BRAZEN CENTER FOR THE PERFORMING ARTS
Moorhead, Minnesota

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

By

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

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Thesis Abstract:

This thesis project consists of creating a bioclimatic performing arts center in Moorhead, Minnesota. The thesis will examine the correspondence between the biological imperatives of human sustainability and the deep human need for artistic performance in the civic culture.

Statement of Intent

The Project Typology:

A bioclimatic performing arts center located in Moorhead, Minnesota.

The Theoretical Premise:

The thesis will examine the correspondence between the biological imperatives of human sustainability and the deep human need for artistic performance in the civic culture. Design metaphors, analogies, and or tectonics will be developed from the examination.

The Project Justification:

Moorhead is searching for ways to build a new performing arts center. This project can help influence decisions and be added to the dialogue.

Thesis Proposal

1. The Narrative

This thesis project is about creating and developing the best solution for a sustainable performing arts center located in Moorhead, Minnesota. Through intensive research and examining case studies it will show why a performing arts center is a necessity to the community. The center will be environmentally friendly and address sustainable issues. It will examine the correspondence between the biological imperatives of human sustainability and the deep human need for artistic performance in the civic culture. By doing so, the performing arts center will be beneficial to its users and enhance opportunities for the community. Surrounding educational facilities like MSUM and Concordia College will play an important role in its site location and future responsibilities as primary users.

A performing arts center will influence the community greatly in Moorhead, Minnesota. Currently, there is public outcry for such a facility, especially one that is sustainable and environmentally friendly. A well respected and sustainable performing arts building is just what the public is looking for. A large scale performing arts center can be an important part of an educational experience and source of entertainment for the community and surrounding communities. By creating a sustainable building it will educate the public about the importance of using and promoting sustainable issues. The building should use a smart system that allows people to monitor all its sustainable issues at any given time. Moorhead needs to bring forth such a facility and involve its nearby colleges and schools as its primary users. By doing so, shared responsibilities will be presented ensuring long-term usage and success.

A sustainable performing arts center will strengthen its educational purpose and function in the community. It creates an opportunity for the city and local colleges like MSUM and Concordia to have a performing arts facility located near them. This would allow them to use the building for their own educational purposes and entertainment. It also creates strong ties with the community as well as strengthening the city's reputation. Overall, this thesis project will provide merit for why such a building is needed in our community.

2. A User/Client Description

The performing arts building will be owned and operated by the city of Moorhead with special consideration to its users. The primary users will be students and faculty of the tri-college campuses which include MSUM, Concordia College, and NDSU. The scheduling of the building usage times will be of utmost importance to ensure maximum usage for the community and local colleges. Peak usages of the performing arts facility will be during the colleges fall and spring semesters with some outside uses. The primary users will play an important role in providing building maintenance and fulfilling its annual budget requirements. A special economic issue that will result in lower annual budget costs will result from educational funding from federal, state, and local governments. Other considerations for this facility include what kind of parking requirements will be associated for each of the users. Due to the great number of users there will have to be special permit requirements and incorporate a bus system route for the facility.

3. Major Project Element

Some of the major project elements include spaces like a large scale performance area or auditorium that allows maximum seating for audiences. This should take special consideration to the maximum number of people occupying the facility at any given time or event. Also, corridors and lobby areas are of great importance for the building to function properly. Another major element will include parking spaces and bus route systems to ensure good circulation to and from the building. The need for overflow parking areas need to be considered for large scale events. By limiting the amount of parking areas at the site it will promote a more sustainable atmosphere. It will provide more green space on the site and reduce pollutants from water runoff. Parking areas on site should be sustainable and use some type of permeable surface. Other major project elements include the number of restrooms needed, conference rooms, mechanical spaces, electrical spaces, circulation areas, egress, elevators, stairs, service areas, loading dock, maintenance, and public outdoor spaces.

Through research the following spaces will be determined and other spaces may result. The need for classrooms for such an educational facility is of great importance and will make it more convenient for the learning process. Also, vocal and instrumental sound rooms will need to be calculated into the building. Another space needed for this type of facility is a greenroom. Other possibilities for this performing arts building is to have a smaller scale auditorium for performances. Overall, these spaces will be dependent upon further research and documentation which will be stated in the program.

4. Site Information: Macro to Micro Scale

The proposed site for the project is located one block east of Concordia College and two blocks south of MSUM's campus in Moorhead, Minnesota. The site is a great location due to its close proximity to both campuses. It would provide convenience for these campuses because it would limit the amount of transportation needed for students and faculty. Also, the site is located toward the central part of the city which allows convenience for the community as well. The site itself is very large and relatively flat with very little restrictions.

As part of the site inventory the historical, social, political, and economic issues will be addressed as research is collected and documented. The importance of the site location is of great concern when relating it to these things. As part of its geographic location the site is located along 12th avenue and 11th street south in Moorhead. The site is approximately a block square with great view to all directions. It has easy access to and from the site and is located near a major transportation artery. Eighth Street runs a block west of the site and Eleventh Street runs adjacent to the site. The site also provides opportunities for future expansion if necessary. The following pictures to the left are taken of the site in context to its surroundings.

Site Information: Macro to Micro Scale (continued)

Some of the physical attributes of the site inventory that will be researched include the following:

-Ecological/Environmental issues

1. Solar Orientation

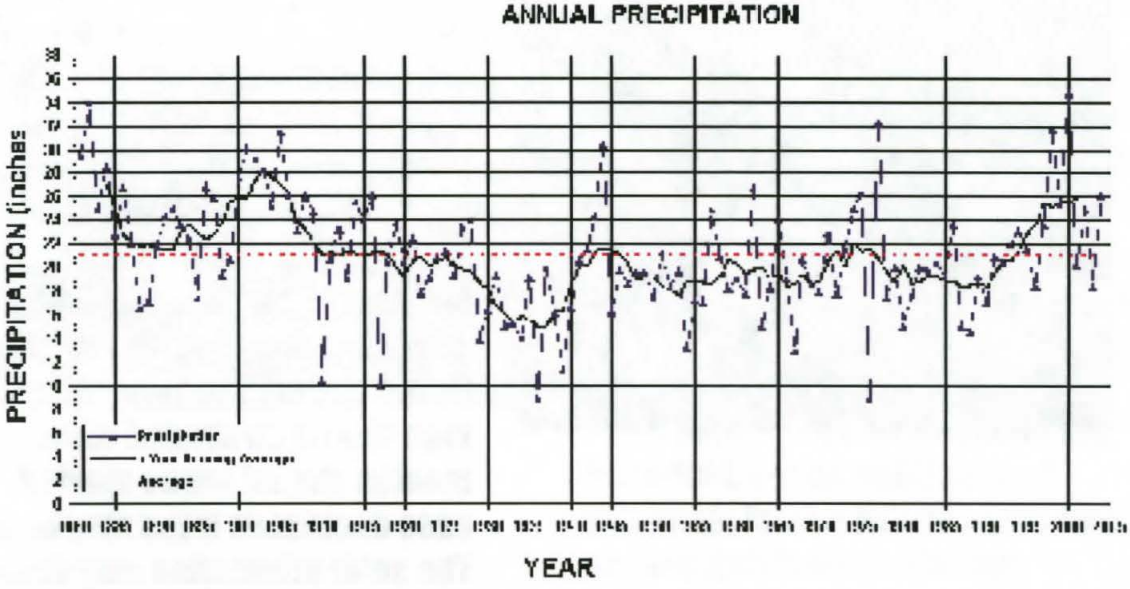
The south façade of the building will maximize the amount of solar heat gain and should be important in determining building materials and amount of glazing used. It will also determine the location of sun shading devices and where landscaping should take place. During the summer months the south side should be shaded while winter months should not be shaded. In this case deciduous trees may be used. The solar orientation may determine or influence where specific spaces may lie within the building to maximize solar heat gain and loss.

2. Prevailing wind analysis

The prevailing wind will influence landscaping and material type. During winter months landscaping can help block or prevent cold northerly winds from hitting the building directly. The building material type will also be influenced by the prevailing winds.

Site Information: Macro to Micro Scale (continued)

3. Annual Precipitation

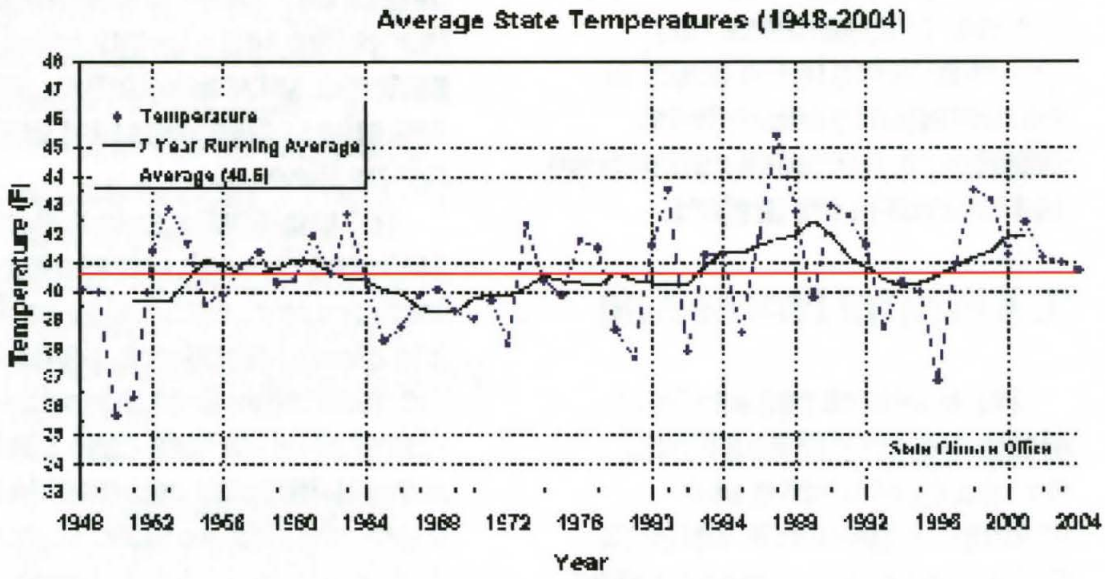


The annual precipitation will have an effect on the drainage of the site and if drainage ponds are necessary. The need for permeable materials may also be influenced from these precipitation patterns. The water table is affected by the amount of precipitation and needs to be considered in the building process. Soil types are also affected by the amount of water present and must be researched in the site analysis.

Site Information: Macro to Micro Scale (continued)

4. **Acoustical Characteristics**

5. **Annual Temperatures**



The annual temperatures diagram show trends in temperature and may influence what kinds of things are happening to the site. This may influence building orientation, sun shading, and other sustainable issues.

- Vegetation
- Geology
- Soils
- Hydrology

5. Project Emphasis

The need for an artistic performing arts center and the biological imperatives of human sustainability are the main emphasis in researching the theoretical premise of this project. The importance of the center to its community is highly regarded as well as the sustainable issues at hand. To experience this type of building in the realm of the sustainable educational experience, it creates enthusiasm and interest in the project.

6. A Plan for Proceeding

The research and analysis of this project will be a Mixed Method, Quantitative, and Qualitative approach. Through this a concurrent transformative strategy will be employed which will be guided by the theoretical premise. The implementation will gather both quantitative and qualitative data concurrently. The priority will be assigned by the requirements of the theoretical premise and the integration of the data will occur at several stages in the process of the research. This will depend on the requirements of the examination of the theoretical premise. Throughout this process analyzing, interpreting, and reporting of results will occur.

The quantitative data includes statistical and scientific data. Statistical data is gathered and analyzed locally or obtained through archival searches. On the other hand, scientific data is measured and obtained through instrumentation or through experiments. These are usually gathered directly or through archival search. The quantitative data to be researched will include things like soil surveys, precipitation patterns, solar orientation, wind roses, and other categories that quantify information.

