

**A TWO-WAY BRIDGE FOR CULTURAL CONFLUENCE:
SCIENTIFIC AND SPIRITUAL LEARNING METHODS FOR
ANISHINAABE AND NON-INDIAN STUDENTS**



Figure 01

TYLER ERTL - M. ARCH THESIS
NORTH DAKOTA STATE UNIVERSITY
DEPARTMENT OF ARCHITECTURE


**A TWO-WAY BRIDGE FOR CULTURAL CONFLUENCE:
SCIENTIFIC AND SPIRITUAL LEARNING METHODS FOR
ANISHINAABE AND NON-INDIAN STUDENTS**

**A DESIGN THESIS PRESENTED TO THE
DEPARTMENT OF ARCHITECTURE OF
NORTH DAKOTA STATE UNIVERSITY**

BY

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**IN FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF ARCHITECTURE**


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A TWO-WAY BRIDGE FOR CULTURAL CONFLUENCE: SCIENTIFIC AND SPIRITUAL LEARNING METHODS FOR ANISHINAABE AND NON-INDIAN STUDENTS

Education has been at the forefront of all cultures since the beginning of time. Success, often described and held to different standards throughout the world, has often relied on its instructors, setting, and facilities. As technology develops, its role in today's schools and educational facilities increases. Many of these environments do not have the facilities to keep up with the ever-changing technologies that the instructors must use to stay relevant.

Along with these facility needs comes the constant needs of its users to feel safe, welcomed, and included. Native American learners struggle with their traditional cultures and fitting those traditions into the larger context that is the 21st Century society. This thesis research provides architectural solutions to the shifting needs of today's learning from traditional to 21st Century environments. Educational spaces that induce student learning are also engaging for those students and can bridge even the largest of cultural gaps.

Research investigates and analyzes learning methods that are successful and precedents that effectively demonstrate strategies or salient qualities. It also examines architectural conditions that support an encompassing variety of instruction methods. Research also demonstrates cultural solutions to healing the anxieties of the Native American students in the local area while potentially affording benefits to alternative learning strategies for Non-Native students.

Architecture for engaged learning should express shared meanings and enhance potential for cross-cultural discovery and inclusion.

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Figure 02

NARRATIVE OF THE THEORETICAL ASPECT OF THE THESIS

NARRATIVE OF THE THEORETICAL ASPECT

Educational facilities are often important architectural structures to American cities. They provide a sense of safety and community that creates a greater feeling of unity within a given city. A person's education and their time spent in school lays the foundation of who they are but also memories that last a lifetime: friends made, skills learned, experiences shared. These memories are often sparked by the facilities in which they spent the first 18 years of their lives. The experience of a school is reinforced through its architectural features, which often hinder the development of its students not only academically, but socially as well. Today's students absorb information through an extraordinary amount of mediums. Technology constantly changes those mediums and educators struggle to keep up with those demands. We are also beginning to understand that traditional teaching methods are regularly failing to reach all students and reduced public and governmental funding is not aiding the situation. In a system where standardized testing performance determines the success or failure of a student, current facilities aren't conducive to the shifting instruction methods.

New studies by educators and architects are beginning to realize the gap is growing and something needs to be done. The heavy, institutional, double-loaded corridor with single use spaces is a style that doesn't lend to flexibility and shifting educational needs. Other factors that educational facilities face are cultural discrepancies in demographics that contain multiple different races and cultures. Here in the northern Midwest, there are high populations of Native Americans who constantly struggle with the balance of their native cultural traditions and the 21st century society. Schools are at the forefront of this issue. Throwing these students into the same classrooms and facilities without acknowledging these differences can lead to discomfort and lack of engagement

within the students. New educational facilities and programs must take cultural and societal issues into account when planning architectural spaces.

In order to solve these issues, we need to discover what types of spaces are conducive to different learning and instruction methods and what those methods entail. Creating flexible options that are safe and comforting to its users and are culturally sensitive to those users is a necessity to new facilities. A sense of place and pride can create a space that people of the community can be proud of. Supporting the local demographic must start in our schools. My argument is that architectural solutions to shifting learning methods and cultural needs must be discovered to push the development of today's students.

THE SITE

Bemidji, Minnesota is a community full of cultural and natural history. Nestled along the shores of Lake Bemidji and the beginning of the Mississippi River, its beauty and sense of place is unique to the area. Its relationship to the natural elements provides a rich history of outdoor activities. Bemidji has deep Native American roots and serves as a commercial center between the cities of Grand Forks, North Dakota, and Duluth, Minnesota. Because of strong commercial ties, the city has expanded away from a small village to a booming city of commerce. A result of such expansion is a constantly growing school district with a large influence from the Cass Lake Indian Reservation. Bemidji's schools lie on the western edge of the city, with viable space to expand yet keeping its balance of the natural elements and connectivity to Bemidji proper. With wetlands and forests surrounding the site in question, possibilities abound for incorporating these elements into a strong architectural solution to a new learning environment while adhering to the cultural traditions of the area.

NARRATIVE OF THE THEORETICAL ASPECT OF THE THESIS

THE TYPOLOGY

Creating a space that people of the community can be proud of and provide the school district with a new standard of educational learning environments would invigorate the identity of the surrounding area. Also, an environment that Native American students will feel comfortable and a significant in part of the school community, while providing gradual balance between their traditions and 21st century learning techniques that will prepare them for Bemidji High School integration. Establishing learning environments that aid instructors in various teaching methods and cultural traditions will become a precedent for not only Bemidji, but the larger region as a whole.

PROJECT TYPOLOGY

In order to successfully examine the theoretical premise, this project will lay the groundwork to create a educational facility that displays the various learning and instruction methods discovered in the research. Declaring this facility as a Magnet school will provide a focused scope to demonstrate these techniques.

Also, to support the Native American population of the Bemidji area, the facility will work to prepare students for integration into the public high school. Representing the great pride of these students' culture will be a necessary element in developing a safe and engaging learning environment.



Figure 03

CASE STUDY

Thomas Deacon Academy, Peterborough, UK

INNOVATION AND HIERARCHY

Architect:.....Foster + Partners Ltd
Typology:.....School Academy
Size:.....18,197 square meters
Year:..... 2007

Introduction / Description.....

This building is a much larger example than what this project will call for, but it provides a look at a global recognized educational facility. It is composed of 6 classroom wings, tied together by a central shared core that contains a larger lecture theatre and a library. On the interior, there are string of classrooms and smaller break-out spaces, followed by the more private and quieter instruction and study areas along the outside with views to the outdoors. The building also allows for many passive sustainability options such as a breathable glazed roof, brise soleil, and diurnal cooling.

Research Findings.....

While unlike other cases in its size, it bears a few common characteristics with others. It provides students with a variety of spaces to learn, individually, small group, large group, and traditional and non-traditional classrooms. The school also has such a community feel to its larger shared spaces, which is something this project will need to utilize to create an innovative and welcoming learning environment.



Figure 04

CASE STUDY

Thomas Deacon Academy, Peterborough, UK

Architectural Information.....

Structure: The building's structural elements are arching steel beams that brace the canopy above consisting of a system of triangular acoustic panels, solar panels, and vents.

Natural Lighting: The design allows for all spaces to be naturally lit. The glazed roof provides daylight into the central core areas and the pod shaped form brings light into the classroom spaces.

Massing: The six classroom pods or volumes that are 3 stories high make up the outer forms, while leaving the center open for community spaces.

Circulation to Space: The design houses all circulation within the central community and shared spaces. This allows for the more intimate and quieter spaces to be uninterrupted on the outer edge.

Geometry: The form of the building seems to be derived from the desire to provide all spaces with natural light and views out onto the site.

Hierarchy: Overall the layout of the spaces is simple: the center core is for community and shared spaces. Moving outward, the next set of spaces allow for small group learning and gathering. Finally on the outside, quieter classrooms and study spaces are closest to the exterior for views and farthest from the commotion. A very elegant solution for creating a variety of spaces.



Figure 05

Thomas Deacon Academy. (n.d.). Retrieved October 15, 2015, from <http://www.fosterandpartners.com/projects/thomas-deacon-academy/>

CASE STUDY

Thomas Deacon Academy, Peterborough, UK

Responses to Site.....

Environmentally: The building's odd shape allows for maximum daylighting and views out onto the site. Exterior solar shading allows the building to be protected from all orientations.

Socially: The design's unique shape also allows for different spatial gatherings both inside and outside. Outdoor classroom settings can be very beneficial to students and community gatherings.

Conclusion.....

After examining the design, one major takeaway is the innovative hierarchy of spaces. Creating a variety of learning environments allow students to explore different subjects in a variety of different ways. Whether a student requires more intimate interactions or large group interactions, the building supplies a space for it all.

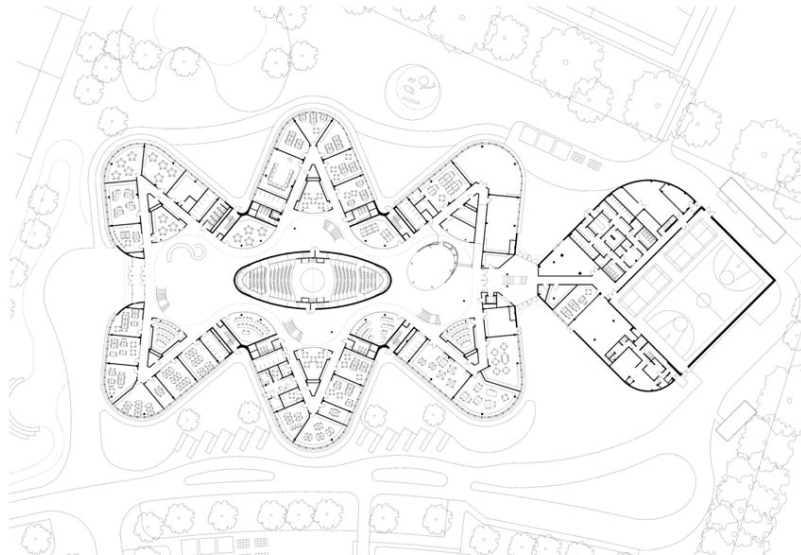


Figure 06

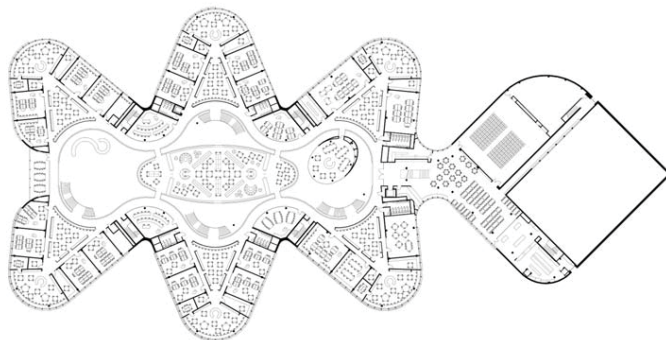


Figure 07

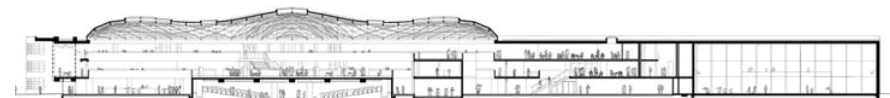


Figure 08

Thomas Deacon Academy. (n.d.). Retrieved October 15, 2015, from <http://www.fosterandpartners.com/projects/thomas-deacon-academy/>

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CASE STUDY

STAPLETON HIGH SCHOOL, DENVER, CO

TECHNOLOGY AND SCALE

Architect:.....Klipp
Typology:.....Charter High School
Size:.....68,883 square feet
Year:..... 2005

Introduction / Description.....

This nationally renowned charter high school is the first public high school in Colorado to provide every student with a wireless, personal computer (OWP/P et al. 2010). With adaptable classrooms and studios for individual or small group learning, the 425 student high school is a state of the art building for learning with technology. This building design also uses pods or clusters to organize its spaces, with all circulation taking place in a spine that runs along the pods. Flexible learning spaces accompany each pod and also take place along the double height circulation space. Being a two story building for a smaller number of students, this design shares some characteristics with this project.

Research Findings.....

While this case is a smaller version than others, it focuses on similar attributes. It creates a multitude of different learning spaces, but also places an importance of the program inside the building, reminding us that what happens inside the building after completion has an effect on the success or failure of a building.

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Figure 09

Architectural Record | Schools of the 21st Century | Case Study: Denver School of Science & Technology, Denver. (n.d.). Retrieved October 15, 2015, from http://archrecord.construction.com/schools/0701_CS4_denver-1.asp

CASE STUDY

STAPLETON HIGH SCHOOL, DENVER, CO

Architectural Information.....

Structure: This building actually laves its structural and mechanical elements open to its users to be seen as a learning tool. Its metal stud and open joist construction teach students about assemblies.

Natural Lighting: A east-west orientation eliminates a majority of solar heat gain, and also maximizes daylighting. Many of its spaces do not require much artificial lighting during the school day, such as the circulation spaces [Figure 10].

Massing: Again, this 2 story pod based design allows for maximizing daylighting and views out from the classrooms and learning environments. The pods are aligned off of the central circulation spine on the north side.

Circulation to Space: This design uses circulation spaces as learning spaces. Its corridors are wide enough to provide soft seating areas for students to gather and study on. The flow of traffic from entry to the opposite end of the building is very fluid and easy.

Geometry: The building is mostly rectilinear in form, using angles to compliment various common spaces and larger group areas.

Hierarchy: In this study, the pods stem off of the central core, creating this important gesture right down the middle of the building. The clusters of classrooms are important, but this school definitely places an emphasis on community spaces.

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Figure 10

Architectural Record | Schools of the 21st Century | Case Study: Denver School of Science & Technology, Denver. (n.d.). Retrieved October 15, 2015, from http://archrecord.construction.com/schools/0701_CS4_denver-1.asp

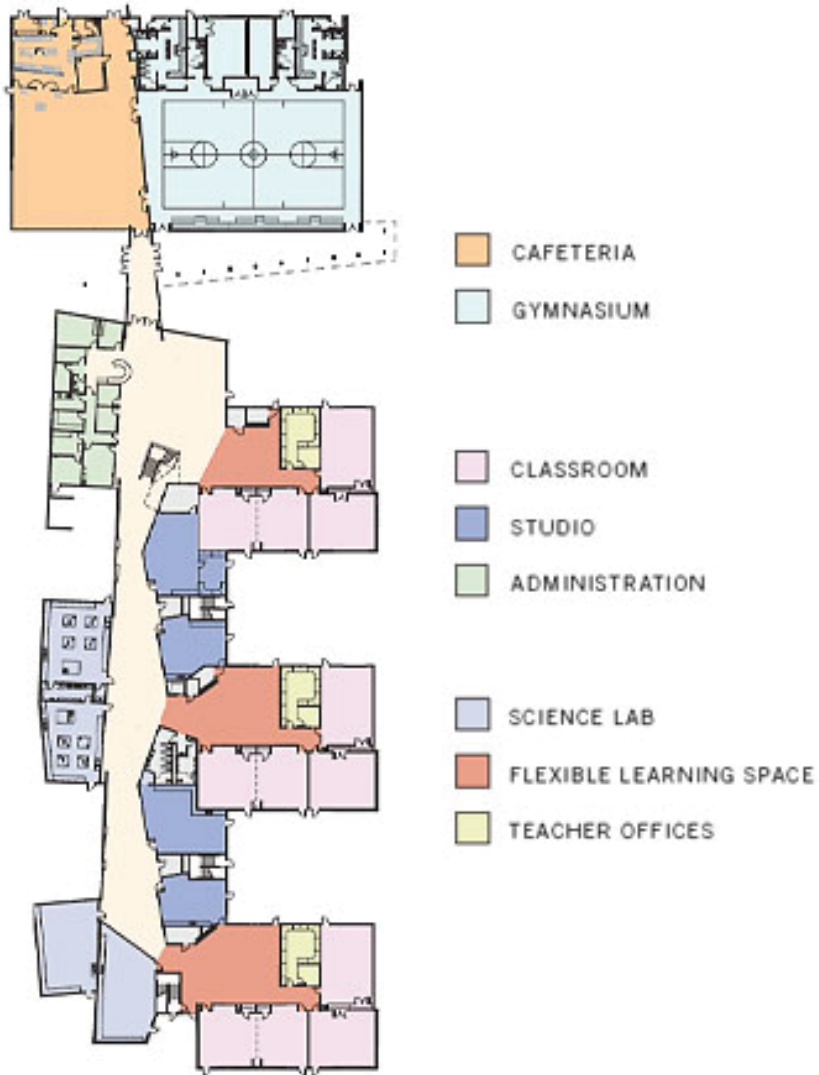


Figure 11

Architectural Record | Schools of the 21st Century | Case Study: Denver School of Science & Technology, Denver. (n.d.). Retrieved October 15, 2015, from http://archrecord.construction.com/schools/0701_CS4_denver-1.asp

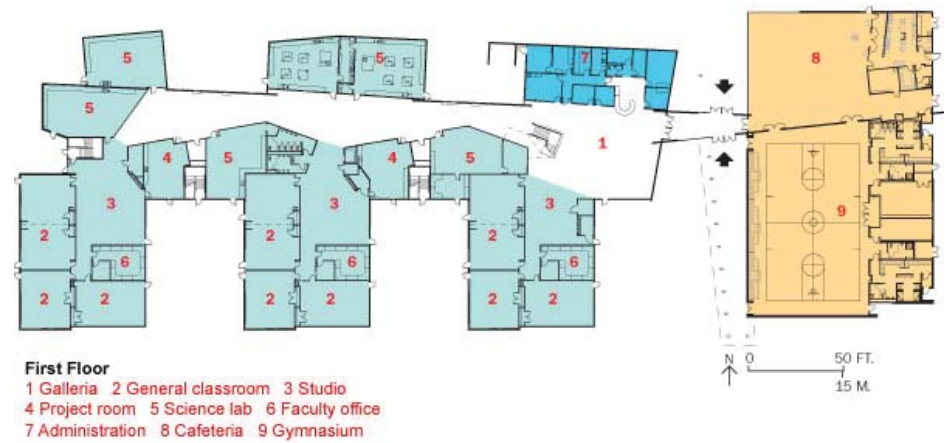


Figure 12

CASE STUDY

STAPLETON HIGH SCHOOL, DENVER, CO



Figure 13



Figure 14

Responses to Site.....

Socially: Denver is a diverse area. This school is a place where those ethnically diverse students can gather as a community and interact with one another.

Culturally: Along with interacting socially, the is culture created and shared when that interaction takes place.

Environmentally: As stated earlier, its east-west orientation allows for decrease solar gain and maximizing daylighting. According to archrecord.com, it uses 50% less energy than a similar code compliant building.

Conclusion.....

By looking at this school you would never know it is a technology based school. The program is integrated with the building environment. It shows that the learning method and instruction styles are just as important as the physical learning environment is. Developing a curriculum and programs that work well within the spaces and also having flexible spaces for multiple different programs is a relationship that can ebb and flow. This will be an important aspect to include in the project moving forward.

