and fits well. Even though they are a much larger brewery that did not hinder the display of their equipment, but also allows for brewery to remain open while they are actively brewing. When I visited this brewery we had to wait about half an hour to get a table and there were no openings for tours. Both the parking lot and bike racks were packed. The popularity only added to the bier hall feel. (Surly Brewing Co., 2015)

Key Elements: **Social, Brewpub, Architect Involved, Destination Brewery, Germany Traditional**

Figure 11

Figure 12

Analysis

Of the six this is the most recent, and the most designed brewery. Fireplaces and fountains with beer themes are throughout the walk to the entrance. As you enter there is an emphasis on raw materials that remains a theme throughout. A natural progression leads you through the entrance beyond the bathrooms to the gift shop and host station. This allows people to come to the building for many different reasons and easily go to where they belong. Beyond the host station is the huge bier hall on the first floor which overlooks the brewing equipment, again protected by glass. Above the bier hall is a meeting space and a sit down restaurant. The walkway to these spaces overlooks the bier hall and provides another angle of the bar and brewing equipment. Outside, accessed by the bier hall, is a large deck with more seating, an outdoor bar, and a large lawn. The lawn is a mixture of walkways, green areas and other landscaping. Sculptures are throughout along with various yard games and spaces to sit in the grass. This is the strongest of the sixes outdoor spaces and shows because it is often very busy. Multiple fireplaces are throughout for the cooler months. This is all held together well by the large abandoned grain silo casting a shadow on the site. The building is odd shape in elevation, but works well with the various outdoor spaces punched into it. The dark metal panels on the outside give it a much larger feel than it truly is. Due to the separation of equipment, the brewery can operate while it is occupied.

What started it all

Summit Brewing Company; *A More Meaningful Brew* (240,000 BBL produced per year)

Starting in 1986, summit was the only one of its kind for a very long time. They were not able to brew beer fast enough because they were the only ones in the market. They have become the standard for breweries and lead the recent changes in brewery perception. They remain very traditional with German roots throughout the brewery and process.

The brewery, in St Paul, is designed for efficiency and produces the most beer of all the case studies here. There has been multiple add-ons over the years that primarily increased the brewing capacity. The recent taproom renovation allowed for plenty of space for visitors along with a popular outdoor space near the Mississippi river. The taproom is very traditional in that it is very similar to a German bier hall, where it differs is the connection between the bier hall and the brewery. Bronze equipment is displayed, but also behind glass. This allows the taproom to remain open while the brewery is in operation. Giving something to watch while visitors enjoy their beer. When I visited I took advantage of the small outdoor spaces with yard games. In fact I spent very little time inside the brewery other than the guided tour. (Summit Brewing, 2015)

Key Elements: **Social, Architect Involved, Destination Brewery, Germany Traditional**

Figure 13

Figure 14

Analysis

Summit balances its operation with visitor spaces by displaying the important equipment and hiding the rest. By only showing the copper mash tanks behind glass it severs as reminder enough of what the building is used for. When you walk in to the brewery there is a bit of an awkward transition between the private office space, gift shop and beir hall. The bier hall is a large, high space with a surprisingly small bar. The gift shop feels crammed into the corner. It is in the office side of the building and is disconnected from the bier hall. The rest of the brewery is very open both horizontally and vertically. This proves to the people visiting how much beer summit produces. Due to a lack of space that had to build a second building specifically for canning next to the original building and pipe beer over to it. Once again this provides a very disconnected feel, but is understandable due to their size.