The qualitative data will be gathered through direct observation, local surveys, archival searches, and direct interviews. Some of the qualitative data that will be researched include case studies from several different geographic regions. There will also be interviews with Concordia and MSUM. There opinions and input will be weighed heavily and help in the programming process.

The design methodology includes both a graphic analysis and language based methodology. The graphic analysis may include using one of the following or combination there of; an interaction matrix, interaction net, venn diagramming, morphological charting, or other possibilities. This analysis will show the relationship of spaces and concepts to each other. It will help in spatial organization

A Plan for Proceeding (continued)

and show how things are related. The language based includes a philosophical logic which includes adduction and deduction. Adduction brings forward as an argument or as evidence while deduction is concluding from a set of premises. Phenomenology may also be used which is an examination of the objects or events as they appear in experience. The last language based methodology is dialectical which is known as a logical argument. All of these design methodologies will be used at some point through the process of the research.

The documentation of the design process will use digital means. The use of digital drawings, scanned images, and photography of a model will be the primary documentation of the design process. Another important part of the documentation process is the use of sketchbooks. All these means will be incorporated into the documentation of the project in which a final exhibition will result. A final power point presentation and final thesis document can be easily developed.

Schedule of the work for thesis project are as follows. (Some dates may change.)

Thesis Proposal

A Plan for Proceeding (continued)

Week One: October 24 - 28

October 24: Meet with Professor Mohamed Elnahas
October 27: Final Proposal due

Week Two: October 31 – November 4

Work on Thesis Program
Site Inventory/ Analysis
Case Study Research

Week Three: November 7 – 11

Work on Thesis Program
Case Study Research
November 11: Veterans' Day Holiday

Week Four: November 14 – 18

November 16: Meet with Professor Mohamed Elnahas
Work on Thesis Program
Interviews with Concordia and MSUM

Week Five: November 21 – 25

November 23: Draft Thesis Program Due
November 24 -25: Thanksgiving Holiday

Week Six: November 28 – December 2

November 28: Meet with Professor Mohamed Elnahas
Thesis Program Revisions

Week Seven: December 5 – 9

December 8: Final Thesis Program due

Week Eight: December 12 – 16

Finals Week

December 17 – January 9

Christmas Vacation
Work on Concepts/Sketches

Week Nine: January 10 – 13

Work on Concepts/Sketches

Week Ten: January 16 – 20

January 18: Meet with Professor Mohamed Elnahas
January 16: Martin Luther King, Jr. Holiday

Week Eleven: January 23 – 27

Preliminary Design

Thesis Proposal

A Plan for Proceeding (continued)

Week Twelve: January 30 – February 3

Design Work

Week Thirteen: February 6 – 10

February 6: Meet with Professor Mohamed Elnahas
Design Work

Week Fourteen: February 13 – 17

Finalize Design Work

Week Fifteen: February 20 -24

February 20: Meet with Professor Mohamed Elnahas
Model Work
February 20: President's Day Holiday

Week Sixteen: February 27 – March 3

Model Work

Week Seventeen: March 6 – 10

March 8: Meet with Professor Mohamed Elnahas
Mid-semester Thesis Reviews

Week Eighteen: March 13 – 17

Spring Break

Week Nineteen: March 20 – 24

Work on Thesis Presentation

Week Twenty: March 27 – 31

March 27: Meet with Professor Mohamed Elnahas
Work on Thesis Presentation

Week Twenty-one: April 3 – 7

Work on Thesis Presentation

Week Twenty-two: April 10 – 14

April 12: Meet with Professor Mohamed Elnahas
April 14: Easter Holiday

Week Twenty-three: April 17 -21

April 17: Easter Holiday
Work on Thesis Document

Have Thesis Project Completed

Week Twenty-four: April 24 -28

Work on Thesis Document
April 24: Thesis Projects due at 4:30 p.m. on the Fifth Floor Downtown
April 25 -26: Annual Thesis Exhibit on the Fifth Floor Downtown

A Plan for Proceeding (continued)

April 27 – 28: Final Thesis Reviews

April 28: Draft of Thesis Document due

Week Twenty-five: May 1 – 5

Revisions to Thesis Document

May 1 – 4: Final Thesis Reviews

Week Twenty-six: May 8 – 12

Complete Thesis Document

May 11: Final Thesis Document due at 4:30 p.m. in the Department Office

7. Previous Studio Experience

Second Year:

Fall Semester: Professor Milten Yergens

Shape and Volume Project

Dwelling Wall Model

Four Story Mixed Use Building

Spring Semester: Professor Vincen Hatlen

Broadway's Railway Park

Branch Library Project

Caribou, Maine

Fellowship Green Project

Third Year:

Fall Semester: Professor Ron Ramsey

Shaker Barn Renovation

Pipestone National Monument Project

Spring Semester: Professor Mohamed Elnahas

Convention Center

Columbia, South Carolina

UND Aerospace Project

Fourth Year:

Spring Semester: Professor Cindy Urness

Dayton's Bluff Urban Design Project

Fall Semester: Professor Darryl Booker

San Francisco High-rise Project

Marvin Windows Project

Fifth Year:

Spring Semester: Professor Ganapathy Mahalingam

On the Verge of Echoes

Rivulets of Equal

Theoretical Premise Research

Philosophy: Phenomenology of the Client-Architect Relationship

In the book, ***Dwelling, Seeing, and Designing Toward a Phenomenological Ecology***, it states that the phenomenology of relationship in architecture is the process whereby two worlds are drawn together in a lasting way. The problem or argument made today is that social policy and environmental design often fail because they are founded in connection rather than a relationship. It is important to understand relationships of things because this is the key in being a successful designer. A person should not rely on connections which are defined as arbitrary linkages between worlds that are susceptible to breakage or change. For example, a phenomenology of the client-architect relationship could help clients realize that architecture is more than simple building. A strong relationship will get the client involved in the design process and provide better and more sustainable results. Sometimes clients have little sense of how important the built environment is to human livability but through a dual relationship the architect can explain these things as well as the client can express his or her views.

In conclusion, the relationships between the designers and users/ owners of the performing arts building are essential in creating a building that will be sustainable and successful. This strong client relationship will help the design process go smoothly and move toward a more successful architecture. Also, by creating relationships with parties involved, it will help the designer understand their needs and what they expect to come out of a project. With this in mind the designer can incorporate this into a well sustained design.

Philosophy: Green Philosophy

In the book, ***Design for Sustainability***, it discusses that green philosophy is about calling or designing for sustainable development. It says that human well-being relies on the integrity of the biosphere and our sense of connection with nature. Nature has an inherent value or right to exist outside of the usefulness to humans. One of the problems with preserving green space is the hierarchy of individuals or abuse of power. As stated in the book seeking power to obtain and maintain control over others involves acquiring and/or exploiting human and natural resources. Today, we need to concentrate on the sustainable development and remove this abuse of power from certain groups or individuals. Currently, we see the

individual as integral to society and nature which produces feeling of care rather than rights as in a business owner. By designing creatively it can avoid trade-offs between nature and society.

In conclusion, all of these green philosophies should be kept in mind when designing a sustainable performing arts building. By creating a sustainable design it will promote, encourage, and educate people about the importance of being green. It is aesthetically pleasing as well as environmentally friendly. By preserving our environment and natural resources it will provide a healthier environment for everyone and help educate others about its importance.

The Social Sciences: Anthropology

In the book, ***Architectural Anthropology***, it discusses the mutual interaction of people and their built environment. It states that the subject matter of architectural anthropology is not the exploration of the whole spatial dimension of human behavior but just of the product of human constructive or building behavior. It emphasizes the need to relate built spaces and places to all aspects of human life including evolution. Today, an anthropological outlook is increasing in the architectural world when creating three-dimensional built space. It is important to look at the cross-disciplinary collaboration with the social sciences especially anthropology because it is important in satisfying or fulfilling human building needs.

In conclusion, anthropology is increasing among the architectural world showing relationships between different cultures or people with their built environment. It is important to acknowledge these relationships or interactions when designing a space. By studying human interaction with the built environment it will help make better design decisions and choices. There may be different anthropological ideas on sustainability or performing arts buildings themselves. So in researching different regions or areas it may influence the design. Human qualities and how they interact with a built space are very important and should be held in high regard throughout the design process.

The Social Sciences: Sociology

In the book, ***Social Purpose in Architecture***, it shows examples and influences of different social cultures in architecture. It explains how social thought has changed or shifted over time. It has and is still changing throughout many points in the world. There are many different social groups that have created new possibilities for the development of architecture. One of the questions that arise is whether intellectual background led to a change in social consciousness rather from economic necessity. A

Theoretical Premise Research (Continued)

change in social consciousness suggested that a change which found expression in architectural purpose and form. It would be safe to say that a combination of both intellectual background and economic necessity reflected and influenced each other. Throughout time social cultures have influenced architectural form and purpose creating many variations of the built environment.

In conclusion, social or cultural backgrounds influence architectural design. By looking at different variations of designs in society and from different parts of the world it may influence how I design a sustainable performing arts facility. Many still come back to the simplicity of form and function throughout architectural history. Hopefully, I can incorporate some of these things into my design by giving me a new outlook of how different societies view the built environment.

Philosophy: Philosophical Aesthetics

In the book, ***Environmental Aesthetics***, it states that the subject of environmental aesthetics is more than just monitoring tastes or beliefs. It is about seeking universal principles that explain commonalities or differences in response. There are two types of components when looking at aesthetic qualities. They are formal and symbolic components. Symbolic analysis focuses on style and content while formal analysis of aesthetics focuses on attributes of the object as they contribute to aesthetic response. Some examples of formal analysis include size, shape, complexity, color, and balance. Examples of symbolic analysis include things like comparing a real flower with a fake plastic flower. Although an artificial flower may look real, it will likely call up different meanings when the observer realizes it is artificial. Therefore, the aesthetic experience of the urban environment may be different from one individual to another. What they experience may be different from what others experience.

In conclusion, these aesthetics must be closely monitored so that the end result is successful. In developing and creating a sustainable performing arts facility, all factors must be considered in achieving aesthetic qualities. For example, the building materials can be affected aesthetically. Materials may look pure while in fact they are fake or an imitation of the material represented. Some individuals may see this as being aesthetically pleasing while others may not. It is important to represent what is thought to be aesthetically pleasing as a whole of society. Therefore, the aesthetics in architecture should be a very important part of the design process.

Architectural Theory: Behavioral Sciences

In the book, ***Creating Architectural Theory***, it states that the main goal of the behavioral sciences is to build positive theory. This means that they are seeking to describe or explain phenomena. If they are able to do this well it allows them to predict future patterns of activities and values. This will help in determining what society's expectations or values will be. It will help to identify and create the best design solution for the project. Throughout history there has been a variety of architectural styles resulting from a number of factors. There has been the emergence of new types of clients, changes in lifestyles, culture, values, and new technology. With this said it is the designer's goal to create environments that meet these human needs.

In relation to my theoretical premise the behavioral sciences can be an important part of the design process. If the designer is able to acknowledge where the future is heading and what is expected it will help create the best possible design solution. The designer should be able to adapt to or determine expectations brought forth by society. By interviewing and observing, it allows pertinent information to come forward and influence the design process and solutions. It is my intention to use these interviewing strategies to achieve the goals or expectations of the community in Fargo/Moorhead. In conclusion, the behavioral sciences have tremendous impact in the architectural profession and should not be ignored.

Architectural Theory: Typology

In the book, ***Repairing the American Metropolis***, typology is the study and theory of architectural types and can help solve spatial problems. It is argued that almost any spatial problem has been solved in the past. So it is encouraged to look at past scenarios because they have been proven time and time again. An architectural type is not easily explained because it is like a template copied over and over with endless variations. Some may argue that this limits creativity but in fact it is great for solving programmatic issues.

