

# contrasting history

design thesis  
jared jensen





embracing the past:

adaptive reuse

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

By

Jared M Jensen

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

	
Primary Thesis Advisor	Date
	
Thesis Committee Chair	Date



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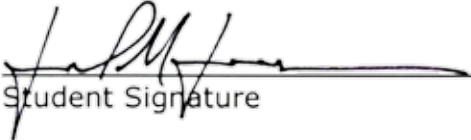
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**statement of**

**intent**



This graduate thesis examines the inherent meaning in a constructed building and using that to find a new purpose for that building that embraces its style, age, and purpose. Through this connection with history, the thesis project will attempt to show that adaptive reuse can be used as a tool for revitalizing a community that has been broken down by population decline and blighted buildings. As humans continue to struggle more and more with managing the use of earth's resources, adaptive reuse will become an extremely important and cost effective method to reducing the amount of material used in building construction.

KEYWORDS: adaptive reuse, repurposing, preservation, residential, retail, mixed-use, sustainability, community, revitalization, urban renewal



How can the adaptive reuse of buildings be done in a way that embraces history in order to revitalize a community?

### typology

The project will be a multipurpose community center including a theater, meeting rooms, studio space, classrooms, retail, and gallery space to be located in Superior, Wisconsin.

### claim

Adaptive reuse projects can revitalize and enliven community by embracing the history of not only the building which it redefines, but also of the area in which it exists.

### premises

Adaptive reuse is an excellent way to conserve materials and extract less raw materials from the earth. As our current culture of consumerism continues to strain the earth's resources, adaptive reuse will be important in bringing us back into balance.

Context is an important aspect of architectural design. An excellent architectural design must understand and interact with its context; in the case of adaptive reuse this includes the original structure.

Adaptive reuse projects completed in a such a manner are excellent educational resources. A building that expresses the culmination of its old

**statement of intent**

and new elements becomes a place of learning about the importance of reuse and recycling, as well as about the history of a building and a community.

### unifying idea

Adaptive reuse is a method of sustainable building through which one can learn about architecture and sustainability in harmony with the history of our cities.

### project justification

By using adaptive reuse in a way that embraces history we can create an architecture that can revitalize a community.





**the**  
**proposal**



We live in an age of consumerism. The rate at which we extract natural resources from the environment to use for building, manufacturing, and transportation is ever increasing and staggering. Eventually, we, as humans, need to realize that we need to come back into balance with our environment by using less and replacing what we use. The adaptive reuse of architecture is an extremely important way that we can reduce the amount of materials used in building.

Reusing the quality buildings that surround us by adapting them to our ever-changing needs must be done in a way that not only changes and prolongs our future but also teaches us about history. To take and reuse a building, one must consider and understand the building fully and draw inspiration from these understandings in the reuse.

It is important to me that a project of this type be done in a way that creates an example for the future. For this reason I have chosen a theater/community center as the typology; a place where people will come together to celebrate community. I have chosen Superior, Wisconsin as a site for this project because it contains many abandoned industrial buildings that are highly suitable for adaptive reuse and because it is a community in need of a space such as this—a building that can **revitalize** the community.

The project is for the community of the Duluth, MN and Superior, WI. The land and project will be owned and executed by a coalition of the cities of Duluth and Superior and operated and maintained by a non-profit organization set up solely for the that purpose.

Users of the theater/community center will be a diverse collection of actors, artists, performers, schools, teachers, students, corporations, but will exist mainly for the use of the community. These users will need and expect ADA accessibility and a parking layout that is quick and easily accessible.

The venue will be used to host plays, musicals, concerts, small conventions, art classes, exhibitions, and lectures.

Peak usage will occur during shows or concerts and will require parking accommodations for roughly 1000 guests.

### auditorium

The main focus in the program will be an auditorium with seating for roughly 600 patrons. The auditorium will require special design considerations in areas such as: accoustics, HVAC, lighting, and sound. Additional support spaces such as dressing rooms, sound/light room, storage, and staging areas will also be required.

### gallery

Gallery/exhibition space for artists' works will be provided, possibly in conjunction with lobby space or a shop.

### class rooms/meeting rooms

Versatile spaces to be used for meetings and conferences as well as for art classes.

### studio space

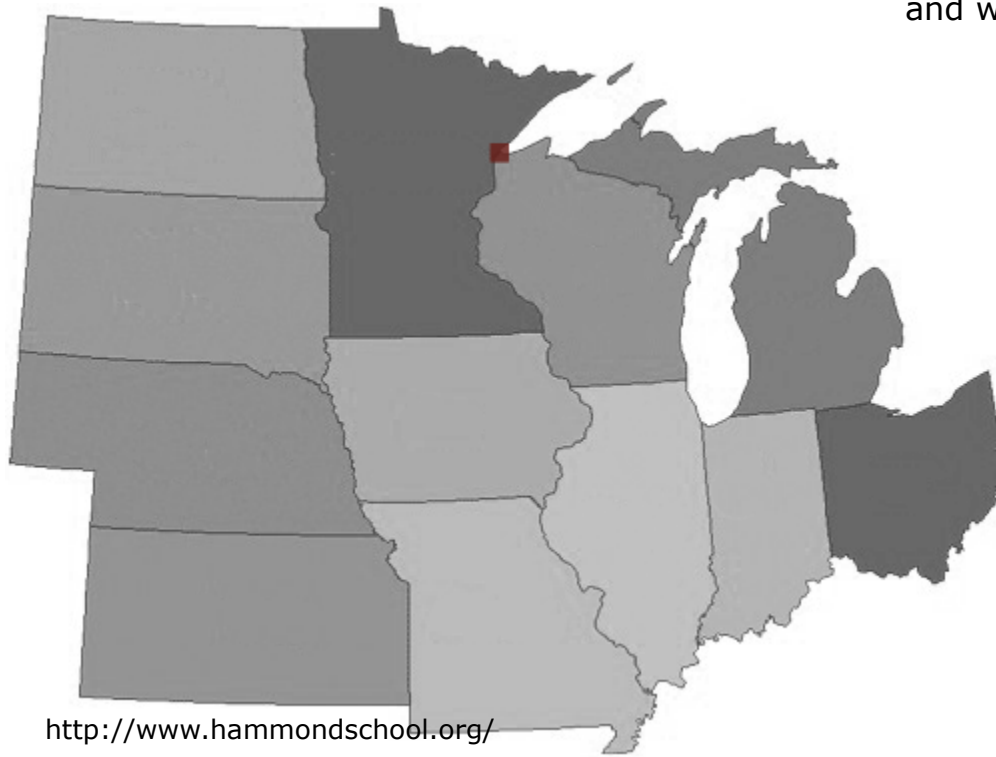
Studio spaces will be used and rented out by local artists who participate in the teaching and taking of classes as well as the exhibition of their works.

### entry/lobby

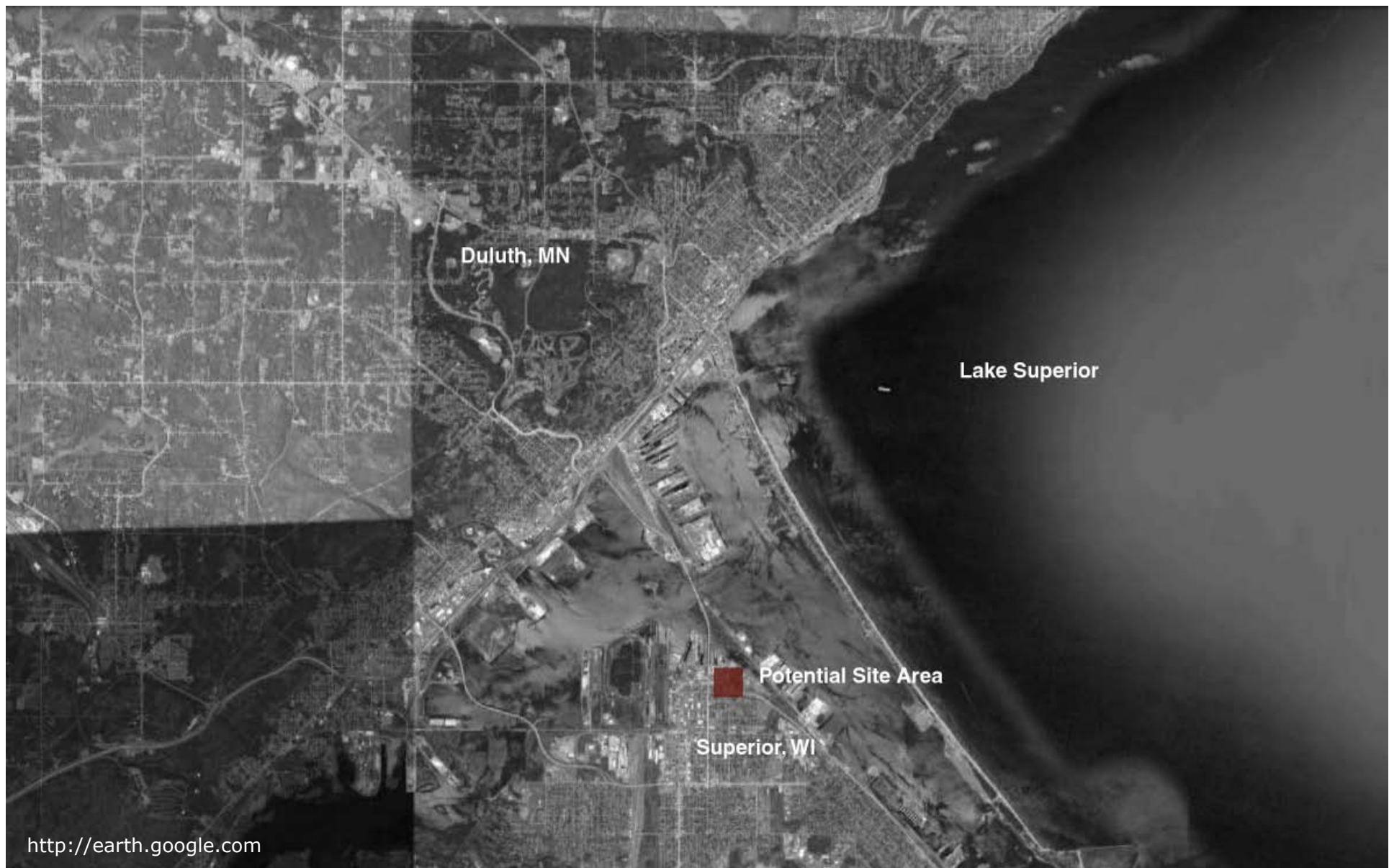
A prominent entry atrium will be an extremely important part of a successful design. The entry will be a space that fosters community and interaction before, during, and after events.

## major project elements

The upper midwest is home to the Great Lakes and the Mississippi River Valley. The northern part of this region experiences cold, dry winters and warm, humid summers.



<http://www.hammondschool.org/>



The proposed site is located in the Duluth, MN metro area and in the city of Superior, WI. The area is an important transportation hub and has been since its establishment, as it is the furthest inland

port city connected to the Atlantic ocean. This has created many buildings suitable for adaptive reuse (warehouses and industrial buildings built around 1900).

site: [duluth/superior](http://duluth/superior)

The site chosen for my design thesis is at 1521 Tower Avenue in downtown Superior. 1521 was chosen for many reasons: its proximity to civic functions such as the public library and city hall as well as downtown activities such as shops and social venues, the age of the building (finished in 1891) the square footage is within a desirable range, and because the building is in fairly good condition.





This thesis will focus on the way the intricacies of the design process on an adaptive reuse project. These intricacies develop from research, observations, and knowledge associated with the style, age, and purpose of the original structure. The project will attempt to find a way to use this information during the design process and to help come up with a complete and comprehensive design solution.

The thesis will also look at adaptive reuse as an important sustainable method and the revitalization of a community.

### research direction

Research will be conducted in many different areas. A thorough understanding of adaptive reuse will be necessary. This will also include an investigation into the chosen site/existing building. Research will also be conducted in both the theater and community center typologies, including gathering spaces and acoustics.

### design methodology

The design methodology that I have chosen for this project is a mixed method model. I will be compiling and analyzing both quantitative and qualitative data. Research direction will be motivated by the unifying idea, the premises, the project typology, and the project emphases. This research will be conducted through a multitude of sources, including: interviews, observation, analysis, journal articles, case studies, etc.

### documentation of design

The design process will be closely monitored and documented as it is imperative to the results of this thesis. All parts of the process, sketches, models, drawings, charts, writings, photographs will be appropriately recorded and organized digitally. The thesis book will exhibit these documents as proof of the design process followed.

### second year

Fall 2007 - Mike Christenson  
A House for Tea  
Minneapolis Rowing Club  
Compact Office

Spring 2008 - Stephen Wischer  
Interactive Theatre  
Music House

### third year

Fall 2008 - Cindy Urness  
North Dakota Center for Excellence  
Moorhead Public Library

Spring 2009 - Ron Ramsay  
Shaker Barn Auditorium  
Chicago Condominiums

### fourth year

Fall 2009 - Darryl Booker  
San Francisco High Rise  
KKE Musical Instrument Design

Spring 2010 - Booker, Kratke, Gleye  
Santo Domingo Community Planning &  
Housing Design  
School for Kigoma, Tanzania

### fifth year

Fall 2010 - Mark Barnhouse  
Water Resource Experiment Station

## previous studio experience



**the**

**program**

## introduction

This thesis will investigate the use of adaptive reuse in order to revitalize a community by embracing its history. The city of Superior was a once thriving area that has experienced population decline and as a result has become a community in need of rejuvenation. The project will attempt to show that a historical building adapted into a community space can revitalize a community in distress.

Research was conducted in several areas to support the theoretical premises and the unifying idea, which is rooted in the idea that the adaptive reuse of historic buildings, done in a way that embraces and respects the buildings history, can revitalize a community in despair. They are: the role of history in adaptive reuse, understanding the connection between blight and population decline, adaptive reuse and sustainability, and the revitalization of a community through adaptive reuse.

## history

There are several important factors in successfully completing an adaptive reuse project to revitalize a community. First, the project must be rooted in history. "But while good modern buildings can be designed and built today, no community can

create an historic architectural legacy” (Ziegler, 1971). History is the reason that adaptive reuse can work better than demolishing and starting over. This legacy that is inherent in historical buildings speaks of a different time; one when growth and expansion of the city was rapid and people lived and worked in a different way than we do today. The reuse of historic buildings then allows us to access and begin to understand how our predecessors lived. It is important to save these buildings, but to do so in a way that creates a meaningful new use for the building so that it will be well kept and respected and used by the community.

The increasing popularity of adaptive reuse can be largely attributed to people wanting to maintain a piece of history. People find cultural and historical value in a building rather than just looking to its economic value. “People want a story to go with their building, and whether the story relates to chickens, mill workers or parishioners, adaptive reuse connects people with the state’s history” (Cohen, 2010). This connection to history is what makes adaptive reuse appeal to the majority of citizens and thus what makes adaptive reuse successful.

Adaptive reuse is an excellent method of revitalizing a city because it garners pride within the community. This sense of pride in community that can be obtained through reuse is rooted in history. It is because a place has a rich history that people will care about it. This is why adaptive reuse must be done in a way which embraces history. It would be foolish to tell someone that their house is so deteriorated that they must vacate it and see it demolished. But if instead you take the approach that the neighborhood has great architectural and cultural value to the city and we must find a way to upgrade it, then the reception will be much better (Ziegler, 1971). People have a relationship with the buildings and community around them that is tied to all of the experiences that they have with that building or within that community.

The methods in which history is obtained are extremely important. One must truly understand the building in order to assure that the new design does not destroy the character of the building. It is imperative that the architect retain the historical and cultural integrity of the building and give it a modern feel (Cohen, 2010).

### urban decay

Population decline and blight are an interconnected



problem that feed each other in a cycle that is difficult to break.

A city can experience urban decay for many reasons: de-industrialization, de-population, changing populations, economic restructuring, abandoned buildings, high unemployment, local political factors, and crime.

Deteriorated and vacant properties deter population growth and can even cause a decline in population. This results in businesses choosing to invest less in the community in the form of new stores, services, factories, and other forms of employment and sales. This hurts the local economy and shrinks the tax base, reducing the ability of the local government to take action against the problem. As a result of the suffering economy, existing businesses will close their doors leaving abandoned buildings to fall into disrepair further fueling the decay. Unemployment will rise and people will be forced to leave to find work. As population declines, houses become empty or foreclosed creating blight. Thus the problem is a cyclical one that needs a strong counter effort to stop the decay and disinvestment (Logan & Schilling, 2008).

## sustainability

The Environmental Protection Agency defines sustainability as “social and environmental practices that protect and enhance the human and natural resources needed by future generations to enjoy a quality of life equal to or greater than our own” (EPA, 2010). It is important to realize that sustainability is about much more than being green or environmentally friendly, it is about thinking and acting in such a way that the community around you can be viable for generations to come. Adaptive reuse is sustainable not just economically in the way it saves resources, but it is sustainable in the sense that it sustains history and culture. It takes a piece of the past and preserves it in a respectful way for future generations to enjoy. If we allow these buildings to go into disrepair and be demolished, there is no way to recreate them, and they will be gone forever.

The environmental benefits of adaptive reuse are many. In the United States it is estimated that more than 200,000 buildings are demolished every year and that activities related to the built environment generate 30-40 percent of all waste (Knecht, 2004). Adaptive reuse avoids this dilemma by using what is there instead of demolishing. On top of the fact that there is little or no demolition waste involved with adaptive reuse,

is the fact that the new materials required to bring the building to a usable state will be much less in comparison. Adaptive reuse takes advantage of the non-recoverable energy embodied within the existing building materials, a benefit which is hard to quantify. The amount of energy used in the construction (including processing, transporting, and erecting) of new buildings accounts for more than 5% of the energy consumed annually in the United States (Booz, Allen, & Hamilton, 1979).

### revitalization

Adaptive reuse can revitalize an historic district or city in many ways. It has numerous economic, social, physical, aesthetic contributions to make to society. Booz, Allen, & Hamilton Inc. found in their study of four US metropolitan areas that "The preservation of irreplaceable historic and architecturally important properties, the restoration of exceptional buildings, and the renovation and adaptive reuse of other noteworthy structures have, in fact, encouraged a return-to-the-city movement" (Booz, Allen, & Hamilton, 1979). This movement brings with it increased revenue from property and sales taxes for the local government, creates spaces and functions which are used at all times of the day, and adds to the general beauty of the city.

### research results

In the past several decades investment from both the public and private sector has increased substantially in historic preservation and adaptive reuse. There has been an especially large trend of adaptive reuse in the last 5 years. It is expected that by the year 2015 adaptive reuse and renovation projects will jump from 5 billion dollars to 15 billion dollars (McGraw Hill, 2010).

Cities that have made an effort to restore and renovate buildings in large sections of the city have seen many benefits. These benefits can be seen in all areas of society including, local economies, aesthetic qualities, and social benefits. A study conducted in the late 1970s concluded that “without exception, the quality of life has increased considerably in each of the four historic districts” that were studied. In Alexandria, Virginia, for instance, 98% of the buildings in an historic district consisting of 120 blocks were renovated. Retail sales in the area increased at a rate of 24% annually over a six year period. In 12 years violent crime dropped from 21.4% of total Alexandria crime to 14.5%. Property values increased by 43% over a seven year period (Booz, Allen, & Hamilton, 1979).

“Downtowns traditionally provide a focus for local

communities, giving a sense of identity to their residents” (Tyler, 2000). It is this identity which begins to revitalize a community and makes people care about the place they live. When people care they are willing to see tax dollars be put to use on further restoration of their downtown area.

### conclusion

Through the research conducted and presented here it is evident that the problem of urban decay is a relevant and pressing problem as cities throughout the United States and abroad face population decline. This decay must be addressed and our communities must be revitalized for the good and well-being of our populations. One way in which this revitalization can be brought about is through the careful restoration of historic buildings and districts. It is clear that pride in the history of a place or building can be a catalyst for building a sense of community. Without our history we have no sense of place or feeling of attachment to our cities and the built environment.

The research provides examples of communities where the restoration of historic buildings provided the area with a renewed sense of community evident in the social and economic statistics that were compiled before and after the extensive revitalization project.

### research results

I began my research for this section of the program document based upon specific points that were developed in response to the theoretical premise and unifying idea that I established at the beginning of this project (adaptive reuse of historic buildings done in a way that embraces and respects the buildings history and can revitalize a community in despair). The four main points that this led me to were the role of history in adaptive reuse, understanding the connection between blight and population decline, adaptive reuse and sustainability, and the revitalization of a community through adaptive reuse.

History will have a big impact on my thesis moving forward. Understanding the history of the Duluth-Superior area, as well as that of the building and site that I have chosen for my project, will allow me to design a community center that can become a part of the culture of Superior. The building will also allow citizens to look into the past and understand their city's rich history while simultaneously looking forward into the future of their community.

The research I conducted on urban decay and population decline will be important in understanding the tough challenges that Superior faces as a community. This understanding will

allow me to design a building for the public that is sensitive to the specific needs that this community has. Urban decay is a vicious cycle that will continue to worsen in Superior unless something is done about it. I hope that this thesis will be a starting point.

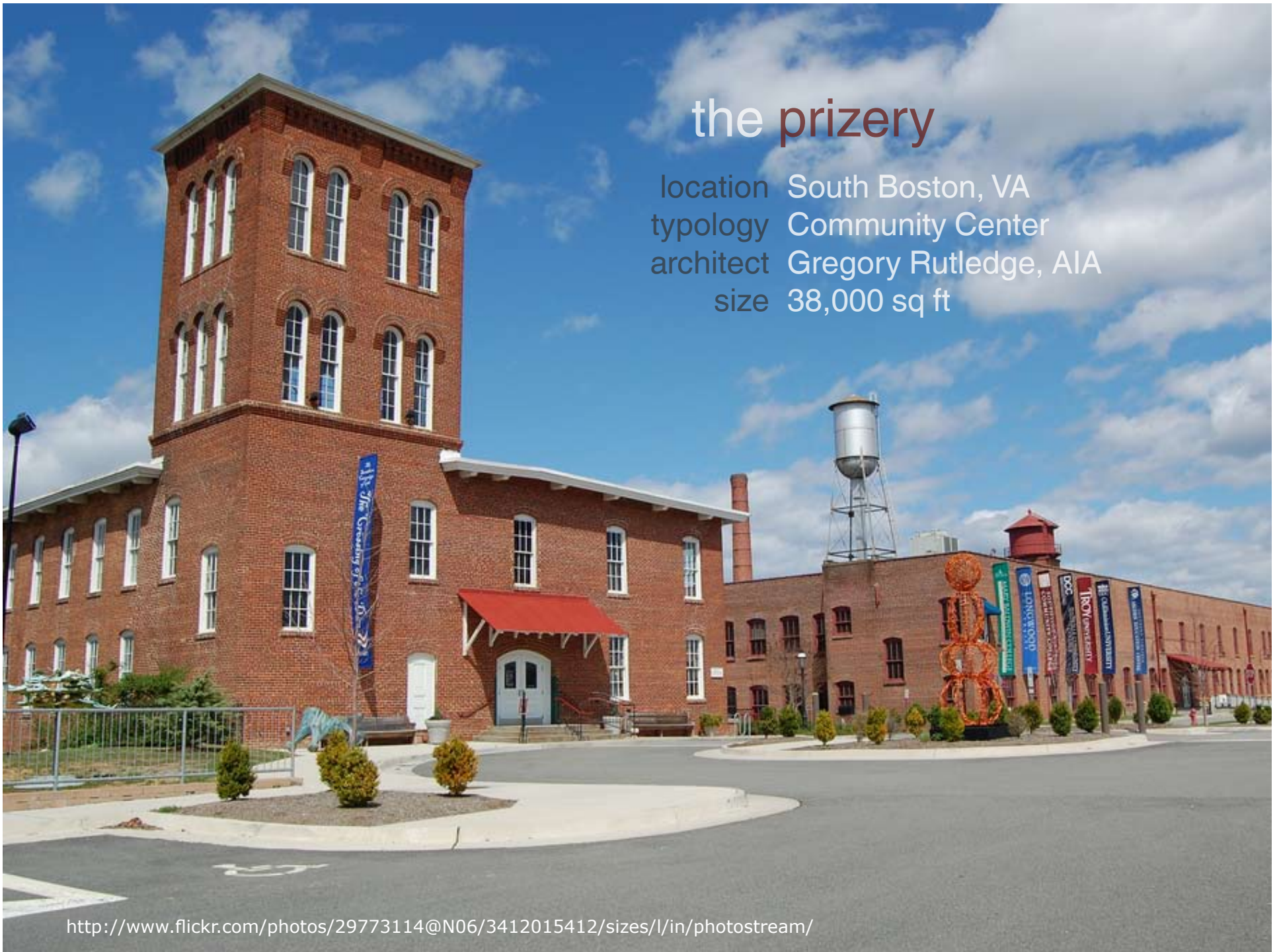
Sustainability is always an important issue in any design. Adaptive reuse is a highly sustainable building process in which the embodied energy in existing building materials can be put to a new use and kept out of a landfill as well as preventing the creation of new building materials. In my research, however, I found that the environmental aspects of sustainability are not necessarily the most important to consider. A community caught in the cycle of urban decay requires buildings that are sustainable in economic and cultural ways as well.

Finally, I found that revitalization of a community is not only possible through the rejuvenation of historic buildings and areas, but in downtown areas this is a preferred method. However, it is also important to remember that the preservation of historic buildings is important, but only in combination with the preservation of the viable functions of downtown such as commerce, entertainment, etc.