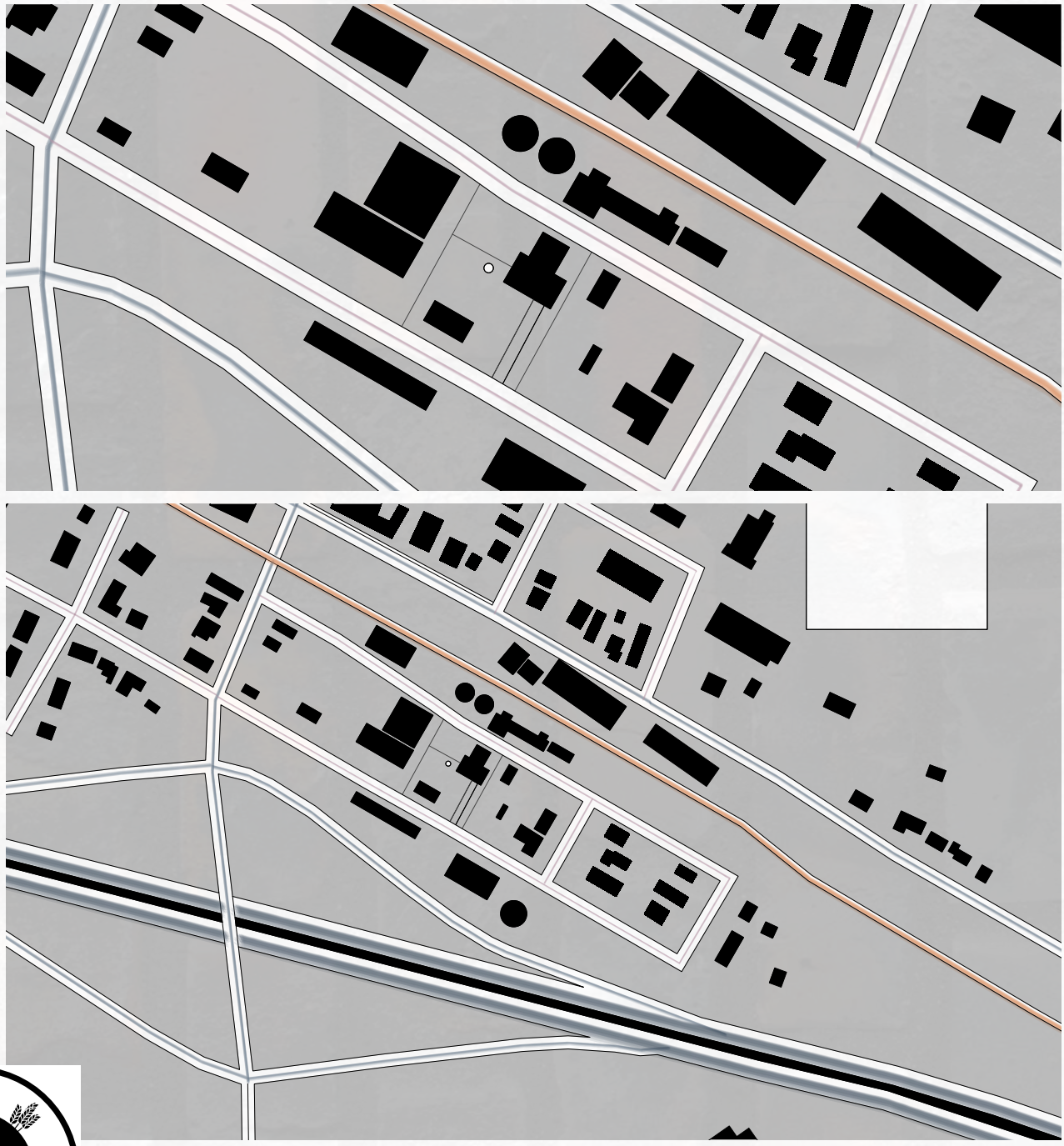
Site Analysis

Built Features

The built features on the site include the rebuild Swany White Flour Mill to the North East, and a small decrepit garage to the South West. In the center of the site sits the 50 foot high brick smoke stack of the original mill. The adjacent sites have a mixture of industrial buildings and residential. To the north is a grain storage facility including two grain silos; to the West is two small prefab metal buildings that houses a few small businesses and are used for storage; to the South is a set of storage garages; and to the East is a small block of about ten houses.

Vehicular & PED Traffic

The site has minimal traffic for both vehicles and pedestrians. The North West of the site is a large gravel parking lot, the site where the old mill used to sit. There is access on the south of the site for a truck to back to the new mill to load and unload, but this is not a through street, and is used rarely. Due to the location of the site within the city of Freeport the traffic that used the adjacent roads are either residents of the small group of houses to the west or are there for one of the three small business around the new mill. During harvesting season the road to the north of the site is busy with semi-truck traffic unloading grain. Just to the north of the grain storage facility is the Lake Wobegon trail, which throughout the year has active foot and bicycle traffic.

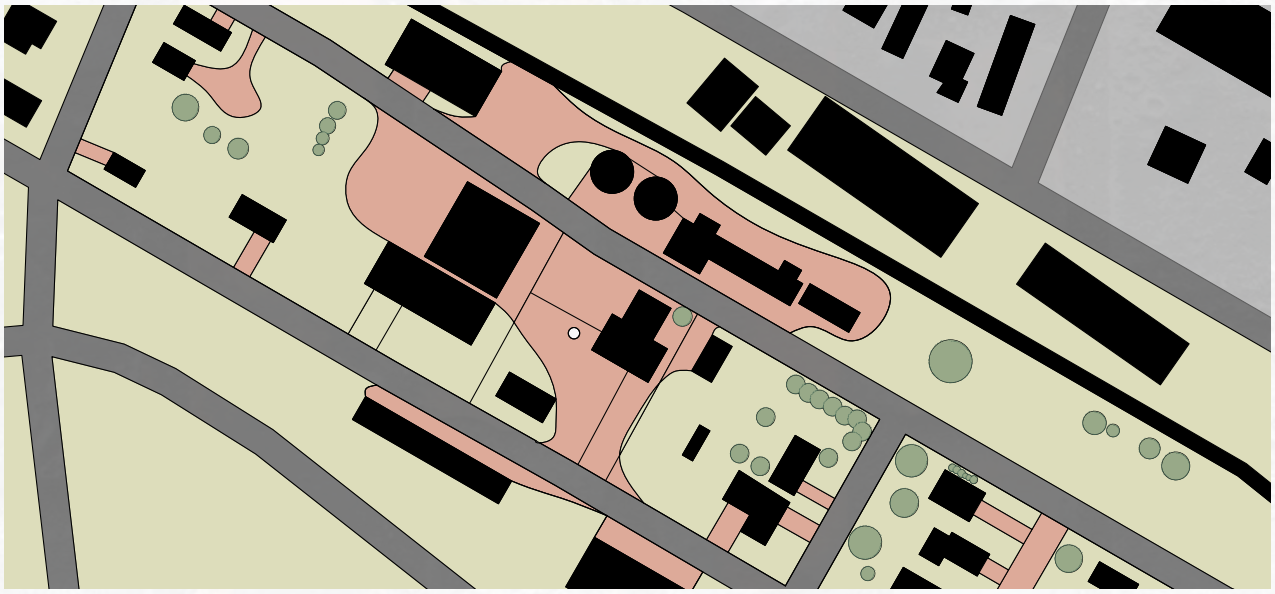


Character

The character of the site are quite and industrial. The small town feel is throughout the site and industrial connection to residential offers a unique juxtaposition. The fire charred chimney can be a confusing aspect of the site to newcomers, and the new Swany White Flour Mill has a suburban residential feel.