CASE STUDY

ROSA PARKS ELEMENTARY SCHOOL AND COMMUNITY CAMPUS

CENTER OF COMMUNITY

Architect:.....Dull Olson Weekes - IBI Group Architects, INC
Typology:.....Elementary School and Community Campus
Size:.....66,863 square feet
Year:..... 2006



Figure 15

Introduction / Description.....

Built in a low-income development [New Columbia] in North Portland, where a sense of community is very strong, the elementary school is connected to a Boys and Girls Club, along with the Portland Parks Community Center. Certain areas of the buildings are open to public use, making it more than just a school. It is a center for a community to come together. The school is divided into four neighborhoods that surround the common areas. There are shared functions between the school and the community areas, such as the cafeteria, art, computer services, and music. Rosa Parks Elementary was also awarded LEED Gold.

Research Findings.....

This is a very interesting and different type of educational facility than the other cases looked at. Its relatively small site and walk-on campus style make it very unique to that community, which is an aspect that the city of Bemidji could utilize. Creating a sense of pride and unity in a community is an often overlooked when design schools and educational facilities, one that must be adapted in this project.

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School Designs. (n.d.). Retrieved October 15, 2015,
from http://schooldesigns.com/Project-Details.aspx?Project_ID=3243

CASE STUDY

ROSA PARKS ELEMENTARY SCHOOL AND COMMUNITY CAMPUS

Architectural Information.....

Structure: A combination of traditional masonry and wood timber construction, this truly is a beautiful structure. Exposed wood timbers in common areas give a welcoming feeling to the school.

Natural Lighting: By placing all classrooms on one side of the building and common / circulation spaces on the other, it ensures that all spaces receive ample amount of sunlight. A smaller building like this one allows for efficient spatial planning as such.

Massing: Very rectilinear in form, almost like boxes with various heights depending on the function of the space. Long circulation and break out spaces on one side, classrooms on the other.

Circulation to Space: The circulation consists of smaller break out and gathering spaces along it. Placed on one side of the building, opposite the classroom neighborhoods. The height of circulation spaces is higher than classrooms and break out areas to take advantage of a larger volume.

Geometry: Based on a very small site [1.8 acres], the building is very geometrically efficient, yet the entire program fits on one level.

Hierarchy: This plan works together to form neighborhoods consisting of the same elements in each one. Various heights determine which spaces are for large or small group activities.

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Figure 16



Figure 17

School Designs. (n.d.). Retrieved October 15, 2015, from http://schooldesigns.com/Project-Details.aspx?Project_ID=3243



Figure 18



Figure 19

CASE STUDY

ROSA PARKS ELEMENTARY SCHOOL AND COMMUNITY CAMPUS

Responses to Site.....

Socially: As the school is part of the community center, it creates a sense of unity. That community sense spills over into every day social activity, altering the educational culture.

Environmentally: Certified as LEED Gold, there are many aspects of the building and the site that are sustainable design elements. The site is only 1.8 acres, so the design needed to be efficient. Utilizing glass and exterior shading, solar gains are used to reduce costs and energy use. The site also collects storm water in retention landscaping. It is also a walk-in school, making good use of extra spaces for indoor and outdoor learning environments.

Culturally: In a low income area, providing the community with a sort of beacon that they can be proud of can be a morale boost. Creating a sense of pride is essential, and this campus does exactly that.

Conclusion.....

The amount of community interaction on this campus really ties the area together. Creating a sense of gathering relates to what this project should aim to do as well. The natural materials and personable spaces give off a welcoming and safe vibe. Material choices and colors play a large role in a school not feeling so 'institutional'. The spiritual / subconscious senses are significant in the success of a space.



Figure 20



Figure 21

School Designs. (n.d.). Retrieved October 15, 2015, from http://schooldesigns.com/Project-Details.aspx?Project_ID=3243

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CASE STUDY

MILLE LACS CEREMONIAL BUILDINGS, ONAMIA, MN

SPIRITUAL STIMULATION

Architect:.....Cunningham Hamilton Quiter
Typology:.....Native American Ceremonial Buildings
Size:.....3,300 & 3,400 square feet
Year:..... 1993

Introduction / Description.....

The Native Americans have strong traditional and cultural values, and one architectural structure that displays both are their ceremonial buildings. This case study is of two similar structures in Mille Lacs, MN. Through the structure, shape, lighting, and materials, evoke the spirit of what takes place in these buildings. Simple in program, they are the main ceremonial spaces with a few support spaces along the outside of the building.

Research Findings.....

This is a very different space compared to the educational facilities examined previously, yet there are a few strong characteristics that take place in both. Materiality can evoke strong sensory emotions that can influence experiences in the spaces. Lighting, too, affects the experience of both. The shape, scale, and volume of a space gives off different vibes that only that place can stimulate. A space like the ceremonial buildings, when put in the context of an educational facility, could really be a unique feature, especially in an Native American Magnet School.



Figure 22

Krinsky, C. (1996). *Contemporary Native American Architecture: Cultural Regeneration and Creativity*. New York, New York: Oxford University Press.

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CASE STUDY

MILLE LACS CEREMONIAL BUILDINGS, ONAMIA, MN

Architectural Information.....

Structure: Made of earthen materials, concrete, wood, etc. Structural elements in the buildings are laminated wood beams. In the Mille Lacs building, the beams form a bowed square in the center, whereas in the Lake Lena building, they reach into the center, forming an octagon and calling the significance to the center.

Natural Lighting: These spaces are normally low lit. Light from the narrow clerestory windows is the only source, but this stimulates the senses as part of the performance.

Massing: The buildings are one solid form, the performance spaces in the center while support spaces are along the outer rim.

Circulation to Space: Since the structures are mostly used for ceremonies, the circulation consists of entering the main space and finding your seat. The seating is movable, allowing for different configurations to take place.

Geometry: The circular form is important not only in these structures, but in most Native American architecture. The focus is always meant to be in the center, on the performance, so circular geometry is chosen to guide that purpose.

Hierarchy: Again, all focus is on the center. These buildings have little for other spaces or rooms, so the hierarchy lies within the center of the ceremonial space.



Figure 23

CASE STUDY

MILLE LACS CEREMONIAL BUILDINGS, ONAMIA, MN



Figure 24



Figure 25

Responses to Site.....

Environmentally: The buildings are constructed from natural materials, often meant to recall memories to their natural settings. Earthen floors were used in the center, as they have a strong desire to be in contact with the earth during performances and ceremonies [Krinsky, 1996].

Culturally: Krinsky states that the importance of these structures is on the communities actions, both past and present. Distractions are unwanted, therefore the architecture must reflect that. Simplicity, and no room to waste, is how these buildings serve their purpose.

Conclusion.....

These buildings' simplicity and spiritualness is a characteristic that a project integrating Native and Non-Native cultures can have. The art of story telling, the passing of information from elder to pupil, is both centered on the welfare of the student and the community. When integrating different cultures into one educational community, a space like this may be very beneficial for all its users.

Krinsky, C. (1996). Contemporary Native American Architecture: Cultural Regeneration and Creativity. New York, New York: Oxford University Press.

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TYPOLOGICAL RESEARCH SUMMARY

INTRODUCTION

The case study series in which this document entails focused on the premises of educational learning environments and the traditional architectural techniques used by Native American cultures. One of the resources used in forming this proposal provided many different case studies, several of which were analyzed. Since this project is to be a magnet school integrating Native and Non-Native learners, studying the traditions of Native American architecture was necessary, and it barely scratched the surface. More information will be needed on this topic, as it can be very influential to the Theoretical Premise of the project.

After investigating the case studies, the Theoretical Premise seems to have strengthened and remained fairly unchanged. New ideas, however, have come across and will be added. Discovering the impacts that a community can have on an educational facility has come to bear even more significance after the case studies, especially Rosa Parks Elementary School and Community Campus in Portland, Oregon. Also, it is now more important to create a culture within the school, something with passion, spirit, and unity as the Native American Ceremonial Buildings do. The basics of the Theoretical Premise have not changed, but certain aspects have grown in importance. Architecture is supposed to mean something, so make sure it does!

ANALYSIS

In general, each case study underwent a similar process of discovery. Each building or buildings was looked at through an overall lens, which then identified certain aspects

or characteristics that were deemed valuable to look at in further detail. Afterwards, each case study was given a descriptor or phrase that lets the viewer understand what the take away was from that particular case, but it also reminds the investigator as well.

There were certain common characteristics among the cases. For example, all three schools that were analyzed has some form of hierarchy at play with in the spaces. How each case handled that hierarchy differed, but it was at play in each. Uncommon characteristics were the in the way each school dealt with its program. One was contingent on technology, whereas another was heavily community based.

Reviewing various sites with similar typologies have induced a feeling a excitement in regard to the site chosen for this project. It has many of the same characteristics that those analyzed did. It also has a sense of spirit and adventure that the Native American architecture conveyed.

At first there were concerns about the integration of two vastly different cultures, but after discovering more about both educational learning environments and Native American culture, it seems very likely that the two will mesh very appropriately. Creating a safe, welcoming, and inspiring place will bridge all cultural differences.

CONCLUSION

Overall, the amount of technical information obtained through the research will have an impact on spatial and functional relationships moving forward. Community and cultural aspects and ways of thinking have improved as well. Each case study provided valuable information and exposure.

MAJOR PROJECT ELEMENTS

SPATIAL REQUIREMENTS	PROGRAMMATIC ELEMENTS	DESCRIPTION
LARGE	GYMNASIUM, CAFETERIA, AUDITORIUM, OUTDOOR AREAS	LARGE ACTIVITY SPACE, STORAGE, PERFORMANCE SPACES, REHEARSAL SPACES, PLAYGROUNDS, ATHLETIC FIELDS, LEARNING/ GATHERING AREAS, PARKING, BUS LANES
MEDIUM	ADMINISTRATION, CLASSROOMS, MUSIC, ART, TECHNOLOGY EDUCATION, LIBRARY	OFFICES, WORKROOMS, WAITING AREAS, NURSE, TYPICAL CLASSROOMS, SPECIAL EDUCATION ROOMS, COLLABORATIVE SPACES
SMALL	SUPPORT SPACES	RESTROOMS, STORAGE, MAINTENANCE, CUSTODIAL, KITCHEN, POWER/DATA,

USER / CLIENT DESCRIPTION

USER GROUPS	DESCRIPTION
ADMINISTRATION	RECEPTION, PRINCIPAL, COUNSELOR, NURSE
FACULTY	TEACHERS, SPECIALISTS, PARA PROFESSIONALS
MAINTENANCE / SERVICES	CUSTODIAL, BUILDING MANAGEMENT, KITCHEN STAFF
STUDENTS	ELEMENTARY-MIDDLE SCHOOL STUDENTS
VISITORS	EVENT ATTENDEES, COMMUNITY MEMBERS

* Building useage will peak from September to June, Monday-Friday, 7 am to 5pm. Subject to change due to after school and community events.

THE SITE

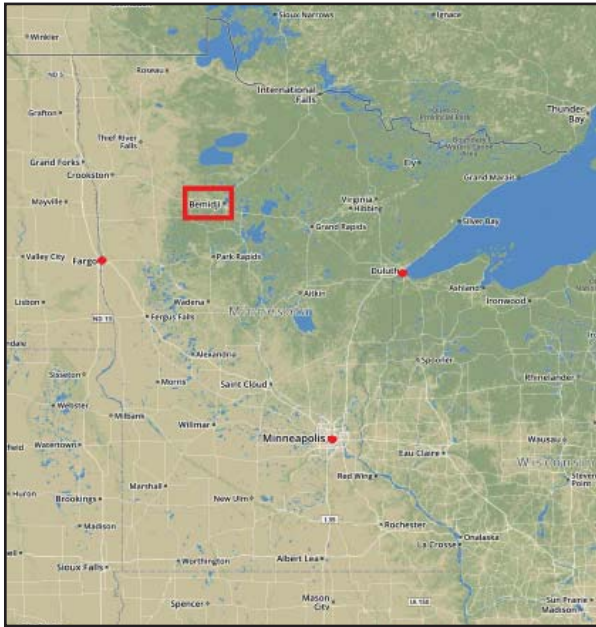


Figure 26

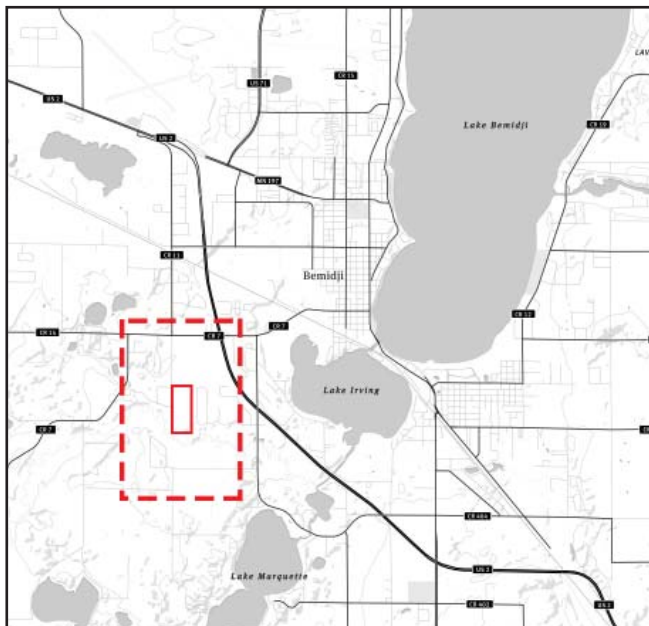


Figure 27

MACRO SITE CONTEXT

Bemidji, Minnesota was chosen as the site for this project. It is a growing community and with that comes the need for educational facilities to respond. Bemidji has a rich culture and history, with natural beauties such as Lake Bemidji and the beginnings of the Mississippi River. Along the shores of the lake is downtown Bemidji, with Paul Bunyan and Babe the blue ox standing guard over its people.

Still, there exists some cultural discord within the community between Native Americans and Non-Natives. With the hopes that a magnet school can bring together these cultures, Bemidji provides many opportunities.

CITY OF BEMIDJI VALUES:

- Connections to Nature
- Healthy Urban Areas with a Strong Community
- Diverse Population with Native Ties, Tourism and Commercial Center that Attracts Visitors

THE SITE

MICRO SITE CONTEXT

The specific site chosen within Bemidji has many benefits and challenges. It exists as the Bemidji School District's plan for development of another school to deal with growing numbers. Just down the street from the existing high school, it creates a sense of connectivity with the school district. Certain amenities between the two sites could be utilized to serve both due to their adjacency.

The site currently has trails leading down to the winding Mississippi River, which borders the south end of the site. This creates an opportunity to develop these trails and design areas for student engagement and learning. Lying on the edge of Bemidji proper, it has peaceful and natural qualities that other areas do not offer.

There are many site challenges. It is a fairly narrow site, which can be difficult due to the large capacity of schools exterior needs. The site is also near the Mississippi River, which has setbacks and requirements for development and preservation. Also, the street adjacent to the site is a dead end, making accessibility a major question to answer.

SITE FEATURES

- Natural Setting and Views
- Adjacent to High School and Mississippi River
- Opportunities for Design Solutions



Figure 28

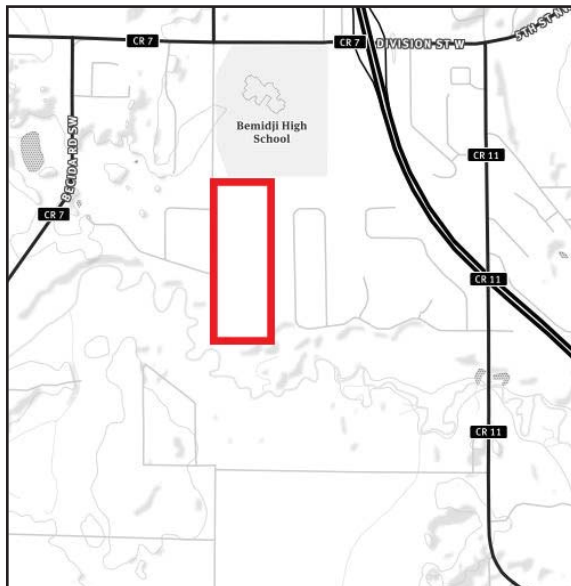


Figure 29

PROJECT EMPHASIS

GUIDING PRINCIPLES

1. IDENTIFICATION OF STUDENT LEARNING METHODS THAT PUSH THE DEVELOPMENT OF TODAY'S STUDENTS

As discussed earlier, students are absorbing information through different means and methods. What are learning techniques that are being successfully used in today's schools? How are they engaging the students and reaching out to all? Which methods develop the students not only academically, but socially as well?

2. INTEGRATION OF TRADITIONAL AND 21ST CENTURY LEARNING ENVIRONMENTS IN AN ARCHITECTURAL SETTING

Once these student learning methods are established, how do we design our spaces to incorporate such a variety of instruction styles? What are the values of traditional instruction spaces versus 21st century spaces and how do we combine them to take advantages of both?

3. CREATION OF A SPACE IN WHICH ITS USERS FEEL ENGAGED, SAFE, AND INSPIRED WITHIN THE SCHOOL COMMUNITY

The institutionalized designs of educational facilities often leave students feeling disengaged and uninspired. What architectural features can combat this enigma while keeping our students safe from various natural and man-made disasters? How does a physical space evoke a sense of pride and acceptance within a divided community?

4. INCORPORATION OF NATIVE AMERICAN AND NON-NATIVE TRADITIONS AND CULTURES TO UNIFY THE COMMUNITY OF BEMIDJI PUBLIC SCHOOLS

In a community with divided, yet proud cultures, how do we combine cultural differences to unify a community? What are the roles of the educational environments in this task? Which programs and activities both inside the school and on the site can show students the qualities of those differences?

PROJECT GOALS

ACADEMIC GOALS

In line with the standards set by the program, this thesis should develop a few key elements to determine its success. Research describing the key elements in a student's education and development in educational facilities should drive the progression of the project. It serves as a solid foundation, leading to instruction and learning methods that reach a larger range of students.

This research and discovery will then inform the design of the educational spaces. These spaces will be flexible to incorporate multiple learning methods. In addition to the educational purposes of the building, it will serve as a cultural confluence for the students and the community. Teaching its students to be mindful of other traditions and cultures will further develop relationships and experiences before merging into the public high school. The school will use traditional and 21st century learning environments to showcase different programs and activities that support this guiding principle.

All together, the project should exceed the minimum standards of the Thesis program and be an all encompassing project. The research should back up statements made by the architecture and support the main thesis and its guiding principles of 21st century learning environments and how a culturally divided community can be unified through a work of architecture.

PROFESSIONAL GOALS

Through experiences in the professional world of architecture, it has become apparent that educational architecture is a large and significant part of the profession. Its societal

impact has grown even more over the past decade with the current shift of needs in today's schools. This thesis should reflect those needs and show professionals currently in the field of its relevance to educational environments today. It should describe the important role in which architects play in the education and development of its youth. Environments can have positive and negative impacts on their users, and this thesis should outline a multitude of impacts that hopefully can influence in a positive way.

It is a strong goal to be looked at as a reference on the subject of educational learning environments. The work should speak to the knowledge and understanding obtained from the research and development of the program and the architecture itself. A wholesome project will communicate a well-rounded skill set from research to modeling to communication capabilities, all of which are necessary in the field today.

