

Willmar Junior High



Examining Education & Environment



Adam McLane
2005-2006 Senior Design Thesis

Department of Architecture & Landscape Architecture
North Dakota State University



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

By

Adam S. McLane

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

Primary Thesis Critic
Ron Ramsay

Thesis Chair
Don Faulkner - Associate Professor

May 2006
Fargo, North Dakota

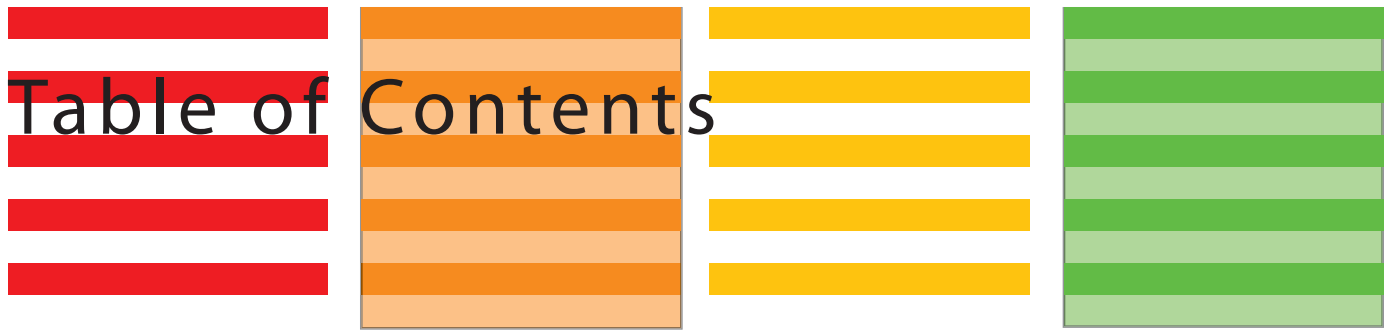


Table of Contents..... 1-2

Project Introduction.....3

- Abstract
- Project Typology
- Theoretical Premise
- Project Justification
- Project Emphasis
- Narrative
- Statement of Intent
- User Client Description
- Site Information
- Major Project Elements
- Previous Studio Experience
- Plan for Proceeding

Theoretical Premise Research..... 11

- Empiricism
- Rationalism
- Sociology
- Anthropology
- Semiotics
- Ethics
- Research Summary

Case Studies..... 19

- The Accelerated School
- Lillian C. Schmitt
- Northside Middle School
- School De Vogels
- Ann Richards Middle School
- P.S. 156, I.S. 293
- Library & Science Center
- Seven Hills Private School
- Jackie Robinson Middle School
- Case Study Summary

Historical Context..... 31

Thesis Project Goals..... 32

Site Analysis..... 33

- Qualitative Aspects
- Quantitative Aspects



Programmatic Requirements..... 48

Process Documentation.....54

Solution Documentation.....63

Reference List.....70

Apendix72

Personal Identification.....78

Project Introduction



Abstract

A new junior high school for Willmar, Minnesota that will examine the meaning of “environment” and its effect on both interior and exterior spaces in relationship to education.

Project Typology

A new Junior High School for Willmar, Minnesota.

Theoretical Premise

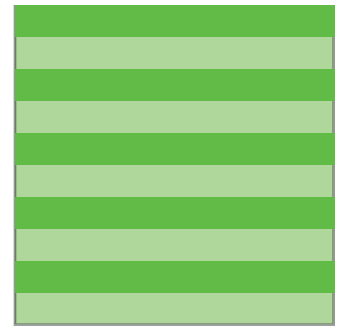
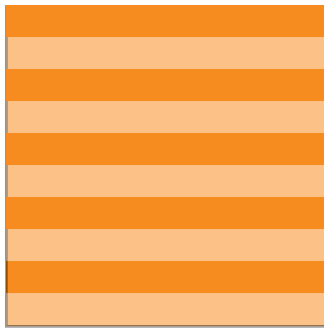
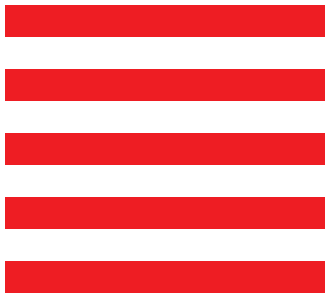
The thesis will examine the meaning of “environment” both interior and exterior, and their relationship to education. Design metaphors, analogies, and or tectonics will be derived from this examination.

Project Justification

Willmar has allowed its schools to deteriorate and this has had an adverse effect on education.

Project Size

This project will encompass the 7th and 8th grade levels with-in the Willmar Public School system consisting of about 700 students.



Narrative

I grew up in the Willmar Public School System and in my 12 years there I went through 5 different school buildings each having their own problems. But when I was young and going through these schools I never really noticed or paid that close of attention to the problems that were all around me. It was not until after I graduated high school and had completed a few years of college that I began to realize how old and out of date some of the schools were, especially the Willmar Junior High.

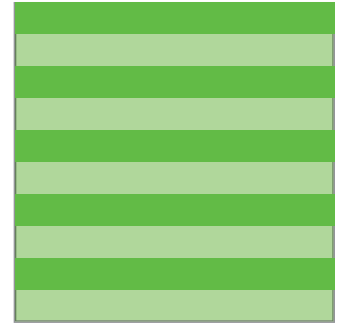
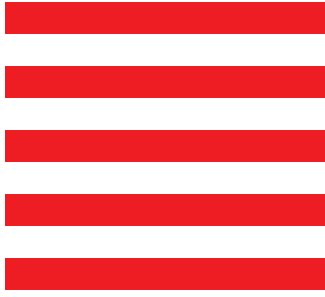
When I was going through my 2 years at the Jr. High I can remember that I never liked being there. It was not a very good educational environment because the building is laid out in a figure 8 pattern which students were only allowed to walk around in one direction and the building is very cold and un-welcoming. This I believe is the reason why we have problems at schools dealing with attendance, grades and overall attitude to other classmates and faculty. To remedy this problem, there has been more and more emphasis placed on the environment in which we educate our children. This project will explore and determine the best type of environment our children and future children should be educated in.

By discovering what type of environment is best for our children to learn in we will then be able to begin educating them with new and more complex curriculum. To discover this, my research will investigate the current student population at the Willmar Junior High School and the grades they are currently receiving. Using my research I will locate a site that will positively impact my final design solution. My research will also be used to develop the program for this new educational facility, including what type of new layout and design should be used and also what type of teaching methods will be most affective for the education of the student population.

Statement of Intent

Most of the schools in the Willmar school district are in desperate need of repair. Their layouts are not user friendly and they do not have a good learning environment for the student population. This I believe is the reason why we have problems at schools dealing with attendance, grades and overall attitude to other classmates and faculty. To remedy this problem, there has been more and more emphasis placed on the environment in which we educate our children. This project will explore and determine the best type of environment our children and future children should be educated in.

By discovering what type of environment is best for our children to learn in we will then be able to begin educating them with new and more complex curriculum. To discover this, my research will investigate the current student population at the Willmar Junior High School and the grades they are currently receiving. Using my research I will locate a site that will positively impact my final design solution. My research will also be used to develop the program for this new educational facility, including what type of new layout and design should be used and also what type of teaching methods will be most affective for the education of the student population.



User/Client Description

In designing this new Jr. High School there are two major user/client groups that I will be designing for. They are the 700 7th and 8th grade students and faculty that will be using the facility most frequently and also the community who will have the ability to use certain spaces with-in the building. While these two groups will be the primary users of the facility, the building itself will be owned and maintained by the Willmar Public School District. The users of the facility will need to comply with the rules and guidelines set forth by the school district in order to maintain the quality of the educational environment.

Some of the qualitative and quantitative requirements of these groups may include:

- Peak usage time during the school year
- Parking will only need to include staff parking and service vehicle parking. Bus pick-up and drop-off location will also be needed.
- Medical and mental health issues will need to be addressed for the disabled students in the school district that may attend this school.

Site Information

The site for the new Willmar Jr. High is located in Kandiyohi County in Willmar, MN. I felt that this site was the best for my project because it is near the existing Jr. High and it was also largely favored to be the site for the Sr. High when it was built in 1994. This site also has a close relationship to the main bus garage and is just down the street from the local area family YMCA.

History

Agricultural expansion and the establishment of Willmar as a division point on the Great Northern Railway determined the growth of the community. The first settlers arrived during the 1850's because they were attracted to the fertile land and an abundance of timber and game. It was the Great Sioux Uprising of 1862 that left the town abandoned for years until the railroad brought new settlers in 1869, many of the settlers being Swedish and Norwegian. In 1870 Leon Willmar-a Belgian acting as a European bondholder of St. Paul and Pacific Railroad Company purchased Section 1 of Willmar Township. Willmar was established as the county seat in 1871 and was incorporated as a village in 1874 and as a city in 1901.

Willmar is the fastest growing non-metropolitan city in Minnesota. Continued growth is predicted for Willmar because of the diverse economy, growth in the number of smaller industries and the lakes and other recreational attractions around the area. The residential neighborhoods of Willmar reflect the high quality of life in this community. The tree lined streets, well-kept homes and spacious lawns are warm and inviting.



Major Project Elements

These are some of the indoor and outdoor spaces that will need to be incorporated into this project to make an optimal educational environment.

- Entry Space
- Atrium
- Circulation
- Parking/Bus Drop-Off & Pick-Up
- Common Spaces
 - o Classrooms
 - o Large Group Learning
 - o Team Learning Areas
 - o Small Group/Conference/Office
- Library/Media Center
 - o Entrance, Circulation, Distribution
 - o Seating, Stacks, Computer Access, Reference
 - o Small Group/Conference/Office
 - o Multimedia Editing
 - o Classroom
 - o Workroom/Storage
 - o Professional Library
- Technology
 - o Computer Labs
 - o Control Rooms
 - o Copy Center
- Science
 - o Classrooms/Labs
 - o Storage/Lab Prep
- Special Education
 - o Classroom (7 – 10 students)
 - o Classroom/Lab
- Technical Education
 - o Tech Lab
 - o General Shop
 - o CADD/Graphics
 - o Principles of Technology
 - o Storage/Support Space
- Family & Consumer Science
 - o Classroom
 - o Classroom/Lab
- Art
 - o Multipurpose
 - o Drawing and Painting
 - o Ceramics
 - o Kiln, Glazing, Clay, Damp Room
 - o Photography/Darkroom
 - o Office/Storage
- Music
 - o Instrumental
 - o Choral
 - o Instrument Storage
 - o Small Practice
 - o Group Practice
 - o Office/Lesson Studio
 - o Instrument Repair
 - o Performance Equipment Storage
- Physical Education/Athletics
 - o Gymnasium (Two Stations)
 - o Multipurpose
 - o Weights/Fitness
 - o Adaptive Physical Education
 - o Physical Education Locker Rooms
 - o Athletic Locker Rooms
 - o General Storage
 - o Athletic Storage
 - o Spectator Seating
- Landscaping
 - o Wetland Area
 - o Outdoor Classroom
 - o Nature Trails



Previous Studio Experience

Second Year Design Studio

Hatlen – 271

Ramsay – 272

Third Year Design Studio

Elnahas – 371

Martens - 372

Fourth Year Design Studio

Kennedy – 471

Kratky – 472

Fifth Year Design Studio

Martens – 571

Ramsay – 572

2002 – 2003

- Prairie Images Design Studio, Fargo
- Tea Squared, Fargo

- “Packing the Suitcase” High Rise Apartment Building, Chicago, IL
- Hiawathan Rowing Society, Minneapolis, MN
- Finn Creek Open Air Museum, New York Mills, MN

2003 – 2004

- Wood Construction Pedestrian Bridge, Fargo
- Art Gallery, Chattanooga, TN
- Remodel & Addition to the Moorhead Cultural Center

- Fluid Motion Dance Studio, Fargo
- Masonry Resource Center, Southern, MN

2004 – 2005

- Minneapolis Riverfront Re-Development

- Bio-Climatic High Rise, San Francisco, CA
- NDSU Downtown 2 (Marvin Windows Competition) Fargo

2005

- Valley City Auditorium Adaptive Re-Use, Valley City, ND

- Senior Design Thesis



Plan For Proceeding

My research and analysis will be a mixed method, quantitative and qualitative approach and concurrent transformative strategy will be employed. During this process I will gather information based upon the priority I see fit in regards to my theoretical premise. Some of the quantitative data gathered will include interviews with staff and local educational experts and case studies. Some of the qualitative data gathered will include personal experiences, survey of the student population and interviews of past students.

The design methodology I will employ will be the philosophical logic of abduction. I intend to bring forward my argument and support it based upon the information I collect. During this process I will document my progress by means of photographs, sketches and notes.

Fall Semester

Oct. 13 th	Rough draft of thesis proposal due
Oct. 27 th	Final proposal due/Last day of ARCH 561
Nov. 11 th	Veterans Day (No School)
Nov. 14 th -18 th	Final week of ARCH 571/presentations
Nov. 21 st -Dec. 8 th	Investigate background issues, program research & site inventory
Nov. 23 rd	Draft thesis program due to primary
Nov. 24 th -25 th	Thanksgiving Break (No School)
Dec. 8 th	Final thesis program due to primary
Dec. 9 th	Last day of classes
Dec. 12 th -16 th	Finals Week
Dec. 12 th -18 th	Identify possible form givers based on the program
Dec. 19 th -26 th	Base map & site analysis completed. Conduct interviews while home over break.
Dec. 27 th -Jan. 6 th	Site relationships & functional relationships Complete site design 2 graphic concepts completed

Spring Semester

Jan. 10 th	Classes begin
Jan. 11 th -18 th	Space-planning relationships resolved
Jan. 16 th	Martin Luther King Jr. Holiday (No School)
Jan. 19 th -26 th	Study form, volume & massing
Jan. 27 th -Feb. 5 th	Circulation system resolved Vertical sections/Structural systems Start interior/exterior sketches
Feb. 6 th -16 th	Material studies/exterior elevation studies
Feb. 17 th -24 th	Wall sections resolved & material studies complete
Feb. 20 th	President's Day Holiday (No School)
Mar. 6 th -10 th	Mid-semester thesis reviews
Mar. 13 th -17 th	Spring Break – Revisit issues addressed above



Plan For Proceeding...Cont.

Mar. 20 th -24 th	Interior space studies & sketches finalized
Mar. 27 th -31 st	Storyboard layout of final presentation
Apr. 3 rd -24 th	Presentation boards, models, printing & mounting
Apr. 14 th -17 th	Easter Holiday
Apr. 24 th	Thesis projects due at 4:30 on the fifth floor downtown
Apr. 25 th -26 th	Annual thesis exhibit on the fifth floor downtown
Apr. 27 th -May 4 th	Final thesis reviews
Apr. 28 th	Draft of thesis document due to primary
May 5 th	Last day of classes
May 8 th -12 th	Finals Week
May 11 th	Final thesis document due at 4:30 in department office
May 12 th	Commencement at 5:00pm - Fargodome

Research Papers



Empiricism

Empiricism is the view that all knowledge originates from experience. There are five central pillars of empiricism; all our ideas are derived from experience, we can only perceive our own ideas, knowledge consists in the perceiving of ideas, all significant words stand for ideas and we can have no a priori knowledge of the world. All of these ideas are based on the views of perception, concepts, knowledge and language.

I believe that empiricism is tied very closely to my theoretical premise because it forces you to think about the experiences you had in school and how they have formed you into the person you are today. Focusing on those ideas and experiences from the past it will drive me to design a school environment that is conducive to learning through ones experiences.

Other deep and meaningful ideas will need to be considered during the process of design so I can fully understand the views of empiricism. Such ideas include, if an idea cannot be derived from experience, then we are not justified in using it to make judgments about experience. I think this means that everything little idea or thought you have had in your life is directly tied to a specific experience you had. So, if you have not had a specific experience then you will not have any ideas relating to that. Another empiricists' idea is that simple impressions form the building blocks of knowledge. I believe this idea ties very strongly to my theoretical premise because a simple impression such as a green courtyard, a uniquely designed room or lively colors can have an impression on a student it will only further enhance the knowledge they will gain.



Rationalism

Rationalist thinkers have the opposite views of empiricist thinkers. Rationalists believe that reason without the aid of sense perception, can give us knowledge of the world. This kind of contradicts my original thoughts and ideas that we need to be surrounded by a stimulating environment to aid in the learning process and that having those special interactions with the world around us will give us a better knowledge of the world.

Rationalists do have some views that are similar to those of empiricists. Like the view that particular truths have to be known by sense experience and cannot be known by reason alone by Descartes who is considered to be the founding father of modern rationalism (Thomson, 106). To me this makes more sense than saying that you can gain knowledge of the world with-out sense perception. It just does not seem logical to think that a student in school that does not have any of their senses stimulated would learn the same amount or more as a student who is subjected to a wide variety of environments that will allow them to experience the world on multiple levels of sensory perception. I believe this will allow the student to learn at an increased rate as opposed to those students that are not allowed to have their senses stimulated in a learning environment.



Sociology

Over the past few years the Willmar public school system has seen an increase in multicultural students due to the fact that there are many jobs available in the Willmar area that are suited to individuals with little or no work experience. With this increase in the multicultural population I believe that this issue needs to be address to better understand how to educate our students in such a diverse environment.

According to James A. Banks there are three different strategies and approaches to multicultural education in the United States: curriculum content approaches, achievement approaches, and inter-group education approaches (Banks). The curriculum content approaches try to incorporate the voices, experiences, cultures and struggles of cultural and gender groups into the curriculum. This will allow the students to better understand the multicultural students in their class by allowing them to hear stories of where they are from and hear information about their lifestyle so that they will be able to communicate well in their school and social environment.

The achievement approaches see multicultural education as a set of goals, theories and strategies designed to increase the academic achievement of lower-class students. In this approach you would ask the students to not only set educational goals for themselves but to also set social goals so they will be able to become more involved with other kids in the school system. In setting these goals it will give the student a sense of achievement and satisfaction when they have achieved their goal.

The third and final goal is the inter-group education approaches, which is designed to help students develop more positive attitudes toward people from various racial, gender and cultural groups. I think that this is one of the most critical areas of youth education today because when I was in junior high most people had negative attitudes towards other students that were different from them. If we could incorporate these three strategies into the Willmar public school system I believe that we would get an educational environment more conducive to learning.



Anthropology

According to The American Heritage Dictionary of the English Language, anthropology is the scientific study of the origin, the behavior, and the physical, social and cultural development of humans. According to this definition we could determine a child's learning potential from their family background or any other information about their past. This idea agrees with the claim that an individual child's school achievements can be predicted more accurately from knowing the family background. This makes it sound like schools have little influence on achieving a higher level of intellect for our children but if the school can increase the physical, social and cultural developments of children then we can put aside the notion that a child's learning potential is based on their family history.

Studies have shown that levels of attainment reached by children are influenced by a wide range of factors outside of school (Tomlinson). So one would believe that if we want our children to attain the highest levels of academic achievement we must find ways to encourage our children to stay involved in school by offering classes and after school activities that will appeal to their interests and not ones that will be cheapest for the school system.

A study of fifty inner-London junior schools conducted during the 1980's by Mortimore and his colleagues compared the effects of schools on the progress of different groups of children. They concluded that effective schools tended to enhance the performance of all the students regardless of social or ethnic backgrounds (Mortimore). This also shows that if you design an aesthetically pleasing environment for our children's education then their background will not matter for their learning potential.



Semiotics

Everything around us has an affect on our perception of the world and what meaning that object may have to us; this is also true for buildings. I believe that every building creates an association in the mind of whoever is looking at it, whether the designer intended it or not. So it is important for us as designers to understand buildings and the perceptions they may create so we can design better buildings to create unique impressions. There are three main levels of semiotics that may be useful in designing a building to achieve those desired perceptions. The first level is pragmatics which deals with the origins and the effects of signs on people (Broadbent, 126). Keeping pragmatics in mind when I am designing my school will have a huge influence of the style and type of building because I want people to be able to know right away that it is a school building and that the focus of the school is to increase the knowledge of the students through use the unique educational environment.

