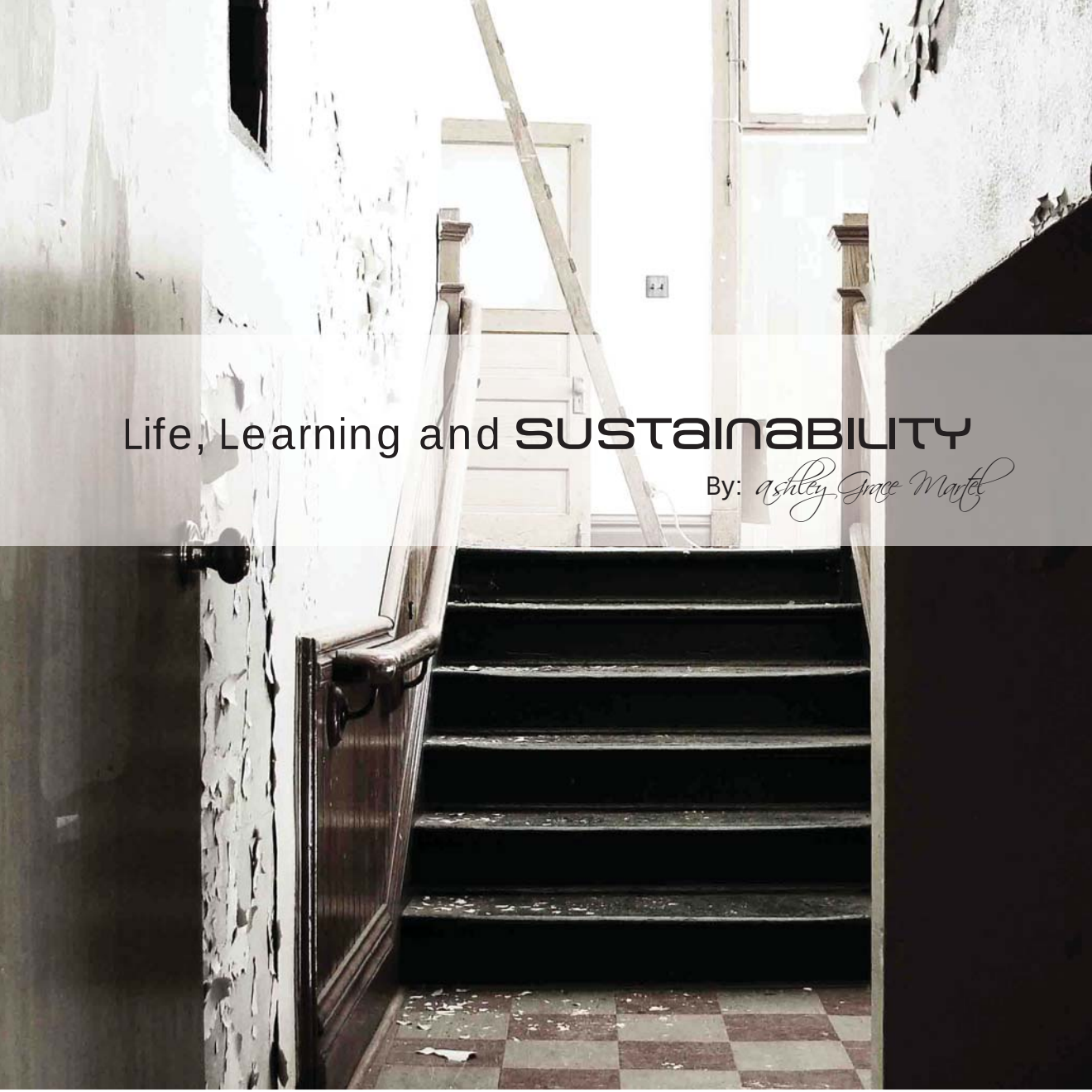

Life, Learning and SUSTAINABILITY

By: Ashley Grace Martel

LIFE, LEARNING AND SUSTAINABILITY

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

By

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

Primary Thesis Advisor

Thesis Committee Chair 5/4/12

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Table of CONTENTS.

thesis abstract

Thesis abstract

The thesis Life, Learning, and Sustainablility examines the way in which architects can instill a sense of sentiment towards sustainability in future generations. Architects deplete our resources, and therefore through creative use of their site architects can find more sustainable methods and strategies for building so that we may not have to be without our resources in the future. It is through memories and a sense of community that we impact generations to come and change the future. There is no time like the present to take architecture to the next level and help a world in need by preserving our most precious resources and that natural beauty of the world around us.

This thesis will consist of a project under the typology of a 55,000 square foot elementary school in northern South Dakota. This project will specifically look at the rural farming communities of Hosmer, Roscoe, and Bowdle. Communities with a rich German-Russian heritage and weather conditions that can range from drought to blizzards.

Successful completion of this project will result in a model for how to preserve small communities that become desolate especially when faced with school mergers; through use of memory it will instill a renewed sense of community and sustainability in future generations and cause architects to rethink the design of a school.

keywords

future
community engagement
memory
natural resources
need
sentiment
resourceful
school
site
sustainability
school

statement of INTENT

problem Statement

In what way can architects instill a sense of sentiment towards sustainability in future generations?

Project TYPOLOGY

The typology chosen for this thesis is a school building.

CLAIM under Investigation

A design that successfully and economically utilizes a site's resources and engages a community can evoke a sense of sustainability for generations.

Supporting PREMISES

As architects we contribute to the depletion of our resources.

When people interact with spaces, memories are instilled in them. "When autobiographical memories are evoked, there is reduced analysis of product information" (Baumgartner, Sujan, & Bettman, 1992). Positive memories of a space can comfort us and influence our future decisions.