PERSONAL GOALS

For my entire life I have had ties to the community of Bemidji. Its wilderness and natural beauty is one of the many gold standards set by the great state of Minnesota. Yet, nothing is without faults. The community's discord between the Native American people and Non-Native is a clear rift in the area. Their cultures and traditions are not fully understood, not only between the two, but even from within each culture. A Magnet school could begin to bridge that gap between the two, educating its students on traditional and cultural differences and similarities. Preparing those students to merge together into the realm of high school would be an opportunity

PROJECT GOALS

to create memories and share experiences together as one wholesome community. I believe this is a crucial part to society moving forward into the 21st century.

Education is another area of significant interest. Its impact on a child's development is immense. As mentioned previously, it is not only knowledge and wisdom one receives in school, it is memories and experiences, for good or bad, that an individual carries for the rest of their life. I believe that there is more to a student than what a test score can reveal. There are hidden talents, secret passions, but also certain student needs that are unnoticed or pushed aside to ensure they pass the mandated tests. In reality, it is my belief that different learning and instruction methods can aid in reaching a larger range of the student population. It is one of my main goals to determine what those methods are, and how we can incorporate them into architectural solutions.

The architecture of educational facilities itself is an area that has gone unchanged for many years. With information describing how a simple classroom can be used in a multitude of different arrangements and activities, the spaces can begin to change on a larger scale. Many firms and educators have worked to research these techniques, and it is my goal to compile this information and utilize it in such a manner that it will communicate these ideas as common knowledge in the profession moving forward.

SPECIFIC GOALS

- **RESEARCH LEARNING AND INSTRUCTION METHODS**
- **DEVELOP FLEXIBLE LEARNING ENVIRONMENTS THAT UTILIZE THESE DISCOVERED METHODS**
- **CREATE A REFERENCE DOCUMENT ANALYZING VARIOUS LEARNING ENVIRONMENTS AND THEIR IMPACTS ON STUDENT AND TEACHER ENGAGEMENT AND DEVELOPMENT**
- **PROVIDE A PLACE IN WHICH THE COMMUNITY OF BEMIDJI CAN BE PROUD OF**
- **IDENTIFY WITH NATIVE AMERICAN CULTURE, AND DISCOVER TRADITIONS THAT INFORM ABOUT OUR NATION'S HISTORY AND VALUES**
- **DESIGN A SAFE AND ENGAGING LEARNING ENVIRONMENT FOR BEMIDJI'S YOUTH**
- **DEVELOP AND PUSH SKILLS OF MODELING, CONSTRUCTION TECHNIQUES, AND THEORIES OF EDUCATIONAL ARCHITECTURE TO UTILIZE IN PROFESSIONAL DEVELOPMENT**

PLAN FOR PROCEEDING

DEFINITION OF RESEARCH DIRECTION

Theoretical Premise / Unifying Idea

1. Precedents in 21st Century learning environments
2. Precedents in Native American culture and architecture.
3. Identifying architectural conditions that support learning environments and a variety of learning styles.
4. What are challenges that come with combining 21st century instruction methods and Native American traditional and cultural methods?

Goal: By visiting and researching educational facilities both local and distant, an analysis will be determined to inform how to develop a safe and inspiring school.

Project Typology

1. Determine guiding principles and design criteria that will guide all design decisions moving forward.
2. Those principles and criteria will reflect educational and cultural standards determined by the research.

Goals: Information from educational, cultural, and design sources will determine what the students of Bemidji need to be successful students. [*What can architecture do to influence the development of instructors and their students?*]

Historical Context

1. How do cultural and social issues affect Native and Non-Native integration into schools?
2. How does the community affect the school district?
3. What educational traditions do the Natives have?
4. Which instruction styles have been successful?
5. What are current and past trends in 21st century instruction methods?

Goals: Analysis will show trends in instruction methods and cultural aspects of education. Criteria for handling Native and Non-Native integration and correlations between learning styles and architectural features will be established.

Site Analysis

1. What aspects of the site and its natural features present challenges for development?
2. What features can aid the architectural elements in creating a successful learning environment?
3. How can the school be developed while minimizing effects on the site and natural habitats?
4. How will the site fit into the larger context of the school district?

Goals: Use site visits and analysis to determine strategies for building placement. Information will be obtained regarding not only the site proper, but the larger regional and community context as well.

Programmatic Requirements

1. Based on precedents and other research, what spaces will reflect positively on the instruction/ learning methods adopted for use?
2. How do the individual classrooms unify into a larger learning community?

Goals: Using precedents and research, successful spatial organization and function will be determined. [*Successful, meaning multiple spaces created for the various learning styles discovered in research throughout the building*].

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DESIGN METHODOLOGY

GENERAL METHODOLOGY

Use experimental and simulation strategies to create, test and conclude/analyze the data to understand/explain how a variety of learning spaces improve student learning. Essentially, a mixed-method, quantitative/qualitative approach.

Casual comparative studies, as defined by Architectural Research Methods by Groat/Wang, will be used to select comparable classrooms and learning environments and collect data on a variety of select variables. Based on the research obtained, the development of classroom designs and then using software programs to analyze each variable will provide the data necessary to correlate with recommended levels.

Quantitative Analysis

Induction - Interpret statistical and scientific data / information discovered through research and investigation.

Qualitative Analysis

Deduction - Interpret information gathered from interviews or observations to make decisions that meet the guiding principles and design criteria.

Exploration

Using research continually throughout the entire process, all decisions will be checked against the guiding principles. This will validate all design decisions moving forward. These research areas include: Typology, historical context, theoretical ideas, site analysis, case studies, local and regional information and master plans.

DOCUMENTATION OF DESIGN PROCESS

Decision - Making Tools and Techniques

1. Hand Drawings / Sketching
2. Physical Modeling
3. Computer-aided Software
 - Autodesk Revit
 - Autodesk AutoCad

The entire process will be very important to document and preserve. Organization of information will be key, therefore a weekly journal will be kept for later reference.

Design Preservation Methods

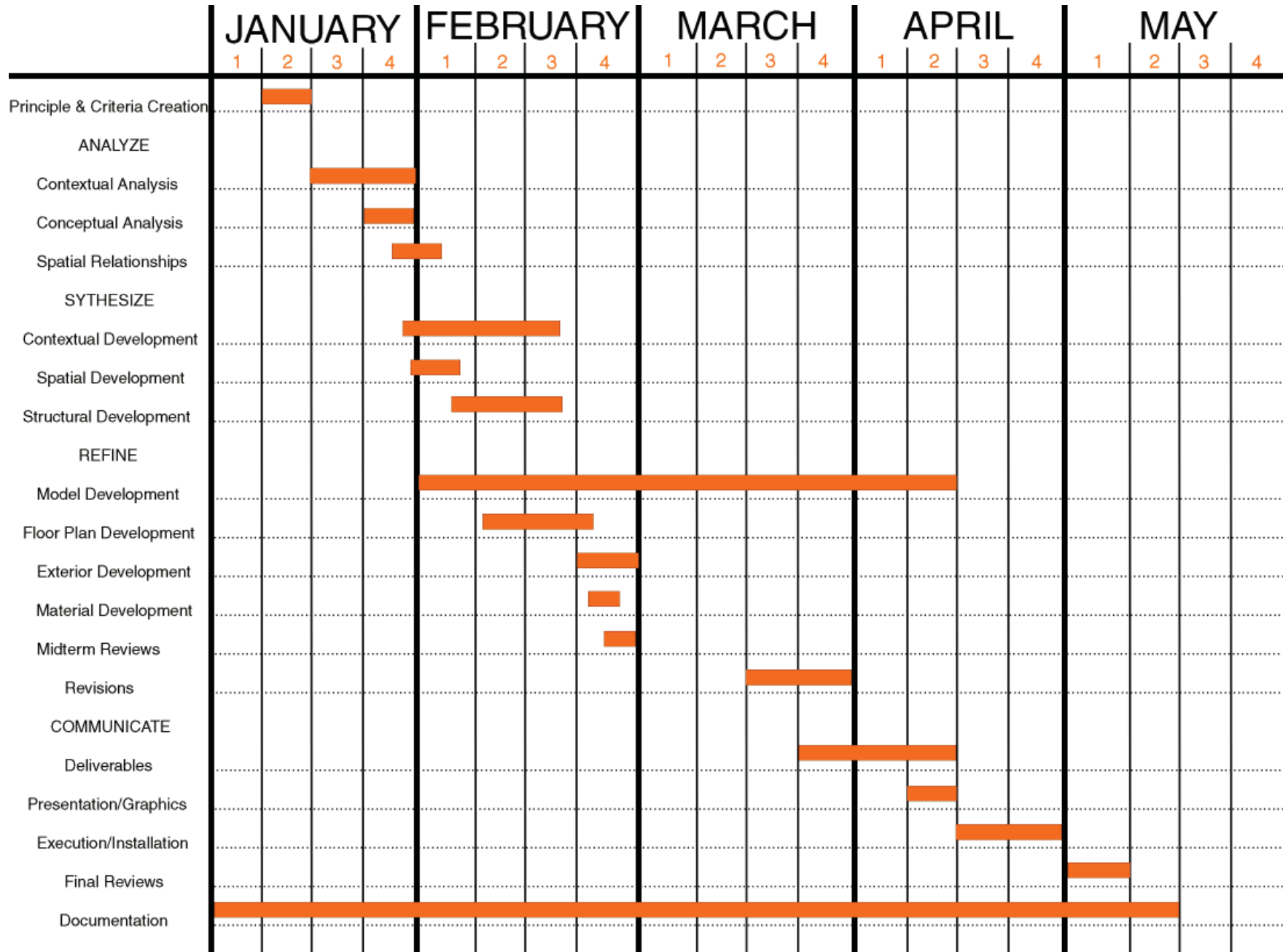
1. Hand drawings or modeling will be documented through photographs and/or scanned images.
2. Weekly meetings and discussions with thesis advisor(s) documented in notes. Weekly updates given to advisor for feedback.
3. Continuing research documented and dated for later reference and addition to main thesis document.
4. Files will be backed up weekly via external drive and Google Drive.

Publication of Material

1. NDSU Institutional Repository
2. Final Presentation Booklet

PLAN FOR PROCEEDING - SCHEDULE

Influenced by Professor Steve Martens 12-Step Program for Design Action



THESIS PROGRAM



THEORETICAL ASPECT RESEARCH



Figure 30

INTRODUCTION

Throughout the proposal and programming phases of this thesis project, multiple topics of interest have been researched, providing support to the Theoretical Premise and Unifying Ideas of the project. The following is information found to have a strong correlation to those premises: Psychology, Humanistic Hierarchy, Materialism, and Historicism.

THEORETICAL ASPECT RESEARCH

PSYCHOLOGY

According to Howard Gardner in *Multiple Intelligences* (2006), intelligence is a computational capacity to process information that originates in human biology and psychology. Humans are capable of containing multiple intelligences, different ways of solving the same problem. Problem solving is a much needed skill set in today's world, tested constantly within school. Yet, often times students success in this area is determined by a uniform test scores that, once added up, it somehow proves a person's intelligence. This works well for some with the right score, as Gardner adds, but it doesn't acknowledge that people learn with different styles and strengths.

"This model for a school is based in part on findings from sciences that did not even exist in Binet's time: cognitive science (the study of the mind) and neuroscience (the study of the brain). One such approach I have called the theory of multiple intelligences." (Gardner, 2006, p.5).

As identified by Gardner (2006), there are seven original intelligences: Musical, Bodily-Kinesthetic, Logical-Mathematical, Linguistic, Spatial, Interpersonal, and Intrapersonal. It has also been acknowledged that there could be more, waiting to be discovered. This displays how important it is to provide today's youth with the means to open themselves to multiple intelligences, multiple ways of solving the same problem. By creating different learning environments, this proposed educational facility will allow its faculty to instruct in a variety of ways in order to reach more students.

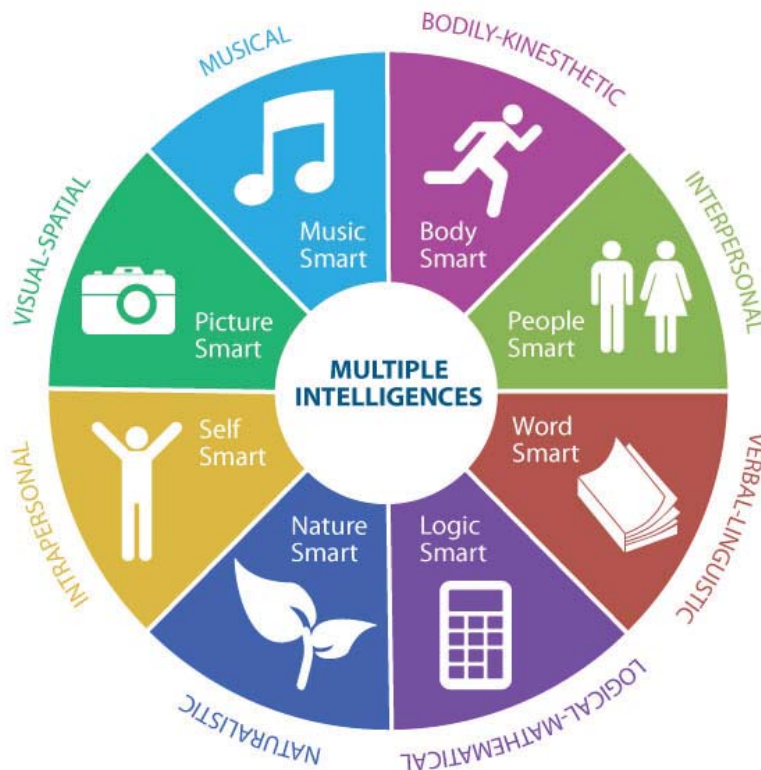


Figure 31

THEORETICAL ASPECT RESEARCH

HUMANISTIC HIERARCHY

Abraham Maslow described human needs as a hierarchy, stating that once one need was fulfilled, they would move on to the next one. He also realized that some needs were of more significance than others. Beginning with the most basic need of all, physiological needs, they slowly move towards self-centered ones that reflect solely on the individual. Maslow defined them as following:

1. Physiological
2. Safety
3. Belonging/Love
4. Self-Esteem
5. Self-Actualization

As humans age, their needs change as well. Children place more value with the more basic needs, whereas an adult looks to pursue talents and achievements. This is important to understand when beginning the design phase. Children will only begin to learn when they feel safe and welcomed, so these needs must be addressed early on. A place where students are accepted can often be a sanctuary from home life. Once these are met, the design can move towards creating spaces for students to discover themselves and begin the self-actualization phases of their educational careers. (OWP/P Architects et al., 2009, p.34).

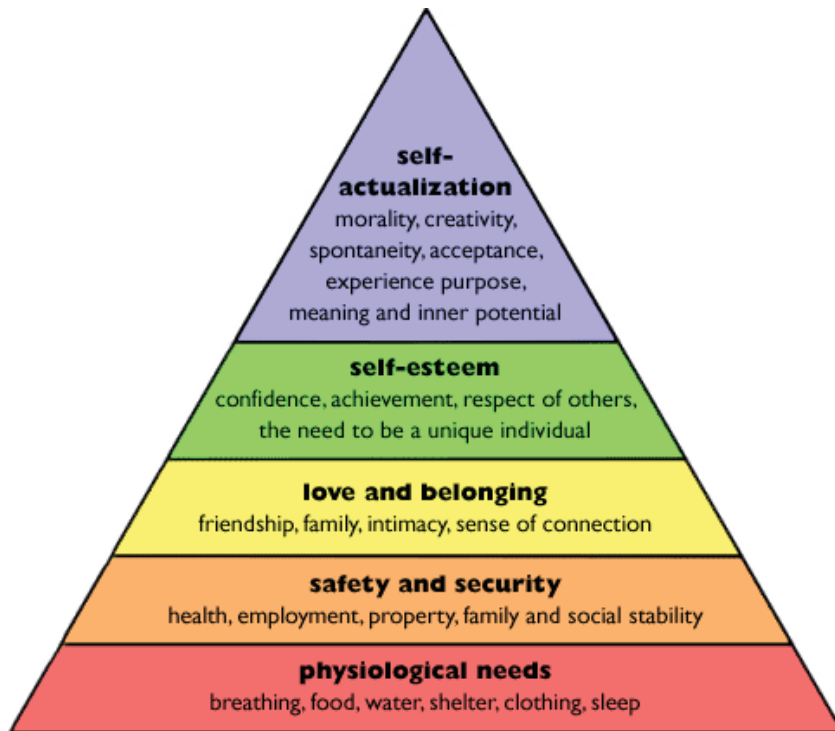


Figure 32

THEORETICAL ASPECT RESEARCH

MATERIALISM

Materialism is a sometimes difficult subject when dealing with educational facilities. To ensure the safety and security of the students, schools in the past have minimized material expressions. Minimizing the glazing limits threats from the outdoors but also reduces sunlight. In *The Third Teacher*, the authors discuss how increasing daylight in classrooms can have a positive effect on students learning and test scores (OWP/P, et al., 2009, p. 47). Acoustics are another important aspect in schools. Using absorptive materials can reduce background noise and increase focus. Another important facet in which *The Third Teacher* (OWP/P, et al., 2009, p. 177) explains is sensory experiences. Places that trigger the senses into action aid students in information retrieval and retention. Light, color, and texture are important features to think about when choosing materials. Specifically, OWP/P et al. (2009) describe how they should be used.



Figure 33

Color: Use a subtle chromatic range with many shades. Include colors similar to each other, tone upon tone, which can generate vigor and variety, and colors that contrast with one another.

Light: Offer an environment illuminated from a variety of sources: incandescent, fluorescent, vapor, halogen, etc. Light should be able to create shadows. Provide concentrated as well as diffuse light and different color “temperatures”: warm white, cool white, rose white. Staff and children should be able to vary the light intensity and color.

Materials: Create a multi-sensory setting with surfaces that are smooth and rough, wet and dry, opaque, bright, translucent, and transparent. Have features that change over time (wood, stone, flowers, fabrics) or remain unchanged (glass, steel) (p.178).

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THEORETICAL ASPECT RESEARCH

HISTORICISM

According to OWP/P et al., (2009), most of today's schools were built between the 1950's and the 1970's. Due to the invention of air conditioning and the political climate with a lot of violence, but also due to high costs, schools were built focused on the interior and ignoring the outside world. This style was believed to limit distractions and conserve precious energy (p.47). Double loaded corridors placed classrooms side by side and across from each other, down narrow, dim hallways. While this was safe and secure for the users, it lacked inspiring features to encourage student creativity and stimulate learning. Today, designers are beginning to understand the importance of creating educational facilities that are safe, yet don't give its users a feeling of imprisonment.

Other elements that have been changing along with the architectural thinking are the teaching and instruction styles as well. To support these varying instruction methods, teachers need spaces to prepare for their lessons and collaborate with other teachers. OWP/P et al. states on page 59 that classrooms have long been designed for the teacher front and center, but if we shift the focus to the learners instead, the learning becomes dominant. This reinforces the theory of multiple intelligences, and, thus, multiple instruction methods.