In relating it to my theoretical premise it will help develop the types of spaces needed for a sustainable performing arts facility. By looking at other performing arts buildings it will help shape and provide the best solution of spaces for my performing arts facility. Typologies of buildings or spaces are a great way in gathering information and producing spaces that function appropriately. You are still able to have creativity in the design and create alternative solutions. The typology is

often called or identified with a model and is subject to change. It is something that can be referred to and is not set in stone. It is a great tool for the programming process because it gives you an overview of what certain buildings consist of and how they have functioned in past projects.

Architectural Theory: Topology

In the book, *Towards a Phenomenology of Architecture*, it has great insight on what topology is all about. It discusses how the human mind works and how he or she identifies certain geometries with certain uses. For example, usually vernacular design has topological organization in which certain neighborhoods have a certain structure or organization. Apartment buildings or complexes can be identified easily because they usually have the same shape or geometry. All of these things suggest that some buildings regularly have some association with a shape or form. When looking at sustainable concepts in buildings a person must focus or visualize what his/her understanding of nature is. A person or designer wants to build what he sees and relate it to nature or sustainable ideas. As Heidegger explains, visualization, complementation, and symbolization are the keys in bringing the environment to the unified whole. If a person can see these relations it will improve their design.

In conclusion, by establishing or recognizing different topologies it can help influence my theoretical premise. It will help in representing sustainable ideas in the performing arts building and possibly see how other performing arts buildings are represented in form or shape. The association of topologies to spaces and how people see or recognize them can be a very helpful tool in the design process. These topologies will influence my theoretical premise and affect my design in some way or form.

Philosophy: The Phenomena of Natural Place

The phenomena of natural place is an important aspect in architecture and should be part of the built environment. According to the book, *Towards a Phenomenology of Architecture*, it says that the phenomena of natural space are about understanding. When a man denotes the meaning of the experience and gives the environment meaning he or she will feel at home. It will give meaning to the ground you walk on and make people aware of the environment or natural space around them. The understanding of the natural environment grows out of the primeval experience of nature. How people feel and react to the natural environment affects how they do things in the built environment. However, the majority of people still see things like rocks, vegetation, and water to be associated with natural things. Therefore,

these natural things make people feel more at ease and comfortable with themselves. As a result, designers are incorporating these things into their design. This allows people to give meaning to the space and be environmentally friendly at the same time.

In conclusion, the phenomena of natural place is very important in giving space meaning and making people feel at home. It relates very well to my theoretical premise because sustainability is a major issue and part of the natural place. If a designer can accomplish this type of phenomena it will give meaning to the building as well as educating people about the sustainability and importance of nature in the built environment.

Philosophy: Environmental Ethics

Ethics in architecture are very important when considering the right thing to do. It can be very controversial or argumentative depending on the parties involved in the design process. Some individuals may have different opinions or beliefs about a certain idea. As a result, designers must thoroughly analyze the criteria and determine what the positive or ethical thing is to do. According to the book, ***Understanding Sustainable Architecture***, environmental ethics attempt to explain how human behavior toward the natural environment should be governed. There should be norms and morals established to provide guidelines to protect the natural environment. It is important to make ethical choices in the profession of architecture. This will help protect the environment and present more sustainable approaches and ideas.

In conclusion, ethics is an important part of the architecture profession and should be held in the highest regard. Sustainability is a key concept when talking about environmental ethics. It relates directly and bears on my theoretical premise by discussing sustainable issues. If people are kept aware of their ethical responsibility to nature it will provide a better living environment for the community. Also by practicing sustainability it will conserve energy, water, green space, pollutants, and many other aspects that relate to nature and the environment.

Summary of Theoretical Premise Research

The theoretical premise research was done through ten one page literary searches in which they were analyzed for information that bears on the theoretical premise. Conclusions were drawn from the analysis and will be discussed in the document. There were three different categories discussed in the theoretical premise research. They were

philosophy, the social sciences, and architectural theory. These three main categories were broken down into sub-categories. The first category concentrated on was the philosophies of architecture. This category was broken down into five sub-categories that consisted of the following: phenomenology of the client-architect relationship, green philosophy, philosophical aesthetics, phenomena of natural place, and environmental ethics. The next category discussed was the social sciences. This category was broken down into two sub-categories in which anthropology and sociology were discussed. The final category researched was architectural theories. There were three sub-categories examined consisting of behavioral sciences, typology, and topology. The following will discuss the conclusions of these categories and how they relate or bear on the theoretical premise.

In summary of the theoretical premise research I will discuss the philosophies of architecture for first. In the phenomenology of the client-architect relationship it shows that the relationships between the designers and users/owners of the performing arts building are essential in creating a building that will be sustainable and successful. This strong client relationship will help the design process go smoothly and move toward a more successful architecture. Also by creating relationships with parties involved it will help the designer understand their needs and what they expect to come out of a project. With this in mind the designer can incorporate this into a well sustained design.

Next, I concentrated on the green philosophies because of there importance on the theoretical premise. Green philosophies should be kept in mind when designing a sustainable performing arts building and help eliminate individuals that abuse or misuse our natural environment. By supporting or creating a sustainable design it will promote, encourage, and educate people about the importance of being green. It is aesthetically pleasing as well as environmentally friendly. By preserving our environment and natural resources it will provide a healthier environment for everyone and help educate others about its importance.

The next area I looked at was the philosophical aesthetics and how they bared on the theoretical premise. The book states that aesthetics must be closely monitored so that the end result is successful and give people a better feeling about the building. In developing and creating a sustainable performing arts facility, all factors must be considered in achieving aesthetic qualities. For example, the building materials can be affected aesthetically. Materials may look pure while in fact they are fake or misrepresented. Some individuals may see this as being

aesthetically pleasing while others may not. It is important to represent what is thought to be aesthetically pleasing as a whole of society. Therefore, the aesthetics in architecture should be a very important part of the design process.

When looking at the phenomena of natural place it gives space meaning and makes people feel at home or comfortable about the space. This subject relates very well to my theoretical premise because sustainability is a major issue and part of the natural place. If a designer can accomplish this type of phenomena it will give meaning to the building as well as educating people about the sustainability and importance of nature in the built environment.

Next I looked at the importance of environmental ethics in architecture. Ethics is an important part of the architecture profession and should be held in the highest regard. Sustainability is a key concept when talking about environmental ethics. It relates directly and bears on my theoretical premise by discussing sustainable issues. If people are kept aware of their ethical responsibility to nature it will provide a better living environment for the community. Also by practicing sustainability it will conserve energy, water, green space, pollutants, and many other aspects that relate to nature and the environment.

As part of the social sciences anthropology is increasing among the architectural world showing relationships between different cultures or people with their built environment. It is important to acknowledge these relationships or interactions when designing a space. By studying human interaction with the built environment it will help make better design decisions and choices. There may be different anthropological ideas on sustainability or performing arts buildings themselves. So in researching different regions or areas it may influence the design. Human qualities and how they interact with a built space are very important and should be held in high regard throughout the design process.

Another part of the social sciences state that social or cultural backgrounds influence architectural design. By looking at different variations of designs in society and from different parts of the world it may influence how I design a sustainable performing arts facility. Many still come back to the simplicity of form and function throughout architectural history. Hopefully, I can incorporate some of these things into my design by giving me a new outlook of how different societies view the built environment.

Now I will discuss the architectural theories researched on my theoretical premise. In relation to my theoretical premise the behavioral sciences can be an important part of the design process. If the designer is able to acknowledge

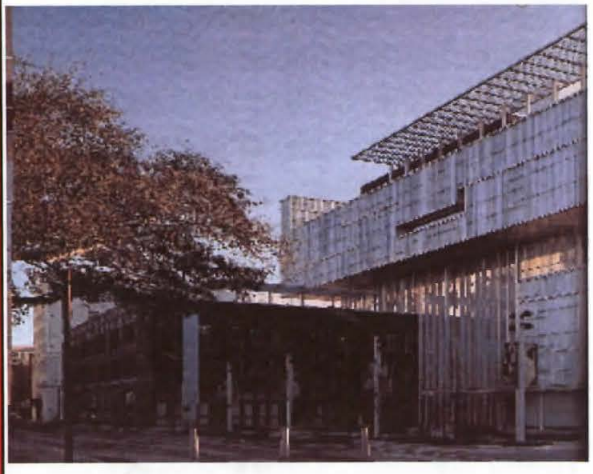
where the future is heading and what is expected. It will help create the best possible design solution for the building. The designer should be able to adapt to or determine expectations brought forth by society. By interviewing and observing, it allows pertinent information to come forward and influence the design process and solutions. It is my intentions to use these interviewing strategies to achieve the goals or expectations of the community in Fargo/Moorhead. In conclusion, the behavioral sciences have tremendous impact in the architectural profession and should not be ignored.

When researching typology and relating it to my theoretical premise it will help develop the types of spaces needed for a sustainable performing arts facility. By looking at other performing arts buildings it will help shape and provide the best solution of spaces for my performing arts facility. Typologies of buildings or spaces are a great way in gathering information and producing spaces that function appropriately. You are still able to have creativity in the design and create alternative solutions. The typology is often called or identified with a model and is subject to change. It is something that can be referred to and is not set in stone. It is a great tool for the programming process because it gives you an overview of what certain buildings consist of and how they functioned in past projects.

The last thing discussed in this summary of the theoretical premise research is the topologies. By establishing or recognizing different topologies it can help influence my theoretical premise. It will help in representing sustainable ideas in the performing arts building and possibly see how other performing arts buildings are represented in form or shape. Topologies often suggest that certain buildings regularly have some association with some geometric form or shape. The association of topologies to spaces and how people see or recognize them can be a very helpful tool in the design process. These topologies will influence my theoretical premise and affect my design in some way or form.

Case Study Research

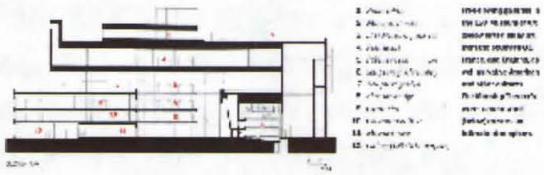
Shaw Center



The first case study that I will look at is the Shaw Center for the Arts located in Baton Rouge, Louisiana. The center is approximately 125,000 square feet and is about one hundred feet tall. Its main characteristic of its appearance is a rain screen of channel glass over corrugated metal. It has great aesthetic qualities and is very appealing to the eye. The center houses LSU's 17,000 square foot Museum of Art, 325 seat Manship Theatre, two smaller rehearsal theatres, performance spaces contained on a separate wing, two restaurants, small galleries, classrooms, and offices. Other spaces include a public lobby, theater lobby, museum store, museum lobby, public terrace, curatorial, elevator bridge, and sculpture garden.

The center makes use of it surroundings by mimicking the river with its glass curtain wall. The glass curtain wall and monolithic form resembles the river's shimmering, rippled surface and colors. Another thing that the center does is make use of its views due to the great height of the center. It maximizes the views to the Mississippi River and the center can be virtually seen from anywhere in the city. Another thing that the center does is incorporate as much natural light into the building while visually connecting the center's many components. Also the center has many aesthetic qualities which include polished concrete floors, exposed concrete support columns, and perforated-aluminum elevator and stairway coverings. These are all things that make it feel like a place where you

Case Study Research (Continued)



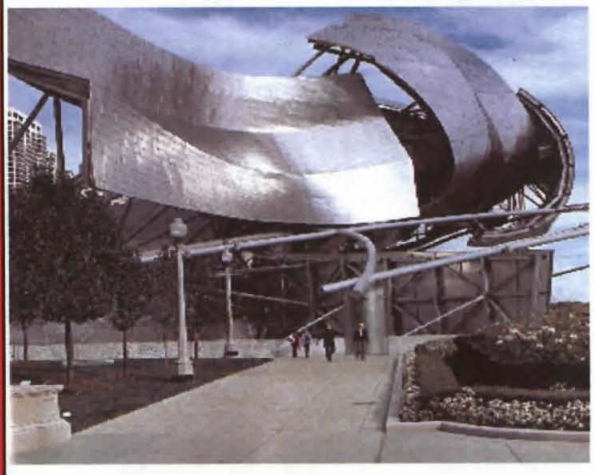
should make art rather than where you see it. However, there is one thing that is different from most case studies. Being the center is located in a hurricane zone the structure of its curtain wall is strengthened by using various sizes of greenish channel glass filtered over corrugated aluminum.