Our communities have resources, resources which many other countries live without. With those resources we can make advances that will affect future generations.

Supporting PREMISES

A site has many resources that can be overlooked, that when used to their fullest potential can reduce the depletion of our non-renewable resources.

Theoretical/Unifying IDEA

Through creative use of its site, this thesis will reduce the depletion of our non-renewable resources in a way that will engage the community and instill a sense of sustainability in generations to come.

Project JUSTIFICATION

There is no time like the present to take architecture to the next level and help this world in need. Architects can help those in need through sustainable designs that resist depleting our most precious resources and preserve that natural beauty of the world around us. Through design ingenuity and engaging the community and its sense of connection, we can instill a sense of sustainability in generations to come. As a result of the latter, they too can have the best of both worlds, technology and nature.

statement of INTENT

the *Proposal*

the *Narrative*

This thesis examines the way in which architects can instill a sense of sentiment towards sustainability in future generations. A design that successfully and economically utilizes a site's resources and engages a community can evoke this sense of sustainability. The architecture profession contributes to the depletion of our resources, resources other countries are without and we could someday also be without if we don't start putting sustainable systems into action. Sustainable strategies only become prevalent if we truly start to realize their importance and connect with them. When people interact with spaces, memories are instilled in their minds and the spaces. Positive memories of a space can comfort us and influence our future decisions. Through creative use of its site this thesis will reduce the depletion of our non-srenewable resources in a way that will engage the community and instill a sense of connection to sustainability in generations to come. There is no time like the present to take architecture to the next level and help this world in need. Architects can help those in need through sustainable designs that resist depleting our most precious resources and preserve that natural beauty of the world around us. Through design ingenuity and engaging the community and its sense of connection, we can instill as sense of sustainability in generations to come. As a result of the latter, they too can have the best of the worlds of technology and nature.

In today's society and economy we need to, if we haven't already, make the best out of our situation. Every profession has the potential to make a difference in the world and make the best of the situation. Architects can promote our economy by creating jobs. How can we create jobs? Through new innovative solutions and products, jobs will be created. The need for bricks creates jobs that transform the mud and materials into those bricks we use. As architects we also have a unique opportunity that I believe most of the time gets overlooked. Architects can make statements in our communities. How can we use this to our advantage? What does the future need? Where can architecture continue to take us? Do we need just another unique form or should there b222e more to it? Why are some things important to society and get implemented while others are not? What causes a populations' preferences? Designers have the ability to make pleasing, highly functional spaces people will

innately prefer if they meet their needs and desires. Even on a simpler level, sometimes we prefer things just based on tradition and what we are used to. We create connections with products and spaces.They become what we are used to and they trigger emotions and memories.

As the architect of this project, a desire is triggered to make the most of what I am given. As the old saying goes "when life gives you lemons, make lemonade." Throughout my life I have grown up knowing the importance of making the most of what you are given. I grew up in a small house that my family worked gradually to improve as time went on and when the means were available. From this experience I have found annoyance is seeing how society seems to expect master bedrooms, master baths, and granite countertops when individuals are just starting out, sacrificing in the now rather than waiting and working for the future. But if one considers the root of all this, one realizes that this is what the individual grew up with and is what the individual is accustomed to. As a human race we are more inclined to the things we grow up with. We will tend to use the same dish soap our parents bought when we were growing up. We will find sentiment in the style of architecture our memories were created in. Do you think any of the historical buildings we have now were intended to evoke the sentiment they currently do? Sentiment can do powerful things and architecture can create sentiment.

"make the most of what you are given."

What can sentiment do for our current world situation? One can find statistics everywhere stating that much of our world is struggling in want. We are depleting our non-renewable resources and will someday be without them. We are even using up our fresh water faster than it can replenish itself, leaving many communities worldwide without enough water to drink. Is that not something that makes you want to help in any way you can? Even if it does not evoke that desire, one has to also realize that could one day be us, the ones with the resource we need and even want for the time being. If we don't change our ways we have to inevitably realize that will be us. So why not start here? Why not start conserving water and non-renewable resources here and now? How can we get people not wait till it is too late? Subtly? Through architecture?

If we start creating aesthetically engaging and economically feasible architecture in communities that lack the sustainable mindset and have them function efficiently and effectively people may start to change

the community's view of sustainable methods of building. The methods that conserve power, water, resources and the like. If these sustainable facilities bring people in and better the communities in the ways sustainable systems and considerate architecture can, this architecture may leave a mark on people's lives. The inhabitants will form memories there and maybe even become accustomed to it and form a connection with it. While seeing the value in sustainable systems they may just actually enjoy the space and therefore become educated in sustainablity, have the structure leave a mark or memory, and create an inclination towards sustainability in the future. If sustainability can create this people may not be as inclined to go without sustainable systems and it could become what they expect, rather than just a master bedroom with ensuite bath. Couldn't that create a better future?

My thesis seeks to become an example of this subtle, hopefully generation-changing shift to sustainability by engaging multiple communities that lack implementation of sustainability by especially focusing on those most open to new ideas, those people that are our future, students. The students of the Hosmer, Bowdle, and Roscoe schools are from towns that are diminishing with time. With ten or so students per grade and with merging of two of the schools having already taken place, it is only a matter of time with the third. When one school is forced to move to another town's school, it increases the depletion of their previous school's town. Diminishing towns is not something that is desired, and leaves abandoned buildings and materials and displaced families. People care about their roots and school displacement is hard pyscologically on the students. Therefore this project will create a school that is centrally located in order to not completely displace any of the students, for in a rural setting people are used to traveling a distance to get to their school or other destinations. This will then aid in preserving each families' connection to their hometown and decrease the depletion due to possible migration with a new school district in a separate town. By then using the site to its fullest a passive and sustainable building will be created by reusing what would be and are abandoned school buildings and preserving a sense of connection and history in the new school.