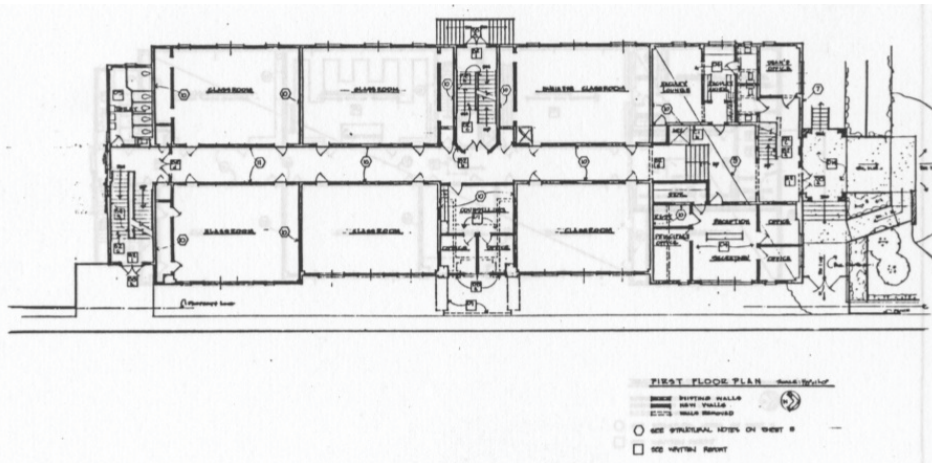


Figure 34

LITERATURE REVIEW

Howard Gardner's book on Multiple Intelligences discusses the psychological theory of multiple intelligences of the human mind, as the title describes. Gardner has gone on to identify seven distinct intelligences: Visual-Spatial, Bodily-Kinesthetic, Musical, Interpersonal, Intrapersonal, Linguistic, and Logical-Mathematical. He uses the development of the Intelligence Quotient, or IQ, to show that ratings along one intellectual dimension is incorrect and limiting. He goes on to describe that these differences in intelligences challenge the fact that all students can learn the same materials in the same way and that standardized testing is insufficient in our educational systems. The book breaks all of this down in three sections: The Theory, Educational Perspectives, and New Vistas.

This source has proven to be valuable to the development of the project. It's description of multiple intelligences provides a solid foundation to the initial discovery that multifunctional, flexible learning spaces can reach a larger portion of students than simply the traditional instruction methods and educational spaces. The research and design can use these different intelligences as a tool to develop the architectural spaces based on the multiple ways in which today's students learn. Gardner also points to other intelligences that may exist within the main intelligences or that haven't come to fruition yet. This explains how important it is to open up these students to as many different experiences as possible. Through multi-media and multi-functional instruction and environments, we may be able to push students into realms we have not yet discovered. Pushing the elements into classroom design and instruction methods will have a serious impact on how we go about educational environment design in the future.

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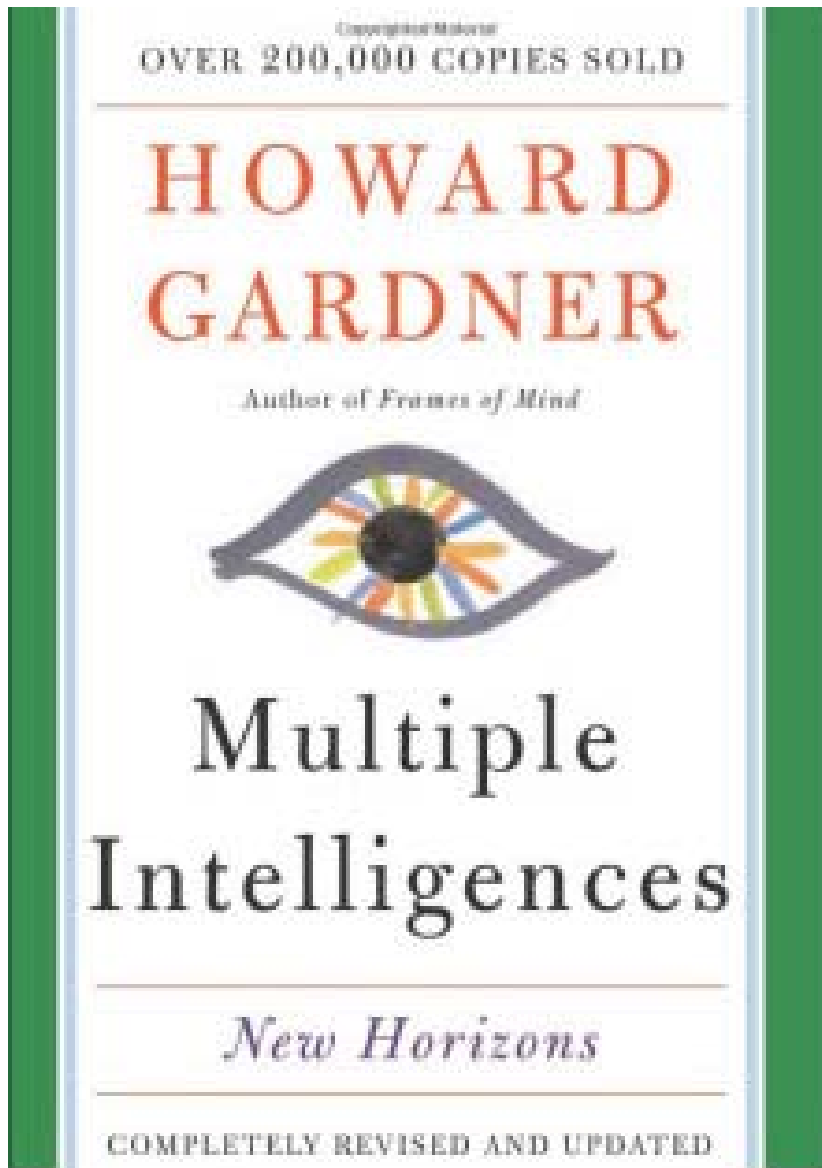


Figure 35

LITERATURE REVIEW

The Third Teacher by OWP/P Architects, VS Furniture, and Bruce Mau Design is a comprehensive book describing 79 ways design can influence the teaching and learning processes. It goes into depth describing how each of the 79 ways is successful in doing so. The book is very engaging, providing graphic representations of facts and figures. It backs up all of its information by including interviews with experts in the field, statistics, and in text citations as well as an excellent bibliography.

The book divides its information into 8 groups: Basic Needs, Minds at Work, Bodies in Motion, Community Connections, Sustainable Schools, Realm of the Senses, Learning for All, and Rewired Learning. These groups, or chapters, work together to cover all of the bases in educational learning environments, whether that be the mental or physical environment. Along with these chapters are case study examples describing the topics they just discussed in a real situation or context.

While I found the entire book to an excellent source that covers the whole realm of the educational learning environment, there are sections which I found to be more useful than others. The section titled, Minds at Work, was one of those areas. It described how students need a variety of learning methods and differences in curriculum to properly develop their brains. Creativity and imagination are significant elements of child development. One quote I found very compelling was one from Marshall McLuhan. It said “Education must shift from instruction to discovery-to probing and exploration”. This in itself points to the fact that we are beginning to understand that traditional instruction methods are not satisfactory in the development of our students.

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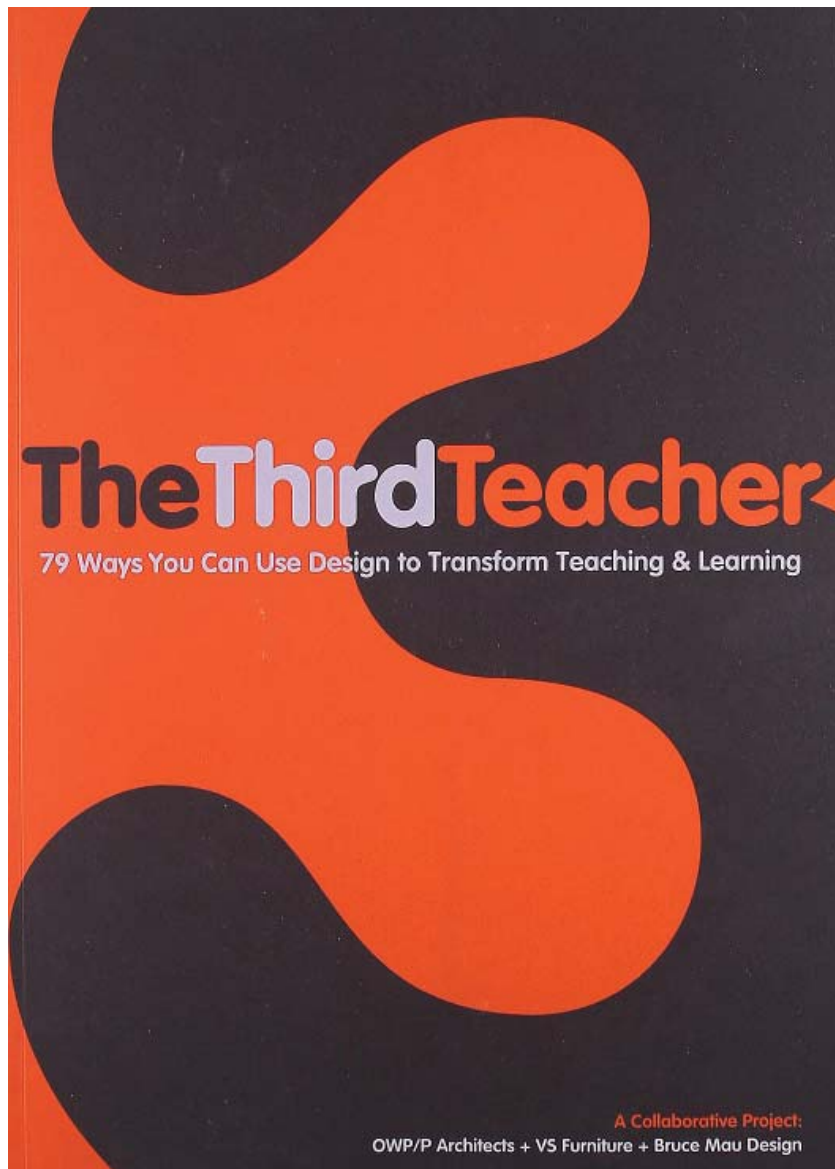


Figure 36

LITERATURE REVIEW

In my research and design, I must discover what architectural spaces and elements lend to this discovery that is needed to increase the creativity and imagination of its users. Technology integration into these areas will also be important. Children absorb information through a large variety of spaces in today's world, and our learning environments should reflect and support that.

That section also refers to leading psychologists in the field, such as Howard Gardner. This lead me to other sources to influence my ideas about the mind at work. Howard Gardner has proven to be a very valuable source as well.

Another section that I found to be very compelling was titled Bodies in Motion. This chapter describes the physical environments and how children use movement to inform their learning. Restricting students to hard plastic chairs can limit their retention and discovery. It points out that a variety of furniture that are used for different purposes and learning objectives can vastly increase brain development. As Confucius said, "I hear and I forget. I see and I remember. I do and I understand". The chapter also confirmed my ideas that flexible and agile learning environments can be engaging for both the students and the teachers. This will be an area of significance for me moving forward, to make sure that the spaces but also the furniture lend themselves to be reconfigured depending on the activity that will be taking place in those areas. Free choice is also an important aspect of schools. By giving students a say in their schools and environments, they become more involved in their education. Overall, the spaces must be flexible and engaging.

The other chapter that was very influential was the

section titled Realm of the Senses. This talked about what the title describes, the senses. The section quotes Dr. George Sheehan, saying "the mind's first step to self-awareness must be through the body". Students learn mostly through visual stimulus. This leads to believe that the spaces must be stimulating visually. Colorful spaces with lots of natural light can be that stimulation. Also, providing students with areas where they can think hands-on is crucial, along with areas rich in sensory experiences.

This source has been and will continue to be a valuable resource throughout the research and development of the learning environments in which I design. The connections between the mental and physical world are so apparent now, more so than I ever would have thought previously to reading this book. Every surface, color, chair, and subject have such a strong influence on the mind. This will inform my design criteria moving forward and create a solid base for all design decisions in the future.

LITERATURE REVIEW

This book by Carol Herselle Krinsky offers a record of contemporary Native American architecture that can be useful to providing this project with information regarding the architectural traditions of Native Americans. Krinsky states that the idea of contemporary Native American architecture has developed only in the last 25 years of the 20th century, and with it a sense of cultural renewal.

As this project aims to unite the Native and Non-Native cultures of the area, creating a well-balanced architectural design emphasizing both is essential. Krinsky points out the cultural revival movement that many indigenous have been taking part in has been gaining steam since the middle of the 1960's. Citizens are more involved in their cultural upbringing and history. Schools and community centers have been constructed to support this movement.

Many works, however, have gone unnoticed in the architectural world. Krinsky states that the nation pushes for integration and acceptance, but questions whether Natives are accepted within the Non-Native society. Bemidji is in need of this acceptance. One area in particular interest to me is the ceremonial structures and how an educational facility could incorporate this type of structure and activity.

As stated in this resource, architectural elements can provide areas of cultural education and facilitate awareness and growth. They are an important link between architecture and culture. Case studies, such as the Mille Lacs Building and Lake Lena Building provided in this resource, will lead to design solutions for varying learning environments in the project moving forward and provide insight as to how to incorporate Native American culture into the program.

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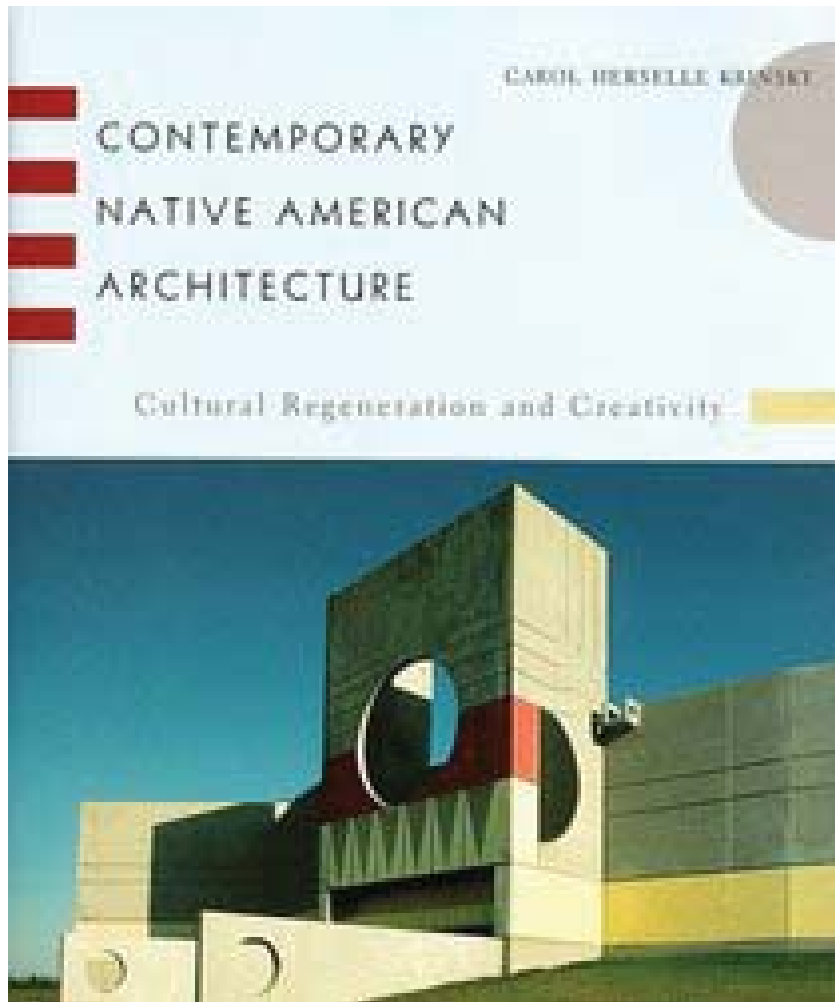


Figure 37

LITERATURE REVIEW

This source focuses on the traditional forms of Native American architecture. Nabokov and Easton talk of the significance of Indian architecture as a part of American Indian life. The architecture reflects its residents and users, and in turn, you can understand their culture through these structures.

Nabokov and Easton outline how Native American architecture is not only the design and construction of these structures, but the human thoughts, actions, activities, and natural representations they symbolize. This description bears an important connection to the project. In an effort to connect to Native American culture, this source has encouraged me to think of buildings not only as architectural spaces, but the activities that take place within them. This can potentially provide educational spaces with more meaning and cultural importance, rather than reducing a space down to simple square footages.

Nabokov and Easton also mention the importance of celebrating the talents and skills of Native American builders and their use of local materials. Cultural customs and social rules were transmitted orally, which is a learning style that can be useful in 21st century learning environments. By combining the system of oral learning and Native architectural materials and building methods, the educational learning spaces will be more meaningful and inhibit learning among today's students.

As the project moves into the schematic design phase, this resource will be a valuable one to successfully integrate Native structures and building types into an 21st century learning environment that supports both Native and Non-Native students.

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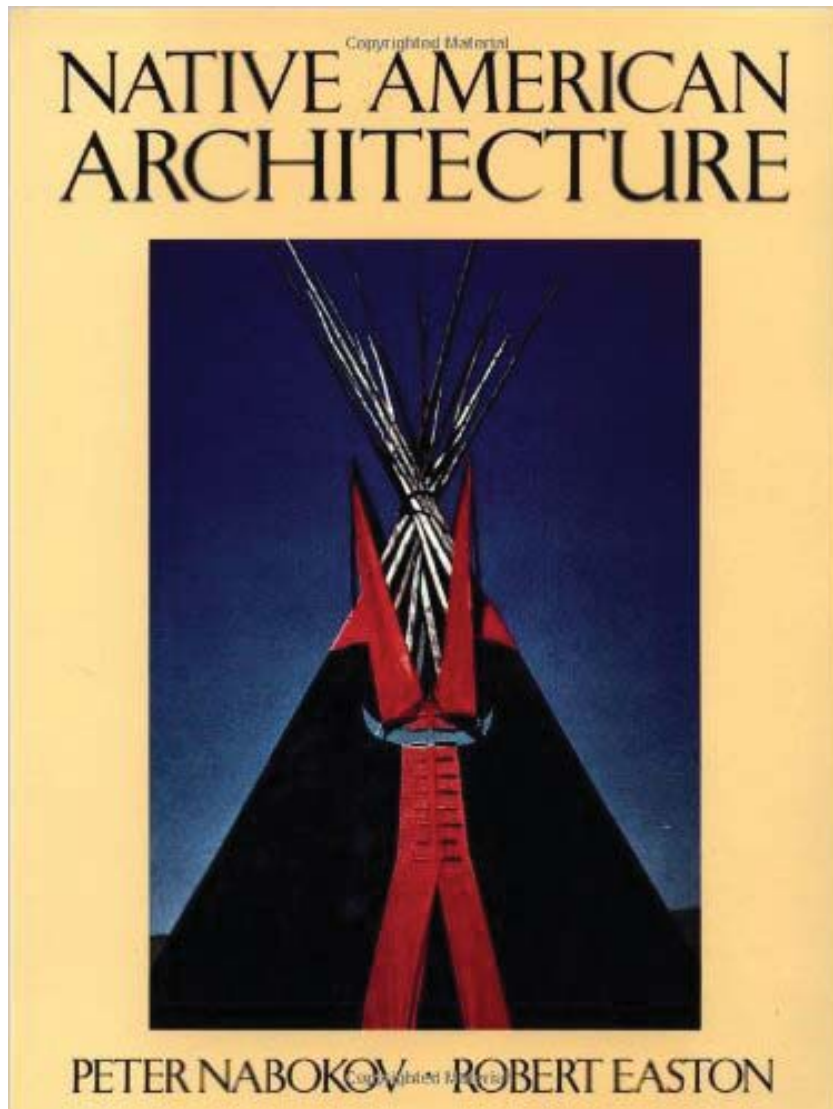


Figure 38

RESEARCH & LITERATURE REVIEW SUMMARY

In summation all of the resources that have contributed to this project so far work together to form a cultural confluence of information. They not only have formed the backbone of the project, but are linked to one another as well. The Third Teacher by OWP/P Architects, VS Furniture, and Bruce Mau Design talks of design choices that influence learning and touches on the mental forces at work. It hints at the multiple ways a student can learn, which links itself to the book Multiple Intelligences by Howard Gardner. This, as the title suggests, reviews how there are multiple intelligences and multiple ways we as humans take in information and communicate that information as well. It talks of how important it is to open our youth to many different learning opportunities.