# the prizery

location South Boston, VA  
typology Community Center  
architect Gregory Rutledge, AIA  
size 38,000 sq ft



<http://www.flickr.com/photos/29773114@N06/3412015412/sizes/l/in/photostream/>



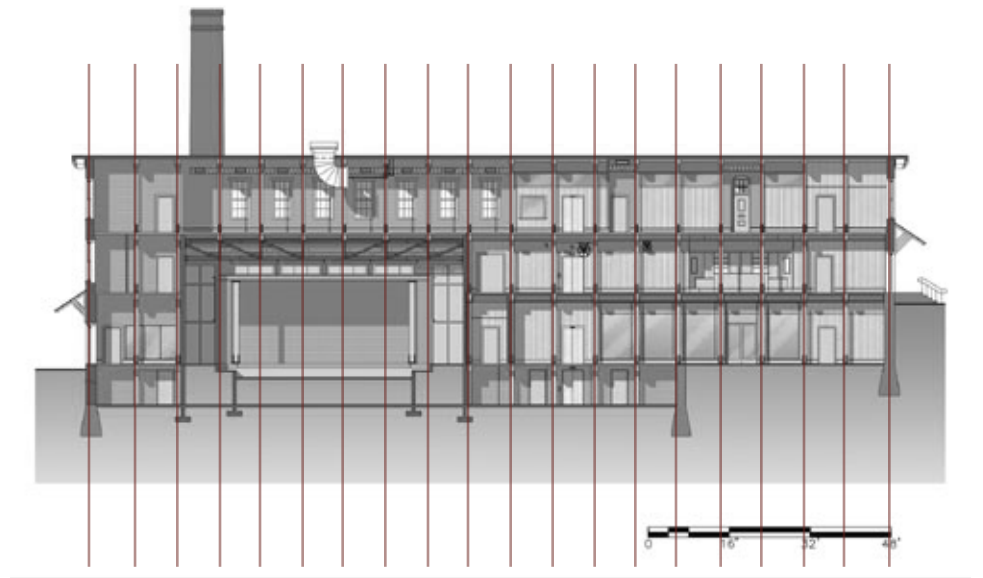
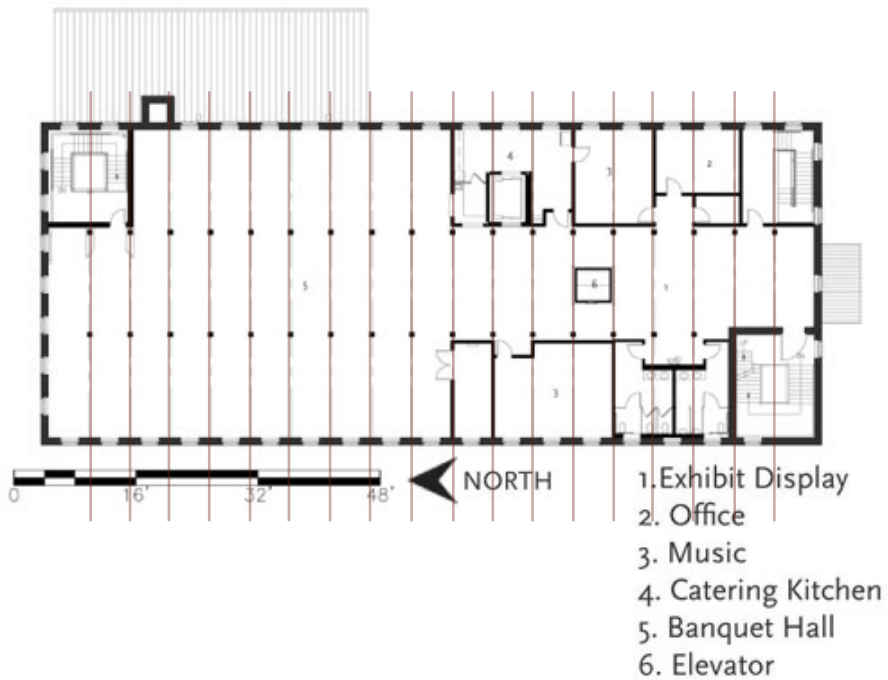
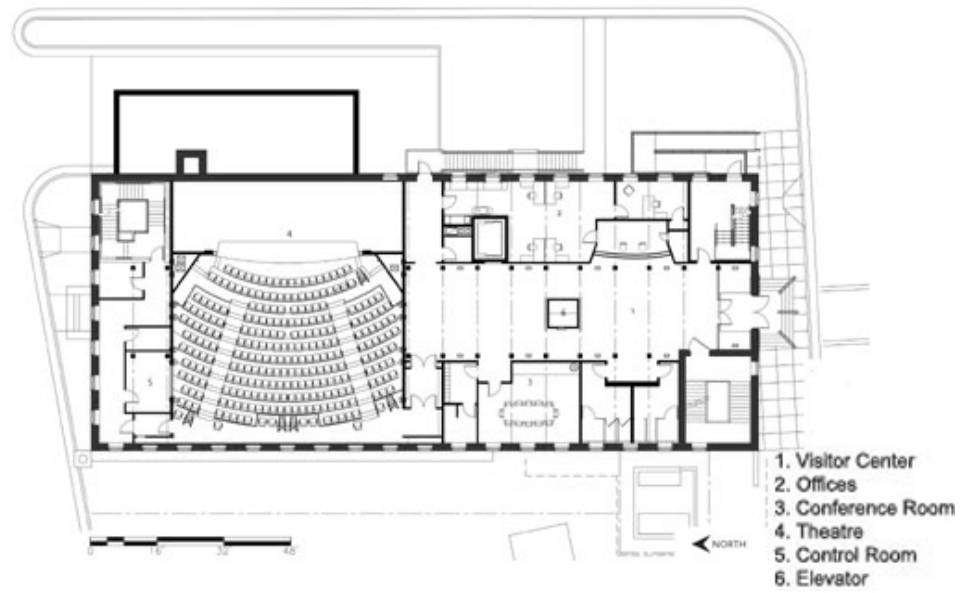
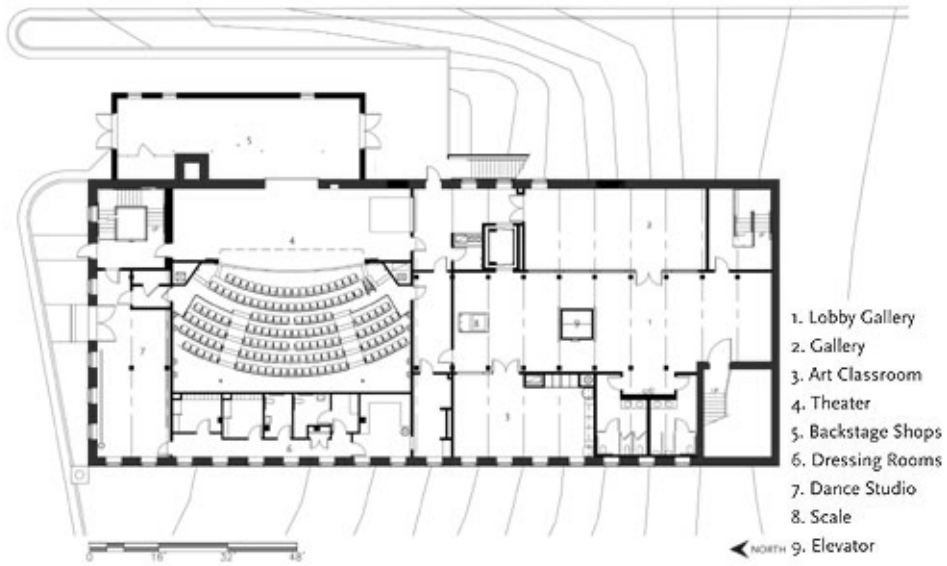
The Prizery is a community performing arts center located in South Boston, Virginia. The 38,000 square foot community center was designed by Hanbury Evans Wright Vlattas & Company with lead project design architect Gregory Rutledge, AIA.

This three story warehouse was once a vital part of the area’s tobacco industry. The name comes from the function of the building-where tobacco was bundled or “prized” before being distributed throughout the country. After World War II, the tobacco industry experienced a massive downsizing which sent the South Boston economy into a downward spiral. Warehouses closed and were left abandoned to decay, jobs disappeared and unemployment became a serious problem; as a result the community of South Boston began to suffer.

The exterior brick shell of the building as well as it’s heavy timber framing was restored to it’s original glory. Inside, however, the new partition walls and building elements were kept separate from the existing building. This allowed the structure and remaining elements to be put on display, offering a glimpse into history. Artifacts from the warehouse were also put on display.



## case study: the prizery

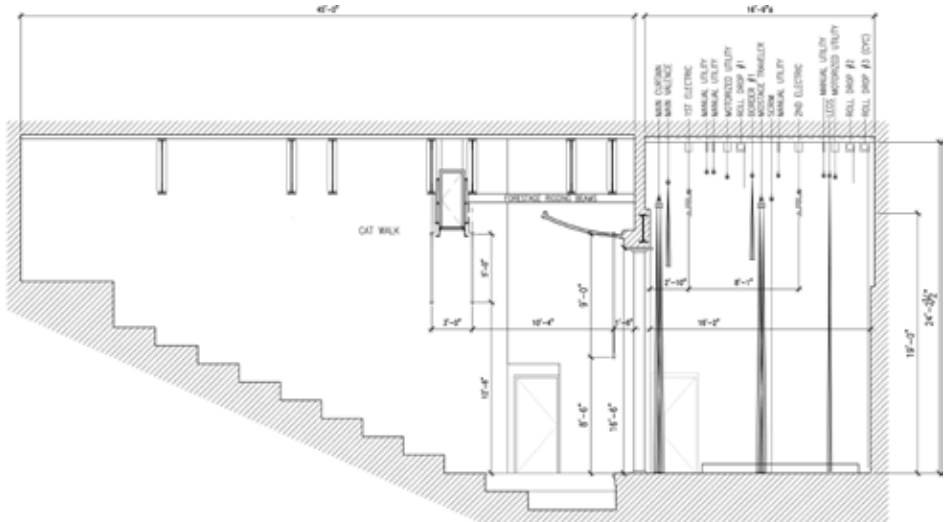
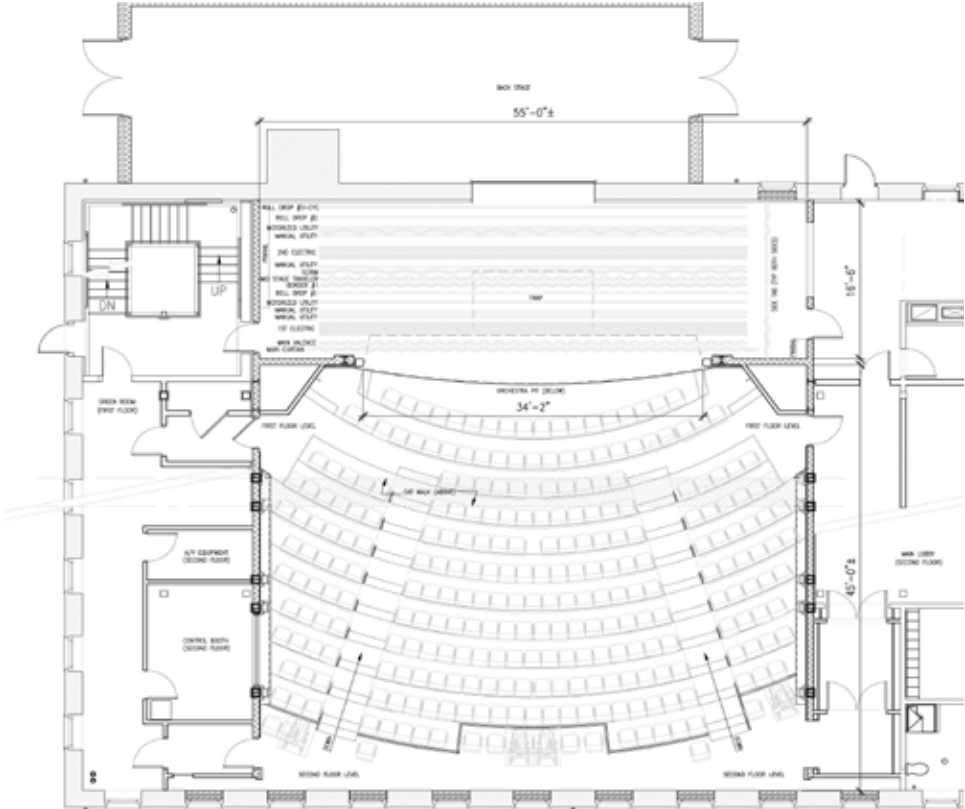


In order to accommodate the large open floor plan that the theater required, the structure in this area of the building needed to be altered. A floor plate was removed as well as the columns and beams that held it in place. The timber structure was replaced with steel in order to support the larger spans.

Aside from the auditorium the original structural grid is used to delineate spaces, create openings in the facade, section off spaces. The geometries of space are defined by this grid in both plan and section.

The section and plan of the theater will be excellent technical resources for the design of my auditorium space. The drawings will be useful in determining some of the more complex issues with auditorium spaces, including: stage and back stage design, fly space heights, seating arrangements and programming elements such as square footages and support spaces.

The functional and spatial relationships as well as the progression of spaces through the building will be noted in the design.





# the guthrie theater

location minneapolis, mn  
typology theater  
architect jean nouvel  
size 285,000 sq ft



<http://www.flickr.com/photos/dr-eric/168066077/sizes/l/in/photostream/>

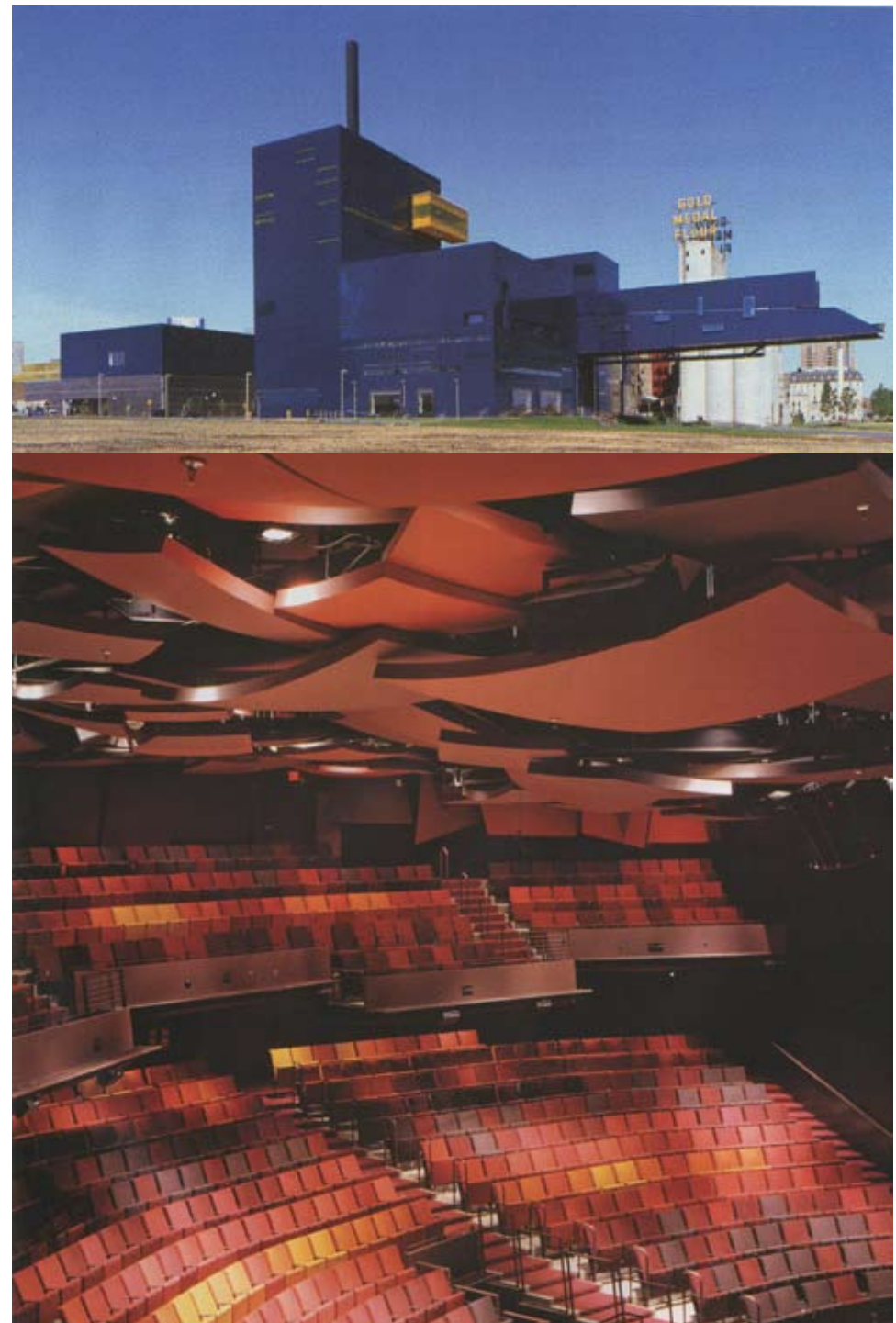
The new home for the Guthrie, a 285,000 square foot theater complex located in Minneapolis, Minnesota, was completed in June of 2006. Jean Nouvel's beautiful design mixes modern and industrial styles to become one of Minneapolis' most distinct pieces of architecture. The factory resemblance resounds wonderfully with the surrounding buildings in Minneapolis' Milling District.

Perhaps the most unique feature that is visible from the exterior is the 178 foot cantilever that ends in viewing area with sights down towards St. Anthony's Falls.

The progression through spaces is clear. A large two story atrium features ticketing, a shop, and vertical circulation. Public gathering spaces and lobbies are placed strategically throughout the building.

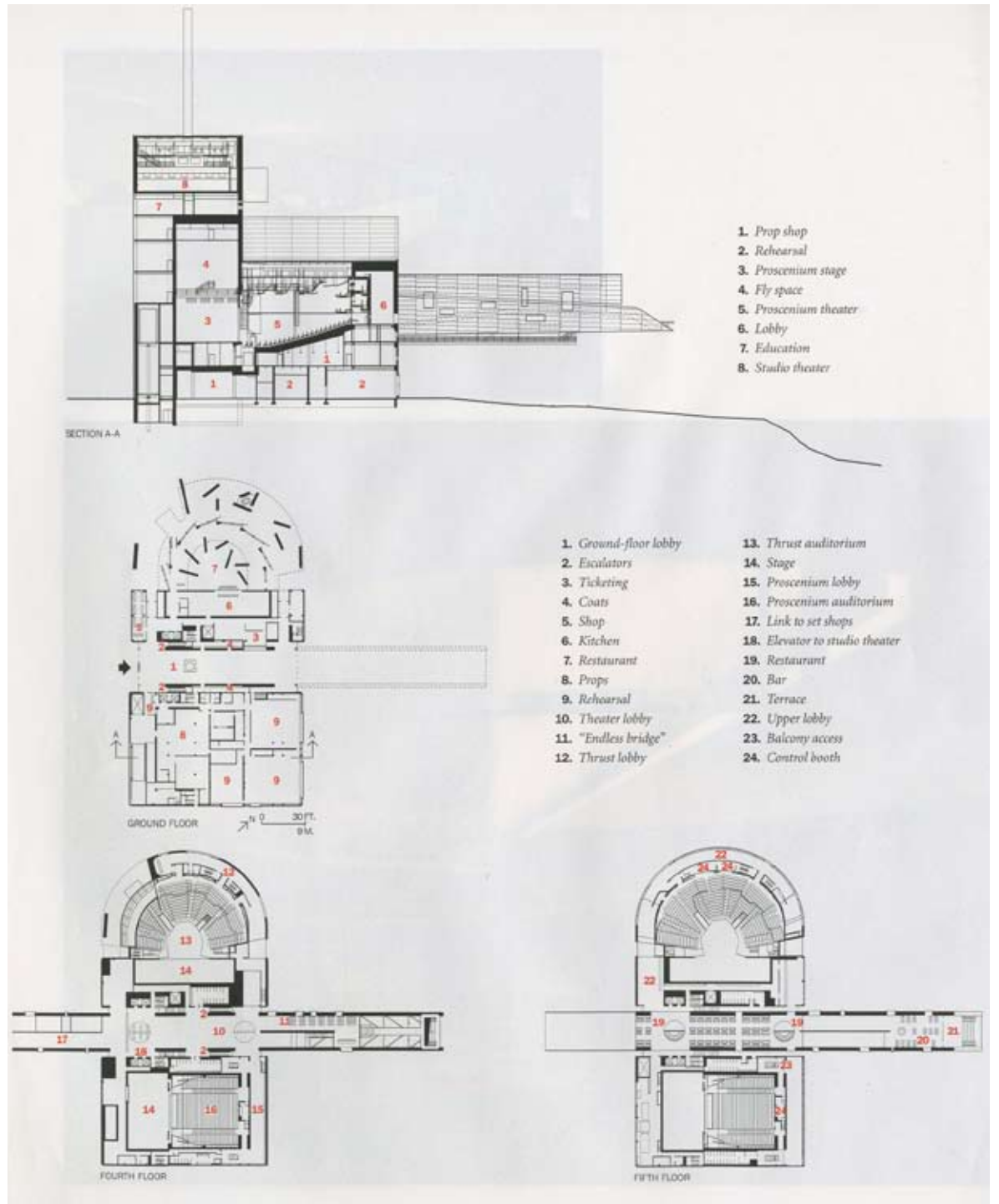
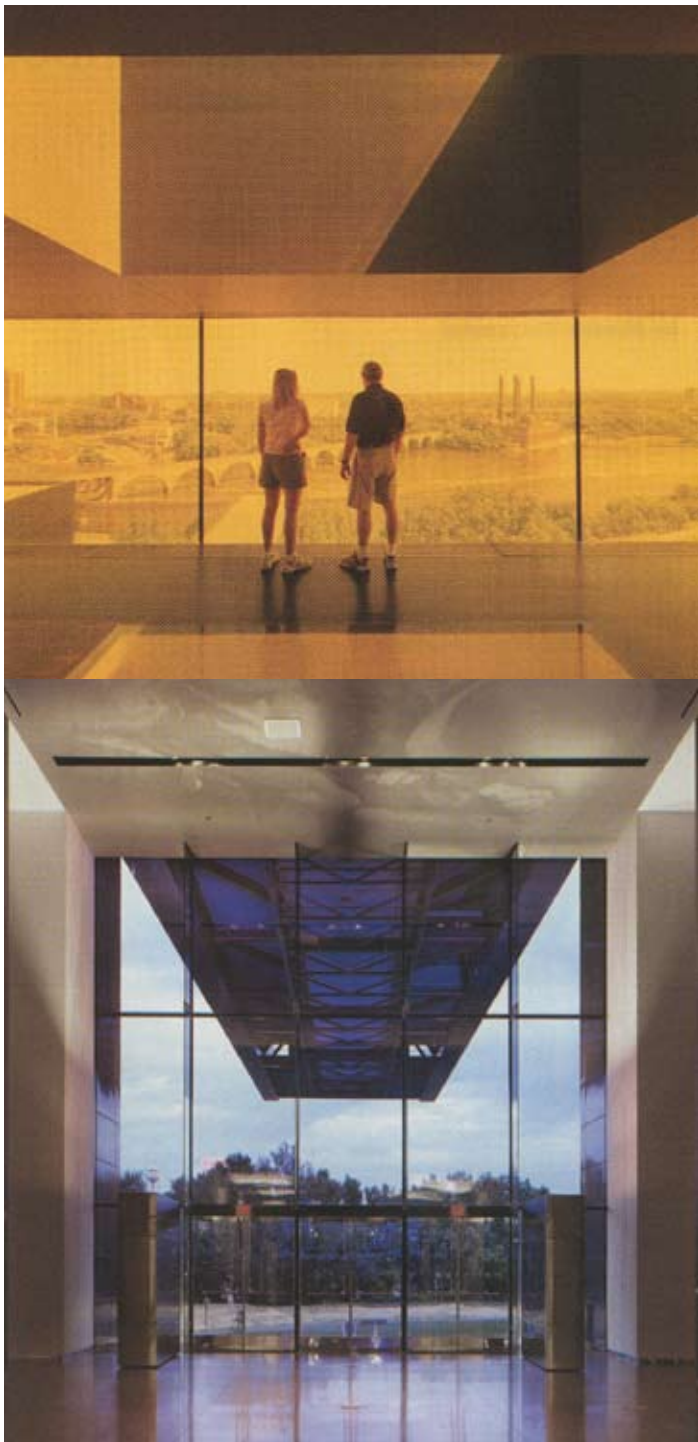
The massing of the building is additive with several different geometries coming together. This helps the building relate to the mills that are adjacent to it.

The steel structure allows long spans leaving spaces clear and open throughout the building. The clear spans allow for uniquely shaped



## case study: the guthrie theater

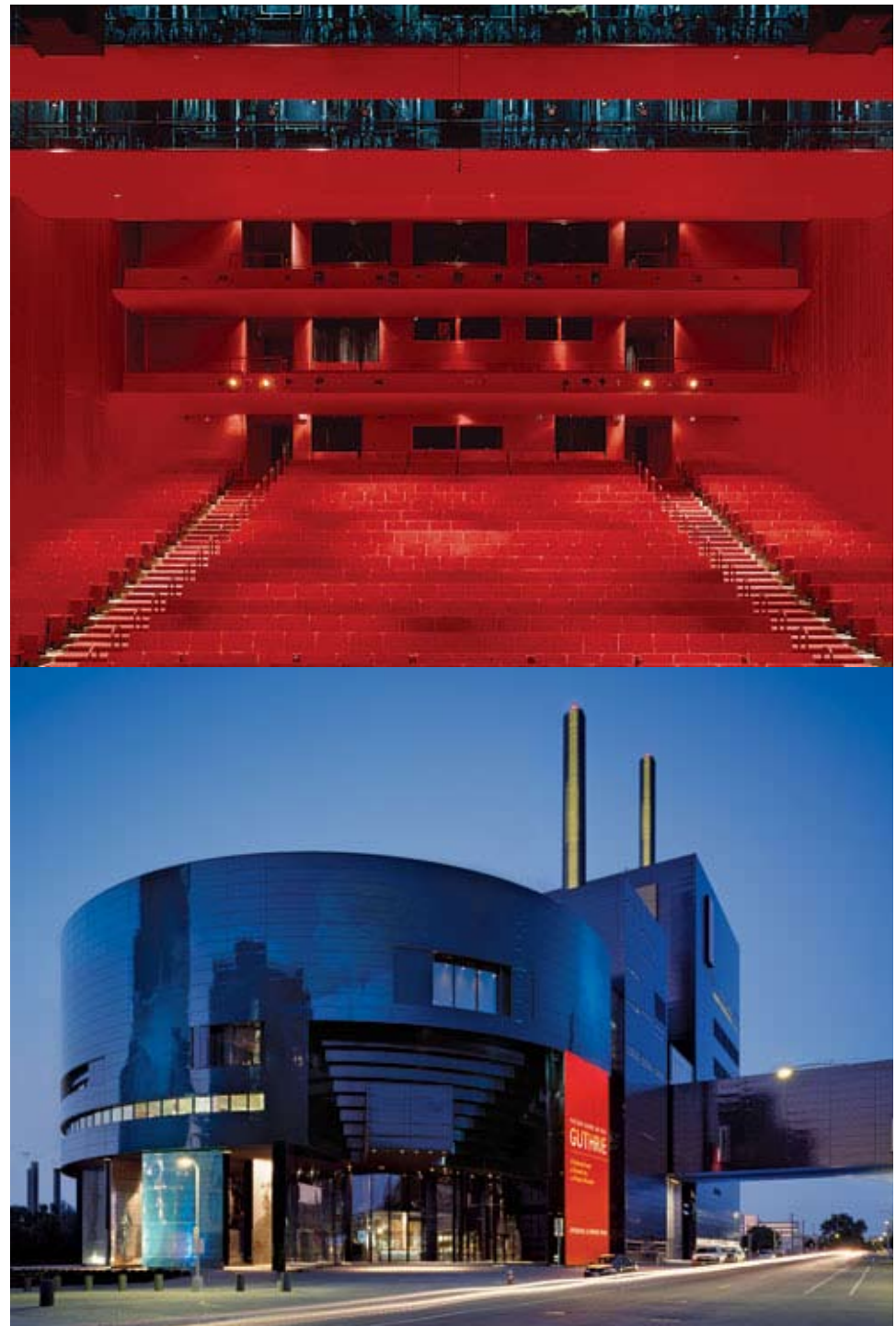




spaces that are fit specifically to their use. Each auditorium is also structurally isolated for sound insulation purposes.