The second level of semiotics according to Broadbent is semantic. This deals with the ways in which signs actually carry their meaning. This level of semiotics will require some further research on my part to find out what specific qualities of school will best convey the message that this school is improving the intellectual levels of the students that attend there. To improve the intellectual levels of the students may go beyond the design of the school. It may involve the final level of semiotics which is syntactic or syntax. This deals with the combination of signs and how words are put together to form sentences. This will be accomplished by the faculty of school by learning how to properly and effectively communicate with their students so that are intellectually stimulated and there for increase their chances of becoming a brighter your mind. Having students increase their educational learning ability is my main focus and semiotics will be a great driving force to accomplish this.



Ethics

The ability to decide what is right or wrong, what is acceptable or unacceptable, is part of everybody's lives every single day. For architects, we have to make decisions to represent what we know, what our education tells us and what is right, proper, decent and safe. Not only is this valuable information for when I am out in the real world practicing architecture but it applies right now to my thesis project as well. I need to decide for myself during this process what is right or wrong when I am examining the meaning of 'environment' and its relationship to education and most importantly to me is the fact that I have my four and a half years of education behind me and need to make sure that I reflect on that so I can create the best learning environment for my thesis.

Since architecture is a particularly vulnerable profession, in that people at all levels are continually trying to exercise some sort of influence, some sort of pressure on the architect (Haut, Richard). Our architectural education should be trying to give us grounding in being able to assess and understand the ethical implications of what we are going to be faced with. Sure it easy to disregard this kind of information while I am in school because it does not seem like a big deal, but now is the time to focus on my moral and ethical standings so I will be better prepared once I enter the world of architectural practice.



Research Summary

Case Studies



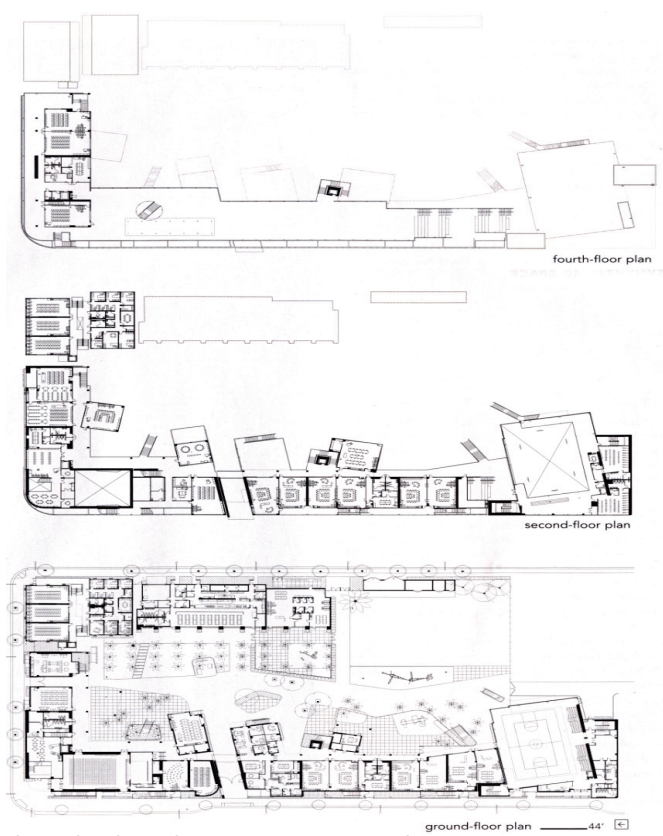
TAS: The Accelerated School

Location: South Los Angeles, California
 Architect: Marmol, Radziner and Associates
 Year: 2001
 131,000 Square Feet
 Cost: \$37 Million
 Prekindergarten – 12th Grade

The architects that designed this school had a very tough task in front of them because they had no previous school experience and the location for the school was notorious for crime and it was the site for the 1992 riots.

With the help of parents, students and teachers this school became a four-story fortress that is situated on a 3.2 acre campus. Every square foot in this school participates in learning or playing giving the students an opportunity to learn and socialize outside of traditional educational practices.

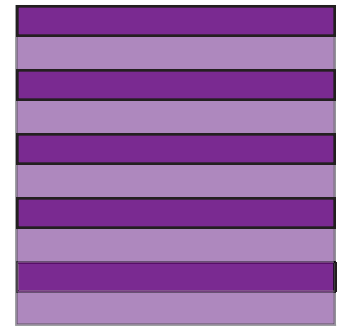
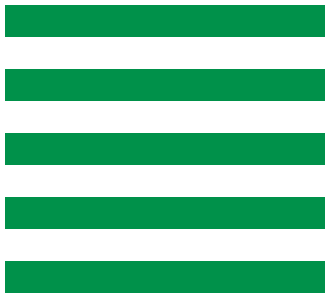
To increase community involvement, facilities clustered along the buildings north and west edges can be secured so that visitors can enter from the street. Almost every classroom has a unique shape, orientation and window placement so that light and one's sense of place shifts as students move through their day. After researching this school I realize how important it is to be able to integrate multiple cultures into a school atmosphere and also be able bring the outdoors indoors and visa-versa.



Floors plan show a linear organization around an outdoor courtyard.



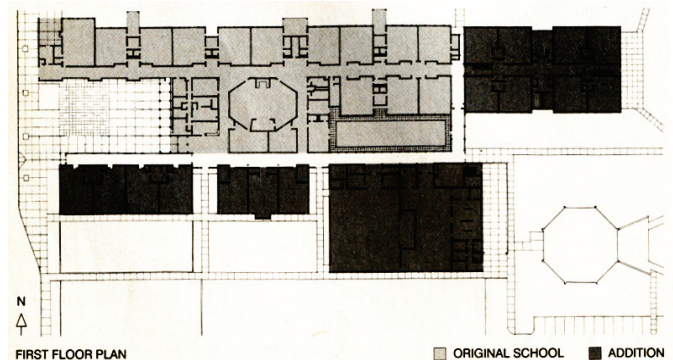
In a tight urban area they pushed the building up to accommodate all the students.



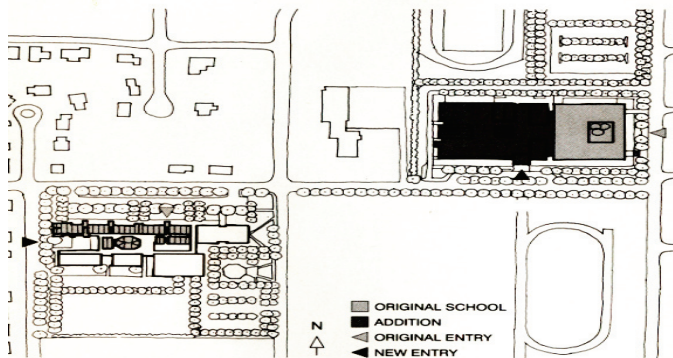
Lillian C. Schmitt Elementary School

Location: Columbus, Indiana
 Architect: Harry Weese & Associates
 Year: 1957
 31,500 Square Feet
 250 Students
 Renovation/Addition: 1992
 Architect: Leers, Weinzapfel Associates
 53,000 Square Foot Addition
 650 Students
 Cost: \$8.6 million

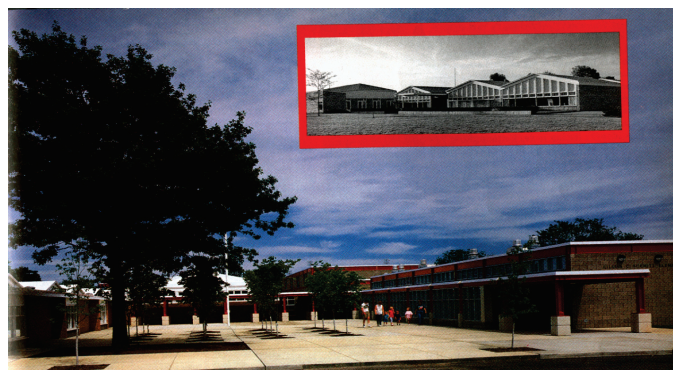
The plan, Figure ?? shows how Weese designed the original school to be a main linear corridor with classrooms on the north and south side. In the addition Leers decided to break away from Weese's active roof line and design a series of flat-roofed pavilions that echoed the classrooms below. In contrast with the original load-bearing brick and glue-lam construction, Leers developed a steel framing system with exposed roof decking. The addition of the second wing, parallel to the original created a new entrance courtyard that the school requested. By shifting the circulation patterns to two parallel axes the original hexagon-shaped multipurpose room became the new library and computer center, the heart of the new facility. Like the TAS this school demonstrates how important it is to have a courtyard or some sort of interaction with the outdoor environment. This building is also a good example of how important it is to keep the facility at a scale that the children can relate with and not feel overwhelmed.



FIRST FLOOR PLAN
Floor plan emphasizing linear central corridor.



Site plan showing both Lillian C. Schmitt & Northside Elementary.



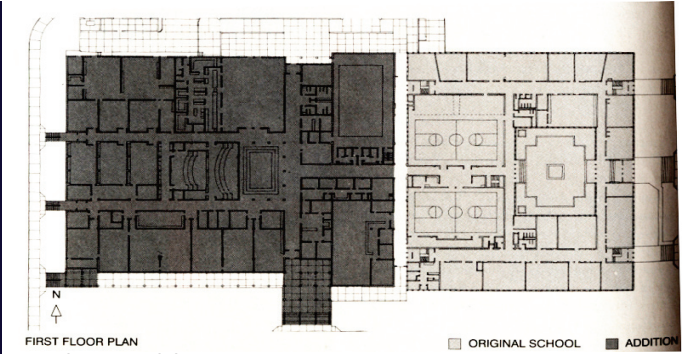
The school is at a scale the children can relate to.



Northside Middle School

Location: Columbus, Indiana
 Architect: Harry Weese & Associates
 Year: 1961
 900 Students
 Renovation/Addition: 1992
 Architect: Leers, Weinzapfel Associates
 83,000 Square Foot Addition
 Cost: \$14.8 million

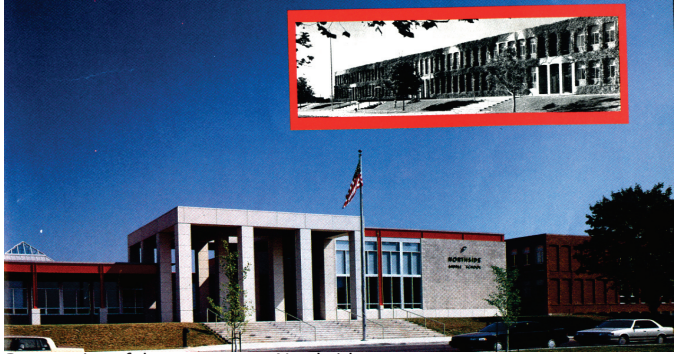
Unlike the last two schools this one is not designed around a central courtyard. Instead it is designed around a central sky lit common area, similar to Weese's courtyard scheme. That is about the only similarity between Northside and Scmitt other than the fact that they pretty much share a backyard. This school has a much larger and heavier feel to it which helps represent the larger functions that take place inside such as the library, swimming pool, band room, science labs and cafeteria. Leers also added geometric volumes above the original horizontal profile contrasting Weese's brick building. Leers also tried to represent some of the interior spaces by making them noticeable from the outside like the pyramidal skylight signals the common area, double barrel vaults announce the cafeteria and a greenhouse anchors the horticulture department. I think this was done very well because it allows people on the outside to relate to what is on the inside. Form follows function.



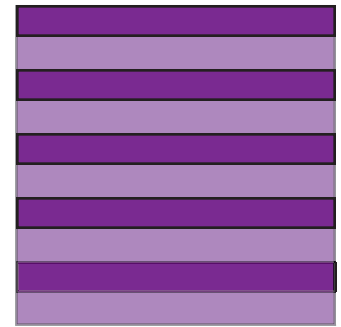
Central courtyard design.



Skylight indicating central commons area.



Perspective of the entrance to Northside.



Primary School De Vogels

Location: Oegstgeest, the Netherlands

Architect: Herman Hertzberger

Year: 2000

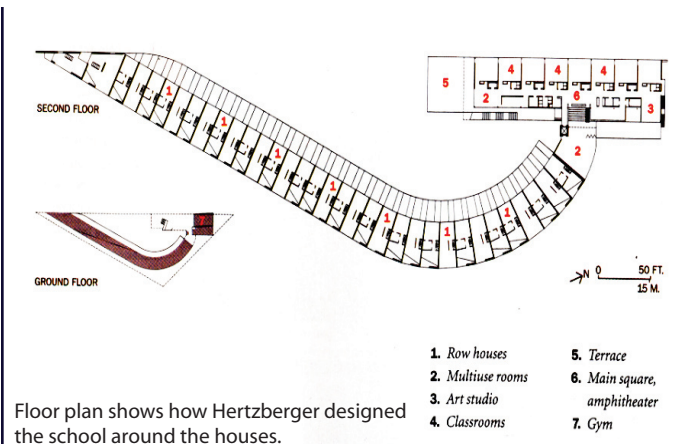
11,200 Square Feet

Cost: Withheld

Herman won a competition for this school and 32 adjacent row houses to be placed on a site that was too small for the required program. To solve this problem Hertzberger arranged the houses in a bow like curve that defines a strong public space and he raised the classrooms into the air so the houses would have views uninterrupted by the school.

The classrooms are raised 16 feet to span the gymnasium that occupies part of the site. I think the views at this height would be wonderful and the amount of daylight coming in would also be appreciated but I would think that in the summer month's it would get quite hot and you would not be able to look out your window's and see trees or grass. The building is accessed by a staircase that acts as a wide podium under the classrooms inviting children to either gather and socialize or make their way to "higher" learning.

The interior is designed to be similar to a conventional school with classrooms opening up into corridors or "streets" and a "main square" in the form of an amphitheater (Cohn). The form of this school is also very open to change and adjustment in the future with the possibility of building more classrooms on the terrace or perhaps a courtyard which seems to be very popular in school designs.



Floor plan shows how Hertzberger designed the school around the houses.



Classrooms opening up into the corridor.



Terrace cantilevering out over the play area with the row houses in the background.



Ann Richards Middle School

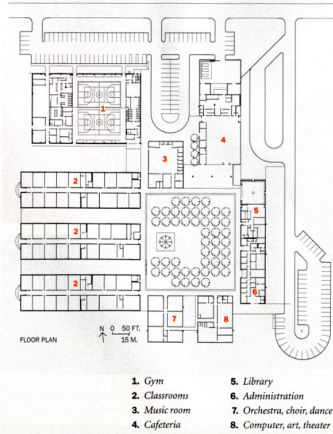
Location: La Joya, Texas
 Architect: Kell Munoz Architects
 Year: ????
 130,000 Square Feet
 Cost: \$8.4 Million

La Joya needed a school that was intimate, lively and welcoming and that is what they got from their playful and visually exuberant school. The stucco walls glow red, blue, green, mustard and magenta which reflect the colors of Mexico and the desert.

The heart of the school is a large open plaza, similar to those in small Mexican towns from which many La Joya residents come. The plaza is the social and cultural center of the school where students can mingle between classes and return in the evenings or weekends for special events.

Most of the students in this school are economically and linguistically disadvantaged. So this is more than a school to a lot of them. It is also a place of refuge and sanctuary. The kids here have a real sense of ownership in the school and that connects them to their own culture.

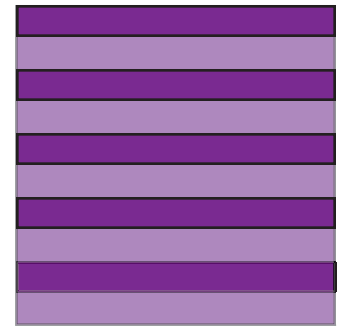
I believe that most important aspect of this school is that it has such a strong sense of belonging for its users. It may have a very basic and simple layout but the connections made are the most important.



Organization around a central courtyard with many trees.



Showing how the classrooms open out into the main courtyard.



P.S. 156, I.S. 293

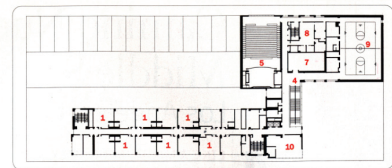
Location: Brooklyn, New York
Architect: Mitchell/Giurgola Architects
Year: ????
157,000 Square Feet
Cost: \$52 Million

This school is arranged around a long linear corridor in the rough and tumble neighborhood of Brooklyn. This school encompasses almost a full city block doubling as a community center utilized by most of the local families for performances, sports and social and educational events.

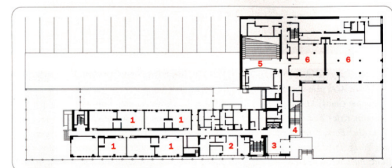
The main driving force behind this large school is the arts. A grant made it possible to create two art classrooms, a dance studio, music room, recording studio and a 416-seat auditorium. The art is reflected in the design by the two story wall of glass tiles that overlooks the grand stairway marking the entrance which I believe will give the students a feeling of being involved in the artwork around them. You want your students to feel important and to feel like they belong. All of the interior spaces are very utilitarian and user-friendly using such materials as; terrazzo floors, steel doors, painted concrete block walls in the classrooms and finished glazed concrete block in corridors and all public spaces.

I believe that fun atmosphere created at this school achieves the goals of both the public and the students while uplifting the local community. I can see this being a place where everyone wants to be. Which is an important design quality which may be lacking in some of the previous case studies.

- 1. Classrooms
- 2. Administration suite
- 3. Entry
- 4. Stair
- 5. Auditorium
- 6. Cafeteria
- 7. Dance studio
- 8. Music studio
- 9. Gymnasium
- 10. Art classroom



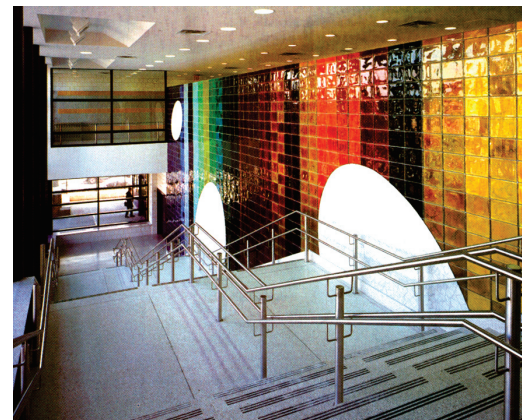
SECOND FLOOR



GROUND FLOOR



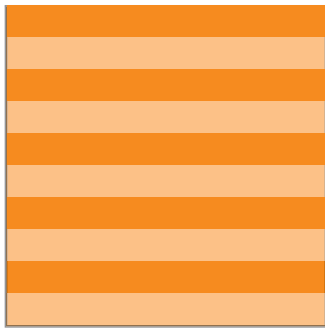
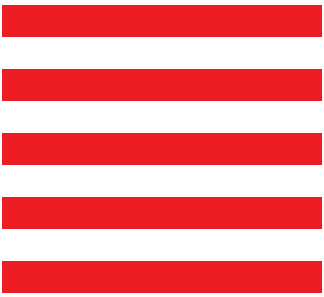
Floor plan illustrates linear circulation.



Colorful tile make this stairway feel very energetic.



3-D model of exterior and play area.