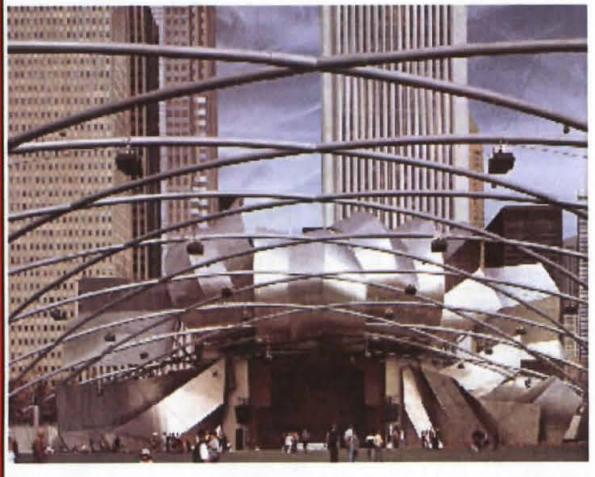
Overall, these things have the same basis and intentions of the other case studies I have looked at. They make use of their surrounding environment and have many of the same programmatic elements. It has many aesthetic qualities and makes use of our natural environment. This case shows the importance of the spaces that go into a performing arts center and how it relates to the community and surrounding elements and ideas.

In conclusion, this case study gives me ideas for aesthetic qualities in a performing arts center and provides me with information on programmatic elements. It relates and supports my theoretical premise well. By providing opportunities of spatial elements and the use of natural day lighting it will support my theoretical premise on sustainable and programmatic issues. It also shows the importance of society and why a performing arts center means so much to them.

Case Study Research (Continued)

Jay Pritzker Pavilion





The second case study I looked at in dealing with the performing arts is the Jay Pritzker Pavilion located in the Millennium Park in Chicago, Illinois. The park is twenty-four and a half acres with a price tag of 475 million dollars. The Jay Pritzker Pavilion itself cost about 60.3 million dollars and spreads across Grant Park. The pavilion consists of outdoor seating for 4,000 fixed seats and 7,000 on the lawn. As the article states it has a band shell with a boldly cantilevered headdress of gleaming, stainless-steel curls reaching 120 feet high. It is 600 feet by 320 feet wide and appears to be much like a dome trellis. The trellis extends over the audience supporting all the technical equipment such as speakers and wires. The Pritzker Pavilion wraps the underground of the Harris Theatre for Music and Dance. It consists of a huge lobby area proceeding to the auditorium.

In my research findings the Pritzker Pavilion and Millennium Park have many consistencies with other performing arts centers. It uses outdoor performance areas as well as making use of indoor theatres. This is very typical of many performing arts buildings and parks. The park relates very well to its surroundings and the design scheme for the adjacent bridge is very important. It works as a pedestrian path and eliminates or blocks noise from the busy streets beneath. One of the things that are uncommon in this case is the lack of enclosure for things like classrooms and offices for educational purposes. Therefore, some of the programmatic elements may differ

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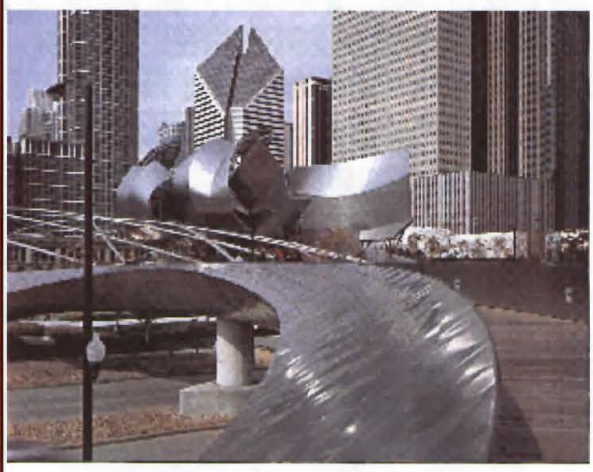
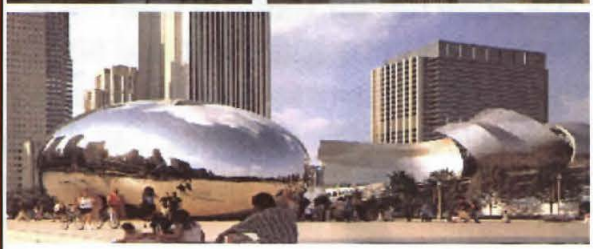




from what I had in mind for my theoretical premise. But it gives me some other ways performing arts centers can be approached.

In conclusion, this case study may influence my theoretical premise by showing the importance of using outdoor facilities for performance areas. It gives great insight of how they can be approached and what things you can do with them. It is a great way to produce green and sustainable space. Another thing that influenced me was the atmosphere of the space. The space was full of feeling and emotion which is a very important and characteristic for representing a space of the performing arts. This case study also dealt with acoustical solutions for the performance area. By shaping and allowing structures to create the best acoustics for the space is of utmost necessity. Also by using materials to eliminate or block outside noise is an important factor in your design. Therefore, these considerations support my theoretical premise and will be considered in the design process.

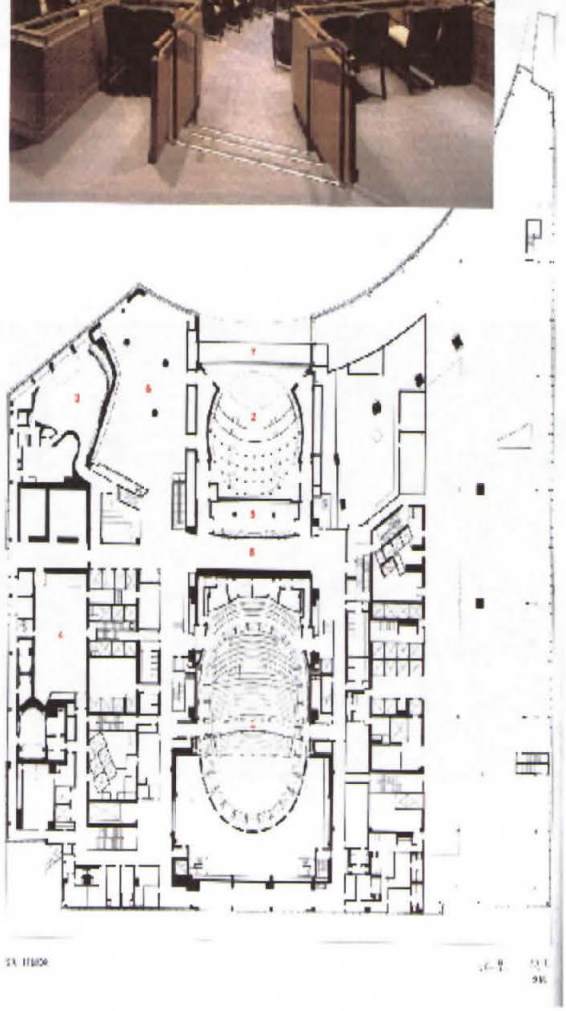
Case Study Research (Continued)

Jazz at Lincoln Center

The third case study I looked at was the Jazz at Lincoln center located in New York City. The performing arts center for jazz is located on the fifth, sixth, and seventh floors of SOM's Time Warner Center. It is approximately 157,000 square feet and cost 128 million dollars which was completed in October 2004. The space consists of four performance spaces with a Ertegun Jazz Hall of Fame and huge lobby space. One of the spaces includes a primary concert hall called the Rose Theatre which seats 1,231 people. The next space is a cabaret overlooking Central Park that will hold up to 550 people. This space was named the Allen Room. The third performance space is an intimate jazz lounge called the Dizzy's Club Coca-Cola. Finally the fourth major performance space is the Irene Diamond Education Center which is used for a rehearsal space and recording studio. The goals of these spaces were to have intimacy, acoustic richness, and a refined sense of originality. They were to develop an aesthetic that evokes jazz's elegance, dignity, and joy.

Some of the characteristics in the Rose Theatre include a very intimate atmosphere between the performers and viewers. The farthest distance any person is from the stage is 88 feet. It uses a movable seating tower which is divided into loges. It wraps the audience around the stage increasing the sense of closeness or intimacy of the space. Another thing that this space does is use lighting to provide a type of mood and aesthetic quality to the space. The

Case Study Research (Continued)

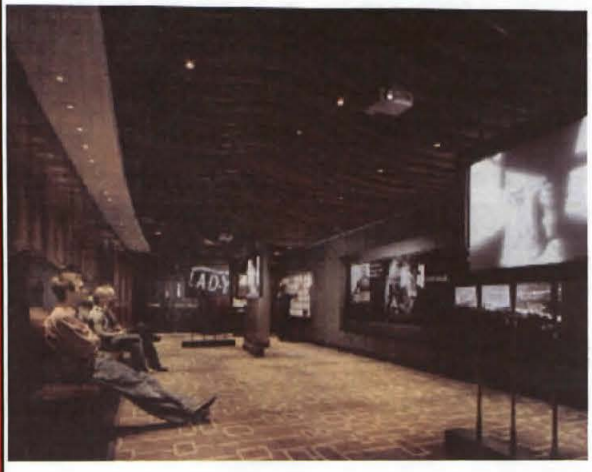


Allen Room has many distinguishing characteristics in which it uses a double-glazed window behind the stage that looks toward Central Park. The inner layer of glazing is tilted back to avoid direct light and sound reflection. A characteristic that sticks out in the Dizzy's lounge is that it uses curved bamboo walls. The space creates a sense of movement and rhythm that reflects musical attributes for the performance space.

Some of the things that this case study has in common with other case studies are that they use similar seating arrangements for performance spaces. This performing arts center uses acoustic absorbers throughout its performance spaces and is typical in all performing arts centers. Another thing that this case study does is take advantage of the views around the site. However, there is one thing that is different or uncommon when comparing them to other case studies. This performing arts center is located on the fifth, sixth, and seventh floors of the Time Warner Center. Usually, or many performing arts facilities are housed in their own space or building. So this is a different approach to a solution of for performing arts complex. Another thing that is uncommon with this case study is that it presents the first jazz performing arts complex of its kind.

In conclusion this case study shows that the performing arts can be housed in a variety of ways and still be successful. It takes advantage of the views around it and creates a sense of place with its interior use of materials.