The Guthrie Theater will be an important tool in understanding modern design in an historic industrial district. The design solution that Nouvel created is positioned right on the edge between being out of place and a sense of belonging. Nouvel's use of materials is inspiring. The blue aluminum sheathing that makes up the skin appears nearly seamless and fades away into the blue sky. This seamlessness is broken up only by slit windows which allow natural light to penetrate into the corridors and lobbies, while the auditoriums are located in the core of building so as not to waste daylighting chances. The studio theater features an adjoining lobby with yellow tinted glazing bathing the space a vibrant yellow light.

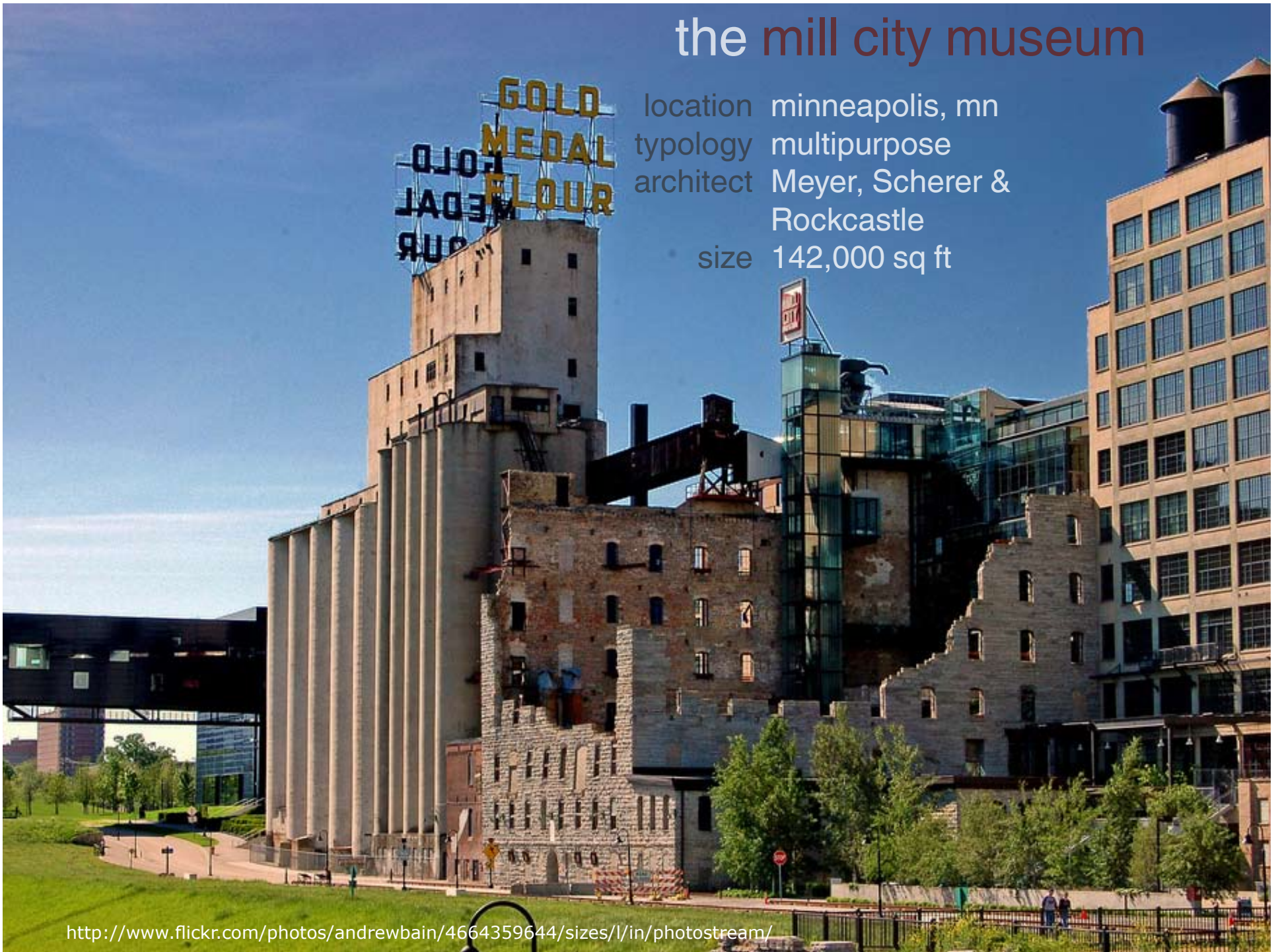
The Guthrie Theater case can help to define the way a community theater such as this can revitalize a community. It also does an excellent job of becoming a cultural icon and helping the community create a sense of place.





# the mill city museum

location minneapolis, mn  
typology multipurpose  
architect Meyer, Scherer &  
Rockcastle  
size 142,000 sq ft



<http://www.flickr.com/photos/andrewbain/4664359644/sizes/l/in/photostream/>



The Mill City Museum located in Minneapolis, Minnesota, is a unique adaptive reuse project making use of an historic ruin in the Minneapolis Milling District. The mill, called "Washburn A Mill" was built in 1878. It could grind enough flour in one day to produce more than 12 million loaves of bread.

In 1991 the mill was destroyed by fire and crumbled to the ruin it appears as today. Meyer, Scherer & Rockcastle (the project architects) convinced the Minnesota Historical Society to save the ruins and consider using the shell to enclose a new structure. The 142,000 square foot multipurpose structure features a museum including artifacts and exhibits on the history of milling and Minneapolis, as well as on the top five levels.

The principal in charge of the project, Tom Meyer, explained that they felt that "the challenge was to draw out the meaning and purpose of the building and orchestrate that, not create it."

MS&R chose to design the new infill building in a way that completely contrasts from it's historic skin. In this way it creates a distinction between the old use and the new so that the two can in no way be confused with one another.

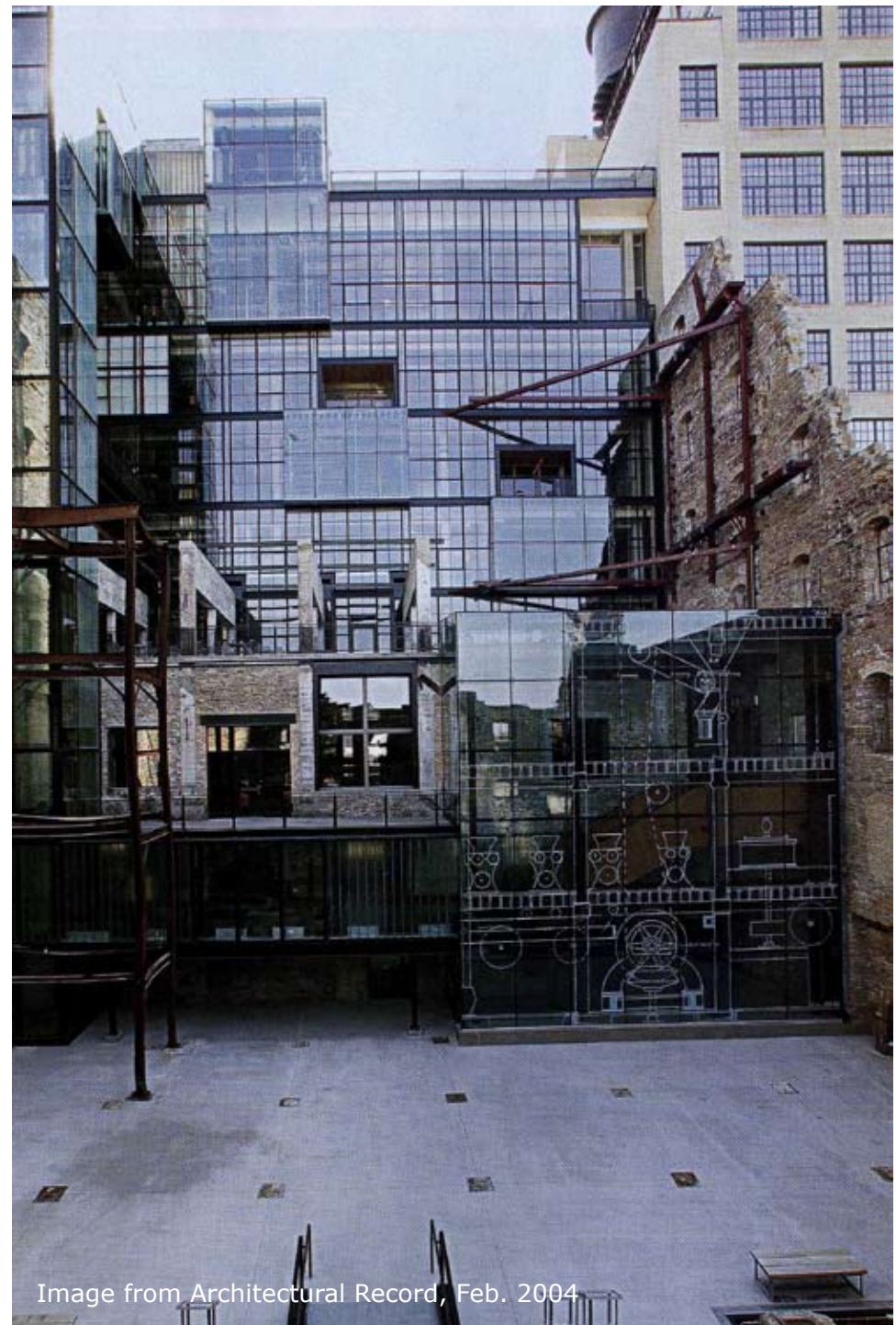


Image from Architectural Record, Feb. 2004

## case study: the mill city museum



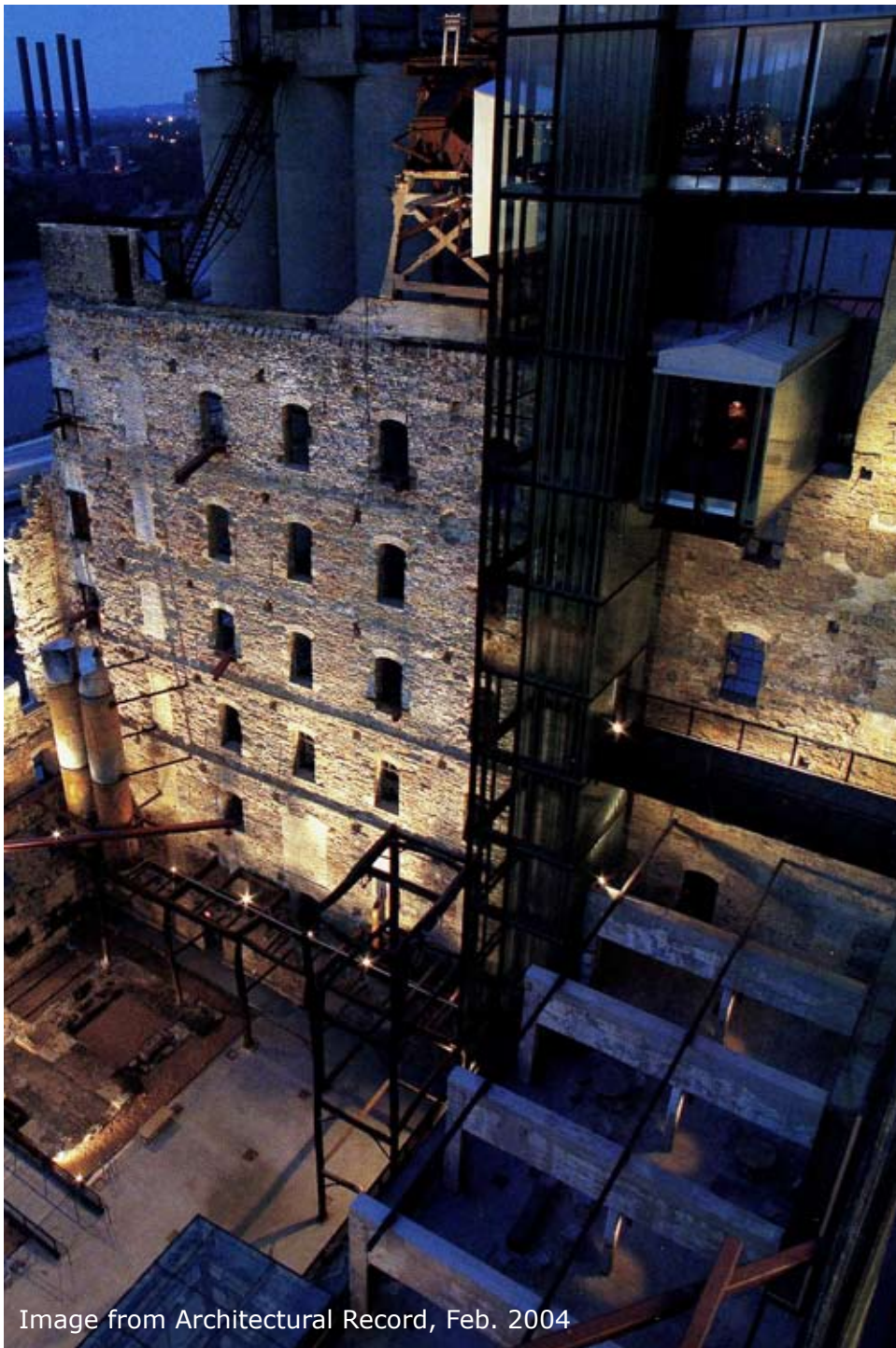


Image from Architectural Record, Feb. 2004

In plan the new infill structure relates itself to the original mill plan in the way that it follows the structural grid on an every-other basis. The original columns were spaced at 13 foot intervals and the new building's columns are spaced at 26 foot intervals.

Natural light is drawn in mainly from the north facade, which is nearly entirely made up of curtain walls.

Geometries are strictly on a square grid as established by the existing structure. Massing appears to be subtractive from the shell of the mill ruin.

The new building's floors also relate closely to that of the mill. Floor plates are spaced according to the window placement in the shell. The roof of the new structure sits at about the same height as the mill had.

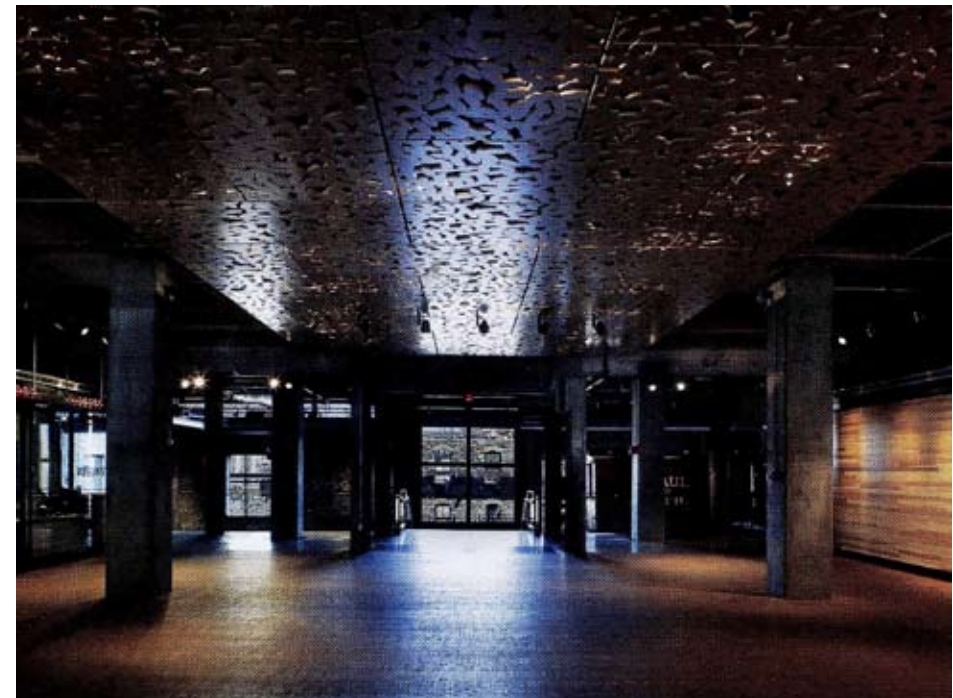
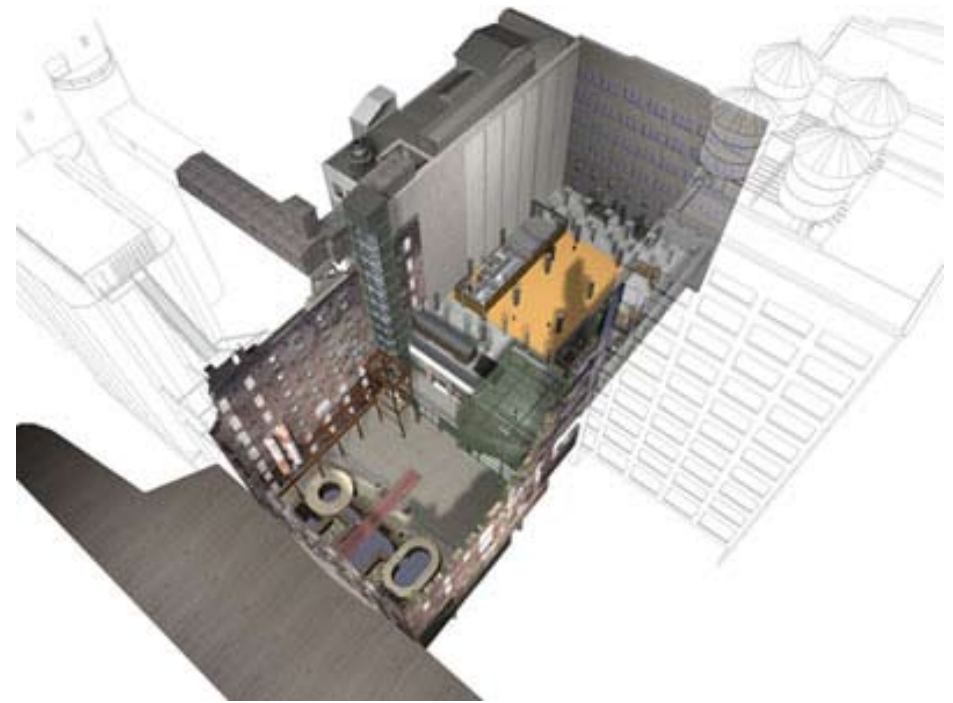
The museum will be helpful in the way that it relates to its site and host building. MS&R did a wonderful job of elegantly joining new with old. The way that the building shell becomes an exhibit in and of itself is an inspiration to draw from for my project.





SECTION LOOKING EAST  
 0 20 FT.  
 0 M.

- |                      |                     |
|----------------------|---------------------|
| 1. Lobby             | 7. Canal            |
| 2. Rail corridor     | 8. Elevator         |
| 3. Stair to exhibits | 9. Observation deck |
| 4. Exhibits          | 10. Conveyor        |
| 5. Ruin courtyard    | 11. Offices         |
| 6. Turbine pit       | 12. Mechanical      |



case study: the mill city museum

Images from Architectural Record, Feb. 2004



The case studies that I chose to review represent my attempt to gain knowledge in the areas of adaptive reuse as well as theater and community space design.

The most important question that these case studies answer for me is how to mesh the new elements with the original structure?

Meyer, Scherer & Rockcastle's Mill City Museum uses glass, steel and concrete in a way that the original wood and brick were used. The modern materials contrast while at the same time work together with the original building materials. This distinction is subtle enough to be respectful of the Mill structure but differentiated enough to leave no questions as to what parts existed in the original structure



The Prizery, on the other hand, left the building mostly untouched besides a few restorations of deteriorating brick and windows. These restorations, however, were done in a way that was historically consistent with that of the original structure. The new parts of the building keep their distance from the old putting the history on display as if the entire building is a museum exhibit.



There are also questions of the aspects of theater design. The Prizery is an excellent example of how to retrofit a large open space into an existing building that the original plan does not support. It was possible for the architect to elegantly mesh new structural technology (steel) with the existing structural technology (heavy timber) in a way that is not disrespectful to the original structure.

Nouvel's Guthrie Theater offered an excellent example of modern building in a historical district as well as that of modern theater technology. The Guthrie Theater is located in a historic district, but is by no means meant to imitate the aged buildings that surround it. It does however have a industrial feel to it that is relevant to the building's surroundings.

All of the cases presented here will have programmatic elements that will be helpful in determining the program for my project. Each one has distinct spaces that relate to my project's major spacial elements. The cases will also inform me on a functional and spatial basis, allowing me to learn from the relationships that each case's program has set. Technical details such as seating in auditoriums and the related spaces will be important to my programming.



## the twin ports

The Duluth-Superior area, or the Twin Ports, has a long history in trade and transportation. The Sioux and Ojibway tribes were the area's original occupants, thriving off of the plethora of fur-bearing animals located there. In the early 1600's, French explorers realized what the tribes had already known and begun to take over the fur trade.

The two cities truly began to grow in the latter half of the 19th century. In 1852, the government conducted a land survey which found the area to be rich with furs, timber, and iron ore. A land rush followed.

Together, Duluth and Superior are home to the largest and furthest inland port in North America. With the arrival of the railroad in the 1880's, the Twin Ports became an enormous transportation hub in the Midwest. Superior's slogan was "Where Sail Meets Rail." At the turn of the 19th Century, the two ports surpassed New York City and Chicago in gross tonnage handled, making it the biggest transportation hub in the nation.

In the early 1900's, the area continued to prosper as the steel industry moved in and began



mining and refining iron ore. The mining and manufacturing of iron ore brought about a rise in population that peaked around 1950 at about 150,000 people living within the limits of the two cities.

The Twin Ports' Harbor was used extensively during World War I and World War II. Massive amounts of iron ore were being processed and shipped out to manufacturing factories across the country in order to build tanks, ships, and other war vehicles. Duluth also became home to a shipbuilding yard to aid the war effort.

During the 1970's, foreign competition in the steel market devastated the local economy. The U.S. Steel Duluth Works plant closed in 1981. Unemployment surged to more than 15 percent by the end of the 1980's. The inner city populations of both Duluth and Superior dwindled, with both losing close to 20 percent of their populations between 1960 and 1990.

Both cities struggled to cope with the population decline and turned to the tourism and service industry to revive the economy. Duluth has taken advantage of and flourished as a result of its tourism. Many historic industrial buildings and warehouses have been restored and are now full

of one-of-a-kind shops, pubs, and restaurants. Duluth's collection of parks, museums, recreation opportunities, and historic buildings that have a unique connection to the history of the area brings 3.5 million visitors to the city annually contributing more than \$400 million dollars to the local economy.

Superior, however, continued to struggle in finding its identity in the post-industrial economy. The tourism industry has been mildly successful for the city, with the development of Barker's Island, but not enough to revitalize the economy or the community. Superior continues to try to draw large industrial and commercial businesses to the area.

### adaptive reuse/historical preservation

Historic preservation, that is to restore or rehabilitate an existing structure in order to preserve it for the future, in the United States began in the early 1800's. With the rapid growth and changes that the nation was experiencing, buildings quickly became obsolete or in the way of expansion.

Most early movements in preserving historic structures were brought about by citizens



themselves. The government itself took very little action in historic preservation of architecture until the 20th century.

Historic preservation received a substantial boost during The Great Depression in the 1930's. Roosevelt's New Deal WPA projects including many restorations of historic buildings and locations.

In 1949, The National Trust for Historic Preservation was formed. This entity was charged with the duties of identifying national preservation issues, support for preservation efforts, communicate with people who control the future of historic resources, and expansion of private and public financial resources for preservation activities.

The 1970's brought about a large movement towards adaptive reuse and revitalization of historic districts. During this time the government was extremely interested in understanding the links between historic preservation and urban revitalization. In 1979 several studies were issued by the government in order to try to quantify the assumption that these types of projects were valuable.

Recently many communities across the United States have seen developers interest in historic

## historical context



A depiction of The Grand Opera House built in the early 1900's in Superior, WI.

buildings grow substantially. They see these buildings for what they are, an important piece of history. They understand that this history will give people a sense of place and that the demand for living spaces in such structures is high.

### 19th century architecture

Much of the architecture in the late 1800's and early 1900's had a distinct functional character to it. After the Great Chicago Fire of 1871, building materials were often limited to more fireproof materials that were available at the time such as brick, stone, and iron.

Classical revival was a popular architectural style of the age. Buildings of this style often featured prominent arches and columns, as well as highly decorative features around doors and windows as well as cornices.

It was also during this time that the economy in Superior was starting to take off. The rapid growth brought about many buildings of this classical revival quality in a very short time. Land and investment companies from big cities across the nation (particularly New York and Chicago) began developing blocks in the downtown to keep up with the population and economic growth.

## community theater

Performance theater has been a part of civilized life for many thousands of years. The first recorded performance was in 2500 BC in Egypt. The Greeks, however, are credited with growing theater performance as an art, inventing dramatic criticism and career acting, as well as the first attempts at the theater as a built architecture.

The Greeks built their magnificent theaters into hillsides, ravines, or natural bowls. This allowed them to solve the sight line seating problem. Over time they refined the way that seating stepped up and the way in which it was laid out. Much of the theater technology developed by the Greeks in early Greek civilization is still used today.

The Romans further refined Greek theater technology with their technical minds, logic, and attention to detail. A majority of theaters began to be constructed as interior spaces during the baroque period. Theater seating technology slowly transformed from backless solid stone "bleachers," to wooden benches with backs, to the individual wood framed upholstered seats that we know today.

## historical context

To set and follow a schedule that challenges me and helps me to reach my maximum potential.

To document the process of my project thoroughly in order to fully convey the affect that history had on my design process.

To execute the project in a way that demonstrates my abilities to work at a professional level by producing a project that is thoroughly researched, well developed, detailed, documented, and presented in a way that is consistent with the expectations that are placed upon architecture firms.

To present a design solution that responds to the needs of the community in a way that respects and draws inspiration from history.

To represent my project to its fullest potential in my thesis document, project boards, and digital presentation so that my ideas can be conveyed clearly and concisely.