On the other side of things, in order to incorporate the cultures of the Native American students that will attend the school, resources were needed to inform me of Native traditions and customs. Contemporary Native American Architecture by Carol Krinsky talks not only of works of architecture, but the cultural revival that has taken place as well. Interest in understanding their ancestors and cultural values is growing within the Native populations. Now, the resources and facilities for them to do so are more important than they have ever before.

Native American Architecture by Nabokov and Easton is a similar force, focused on the architectural customs of the Native American populations throughout the United States and Canada. Each tribe has its own traditions and thus different forms of architecture. Many share similarities however.

One significant aspect that all these sources share is the ideology that a building is more than a set of spaces, but

the activities that take place within those spaces. Krinsky talks of ceremonial spaces and the rituals that take place there. Contact with the Earth and their surroundings are essential, and its focus is community. Areas like this could be useful collaboration spaces in an educational setting, with thoughtful expression of local materials to bring its users closer to nature and the outdoors.

These Native American architectural features provide an opportunity for the programs that are housed inside them to reflect the culture of the origins as well. Oral storytelling, religious and ceremonial activities took place in these beautiful buildings and perhaps activities such as these could take place in an educational sense as well. A mix of traditional and 21st century learning methods should create a safe and welcoming place for the students.

The Third Teacher has been the best resource of all, providing multiple examples and case studies, interviews and conversations, to back their claims. For an architectural resource, the book describes the learning processes with great detail. Orientation, color, lighting, layout and configuration all possess the power to influence its users. Providing students with facilities that allow for multiple learning styles and configurations engages them and promotes collaborations and imagination.

These resources have been of great service to the programming phases of the project and they will continue to provide guidance throughout the design phase. They have provided other sources that may come into play in the near future. Overall, I feel confident in my research and background information to create a valid and inspiring educational facility of the community of Bemidji, Minnesota.

PROJECT JUSTIFICATION

We need to help students and parents cherish and preserve the ethnic and cultural diversity that nourishes and strengthens this community - and this nation.

- Caesar Chavez

In today's world where children are facing constant pressures from society, preserving their ethnic and cultural diversity definitely takes a backseat. Bemidji is a proud community with diverse population. With a large Native American population that struggles to integrate with the Non-Native culture, creating an educational space that can bring the entire community together is a significant need for the area.

Bringing life to such a spiritual site and area will be a great place to create this cultural confluence. The site is just south of the existing High School, which will play an important role in making the new facility fit into the larger context of the school district and community. It's quiet and peaceful location along the Mississippi River provides an opportunity to involve the natural world into the curriculum of the magnet school and pay homage to traditional Native American architectural elements and programs.

This project provides a great opportunity to showcase a culmination of knowledge obtained at North Dakota State University. Technical skills combined with cultural understandings of building types and the area of Bemidji should lead to a sustainable and supportive center for this community.



Figure 39

HISTORICAL, SOCIAL, AND CULTURAL CONTEXT OF THE THESIS

INTRODUCTION:

Bemidji, Minnesota has an interesting history and culture. Prior to the 1880's, the areas only inhabitants were about fifty Native Americans from Leech Lake. In 1896, the village of Bemidji was established, with logging and homesteading as the main job titles. From then on, after the railroad was established, Bemidji became a trading center between Duluth and Grand Forks. Bemidji is a proud community with strong a Native American population, about 11.3% of the overall population. To bring this proud community together even further, a Native American magent school will create a cultural confluence of all inhabitants.



Figure 40

HISTORICAL, SOCIAL, AND CULTURAL CONTEXT OF THE THESIS

HISTORICAL CONTEXT:

According to Independent School District #31, the kindergarten through 5th grade enrollment levels are the highest of all grade levels in the district, and are projected to increase to about 2,500 students each year within those levels. Typically when enrollment increases, schools look to increase their facilities to account for more students. Also, with all day preschool set to start in 2016, schools will be struggling for space. In a district already planning an expansion at the middle school level, a new facility would ease these changes that have seen an increase of 500 students since 2007. The population of Bemidji has been growing at a rate of nearly 3% as well, pushing future class sizes, according to the United States Census Bureau. With a Native dropout rate of over double that of White students, schools throughout the state, such as American Indian Magnet in St. Paul, have been attempting to upgrade their facilities over the past few years.

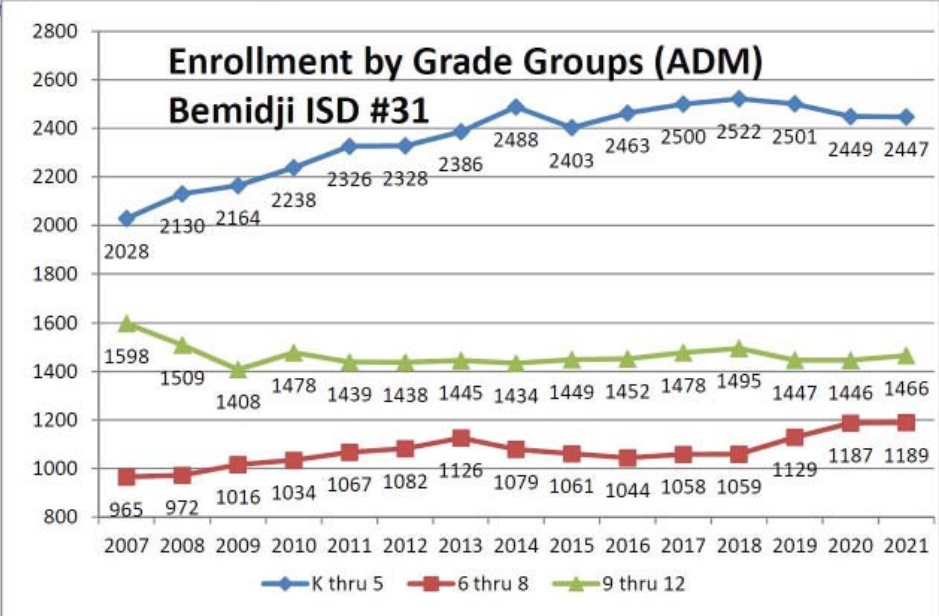


Figure 41

HISTORICAL, SOCIAL, AND CULTURAL CONTEXT OF THE THESIS



Figure 42

HISTORICAL CONTEXT:

Krinsky describes the discord that has long plagued the Native Americans in an educational sense. The neglect of education lead to the creation of boarding schools, whose children were forced from their homes and were taught in ways that enforced assimilation to societal norms. The federal government tried to solve the problem by allowing religious missionaries teach, but this created even more separation as some students would become Catholic while others in their extended family may be Episcopalian. Then there was the issue of reservations and whether they were to separate or confine, it severely hurt the chances of acculturating and assimilating (Krinsky, 1996). In order to combat these downfalls, a few government sponsored buildings were erected to support tribal life and culture, which is what a Native American magnet school could do for a community like Bemidji.

HISTORICAL, SOCIAL, AND CULTURAL CONTEXT OF THE THESIS



Figure 43

SOCIAL CONTEXT:

As stated before, there has been a culture shift within the Native American population. There is renewed interest in the traditions and languages of their ancestors way of life. Oral history and storytelling is a curious way of passing information to today's world, however, one that has been proven to be useful in the past. This cultural renewal, as Krinsky states, isn't as passionate as others, or based on religion. The primary forces pushing for that renewal seem to be for personal identity or political standing. If within the school we can create a place that Native American students feel comfortable exploring their cultures and traditions, then, as an architectural solution, it will be successful.

HISTORICAL, SOCIAL, AND CULTURAL CONTEXT OF THE THESIS

SOCIAL CONTEXT:

In a time where our society struggles to come together as one, it is our schools that need to be places of equality. For a nationality that has struggled to fit into the larger context of society, our schools can bridge the gap over these troubling waters. However, it is pertinent to not force assimilation onto the students, but embrace cultures and traditions that both Natives and Non-Natives can appreciate. Providing a cultural center for the community to educate and support these values could be a huge bonus for this area. This project could be a starting point for other community support projects in collaboration with educational facilities.

PHYSICAL CONTEXT:

Situated along the Mississippi River, the site in Bemidji, MN has a lot of spirit. Just south of the existing high school campus, the site fits into the larger community setting of the school district. Native American traditions and culture largely revolves around the natural elements, and the site is full of those elements. Outdoor learning environments provide a different perspective for students, and there are many possibilities here. Not only is the goal to design a school building, but to develop the site into a meaningful learning experience for its users.

HISTORICAL, SOCIAL, AND CULTURAL CONTEXT OF THE THESIS



Figure 44

PHYSICAL AND SOCIAL CONTEXT:

Bemidji is a very active community. It has miles of biking and hiking trails and bears a cultural connection with the Mississippi River and its headwaters in Itasca State Park. Currently, the site is home to a hiking trail that twists and turns throughout the landscape. It provides a vibe of peace and innocence that encompasses the feeling throughout the city of Bemidji. This is a social and physical attribute that is important to carry over throughout the development of the project. With Lake Bemidji nearby and the Mississippi River to the south of the site, water activities play an important role not only in the social aspects of the area, but the cultural values of the area. The features exhibited here are important ones to the larger region of northern Minnesota and its people, both Native and Non-Native.

SITE ANALYSIS



Figure 45

NARRATIVE INTRODUCTION

Bemidji, Minnesota is a community full of cultural and natural history. Nestled along the shores of Lake Bemidji and the beginning of the Mississippi River, its beauty and sense of place is unique to the area. Its relationship to the natural elements provides a rich history of outdoor activities. Bemidji has deep Native American roots and serves as a commercial center between the cities of Grand Forks, North Dakota, and Duluth, Minnesota. This wonderful area is the perfect environment to support a Native American Magnet School.

SITE ANALYSIS

NARRATIVE

When determining a site to use for the development of a new educational facility, much thought had to be put into the users of the space. Young students require a generous amount of space in order to learn and grow. With the information that has been researched, it was pertinent to provide the school with alternative learning environments, both within the school, but throughout the site as well. Therefore, the school needed to be placed on a large site with room to expand beyond its walls. Utilizing the site to its full extent was important as well.

Another requirement that has been set forth by the project is to feel a part of the educational community that is Independent School District #31. That said, the areas surrounding the current schools had to be analyzed in order to fit into the current context. The area south of the existing Bemidji High School on Division Street S and east of Adams Ave SW contains that perfect connection. The ability to share certain features with the existing school district will release this facility from a few of those constraints. Sporting and athletic fields can be shared, allowing that square footage to be used otherwise. Also, the development of this site will benefit the existing school in ways as well. Shared spaces between these adjacent facilities will influence the feeling of community.

The site exhibits strong naturalistic expressions, from the largely wooded area, to the river to the south. Away from all major roadways and downtown Bemidji, it is quite secluded and peaceful. This provides a perfect area for outdoor learning spaces and activities. Many Native American traditions and cultural values revolve around the natural world.

Using natural materials throughout the building should reflect back the resources and economy of the region. With great view sheds in all directions, this project calls for blurred lines between indoor and outdoor spaces.

The site has three main areas: a majority of wooded areas, a large grassland clearing in the middle, and a low, wet area that follows along the river. With this variety of form, it allows for different activities to take place in the different areas. The grassland clearing in the middle of the site would be a fitting place for the structure itself, as to minimize effects on the overall site. While no construction is completely unobtrusive, consolidating most of the construction in one area would be of huge benefit. By placing the building there, it takes advantage of views and nestles it in between groves of trees.

Currently, the site is owned and used by the school district. Trails are cut into the site, winding their way from one end of the site to the other. These trails are well maintained, giving a sense of genuine care and respect to the site. This is a quality that would benefit the project moving forward. Teaching students to care for and respect their surroundings is a lifelong characteristic that often is taken for granted in today's world. These descriptions merely scratch the surface of the potential of the site. Throughout the next section, the site will be analyzed through a variety of different lenses, each one expressing the site in a new way. Bemidji has a rich and exciting culture, and this project should reflect that within it.

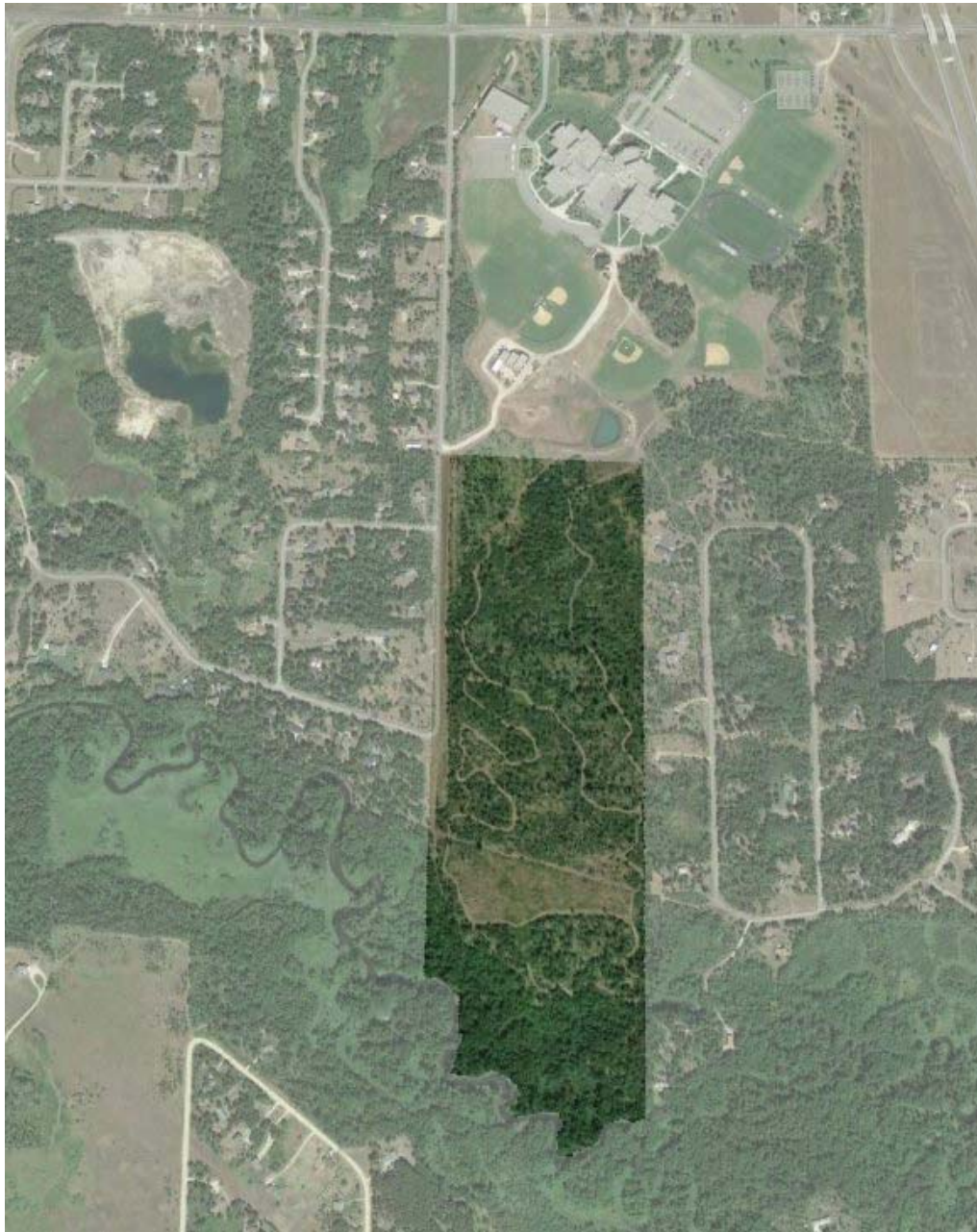


Figure 46

SITE ANALYSIS



Figure 47

TEXTURES

The map to the left shows the existing textures on the site. These textures are defined by the density of the vegetation, forming 3 distinct group both from an aerial view and experience at the ground level. These textures provide a different feeling to each of the areas as it is experienced. Walking through a densely wooded area versus a sparse meadow evoke contrasting sensations. Shade and shadows will change as well within these textures.

SITE GEOMETRY

The image to the right shows the geometries formed by placing gridlines over defining conditions such as roads, natural boundaries, and varying site conditions. It also denotes the built environment of the existing neighborhoods and high school that border the site.




-  - MEDIUM DENSITY
-  - SPARSE
-  - HIGH DENSITY



Figure 48

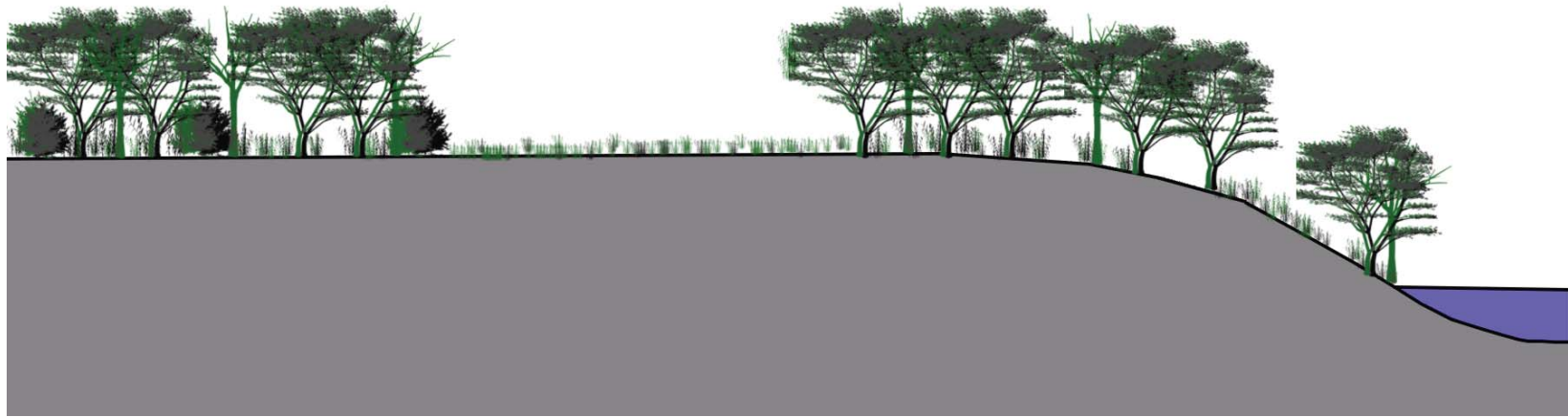


Figure 49

SECTION INFORMATION

When examining the site in section, there is not much variation in topography. The only change comes near the river. Changes in vegetation are most interesting aspect to observe. The clearing in the middle of the site is a focal point for the project, minimizing environmental disruption to the natural habitats. The clearing also has sustainable benefits as well. In the warm summers, shade and

shadows will line the perimeter, while providing air movement to circulate. In the winter the trees will not block crucial sunlight yet still provide protection from the bitter northwest winds. On a site with very little topographical change, there are ways and opportunities for design solutions to be successful at this location.