Vegetation

The site offers very little vegetation and is a mixture of gravel hardscapes and a few patches of grass. Around the site there is a mixture of small bushes and trees that offer as privacy between the industrial sites and the homes to the west. There is also a small amount of landscaping to the South, probably to try and combat the sound of Interstate 94. There are two mature Dogwood trees on the East property line. It is surprising that they survived the fire in 2008.



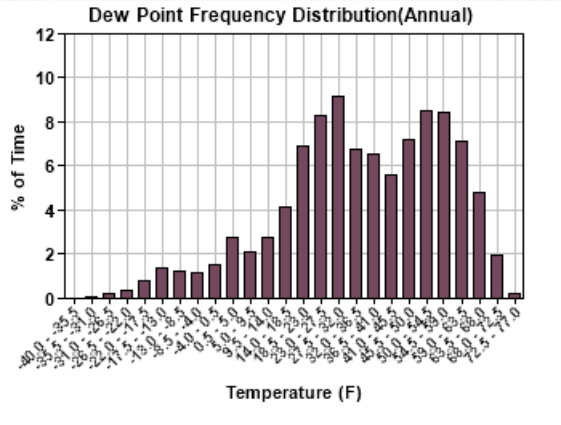
Utilities

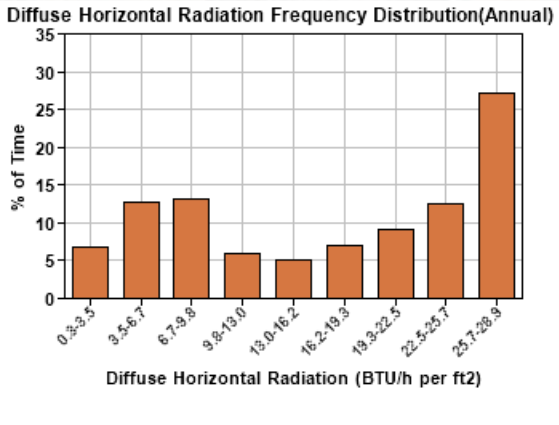
The North and South roads of the site have power lines parallel to them. The North line is currently where Swany White and the neighboring homes and business have electrical access. There is underground power to the South of the site connecting to the South most of the two prefab metal buildings. All of the buildings in the area are supplies natural gas, connections run parallel to the streets. All sewer and water run through the North Street.

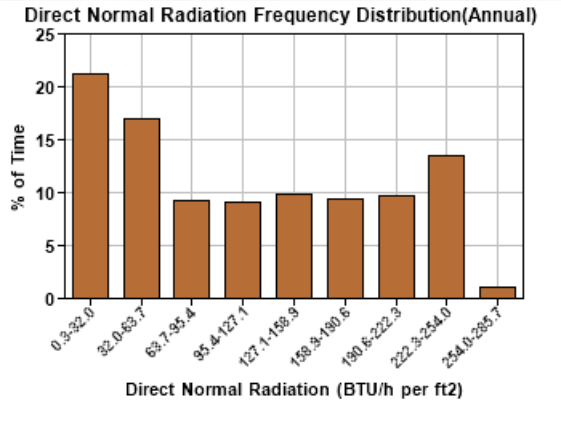
Light

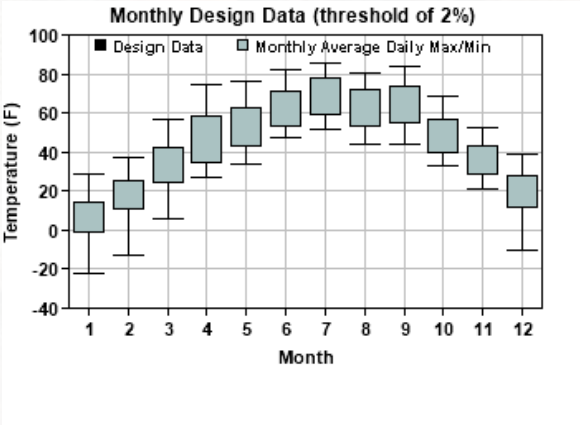
Long summer days are combined with short winter days. Each are effected by the occasional cloud cover. The artificial light on the site is limited by a few security lights that cast an orange glow on everything. There is the occasional headlight from the I94 that intrudes on the site, but overall light pollution is minimal.