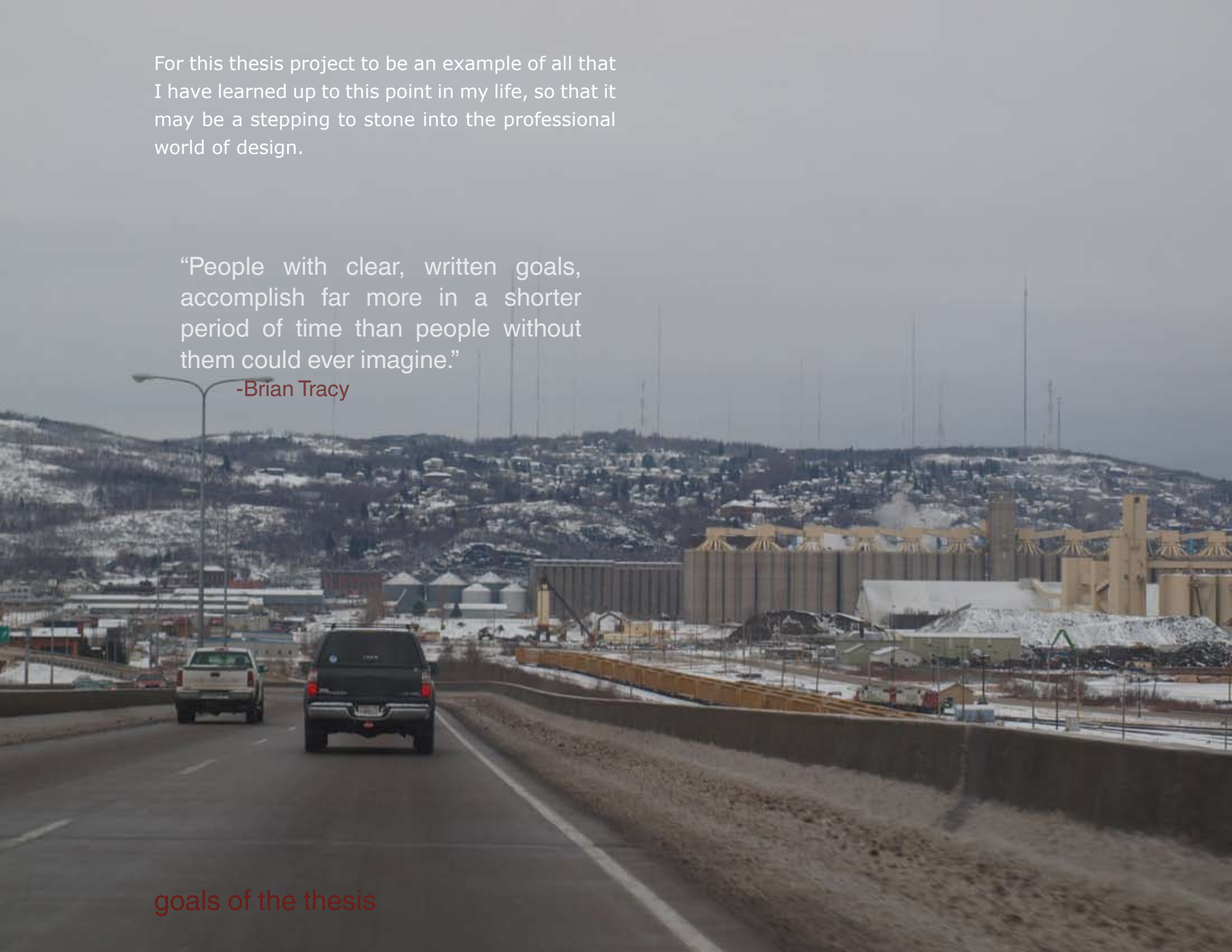
To explore adaptive reuse in a way that responds to and draws inspiration from history; including but not limited to the history of a building, of a city, or of a region.

For this thesis project to be an example of all that I have learned up to this point in my life, so that it may be a stepping to stone into the professional world of design.

“People with clear, written goals, accomplish far more in a shorter period of time than people without them could ever imagine.”

-Brian Tracy

goals of the thesis







Arriving at the site via Interstate Highway 35, the first thing I notice is seemingly endless, beautiful, Lake Superior. As I descend the hill I begin to get a sense of the industrial nature of the bay area. Large brick buildings with tall, slender smoke stacks, rail cars littered about the numerous rail yards, trains and trucks running in and out, and the occasional barge arriving from the northeast.

As I cross the John A. Blatnik Bridge into Superior, I get my first glimpse of the city from above. My first impression of the city is that it is sprawling—buildings scattered about with large paved roads and parking lots in between. Many buildings are run-down and appear to be empty. It appears as though the local economy is suffering. The older buildings that are still standing have intricate details around the windows and doors suggesting that it was not always this way. This place has an interesting story to tell.



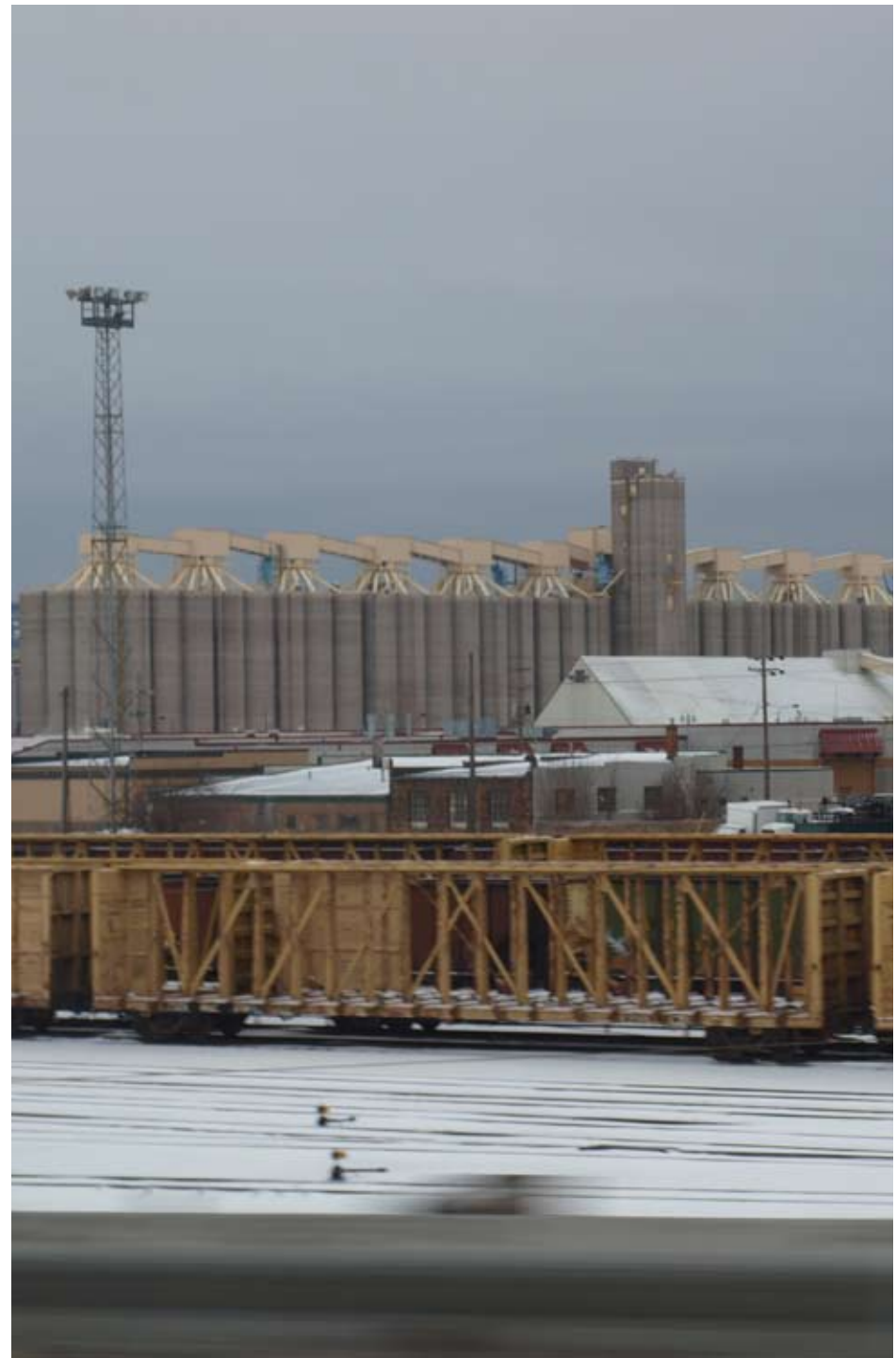
I find my site in the center of the downtown, which is in dire need of revitalization. This community clearly needs a stronger sense of downtown. There is a little more activity here, with the library being across the street, and a few shops to the north. The cars on Tower Avenue are relentless; this does not seem to be a very pedestrian friendly area. Older buildings are scattered here and there with

additions and new buildings filling in. There are relatively few trees when compared to the rest of the city.

To the north there is an alleyway with another old building, circa 1900, on the northeast corner of the block. To the east is Tower Avenue as well as the block occupied by the Superior Public Library. To the South is an attached senior activity center. To the west is another alleyway and a parking lot, as well as a few single family homes.

The building which I have chosen to use for my thesis, 1521 Tower Avenue, is about 100 feet by 100 feet, located in the center of the block on the Tower Avenue (east) side. It is clear that this building has been here for many years; there are many different types of bricks in different areas on the building suggesting repairs at different stages in its history. The arrangement of windows suggests a post and beam construction.

It is immediately clear to me that this is the perfect site for my project. The history here is palpable and this community is in need of the typology that I plan to design. Superior needs to be rejuvenated and I hope that my community center building can be a catalyst for change in this struggling community.





### existing grids

The city block grid is very strong in the downtown area of Superior and is rarely broken. The immediate area surrounding the site is on a grid of blocks measuring 300 feet east to west and 430 feet north to south. The block is broken into thirds by two alleyways that form a T.



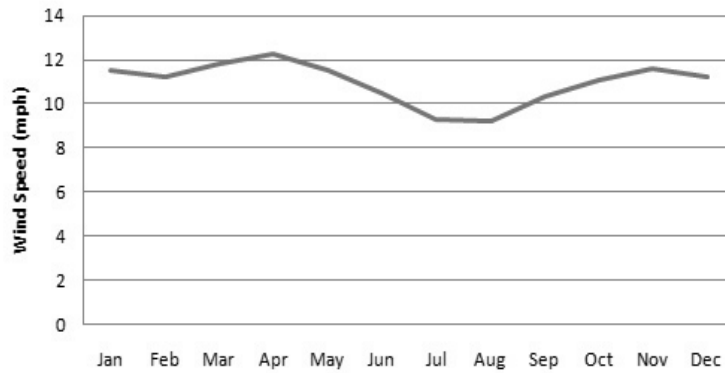




topography  
The topography of the site is very flat the slope of the site is less than 3%. The site is elevated approximately 643 feet above.

site analysis: qualitative

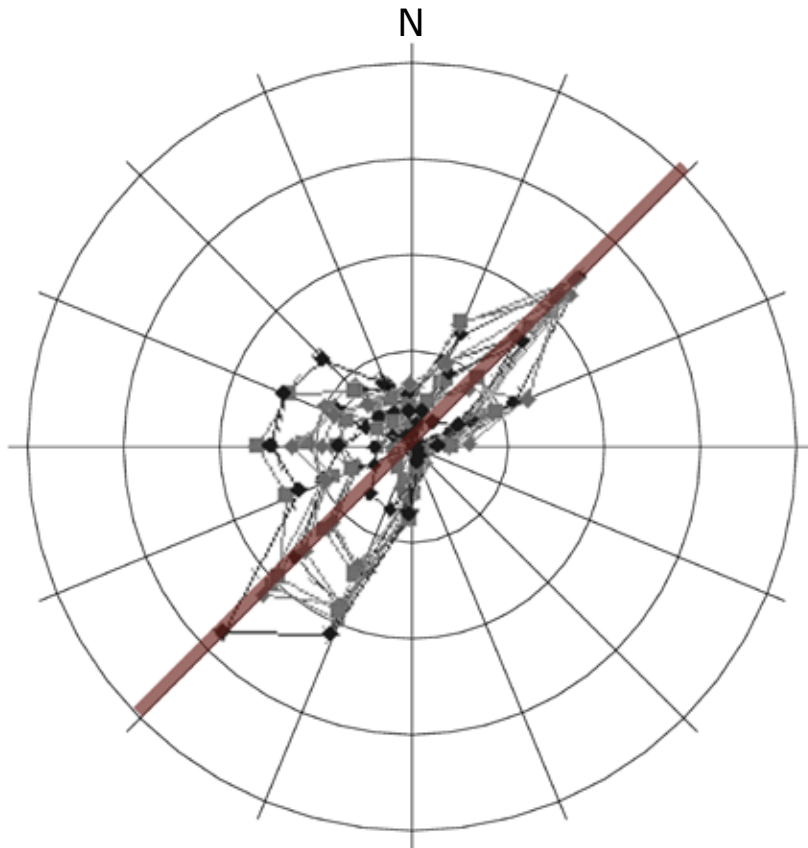
## Wind



## wind

Average wind speeds in the Superior area are slightly higher than the national average and fluctuate between 9 and 12 miles per hour during most times of the year. Winds coming in off of Lake Superior are the cause of the 2 mile per hour difference from the national average. The wind comes from the northeast about 45% of the time, from the southwest 45% of the time and from most other directions a minimal percentage of the time

## light quality



The site receives sunlight from the south. There are no buildings to the south that would block sunlight during most of the day. The vast amount of concrete and pavement surrounding the site create much reflected light.

### vegetation

The site itself is void of any vegetation, however across Tower Avenue the library block has a small public plaza with grass and trees. Some boulevards in the area have grass and sparse trees. The vegetation is all green plant life and planned by people.

### human intervention

The area is a highly developed urban area with no sections left untouched. The little vegetation that is present was human planned and introduced.

### distress

Many buildings in the area are in need of maintenance. Urban decay is made evident by the fact that most buildings and paved surfaces are in poor condition.



## site analysis: qualitative



### traffic

Traffic is heavy at times on Tower Avenue and Belknap Street. Tower averages 9500 cars per day and Belknap 2500 cars per day, according to City of Superior data. Pedestrian traffic during my first site visit was extremely light. According to a study conducted by the city, 32 pedestrians used the Belknap/Tower intersection in during the AM peak and 79 during the PM peak.

### water table

The soils in Superior are moderately well drained and wet soil can be found anywhere between 6 inches to 72 inches beneath the surface depending on the time of year.

### soil

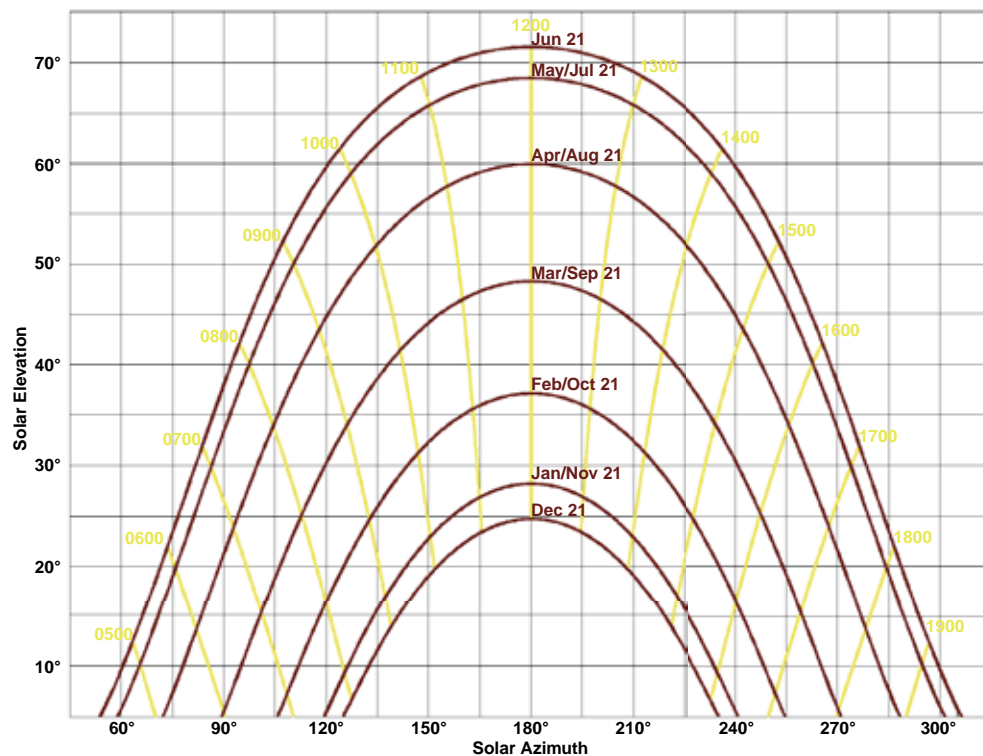
0-3 inches: fine sandy loam  
3-14 inches: sandy loam  
14-60 inches: clay

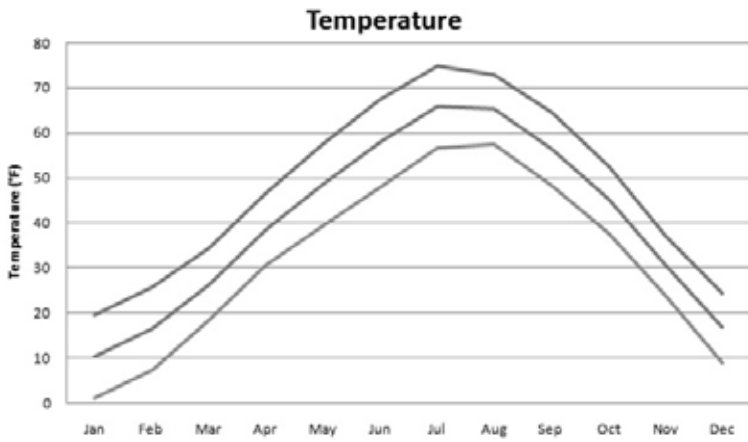
### utilities

Utilities to the site are readily available as they are already connected to the existing building on the site.

### noise

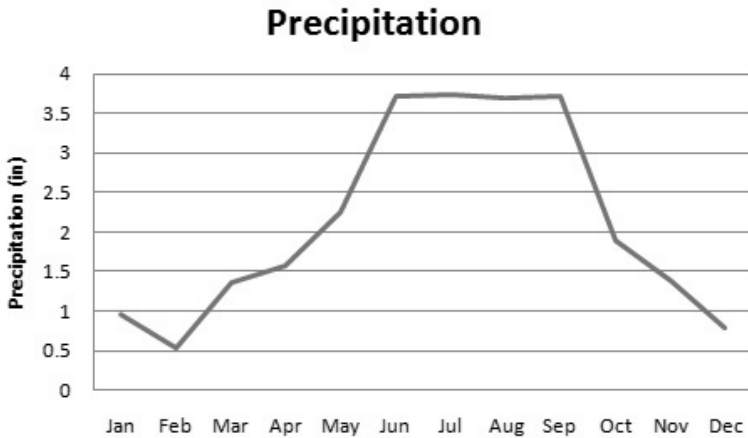
Much of the noise heard on the site comes from the two main corridors: Tower Avenue to the east, and Belknap Street to the north.





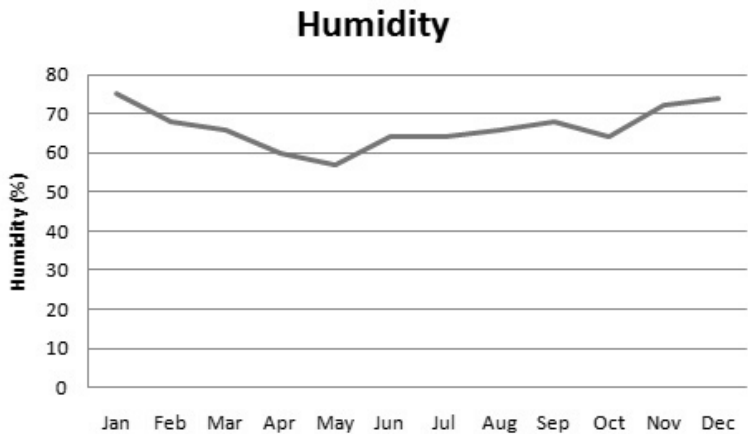
#### temperature

The average temperature in Superior is about 15 degrees Fahrenheit below the national average year around. This area stays cooler in the summer than other midwestern climates due to the lake effect caused by Lake Superior.



#### precipitation

Precipitation is higher than average during the summer months, but well below average for the winter months.

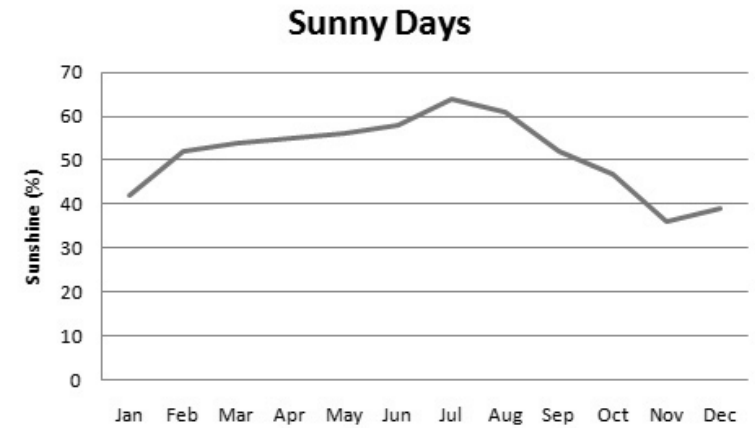


#### humidity

Superior's humidity is slightly higher than the national average because of its proximity to Lake Superior.

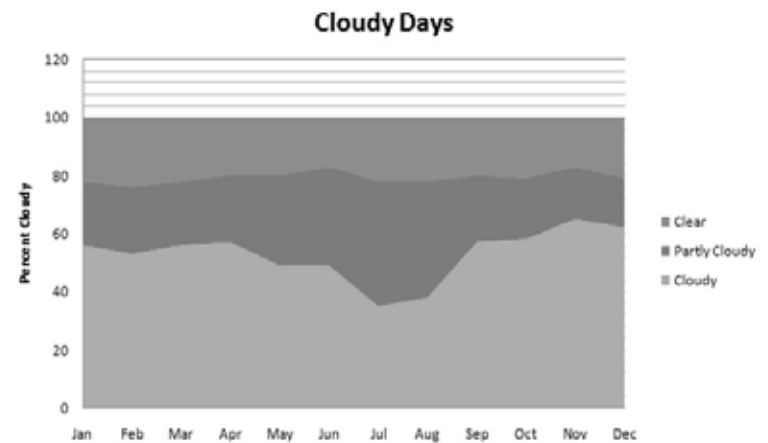
### sunshine

Superior receives slightly less sun than the average Midwest community. This is due to the clouds rolling in off of the lake.



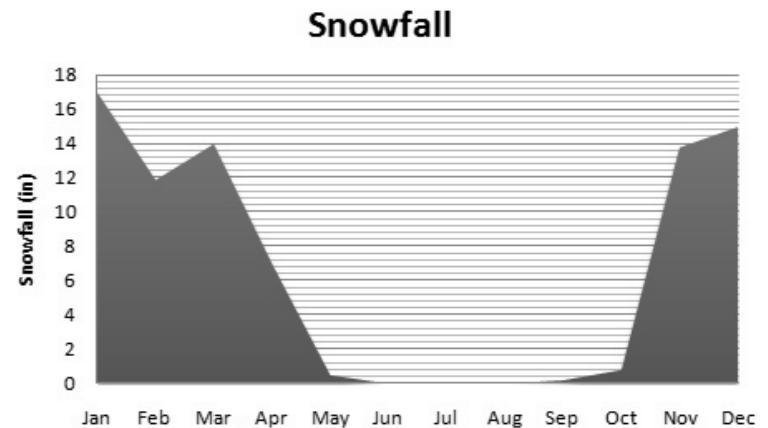
### cloudiness

As stated above clouds are prevalent because of the climate affects associated with Lake Superior.



### snowfall

The area receives snowfall that is substantially above the US average because of the Lake and the surrounding hills.







from site to the north



from site to the east



from site to the south



from site to the west





north on tower ave



front of site



south on tower ave



back of site

site analysis: quantitative

**auditorium** 10000 sq. ft.

Aside from a stage and seating for an audience, the auditorium will include spaces such as: sound/light rooms, and staging areas.

**auditorium support space** 5000 sq. ft.

This support space will include restrooms, dressing rooms, storage, and a lounge area for performers.

**public space** 6000 sq. ft.

The public space will feature the entry atrium, box office, a large public lobby, and exhibition space.

**multipurpose rooms** 2000 sq. ft.

Several conference rooms will be used for staff meetings as well as community meetings.

**administration** 1500 sq. ft.

The administration area will host the offices for the staff required to run the facility.

**studio space** 4000 sq. ft.

Studio spaces will be provided for area artists and teachers of art classes.

**classrooms** 2500 sq. ft.

Small classrooms for hands-on art classes and programs. These spaces will require the ability to handle clay and other related art materials as well as storage space.

**design shop** 4000 sq. ft.

The design shop will include a large open space for set design and construction and include accommodations for wood shop type machinery.

**kiln room** 1000 sq. ft.

A space for a kiln to be housed as well as for clay storage and preparation.

**support space** 18%

Includes any other restrooms, mechanical, and circulation spaces that are required to allow the building to function.