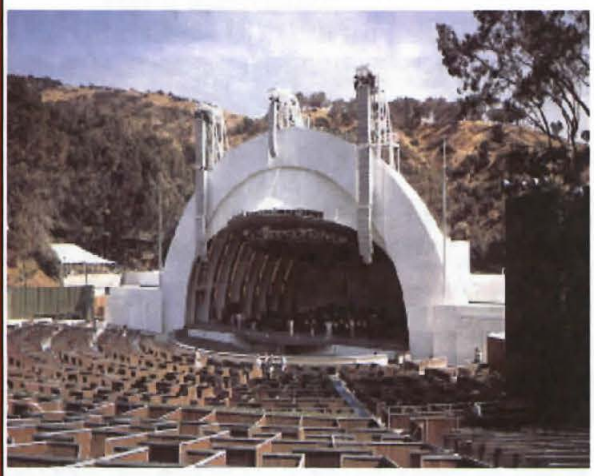
Case Study Research (Continued)

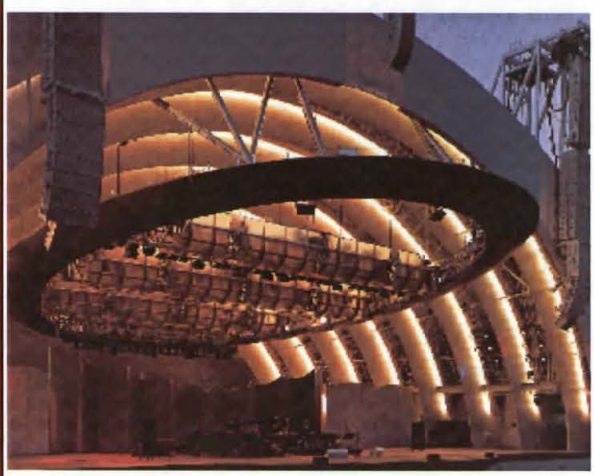


It maintains a sense of intimacy within its performance spaces and resembles and feels like a place of musical desire. As a result it gives further merit and influences my theoretical premise. I will take into consideration the type of natural materials used and how an acoustic space should be designed. Also, lighting is very important in these spaces to provide a sense of place and overall mood of the audience. However, I think other characteristics of this project will not influence my theoretical premise because there are different issues in my project.

Case Study Research (Continued)

Hollywood Bowl





The fourth case study that I looked at was a performing arts center called the Hollywood Bowl in Hollywood, California. It was approximately 28,500 square feet and was completed in June of 2004. This performing arts center is another outdoor concert area with the stage being encompassed by a shell like structure. The performing arts center had a long history in which the original form was built in the 1920's. Over the years it went through many variations of design and construction. The original structure was too small to hold a full orchestra and had poor acoustics. As a result the structure was enlarged and modified with an acoustic ceiling, acoustic canopy, and sun shading devices. Today the space will hold an audience up to 18,000 people and produce better sound quality for the concert goers. Another thing that improves its acoustical performances is operable panels for sound reflection that can be moved or varied for different performances. Other characteristics of the space include being shored up to withstand earthquakes. They also created spaces beyond the stage for recording studios and a library.

Some of the things that are in common with other case studies are the acoustic solutions for staging areas for the performances. Acoustic panels are a key for performance centers and must be properly located for maximum sound conditions. Other things that are common in many case studies are the use of sun shading devices to protect the space or stage area of direct sunlight. One thing

Case Study Research (Continued)

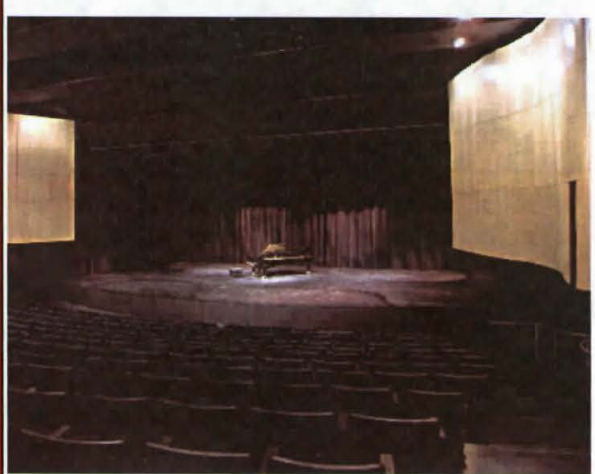
that the performing arts center did was removed reflecting ponds near the stage to provide closer seating for the audience.

In the analysis of the performing arts center it uses many variations of acoustic and structural solutions for the space. It ultimately shows how a building can be remodeled or renovated to provide better acoustics for both the performers and audience that are occupying the space. The performance space also uses sustainable concepts to produce better conditions for the structure and playing areas.

In conclusion the Hollywood Bowl relates or supports my theoretical premise of showing the importance of providing artistic performance spaces in the civic culture. It also uses some sustainable concepts that may be influenced in my design. However this case study is much out of the ordinary in which it is a renovation project. Therefore, the changes from the original structure will be considered or acknowledged to create the best solution for the design. Things can be learned from past projects that have failed so that current projects can be done well. Therefore, it will have influences on programmatic elements for the project.

Case Study Research (Continued)

South Mountain Community College



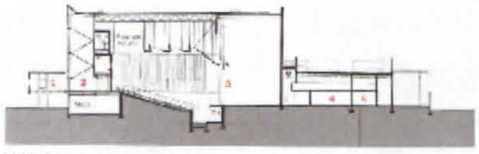
The fifth case study that I looked at was the SMCC, South Mountain Community College, Performing Arts Center located in Phoenix, Arizona. The performing arts center is educational based and is approximately 33,000 square feet. Major program elements include the following: An outdoor lobby, lobby, theater, makeup lab, costume shop, scene shop, black box theatre, control room, dance studio, offices, and classrooms. One of the major characteristics of the performing arts center is that at night the auditorium glows lantern-like while during the day it sheds light into the lobby area. The performing arts center uses as much day-lighting as possible and is included in spaces like the scene and costume shops, makeup labs, black-box theatre, and dance studio.

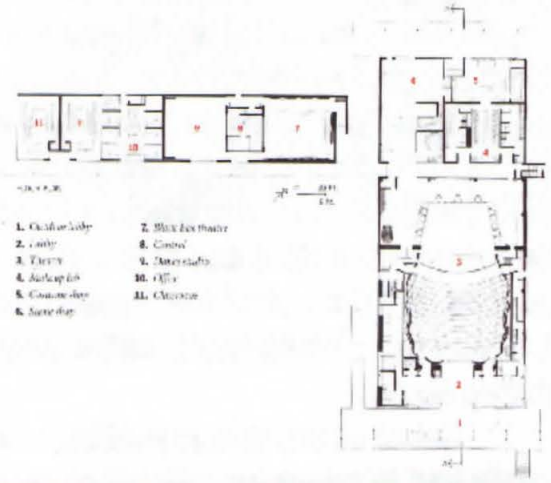
Some of the things that this case study had in common with other case studies is that it emphasizes acoustical spaces for best sound conditions. It uses different materials for acoustic panels and absorbers. It uses curvature of wood panels to enhance sound conditions and it uses draperies for sound absorbers. There is a variety of sound enhancing techniques and is present in almost every case study. Other things that the space does are use day-lighting and sun-shading devices for a majority of the spaces.

In analysis and conclusion, the SMCC performing arts center shows the importance of acoustical spaces by using sustainable processes in their design

Case Study Research (Continued)

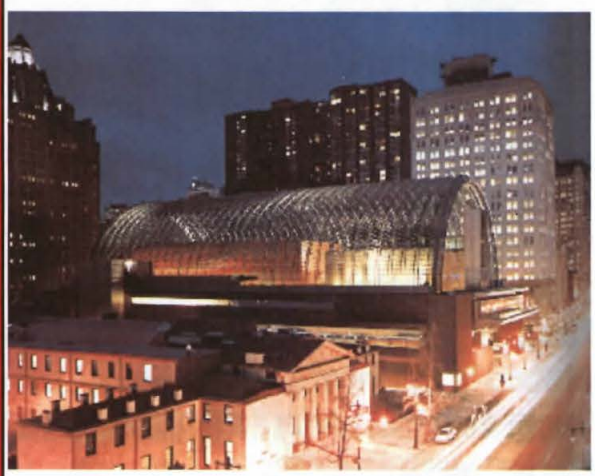
solution. By using natural day-lighting it will save costs and provide a better atmosphere for the space. Also the use of sunshading devices has tremendous effects on interior spaces and will help tremendously in the heating and cooling of the building. Another reason why this relates well to my project is that this is an education facility for performing arts at a college. Overall these are all great contributions toward my theoretical premise and will play an important role in the design solution.

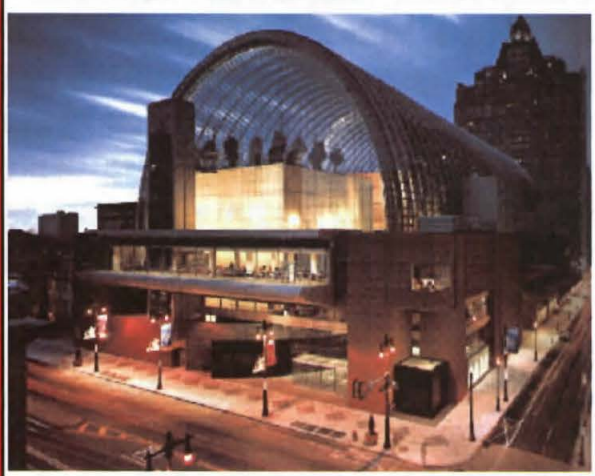




Case Study Research (Continued)

Kimmel Center for the Performing Arts





The sixth case study that I looked at was from the eastern seaboard in Philadelphia. It was named the Kimmel Center for the Performing Arts in which it offered a concert hall made out of glass. Its size is approximately 429,085 square feet and includes a 150 foot high glass-barrel-vaulted structure housing two auditoriums that span 174 feet. Some of its most distinguishing characteristics include a barrel-vault structure, an acoustical stage and canopy that has a high frequency sound source on the stage, a roof garden above the Perelman Theatre sheltered by the arched vault of folded-plate Vierendeel trusses, and the use of reverberation chambers. The main programming elements of the space include a concert hall, recital theater, greenroom, gift shop, box office, lobby, revolving stage, recital theater support, loading dock, stage door, concert hall support, stage, and reverberation chambers.

Some of the things that this case has in common with other cases are that many of the performing arts centers include many of the same programmatic elements. This is very important to include the right spaces for the center to function properly. Other similarities include the use of glass curtain walls to make use of the views available and in this case allow indoor roof gardens which is a great sustainable element for any complex. Another important thing that this case study does is show the importance of the acoustics and reverberation times in the auditoriums

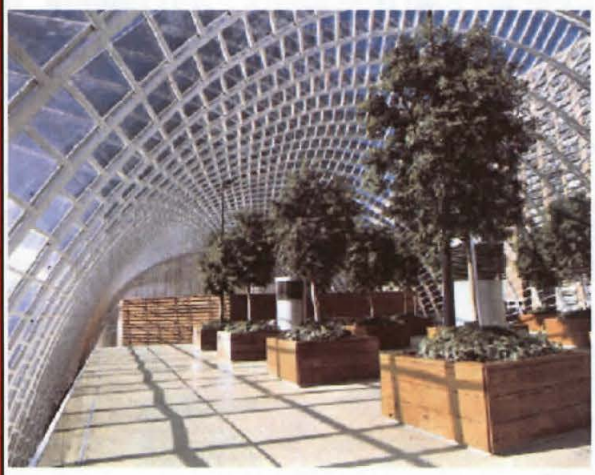
Case Study Research (Continued)

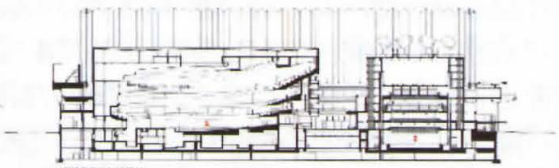
and theater areas. It is important that no echo conditions are formed in the space because this will muffle and create bad sounding performance areas.