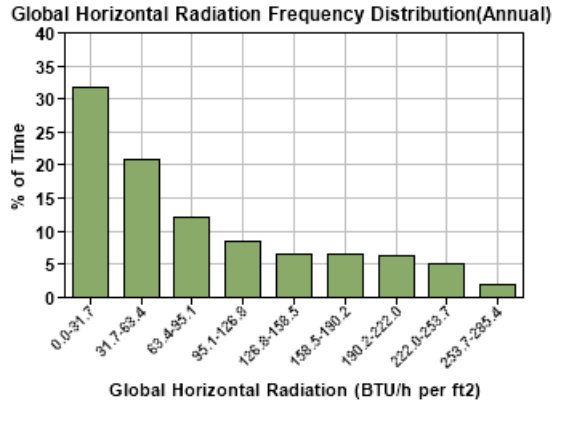
Climate Data

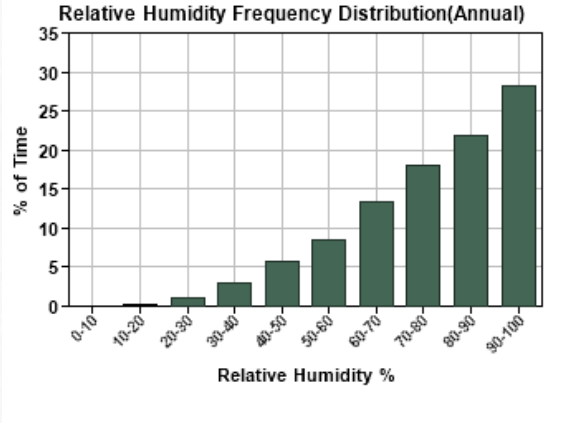


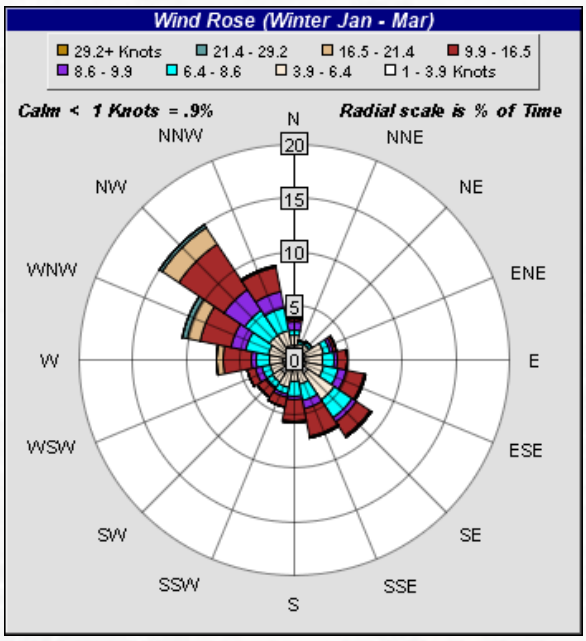











Wind Rose (Winter Jan - Mar)
29.2+ Knots
21.4 - 29.2
16.5 - 21.4
9.9 - 16.5
8.6 - 9.9
6.4 - 8.6
3.9 - 6.4
1 - 3.9 Knots
Calm < 1 Knots = .9%
Radial scale is % of Time
N
NNE
NE
ENE
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SW
WSW
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NW
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20
15
10
5
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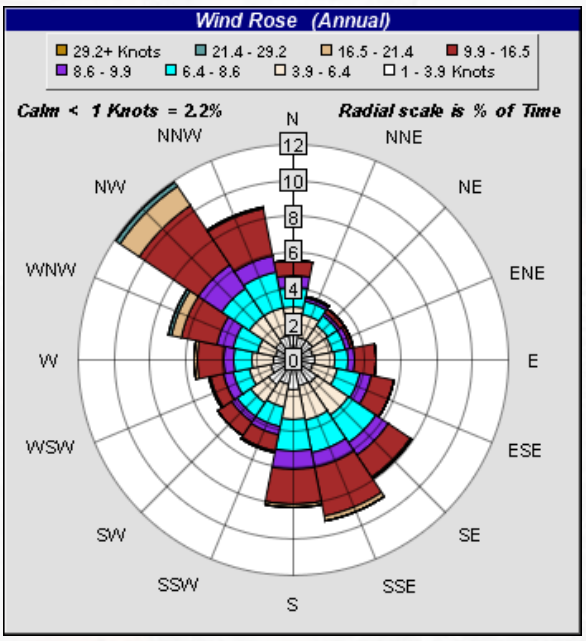
Wind Rose (Annual)
29.2+ Knots
21.4 - 29.2
16.5 - 21.4
9.9 - 16.5
8.6 - 9.9
6.4 - 8.6
3.9 - 6.4
1 - 3.9 Knots
Calm < 1 Knots = 2.2%
Radial scale is % of Time
N
NNE
NE
ENE
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ESE
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SSE
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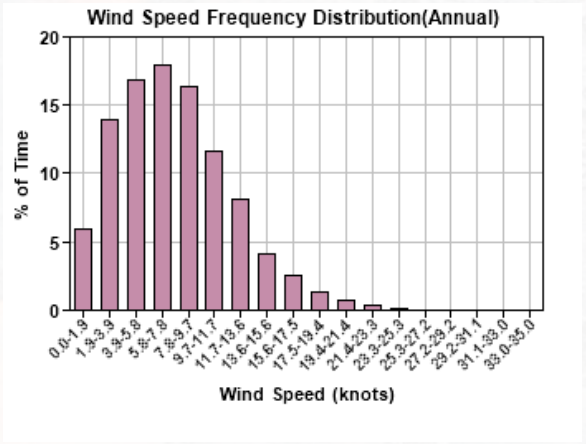
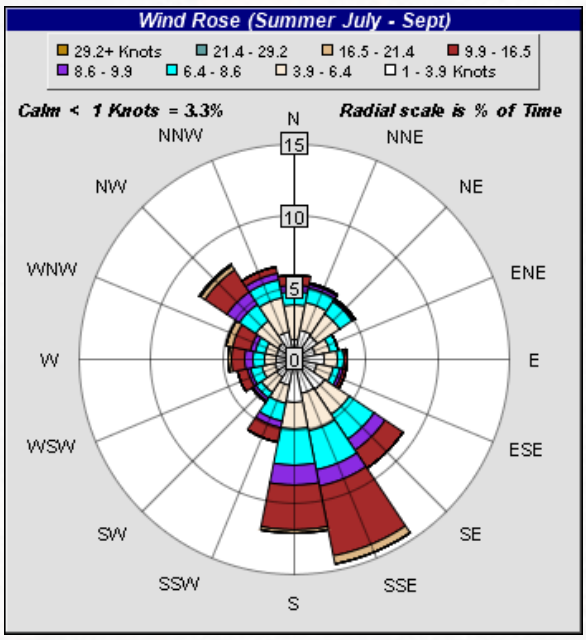
SSW
SW
WSW
W
WNW
NW
NNW
12
10
8
6
4
2
0