SITE ANALYSIS



Figure 50

QUALITY OF LIGHT

Light is a powerful entity. It is empowering and inspiring. Light is very important to learning communities. Natural light is not only significant to one's health, but provides a much needed boost to the mind. It symbolizes hope and growth. Down by the river, it peaks through the trees and shimmers off of the water.



Figure 51

In the middle of the site, the light behaves in a different way. The edges of the clearing are shaded by the trees, but the center is left open for vast amounts of sunlight. This is the ideal location for the building to be placed. With the intense sunlight being cast here, it will support the facility throughout the cold winter months. The design of the structure should allow the golden rays of the sun to enter as often as possible, and the students will learn to avoid taking it for granted.

SITE ANALYSIS

VEGETATION

The site is full of a variety of vegetation. Heavily wooded areas of pine, oak, birch, and maple trees give way to an open prairie of grasses and bushes. This open area is the ideal location for the building footprint on the site, as to minimize impacts to the natural elements of the site.



Figure 52



Figure 53

As the site slopes off to the river at the south end of the site, the vegetation changes again. The trees are widely spaced, long green grasses grow tall, creating a habitat conducive to outdoor learning environments. The site is very green in the summer, and in the fall, beautiful colors and a multitude of textures.

SITE ANALYSIS

WATER CHARACTERISTICS

As the site slowly begins to slope down to the south, the trees thin out and it becomes apparent that there is a body of water on the site, the Mississippi River. Though it is only a matter of miles from its birthplace, it still holds a large importance in this area. Calmly meandering and forming the southern boundary of the site, it evokes a sense of peace and serenity.



Figure 54



Figure 55

This permanent water feature holds spiritual and historical meaning to the area of Bemidji. Therefore, it should have some bearing on the students and staff, utilizing its power and spirit to educate and empower. Outdoor learning environments could be developed next to the river and the habitat observed and researched. Native American values of nature and spirit will be shared and become an underlying theme of the school.

SITE ANALYSIS



Figure 56

HUMAN CHARACTERISTICS

The red markings on the map to the left indicate a man-made trail system that is open to the public. It is the only mark of human existence on the site. Clear of trees, brush, and long grasses, it leads its visitors on a journey through the site. This intervention cutting through the site is not a threat to its existence, but a tribute to its beauty. Like the veins of a living organism, it brings life to the site.

BUILT ENVIRONMENT

Immediately to the north is the Bemidji High School. This forms the ever important relationship to the rest of the school district. Sharing the athletic fields, outdoor learning spaces, and remaining trails following construction of the new facility will instill a bond between them and their users. A quiet neighborhood resides on either side of the site, strengthening the sense of community surrounding the area. Adams Avenue SW runs along the west side, forming the western edge condition. Otherwise, the site is open to the natural elements, providing a clean slate for any new activity.

SITE ANALYSIS



Figure 57



Figure 58

DISTRESS AND SITE CHARACTER

Although there are few distresses on this pristine site, there is one major one that is felt throughout the region. Whether by disease or the slow decay of time, trees throughout the site have dwindled and died, their fallen trunks strewn about across the forest floor. These carcasses have been piled up in some places, as shown in the top image. Others, however, are still lying where they first fell.

Though sad it is, these dead trees help contribute to the character of the site. The fallen trees shed new light on younger foliage, filling in the lower canopy with bushes and saplings. Also, they provide nutrients for new growth.

The grassland clearing in the middle is also a defining feature on the site. Walking on either side looking towards the site, you would never know that a vast open area lay somewhere in the middle. Proof that things are not always what they appear to be.



Figure 59

SITE ANALYSIS

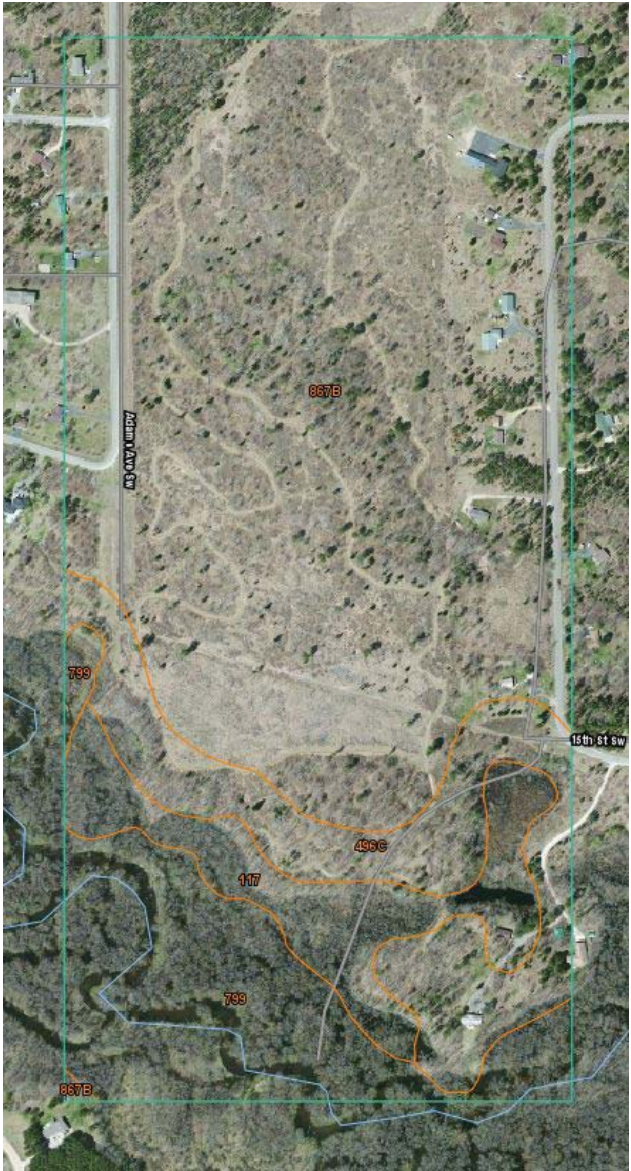


Figure 60

SOIL CLASSIFICATION

Soil Type	Percentage of Area
Cormant Loamy Fine Sand	7.8%
Andrusia Loamy Sand, 6-12% slopes	12.3%
Seelyeville and Bowstring Soils	13.9%
Eagleview-Menahga Complex, 1-8% slopes	66%

The majority of the soils on the site are, as shown above and on the map (#867B), of low slope. It's parent material is sandy outwash, about 80 inches thick, and drains extremely well. The other larger percentage is a mucky soil that surrounds the river and is unsuitable for building. This composition works for the plan of the site, placing the building on the sturdy, well drained soils on the northern half of the site.

SITE ANALYSIS

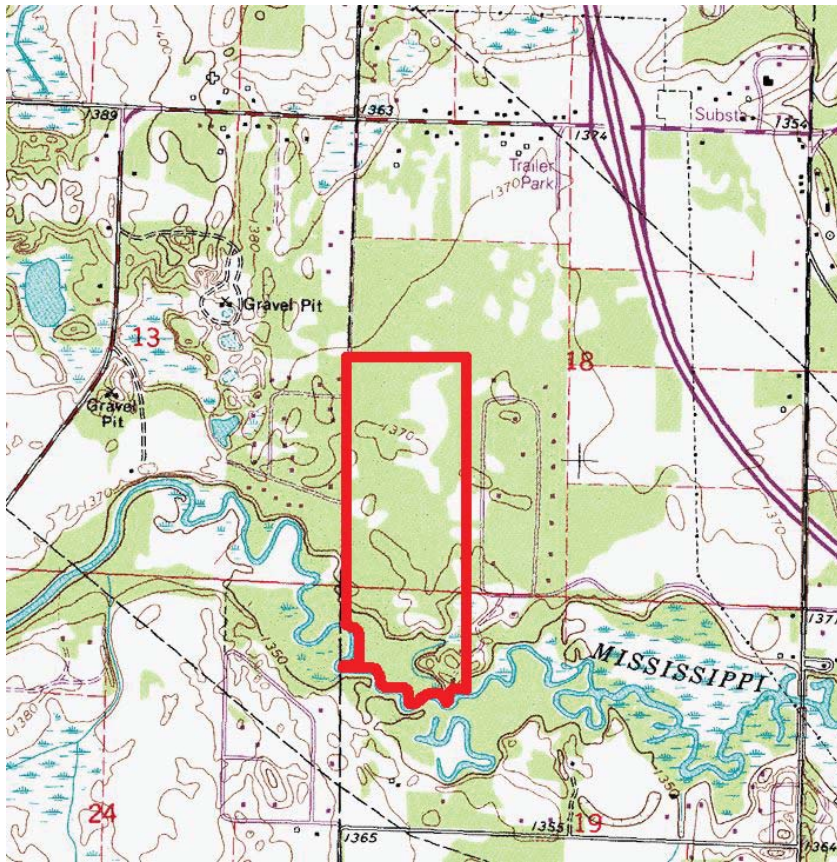


Figure 61

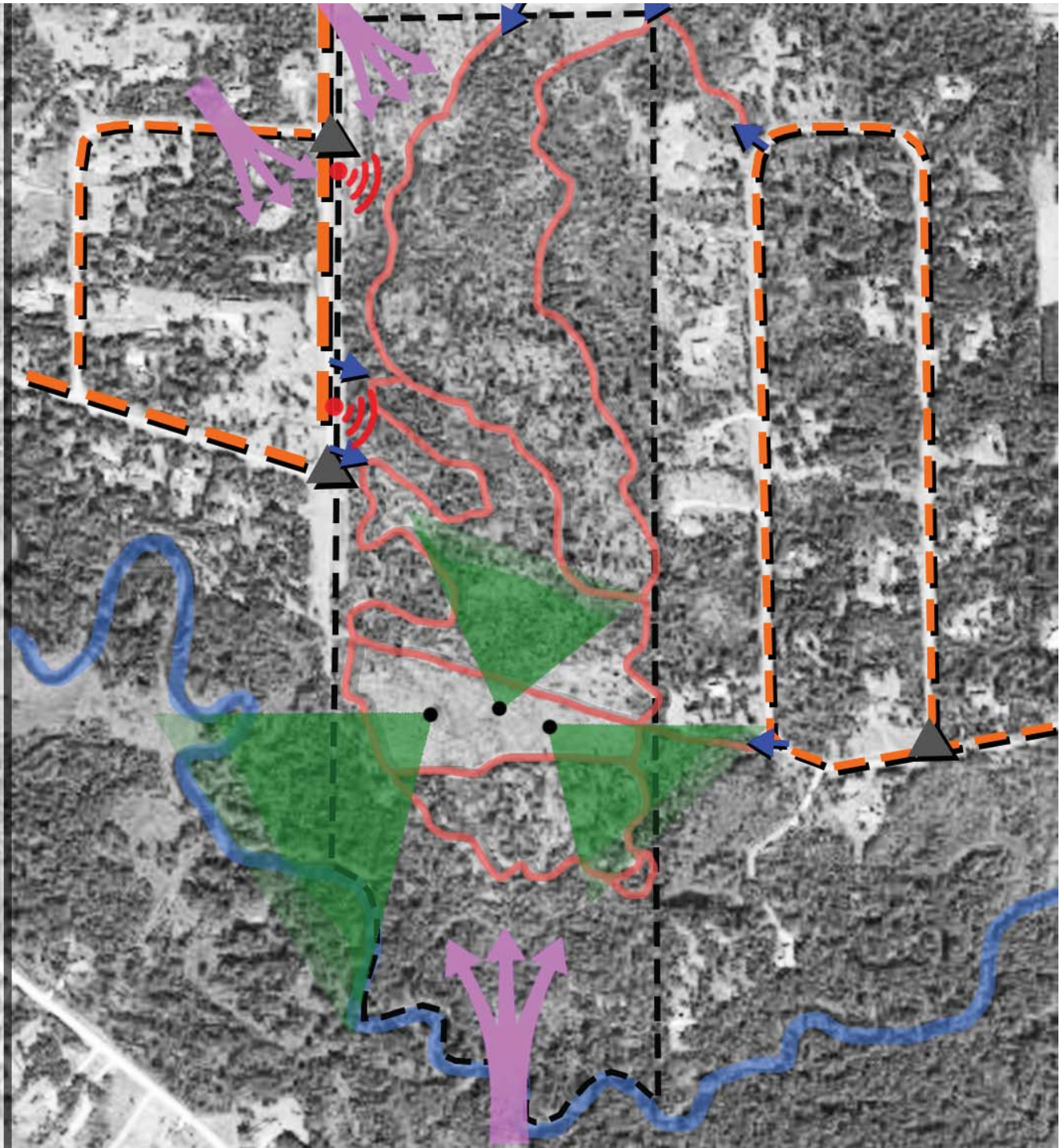
TOPOGRAPHICAL ANALYSIS

The topography of the majority of the site registers a 1-8% grade. This biggest change in grade (6-12%) occurs on the south end of the site, near the Mississippi River. The rest of the site remains nearly flat, sloping slightly south towards the river. While the river isn't large at this stage of it's life, the water drainage of the area clearly moves in the direction of the river. At 1350 feet, it is the lowest of the area.

This lack of a significant slope has little to no effect on the climate, at either the macro or micro level. This also has little effect on the air movement, most of which would be influenced by the wooded areas on and surrounding the site.

KEY

- Site Boundary
- - - Primary Vehicle Traffic
- - - Secondary Vehicle Traffic
- ▲ Intersection
- ➔ Pedestrian Access
- Noise Pollution
- View Sheds
- River
- Walking Trail



SITE ANALYSIS - CLIMATE

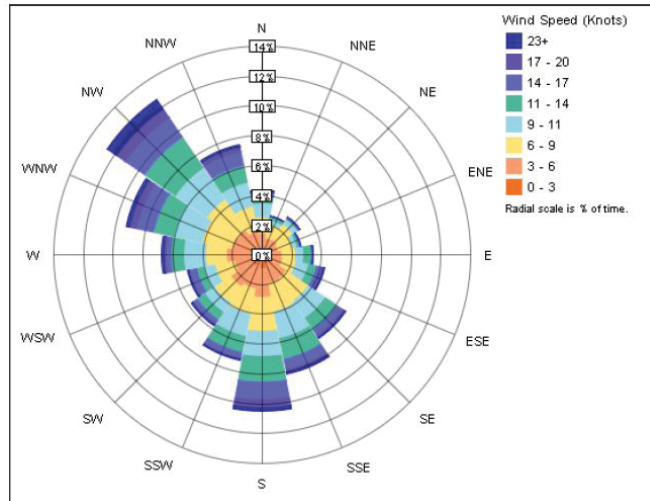


Figure 63

The graph above shows annual wind speeds for Bemidji, MN. The graph below displays the frequency of those winds. As shown, one can see that the northwest and south are the strongest and most frequent for this area, as is similar throughout the region of the northern Midwest states.

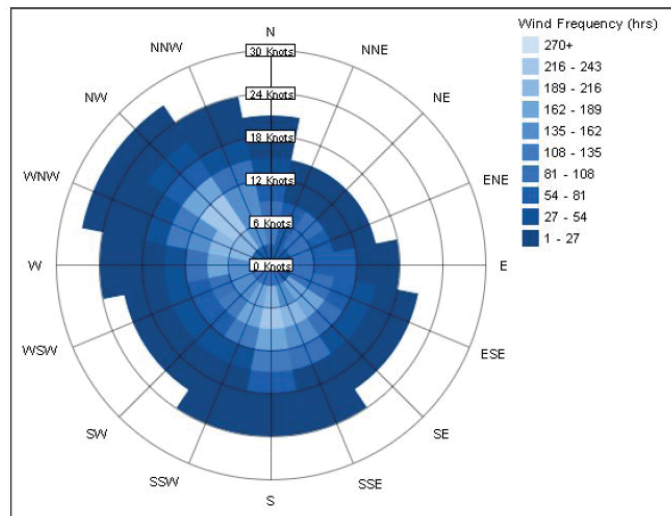


Figure 64

Monthly Wind Roses

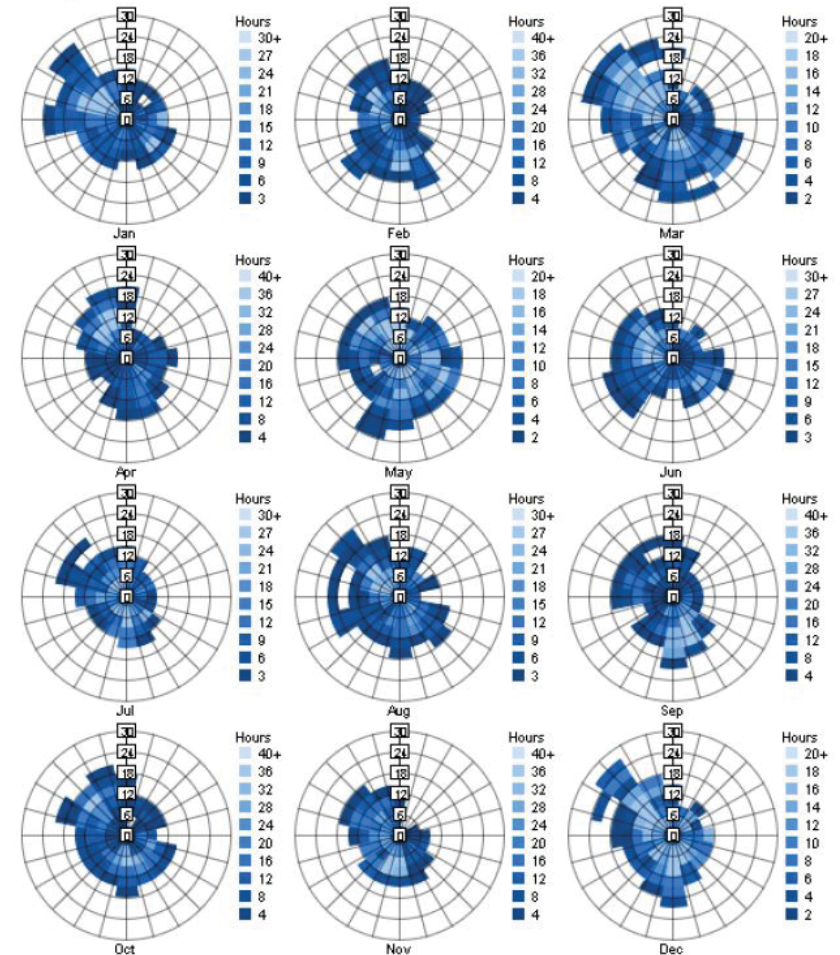


Figure 65

Above are the monthly wind roses for the site. It is clear that throughout the months, the winds shift from the northwest to the south. This will be important to consider when placing the building within the context of the site.