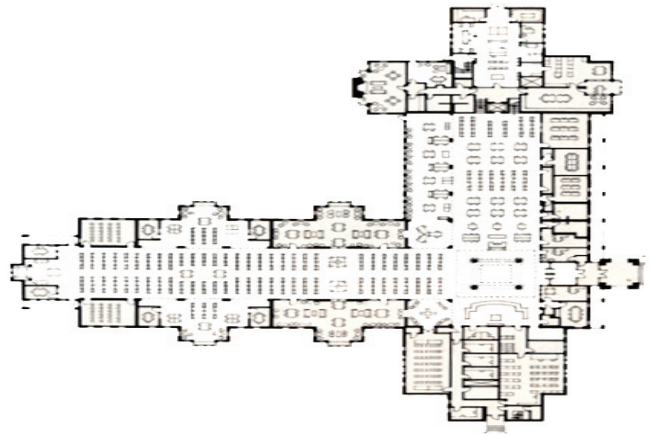
Library and Science Center

Location: Albuquerque, New Mexico
Architect: Shepley, Bulfinch, Richardson and Abbott (SBRA)
Year: 1991
Cost: \$13.5 million

This case study is quite different from the previous case studies done because this building is not just a building for middle schoolers. This building was designed to be a unify piece on the Albuquerque Academy campus. Because all of the school buildings were originally perched at the top of a hill but in 1983 the middle school was constructed at the bottom of a hill, nearly half a mile away. Later on the middle schoolers complained about having to trudge uphill for meals and sports and the older students missed talking with the younger students. To solve this problem they decided to place a new library and science complex midway between the upper and middle schools in attempt to create a social and intellectual hub for the entire campus. I believe this just goes to show that separation with-in a school system is not always best because students do enjoy the interaction with one another.

These two new buildings really took advantage of the wonderful views around them, also attempting to reach out and embrace the landscape. The buildings are long, linear and low-lying very much like Frank Lloyd Wright's work. The library sits along a north-south axis offering views of the mountains and mesas to the east and west. The library is also wrapped with arcades and deep overhangs making it a very energy efficient building. The science building is very different from the library in that it is chunkier and less assertive. It is also arranged around a central courtyard with four classrooms pinwheeling around the courtyard. Once again there really seems to be a pattern with the abundant use of central courtyards and the use of views in school construction. I am really beginning to see the

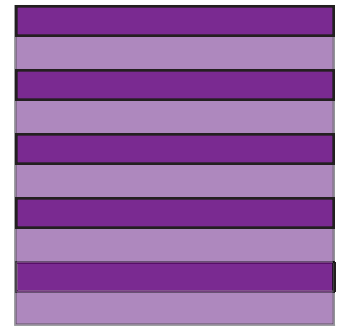
importance of the environment around a student and how it can have an affect on their educational quality.



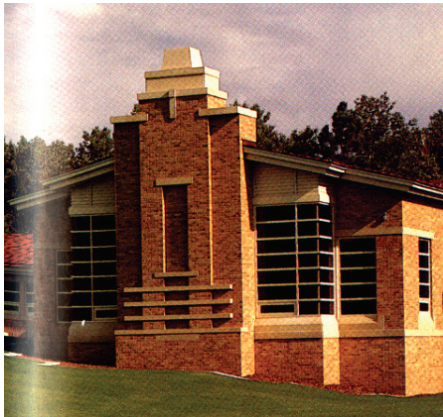
Library floor plan emphasizing linear arrangement.



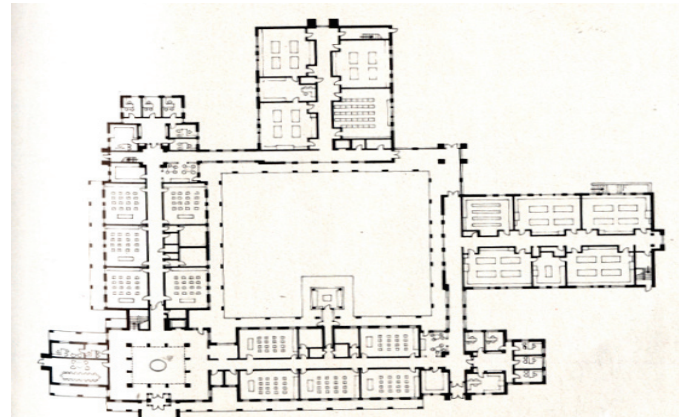
Exterior view of library facility.



Library and Science Center...Cont.



Main reading room in the library.



Science Center floor plan arranged around a central courtyard.



Central courtyard in the science facility.



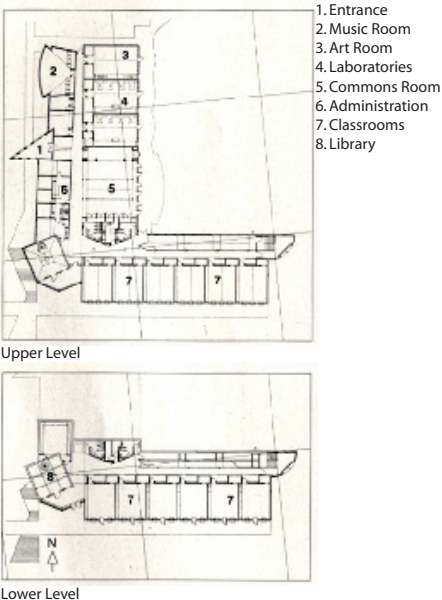
Exterior view of science facility showing similarities to Frank Lloyd Wright.



Seven Hills Private School

Location: Cincinnati, Ohio
 Architect: Pellecchia Architects
 Year: 1984
 Cost: \$3.2 million

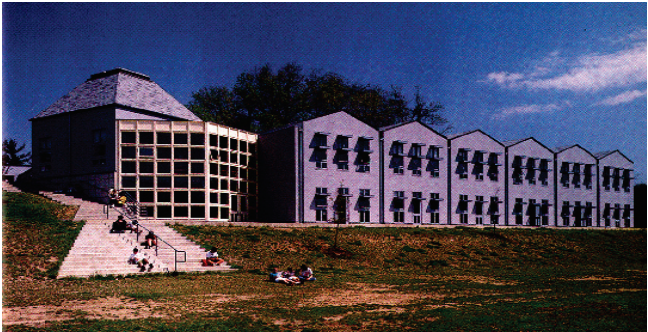
Seven Hills is a great example of expanding an existing school's village-like configuration, while creating a strong visual presence for passing motorists on the busy highway to the rear of the site and the residential street that runs in front of the campus. This new L-shaped middle school does an excellent job of defining a new edge for the campus while being tucked on a sloping, wooded site. Inspiration for the design came from Louis Kahn's un-built convent in Media, Pennsylvania by arranging a series of rooms off of a linear, west-facing wing using geometric shapes. A pie shaped wedge houses the music room, an obtuse triangle marks the main entrance and a skewed library at the juncture of the two wings. The south elevation is very different from the rest of building because it has a series of six gable roofs that gives the appearance of "eyebrows". I did like how they treated the corridors with-in the school. Usually you think of them as being mainly a circulation path but they treated them like gathering spaces for the students. This gives the students a greater ability to interact with the building. Which I think is important in their education because a sense of belonging and involvement will give them a sense of pride and the motivation to achieve high grades.



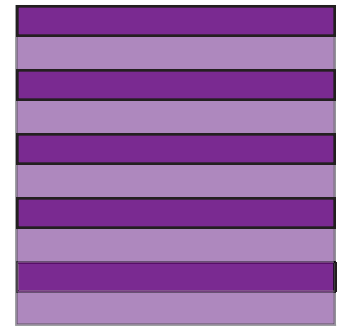
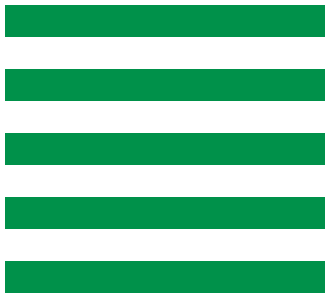
Floor plans showing linear pattern and geometric shapes.



Triangle representing the entrance.



Six gable "eyebrows"



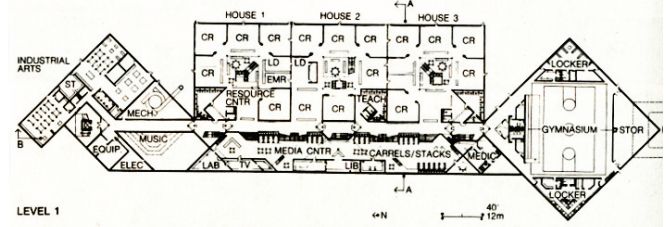
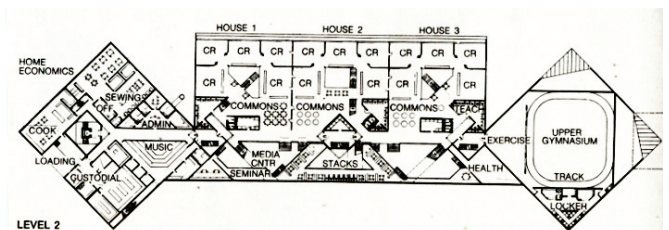
Jackie Robinson Middle School

Location: New Haven, Connecticut
Architect: Stull Architects
Year: 1979
147,000 Square Feet
900 Students
Cost: \$8.7 million

The school facility has taken quite a different approach to its design and layout than the other schools I have looked at. This facility was designed for middle school children in 5th – 8th grade, but also to be used by the community and to include facilities for elderly and preschool children. They also took a different approach in the buildings materiality. It was rather unconventional at the time, using a space-age form of poured concrete, steel frame and translucent acrylic skin.

With most of the skin of the building, including the roof being constructed with Kalwall, the amount of natural light that enters the buildings is very intense. Even the interior of the building was kept very open and translucent allowing all of that light that is entering the building to be able to reach many of the interior areas.

The layout for this school is somewhat similar to some of the buildings I have looked at with its fairly linear layout but this building is broke up into three houses that are divided by three large stair towers and these house's are occupied by classrooms and the rest of the larger learning areas and gymnasium are at the ends of the corridor. To me this appears to have a lot of the program spaces compacted into a small area which may give you the feeling of being led down a cattle shoot but I think with all of the translucent parts of the building that feeling may not be eminent.



Shows stair towers dividing up the heavily windowed houses.



Interior of one of the houses.



Case Study Summary

In doing my case study research I encountered many different types of school facilities with-in the United States and also one in the Netherlands that took a very different approach to school design. After studying these 10 different facilities I believe that my theoretical premise has not changed because most of the school building I researched has a strong correlation between education and environment.

Like I have mentioned before, I noticed a common ground between the indoor and outdoor environment in school facilities. It seems to me that most designers feel very strongly about the aesthetics in a school environment and how they might affect the learning ability of the students. However, there were some school facilities that took a different approach to their designs like; Northside Middle School who decided not to have an actual outdoor courtyard but instead created an indoor central commons place and still having a large area for gathering. The Primary School De Vogels also does not have a central courtyard due to their site restrictions so they compromised and created a large play area on the ground level so the young children would have plenty of room to play and socialize.

Socialization is a very important part of a child's development and that is why it is necessary to create spaces for them to be able to interact with one another in places other than classrooms. Creating these spaces can prove to be difficult when it comes to the site you have to work with and in the case studies I researched there were many different types of sites (inner city, open fields, steep sloped areas and urban developments) used and most of them were able to create the type of gathering spaces needed for a child's development.

Along with the different types of site used for these facilities I also noticed that all of these schools were closely related in their spatial and functional relationships. The majority of the schools were either arranged along a linear path or around a central space whether it was a courtyard or an interior commons area. These layouts really seemed to work for these schools in that it allowed them to create interior spaces to maximize the views to the outside and to create exterior spaces that will stimulate the child's mind and aid in their learn potential.

After all of the case study research I have done I believe that all of the knowledge I have gained will help me in creating a school facility that will be very effective in education our youth.



Historical Context

It is to my knowledge that there has been no attempt or consideration for a new junior high school in Willmar, MN. I do know that the site I have chosen to use for my thesis project was considered as a possible location for the Willmar senior high that was built 12 years ago. To me that says that this location with-in the city of Willmar is an excellent location for a junior high school because it will remain in the city limits and is only 1 mile away from the existing junior high. Which will make it an easier transition for everyone.



Thesis Goals

During my final semester here at NDSU I hope to develop a thesis project that I will be pleased with and one that will reflected all of the knowledge I have gained in the past five years.

I plan to develop a clear and concise theoretical premise that will be the driving force for my research. Once that is completed I will define a project or building typology through rigorous research and high quality case studies that will aid in describing the social, political and economical aspects of my design. Then I will complete a well organized thesis program that meets all of the requirements set forth by the thesis committee that has crisply written text and narratives that incorporates a professional level of graphic content to aid in the understanding of the text. The next important step to take in achieving my goals would be to develop a well thought out schedule that will help me stay on a set schedule so I will be able to see the task's that I complete and the ones that still need to be completed. I will review this schedule with my primary critic so we will both be in agreement on the schedule I intend to follow.

Once my schedule has been established and agreed upon I will proceed to determine a means of collecting data to illustrate that my design has been influenced by my theoretical premise and clearly lies on the quality continuum that is occupied by experimental and un-built work by professional, faculty and students. To illustrate that I have achieved these goals I will communicate my design solutions through a well organized oral presentation aided by superior graphics and models.

When I have completed my senior design thesis I hope to have a sense of personal satisfaction knowing that I have solved my design problem to the best of my ability.

Site Analysis



Qualitative Aspects

On October 15th, 2005 I went and did a complete visit of my site. I wanted to be able to visit my site when the weather was still decent and during the daylight hours so I could get some good pictures to help convey my analysis of the site.

When I first arrived at the north-east corner of my site I couldn't believe how large and open it was. I have driven by this area for my whole life and never really realized how large it really is. As I proceeded to walk south down the eastern edge of my site along Lakeland Drive which has a high amount of traffic on it each day I began to notice that the site appeared to be very smooth and flowing in texture. This was aided by the distinct row markings in the field created by the plows at the end of the harvest season. These distinct lines to me represented that farming is done in a linear fashion and this could be conveyed in the Junior High School by maintaining the historical integrity of the land.

Continuing south down Lakeland Drive I also notice the overhead power lines that appeared to be arranged in an arcade down the west side of the street. These power lines were massive in scale but it helped to bring the vastness of the large field down to a more personal level. I also noticed that the opposite side of the street was lined with houses and trees almost mimicking the power lines.



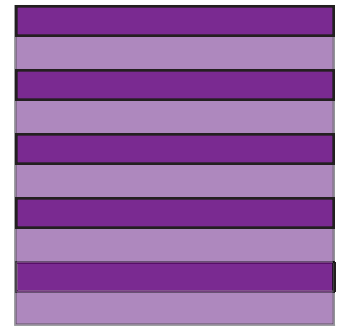
Large open field as my site.



Crop lines showing current use of site.



Power lines and trees lining the eastern edge of the site.



Qualitative Aspects...Cont.

As I neared the south-east corner of my site the local area family YMCA began to come more into view which to me represents a strong sense of community and that is something that should be present in our school. There is a great opportunity in having the YMCA so close to my site because it will allow the student's access to many other after school activities with-in walking distance of the junior high.

Once I turned the corner onto Olena Avenue to walk along the south side of my site the first thing I noticed was the group of trees ahead and how bright the sun was. Even though it was about 4:00pm and I was walking west the intensity of the sun on the site was incredible. It really brought out the natural and earth-tone colors of the surrounding vegetation that was beginning to change colors for the oncoming winter months. Once my eyes adjusted to the bright afternoon sun I noticed that in that group of trees was a natural water area. It was in a low lying area but it looked to be very clean and still. I believe it is a retention pond for the run-off from the YMCA across the street.



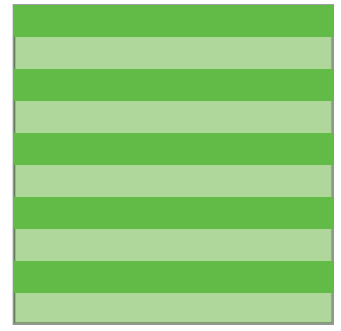
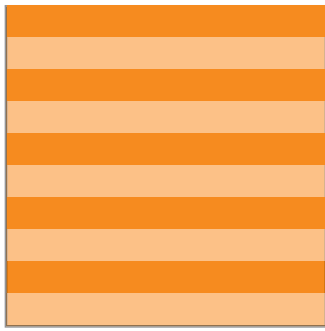
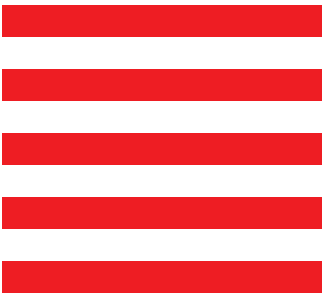
YMCA by the south-east corner of my site.



Bright sun shining on group of trees on Olena Ave.



Beautiful water area on my site.



Qualitative Aspects...Cont.

While I walked around my site that day I did not experience any wind but I can imagine that if there was a breeze that day I would've felt it because there is not much protection around the site other than the trees that line the north and west portions of the site. These trees would not help the site much because the majority of the wind in Willmar comes out of the south, south-east. Along with those trees on the north and west side there are also many house that those two sides and many of the streets that they are on dead end into the western side of the site. I believe there is a great opportunity to extend some of these streets into the site and get rid of the dead end streets and allow for more houses to be built near the new school. This would also help bring down the overwhelming size of the site.



Trees lining the two sides of my site.



Looking down one of the dead end streets to the east.



Looking down one of the dead end streets to the south.



Qualitative Aspects...Cont.

Once I finished walking around my 70 acre site I proceeded to walk out into the middle of the field so I could get a better feel for the surroundings. As I walked to the middle I traveled over a few minor elevation changes but they were not anything that was too drastic or anything that would lead to erosion on the site. When I arrived to the middle of the site I still could not believe how open this area really was but even as large and expansive as it felt I still had the feeling that I was in an enclosed space because as I looked around all I could see were trees. Which tells me that there is a lot of potential in this site because if I can take a wide open site and incorporate a school on it that makes a student feel like he or she is enclosed in a warm and friendly environment I will have then completed a successful project?



Minor elevation changes.

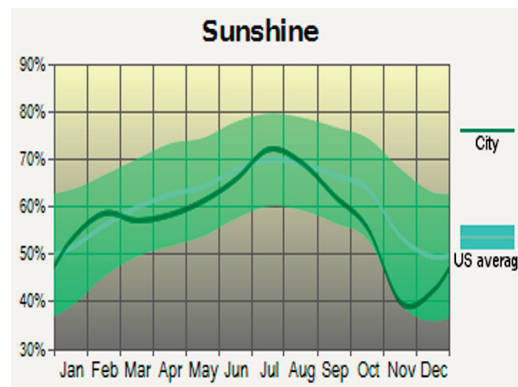
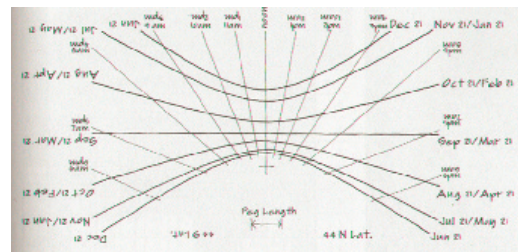
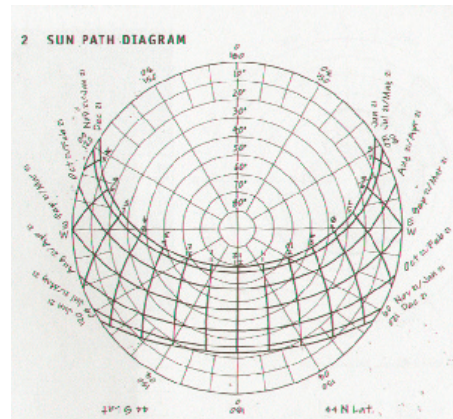


Out in the open field but still surrounded.



Quantitative Aspects: Sun Angles & Sunny Days

The images to the right represent the path and position of the sun at various times of the day throughout the year and the percentage of sunny days during each month. I used 44 degrees Latitude because it is close to that of the site, 45.1N Latitude.