Wind Speed Frequency Distribution(Annual)
% of Time
20
15
10
5
0
0.0-1.9
1.9-3.9
3.9-5.8
5.8-7.8
7.8-9.7
9.7-11.7
11.7-13.6
13.6-15.6
15.6-17.5
17.5-19.4
19.4-21.4
21.4-23.3
23.3-25.3
25.3-27.2
27.2-29.2
29.2-31.1
31.1-33.0
33.0-35.0
Wind Speed (knots)


Wind Rose (Summer July - Sept)
29.2+ Knots
21.4 - 29.2
16.5 - 21.4
9.9 - 16.5
8.6 - 9.9
6.4 - 8.6
3.9 - 6.4
1 - 3.9 Knots
Calm < 1 Knots = 3.3%
Radial scale is % of Time
N
NNE
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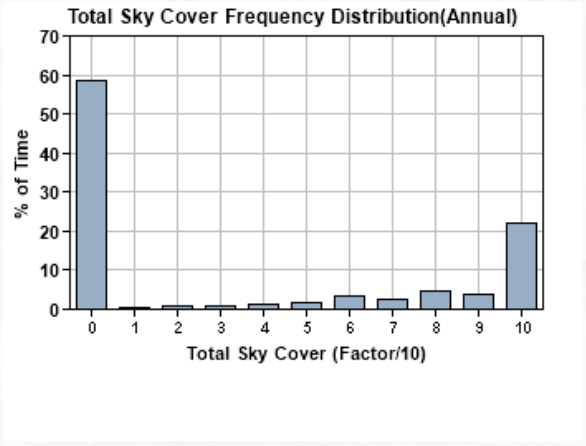

Total Sky Cover Frequency Distribution(Annual)
% of Time
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
Total Sky Cover (Factor/10)

Slope

The site has very minimal change of slope throughout it. There is a slight incline to the South on the site, and a small low spot to the east that water will occasionally collect. There is a cut into the site for the loading dock of the new flour mill. This cut continues from the new building to the South road on the site.

Previous Studio Experience

Second Year

Fall, 2012 **Stephan Wischer**

Tea House, **Moorhead, MN**; *Boat House,* **Minneapolis, MN**

Spring, 2013 **Philip Stahl**, AIA

Dance Studio, **Moorhead, MN**; *Metaphor Chair; Modular Dwelling*

Third Year

Fall, 2013 **Milton Yergens**, AIA

Celebration to Boats, **Northwest Angle, MN**; *Literary Center,* ***Portland, ME***