SITE ANALYSIS - CLIMATE

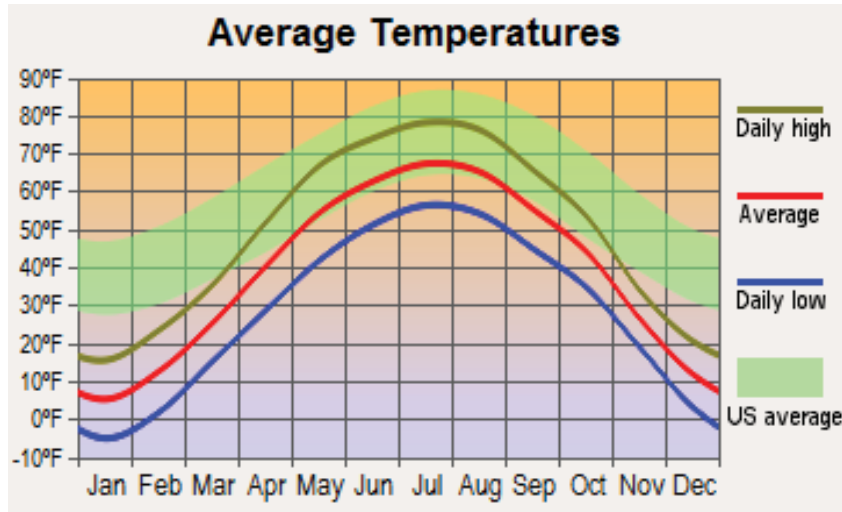


Figure 66

Temperatures and humidity tend to fall within the national average range, until the winter months come along. That is when the discrepancies occur in both areas.

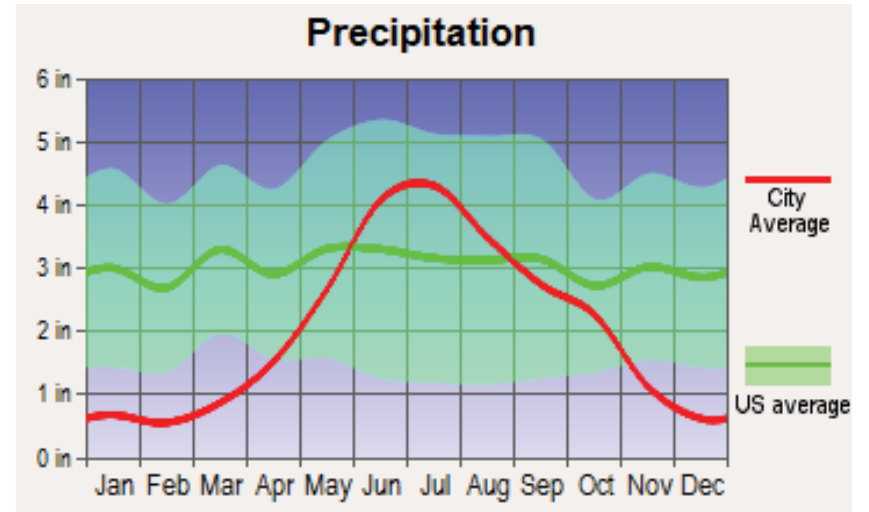


Figure 68

Significant differences occur in precipitation in the area compared to the national average. Above average levels during the summer months and severely below in the winter.

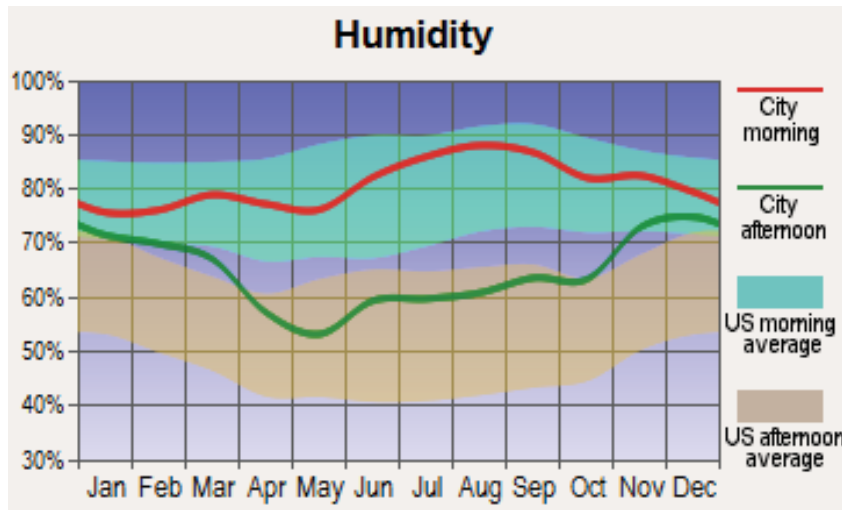


Figure 67

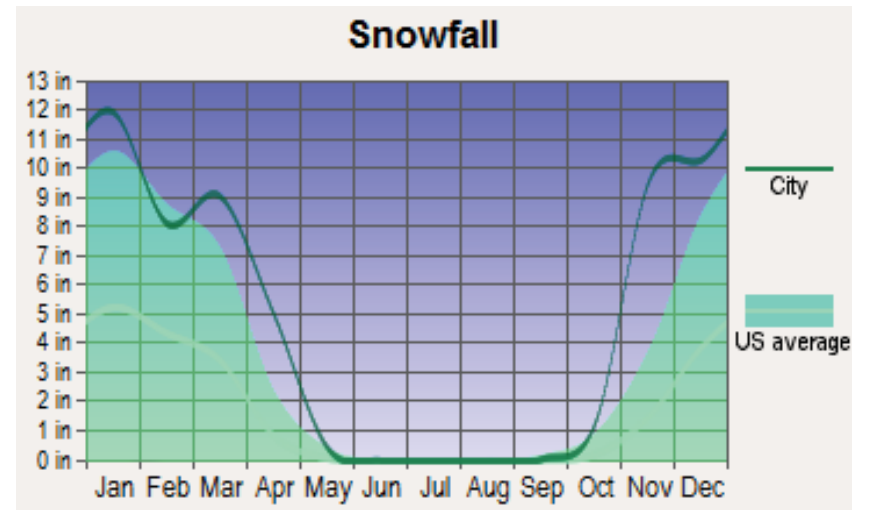


Figure 69

SITE ANALYSIS - CLIMATE

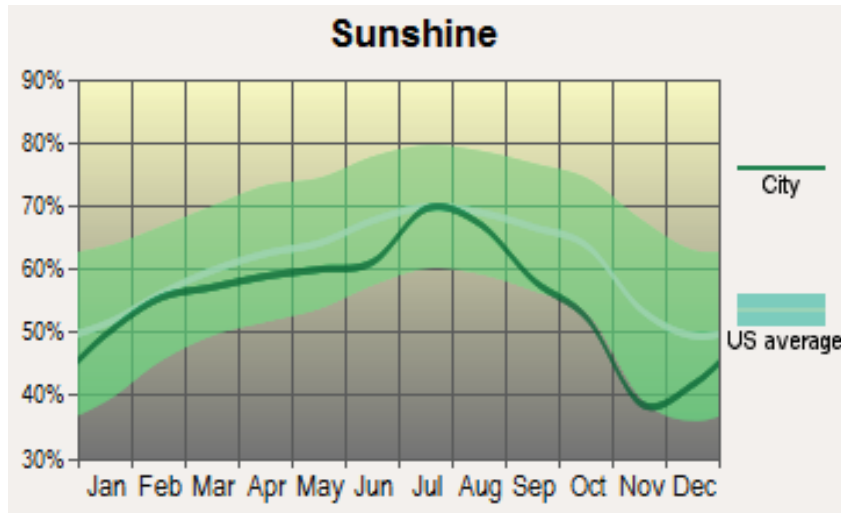


Figure 70

The amount of sun in the area stays fairly consistent with the average until end of fall, where it drops significantly.

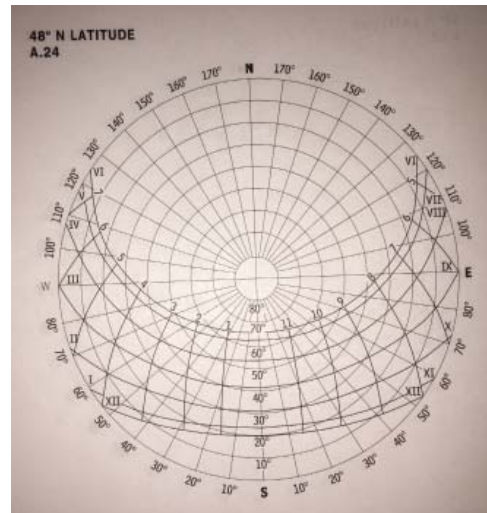


Figure 72

The graphs above and below show the sun paths and shadows for the areas that fall under the latitude of 48 degrees.

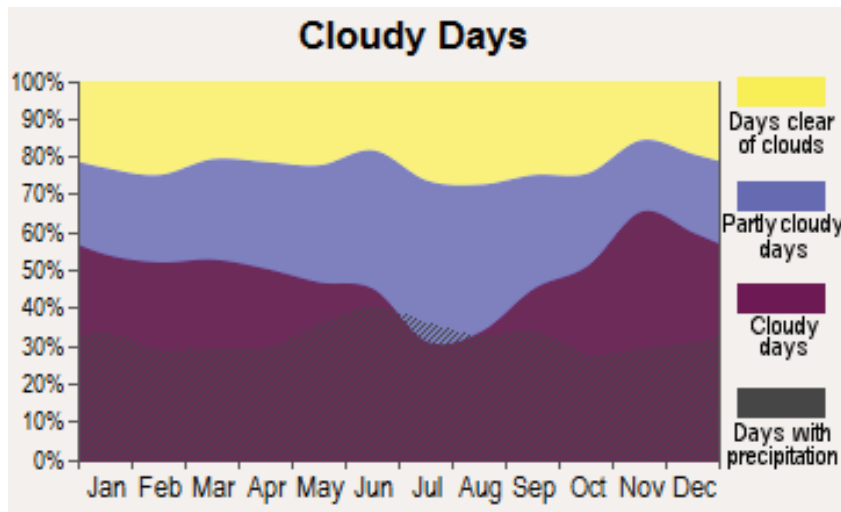


Figure 71

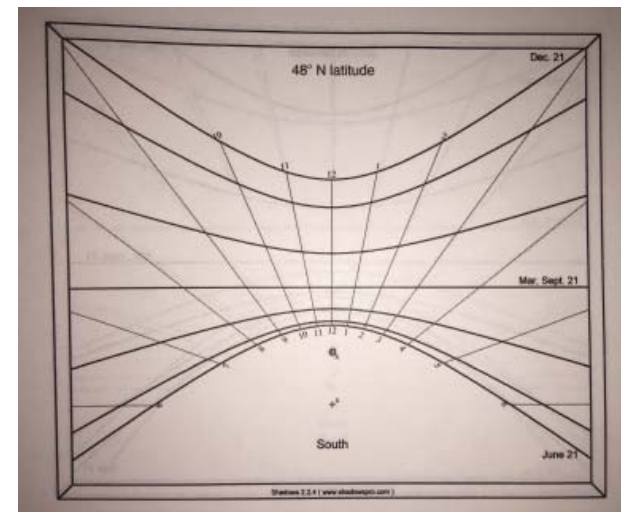


Figure 73

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DEPARTMENT OF ARCHITECTURE



Figure 74

SITE ANALYSIS



Figure 75

SITE ANALYSIS SUMMARY

After extensive research, several main points stand out as items that must be addressed. They include:

Vegetation
Water
Soils
Orientation

Textures
Light
Existing Character

With these serving as focal points and support from the other topics discussed, the design process will be able to make informed decisions moving forward. The site has puristic and naturalistic feel. It's features are inspiring and must be utilized to their full capacity, while keeping true to the history and beauty of the site as it is today.

BUILDING PROGRAM

SPACE ALLOCATION

INTRODUCTION

The description of the space requirements has been determined through the typological research, guidelines determined by the Minnesota Department of Education, and previous experience by the Thesis Investigator. Based on that research, this building program should reflect other projects within the same typology and those being built throughout the state of Minnesota. The case studies provided a larger scope ideology, suggesting what areas of educational facilities are changing and evolving. The Guide for Planning School Construction Projects in Minnesota ensured that the program was meeting the specifications set forth by the state of Minnesota. Finally, personal experiences allowed the project to gain insight on what local firms and local school districts are doing to not only stay competitive, but provide their students with safe, welcoming, and inspiring facilities.

BUILDING PROGRAM

SPACE ALLOCATION

SPACE NAME	QUANTITY	ESTIMATED SQUARE FOOTAGE (PER SPACE)	TOTAL
Typical Classroom			
5th Grade	6	900	5400
6th Grade	6	900	5400
7th Grade	6	900	5400
8th Grade	6	900	5400
Storage/Prep	4	800	3200
Break Out Spaces	8	300	2400
		Total	27200

TYPICAL CLASSROOM

The typical classroom is the space where students will spend the majority of their time while at school. These spaces will be flexible areas to allow the teachers to utilize the room for multiple learning styles and instruction methods. Each grade level receives the same amount of classrooms, as most students will spend a couple periods a day in specials such as Music or Physical Education classes.

The classrooms will be rectangular in shape, as this is the most flexible form for an educational setting. With such a beautiful site, views to the exterior will be celebrated with large windows, which will also support natural daylighting. Depending on the activity, it is important for the classroom to remain flexible. Usage changes grade level to grade level, and also between subjects taught. For example, an activity may require group work while the next may be individually based. To support this, the furniture will need to be flexible as well, able to form different combinations easily.

Classrooms will also be supported from outside the classroom with small break out spaces scattered throughout the classroom organizations. Teachers will also have separate storage and preparation spaces to ensure they have the proper resources for the day.

BUILDING PROGRAM

SPACE ALLOCATION

Lab Classrooms			
5th Grade	2	1200	2400
6th Grade	2	1200	2400
7th Grade	2	1200	2400
8th Grade	2	1200	2400
Storage/Prep	4	300	1200
		Total	10800

SCIENCE LAB CLASSROOMS

Similarly to the typical classrooms, each grade level is designated to have two science lab classrooms. These rooms, while it is encouraged to utilize different learning and instruction methods, are a little less flexible than the typical classroom due to the activities that take place there. Sinks, counter tops, gas, and other fixed elements will limit the amount of shifting that the classroom can undergo. These spaces will be well lit, with views and connections to the outdoors for alternative lessons. Outdoor learning environments will be crucial to the science department and demonstrating the natural world, so they will play a part in supporting the formal lab classrooms.

Other support spaces for preparation and storage will accompany these classrooms as well. These are significant for science instructors who often have multiple demonstrations using chemicals and other dangerous materials that need to be stored and managed for the safety and protection of the students.

BUILDING PROGRAM

SPACE ALLOCATION

Art Classroom

5th-6th	1	1000	1000
7th-8th	1	1000	1000
Storage/Prep	2	300	600
		<hr/>	
		Total	2600

ART CLASSROOMS

Art classrooms will be shared between grade levels as the activities usage sometimes varies depending on grade level. These spaces require a little more space and storage for supplies. Art activities can be short assignments or long projects that depict the materials and storage to support them. The range of those activities is quite large as well.

Connections to the outdoors will also be important to the art rooms as well. Lessons can be moved outside to inspire paintings or drawings, Native American artistic traditions can be shown or performed in the natural elements. With such a vast area to draw inspiration from, it would be harsh to not allow the students to utilize the site for alternative learning activities.

BUILDING PROGRAM

SPACE ALLOCATION

Music Spaces			
Choir Classroom	1	1200	1200
Break Out Spaces	2	200	400
Band Classroom	1	1500	1500
Break Out Spaces	2	200	400
Instrument Storage	1	800	800
		<hr/>	
		Total	4300

MUSICAL SPACES

The musical spaces are one of the areas that require a larger portion of support spaces. They consist of the main, large group practice areas, followed by smaller, break out spaces designated for small group practices. These spaces are crucial for a subject that has so many different parts and student involvement. Teacher-to-student ratios are usually higher in choir and band classes, so individual or small group activities are significant to the success as a class.

In addition to the small break out/practice spaces, the amount of storage, particularly on the band side, is significant. Instruments require storing while the students are in their other classes, therefore instrument lockers are a necessity. The safety and protection of the instruments is vital, as they are valuable and very expensive.

Acoustics are significant to the musical areas as well, which defines some of the architectural designing that will take place here. Risers are an important feature to add to each of the classroom spaces, as well as reflective and absorptive wall and floor materials.

BUILDING PROGRAM

SPACE ALLOCATION

Special Ed				
Small Classrooms	2		450	900
Large Classrooms	1		900	900
Sensory Classroom	1		1200	1200
Office/Storage	1		500	500
			Total	3500

SPECIAL EDUCATION

The areas that support the Special Education department are different from other areas in the school. Large classrooms give way to smaller, more intimate areas for small group or one-on-one involvement. These areas can also be used as quiet areas to calm students or to conduct meetings with parents and other teachers. These spaces also require a decent amount of storage, as they are often activity heavy. For students with physical restrictions or disabilities, equipment to support these students needs to be stored in a safe place.

Another aspect to the Special Education area, which will most likely be in the form of a department suite, is a sensory room. Often special needs student require physical objects to communicate, express themselves, or calm and soothe themselves. The physical environment is just as important, if not more, to these students as it is for others. These tools need to be stored and changed often, so the support of ample storage spaces is a necessity for this department.

BUILDING PROGRAM

SPACE ALLOCATION

Digital Commons/Media	1	2000	2000
Book Stacks	1	500	500
Small Group Spaces	2	150	300
Large Group Spaces	2	900	1800
Classroom	1	900	900
Conference Rooms	2	200	400
		Total	5900

DIGITAL COMMONS/MEDIA CENTER

These spaces look and function very differently than a traditional media center or library. Through research and professional experiences, it has become apparent that schools are looking at media centers and libraries differently than in the past. With the advancement of the Internet and students aptitude with electronic devices, many schools are moving to technology based programs. This no longer requires the massive amount of library stacks containing books and other resources. Now, much of that space has been allocated to other uses. Giving students various options to sit, gather, read, and work are now much more significant. Variety allows students to choose the environment they feel most comfortable with, engaging the students in ways a traditional media center just can't support.

Technological support centers are also becoming a part of these areas. Many schools are using iPads or laptops as part of their curriculum, and these devices require maintenance, charging, and connections. Seating that reflects the use of these devices allows students to move and work differently than in a traditional classroom setting. Support spaces such as small group and conference rooms with TV and projection services provides students with the tools to collaborate and work together with their peers. The spaces are often filled with life and energy, again quite different than traditional media centers.