Quantitative Aspects: Soils

There are 4 main types of soil of my site.

- 114 – Glencoe Clay Loam
- 446B – Normania Loam, 2-5% Slopes
- 954B – Ves-Swanlake Loams, 2-6% Slopes
- 981 – Canisteo-Harps Loam

Glencoe Clay Loam:

This soil type does not occupy too much area on my site but it is a nearly level soil that is very poorly drained, mainly in depressions. It is frequently ponded for brief or long periods of time and most areas of this soil type are typically oval or elongated in shape. The un-drained or partly drained areas are good for supporting marsh vegetation and provide excellent wildlife habitat but a system of subsurface drainage lines can help lower the water table. Because of the ponding, this soil is generally unsuited for building sites.

The typical make-up of the soil is about a 21 inch thick black clay loam surface layer followed by another layer of black clay loam about 18 inches thick. The subsoil is a mottled loam about 5 inches thick and the underlying material is a mottled calcareous loam about 60 inches thick. The seasonal high water table is 1 foot above the surface to 1 foot below. The Glencoe Clay Loam also has an average permeability of 0.2-0.6 inches/hour with a high make-up of organic materials (USDA).

Normania Loam, 2-5% Slopes:

This undulating, moderately well drained soil is on convex side slopes and knolls on till plains. Typically, the surface layer is black loam about 9 inches thick and the subsoil is loam about 23 inches thick. The underlying material to a depth of 60 inches is a mottled, calcareous loam.

Permeability is moderate in the soil at about 0.6-2.0 inches/hour with a high available water capacity and organic material content. The surface layer is slightly acidic or neutral with a seasonal high water table of 3-6 feet. Even with a high water table this soil is fairly well suited for building sites with wetness being a limitation (USDA).

Ves-Swanlake Loams, 2-6% Slopes:

These well drained soils are on the till plains. The Ves soil is on the less sloping side slopes and low rises while the calcareous Swanlake soil is on the more sloping knolls and ridges. The make-up of these two soils is about 60-80% Ves soil and 20-40% Swanlake soil and they are very intricately mixed.

The Ves soil has a surface layer of black loam about 10 inches thick, a subsoil layer about 23 inches thick and the underlying material to a depth of 60 inches is a light olive brown calcareous loam. The Swanlake soil has a surface layer of calcareous loam about 9 inches thick and the underlying material to a depth of 60 inches is a brown and light olive brown calcareous loam.

Permeability in these two soils is moderate at about 0.6-2.0 inches/hour and they also have a high water capacity. The Ves soil has a high organic matter content and a neutral or slightly acid surface layer while the Swanlake soil has a moderate organic matter content and a mildly alkaline surface layer. Both these soils are well suited for building sites (USDA).

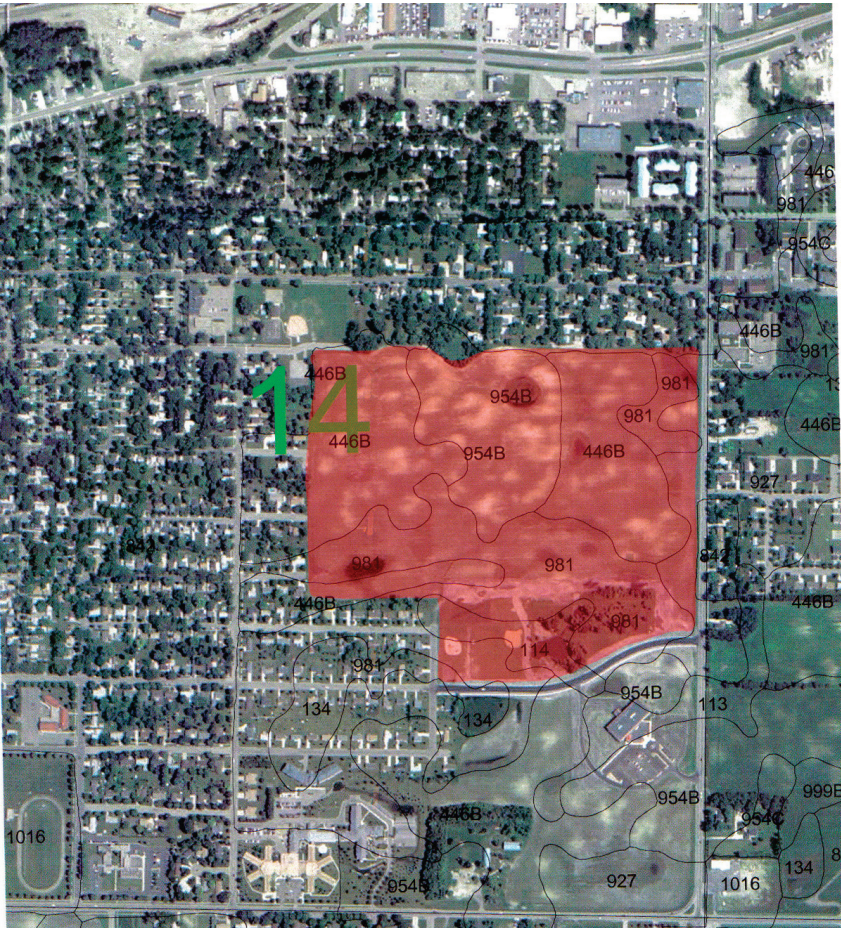


Quantitative Aspects: Soils Continued

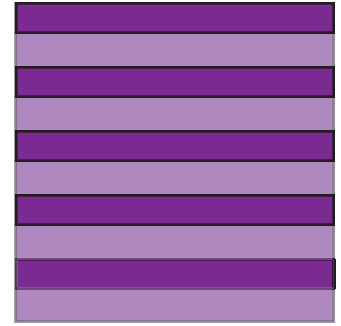
Canisteo-Harps Loam:

These nearly level, poorly drained soils are on the till plains. They are about 35-50% Canisteo soil and 35-50% Harps soil. The Canisteo soil is in plane and concave areas at the base of the steeper slopes while the Harps soil is in slightly convex areas on the rims of depressions.

The Canisteo soil typically has a surface layer of black, calcareous loam about 10 inches thick with a subsurface layer of calcareous loam about 11 inches thick. The Harps soil has a surface layer of black, calcareous loam about 9 inches thick and a subsurface calcareous loam about 6 inches thick. Permeability in these two soils is moderate at about 0.6-2.0 inches/hour and the available water capacity and organic matter content are high. The surface layer of the Canisteo soil is mildly alkaline or moderately alkaline, and that of the Harps soil is moderately alkaline. Surface runoff is slow on both soils and the seasonal high water table is at a depth of 1 to 3 feet. Because of the



Red area represents my site with the soil numbers and boundaries indicated below.



Quantitative Aspects: Utilities, Vehicular & Pedestrian Traffic

In an interview conducted with Bruce Peterson, Director of Planning and Development services in Willmar he informed that all utilities (water, sewer, electric, gas, etc.) are stubbed into the area that I will be using for my thesis. He said they are already there because when they re-paved the road it made sense to put them in then so they will already be there if and when the time comes to develop that area (Peterson).

According to the Minnesota Department of Transportation's study on daily vehicle traffic in 2002, there appears to be a high volume of traffic that travels along the south and east sides of the site and a moderate level of traffic along the north and west sides (MNDOT). These numbers will have to be taken into consideration when designing the new school to ensure that the students, faculty, parents and other city members that travel on those roads will not be greatly impacted by the increase in vehicular traffic.

To read the image on the right: the red numbers indicate the quantity of vehicles that travel on that specific road on an average day between the tick marks.

Pedestrian traffic on and around my site is very minimal except for the people that live on the north and west side of the site that walk to some of the nearby parks.

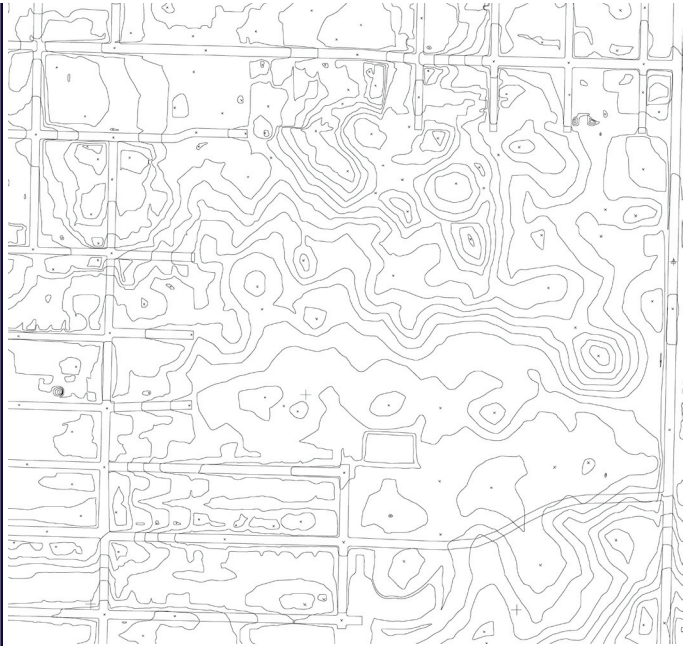


Daily traffic numbers in 2002.

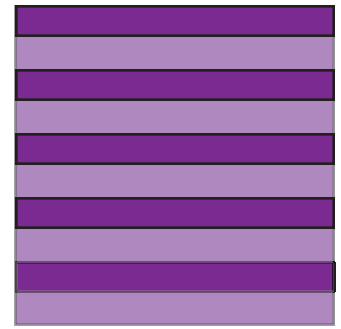


Quantitative Aspects: Topography

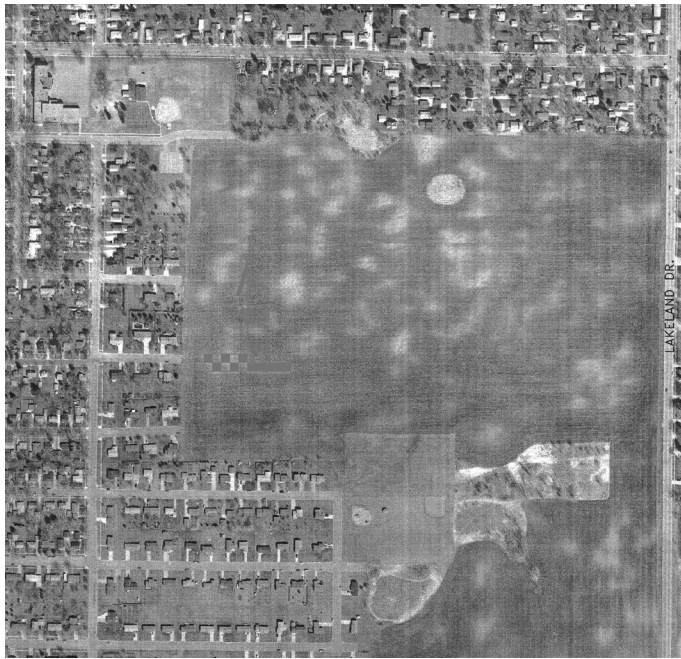
The topography of this site is very similar to the topography of the rest of the city, fairly flat with a few minor elevation changes. Most of the site maintains a 1-6% slope.



Each contour line represents a 2 foot elevation change.



Quantitative Aspects: Aerial & Site Photographs



Aerial photo of the open field (my site).



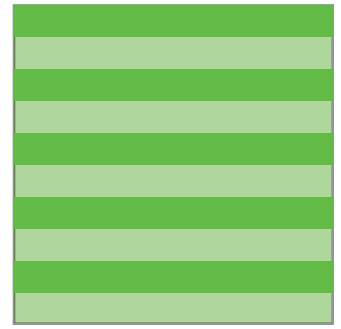
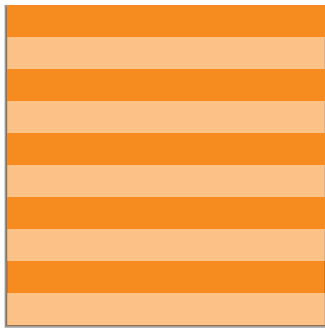
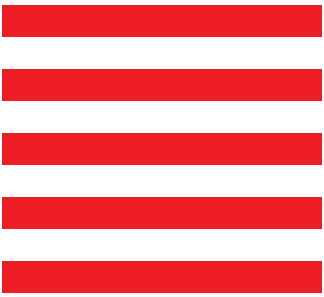
Vast openness.



Some of the trees around the water on the south end of the site.



On the corner of Lakeland Dr. & Olena Ave.



Quantitative Aspects: Aerial & Site Photographs



Water near the south west corner.



Park near some of the house on the south west side.



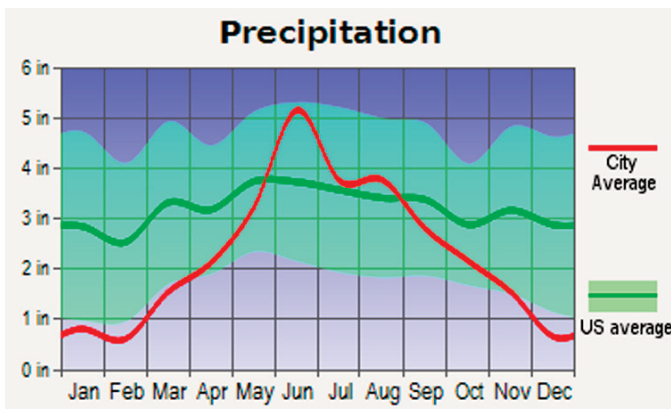
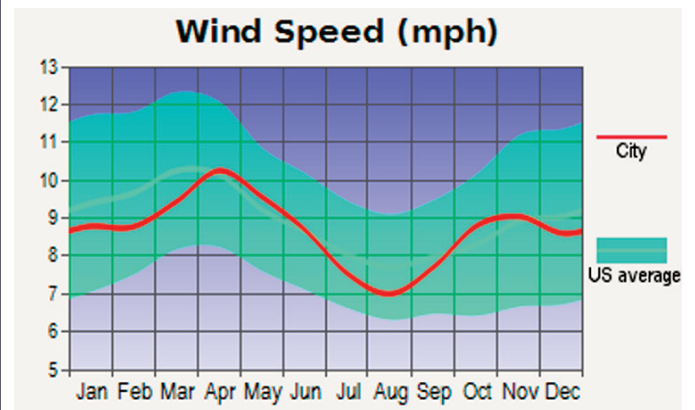
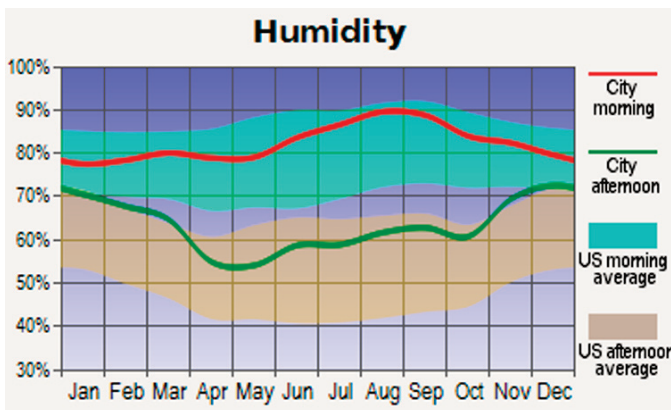
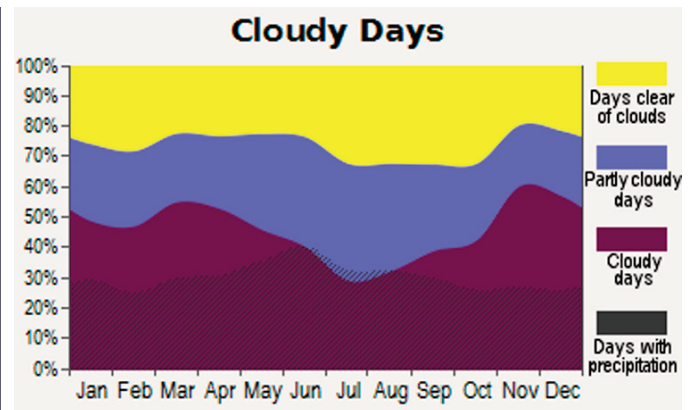
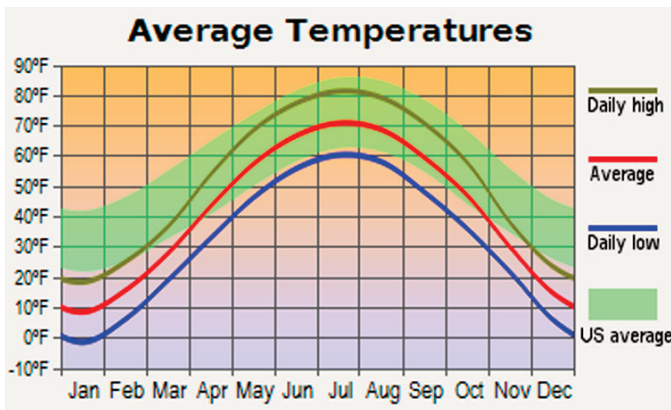
Looking east down Olena Ave.



Dead end streets on the west side.



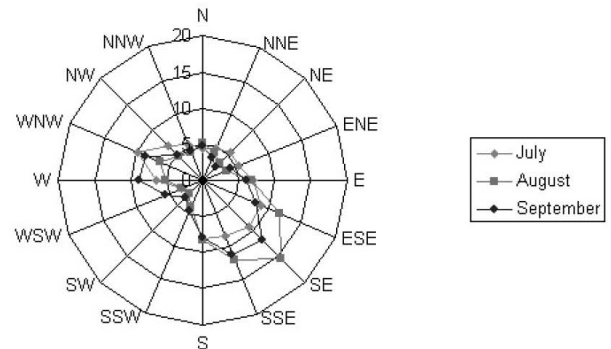
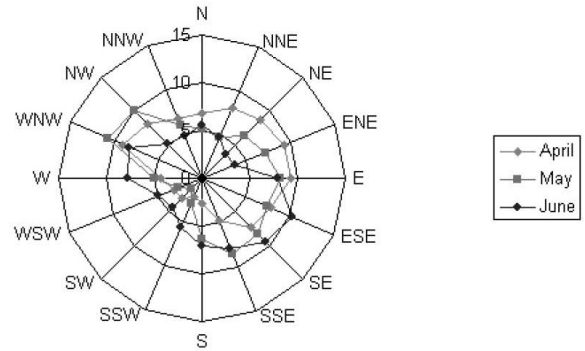
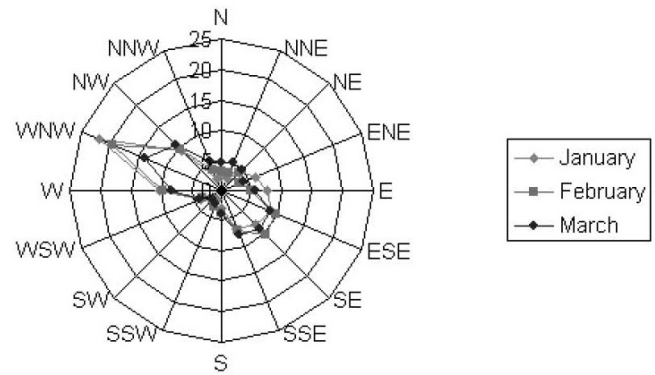
Quantitative Aspects: Climate Data

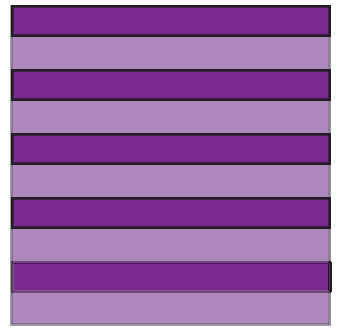




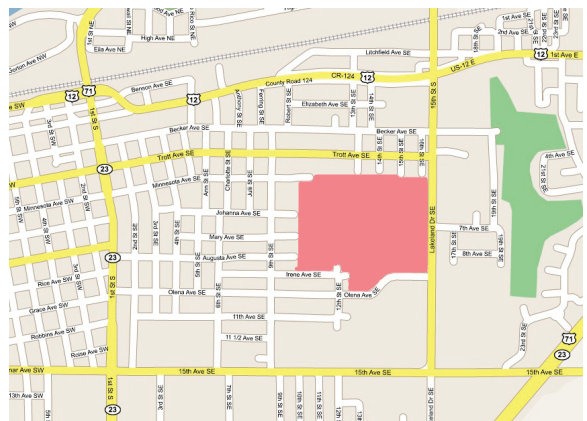
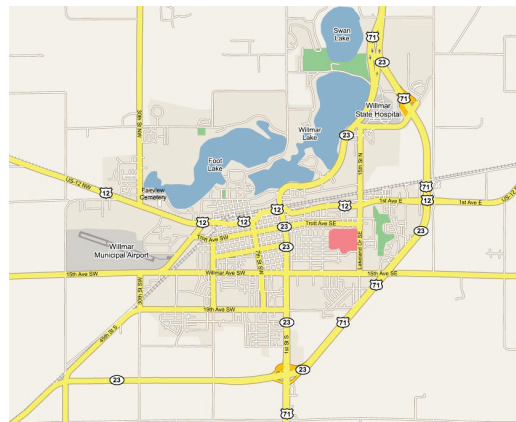
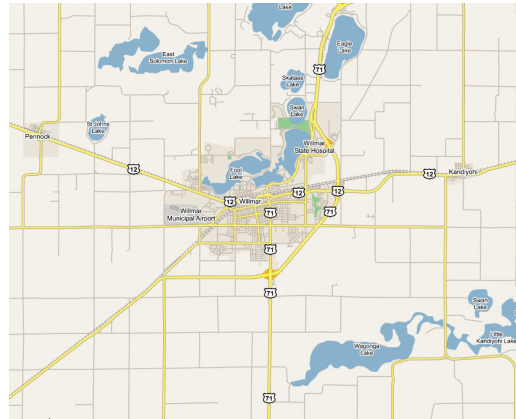
Quantitative Aspects: Climate Data/Wind Rose

By looking at the wind rose to the right you can see that the primary wind direction during the first three months of the year is out of the west-north-west and then it begins to shift towards the north-east to south-east direction in the spring time months. As you get into the late summer and early fall time of the year you will notice the direction is more concentrated out of the south-east.