"create a better future..."

We cannot be certain of the success of anything; the world is full of surprises. Nonetheless, we can always try. I hope my thesis will be an example of a way in which we as architects can make a difference, and even if not successful, maybe someone will come up with a solution to the situation at hand that will stick and take our world into a future that is desired. Through this thesis you will experience my approach and solution to the problem of our diminishing resources and need for sustainability. It is an approach that looks to architects to evoke a sense of sustainability in future generations through a design that successfully and economically utilizes a site's resources and engages a community.

CLIENT Description

user

The youth & teachers of the Hosmer, Roscoe, & Bowdle School Districts and surrounding communities

owner

The South Dakota Department of Education.

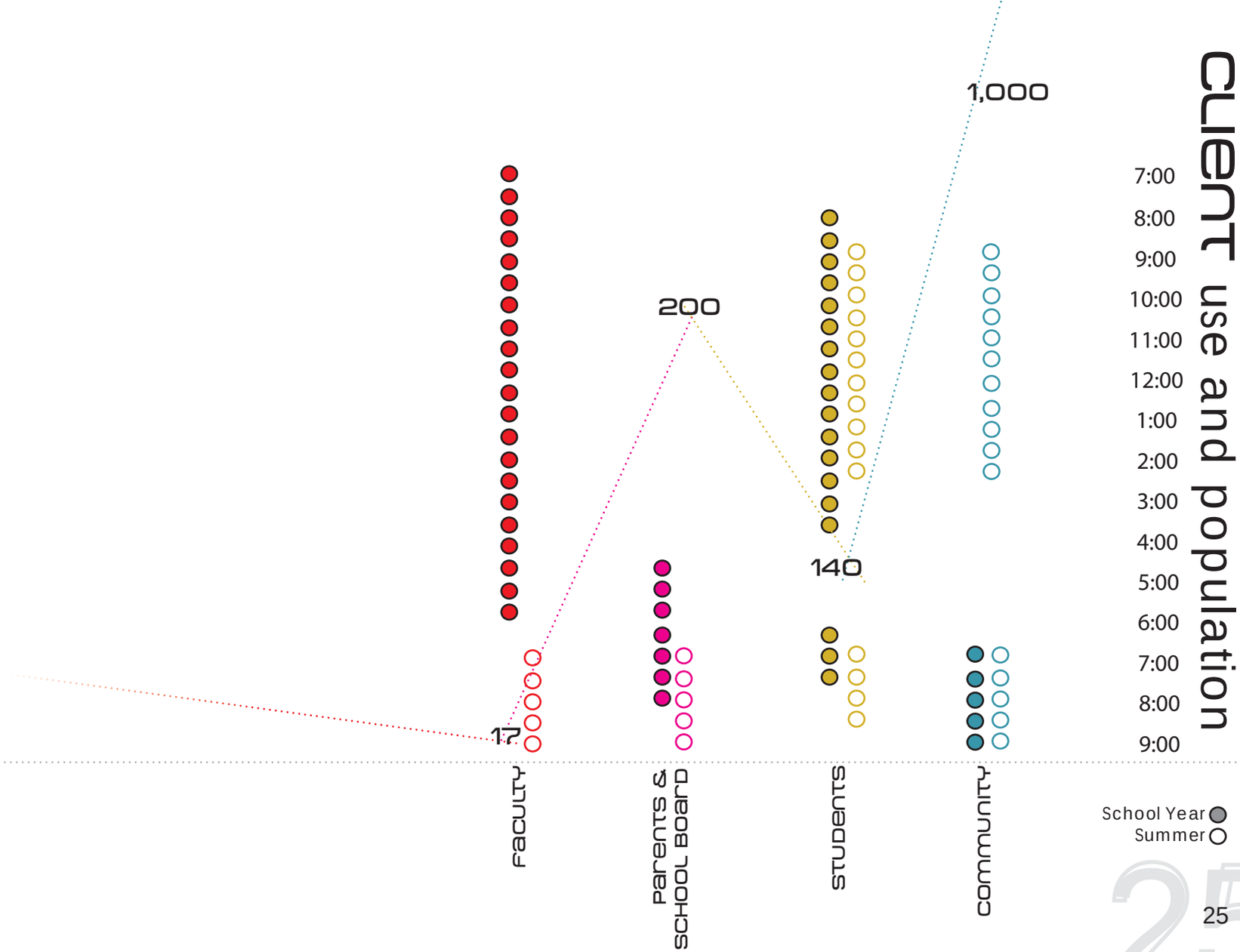
DYNAMIC

This user/client dynamic comes with the unique challenge of the facility implemented by the state and used by the youth and residents of communities. The driving forces for this project are putting the happiness and education of the children first and using sustainable strategies to their fullest while still gaining the full support of state.

ISSUES

Due to farming in and around the towns, most students will take the bus to class while teachers will drive daily and community members will drive to activities. The clients are familar with concepts such as windbreaks, but they are not as informed of sustainable technologies in buildings as other communities are. Their focus is more on efficiency and cost. Accessibility for those with disabilities will be provided.

CLIENT use and population



Faculty

Faculty will be teachers that have previously had classes consisting of approximately 10 students. They will need break spaces, offices/ desks, storage, and classrooms.

Students

The students are from preschool age to sixth grade and live in the small farming communities that would normally be displaced from their existing schools and forced to merge with a surrounding town's school.

School Board

The parents and school board members are more than likely farmers who will use the school during after-school activities, meetings, and parent-teacher conferences.