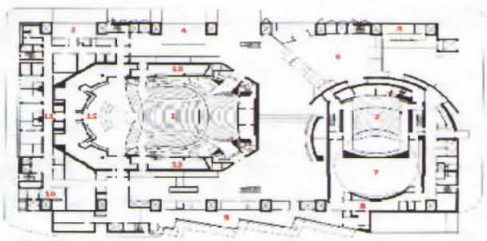
The site for the Kimmel Performing Arts Center works very well and is thoroughly planned out. It is located along Philadelphia's Broad Street which is now called Avenue of the Arts. The changing of the streets name shows how important this performing arts center was to the city. The center was approximately a block square and was located south of the City Hall and north of the University of the Arts which is a 202 year old neoclassical building. Therefore, the placement of the Kimmel Center was placed in the most logical spot for the city because it has history and fits well with the University nearby.

The analysis of the case study shows the importance of performance spaces and how they should relate to other spaces to function properly as a whole. Lobby spaces and circulation areas need to be large enough to hold the people coming and going from the center. Another important thing is to make the space feel like a performing arts center both in looks and feeling while occupying the space. The case shows how glazing can be an important part of the design scheme and why sustainability should be addressed in the design. By bringing the green into the building it creates an aesthetic and feeling that can not be compromised. People feel better and want to occupy the space more often. It can be a learning device and show people

Case Study Research (Continued)





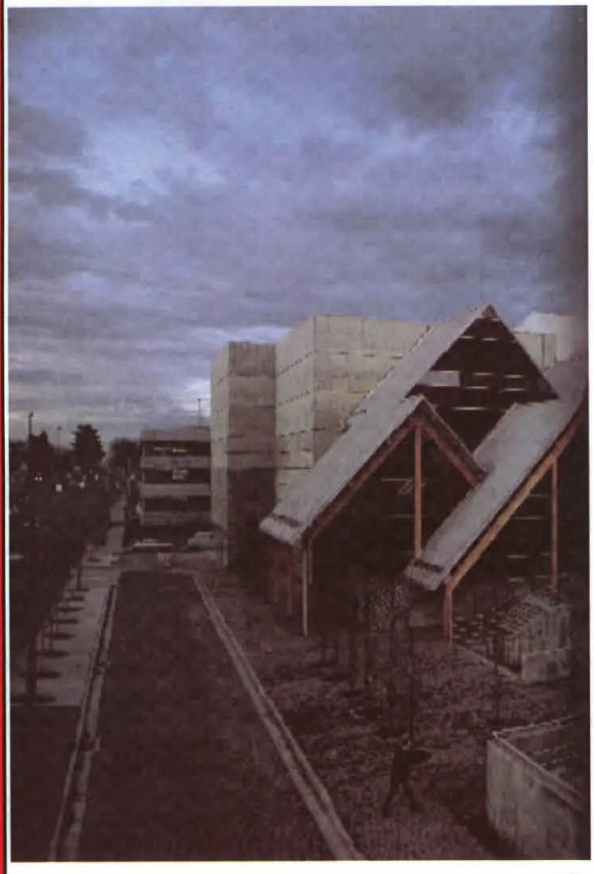


the importance of using sustainable techniques.

In conclusion this case study brings forth many contributions or design solutions for the development and creation of a performing arts center. It shows the importance of providing good acoustics for performance areas and the different type of things you can do to provide adequate sound conditions for the space. By using acoustic panels and ceilings it will help provide the space with the correct sound conditions. Another thing that this case shows is the importance of using sustainable or green techniques in this type of facility. Finally, I feel that it is important to make performing arts centers feel music like and resemble these qualities.

Case Study Research (Continued)

Hult Center for the Performing Arts

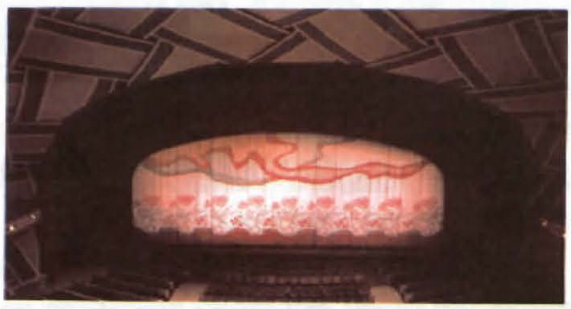


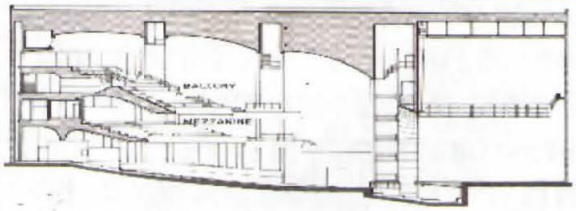
The seventh case study that I looked at was the Hult Center for the Performing Arts in Eugene, Oregon. Existing program elements include a Silva Concert Hall that seats 2,531 people. It has a theater called the Soreng Theater that seats 515 people and a lobby that is shared by both facilities and auxiliary spaces. Another thing that the Hult Center did was create a 515 car parking garage that is separated by a service drive but connects to the lobby mezzanine by an enclosed bridge and passageway.

Some of the common characteristics of the case study include again similar spaces for a performing arts center. They include basic performance areas accompanied by lobby spaces. The Hult Center uses a combination of materials in its structure but still includes using lots of glass to make use of natural light and views. Another thing that is common with this case includes making sure that the performance spaces and auditoriums have the right acoustics or sound conditions for the space. One thing that the Hult Center does is use a poured-in-place flat-roofed concrete shell over the auditorium spaces. The reason for this was because a highway and railroad were nearby and helped in the acoustics of the space. Another reason for this type of construction was because it was the most feasible economic alternative at the time.

In relating the Hult Center to its site it was part of a thoroughly planned master plan prepared by HHPA. The performing arts center adjoins a 12 story

Case Study Research (Continued)





Hilton, a Eugene community conference center, and an additional 300 car parking facility. In programming of the facility it was important that public groups were involved, in which 36 groups helped in the design review process of the Hult Center. This was a really good way to make sure the public was getting what they wanted. Another reason why this was a good location is that it allowed room for the expansion of adjacent buildings like the Hilton and the conference center that relates well to a performing arts center.

In analyzing the Hult Center it shows the importance of site selection for the facility as well as exploring all parties that are involved in the usage of the space. Another thing that this case study shows is that there are several different solutions in receiving the best acoustic spaces for a performance. Also by using certain materials in a space it may have different solutions to problems within that space. By concentrating on the building arts they achieve a style that fits in with a performing arts center.

In conclusion the Hult Center shows the importance of programming the space to its users and placing the center on the right site to have the best placement for a master plan. It is also concerned with the acoustics of the performance spaces and what things can be done to produce better sound conditions. The center also uses style to mimic the musical theme of the performing arts and give people feeling toward the space. Lighting is a big issue in these types of building and in this case they use artificial lighting for the

performance spaces while making use of natural day lighting in lobby and circulation areas.

The Case Study Series and Typological Summary

This case study series show a number of things that are important in performing arts centers and what needs to be done to be successful. There are a number of spaces that need to be present in a performing arts center. All of the case studies researched have the essential elements that need to be included or considered when establishing a program for my performing arts building. Another great contribution of the series is recognizing and using sustainable issues in accordance to providing adequate sound conditions for performance spaces. All of these things support my theoretical premise and intend to be looked at further when making decisions or design solutions for my performing arts project.

In the analysis of the series it is important to show that the site location is of utmost importance for achieving and responding to social views and how they relate to the master planning of its location. Another thing that analysis shows is the importance of views to and from the site and how the center is looked upon physically and metaphorically. The center physically should resemble something that makes people feel that the center is art related or music like. This is very important because it is supposed to represent a place for the arts that has a style and identity for the city. The center should also represent sustainable issues and bring as much green to the center as possible. Also in the analysis of the series a major point or characteristic that is present in all the case studies is that the acoustics of the performance spaces need to be well calculated and designed. All spaces of the auditoriums or theaters need to be designed correctly so that no one is robbed of their experience. Everyone in the space has the right to having the best acoustical seat in the room. This is probably one of the hardest or most complicated issues for performance spaces. The layout of the design affects sound quality among many other characteristics like the type of materials used, type of acoustic panels and absorbers, and the type of acoustic ceilings used over the stage area.

In conclusion to the typological research there are many elements or characteristics that have impacted or influenced my theoretical premise. The case study series have given me knowledge about the different types of spatial elements to use in a performing arts center and have brought forth some other opportunities that could be used for the center. For example, the use of outdoor performance is a great opportunity to bring to the center. It is very sustainable and allows the

The Case Study Series and Typological Summary (Continued)

green areas on the outside to be enhanced and promoted while bringing them into the interior of the building. Therefore, these things will be considered to become part of my design. Also by bringing more sustainable concepts into the design the more opportunities the public will have to learn and educate others about the influence and importance of sustainability. It has an aesthetic quality that most buildings do not offer in our area. By providing a building with an emphasis on sustainability and the performing arts it will become the best solution for a building of its type in our civic culture.

Historical Context of the Thesis

In discussing the historical context of my project it is very necessary for a performing arts building to exist in Moorhead, Minnesota. It relies heavily on social trends and developments in which society has made over the years. In the past there have been very few spaces available for the performing arts. Most spaces were not supplied with the right equipment and acoustics to give the performers the performance they wanted. As time progressed and the increased awareness of this type of facility grew in Fargo/Moorhead, they have realized the importance of such a facility. Just as other cities have come to the same realization. It is important to house a place for the performing arts because it provides and promotes a place for many local attractions and gives the city opportunities and capabilities to have outside performers come to their area. Therefore, a performing art center is a necessity to the community and will prove to be even more of an important factor in the future. Also as the future arises there is becoming a real responsibility for a designer to be sustainable. So we need to start designing buildings with sustainable concepts so we can educate society about the advantages over conventional practices of architecture. Sustainability is the way of the future and a key concept that can be used as an education tool in a building. As a result, a performing arts center with a sustainable approach fits well with the context of our society and building nature of architects.

Goals for the Thesis Project

Goal One:
To have a clear, concise, and meaningful theoretical premise as stated in the statement of intent.

Goal Two:
To have a well defined typology that is researched rigorously with high quality case studies.

Goal Three:
To have a clear eyed description of the social, political, and economic aspects of the design.

Goal Four:
To have a complete and well organized thesis program that meets all requirements.

Goal Five:
To have a well thought out schedule of work for the design process.

Goal Six:
To have a well though out means of collecting and preserving data to show what influence the theoretical premise had on the design.

Goal Seven:
To have a design that clearly lies on that portion of the quality continuum that is occupied by experimental and in-built work by professionals, faculty, and students.

Goal Eight:
To have a superior graphic and model presentation.

Goal Nine:
To have a serious and well organized oral presentation of the project.

Goal Ten:
The compilation of the project will give me a sense of personal and professional satisfaction through out my career.

Qualitative Aspects of the Site Analysis

The qualitative aspects of the site include or cover a wide range of things that are of interest and should be recognized in this project. The site is approximately one block square and is located one block east of Concordia College along 12th avenue and 11th Street. The present property of the site is owned and maintained by Concordia College. Currently the site is very flat with grass and yard like conditions. Surroundings of the site include housing to the north and east with heights ranging to about twenty feet. To the south of the site there are more grass areas that are used for Concordia's soccer and football practices. West of the site includes housing for Concordia's students in which they are probably around forty feet high.

The existing plan of the site is very grid like which is well represented throughout most Moorhead. The site is very flat and has a permeable surface which helps with the absorption and shedding of rainwater. Furthermore, the site does not have any sign of standing water and seems to drain appropriately. Another thing on the site is how the wind affects the site. The site is protected by infrastructure on all sides except the south where there is an open area. Therefore the site is protected by those cold northerly winds in the winter and allows the southerly winds in the summer to cool the building. One thing that is lacking or missing on the site is the use of vegetation and trees. This will need to be addressed in the design in order to provide shading on hot summer days and provide adequate aesthetic qualities for the site. These are all things that are part of a sustainable design and should be focused on throughout the site.