Spring, 2014 **David Crutchfield**, AIA

Lowrise Office Building, **Fargo, ND**; *Community Center,* **Chicago, IL**

Fourth Year

Fall, 2014 **Don Faulkner**, AIA

High Rise, **San Francisco, CA**

Spring, 2015 **Dr. Paul Gleye**

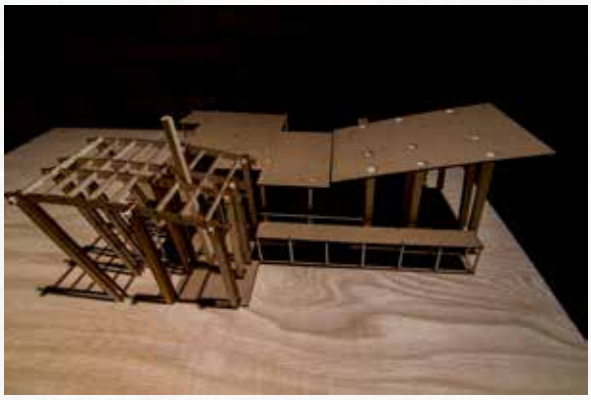
Semester Abroad; **Brussels, Belgium**

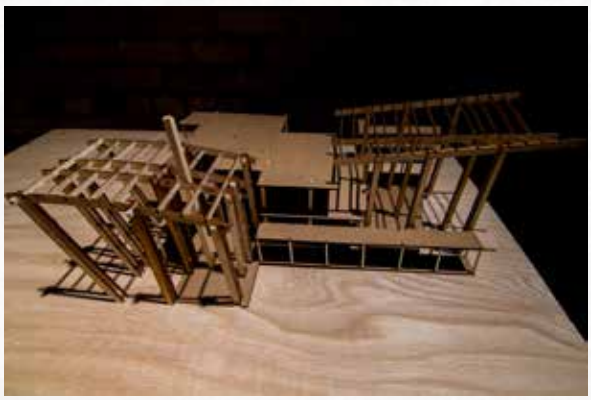
Fifth Year

Fall, 2015 **Dr. Ganapathy Mahalingam**

Graduate Research Studio

Design Solution





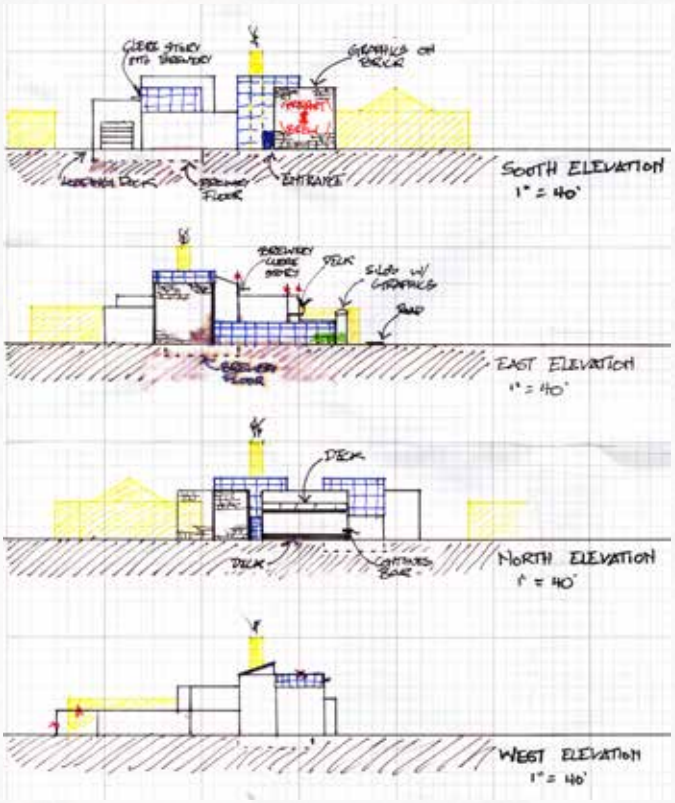

SOUTH ELEVATION
1" = 40'
EAST ELEVATION
1" = 40'
NORTH ELEVATION
1" = 40'
WEST ELEVATION
1" = 40'

Figure 15

Process

The importance of section and elevation changes was important from the beginning of the design processes. The first sketches were of the various elevations of the building with a focus on materials.

Various structure models were built to be able to examine the spaces closer and work through different iterations of the unique roof structures. Through model building the tectonics of the structure was also able to be looked at and designed throughout the process.

Site Plan

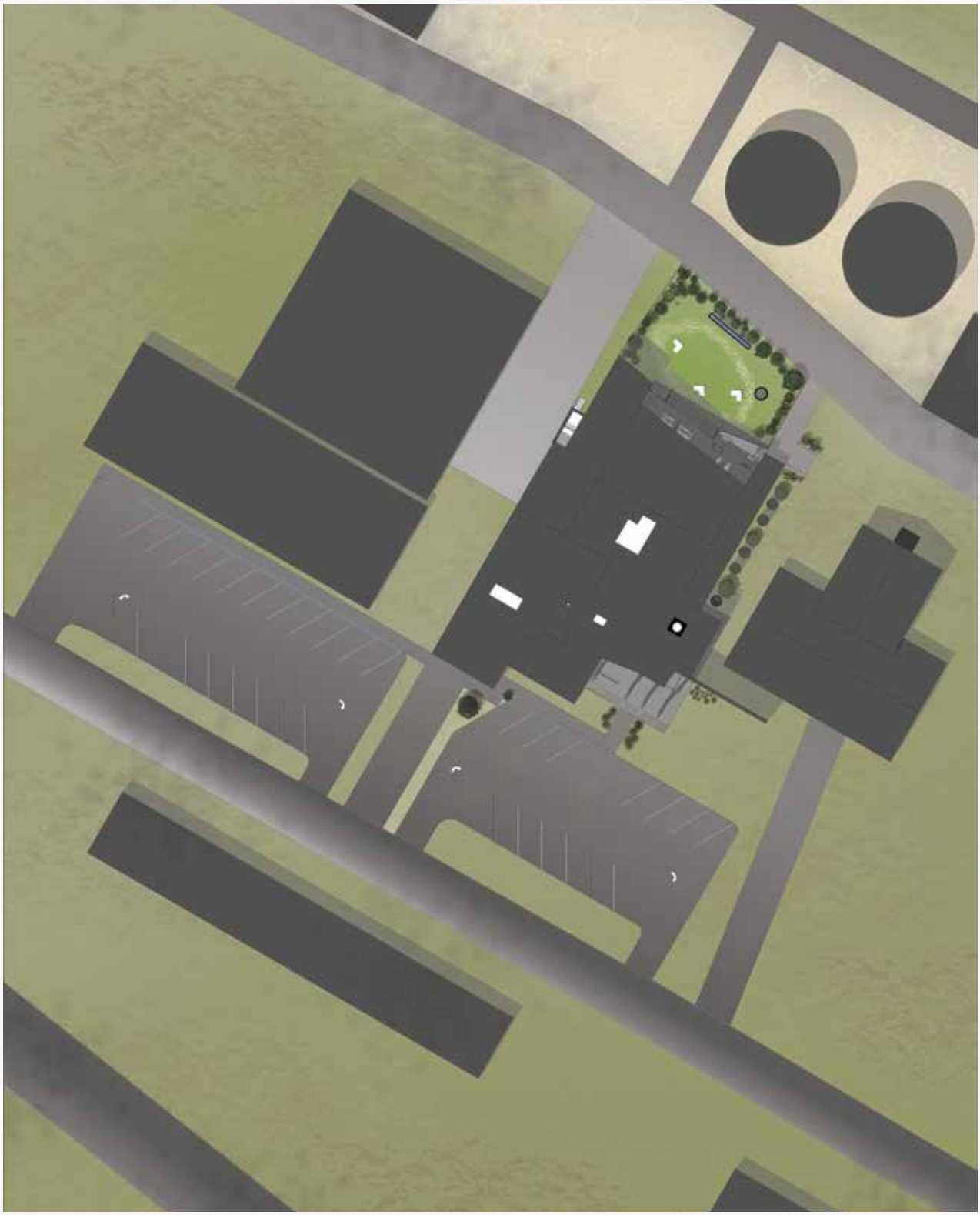


Figure 16

Building Program

Beer Hall	2,300 sf
Brewery	2,100 sf
Entrance Atrium	1,000 sf
Event Space	900 sf
Kitchen	875 sf
Museum	225 sf
Office	750 sf
Restaurant	700 sf
Store	250 sf
Toilets	700 sf
Total	10,000 sf