Parents

The community consists of the residents of the rural farming towns of Hosmer, Roscoe, and Bowdle that are gradually disappearing they will use the site for activities outside of school hours.

Community

classrooms

Through psychologically related research, this will become a space that invites children and promotes interaction. This interaction can facilitate an understanding of sustainable strategies while promoting a positive and enjoyable childhood experience.

preschool & kindergarten

School is a time of education. These classrooms, with appropriate break-out spaces, passive strategies, and material reuse, will not only facilitate a comforting environment for knowledge growth but also social growth, character development and livelihood of the users by improving their health and well-being.

first through sixth grade

office areas

The office will promote efficiency through strategic spatial arrangements, storage, and multi-use spaces. With the needs of the client in the forefront, the spaces will facilitate personal comfort through passive strategies and the needs of privacy, human interaction with break spaces, and security through careful execution of the design and layout of these spaces.

break room, front desk, file storage, principal office, sick room, ISS space, librarian office.

storage

Appropriate storage space for the daily uses of all the clients, such as but not limited to coat rooms, project materials, and files. Through effective placement of these in this project there will be a reduction of excess, an increase of efficiency, and creation of distraction-free spaces that facilitate the students' learning experience and the productivity of the users.

Coat rooms, paper storage, library storage, science equipment, janitorial

assembly

Through creative design elements and careful structure of spaces such as the gymnasium, locker rooms, cafeteria, and kitchen, these spaces will promote activity, socialization, dining, and create ties amongst the community. By allowing these spaces to function for not only their needs but also for other events and activities the community may need, the use and efficency of these spaces will increase, they will address the community's needs, and promote the community to connect with this facility.

library, cafeteria, lunch line, kitchen, gymnasium, locker rooms & bathrooms, physical education offices & storage

TECHNOLOGY

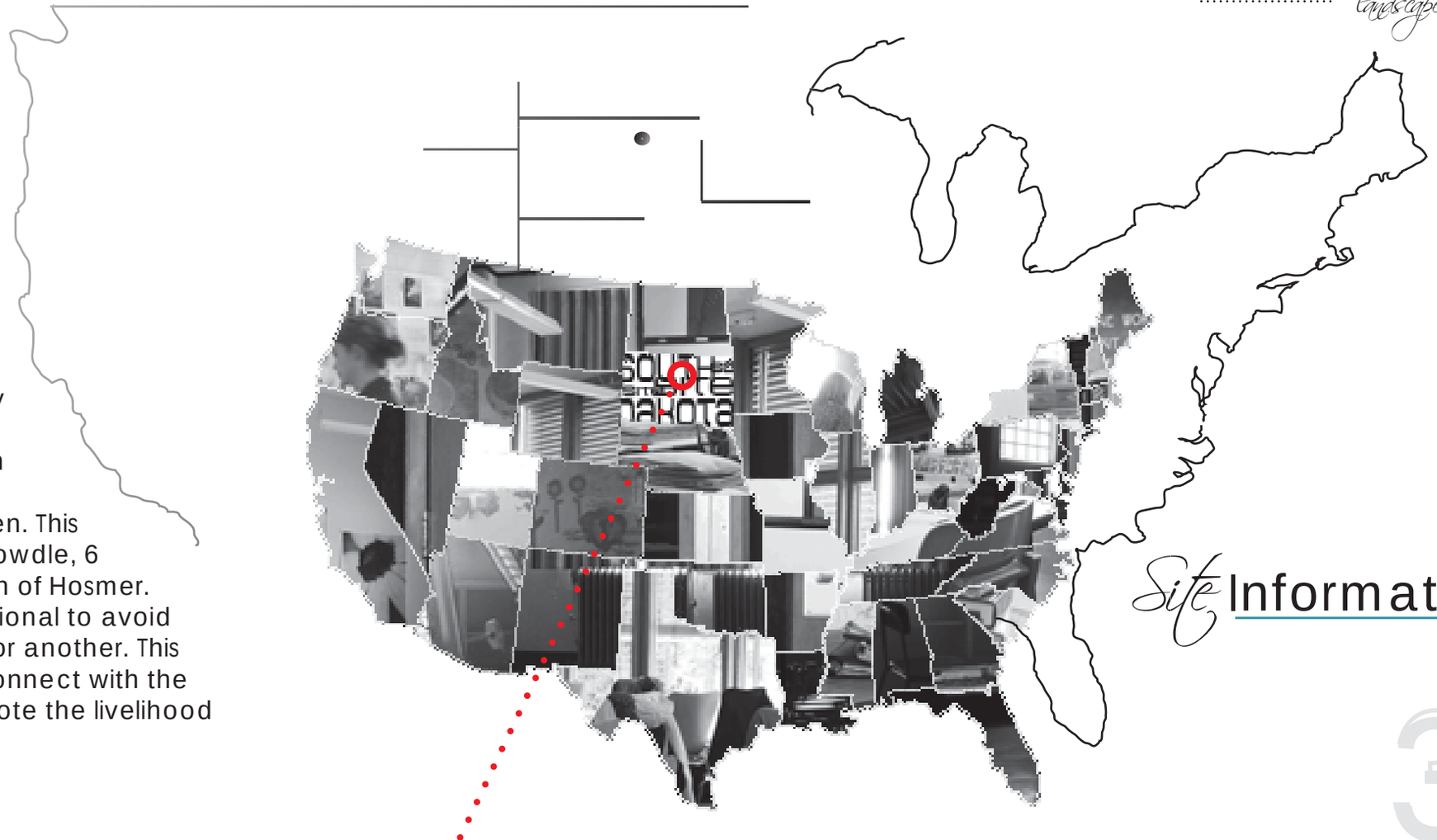
Technology and the lack of technology will be a crucial element in flux with this project. This project will focus on the promotion of technological advancements in non-traditional methods. This project will consider what the site can give and what technology can create opportunity for. (envelope, ventilation, passive strategies, technical equipment, water conservation in bathroom design). That balance and flux will also be present through the education of the students with both a quiet, serene library and easliy accessed computer lab that allow access to all technology has to offer the world of education. Both of the previous will be designed to promote education and will always keep the small town communities' values in mind.