Another important aspect of the site is showing the current human characteristics of the site. Presently Concordia College uses the site for sports related activities such as practice fields for the soccer and football programs. However, there is plenty of room south of the site to house these activities. Therefore it will resolve conflict and distress of the people using this site by having alternative solutions.

In conclusion the site currently shows what attributes and functions are important to the site. It is very important to acknowledge the surroundings of the site and keep them in mind throughout the design process. Also by recognizing wind patterns and water conditions on the site it will help determine what kind of design solution would be appropriate for the site. Another thing that is important is to make use of the views of the site. Currently, there is potential for views in all directions but may be focused on the south to promote more sustainable options for heating and cooling.

Quantitative Aspects of the Site Analysis

In researching the quantitative aspects I will start by providing the sun angles for the existing site. During the winter months the sun angle is approximately 23 degrees while the summer months it is about 70 degrees. The majority of the days have cloud cover and provides poor conditions for the use of solar panels.

The soils of the site are classified as 841 Urban land-Fargo complex. This type of soil is 80% Urban land and the other 20% is poorly drained Fargo soils. Areas of Urban land and Fargo soils are so intricately mixed that it is not practical to separate them in mappings. The Urban land is mostly covered by residential developments while the other areas are used for commercial spaces. Typically these soils have a surface layer of black silty clay about twelve inches thick. The subsoil is very dark gray silty clay again about twelve inches thick. The next layer is strongly calcareous, olive gray silty clay about fifteen inches thick. The underlying material to a depth of sixty inches is mottled, olive gray clay and silty clay loam.

The permeability of these soils are slow and the available water capacity is moderate to high. Surface runoff is slow and the reaction in the surface layer is neutral. Finally the seasonal high water table is less than three feet for this area.

In summary these types of soils promote or are best suited to trees and shrubs that tolerate wet and clayey soil. Also buildings that are constructed on these soils should be constructed

Quantitative Aspects of the Site Analysis (Continued)

above the seasonal high water table. Alternatives that allow deeper construction includes tile drain systems around the foundations to help remove excess subsurface water. Another way to help solve this problem is to design the landscaping to drain water away from the building. One more thing that should be done where these soils exist is to backfill with suitable course material to strengthen the foundation by preventing the soil from swelling and contracting against the foundation.

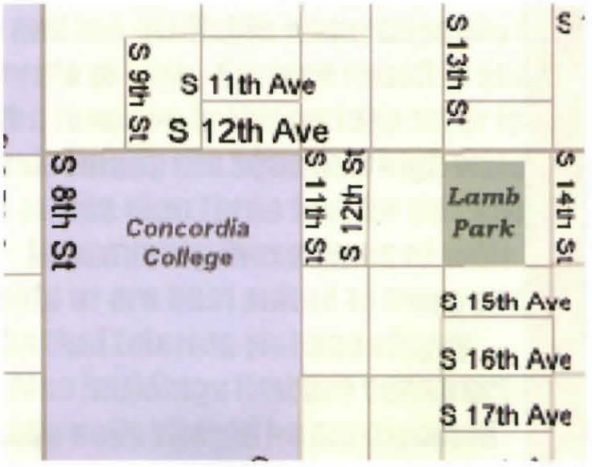
Also readily available to the site is the public utilities. There is easy access to and from the site and will be easily connected to the building. Also there are major arteries for vehicular traffic. Eighth Street runs a block west of the site and Eleventh Street runs adjacent to the site. These circulation arteries provide opportunities for bus routes to come and go from the site. They can be easily incorporated into metro bus service which will allow for less parking areas. Currently there is quite a bit of local pedestrian traffic through this area due to the proximity to both the Concordia College and MSUM campus. Therefore pedestrian traffic will have to be incorporated into the design solution.

The topographic survey shows that there is a slope ranging from zero to six percent for this area. This kind of slope seems flat and is usable for all kinds of activities. Another thing that should be recognized for these types of soils in this area is even with this little amount of slope it seldom floods.

Quantitative Aspects of the Site Analysis (Continued)

When looking at the plant coverings of the site it is mostly grass with minimal amount of trees. This area is very good or well suited for the planting of trees and shrubs that tolerate these wet and clayey conditions. Therefore due to the lack of trees and shrubbery they can be easily planted with faster growing trees to get an immediate effect and slower growing trees for the future.

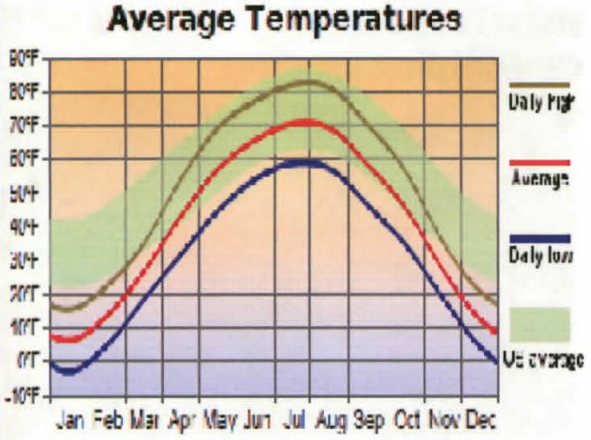
The following images to the left and bottom are from aerial photographs, site photographs, and maps that pertain to the site.

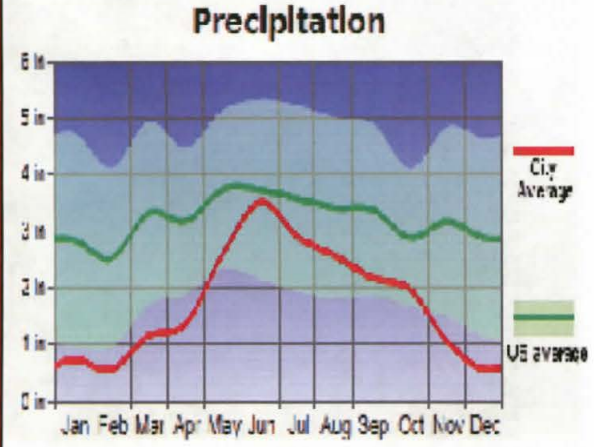


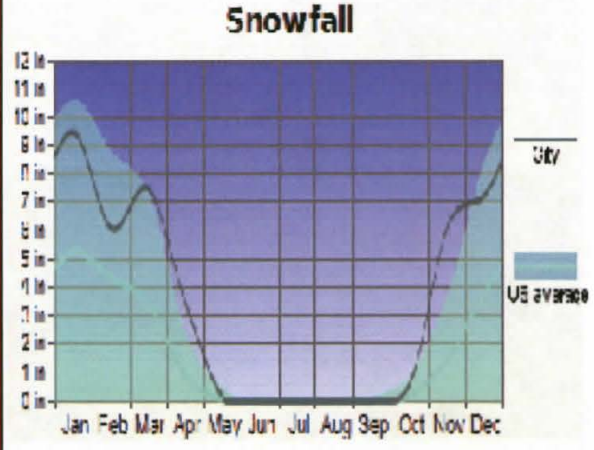
Quantitative Aspects of the Site Analysis (Continued)

The following pictures to the left and below are part of the site reconnaissance in which a photogrid is made. A photogrid is a regular square grid on the base map of the site in which you take photographs looking to the four cardinal directions.

Quantitative Aspects of the Site Analysis (Continued)





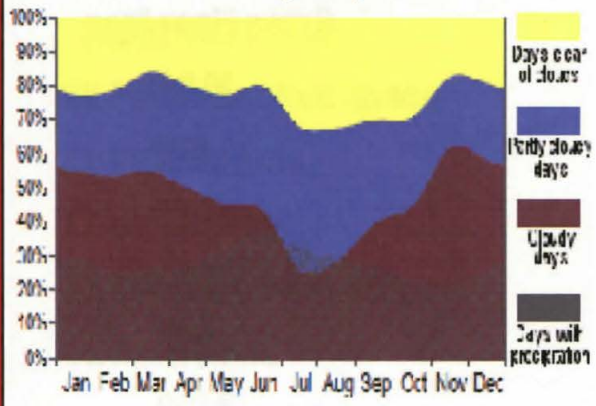


The final thing that I will discuss in the site analysis is the climatic data. Average temperature, precipitation, snowfall, cloudy days, sunshine, wind speed, and humidity are all shown on the graphs below for Moorhead, MN. The prevailing winds are from the northwest in winter months and the southeast in the summertime. As a result, winter winds will want to be sheltered or blocked while in the summer time they should be left alone so that you can maximize cross ventilation. Average temperatures for this area throughout the year include an average between 8 and 70 degrees Fahrenheit. This means that there is a cold weather climate and the design must pay special consideration to heating and cooling and outdoor areas.

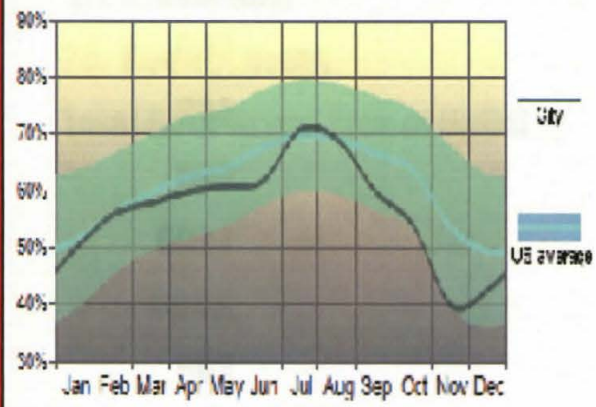
Precipitation for Moorhead is generally very little falling less than three inches per month and is far below the United States average. However, snowfall for this area is quite a bit above the national average and must be considered during the thawing season due to the possibility of flooding. Another thing that must be looked at is the percentage of cloudy and sun-shiny days. Overall, the majority of the time it is cloud covered which limits the possibilities for using solar panels because their efficiency will decrease. Also the amount of sunshine for this area falls just below the national average while the amount of humidity is slightly above.