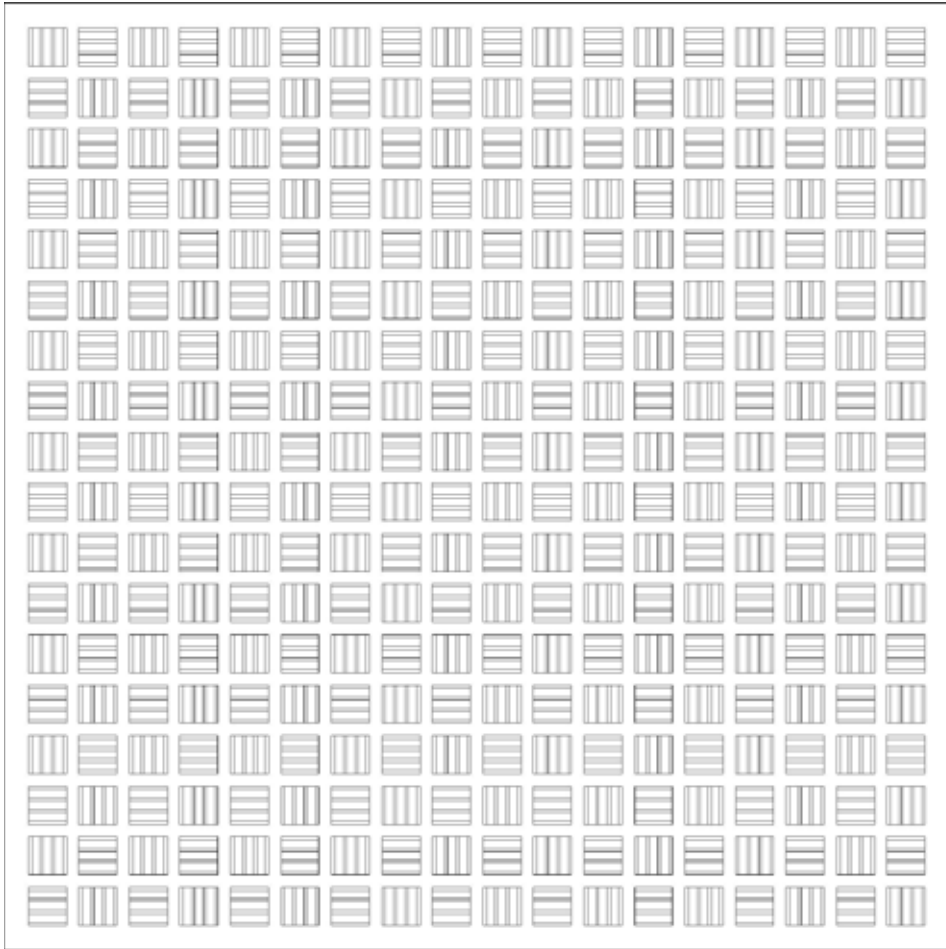
**total: 45000 sq. ft.**



**design**

**documentation**



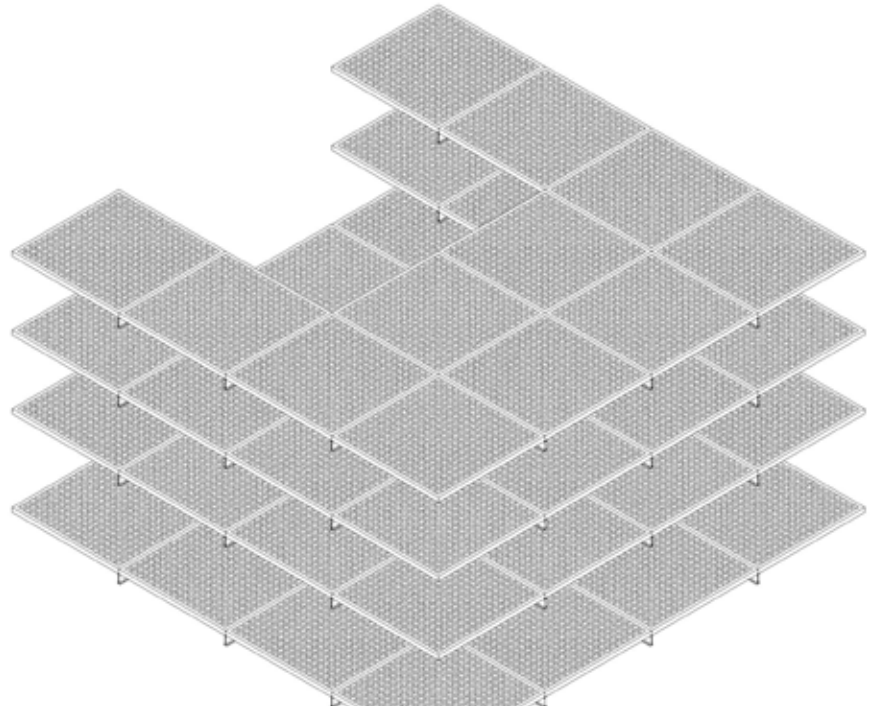
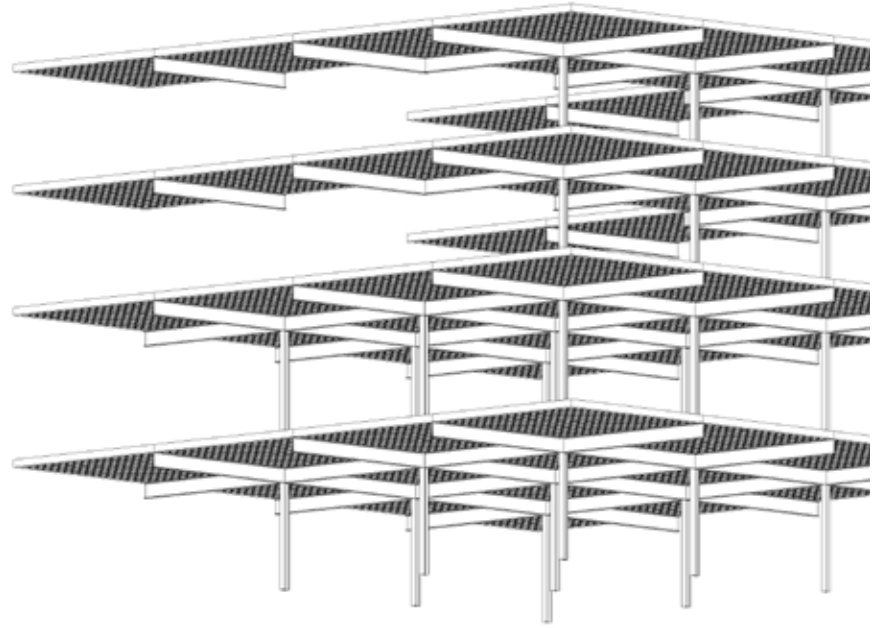


### existing structure

To begin work in the design phase of the project I first needed to understand the existing building as well as I could.

The structural system used in constructing the original building was iron post and beam with a clay-tile/cast-in-place concrete flooring system. The structural grid is layed out in 25'x25' bays.

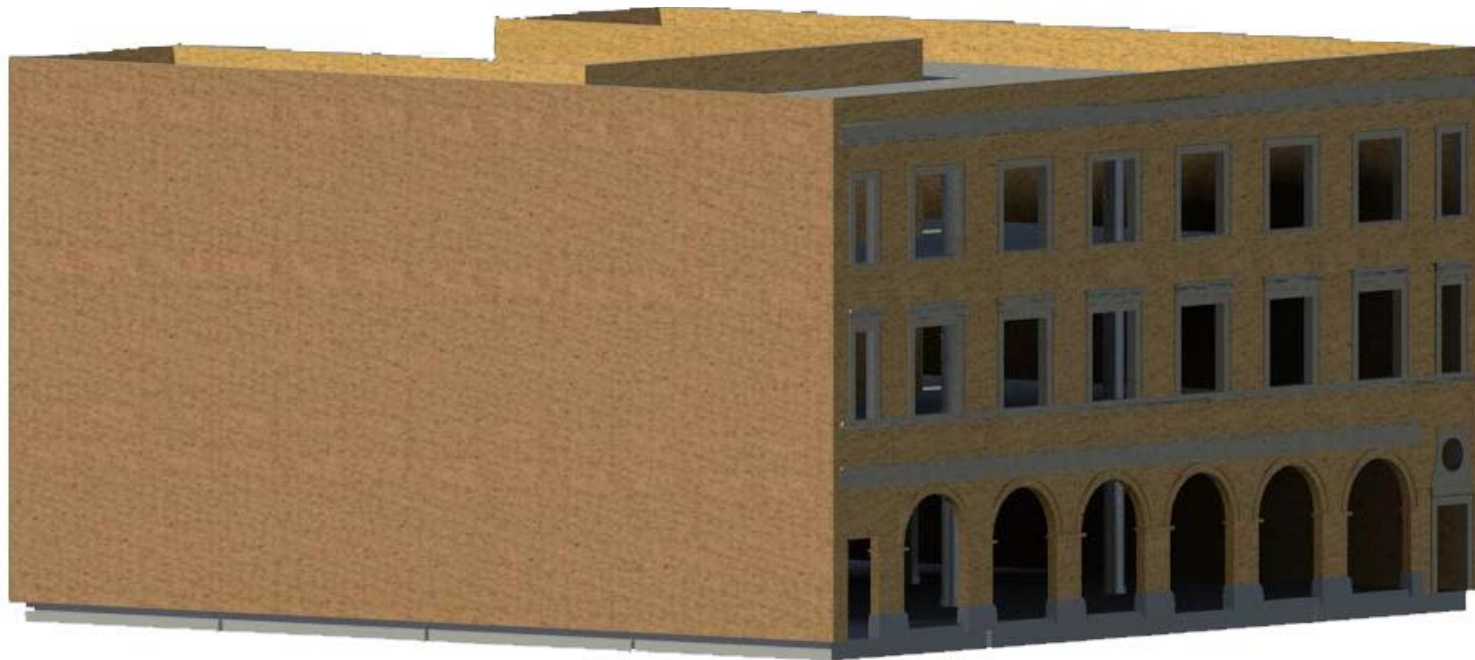


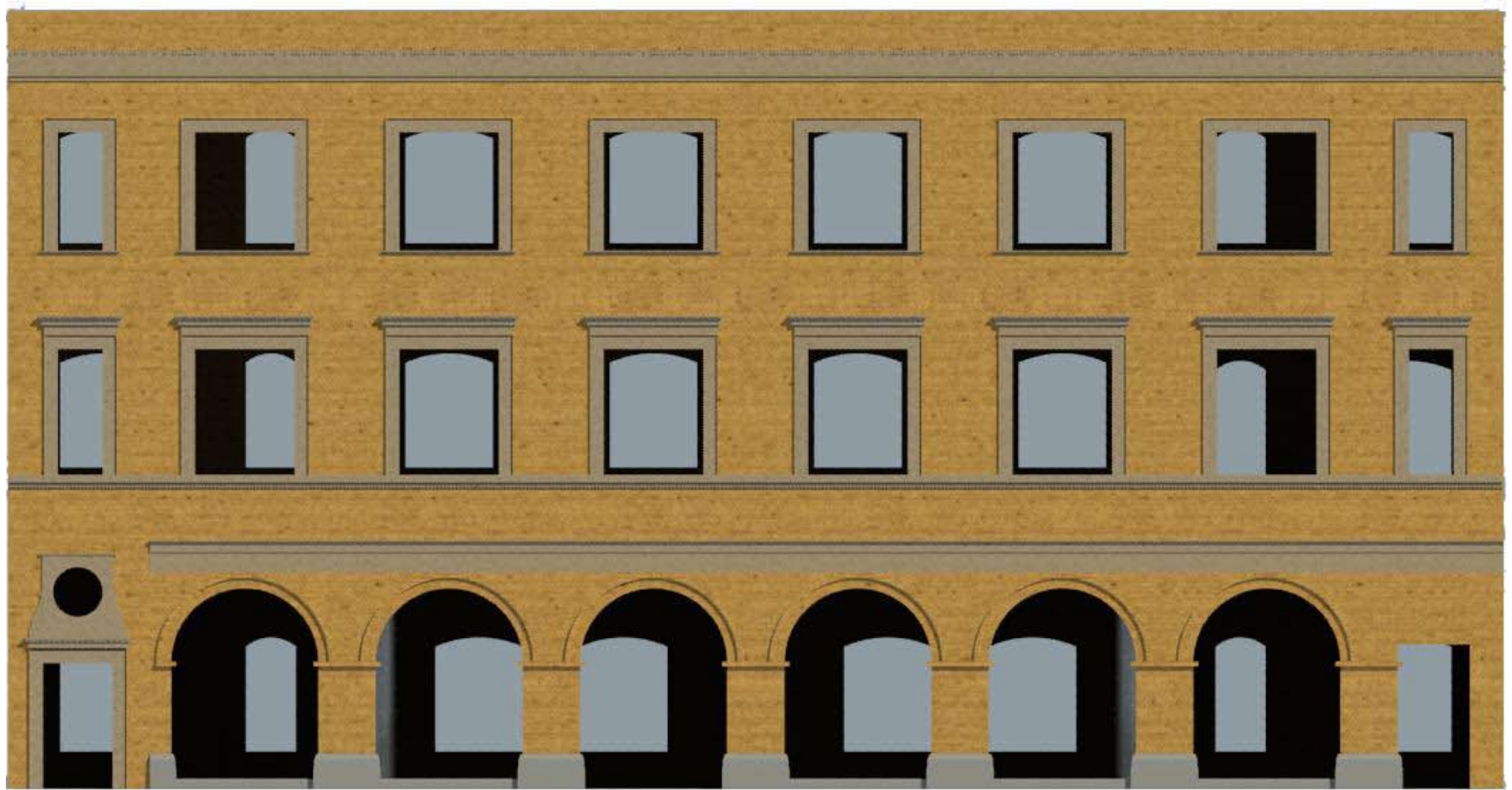




### existing skin

I moved on to studying the bearing wall brick skin of the existing building and modeling the terra cotta trim around the openings.





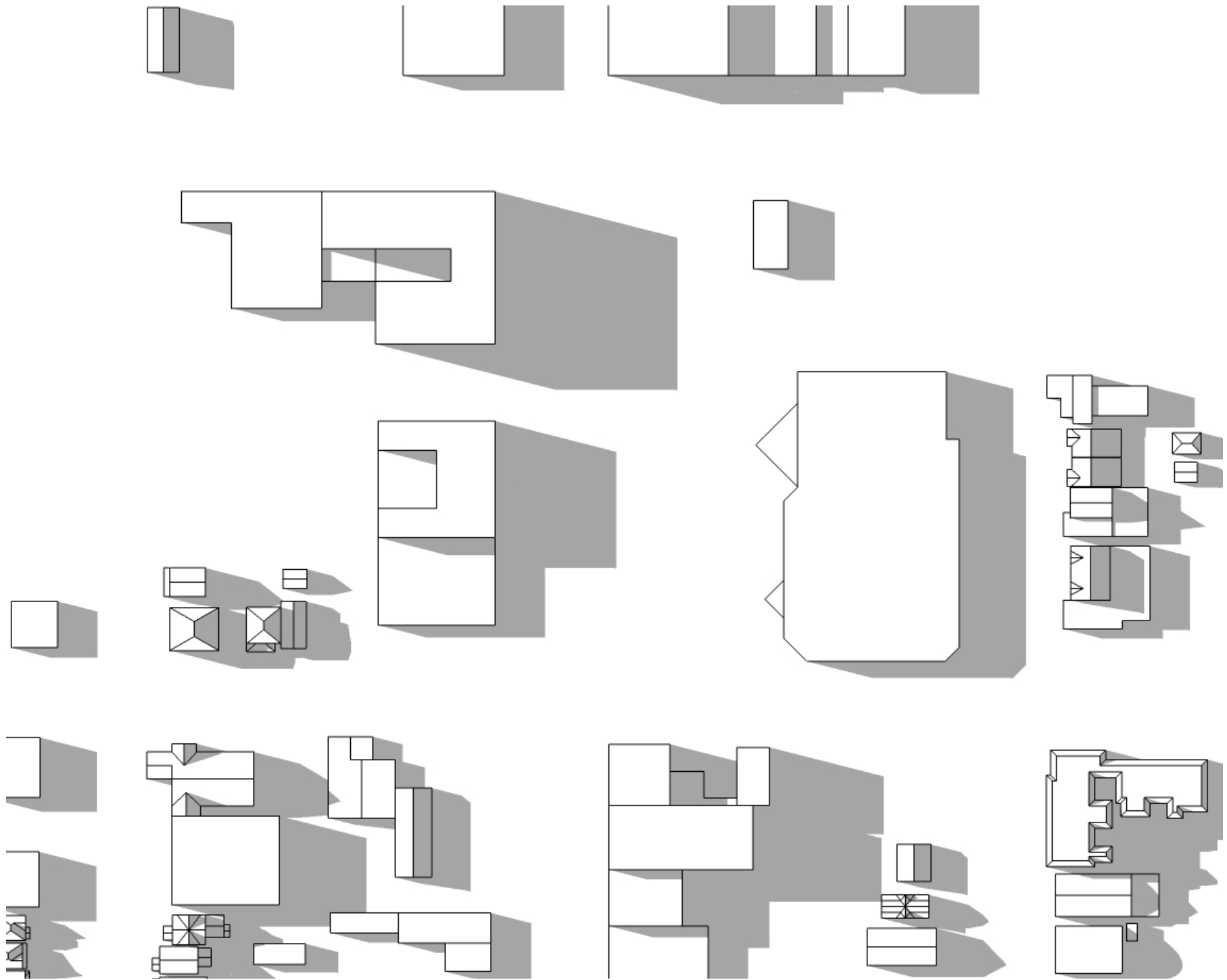


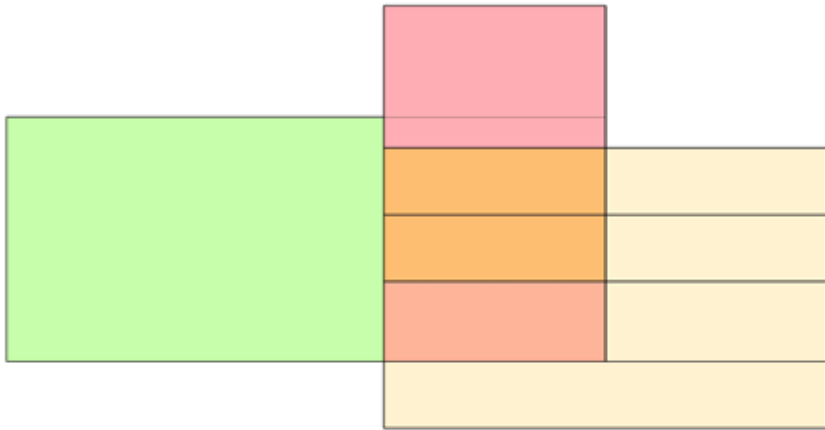
## site context

I then moved on to modeling the site context in order to better understand the way the existing building relates with its site. This allowed me to cut sections through the site as well as do sun studies.





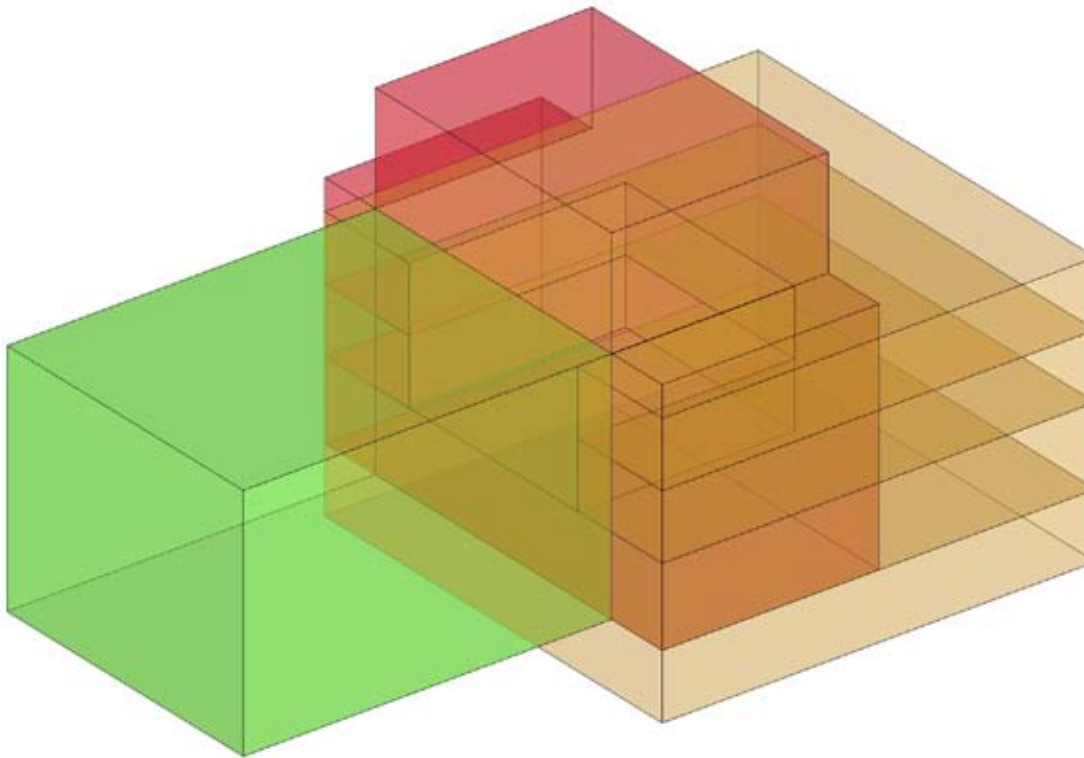




## design development

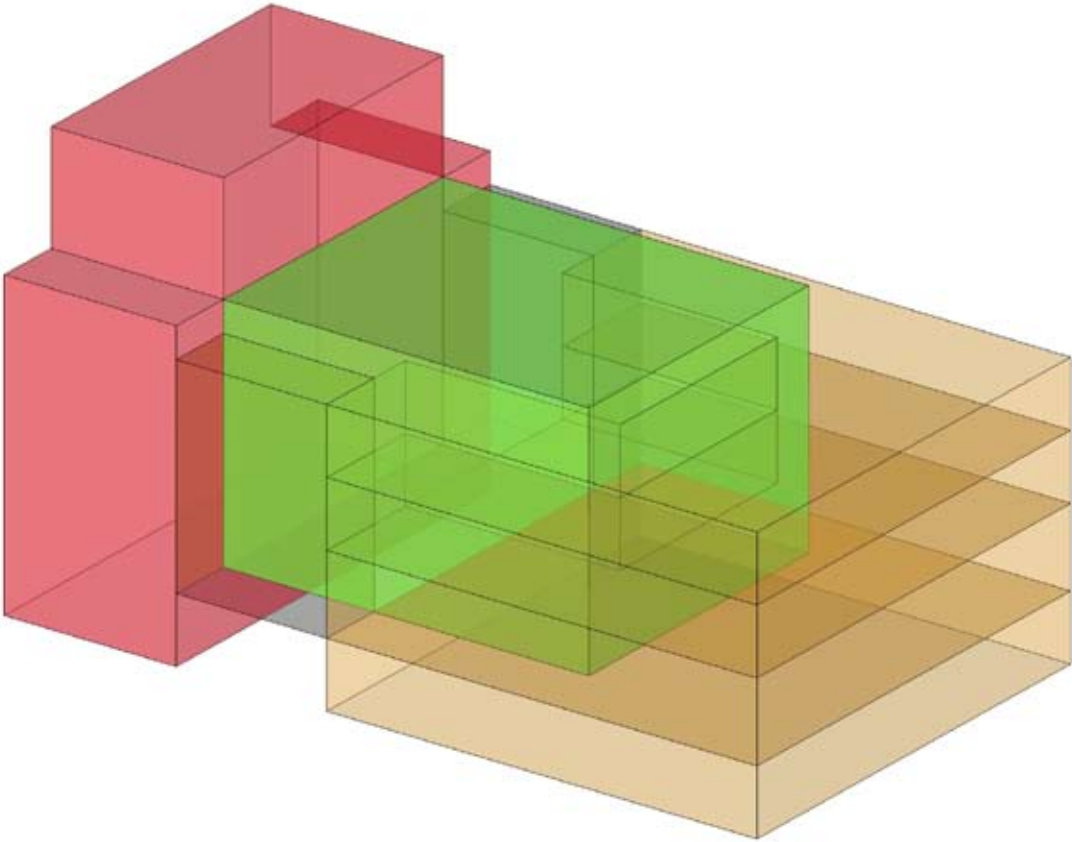
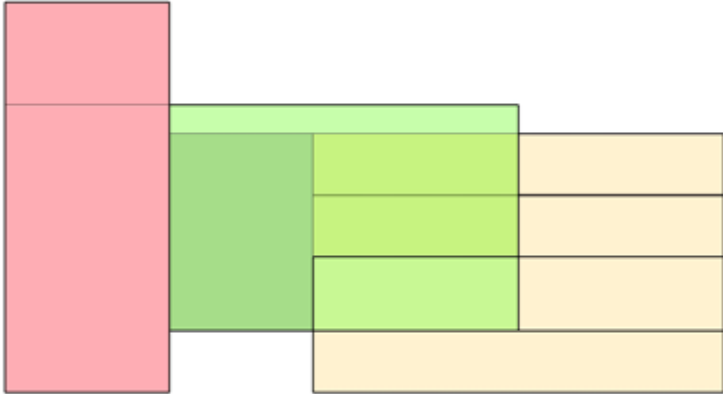
In the beginning of the design process I thought it would be best to fit the theater spaces into the horseshoe like form on the west side of the current building. I used these spacial studies to explore my options.

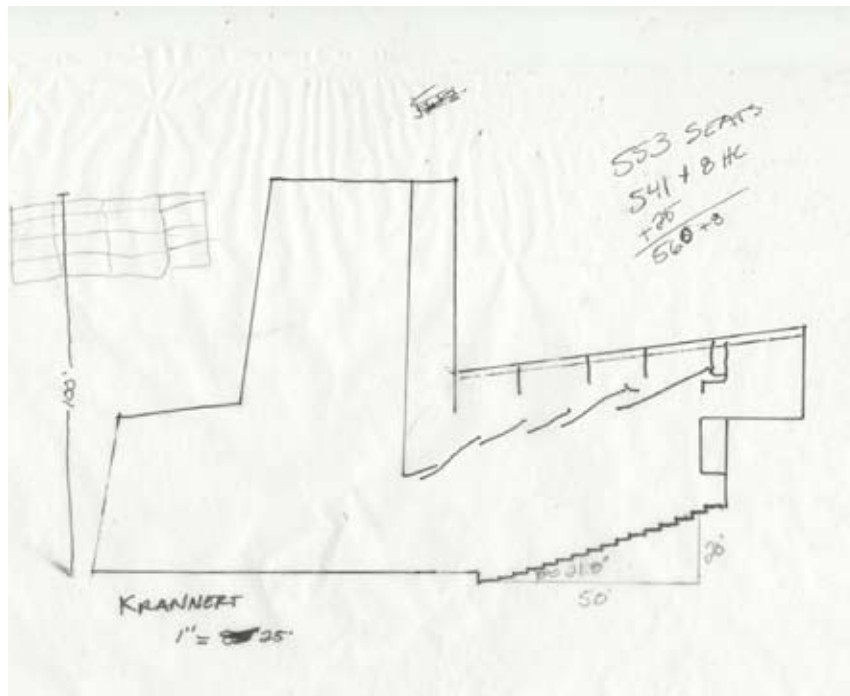
The main problem that I encountered here in these studies was the fly. The fly space needed



to be at least 80 feet tall, which was substantially taller than anything nearby.

The other problem that I had was that the space for the theater itself was restrained to 50 feet wide, very narrow for the amount of seats that my program required.