First Floor

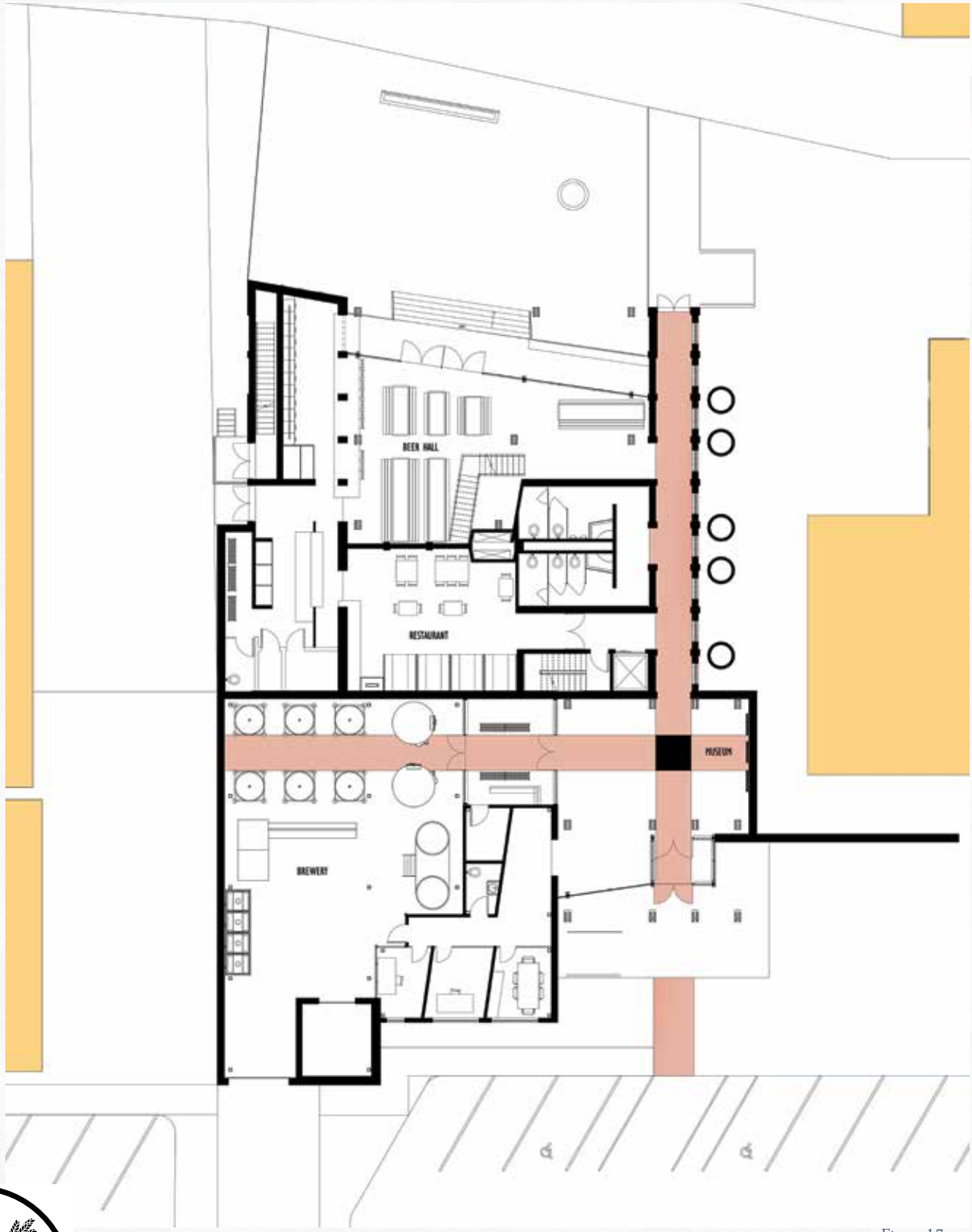


Figure 17

Second Floor

Figure 18

Old Mill Location

Overlaying the old mills location compared to the new helps to show the design decisions made. Specifically the location of the museum space and the extension of the brick wall to match the old mills exterior walls.