BUILDING PROGRAM

SPACE ALLOCATION

Tech Ed				
Woodshop	1		2000	2000
Metal Shop	1		2000	2000
Classroom	1		900	900
Lab	1		900	900
Storage/Office	2		300	600
			Total	6400
F.A.C.S.				
Classroom	1		950	950
Lab	1		1200	1200
Storage	1		150	150
			Total	2300

TECHNICAL EDUCATION / FAMILY AND CONSUMER SCIENCES

The technical classes such as these require a large amount of space allocation in order to support the equipment needed in these areas. The wood shop and metal shop need connections and adequate space for machinery and construction of projects. They also require storage space for tools, materials and projects. Classrooms and labs support the shops for instruction purposes and group discussions.

Family and Consumer Sciences, or FACS for short, teach students life skills such as cooking and sewing. These activities also require a large amount of space for use and storage.

BUILDING PROGRAM

SPACE ALLOCATION

Physical Ed./Athletics

Gymnasium	1	14000	14000
Weight Room	1	2000	2000
Locker Room	2	1500	3000
Storage	2	300	600
Office	2	300	600
		Total	20200

PHYSICAL EDUCATION AND ATHLETICS

Physical Education and its facilities are a large portion of square footages of any school. Gymnasiums, such as this generous two-station gym, are used for many different activities, assemblies, and community events. These spaces need to support large numbers and provide adequate room for all attendees. It is important for this space to be used as a multi-purpose area for non-athletic reasons as well. This is an area to display school pride and culture for the community to see due to the public nature of the events that take place in these spaces.

In addition to the main gym, there are support spaces such as the weight room and locker rooms. The weight room has significant equipment needs and locker rooms are a necessity for physical activities. Storage for sporting equipment is vital as well.

BUILDING PROGRAM

SPACE ALLOCATION

Cafeteria	1	3000	3000
Staff Dining	1	500	500
Kitchen	1	1500	1500
Serving	1	1000	1000
Support Spaces	1	1500	1500
		Total	7500

CAFETERIA AND KITCHEN SUPPORT

While this area is fairly basic, it's needs are significant. The cafeteria needs to support about one third of the student population at a time, and be efficient and safe. This space can also be used as a multi-purpose room for various activities, both school related but also community related. It is important to think about how the community could utilize these larger spaces.

The staff also need a place to eat, calling for a separate dining area. Kitchens have many storage and preservation needs that require large support spaces. Refrigeration, freezers, and dry storage are just the tip of the iceberg. In addition to where the food is prepared, it needs to be served to the students in a separate area. Efficiency and order helps to move such large quantities of students through the line at a reasonable pace.

While lighting and views can be incorporated into the space, much of its success relies on efficiency and simplicity. The ability for these spaces to be cleaned plays a significant role in choosing materials in these spaces.

BUILDING PROGRAM

SPACE ALLOCATION

Administration			
Principal	1	250	250
Assistant Principal	1	250	250
Reception/Secretary	1	500	500
Work Room/Mail Room	1	350	350
Nurse	1	300	300
Counselor	1	250	250
Conference Room	1	200	200
Psychologist	1	200	200
		<hr/>	
		Total	2300

ADMINISTRATION

Often this area is the first thing visitors see when visiting the building. This area also holds the burden of checking people into the building by way of a secure entrance. Security is a significant topic in today's school design planning. Parents take great interest in making sure their children are safe, so ensuring that during school hours visitors cannot enter the building unless being checked in with administration is vital.

Most of this area is simple office and staff support spaces. The nurse is one area that needs special attention. Students enter because they are feeling ill and often times being comforted is a big portion in making these students feel better. Natural lighting and bright colors would aid this purpose of comforting the sick.

Conference rooms also accompany the offices for meetings. The majority of these spaces are private and intimate areas. It is important to remember that administration services need a positive environment just as much as other staff.

BUILDING PROGRAM

SPACE ALLOCATION

Custodial	4		200	800
			Total	800
		Total Estimated Square Footage		93800
Mechanical	10% .10 x 93800			9380
Circulation	15% .15 x 93800			14070
		Total Estimated Square Footage		117250

BUILDING PROGRAM AND SPACE ALLOCATION SUMMARY

According to the Minnesota Department of Education (2003), a middle school with a total enrollment between 500-999 students should allow for 160-190 square feet per student. Using those numbers as a guide, it was determined that, for a future enrollment at 640 students, the total square footage should be within the range of 102,400 to 121,600 square feet. Though the square footage will fluctuate as the design phases continue, the current estimated square footage falls into the recommended range.

Using that number, it was possible to determine a rough estimate of a budget. Estimating a cost per square foot of \$200-\$220, bringing the total cost of the project to be between \$23,450,000-\$25,795,000. Due to its large size, this is an expensive project. This type of expense needs to be supported by the community through the passing of referendums and bond issues. This is a very difficult task to accomplish, as by passing a measure like this requires a rise in taxes. Hopefully, school districts receive government funding to decrease the total, but it is not something a district can rely on.

PROGRAMMATIC RELATIONSHIP GRAPHIC

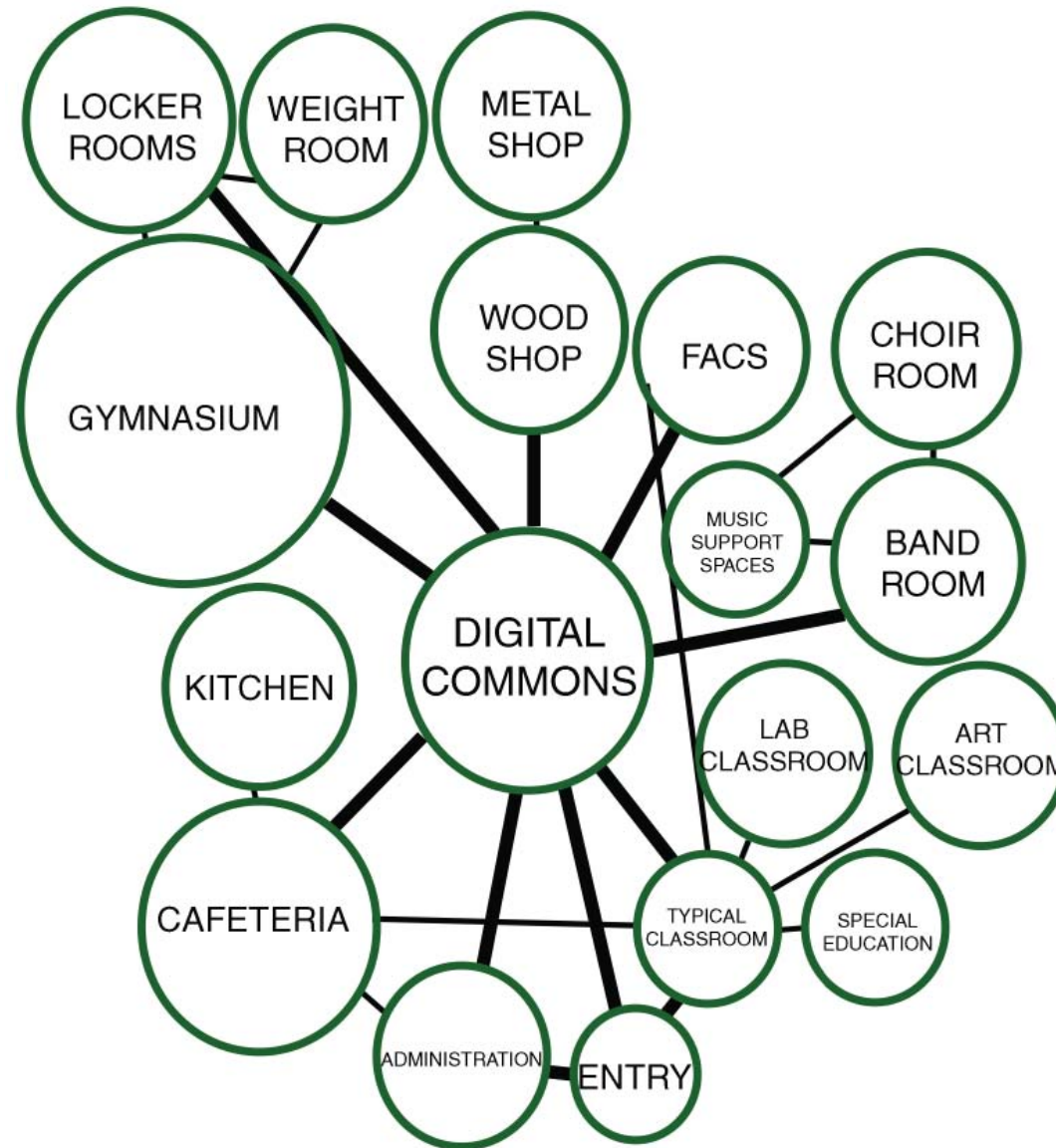


Figure 76

THESIS DESIGN SOLUTION



Architecture for engage learning should express shared meanings and enhance potential for cross-cultural discovery and inclusion. Culture and tradition are important aspects of education that are often pushed aside rather than embraced.

By creating a learning environment that puts an increased emphasis on the cultural traditions of its students, both Native and Non-Native, this facility shows that architecture can indeed bring together a community through discovery and inclusion.

PROPOSED SITE PLAN



NATIVE CULTURAL VALUES



FLOOR PLAN - LEVEL ONE

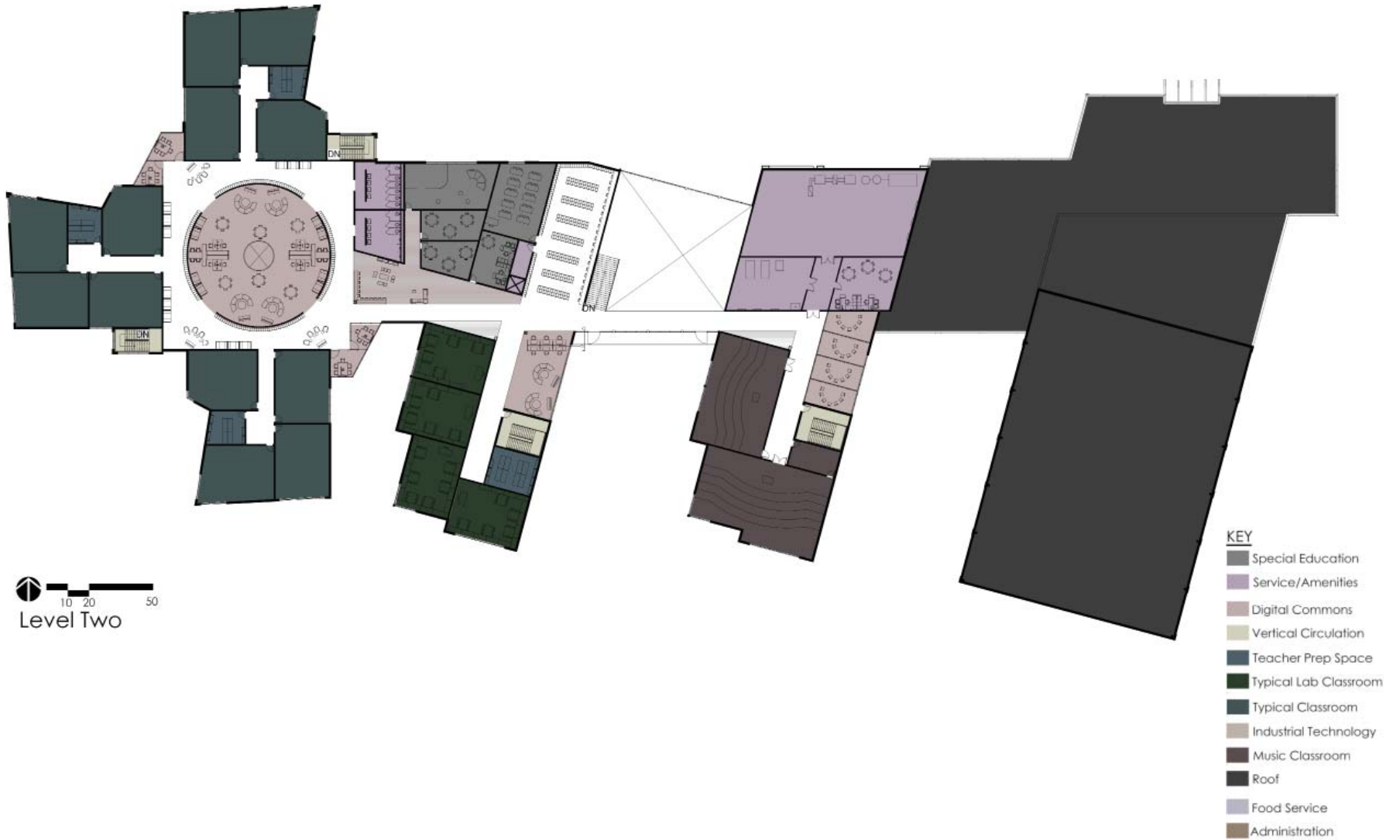


Level One

- KEY**
- Special Education
 - Service/Amenities
 - Digital Commons
 - Vertical Circulation
 - Teacher Prep Space
 - Typical Lab Classroom
 - Typical Classroom
 - Industrial Technology
 - Music Classroom
 - Roof
 - Food Service
 - Administration

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FLOOR PLAN - LEVEL TWO



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INTEGRATE - CLASSROOM DESIGN



Traditional lecture-based instruction allows students to be individually engaged and task oriented.

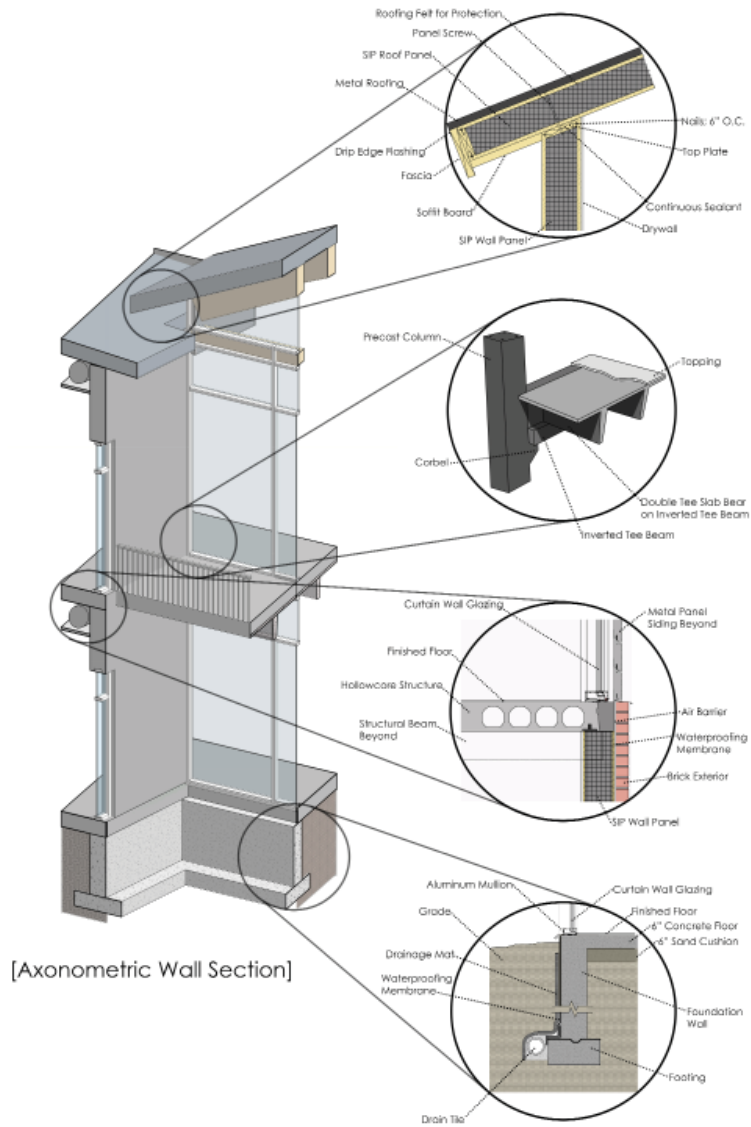


Tables can be arranged to promote group oriented projects and collaboration among peers.



Arranging a U-shape allows for groups to present projects and information to the rest of the class.

DETAILS AND MATERIAL PALETTE



Corrugated Metal Panel



Batten Seam Metal Roofing



Red Brick



Hardwood Siding



Wood LVT Flooring



Glulam Member



Accent Carpet Tile



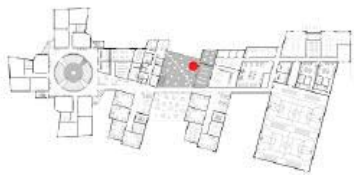
Carpet Tile



Stone Tile



CONNECT [Cafeteria]





[Lab Breakout Space]



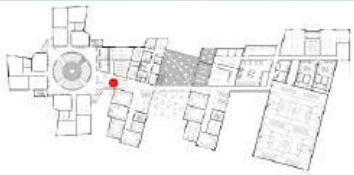


[Digital Commons]



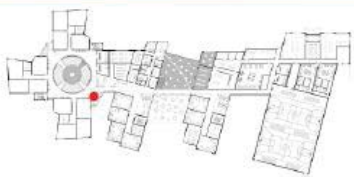


[Digital Commons Seating]



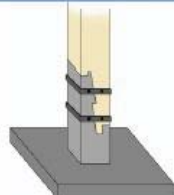
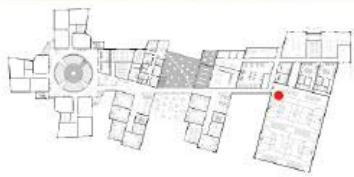


[Classroom Breakout Space]



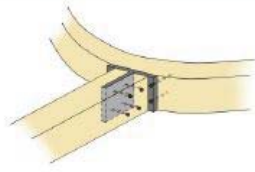
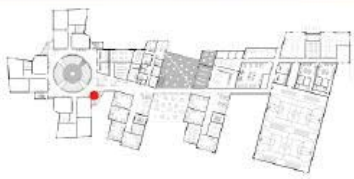


EXPRESS [Recreational Gymnasium]



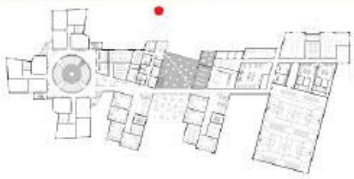


CELEBRATE [Pow Wow/Lecture Hall]





[Outdoor Patio]





THESIS APPENDIX

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PERSONAL IDENTIFICATION

PREVIOUS STUDIO EXPERIENCE

SECOND YEAR

Fall: Stephen Wischer
Projects: Tea House, Boat House

Spring: Rhet Fiskness
Projects: Culinary Arts School, Sensory Pavillion, Dance Studio

THIRD YEAR

Fall: Steve Martens
Projects: Wildlife Research Center, Wellness Spa

Spring: David Crutchfield
Projects: STAR Institute, LOGOS Youth Center

FOURTH YEAR

Fall: Don Faulkner
Projects: High Rise Building, Centennial Project

Spring: Paul Gleye - Semester Abroad, Brussels
Projects: Inter-Beton Concrete Plant, Urban Development Project

FIFTH YEAR

Fall: Ganapathy Mahalingam
Projects: Research Studio: 21st Century Learning

Spring: Steve Martens
Projects: Design Thesis

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Figure 77

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