Quantitative Aspects of the Site Analysis (Continued)

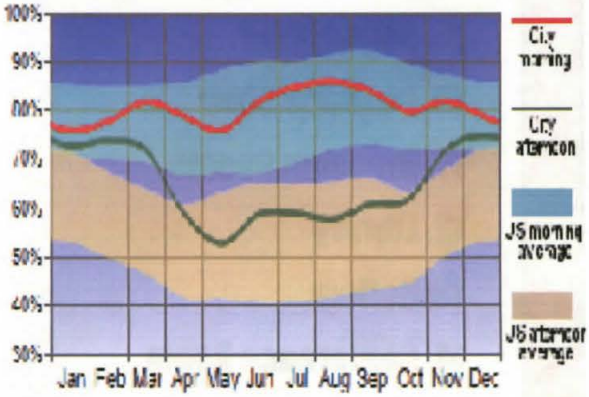
Cloudy Days



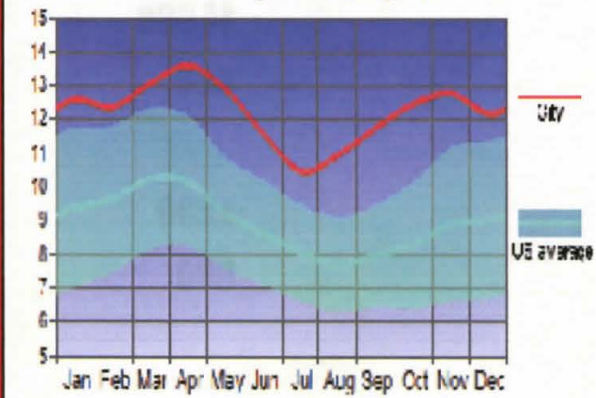
Sunshine



Humidity



Wind Speed (mph)



Programmatic Requirements
Space Allocation

Space	Gross Floor Area
1. Main Theatre	10,000
2. Arena Theatre	6,000
3. Studio Theatre	2,500
4. Lounge	900
5. Dance Studio	1,500
6. Band Rehearsal Room	2,700
7. Choral Rehearsal Room	1,800
8. Main Lobby	5,000
9. Scene Shop	900
10. Costume Shop	600
11. Dressing Rooms	600
12. Library	1,800
13. Gallery	2,500
14. Conference Room	900
15. Class Rooms	
Three at 1,500 each	4,500
16. Mechanical Room	14,000
17. Electrical Room	500
18. Practice Rooms	
Ten at 120 each	1,200
19. Service Area/Loading Dock	600

Programmatic Requirements
Space Allocation

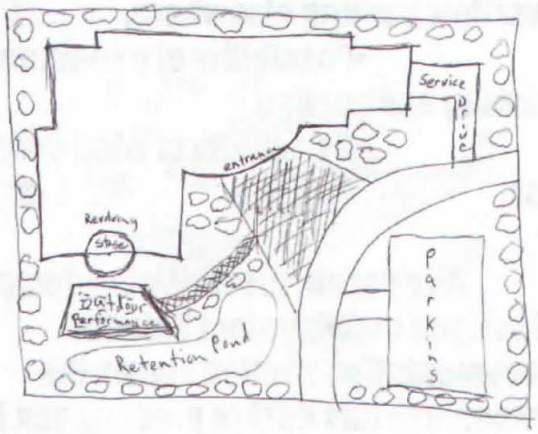
Space	Gross Floor Area
20. Public Outdoor Space	
21. Parking Area	
22. Circulation	14,000
23. Administration Office	800
24. Restrooms	
Men	240
Women	240
25. Greenroom	240
26. Control Room	600
Total Floor Gross Area of Building	74,820 SF

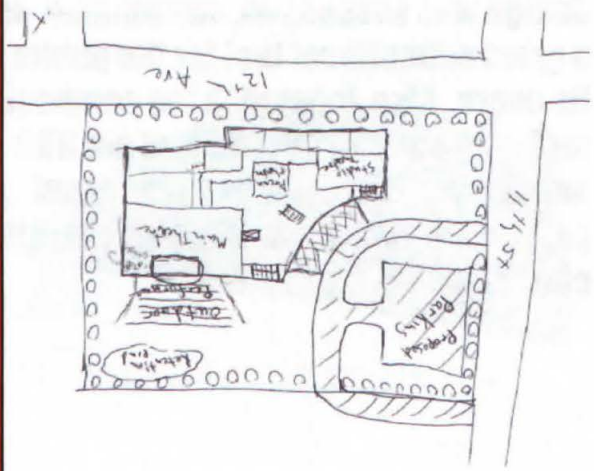
Programmatic Requirements
Preliminary Budget

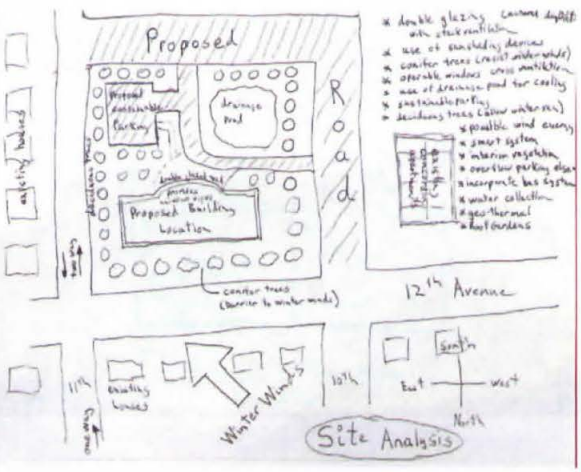
		Percentage of Building Cost
A. Sub-Structure		8.5%
B. Shell		
-Super Structure		10.6%
-Exterior Enclosure		18.1%
-Roofing		4.5%
C. Interiors		20.9%
D. Services		
-Conveying		2.9%
-Plumbing		4.6%
-HVAC	11.5%	
-Fire Protection		2.2%
-Electrical		16.2%
Building Cost	=	$93.53 per SF
E. Contractor Fee	25%	($23.39 per SF)
F. Architect Fee	7%	($8.18 per SF)
Total Building Cost=		$125.10 per SF
74,820 SF x $125.10		$9,359,982.00

Final Project Documentation

Process Documentation



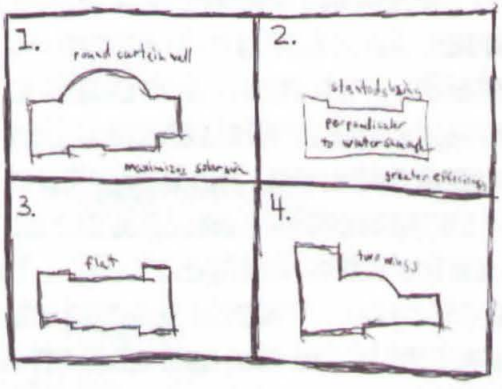


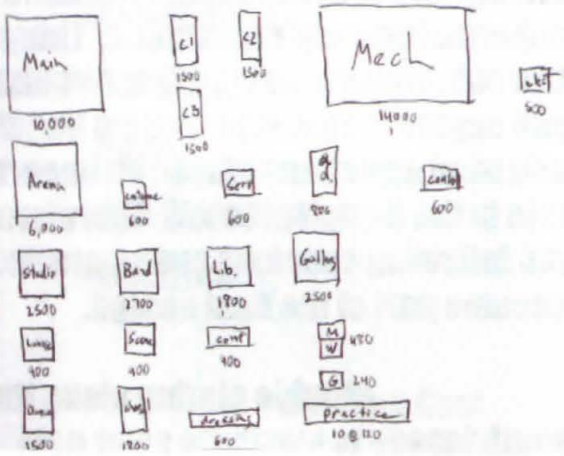


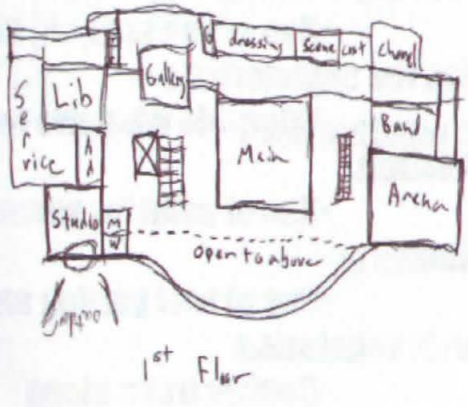
The first process of the project was to find a site that would be suitable for the public and educational facilities in the area. Therefore the proposed site near Concordia College and MSUM was chosen. After doing exhaustive research of similar performing arts centers, concepts and spatial relationships became apparent. The following sketches and computerized concepts are what drove the initial design process. The site inventory and analysis showed what was important to the site and what strategies, concepts, and building forms would result in a successful building design. Major driving forces of the design included site opportunities and constraints. Things like soil, climate, water table, circulation, sun angles, views, surrounding buildings, and wind directions played an important role in the design process. Therefore, the following concepts and strategies became part of the final design.

- Double glazing along the south façade to maximize solar gain during the winter time.
- Clerestory windows for natural day-lighting.
- Use of sun shading devices during the summertime.
- Operable windows for cross ventilation.
- Use of pond for summer cooling.
- Use of roof garden and interior vegetation.
- Conifer trees along northwest facade to block winter winds.

Process Documentation







•Deciduous trees along the southeast to allow winter sun and block summer sun.

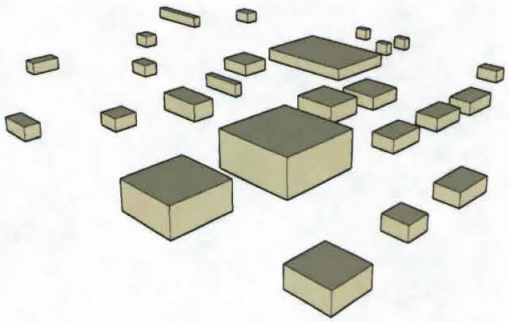
•Incorporate bus system with overflow parking elsewhere.

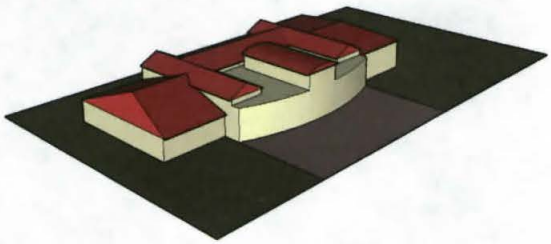
•Possibility of geo-thermal heating and cooling.

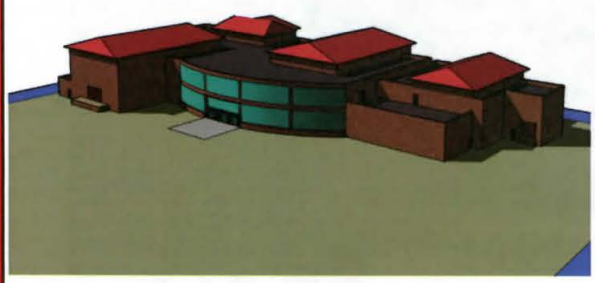
•Possibility of wind energy use.

As a result, the following design displayed in the Project Solution Documentation section shows the outcome of this design process and how such a facility could be an important part of the Fargo-Moorhead area. The design was successful, sustainable, and a great educational tool for the public and its users. Also, located in the compact disk at the end of this manual are DVD animations. They were an important part in determining sun angles and site conditions for the project.

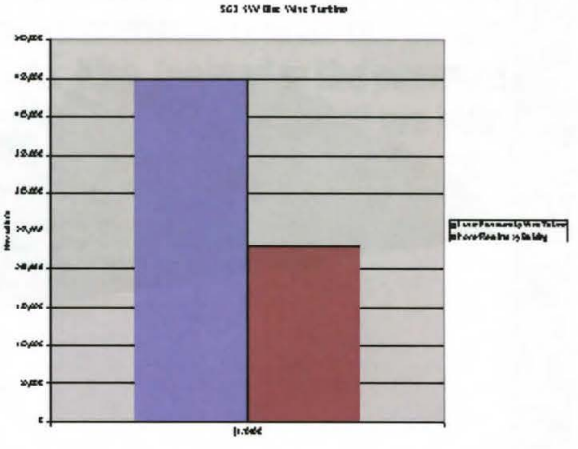
Process Documentation

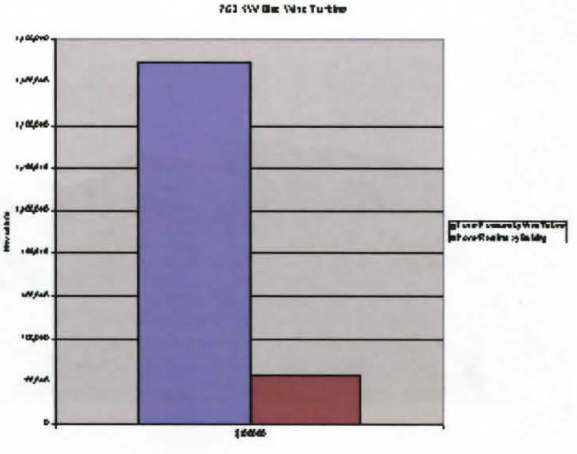






Process Documentation





Project Solution Documentation

Presentation Boards

DVD Slide for Animation (Located in Compact Disk)

Personal Identification

Ryan Siggerud
Hometown:

Quote: "NDSU has been a great educational experience and has prepared me to be a better designer in the architectural profession."

Digital Presentation

The digital presentation is in the compact disk at the end of this document.

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