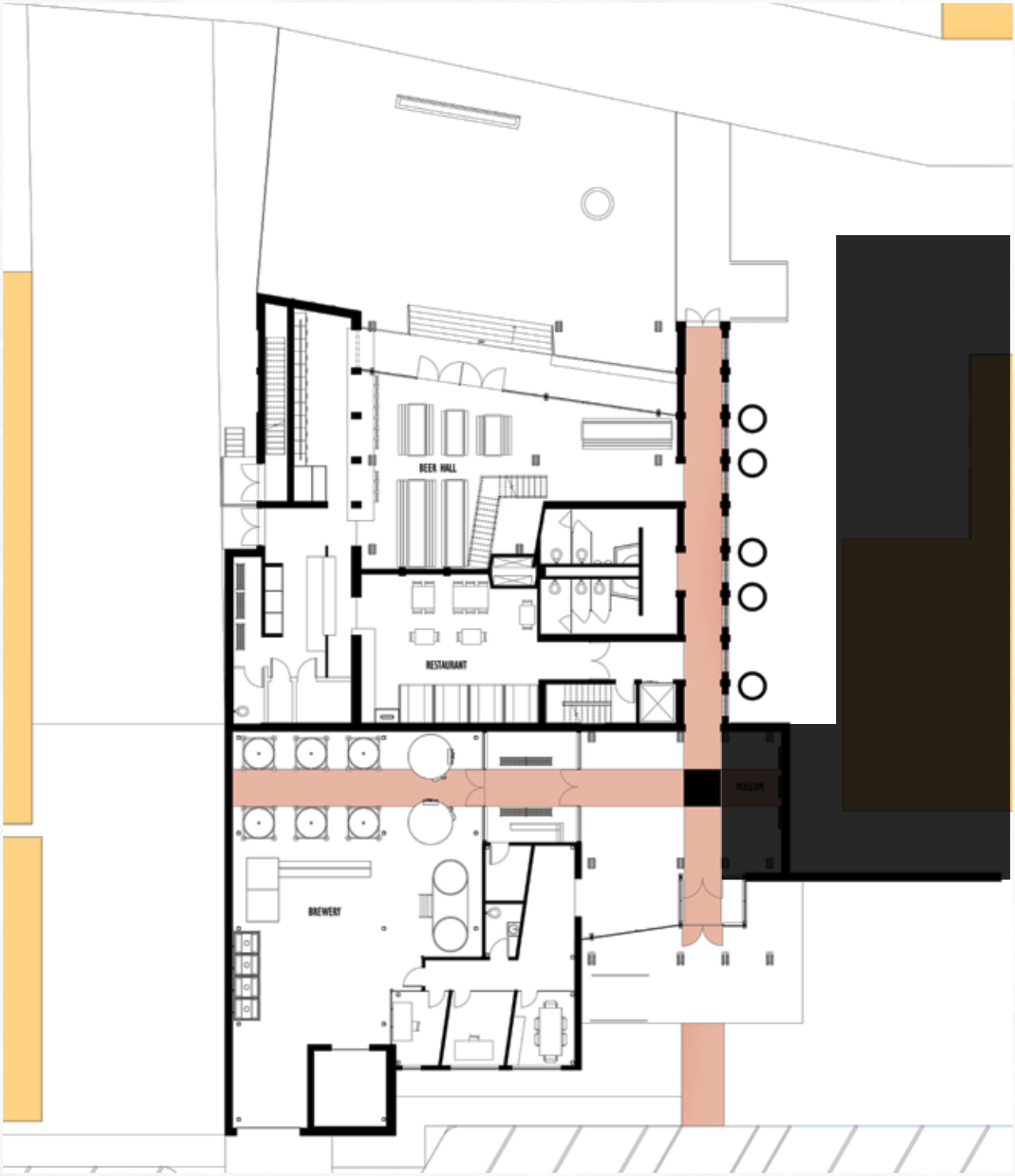


Figure 19

Construction Detail

One of the most unique and complex details of the building is the timbrel vaulted corridor. Designed to give the feel of the caves along the Mississippi that beer was once kept cool in, this drawings shows the various layers of the roof along with the cavity brick wall that separated the corridor and the beer hall.

Figure 20

Figure 21

Figure 22

Main Entrance

This is primary entrance for people who drives to the site, with the large smoke stack in the center of this atrium it creates a space that is constantly dwarfed by the stack. A small section of the stack is taken out in order to convert it into a fireplace, giving it a purpose once again rather than being a static object in the atrium.

Museum

Looking at the main entrance from a different angle this view shows a glimpse of the small museum space along the back wall for displaying information and history of the Swany White Flour Mill. The articulated floor material seen in this view is another tie back to the buildings axis like layout, and homage to the importance of rail travel and expansion to both brewing and milling.

Figure 23

Figure 24

Vaulted Corridor

Designed to feel like the caves that Minnesota beer was once brewed in, this corridor is the main circulation space through the building. The axis that intersects at the smoke stack can also be seen as the secondary circulation space extends through to the brewing equipment.

Brewery Tour

An important aspect for a brewery is its tour as a way to attract new customers. This shows an example of a tour being led through the brewery. This view also shows the layout of the brewing equipment and the clerestory glass that allows for natural daylight into the brewery space.

Figure 25

Figure 26

Beer Hall

The most used space of the building, the beer hall has various different types of seating and tables throughout. This shows the connection from the beer hall to the outdoor bar and backyard space.

Backyard

The backyard provides a space that can be used year round when the weather is nice. With a fountain, fire pit and movable furniture it provides for a versatile set of uses. Another Freeport Brewing sign is displayed on the North side of the building as a way to draw people from the Lake Wobegon trail just to the North.


Freeport Brewing Co.
SMOKESTACK
IMPERIAL STOUT
Freeport Brewing Co.
SWANY WHIT
WHITE IPA
Freeport Brewing Co.
WHEAT FIELDS
HEFEWEIZEN
Freeport Brewing Co.
HOP HULLED
INDIA PALE ALE
Freeport Brewing Co.
HOMELANDER
GERMAN LAGER


Freeport Brewing Co.

Figure 27

More than just Architecture

In order to truly integrate this building into the community the branding was also very important. It had to be something that the town of Freeport would be proud of and support. It also had to invoke an interest into the building and history behind the brewery for people who are not from Freeport. By designing the logo centered on the smoke stack and a variety of different beer names that pay homage to the history of milling and Freeport.

Dedicated to Mr. Terauds, who introduced me to architecture early on. You taught me how important and rewarding good architecture is; above all you taught me how much fun architecture can be. Thanks T!

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"Good people drink good beer"

-Hunter S. Thompson