Computer room, Library, Mechanical room, Bathrooms

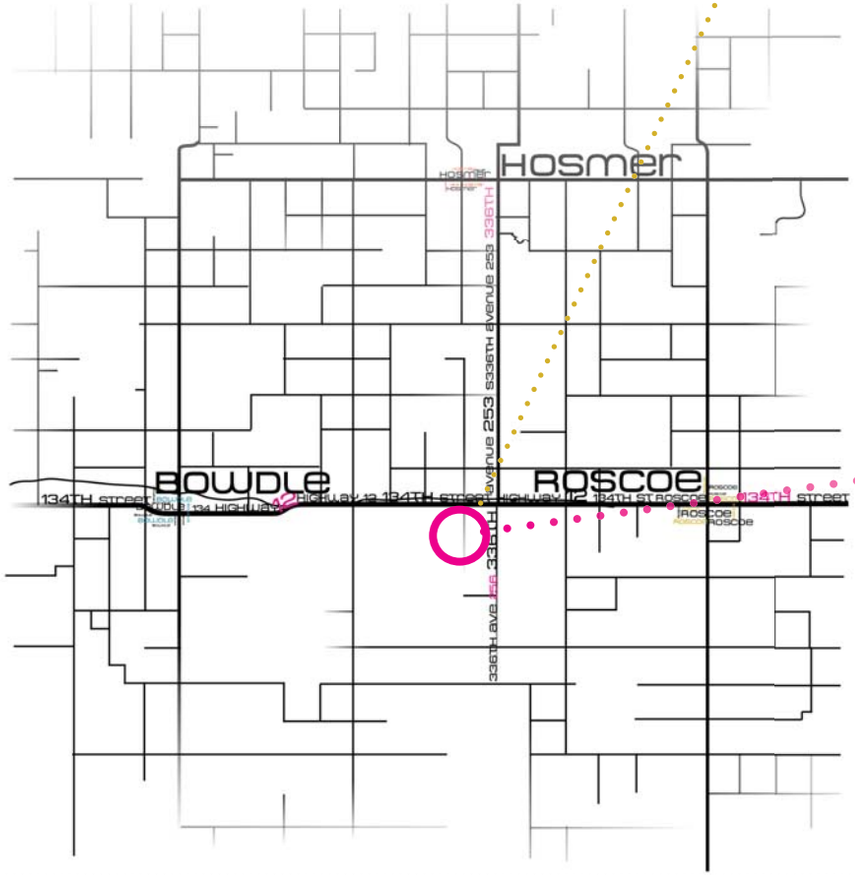
This site is ideal because, as previously mentioned, this region doesn't have a sense of sustainable design in buildings. As communities with dying populations, their schools are being forced to merge. Through mergers, schools become abandoned and students are forced to leave schools that they have grown sentimental toward and therefore may feel decentralized. The unused schools will provide raw materials for the new school, which are in reasonable distance for sustainability and can be used to create moments within the school that will facilitate a connection between the past and present for the students. This particular site is located at the intersection of 336th Ave and Highway 12 in South Dakota with highway 12 being a major means of transportation between these communities and their shopping destination town of Aberdeen. This intersection is exactly 9 miles east of Bowdle, 6 miles west of Roscoe, and 9 miles south of Hosmer. The central location of this site is intentional to avoid any of preference towards one town or another. This location will avoid any substanial disconnect with the students to their hometown and promote the livelihood of all the towns , rather than just one.

A flat prairie terrain livestock, wheat, corn & soybean farmland with scattered trees and slues

landscape



Site Information



Site

There is substantial square feet to work with in this plot of land. But this site does present the challenges of building in proximity to a railroad track and major highway. From these challenges, creative design solutions can be realized, implemented; and then become a resource for similar future projects.

Project EMPHASIS

UNIFYING IDEA

The focus of this project is how architects can creatively use a site to reduce the depletion of our non-renewable resources in a way that will engage the community and instill a sense of sustainability in generations to come.

FOCUS

This thesis pertains to opportunities architects have to instill a connection with sustainability in occupants. The driving focus then grows out of the concept of making the most out of what you are given. This architectural thesis can articulate this through the use of its site. By using existing resources or those that have already served a purpose and through careful spatial arrangement on the site, the design of a school can dramatically be changed. This can then allow architects to decrease their use of non-renewable resources and promote sustainability.

CONCLUSION

Through "making the most of what we are given" in an economic and effective way, we can engage these communities with little previous precedence towards sustainability and allow it to serve as an example that the users will create connections with and therefore impact their future decisions.

Research DIRECTION

Research will be conducted through case studies of schools, discussions with residents, teachers, and students of the area, and other scholarly articles and text.

The focus of my research will be the theoretical premise/unifying idea. Further research will be conducted on the effects/results of school mergers, and schools themselves to gain a programmatic knowledge base and a knowledge of the effectiveness of past, present, and possible schools of the future. In-depth site analysis is instrumental to this project. Solar, wind, and climatic studies will be conducted. Inventory of existing resources will be taken. Ways of reusing existing resources in unconventional/innovative ways, passive strategies, space planning's psychological impact, and historical context will be researched.