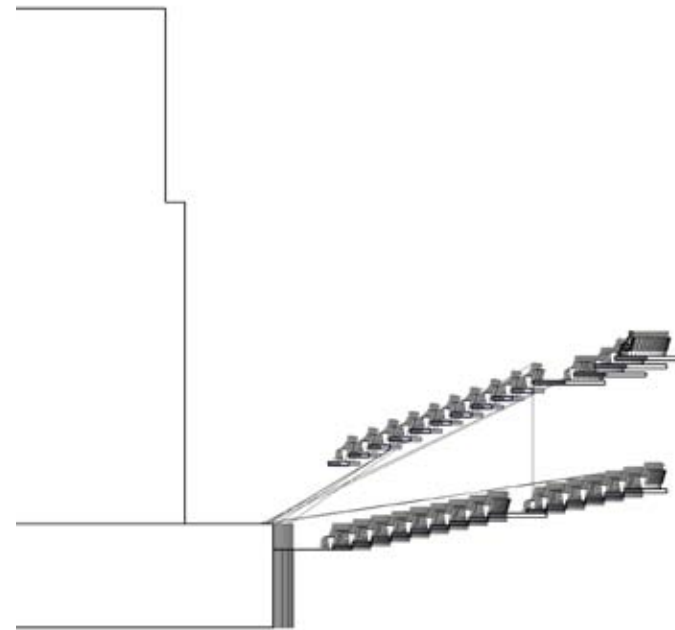
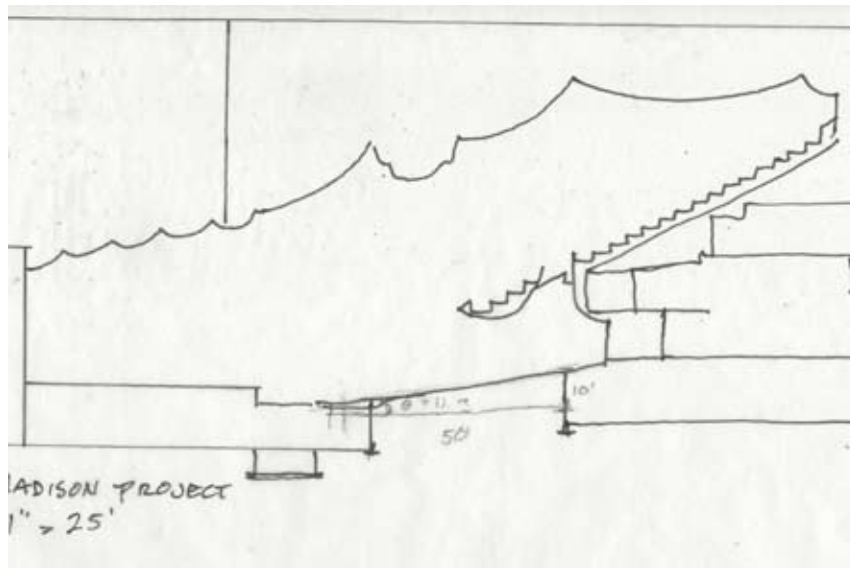




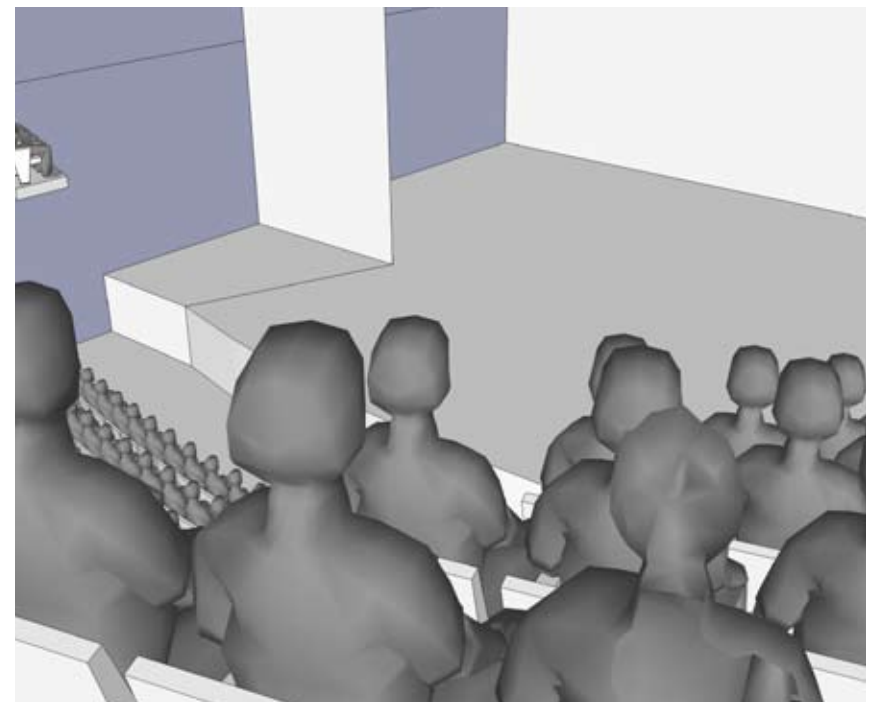
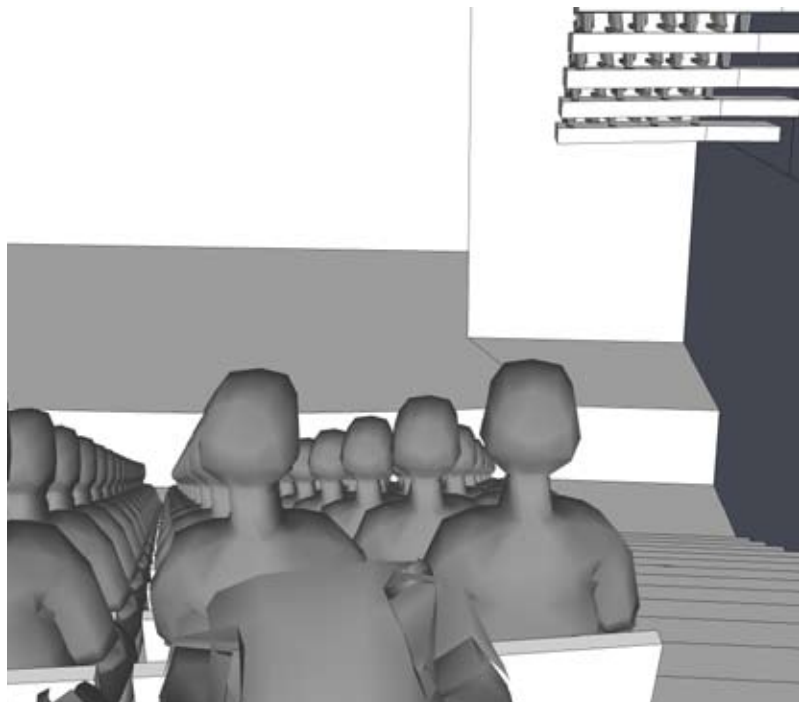
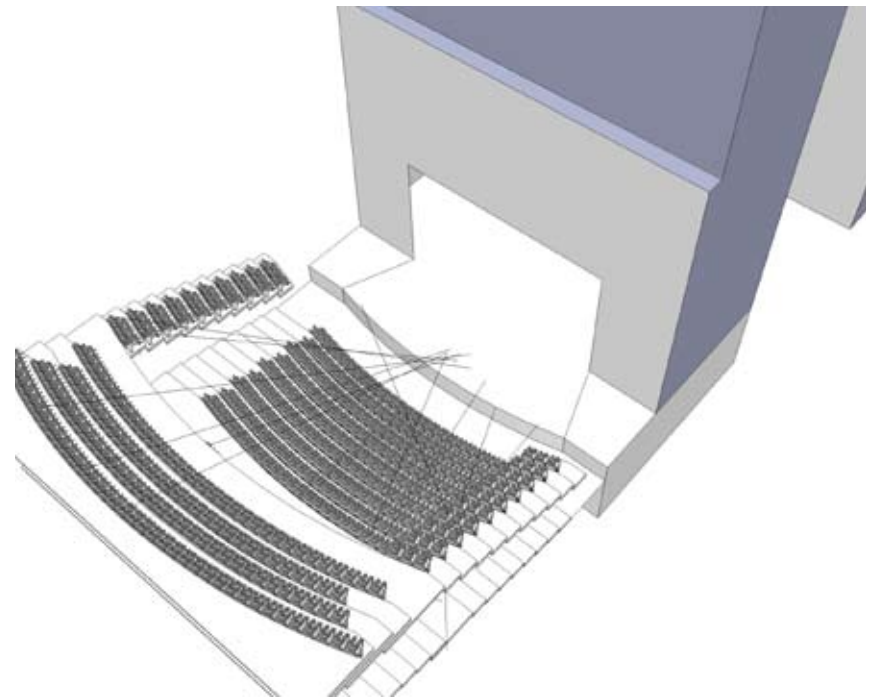
## auditorium

I then studied some example theaters to try and understand how the seating was arranged as well as the volume of the space. These are a couple examples of auditoriums that I studied, making note of the angles of seating and ceiling and fly heights.

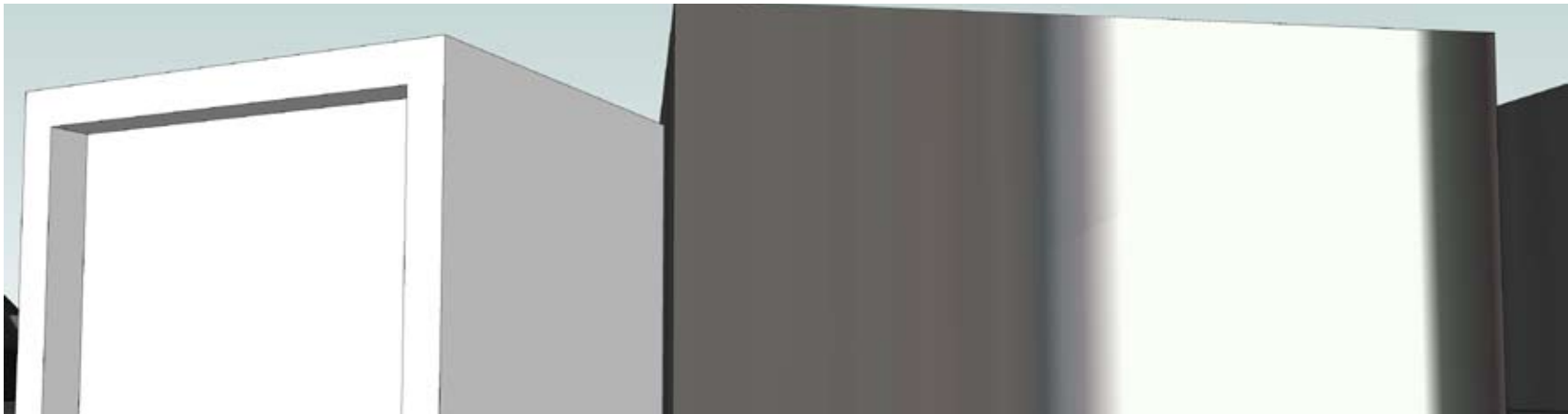
From these studies I began to formulate the layout that I would use in my auditorium, constantly tweaking angles and the radius that the seats were arranged in.



Here you can see some of the many sight line studies that I did to ensure that every seat in the theater had a clear view of the stage.



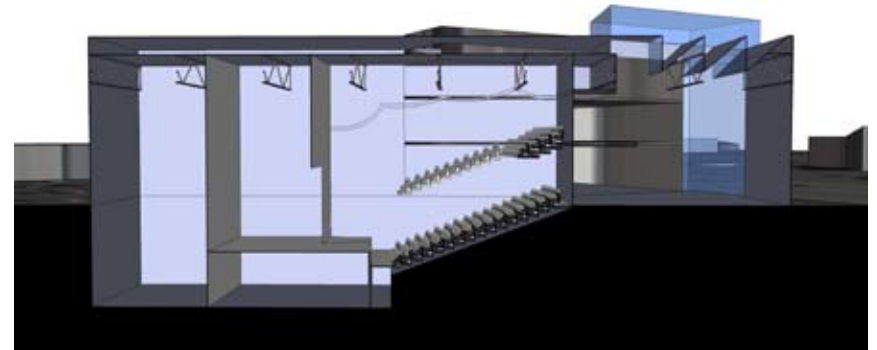




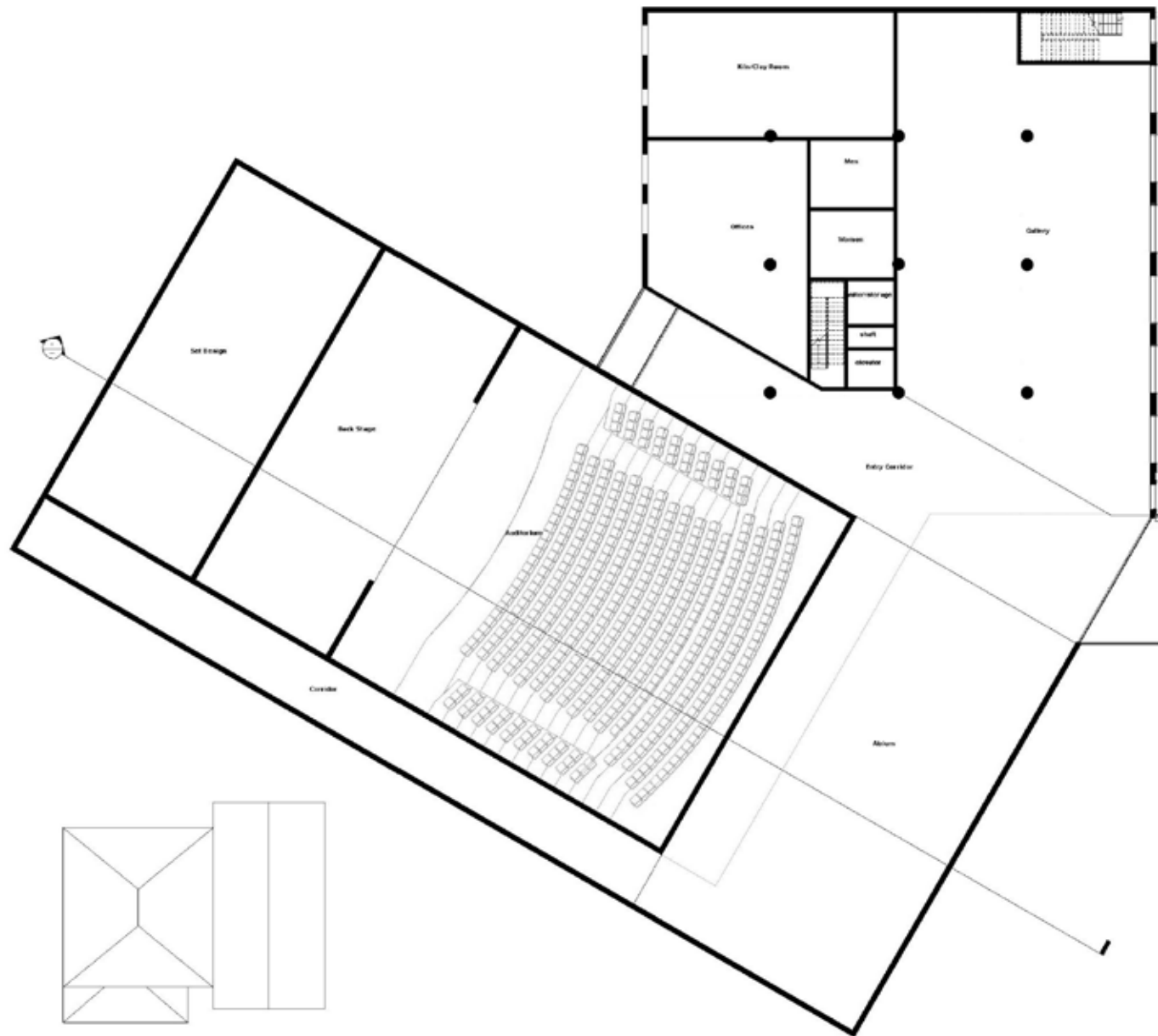
## design development

Nearing midterm I decided that putting the theater space into the "horseshoe" was not following the results of the case study research--to contrast the existing building.

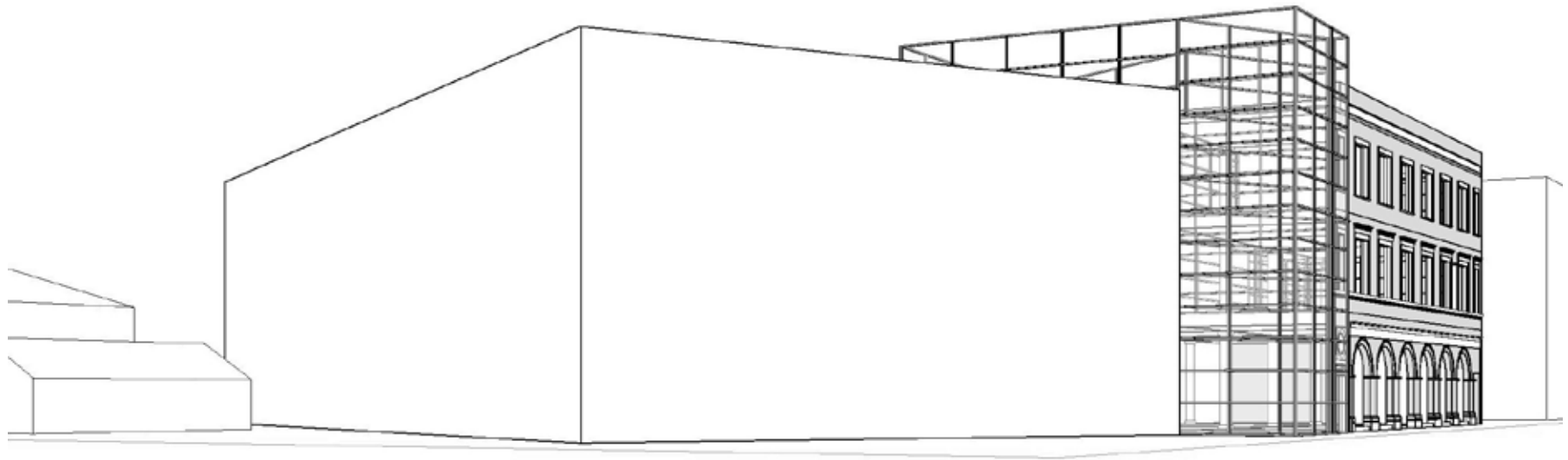
Taking a new direction, I began to develop an idea which consisted of an addition at an angle to the existing building. This created an interesting "notch" type space where the two buildings came together. This notch became a very important point in my design and was eventually inclosed in a glass display-case-like atrium.



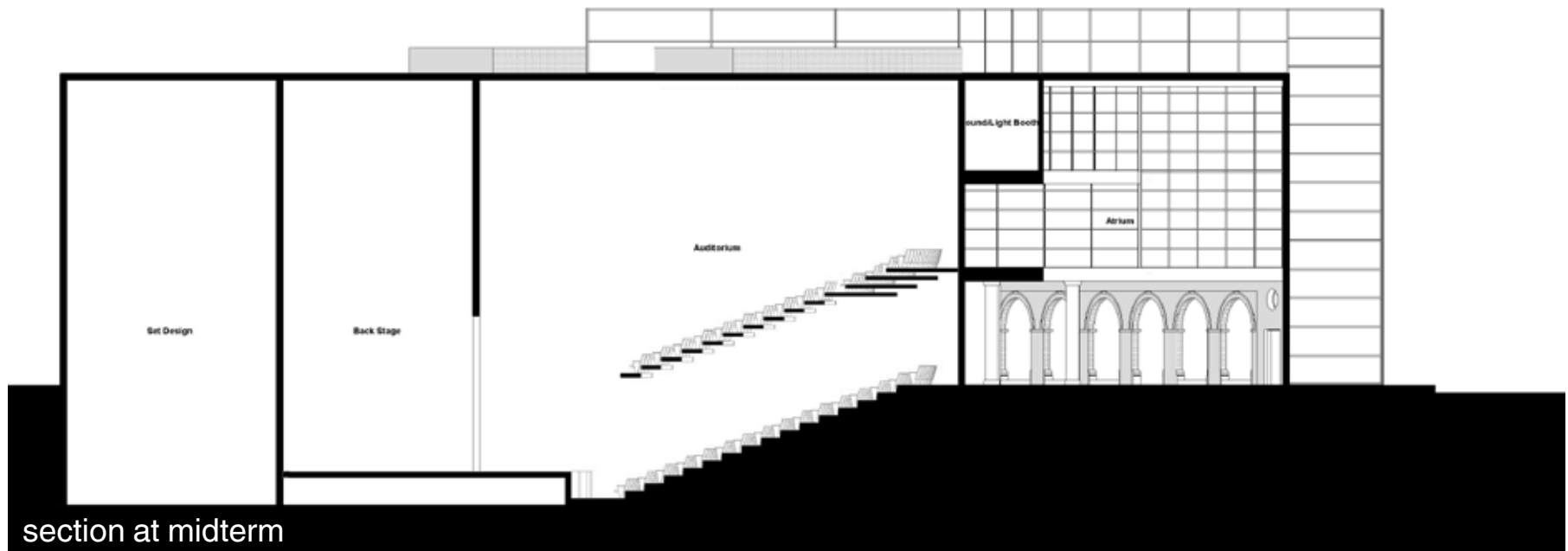
## design documentation



ground floor plan at midterm



exterior from tower at midterm



section at midterm

## addition skin

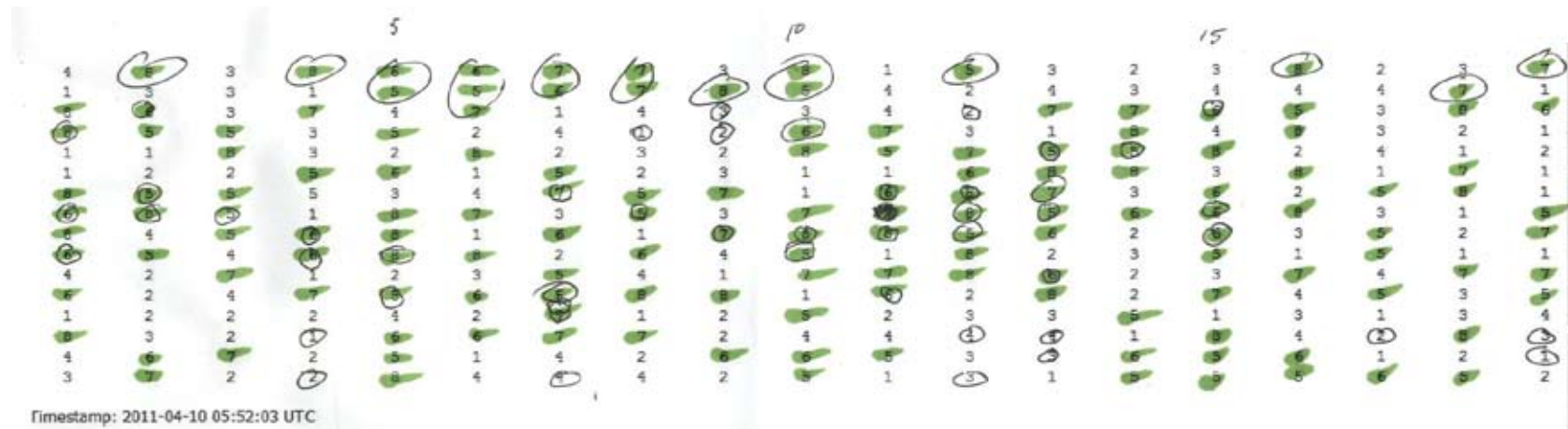
The skin I chose to use for the theater addition is a corrugated aluminum panel. I chose 4 different colors, blue, red, yellow, and silver, as well as using perforated and solid panels. This gave me 8 different types of panel. I used a random number generator to decide the location of the panels as can be seen below. The green highlighted numbers are

perforated panels (1-4) and the circled numbers are those that I chose to change perforated to solid or vice-versa.

Pictured at right are a few examples of what these panels look like and an image of the southern wall that matches the random numbers below.

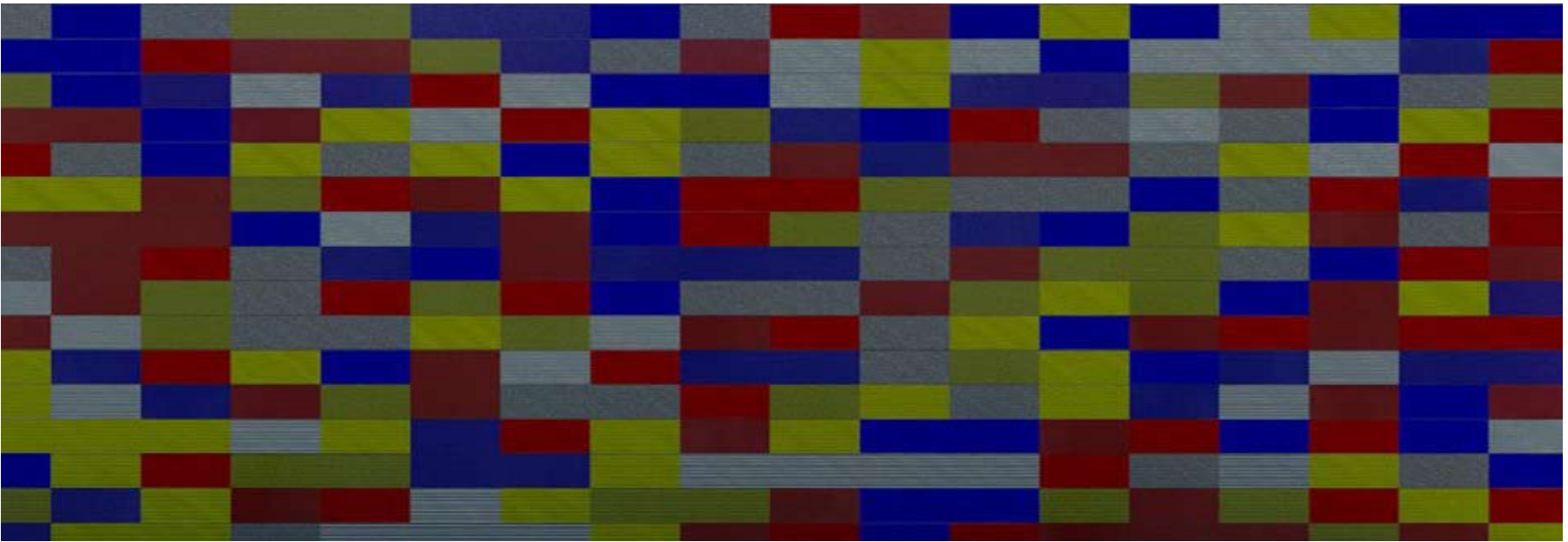
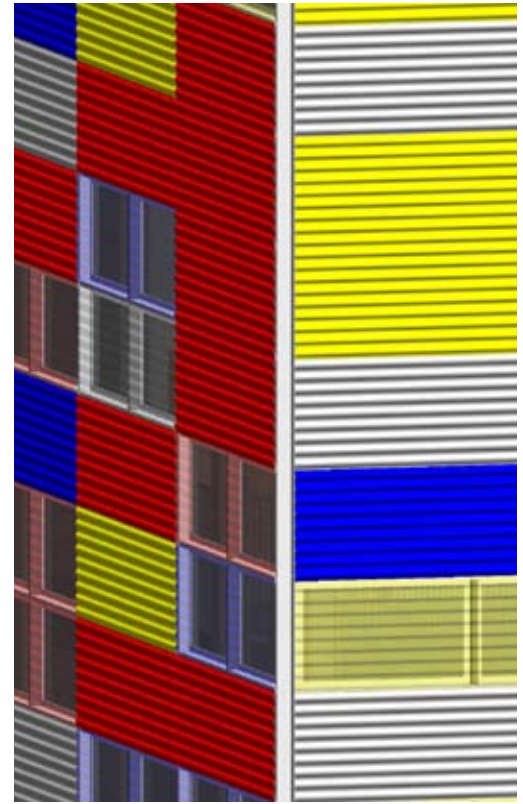
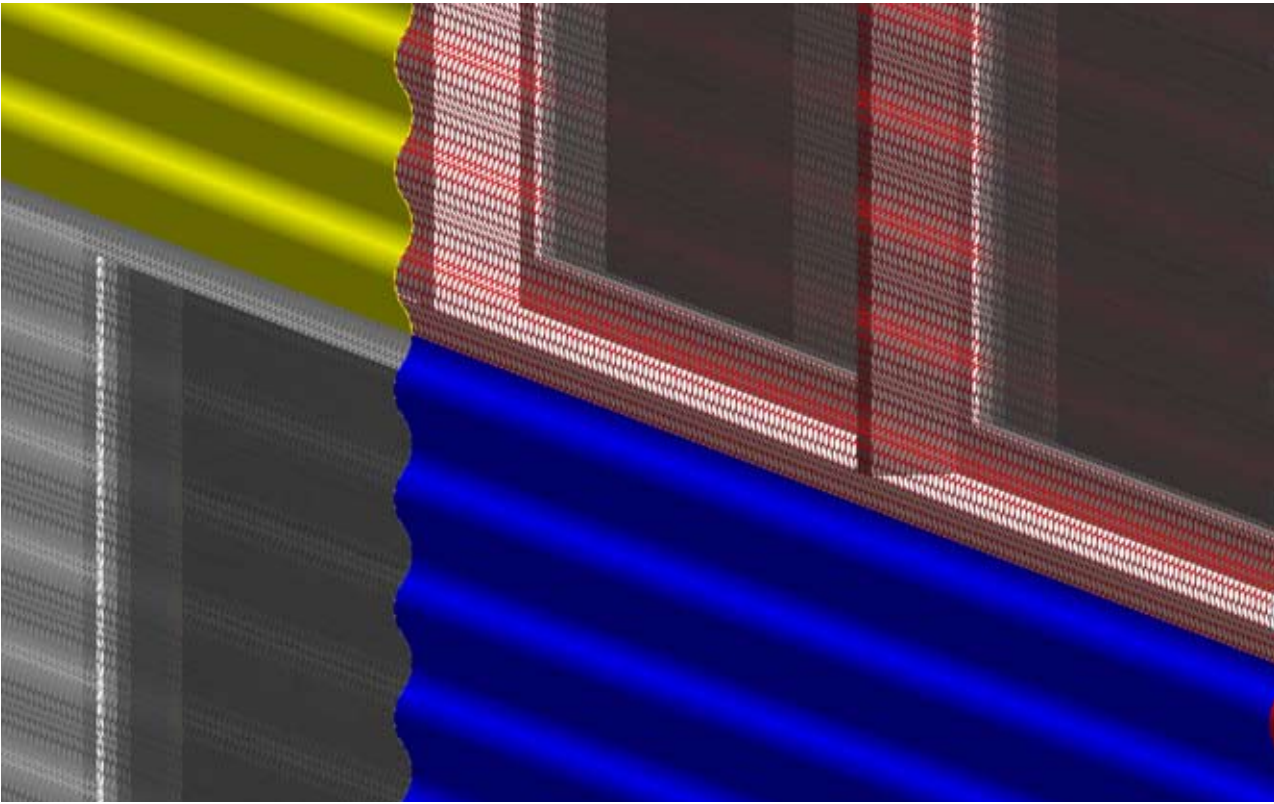
4	8	3	8	6	6	7	7	3	8	1	5	3	2	3	8	2	3
1	3	3	1	5	5	6	7	8	5	4	2	4	3	4	4	4	7
8	6	3	7	4	7	1	4	3	3	4	2	7	7	6	5	3	8
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1	1	8	3	2	8	2	3	2	8	5	7	5	5	8	2	4	1
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8	3	2	1	6	6	7	7	2	4	4	4	4	1	8	4	2	8
4	6	7	2	5	1	4	2	6	6	5	3	3	6	5	6	1	2
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Timestamp: 2011-04-10 05:52:03 UTC