Quantitative Aspects: Site Location



Programmatic Requirements



Administration/Health Services

Reception/Waiting	300 sf
Principal.....	200 sf
Assistant Principal	150sf
Secretarial Work Station	150 sf
Work Room/Mail Area	300 sf
Small Conference Room	200 sf
Large Conference Room	400 sf
Toilets (2 @ 90 sf)	180 sf
Scheduling/Computer Services	200 sf
School Nurse/Health Services	500 sf
Total	2780 sf

Guidance/Student Services

Reception/Waiting	150 sf
Guidance Office	150 sf
Secretarial Work Station	100 sf
Conference Room	200 sf
Psychologist	100 sf
Career Center	300 sf
Testing	100 sf
Records, Supply, Storag.....	250 sf
Student Store/Activitie.....	300 sf
Total	1650 sf

Teacher/Staff

Planning Workstations (50 sf/teacher)	2250 sf
Offices (10 @ 100 sf)	1000 sf
Print/Copy Center	150 sf
Toilets (2 @ 90 sf)	180 sf
Total	3580 sf



Food Service

Cafeteria	2400 sf
Staff Dining	300 sf
Full Preparation Kitchen	2500 sf
Serving Line	1000 sf
Dry Food Storage	350 sf
Cooler	300 sf
Freezer	350 sf
Dishwasher	350 sf
Office	150 sf
Locker Rooms/Toilet	200 sf
Receiving & Holding	400 sf
Total	8300 sf

Library/Media Center

Entrance, Circulation, Distribution	700 sf
Seating, Stacks, Computer Access, Reference	2500 sf
Small Group/Conference/Office	150 sf
Multimedia Editing	200 sf
Classroom	800 sf
Workroom/Storage	500 sf
Total	4850 sf

World Language

Classrooms (2 @ 900 sf)	1800 sf
Total	1800 sf

Mathematics

Classrooms (4 @ 900 sf)	3600 sf
Total	3600 sf

English

Classrooms (4 @ 900 sf)	3600 sf
Total	3600 sf



Social Studies

Classrooms (4 @ 900 sf) 3600 sf
 Total 3600 sf

Earth & Life Science

Classroom/Lab (4 @ 1,300 sf) 5200 sf
 Storage/Lab Prep (2 @ 300 sf) 600 sf
 Total 5800 sf

Family & Consumer Science

Classroom 900 sf
 Classroom/Lab 1400 sf
 Storage/Lab Prep 300 sf
 Total 2600 sf

Special Education

Classroom (7-10 Students) 500 sf
 Classroom/Lab 1000 sf
 Total 1500 sf

Technology

Computer Lab (3 @ 1200 sf) 1200 sf
 Control & Server Storage 600 sf
 Copy Center 700 sf
 Total 2500 sf

Technical Education

Tech Lab 2000 sf
 General Shop 3000 sf
 CADD/Graphics 1600 sf
 Storage/Support Space 250 sf
 Total 6850 sf



Art

Multipurpose	1300 sf
Drawing & Painting	1200 sf
Ceramics	1500 sf
Kiln, Glazing, Clay, Damp Room	400 sf
Storage (300 sf/area)	1200 sf
Total	5600 sf

Music

Instrumental	2000 sf
Choral	2000 sf
Instrument Storage	700 sf
Small Practice	80 sf
Group Practice	150 sf
Office/Lesson Studio	200 sf
Instrument Repair	75 sf
Performance Equipment Storage	300 sf
Total	5505 sf

Auditorium

Seating (500 persons)	5500 sf
Stage	3000 sf
Dressing Rooms (2 @ 500)	1000 sf
Make-Up Room	250 sf
Toilets with Shower	130 sf
Costume Storage	225 sf
Scene Shop	1000 sf
Control Room	250 sf
Catwalks	700 sf
Loading Bridge	150 sf
Piano Storage	80 sf
Green Room	150 sf
Ticket Office	80 sf
Total	12,515 sf



Physical Education/Athletics

Gymnasium (2 Stations)	14,000 sf
Weight Room/Fitness	2000 sf
Adaptive Physical Education	500 sf
P.E. Locker Rooms (2 @ 1500 sf)	3000 sf
General Storage	600 sf
Athletic Storage	700 sf
Spectator Seating	3000 sf
Total	28,500 sf

Building Systems/Maintenance

Custodial	700 sf
Custodial Closets (4 @ 40 sf).....	160 sf
Toilets (2.5% x Net sf)	2649 sf
General Storage (3% x Net sf)	3179 sf
Mech./Elec. (7.5% x Net sf)	7949 sf
Circ. & Structure (35% x Net sf)	37,096 sf

Net Building Square Footage	105,990 sf
Gross Building Square Footage	156,863 sf
Handicapped Parking Stalls	6
Parking Stalls	150
Outdoor Classroom	900 sf

Process Documentation



Process Documentation

I began my thesis process first by deciding what type of project I would be interested in doing. I thought back to when I first began my architectural career at NDSU and remembered that back then I was interested in doing a school for my home town. I wanted to do something that would allow me to work in my hometown and give me a sense of helping the community.

After I decided on designing a new school for the Willmar school district I needed to decide which school I would like to do because there are many schools with-in the Willmar school system and many of those schools are in need of repair. While working at an architectural firm in Willmar over the summer I came across the Willmar Public Schools Assessment that our office had done. As I began to look through the document and study each school to see which one was the most in need of repair I came across the Jr. High that had an estimated repair cost around 3.5 million dollars. You can find the Jr. High School Assessment in appendix A.

Once I decided that I was going to design the new Willmar Junior High School I needed to find a site for the school. This did not take me very long at all because there is very little available land with-in city limits large enough to accommodate a school and the piece of land that I had always thought I would use for my thesis site is where the new Senior High School was going to go but they ended up building that outside of the city limits. I wanted to keep the Jr. High close to the old school so it would be an easy transition for everyone involved. The site I choose is a 70 acre piece of farm land. Knowing that I do not need that much land for a school I intended from the beginning to create a 30 - 40 acre plot for residential housing.



Northeast corner of site



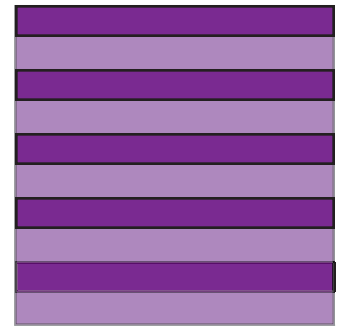
Looking south down Lakeland Dr.



Eastern edge of site



Southeast corner of site



Process Documentation

Once my site had been chosen I waited for a nice day to take a walk all the way around my site and photograph it. As I began my walk in the north-eastern corner and walked along the main road to the east I began to notice all of the planting lines still visible after the winter month's. These lines would later help in the furthering of my design.



Existing YMCA south of site



Existing trees on south side of site



Vast openness of my site



Existing pond on south side of site



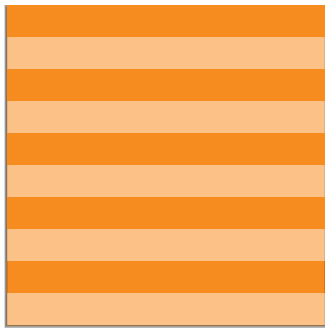
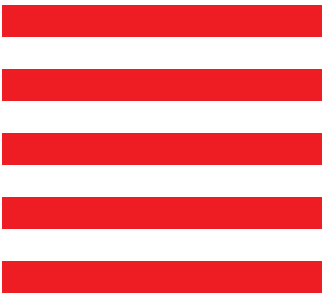
Looking east onto the site



Existing baseball field on southwest corner



Looking south onto the site

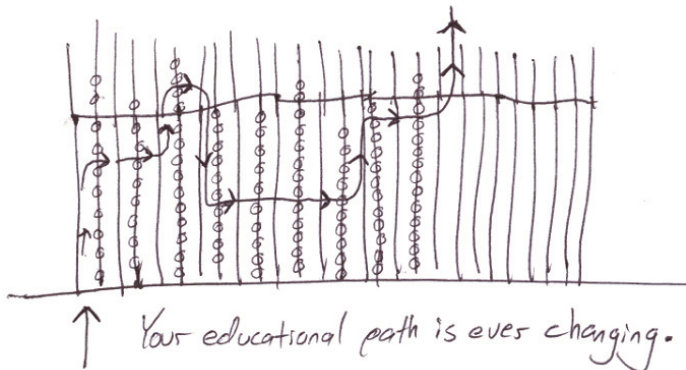


Process Documentation

After I had taken all the pictures of the site I thought I would need I started to think about what concept would really drive the project. Many different thoughts went through my head but I kept coming back to those planting rows that I saw during my site visit. I began to think about how a field of corn is analogous to a child's education. They start out as a small seed in the ground and continue to grow until reach their maturity.

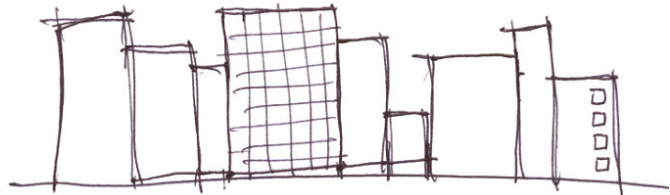


The rows that you see when you drive by a field of corn appear to be straight but they really follow the contour of the land and to a certain extent go wherever they want but still maintain a fairly linear path. Once a child begins its journey down that path they never know exactly which way they will end up going. They may end up going down many paths until they find the one that is right for them



↑ Your educational path is ever changing.

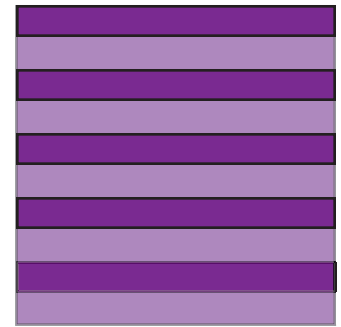
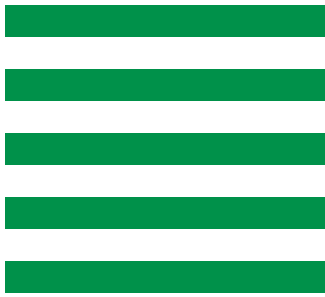
Different heights symbolize different levels of education.



Not only do the children go on different paths than other students do they will also be at different physical, mental and emotional levels than other students. This is represented by the different heights of the corn stalks. One student may be at higher level of education while another student may be more emotionally mature. Eventually the children will reach a fairly equal level of maturity.



Corn Rows: Always remember my site planted with corn & seeing the rows as I drove by as a child.



Process Documentation

After I looked at the different relationships between corn rows and education I began to focus on the importance of the layout of the school. I really wanted something that the children could relate to and interact with. This was very important to me because when I used to attend Jr. High all I can remember is the cold feeling the building gave me. The exterior of the building also represented the interior of building in the sense that it was very monochrome in color and the main circulation path for the school was rectangular in shape. My sister who attends the Jr. High now has told me that violence is so bad that the students are only allowed to walk one direction around the library (the center of the rectangular circulation path).



Existing Jr. High floor plan



Front of existing Jr. High



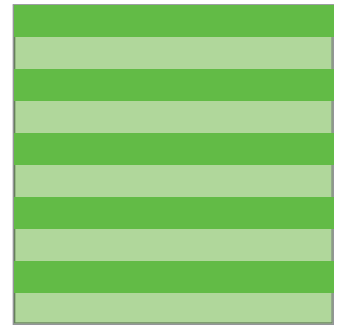
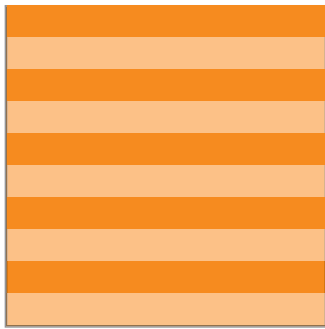
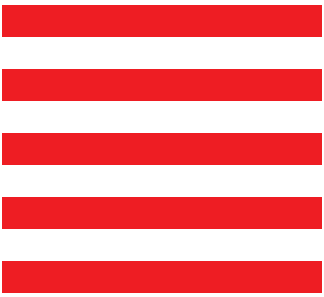
Existing hallway



Existing lunchroom

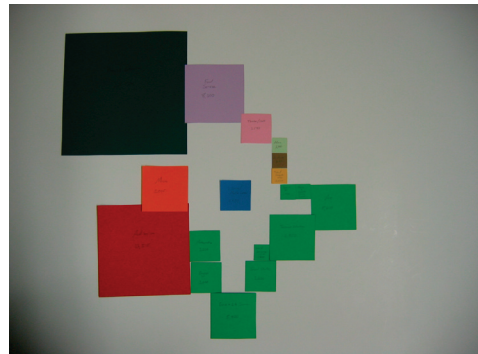
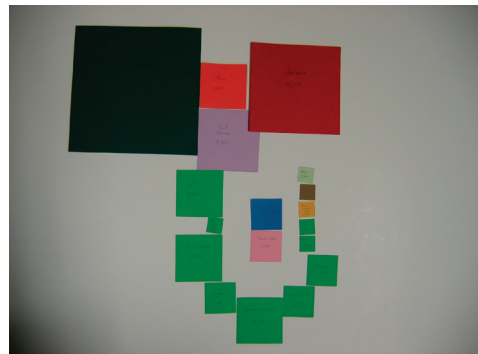
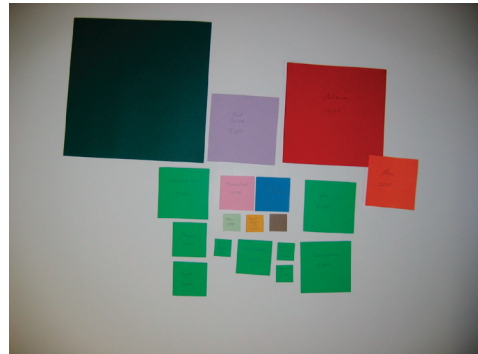
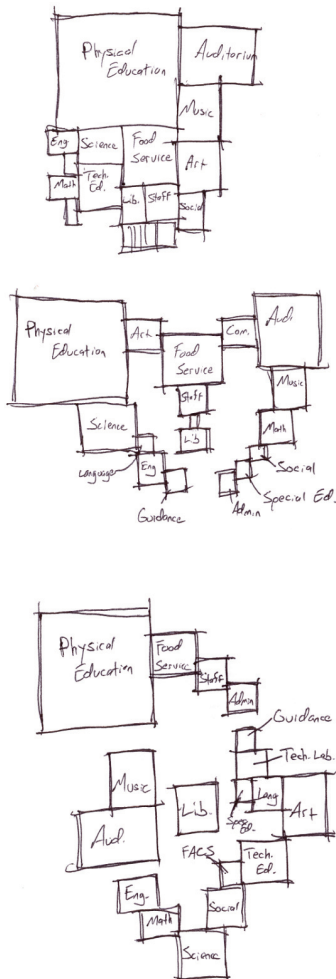


Existing library



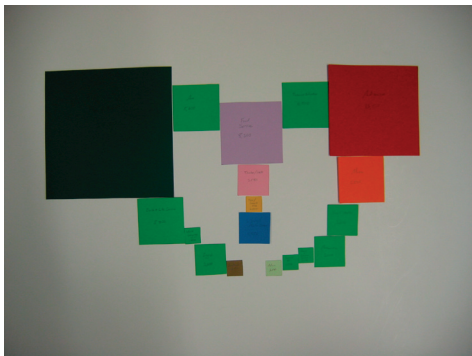
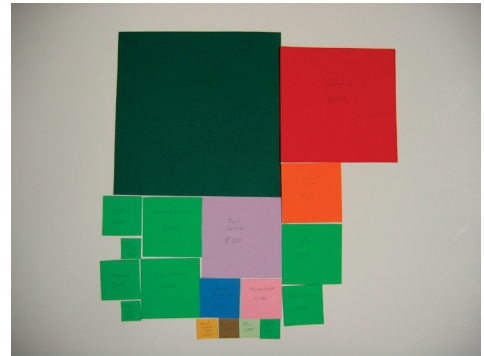
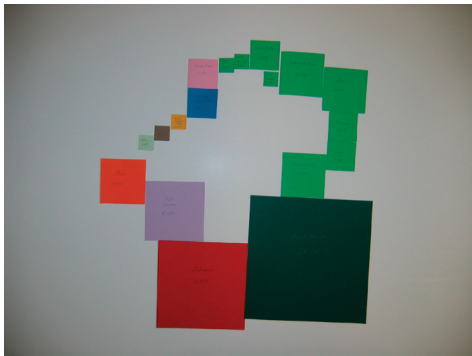
Process Documentation

Focussing on spatial arrangements for the school I began to sketch out some possible massings for the floor plan. To do this I cut out squares for each programmed area of space according to the total square footage I needed and color coded them so I could easily see what spaces needed to be next to each other and which spaces needed to be away from other spaces. This really helped to see what type arrangement would work best. On the next few pages you will see the many different spatial arrangements I came up with before choosing my final one.