Design METHODOLOGY

Mixed Method — Qualitative, Quantitative, Graphic, Digital & Conversational analysis

Concurrent Transformative Theory

This consists of simultaneous gathering of qualitative and quantitative data that is based on and emphasizes the theoretical premise/unifying idea. A theory in which constant integration, analysis and interpretation takes place on data obtained that is represented both graphically and through text.

This method will allow me to collect data qualitatively and quantitatively in the same format I innately go about thinking through a project. Therefore this strategy will enhance my design method and guide my thesis progression effectively and efficiently.

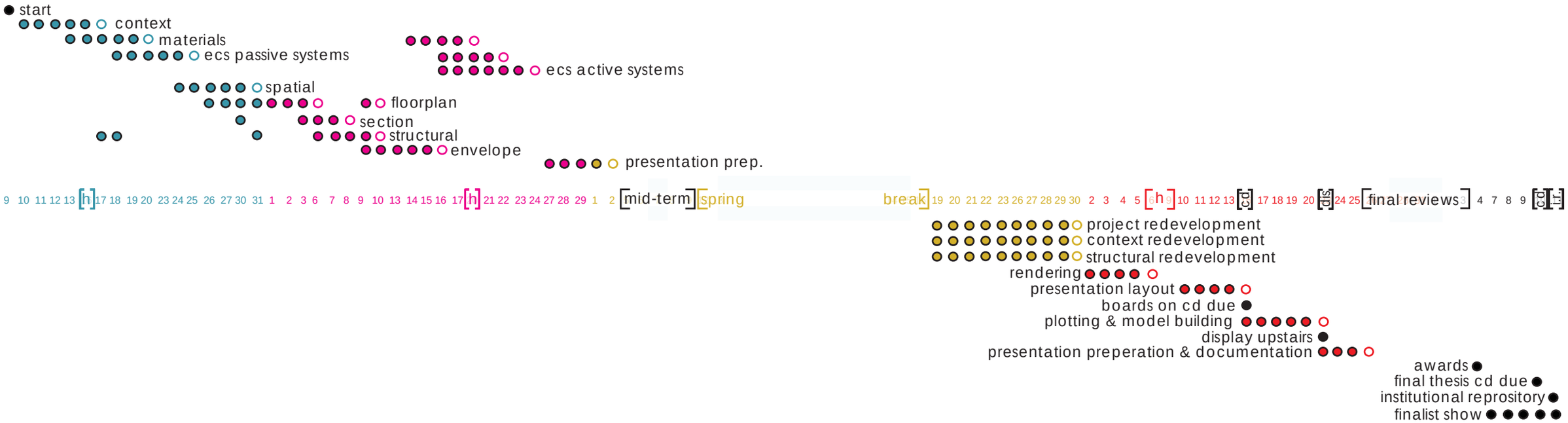
Qualitative — Descriptive/Character observation, interviews & research

Quantitative — Statistics instruments & data search

Plan for Proceeding

DOCUMENTATION Plan

All pertinent information will be compiled digitally. All websites and journal articles of research and inspiration will be bookmarked and then later compiled into a word file that will be saved both on my computer and online dropbox. All sketches scanned in or computer models progressively saved in new files when significant changes are about to occur will be saved similarly. All sketches will to the best of my ability be in my sketchbook but all others and important sketches will be scanned in on Fridays at noon if not before along with the bookmark documentation. Once properly analyzed, the information and progressive images not used in the final thesis book will be compiled into a folder that will be available with my digital submission.


start
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section
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display upstairs
presentation preperation & documentation
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final thesis cd due
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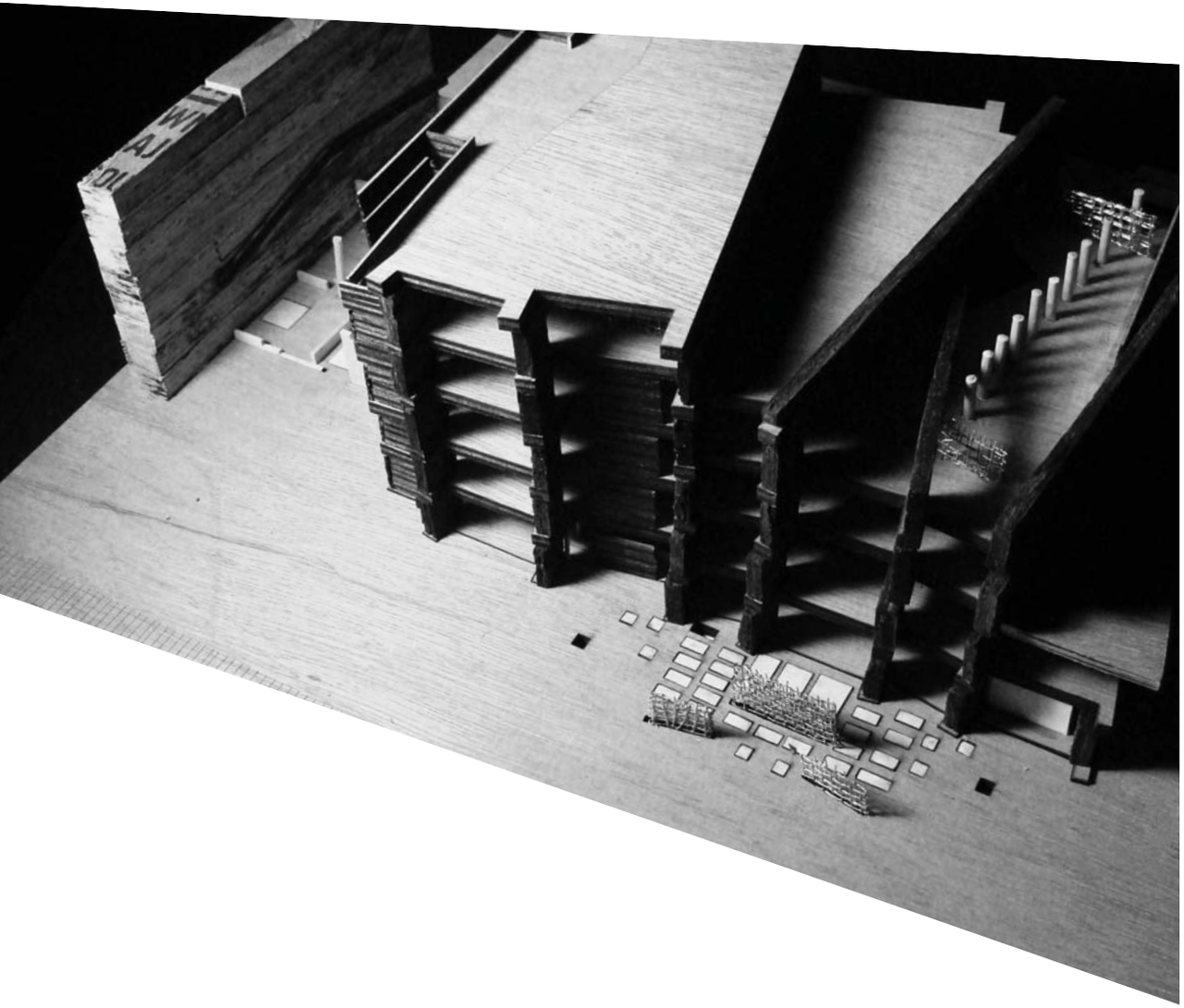