Timestamp: 2011-04-10 05:52:03 UTC

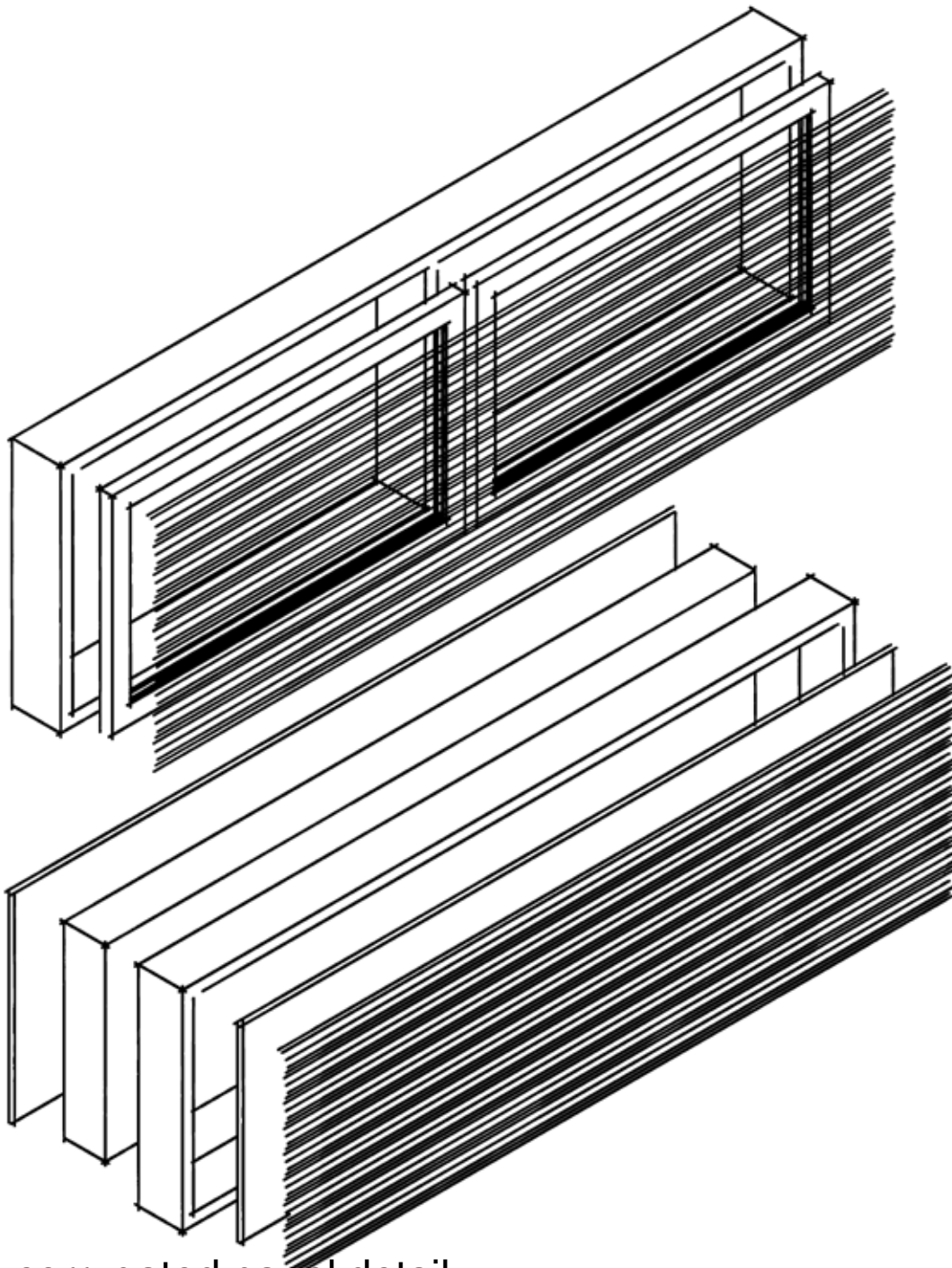




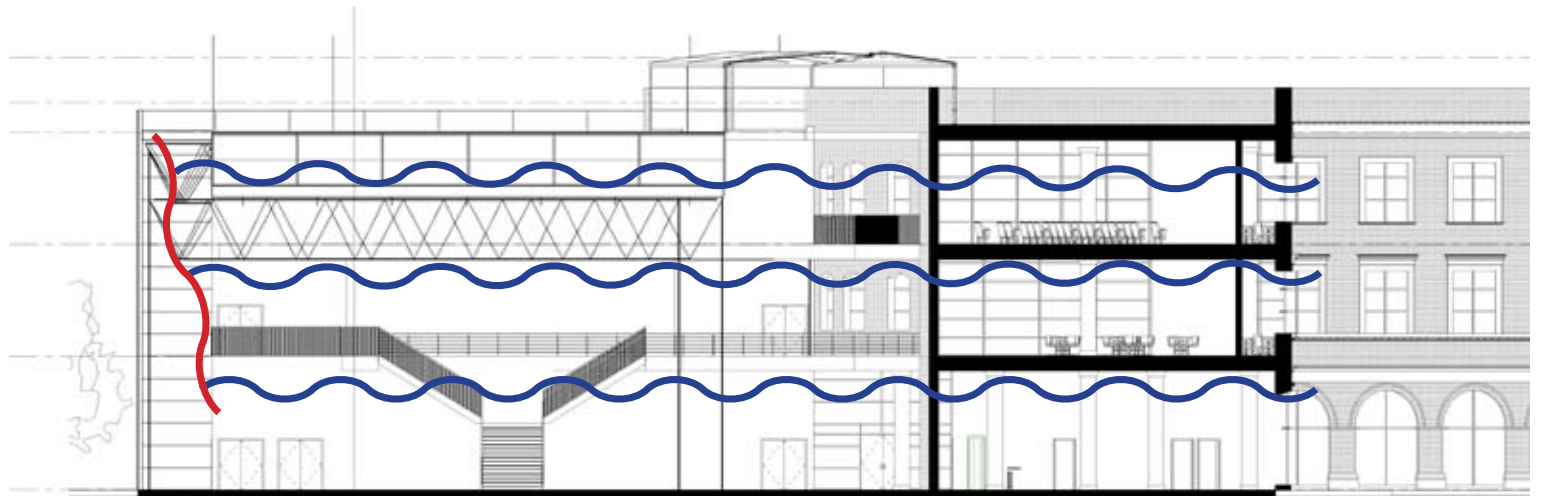


**final**

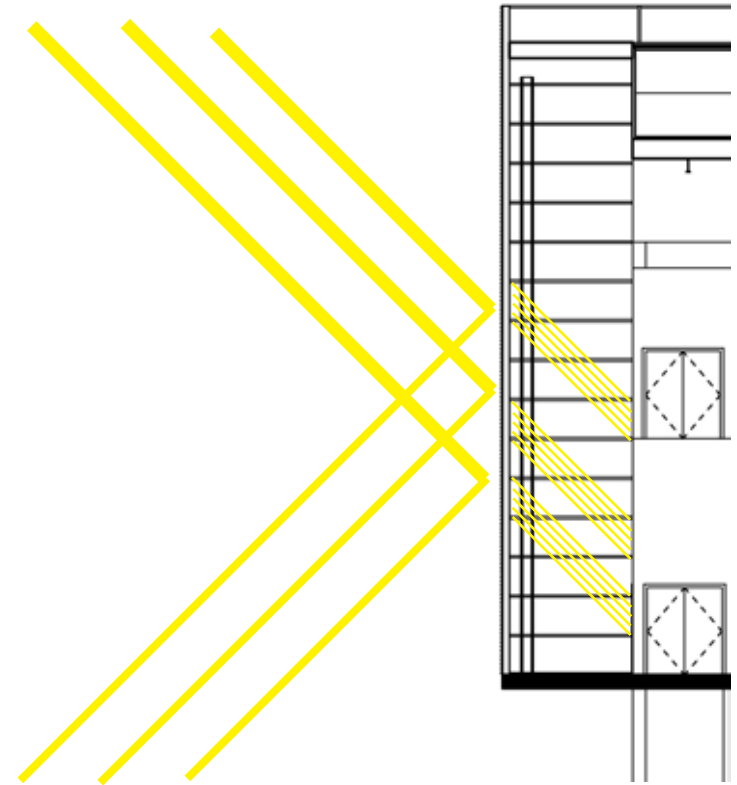
**images**



corrugated panel detail



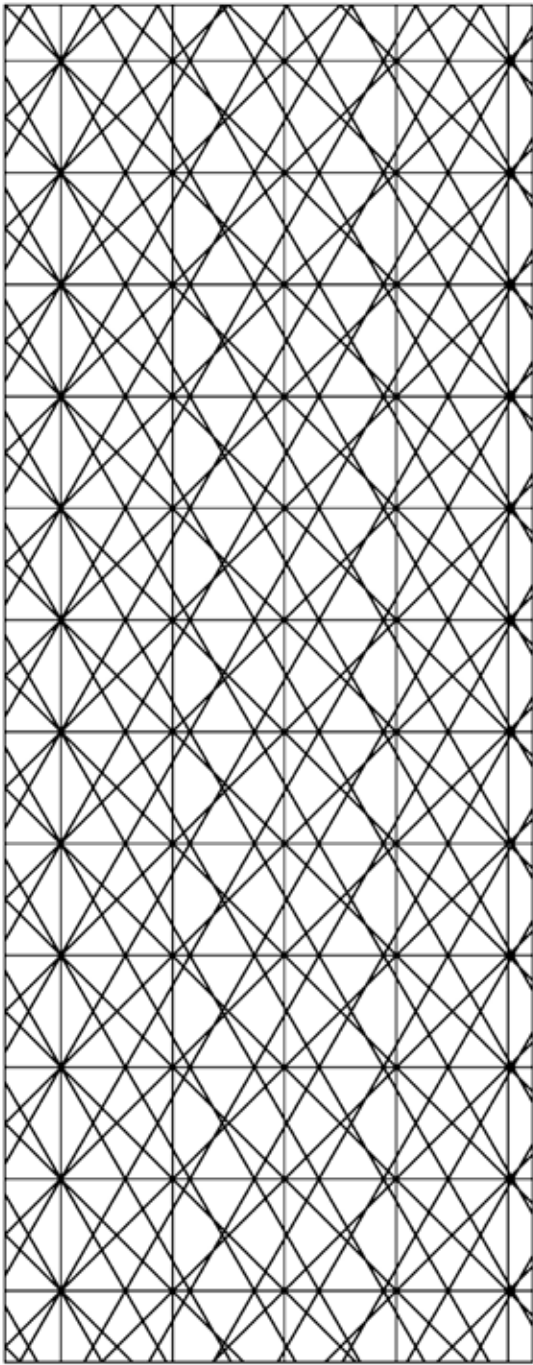
thermal chimney detail



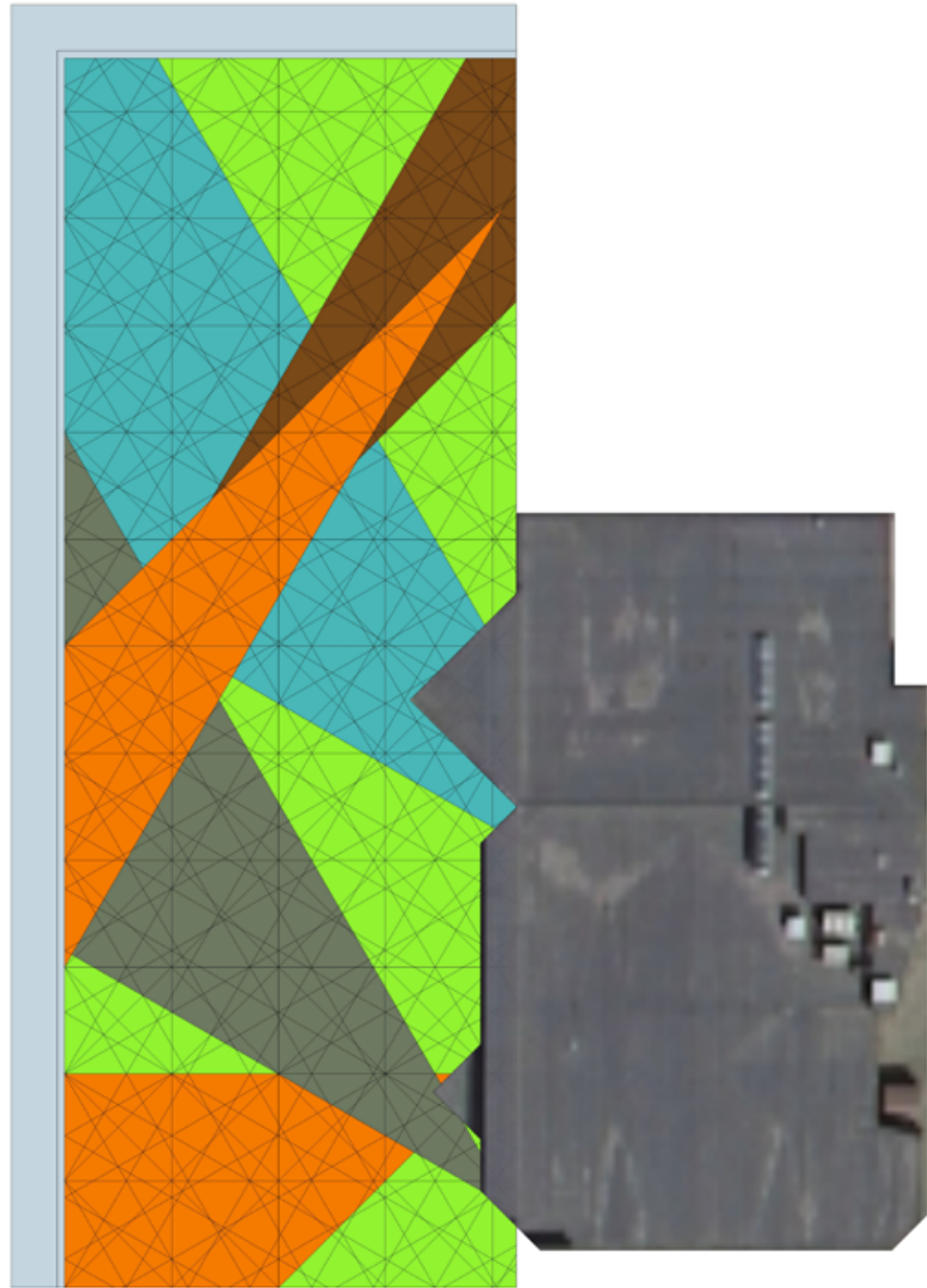
perforated skin detail

design documentation

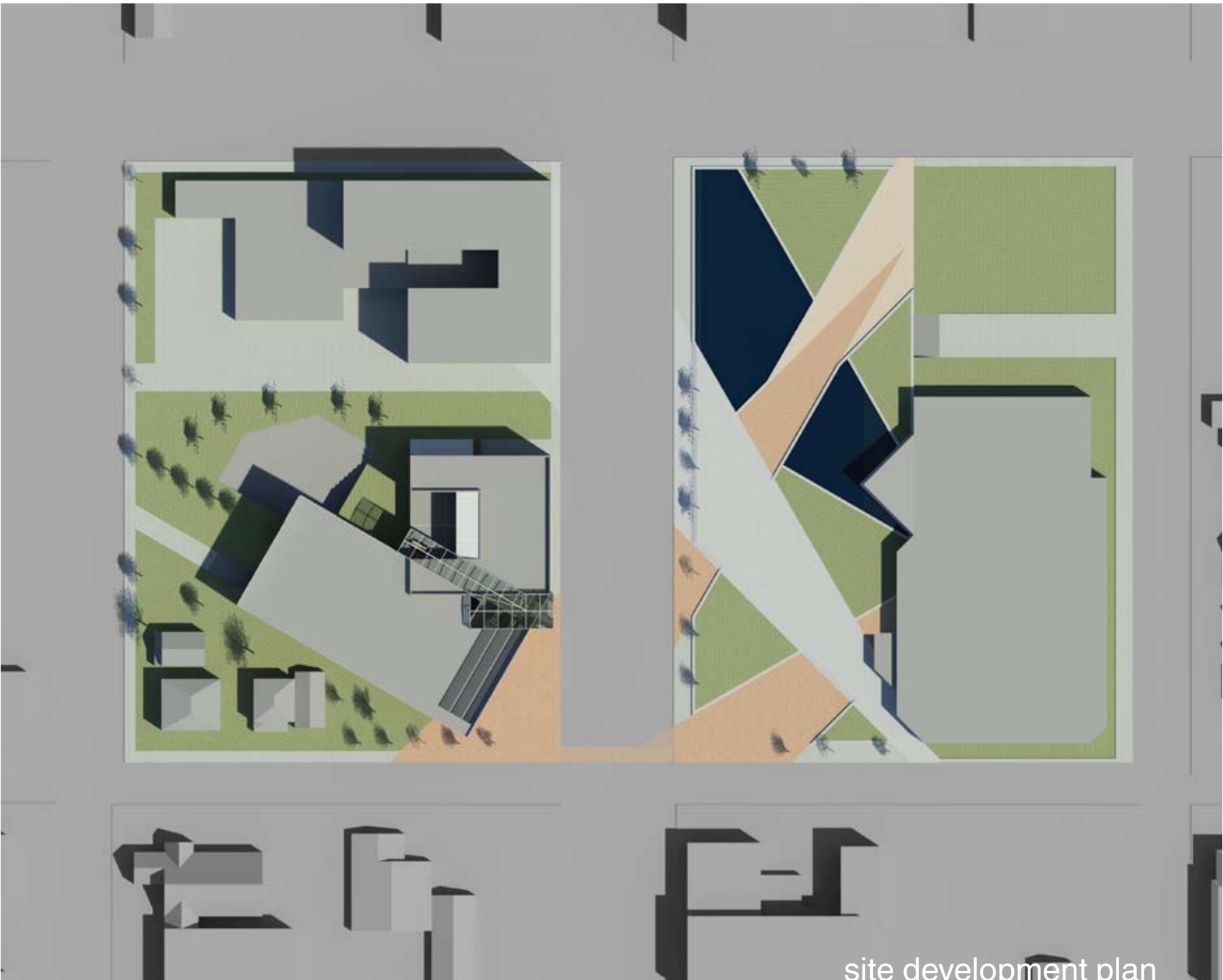




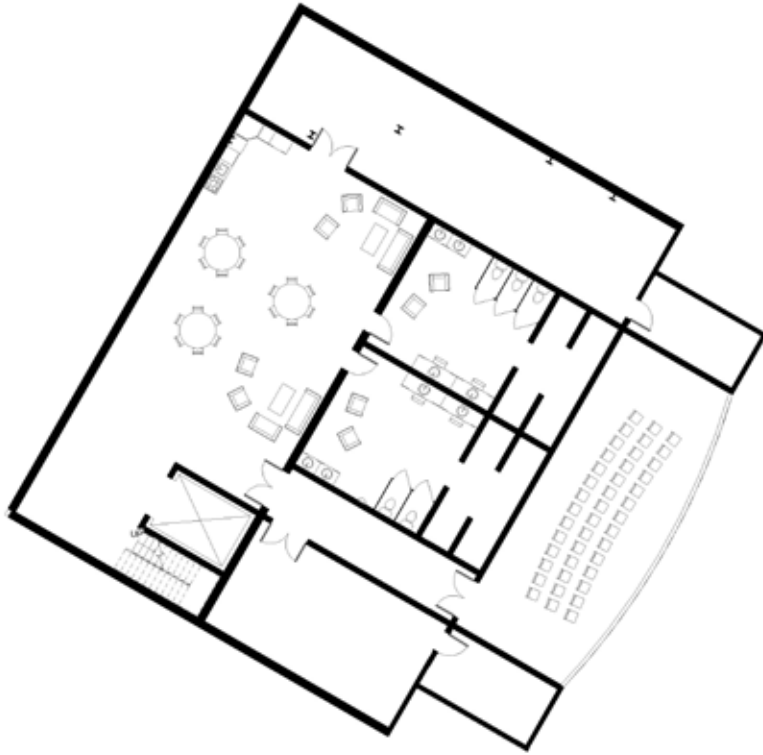
plaza design grid



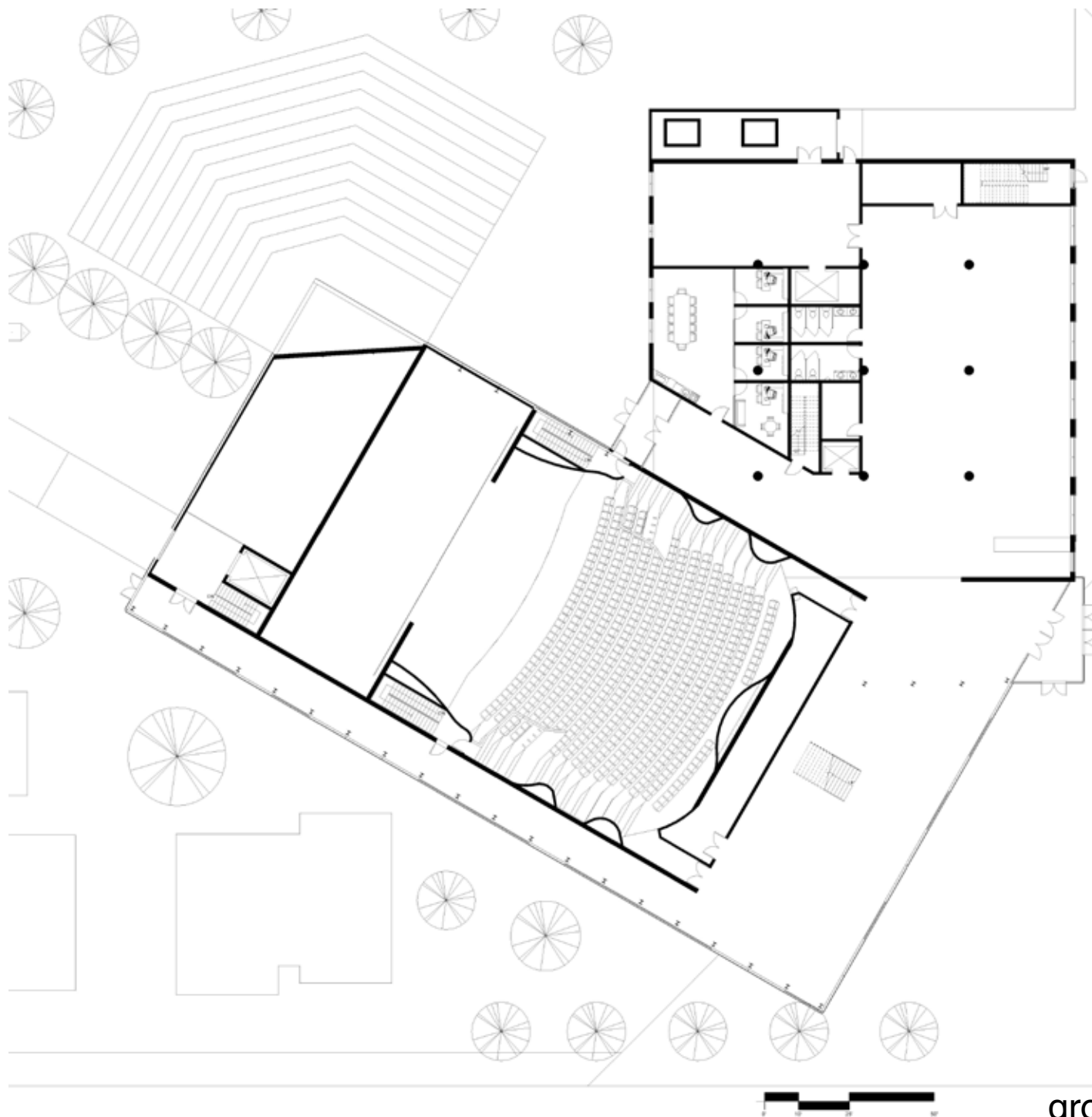
design documentation



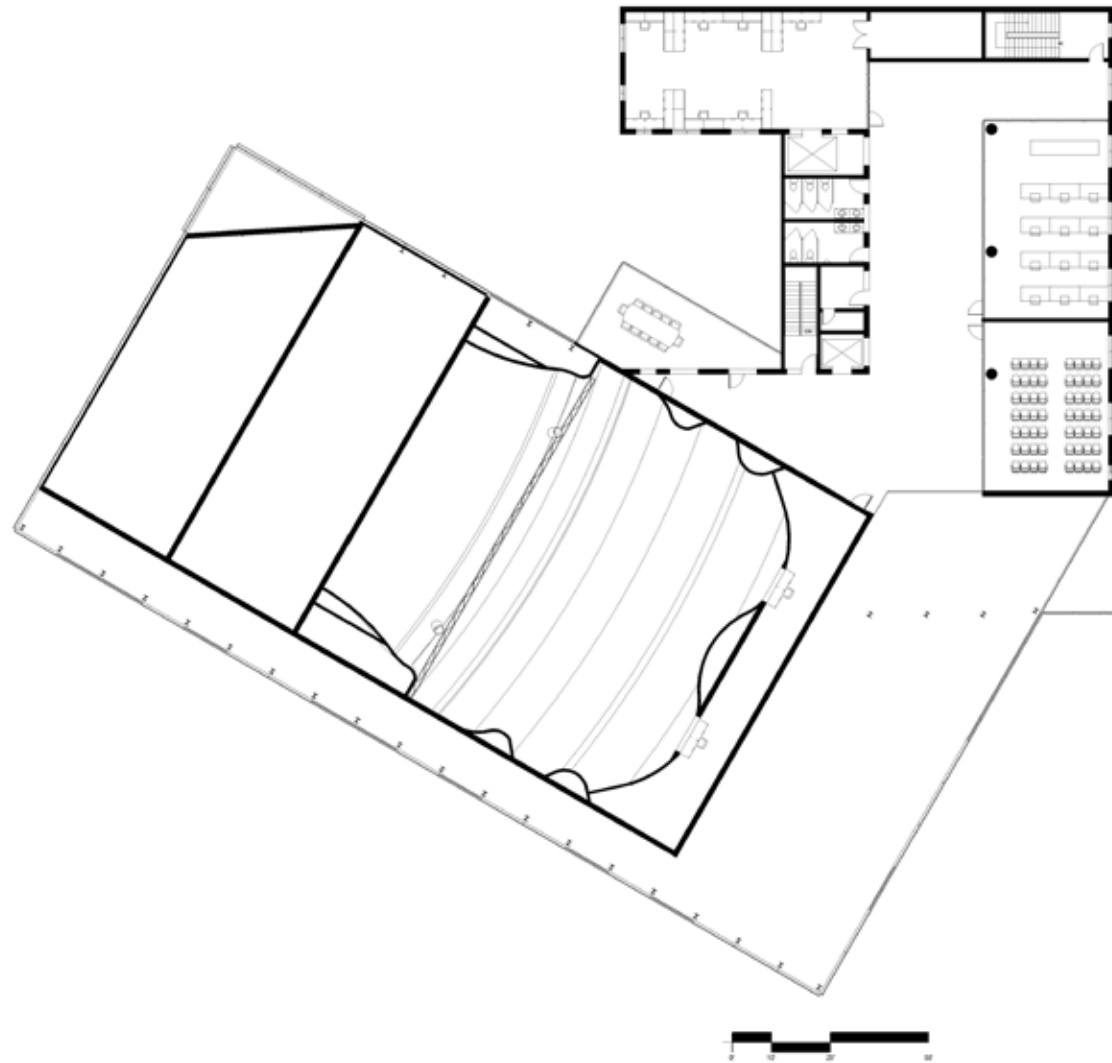
site development plan



basement floor plan

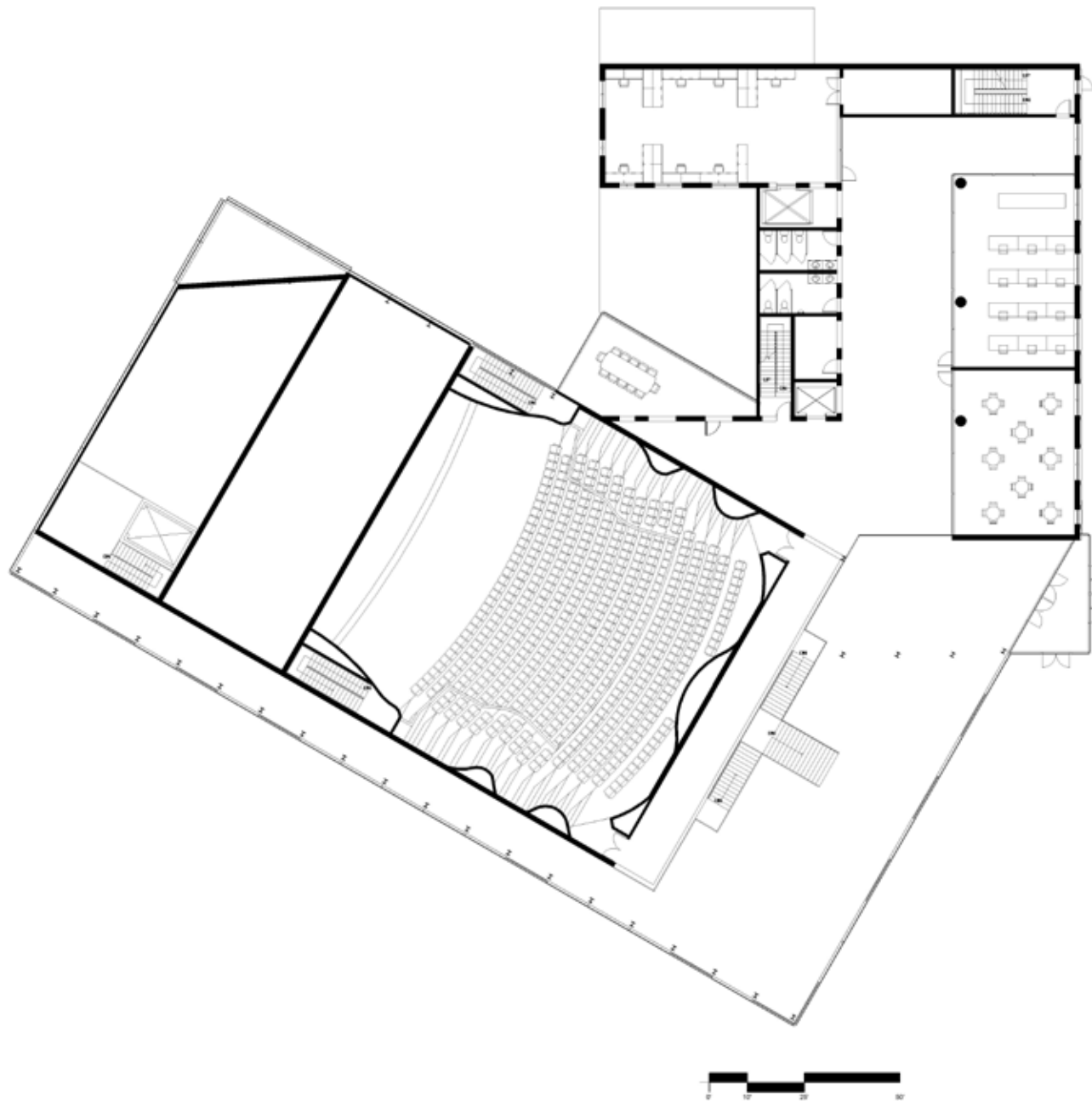


ground floor plan



second floor plan







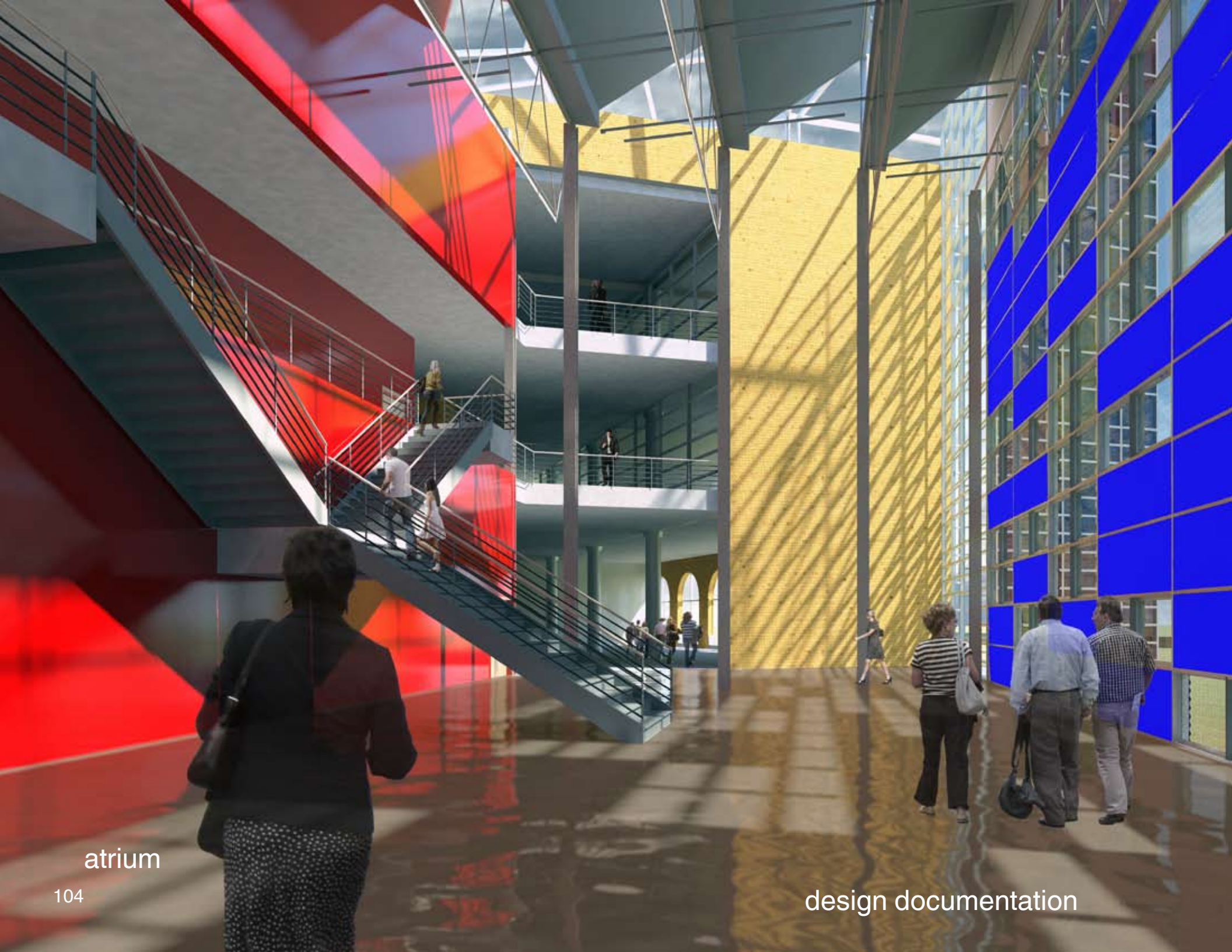
birdseye