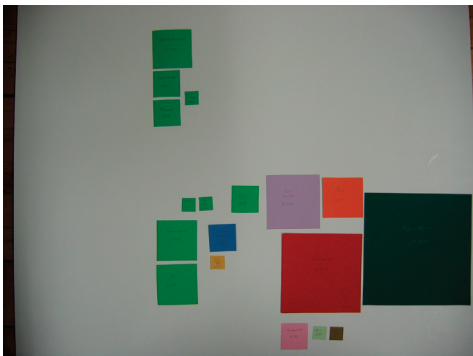
Process Documentation



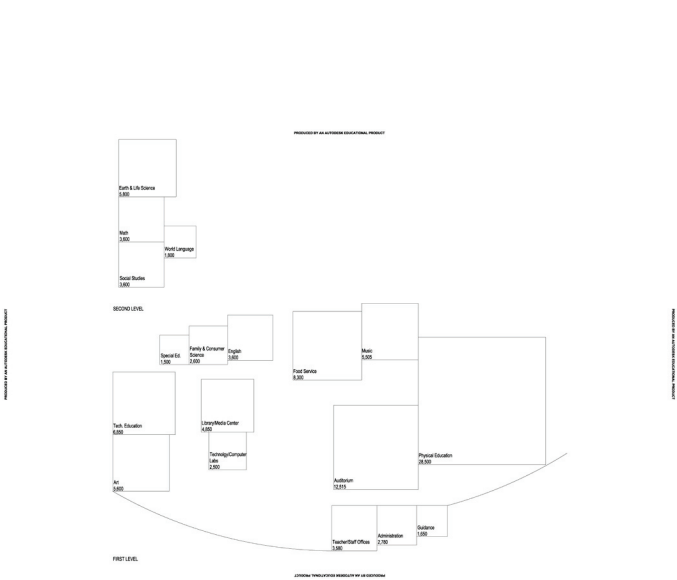


Process Documentation

Once I had taken all of the pictures of the different spatial layouts I had arranged I had to go back and look at all of the pictures and decide which one or combination of two or three I would use. I ended up using my final layout because it was the one that I saw had the most potential and the combination of the spaces really seemed to work well for a school.



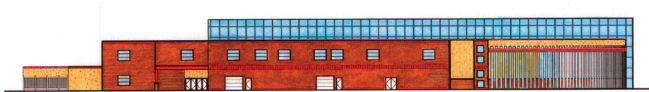
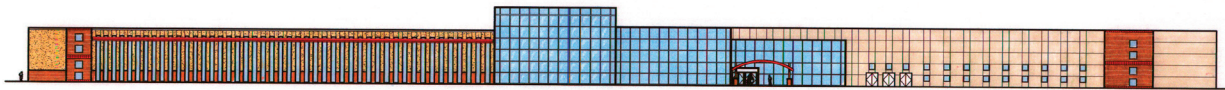
I thought my final layout had the most potential because of the way the building flowed together. I wanted the teacher/faculty/administration area to be up front because they are the ones that run the school and have the most influence of a child's education. I also wanted to be able to separate some of the larger spaces such as: gymnasium, auditorium and music from the rest of the school so those activities could be used by the community after school hours and they would not disturb the rest of the building. I also wanted to have a large commons area for the students to be able to congregate in between classes because their old school had no such spaces. I really did not have to do much adjusting to my initial layout because the commons area just sort of appeared after I laid out the squares. You can see that all of my programmatic spaces are square in shape. It was not my initial intention to keep such a rigid form but as I progressed in my design that form really allowed me to create the spaces I wanted and needed.



The square spatial forms also allowed me to create a simple 30' x 30' structural grid that would carry through on the majority of the building. By having such a rigid spatial layout and grid this would further enhance my concept of the linear planting rows that were at one time abundant on this site. This would allow the students to be able to look down the long commons area and see the large columns that represent the history of the site. The classroom environment is a very important part of child's educational experience. It needs to stimulate the mind while at the same time be a good learning environment. To achieve this I had all of the classroom spaces have at least one angled wall. It has been shown that in doing this it allows you to get students closer to the front of the room and it improves acoustics with in the classroom.



Process Documentation

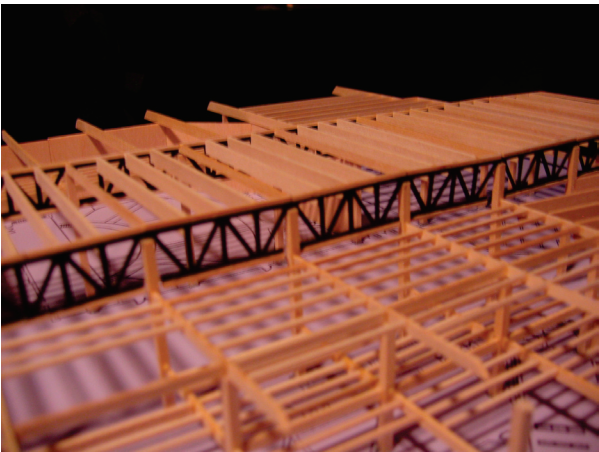
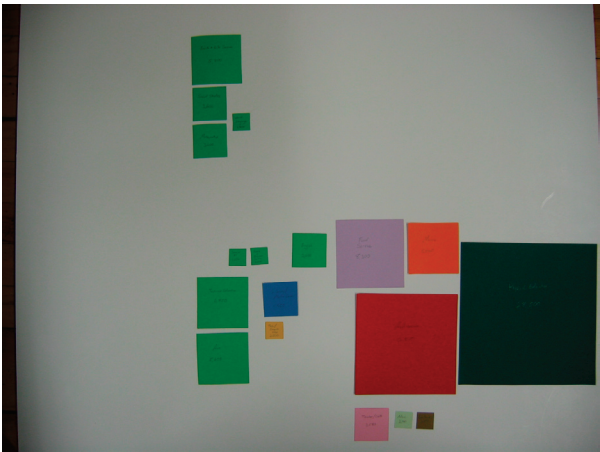
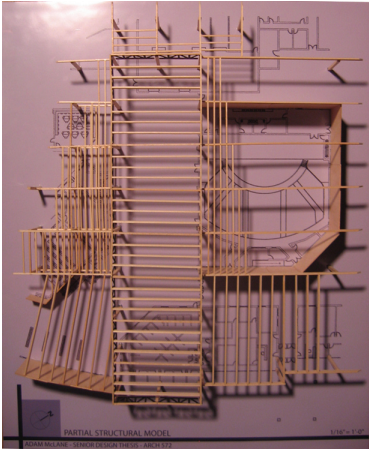
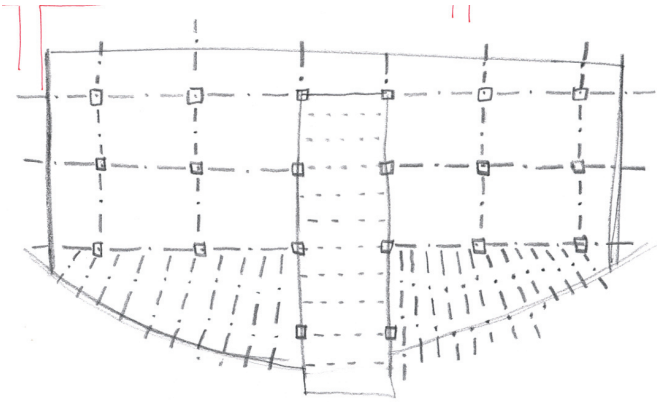


When I began to work on the facade of my building I wanted that to also represent the history of the site but at the same time represent a child's educational process. That is why I ended up using four different materials on the front of my building. The tall narrow windows represent the corn rows that once occupied the site. The three curtain wall areas represent the administration portion of the building and how they should be visible to everyone because they are the driving force behind the children's education. The metal panels on the right side of the building represent another change along the path of education. The two brick faces that stick out on both ends of the building are there to represent a child breaking through an educational barrier. Overall I believe that I successfully created a Jr. High School for Willmar, MN that will effectively educate the children for the future.

Solution Documentation



Solution Documentation

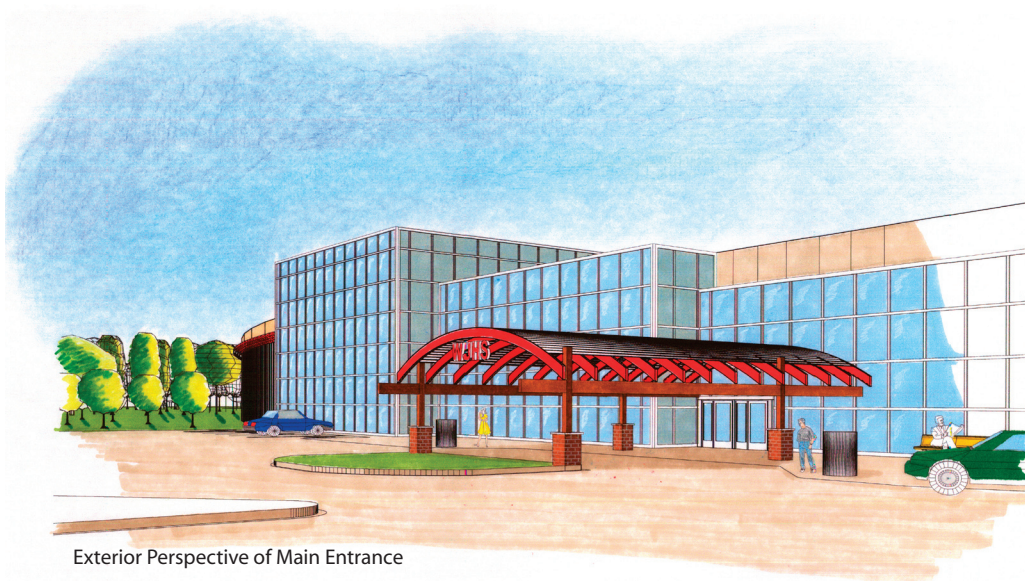




Solution Documentation



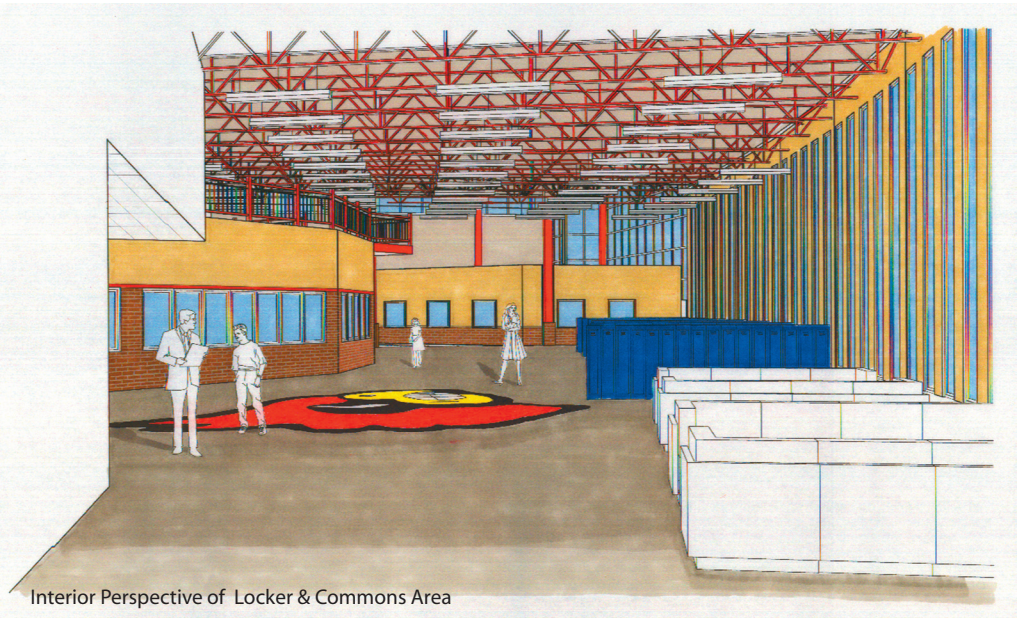
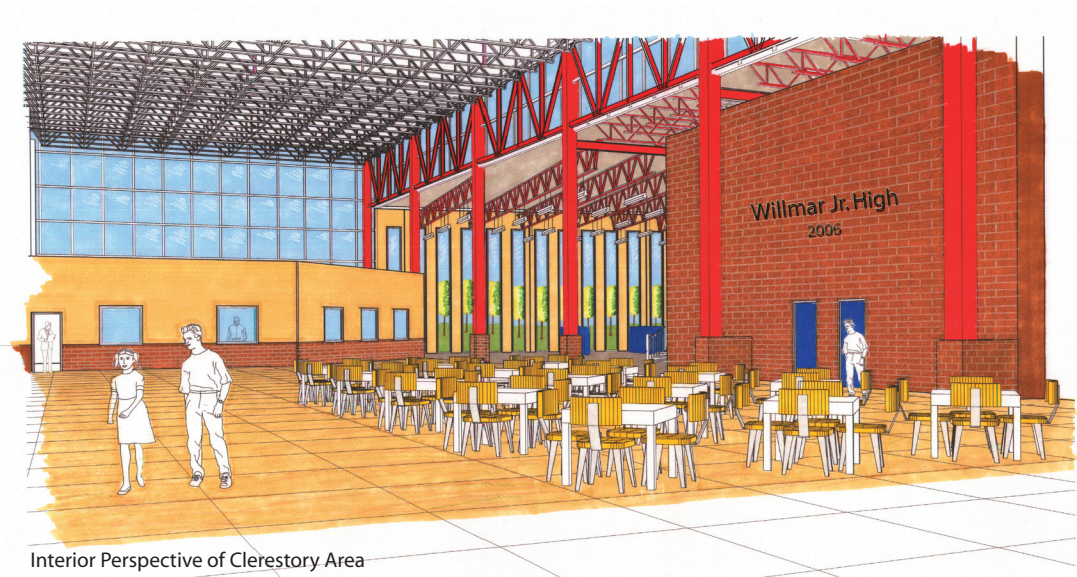
Exterior Perspective

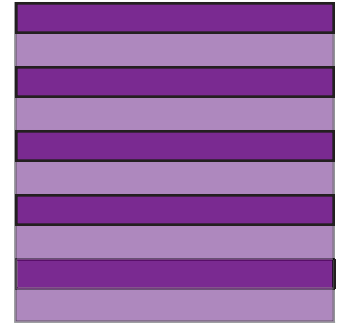


Exterior Perspective of Main Entrance

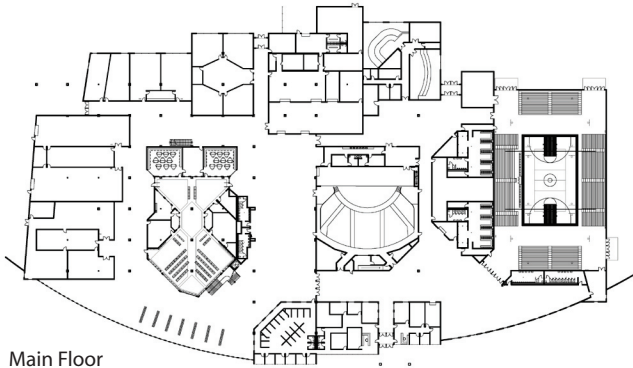


Solution Documentation





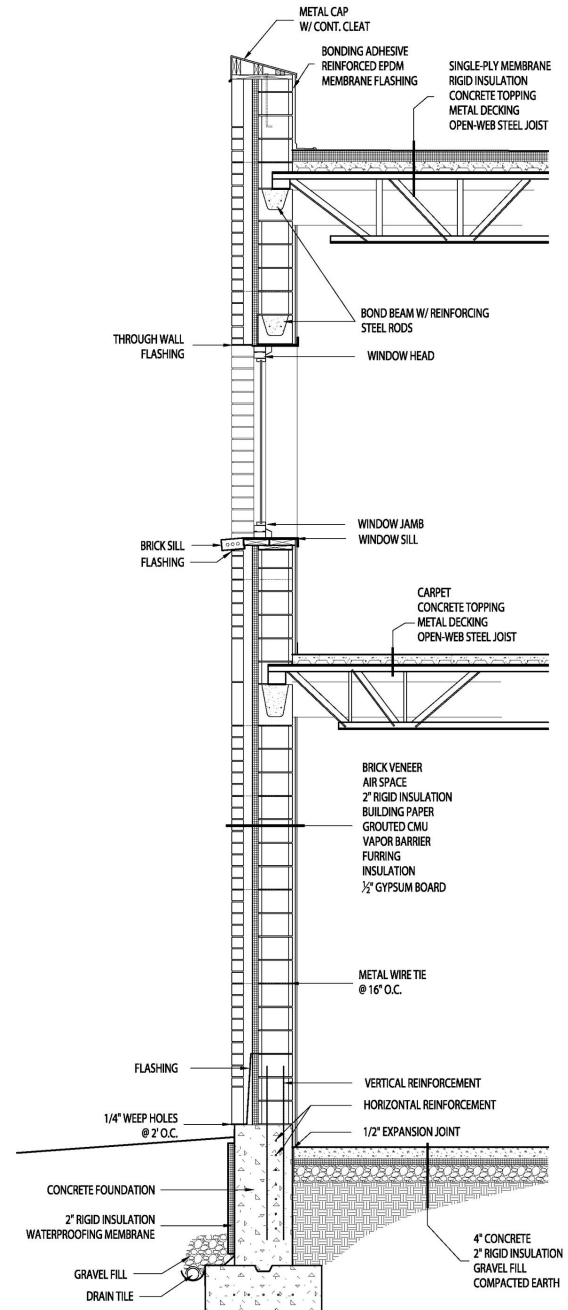
Solution Documentation

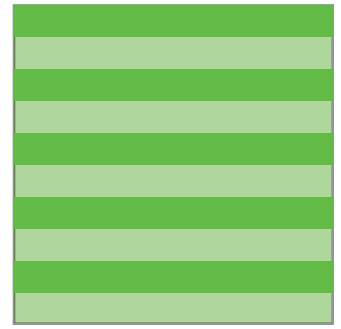
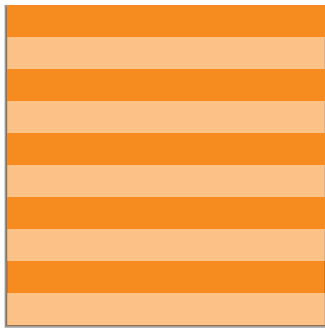
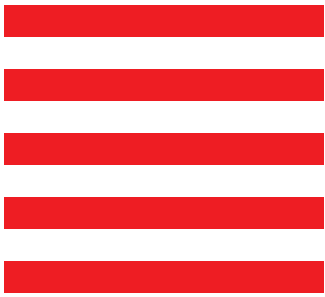


Main Floor



Second Floor





Solution Documentation

WILLMAR JUNIOR HIGH SCHOOL Environment vs. Education



Looking South down Lakeland Drive.



Looking Northwest onto site.



Looking West down Olena Avenue.



Looking East onto site.



Existing YMCA to the south of site.

Why Willmar?

I chose Willmar because of its rapid growth rate, demographic diversity and its need for a new Jr. High School. The current population is nearly 18,500. The median age is 34.2 and 31.3% of the total population is composed of families with children under the age of eighteen. The race of the Willmar area is primarily white at 88.1% while the Hispanic and Latino population makes up about 15.9% of the total population. Having such a diverse population means that there will also be a diverse climate of students with-in the school system requiring different needs to be examined. Another large determining factor for choosing to do a new Jr. High School was the fact that a Willmar Public Schools assessment was done in the summer of 2005 and it determined that the existing Jr. High was in the most need of repair and code updates. The estimate to fix these issues was 3.5 million dollars.



Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

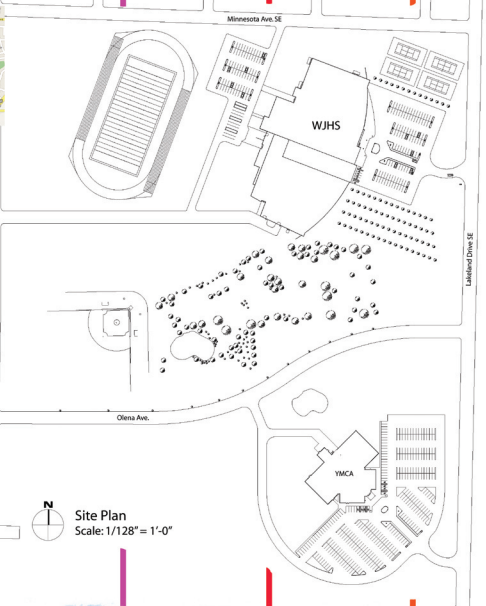
Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential

Proposed Residential



Site Plan Scale: 1/128" = 1'-0"

The Process

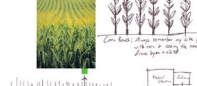
I began the process by taking photographs of my site and also by recalling memories of the site from my childhood. For as long as I can remember my site has always been a field and in that field there would always be rows and rows of crops, either beans or corn and I remember vividly seeing those distinct rows as I would drive down Lakesland Drive. I started thinking that the rows that have always been there are representative of a child education. Even though the rows appear to be straight they move slightly from side to side which would represent the changes that occur during your education.



Existing Jr. High floor plan.



Can look always remember as the plants grow from a seed.



The school building is a new challenge.



Other large scale of school.

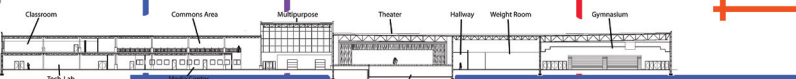


Other large scale of school.



Other large scale of school.

- The Willmar Jr. High School is programmed for the following:
- 700 Students
 - Grades 7 - 8
 - 4 Mathematics Teachers
 - 4 Science Teachers
 - 4 Social Teachers
 - 4 Communications Teachers
 - 2 Art Teachers
 - 2 Industrial Tech. Teachers
 - 3 Health & Wellness Teachers
 - 3 Music Teachers
 - 5 Special Education Staff
 - 3 Media/Library Staff
 - 6 Office Staff
 - 1 Principal
 - 1 Dean of Students
 - 2 Counselors
 - 2 School Nurse
 - 2 Building Maintenance Staff
 - 1 Athletic Director
 - 1 Police Liaison
 - 5 Kitchen Staff



Full Building Section Scale: 1/32" = 1'-0" (North-South)

As I began designing the new school one of the most important things to me was to create a school environment that is flexible and functional. To achieve this I kept the larger volume spaces (gymnasium, theater and music) further away from the rest of the traditional educational spaces



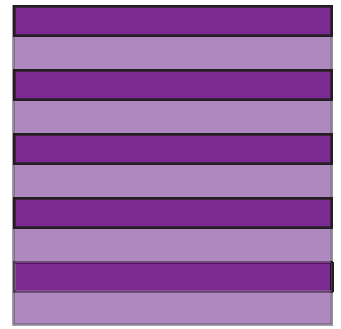
East Elevation Scale: 1/32" = 1'-0"

Large vertical windows to represent the history of the site.

The three different height curtain walls represent the knowledge levels a student will go through.

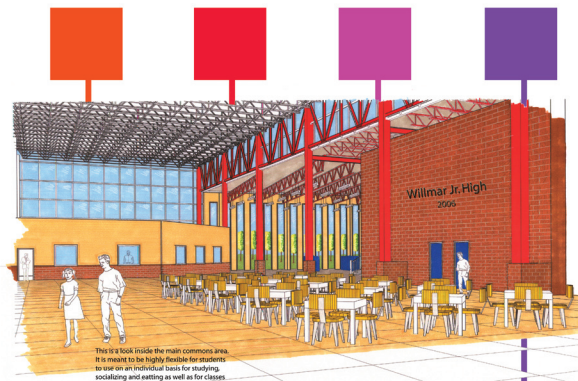
Material change and floor print change represent breaking through educational barriers.

First Board



Solution Documentation

Adam McLane - Senior Design Thesis - 2006



This is a look inside the main commons area. It is meant to be highly flexible for students to use on an individual basis for studying, socializing and eating as well as for classes to congregate for discussions and seminar sessions. Varied locations for classes to be conducted breaks necessary for both students and teachers.

My main objective for Willmar's new Jr. High was to create an environment for students that is conducive to learning with the hopes of raising test scores, attendance and student moral. To do this I created spaces that the students can interact with so they feel like they belong. Research shows that a child's sense of identity and belonging are influenced positively by appropriately scaled and comfortable furnishings, lively colors and a "homey" feel. Students have a much greater "pride of place" in such an environment and believe they are listened to and valued as individuals.



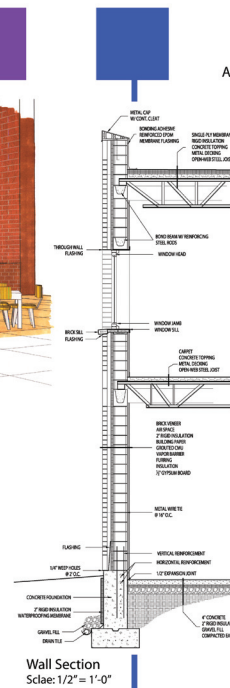
While further designing the layout of the school I wanted to maintain a certain level of linear relationships to tie back to the corn rows that once occupied the site. I did not intend to design the school around a linear circulation path, instead I wanted to represent the lines in the structure while creating a unique circulation path for the students. This path was designed to represent the many different obstacles one may come upon during there education in the Willmar Public School System.

Having the larger volume spaces away from the rest of the classrooms allows those spaces to be used after the regular school day is over and not have the users of those spaces move into the rest of school.

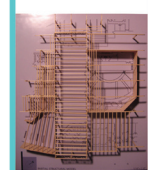


South Elevation
Scale: 1/32" = 1'-0"

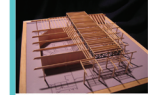
Second Board



Wall Section
Scale: 1/2" = 1'-0"



Partial structural plan



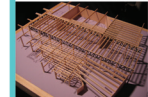
Northwest portion of building



Structure inside clerestory area



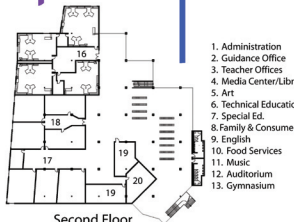
Structure over main office



Partial structural plan

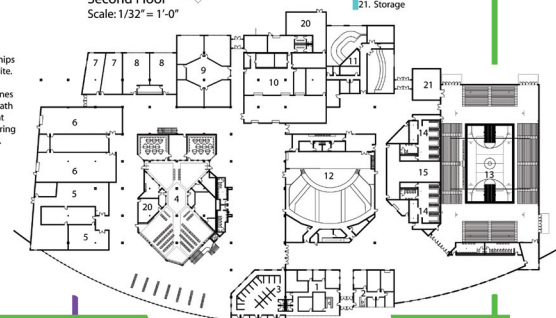


Front facade & structure



Second Floor
Scale: 1/32" = 1'-0"

1. Administration
2. Guidance Office
3. Teacher Offices
4. Media Center/Library
5. Art
6. Technical Education
7. Special Ed.
8. Family & Consumer Science
9. English
10. Food Services
11. Music
12. Auditorium
13. Gymnasium



First Floor
Scale: 1/32" = 1'-0"

14. Locker Rooms
15. Weight Room
16. Science Labs
17. Social Studies
18. Mathematics
19. World Language
20. Mechanical
21. Storage

Reference List



Reference List

Academic Calms. (1992). *Architecture*. April. V.81. n.4. pp. 44-51

Banks, James. (1992). Multicultural Education: Approaches, Development and Dimensions. In J. Lynch, C. Modgil & S. Modgil (Eds.), *Education For Cultural Diversity: Convergence And Divergence* (pp. 83-92).

Broadbent, Geoffrey. (1977). A Plain Man's Guide to the Theory of Signs in Architecture. In K. Nesbitt (Ed.), *Theorizing A New Agenda For Architecture* (pp.122-139). Princeton Architectural Press, New York.

Cohn, David. (2003). Primary School De Vogels. *Architectural Record*. Mar. v.191. n.3. pp. 132-135

Dillon, David. (2003). Ann Richards Middle School. *Architectural Record*. Mar. v.191. n.3. pp. 136-139

Haut, Richard, (2002). Architecture and Ethics. [Electronic Version]. Retrieved November 11, 2005, from <http://www.designcommunity.com/discussion/17659.html>

Kolleeny, Jane. (2003). P.S. 156, I.S. 293. *Architectural Record*. Mar. v.191 n.3. pp. 140-143

Minnesota Department of Transportation. (2002). *Traffic Volumes*, Willmar.

Mortimore, P., Sammons, P., Stoll, L., Lewis, D. and Ecob, R. (1988) *School Matters: The Junior Years*, London, Open Books.

Morton, David. (1979). *Progressive*. Feb. v.60. n.2. pp.68-72

Nesmith, Lynn. (1992). Educating Columbus. *Architecture*. Nov. v.81. n.11. pp. 84-91

Peterson, Bruce. Personal Interview. July 9th, 2005.

The American Heritage® Dictionary of the English Language, Fourth Edition
Copyright © 2000 by Houghton Mifflin Company. Published by Houghton Mifflin Company.

Thomson, Garrett. (1993). *An Introduction to Modern Philosophy*. Belmont, Washington: Wadsworth Publishing Company.

Tomlinson, Sally. (1992). Achievement, Assessment and the School Effect. In J. Lynch, C. Modgil & S. Modgil (Eds.), *Education For Cultural Diversity: Convergence And Divergence* (pp. 389-400).

United States Department of Agriculture. (1984). *Soil Survey of Kandiyohi County*, Minnesota.

Appendix



<u>School</u>	<u>Priority</u>	<u>ProjID</u>	<u>System</u>	<u>SubSystem</u>	<u>Sub-Sub-Sys.</u>	<u>Room</u>	<u>Description</u>	<u>Explanation</u>	<u>Units</u>	<u>Measure</u>	<u>Unit Cost</u>	<u>X</u>	<u>Est.Cost</u>
Jr. High													
Priority : Jr. High													
		JR-3070	Exterior Shell	Openings	Doors	Exterior Doors	Replace exterior doors.		25	EA	1,400.00	1.00	\$35,000
												Subtotal for Priority : Jr. High	\$35,000

Priority 1 : Jr. High

JR-1010	Accessibility	Building Circulation	Ramps	153	Risers - not accessible.	ADA requirement. Code issue.	1	EA	6,350.00	1.50	\$9,525	
JR-1020	Accessibility	Building Circulation	Ramps	154	Risers - not accessible.	ADA requirement. Code issue.	1	EA	6,350.00	1.50	\$9,525	
JR-1030	Accessibility	Building Circulation	Interior Doors	Boy's Locker Room	Door to pool needs operator.	ADA requirement. Code issue.	1	EA	4,550.00	1.40	\$6,370	
JR-1280	Accessibility	Building Circulation	Ramps	Pool	Access needed to seating and exits. 26' Ramp	ADA requirement. Code issue.	26	LF	335.00	1.40	\$12,194	
JR-1290	Accessibility	Building Circulation	Ramps	Stage/Exercise Room	Need accessible ramp.	ADA requirement. Code issue.	1	EA	2,500.00	1.40	\$3,500	
JR-1040	Accessibility	Restroom Facility	Stalls	Boy's Locker Room	Provide accessible stall.	ADA requirement. Code issue.	1	EA	750.00	1.50	\$1,125	
JR-1050	Accessibility	Restroom Facility	Sinks	Boy's Locker Room	Provide accessible drinking fountain.	ADA requirement. Code issue.	1	EA	1,100.00	1.50	\$1,650	
JR-1060	Accessibility	Restroom Facility	Sinks	Boy's Locker Room	Provide accessible sink.	ADA requirement. Code issue.	1	EA	900.00	1.50	\$1,350	
JR-1070	Accessibility	Restroom Facility	Showers	Boy's Locker Room	Provide accessible shower.	ADA requirement. Code issue.	1	EA	520.00	1.50	\$780	
JR-1080	Accessibility	Restroom Facility	Toilets	Boy's Locker Room	Provide accessible toilet.	ADA requirement. Code issue.	1	EA	1,350.00	1.50	\$2,025	
JR-1090	Accessibility	Restroom Facility	Stalls	Boy's Restroom at N. Library	Provide H.C. stall.	ADA requirement. Code issue.	1	EA	750.00	1.50	\$1,125	
JR-1100	Accessibility	Restroom Facility	Toilets	Boy's Restroom at N. Library	Provide H.C. toilet.	ADA requirement. Code issue.	1	EA	1,350.00	1.50	\$2,025	
JR-1110	Accessibility	Restroom Facility	Sinks	Boy's Restroom at N. Library	Provide H.C. sink.	ADA requirement. Code issue.	1	EA	900.00	1.50	\$1,350	
JR-1160	Accessibility	Restroom Facility	Showers	Girl's Locker Room	Provide accessible shower.	ADA requirement. Code issue.	1	EA	520.00	1.50	\$780	
JR-1170	Accessibility	Restroom Facility	Toilets	Girl's Locker Room	Provide accessible toilet.	ADA requirement. Code issue.	1	EA	1,350.00	1.50	\$2,025	
JR-1180	Accessibility	Restroom Facility	Stalls	Girl's Locker Room	Provide accessible stall.	ADA requirement. Code issue.	1	EA	750.00	1.50	\$1,125	
JR-1190	Accessibility	Restroom Facility	Sinks	Girl's Locker Room	Provide accessible sink.	ADA requirement. Code issue.	1	EA	900.00	1.50	\$1,350	
JR-1200	Accessibility	Restroom Facility	Sinks	Girl's Locker Room	Provide accessible drinking fountain.	ADA requirement. Code issue.	1	EA	1,100.00	1.50	\$1,650	
JR-1210	Accessibility	Restroom Facility	Stalls	Girl's Restroom at N. Library	Provide H.C. stall.	ADA requirement. Code issue.	1	EA	750.00	1.50	\$1,125	
JR-1220	Accessibility	Restroom Facility	Sinks	Girl's Restroom at N. Library	Provide H.C. sink.	ADA requirement. Code issue.	1	EA	900.00	1.50	\$1,350	
JR-1230	Accessibility	Restroom Facility	Toilets	Girl's Restroom at N. Library	Provide H.C. toilet.	ADA requirement. Code issue.	1	EA	1,350.00	1.50	\$2,025	
JR-2100	Electrical	Lighting	Fixtures	147, 153,	E-01 Install exit signs.	Need Exit Signs in Room 147, Locker Rooms, Music 153 and Band.	1	LS	6,000.00	1.10	\$6,600	Critical
												Recommendation: Install Exit Signs in these areas per Fire Marshal's request.

<u>School</u>	<u>Priority</u>	<u>ProjID</u>	<u>System</u>	<u>SubSystem</u>	<u>Sub-Sub-Sys.</u>	<u>Room</u>	<u>Description</u>	<u>Explanation</u>	<u>Units</u>	<u>Measure</u>	<u>Unit Cost</u>	<u>X</u>	<u>Est.Cost</u>	
		JR-2080	Electrical	Service		Electric	E-03 New exit door for electrical gear.	Existing electrical service switchboard area has only one exit. The National Electrical Code required two exists from rooms with services over 1200 amps. Recommendation: Add a second exit from front side of 20' long switchgear area. Wall in front of electrical gear is an exterior wall.	1	EA	4,000.00	1.20	\$4,800 Critical	
		JR-3060	Exterior Shell	Openings	Windows		Replace windows.		1120	SF	32.00	1.30	\$46,592	
		JR-3030	Exterior Shell	Roof		Roof	Roof leaks, several locations - old BDR. (fix leaks)	To stop infiltration and deterioration.	6	EA	500.00	1.50	\$4,500	
		JR-3050	Exterior Shell	Roof	Roof	Roof	Replace roof.		414	SQ	279.00	1.10	\$127,057	
		JR-3040	Exterior Shell	Roof		Roof Above Gym	Poor draining - hole SE of roof.	To stop infiltration and deterioration.	3	EA	700.00	1.50	\$3,150	
		JR-3020	Exterior Shell	Walls	Caulking	at Maintenance Addition at Hallway	Poor job sealing - re-seal at flashing. (1994 Re-Roofing)	To stop infiltration and deterioration.	54	LF	4.10	1.50	\$332	
		JR-4020	Grounds	Plant Material	Lawns	Perimeter of Building	Need to slope grade away from building. (Dirt, Labor)	To stop infiltration and deterioration.	107	CY	12.00	1.50	\$1,926	
		JR-4030	Grounds	Plant Material	Lawns	Perimeter of Building	Seeding. 750 LF x 2' wide = 1,500 SF / 9 = 166 SY	To stop infiltration and deterioration.	166	SY	0.75	1.50	\$187	
		JR-5580	Interior Shell	Doors	Hardware	Kitchen	Replace hardware - locksets @ \$190/EA.	ADA requirement. Code issue.	10	EA	190.00	1.30	\$2,470	
		JR-5510	Interior Shell	Specialties	Fixed Furniture	Dish Return	Replace 15' base cabinet and counter top. Stainless Steel	For appearance and function.	15	LF	140.00	1.50	\$3,150	
		JR-5520	Interior Shell	Specialties	Fixed Furniture	Dish Wash	Replace 9' galv. Shelf @ dish table. 6' x 12' Wood Replace	For appearance and function.	1	LS	120.00	1.50	\$180	
		JR-5440	Interior Shell	Windows	Glazing	Corridor D	Replace glass at cross corridor door frame with tempered glass. (east end)	Safety issue.	66	SF	12.95	1.10	\$940 Critical	
		JR-9010	Major Project					All sub-projects should be done at the same time.	New sprinkler system, HVAC, lighting, intercom, and ceilings.	1	EA	1,635,469.06	1.00	\$1,635,469
		JR-6130	Mechanical	Plumbing		Penthouse	M-11 Replace leaking hot water boiler.	One of the hot water boilers in the Penthouse Mechanical space is leaking and is in need of replacement. (Photo #65) Recommendation: Replace existing hot water boiler with new boiler.	1	EA	4,500.00	1.20	\$5,400	
		JR-7010	Statutory	Building Safety	Railings	153	Hand rails at steps.	Safety issue. Code issue.	45	LF	30.00	1.10	\$1,485	
		JR-7030	Statutory	Building Safety	Railings	154	Hand rails at steps.	Safety issue. Code issue.	45	LF	30.00	1.10	\$1,485	
		JR-7040	Statutory	Building Safety	Railings	Boiler Room	Wood Platform - Must GO! Demo.	Safety issue.	1	EA	200.00	1.10	\$220	
Subtotal for Priority 1 : Jr. High												\$1,909,917		

Priority 2 : Jr. High

		JR-1120	Accessibility	Restroom Facility	Stalls	Boy's Restroom at Teacher's Lounge	Replace four standard stalls.	ADA requirement. Code issue.	4	EA	300.00	1.40	\$1,680
		JR-1130	Accessibility	Restroom Facility	Stalls	Boy's Restroom at Teacher's Lounge	Provide H.C. stall.	ADA requirement. Code issue.	1	EA	700.00	1.40	\$980
		JR-1140	Accessibility	Restroom Facility	Sinks	Boy's Restroom at Teacher's Lounge	Replace sink.	ADA requirement. Code issue.	1	EA	900.00	1.40	\$1,260