Tea House . Fargo, ND
& **Boat House** .
Minneapolis, MN
Joan Vorderbergen
Fall '*08*

Dance Academy . Fargo, ND
& **Dwelling** . Fargo, ND
Meghan Duda
Spring '*09*

Probstfield Visitor Center. Moorhead, MN
& **NDSU Downtown Library** . Fargo, ND
David Crutchfield
Fall '*09*

Shaker Barn . New Lebanon, NY
& **Chicago Apartments** . Chicago, IL
Ronald Ramsay
Spring '*10*

High Rise . San Francisco, CA
& **KKE Platonic Solid**
Bakr Aly Ahamd
Fall '*10*

Design Build Passive House Cabin .
Minnesota State Fair & Itasca, MN
Malini Srivastava
Spring '*11*

MXC Health Care Center . Urbank, MN
Cindy Urness
Fall '*11*

Studio **experience**

the *Research*

Education is everywhere, and is a process that never ends. The information absorption is not always conscious, but rather the knowledge gained will gradually present itself. Much growth and development takes place in our youth. In society it is also the time when formal education begins. Formal education usually takes place in architecture, more specifically in a schoolhouse. Memories and emotions reside in the attended schoolhouses. As stated in *Cathedral of Culture,* (1989) "the schoolhouse is synonymous with education and a reminder of an important time in our lives" (Cutler, 1989). But why is this time of education important in our lives? How has education become what it is today? How is the architecture itself pertinent in this situation? What can be learned from the school house and education connection?

"...important time in our lives"
(Cutler, 1989)

The schoolhouse has changed over time. All changes are rooted in the concept that "the schoolhouse was fundamental to the education of the young " (as cited in Cutler, 1989). Over time the once informal education became a systematic, well-organized enterprise. The one-room schoolhouse became a space consisting of self-contained classrooms. During this time a passion arose among community leaders to protect "nothing less than the future of American Society" (Cutler, 1989). But, despite such passion for education and the schoolhouse, education did take turns for the worse. Much of this decline presented itself in the poor maintenance, unpleasant air, and the general conditions of schools in the cities. Floor plans began to be simply duplicated and used time and again without careful, site specific investigation that should take place. But as a result of beliefs of those in power such as Horace Mann, Massachusetts Board of Education Secretary, who said "Schoolhouse design was closely connected to 'the love of study...proficiency, health, anatomical formation, and length of life,'" (Cutler, 1989), reform was a must. Many changes came about in the architecture of the school thereafter. One such design change was the H-shaped school which is explored in the case studies. Whether or not always successful, all these changes were made for "the future of American Society," (Cutler, 1989) the students.

Students are our future. Therefore a schoolhouse needs to be more than an icon. As stated by J. W. Wrightstone, "the classroom must truly stimulate and permit realization" (Cutler, 1989). Many

architectural school house strategies were implemented with this in mind: Daylighting became more prevalent; flexible and open spaces where considered, especially in kindergarten classrooms; the open class room and social efficiency where also promoted. Flexible furniture for classrooms, circulation, and places of play and study for small groups and individuals created a child-oriented school, and as Charles L. Spain states, "the aim of education is to enable each individual to develop to the fullest extent his individual powers..." (Cutler, 1989). All of which coincides with many psychological principles about our cognitive wellbeing and unconscious.

School is a time of growth and development where a person strives to grow into the best person possible. The areas of Gestalt psychology and the work of Carl Jung provide insight into development, the concept of self, and our psychological well-being. It is a known fact that everyone is different. Some are inclined to introversion and others to extroversion. Carl Jung believed it was through a balance of these inner personalities that one could better achieve the ideal self. Schools need to facilitate this balance in order to help the student reach their fullest potential. Jung was also responsible for investigating unconscious patterns. In Kobasa's text we see that these patterns (archetypes) tie us to our ancestors and affect reactions to the situations one is dealt. More directly, one's parents are a major influence on our unconscious (Kobasa, 2009c). Through knowledge of these ties one can create architecture that may take advantage of unconscious inclinations and therefore support our future. Additionally in Kobasa's text, we can see how gestalt psychology also looks at experiences but additionally studies the whole being greater than the sum of the parts and how individuals perceive the world. How one perceives the world is directly connected to feelings and experience. By altering experiences and feelings one's perception triggers memories. Much of one's psychological turmoil can be "attributable to the lack of recognizing and understanding one's feelings" (Kobasa, 2009a). Society also plays a role there. Society can numb emotions and according to Gestalt psychology "many people deny or lose parts of themselves when they are faced with the overwhelming task of coping in society" (Kobasa, 2009a). What are some causal events that would lead to having to cope with society?