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design documentation







atrium





design documentation

auditorium

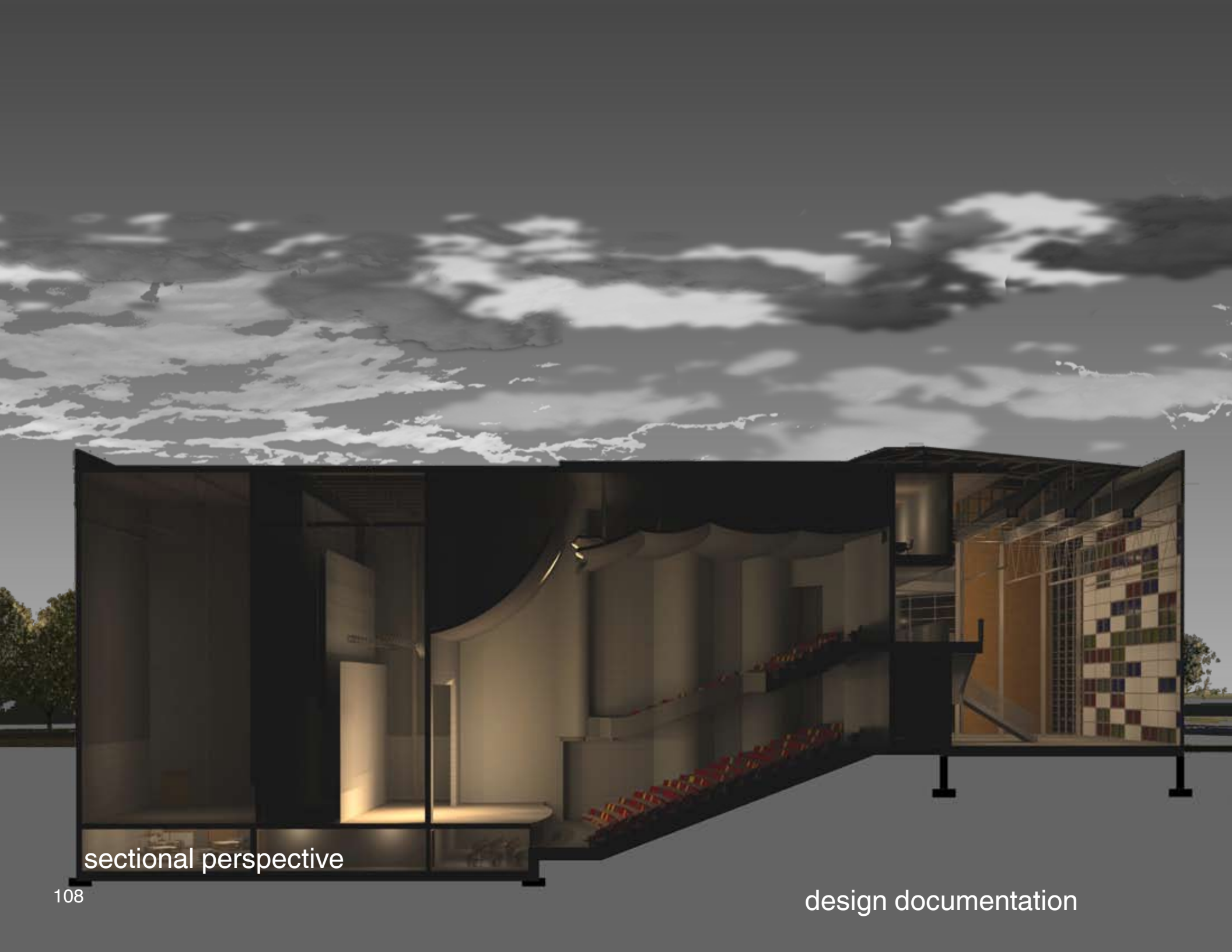




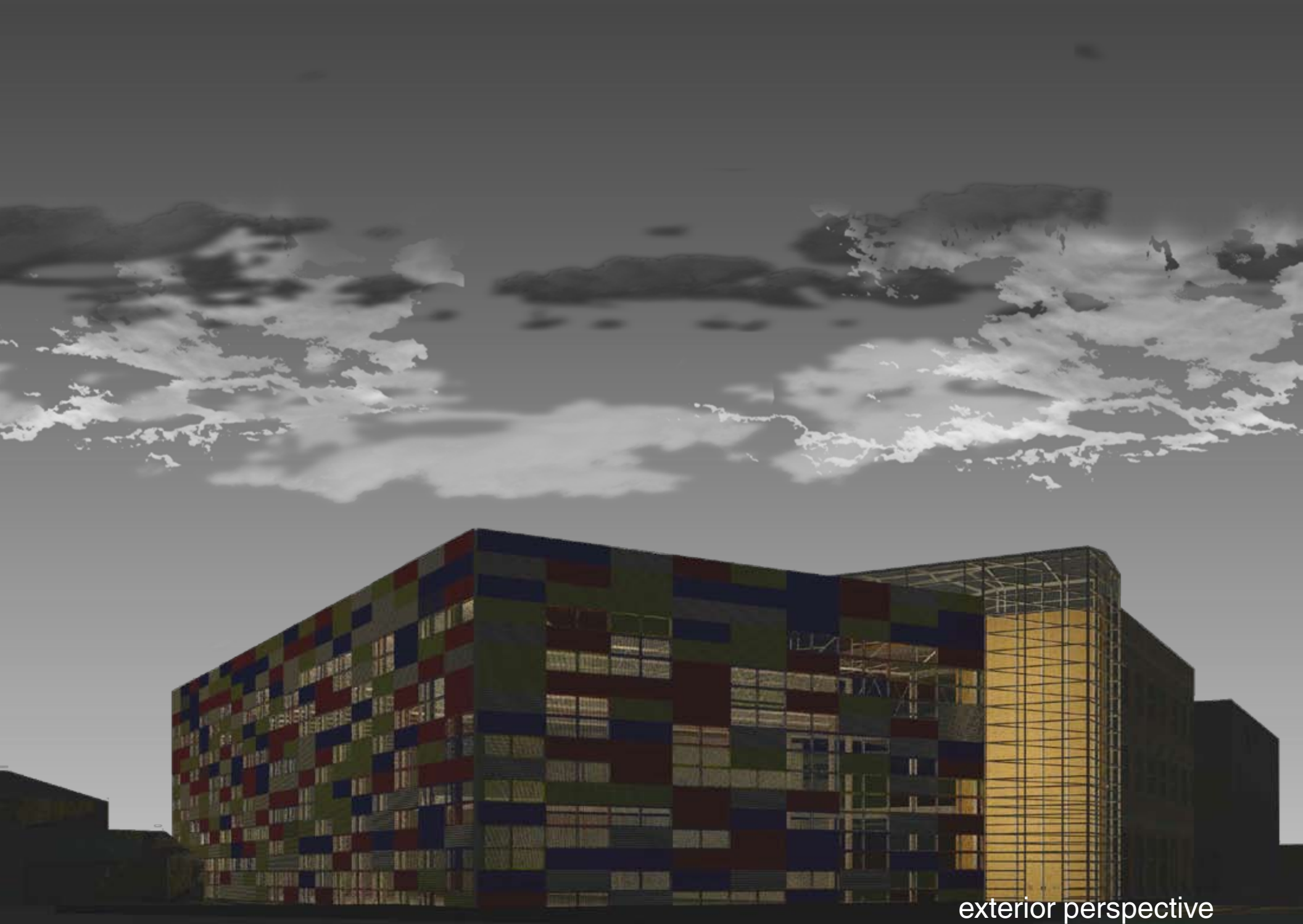
conference room







sectional perspective

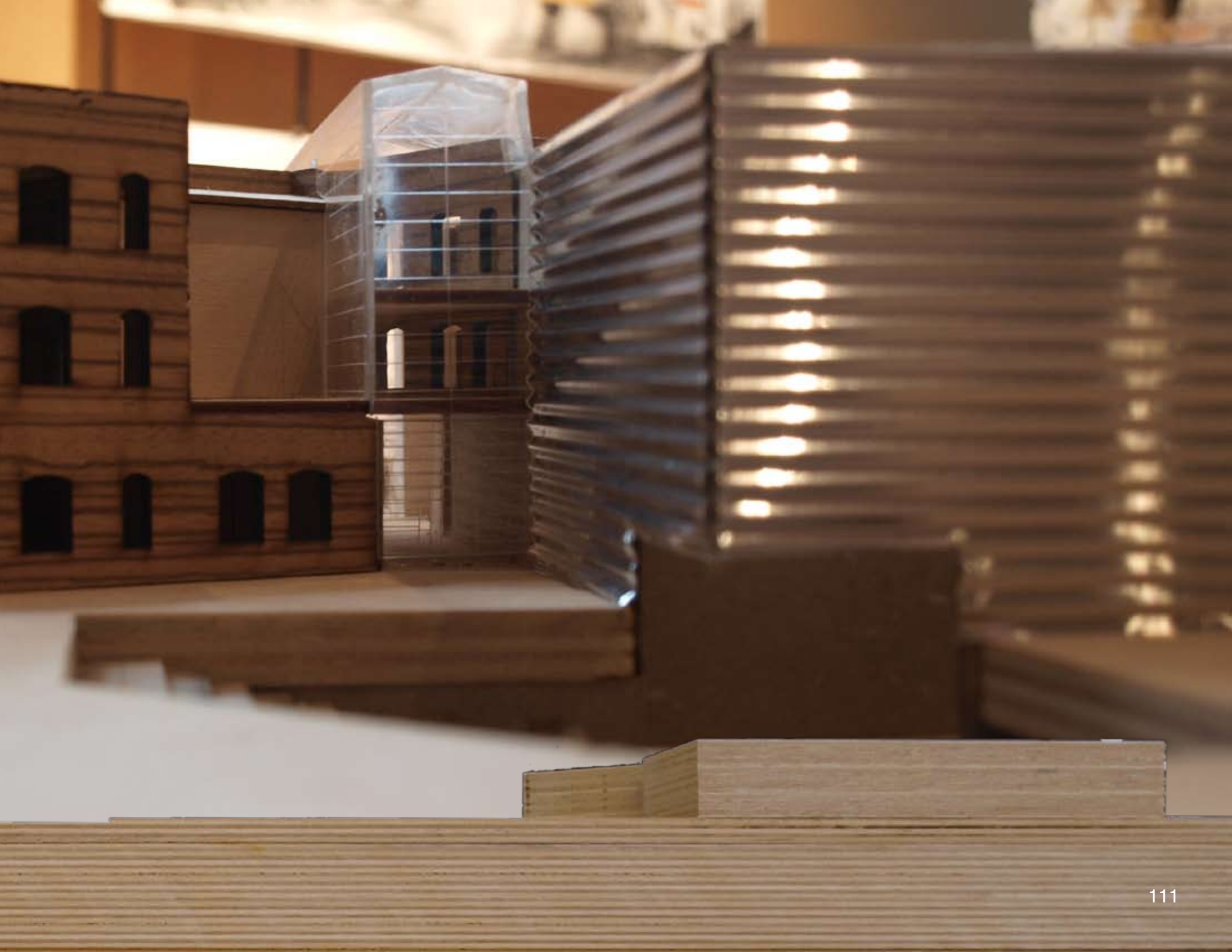


exterior perspective



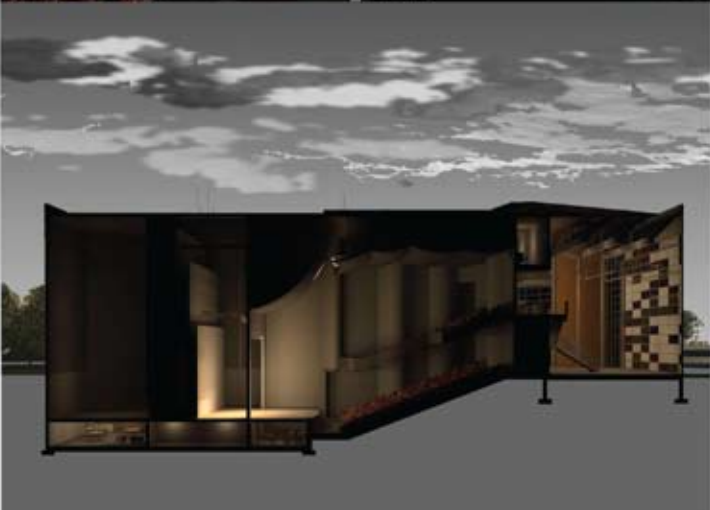
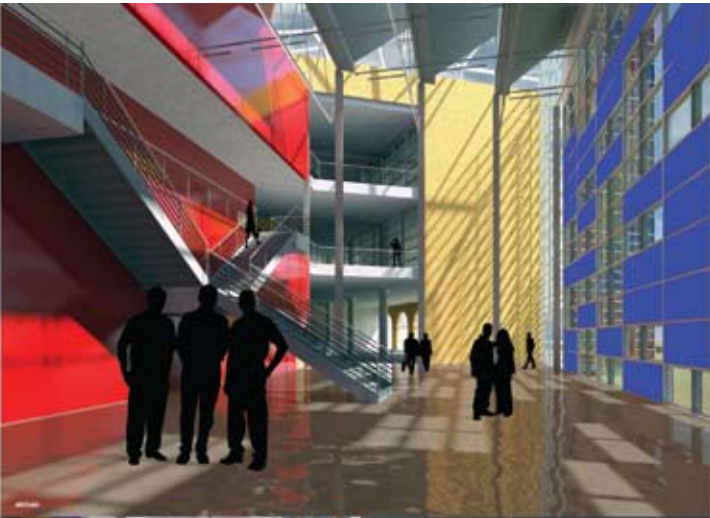
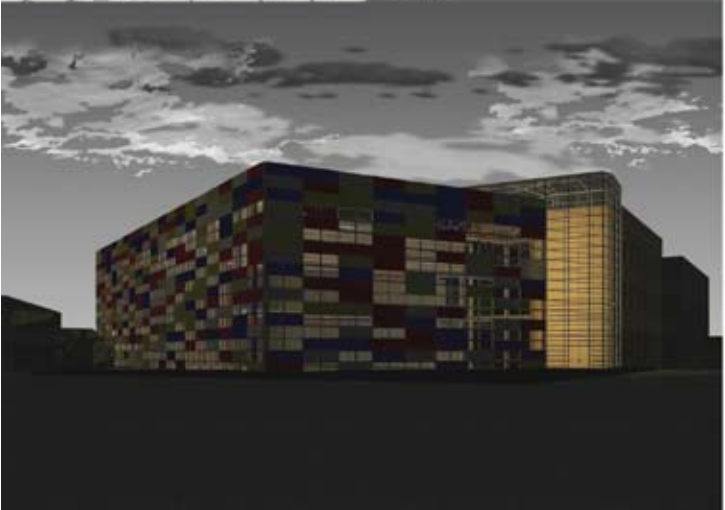
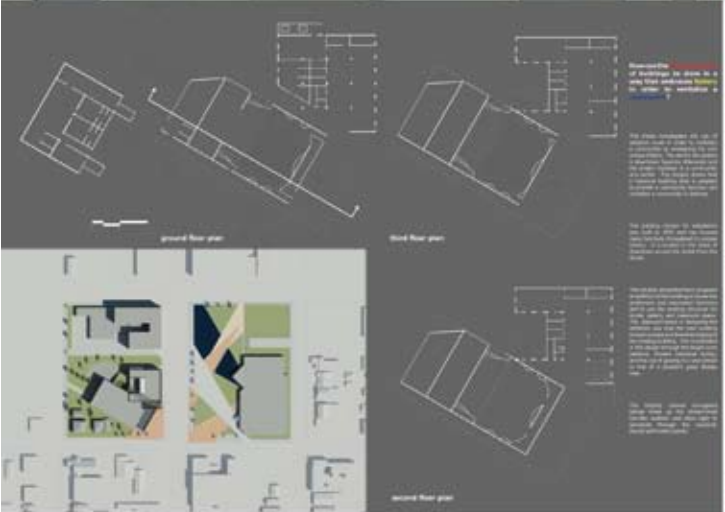
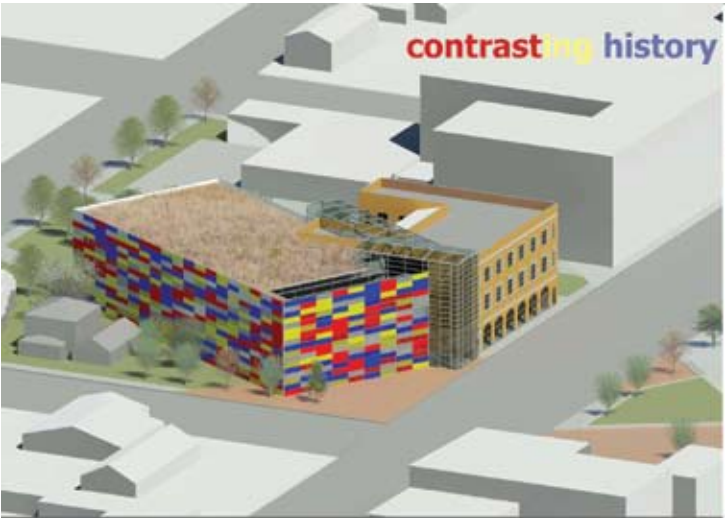












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721 8th St N Apt 1  
Fargo ND, 58102  
701.200.2594  
jared.jensen@gmx.com

Saint Cloud, MN

"Less is more only where more is no good."  
-Frank Lloyd Wright