<u>School</u>	<u>Priority</u>	<u>ProjID</u>	<u>System</u>	<u>SubSystem</u>	<u>Sub-Sub-Sys.</u>	<u>Room</u>	<u>Description</u>	<u>Explanation</u>	<u>Units</u>	<u>Measure</u>	<u>Unit Cost</u>	<u>X</u>	<u>Est.Cost</u>
		JR-1150	Accessibility	Restroom Facility	Sinks	Boy's Restroom at Teacher's Lounge	Insulate pipes.	ADA requirement. Code issue.	1	EA	120.00	1.40	\$168
		JR-1240	Accessibility	Restroom Facility	Sinks	Girl's Restroom at Teacher's Lounge	Replace sink.	ADA requirement. Code issue.	1	EA	900.00	1.40	\$1,260
		JR-1250	Accessibility	Restroom Facility	Stalls	Girl's Restroom at Teacher's Lounge	Replace four standard stalls.	ADA requirement. Code issue.	4	EA	300.00	1.40	\$1,680
		JR-1260	Accessibility	Restroom Facility	Stalls	Girl's Restroom at Teacher's Lounge	Provide H.C. stall.	ADA requirement. Code issue.	1	EA	700.00	1.40	\$980
		JR-1270	Accessibility	Restroom Facility	Sinks	Girl's Restroom at Teacher's Lounge	Insulate pipes.	ADA requirement. Code issue.	1	EA	120.00	1.40	\$168
		JR-2050	Electrical	Low Voltage	Fire Alarm	Classrooms	E-08 Add visual alarm notification to classrooms.	Existing fire alarm system does not have visual notification in classrooms. Recommendation: Install horn/strobe notification devices in classrooms, bathrooms and conference rooms.	50	EA	250.00	1.20	\$15,000
		JR-2040	Electrical	Low Voltage	Fire Alarm	Entire Building	E-09 Add smoke shut-down on air handling units.	Existing air handling units over 2000 CFM do not have automatic smoke shutdown. Recommendation: Install smoke duct detectors and shutdown on existing air handlers over 2000 CFM. Existing fire alarm system will need to have NAC extenders for new devices. (NOTE: IF MECHANICAL ITEM #M-1 IS DONE, THE QUANTITY OF SMOKE DETECTORS FOR REMAINING AIR-HANDLING UNITS SHOULD BE REDUCED TO SIX.)	20	EA	500.00	1.10	\$11,000
		JR-2060	Electrical	Power Distribution	Devices	Classrooms	E-06 Add receptacles to classrooms.	Existing classrooms have shortage of receptacles. Many rooms have extension cords run to nearest receptacle. Recommendation: Install additional receptacles in classrooms as required. Provide two receptacles per classroom.	40	EA	200.00	1.50	\$12,000
		JR-2020	Electrical	Service	Breaker Panels	Lower pool area	E-11 Replace electrical panel.	Existing electrical panels in lower pool area are severely rusted. Recommendation: Install new electrical panel with hazardous coatings to fight Chlorine conditions.	1	EA	4,500.00	1.00	\$4,500
		JR-3010	Exterior Shell	Walls	Masonry	Gym	Some open joints at brick. (re-seal) Minor Pointing @ Reglets	To stop infiltration and deterioration.	43	SF	3.31	1.00	\$142
		JR-4040	Grounds	Athletic Facilities	Courts	Tennis Court	Tennis Court - Total Replace. (\$120,000)		4	EA	18,000.00	1.40	\$100,800
		JR-5570	Interior Shell			Kitchen	Replace pressure oven.		1	EA	7,525.00	1.50	\$11,288
		JR-5560	Interior Shell	Ceiling	Painting	Gym	Re-paint ducts. 440' x 60"	For appearance and function.	1	LS	4,000.00	1.10	\$4,400
		JR-5610	Interior Shell	Ceiling	Acoustical	Pool	Remove exist tile from double-T's. Replace with Spray K-13	Eliminate existing deteriorated acoustical material and replace for greater sound reduction.	5957	SF	6.00	1.20	\$42,890
		JR-5010	Interior Shell	Doors	Painting		Paint door frames.	For appearance and function.	12	EA	35.00	1.20	\$504
		JR-5350	Interior Shell	Floors	Carpet	151	Replace carpet. 32' x 29'	For appearance and function.	928	SF	2.56	1.10	\$2,613
		JR-5400	Interior Shell	Floors	Vinyl	Cafeteria	9x9 tile lifting, esp. at conc. joints. Replace Tile Floor May contain asbestos??	Safety issue. For appearance and function.	4300	SF	2.00	1.30	\$11,180
		JR-5620	Interior Shell	Floors	Ceramic	Pool	Replace tile at perimeter of pool. 254 LF x 2'	Safety issue. Code issue.	508	SF	20.00	1.20	\$12,192
		JR-5670	Interior Shell	Floors	Carpet	Teacher Office	Replace VC tile. 27' x 14'	For appearance and function.	378	SF	1.90	1.10	\$790

<u>School</u>	<u>Priority</u>	<u>ProjID</u>	<u>System</u>	<u>SubSystem</u>	<u>Sub-Sub-Sys.</u>	<u>Room</u>	<u>Description</u>	<u>Explanation</u>	<u>Units</u>	<u>Measure</u>	<u>Unit Cost</u>	<u>X</u>	<u>Est.Cost</u>	
		JR-5310	Interior Shell	Specialties	Cabinetry	145	Replace casework. 70' base		70	LF	216.00	1.20	\$18,144	
		JR-5530	Interior Shell	Specialties	Fixed Furniture	Dry Storage	Replace all wood shelving. 40' shelving X 8' high X 3' deep (4 high)	For appearance and function.	480	SF	8.25	1.20	\$4,752	
		JR-5540	Interior Shell	Specialties	Bathroom Stalls	Girls Restroom	Replace eight(8) stalls.	ADA requirement. Code issue.	8	STALL	750.00	1.20	\$7,200	
		JR-5040	Interior Shell	Walls & Partitions	Painting	101 Store Room	Paint store room.	For appearance and function.	560	SF	0.95	1.10	\$585	
		JR-5210	Interior Shell	Walls & Partitions	Painting	138	Paint walls. (972 sf)	For appearance and function.	972	SF	0.95	1.10	\$1,016	
		JR-5550	Interior Shell	Walls & Partitions	Ceramic	Gym	Some broken and missing tile replacement. apx 50 sf of 4 1/4" x 8 1/2" yellow tiles	For appearance and function.	50	SF	15.00	1.10	\$825	
		JR-9020	Major Project					All sub-projects should be done at the same time.	New lighting and acoustical ceiling treatment in pool area.	1	EA	8,880.00	1.00	\$8,880
		JR-6050	Mechanical	HVAC		Boiler Room	M-05 Install new gas/oil burner on second boiler.	Existing steam boilers are reported to be in good operating condition. One boiler has a new burner (approximately four years old) and one boiler has the original burner. (See Photo #39) Recommendation: Install new gas/oil burner on the second boiler to improve reliability and efficiency.	1	EA	35,000.00	1.00	\$35,000	
		JR-6030	Mechanical	HVAC	Terminal Units	General	M-07 Install new unit ventilators and steam-to-water converter.	There are approximately 12 unit ventilators serving rooms in various parts of the building. While these units are still functional, they are at or past their life expectancy and will require more maintenance as time goes on. (See Photo #54) Recommendation: Replace existing steam unit ventilators with new hydronic unit ventilators. Provide steam to water converter and pipe new hydronic supply and return piping to units for better temperature control and freeze protection (with glycol in system).	1	LS	192,500.00	1.10	\$211,750	
		JR-6110	Mechanical	HVAC		General	M-08 Install new direct digital temperature control system.	The existing pneumatic temperature control system provides basic control functions but lacks accuracy and automation benefits available in modern digital control systems. Spare parts and pneumatic expertise are becoming obsolete in the computer-bases systems now utilized in public buildings. (See Photo #46) Recommendation: Include installation of a direct digital control system with any major building mechanical system upgrade.	155000	SF	1.80	1.00	\$279,000	
		JR-7070	Statutory	Kitchen		Kitchen	Remodel Kitchen.		1	LS	310,000.00	1.10	\$341,000	
											Subtotal for Priority 2 : Jr. High		\$1,145,627	

Priority 3 : Jr. High

		JR-2070	Electrical	Lighting	Fixtures	Maintenance Areas	E-04 Fluorescent lighting in maintenance areas.	Existing electrical area and maintenance areas have incandescent light fixtures. Recommendation: Upgrade incandescent fixture to new energy-efficient T-8 fluorescent light fixtures.	30	EA	200.00	1.00	\$6,000
		JR-5020	Interior Shell	Floors	Vinyl	101	Replace VC tile. 28' x 35'	For appearance and function.	980	SF	1.90	1.10	\$2,048
		JR-5050	Interior Shell	Floors	Vinyl	102	Replace VC tile. 28' x 35'	For appearance and function.	980	SF	1.90	1.10	\$2,048
		JR-5070	Interior Shell	Floors	Vinyl	103	Replace VC tile. 28' x 35' = 980 SF	For appearance and function.	980	SF	1.90	1.10	\$2,048
		JR-5090	Interior Shell	Floors	Vinyl	104	Replace VC tile. 28' x 35' = 980 SF	For appearance and function.	980	SF	1.90	1.10	\$2,048

<u>School</u>	<u>Priority</u>	<u>ProjID</u>	<u>System</u>	<u>SubSystem</u>	<u>Sub-Sub-Sys.</u>	<u>Room</u>	<u>Description</u>	<u>Explanation</u>	<u>Units</u>	<u>Measure</u>	<u>Unit Cost</u>	<u>X</u>	<u>Est.Cost</u>
		JR-5110	Interior Shell	Floors	Vinyl	106	Replace VC tile. 27' x 28'	For appearance and function.	750	SF	1.90	1.10	\$1,568
		JR-5140	Interior Shell	Floors	Carpet	107	Replace carpet. 41' x 27'	For appearance and function.	1107	SF	2.56	1.10	\$3,117
		JR-5150	Interior Shell	Floors	Vinyl	108	Replace VC tile. 28' x 35' = 980 SF	For appearance and function.	980	SF	1.90	1.10	\$2,048
		JR-5170	Interior Shell	Floors	Vinyl	109	Replace VC tile. 28' x 35' = 980 SF	For appearance and function.	980	SF	1.90	1.10	\$2,048
		JR-5190	Interior Shell	Floors	Carpet	130	Replace carpet. 27' x 27'	For appearance and function.	729	SF	2.56	1.10	\$2,053
		JR-5200	Interior Shell	Floors	Carpet	137	Replace carpet. 27' x 27'	For appearance and function.	729	SF	2.56	1.10	\$2,053
		JR-5220	Interior Shell	Floors	Carpet	138	Replace carpet. 28' x 27'	For appearance and function.	756	SF	2.56	1.10	\$2,129
		JR-5250	Interior Shell	Floors	Carpet	141	Replace VC tile with carpet. 41' x 27'	For appearance and function.	1107	SF	1.90	1.10	\$2,314
		JR-5260	Interior Shell	Floors	Carpet	141	Replace carpet. 41' x 27'	For appearance and function.	1107	SF	2.56	1.10	\$3,117
		JR-5270	Interior Shell	Floors	Carpet	142	Replace carpet. 41' x 27'	For appearance and function.	1107	SF	2.56	1.10	\$3,117
		JR-5290	Interior Shell	Floors	Vinyl	143	Replace VC tile. 41' x 27'	For appearance and function.	1107	SF	1.90	1.10	\$2,314
		JR-5300	Interior Shell	Floors	Carpet	145	Replace VC tile. 27' x 56'	For appearance and function.	1512	SF	1.90	1.10	\$3,160
		JR-5330	Interior Shell	Floors	Carpet	146 Office	Replace carpet. 7' x 15'	For appearance and function.	105	SF	2.56	1.10	\$296
		JR-5360	Interior Shell	Floors	Vinyl	153	Replace VC tile. 42' x 27'	For appearance and function.	1134	SF	1.90	1.10	\$2,370
		JR-5390	Interior Shell	Floors	Vinyl	AV Office	Replace VC tile. 12' x 17'	For appearance and function.	204	SF	1.90	1.10	\$426
		JR-5630	Interior Shell	Floors	Carpet	Resource Center	Replace VC tile and carpet. 25' x 27'	For appearance and function.	675	SF	2.56	1.10	\$1,901
		JR-5680	Interior Shell	Floors	Vinyl	Teacher's Lounge	Remove and replace floor tile. 22' x 29'	For appearance and function.	638	SF	1.90	1.10	\$1,333
		JR-5700	Interior Shell	Floors	Vinyl	Tech Office next to 106	Replace VC tile. 27' x 13'	For appearance and function.	351	SF	1.90	1.10	\$734
		JR-5030	Interior Shell	Specialties	Cabinetry	101	Base cabinets. 23' + 32' = 55 LF.	For appearance and function.	55	LF	216.00	1.00	\$11,880
		JR-5060	Interior Shell	Specialties	Cabinetry	102	Base cabinets. 23' + 32' = 55 LF.	For appearance and function.	55	LF	216.00	1.00	\$11,880
		JR-5080	Interior Shell	Specialties	Cabinetry	103 Classroom	Base cabinets. Replace 13 LF. 6' high x 2' shelving x(2)	For appearance and function.	13	LF	225.00	1.10	\$3,218
		JR-5100	Interior Shell	Specialties	Cabinetry	104 Classroom	Replace base cabinets. 32' + 23' = 55 LF	For appearance and function.	55	LF	216.00	1.00	\$11,880
		JR-5120	Interior Shell	Specialties	Cabinetry	106	Base cabinet. Replace 18 LF.	For appearance and function.	18	LF	216.00	1.00	\$3,888
		JR-5130	Interior Shell	Specialties	Cabinetry	106	New upper and lower casework. (10')	For appearance and function.	10	LF	316.00	1.10	\$3,476
		JR-5160	Interior Shell	Specialties	Cabinetry	108 Classroom	Replace base cabinets. 32' + 23' = 55 LF	For appearance and function.	55	LF	216.00	1.00	\$11,880
		JR-5180	Interior Shell	Specialties	Cabinetry	109 Classroom	Base cabinets. Replace 13 LF. 6' high x 2' shelving x(2)	For appearance and function.	13	LF	225.00	1.10	\$3,218
		JR-5230	Interior Shell	Specialties	Cabinetry	139	Base cabinet. Replace.	For appearance and function.	12	LF	216.00	1.00	\$2,592
		JR-5240	Interior Shell	Specialties	Cabinetry	141	Replace casework. 32'+16'+10' x 7' high	For appearance and function.	58	LF	238.00	1.10	\$15,184
		JR-5280	Interior Shell	Specialties	Cabinetry	142	Replace casework. 32'+16'+10' x 7' high	For appearance and function.	58	LF	238.00	1.10	\$15,184
		JR-5320	Interior Shell	Specialties	Cabinetry	146	Replace casework. 70' base	For appearance and function.	70	LF	216.00	1.20	\$18,144
		JR-5370	Interior Shell	Specialties	Cabinetry	156	Replace base cabinet. (7')	For appearance and function.	7	LF	216.00	1.00	\$1,512
		JR-5380	Interior Shell	Specialties	Cabinetry	AV Office	New cabinets. (8')	For appearance and function.	8	LF	216.00	1.00	\$1,728
		JR-5600	Interior Shell	Specialties	Cabinetry	Library	Check-out Desk - Replace 18'.	For appearance and function.	18	LF	300.00	1.20	\$6,480
		JR-5640	Interior Shell	Specialties	Cabinetry	Resource Center	Replace cabinets. 24' (base)	For appearance and function.	24	LF	216.00	1.00	\$5,184
		JR-5660	Interior Shell	Specialties	Cabinetry	Teacher Office	Replace base cabinet. (12')	For appearance and function.	12	LF	216.00	1.00	\$2,592

<u>School</u>	<u>Priority</u>	<u>ProjID</u>	<u>System</u>	<u>SubSystem</u>	<u>Sub-Sub-Sys.</u>	<u>Room</u>	<u>Description</u>	<u>Explanation</u>	<u>Units</u>	<u>Measure</u>	<u>Unit Cost</u>	<u>X</u>	<u>Est.Cost</u>
		JR-5690	Interior Shell	Specialties	Cabinetry	Teacher's Lounge	Upper cabinet.	For appearance and function.	4	LF	216.00	1.00	\$864
		JR-5650	Interior Shell	Walls & Partitions	Ceramic	Stage/Exercise Room	Replace wall tile. (1,600 sf)	For appearance and function.	1600	SF	9.00	1.10	\$15,840
		JR-6020	Mechanical	HVAC	Fans	Kitchens	M-02 Replace existing cooking hood with new Class 1 Hood, with make-up air system and fire-suppression equipment.	The existing kitchen cooling hood and exhaust system is not Code compliant. Cooking hood is required to be Class 1 hood with grease baffles and a fire suppression system. Gas line requires a solenoid valve and electrical equipment under hood requires shunt-trip breakers. Direct-fired make-up air system required to provide tempered exhaust make-up air. (Refer to Photo #47) Recommendation: Install new kitchen exhaust system including Class 1 hood with fire suppression and make-up air unit. All equipment to be NSF approved.	1	EA	35,000.00	1.10	\$38,500
		JR-6010	Mechanical	HVAC	Roof-Top Units	Teacher's Lounge and Music 151	M-13 Provide dedicated ventilation system with A.C.	Ventilation system for Teachers Lounge consists of a retro-fitted duct to take some air from the Music #151 unit ventilator system. System likely does not provide adequate ventilation for both spaces. (See Photo #71) Recommendation: Provide a new rooftop HVAC unit to serve the Teacher's Lounge and return the Music Room unit to the original design serving only the Music Room.	1	EA	7,500.00	1.10	\$8,250
		JR-6120	Mechanical	HVAC	Fans	Wood Shop	M-12 Revise wood shop dust exhaust system to return air to room.	Existing Wood Shop dust collection exhausts the clean air outside the building. This type of operation is inefficient and can lead to building pressurization problems. Recommendation: Modify existing dust collection system to return clean filtered air to the Wood Shop.	1	EA	12,000.00	1.10	\$13,200
		JR-6100	Mechanical	Plumbing	Fixtures	Toilets, Locker Room	M-10 Install new plumbing trim on existing fixtures.	Much of the plumbing trim in toilets and locker rooms is in need of replacement for functional and aesthetic reasons. Some of the original plumbing fixtures have been removed and not replaced. Bradley wash fountains in locker rooms are in poor shape. (See Photos #51-3 and #59-60) Recommendation: Replace functionally defective equipment first, then aesthetically defective trim as applicable areas are remodeled. Replace removed fixtures to provide adequate fixture counts in all bathrooms. Replace wash fountains in locker rooms.	1	LOT	69,000.00	1.00	\$69,000
		JR-7050	Statutory	Building Safety	Stairs & Ladders	Boiler Room	Ship's ladder to door is too steep.	Safety issue. Code issue.	16	Riser	154.00	1.20	\$2,957
Subtotal for Priority 3 : Jr. High													\$328,821
Subtotal for Jr. High													\$3,419,365

Personal Identification



Personal Identification



Adam McLane

can not believe that I have finally made it this far. It feels like yesterday that I was starting my first day of 271 with Vince Hatlen and thinking to myself, "I am never going to make it all the way through this". Sure enough with hard work and determination I made it through but not with out the help and encouragement of a few people.

Kari Giles, my wonderful fiancée who has been by my side the entire way pushing me to do the best that I can, I would not have wanted to do it without you. You are an amazing woman because you understood what this meant to me and how much time and effort I would need to put forth to complete it. I know that we did not see each other too often during the final weeks of my 5th year but you were right there beside me encouraging me to get it done so we could graduate and start our lives together in Blaine.

My parents, whom I truly could not have done it without your support of my every decision. Both of you were there offering encouragement along the way. Everyday I understand a little more all the ways you sacrifice for my happiness and wellbeing. I could only hope to be as great a person as either of you. Thank you for teaching me the value of hard work, it is a lesson that has placed me in the position I am in today.

Ron Ramsay, my primary thesis critic, you have been there through-out my entire college education. I first met you when I was a senior in high school on a college visit to NDSU and you were the faculty member they had me speak with about the architecture program. You have been there through all 5 years of my education teaching me many valuable lessons and not all of them were architecture related. You always pushed me to go that extra mile or look at something from a different perspective and that is something that will stay with me as I venture into the real world. Thank You Ron