Could changing one's school in a school merger cause a child to cope? A school has history that one grows attached to. The unconscious is influenced by history. A schoolhouse is an icon that encompasses a critical time of one's life. Could separation from this connection not then cause emotional distress and therefore influence one's decisions. According to a report on the socio-economic impacts of school consolidation involving the town of Kindred, ND, it was found that the "Vacated Community respondents believed participation in community organization has declined in the last ten years and the quality of life in their community declined after consolidation" (Sell, Leistritz, & Thompson, 1996).Community involvement has been central to and a strong suit of rural areas for generations. The Grange movement was a key element in rural community involvement. During this movement a community service organization was started in the rural areas called the Patrons of Husbandry. This organization was started to give farmers a chance to change, become informed, educated, and combat discouragement. They did this through fighting many unfair practices, especially those involving the railroad, by providing opportunities and community events in halls they built themselves. Building together places for activities can bring a sense of belonging critical to psychological well-being and create ties and emotional experiences. In the past and present, through extended hours and careful consideration to a school's program, schools have been places that educate and provide community events much the same as what the Patrons of Husbandry were trying to accomplish.

> "...They did not want to abandon a familiar educational place. Their schoolhouse was special, afterall. Not only was it nearby and well known. It was very important - a critical partner in the education of the young and the most tangible link between the child and society."
> (Cutler, 1989)

The Patrons of Husbandry built their facilities, facilities that brought communities together. How can we accomplish this today? How can we educate and better our communities. What about by preserving our resources?

We can preserve our resources by considering where chosen building materials originate; the amount of energy that was put into creating them and by looking toward the future to see what items in the building will be able to be reused. Why is this important, you may ask? According to a "1998 U.S. Environmental Protection Agency Report titled *Characterization of Building Related Construction and Demolition Debris* in the

United States it was estimated that 136 million tons of building related construction and demolition debris was generated in 1996"(as cited in Manuel, 2003). Today that figure is estimated to have increased to 150 million tons, as stated by William Turley, the Construction Materials Recycling Association's executive director, and that 150 million tons does not include "road, bridge, and airport construction and renovation" (as cited in Manuel, 2003). Construction and demolition accounts for an enormous amount of waste and with that waste goes many of our valuable resources, the resources used to create the items destroyed and in the creation of new items to replace the ones destroyed. What can designers do about this?

With the H-shaped school design for New York, the idea that a school building should be designed by professionals came about (Ford, 2007). Today, the one-room school houses built by just anyone no longer are used. Beyond that, how can the essence of design still be prominent today in today's economic environmental and social conditions? Materials can be used in construction that will allow a building's materials to be reused. What guidelines should we follow to implement this? Minimal numbers of types of materials, components, and connectors should be used, and materials that are easily recyclable with today's recycling practice should be used (Crowther, 2000). In construction, the materials should not be joined in a way that they are inseparable, such as with chemical connections, and materials should not be toxic or hazardous (Crowther, 2000). One thing to make things easier in deconstruction is to design so that the reusable materials are able to be easily accessed and they should be well documented (Crowther, 2000). Finally, think about the tools that will be used and keep them simple, try not to apply secondary finishes to materials, and make sure the materials are easily maintained (Crowther, 2000). Materials that are easily maintained will result in less replacement from wear or damage and will allow the materials to have a longer life span (Hughes, n.d.). But what about now? What if those of future generations choose not to reuse the components of the building an architect put so much time into creating? What is to say we can't reuse materials now?

Deconstruction, an alternative to demolition, is a step to reusing materials now. What is the difference between demolition and deconstruction, you may ask? According to DeConstruction Services, LLC, "deconstruction involves the systematic and manual disassembly of the affected sections of a structure, saving as many components as possible for reuse and recycling" (Hughes, n.d.). Where demolition involves speed and landfill waste, deconstruction involves more manual labor and time, but also results in saved materials and compensation for your work (Hughes, n.d.). Demolition is actually a new concept, whereas deconstruction has been around for years. During the Roman Empire, "records describe how Roman engineers reused stones from their road system in the building of new roads" (Hughes, n.d.). Labor and safety are key when it comes to deconstruction. Deconstruction does involve more risk which is definitely something to consider. But through careful analysis, safety procedures, and the use of masks risks are decreased. Deconstruction is dangerous, but DeConstruction Services found lower levels of elements such as lead in their employees in comparision to their employees starting levels after years of working in construction (Hughes, n.d.). Safety precautions are key. There are positives and negatives with everything but in an economy full of unemployment and in a time where we need to start caring about our resources or they will disappear and not be available for future generations, deconstruction provides jobs, preserves resources, and was a way of the past. To further that "recyclers usually assert that reuse of building materials generally saves about 95 percent of embodied energy that would otherwise be wasted" (Hughes, n.d.). Also, with deconstruction, hazardous materials are removed and more appropriately disposed of so they will not end up in our landfill or water supply like they would with demolition, and therefore deconstruction increases our safety (Hughes, n.d.).

A better understanding of the deconstruction process increases the understanding of what can be reused and can even inform how to use materials so they may be more easily deconstructed in the future. In deconstruction you start from the inside out or in the reverse order of construction. First the carpets, flooring, ceiling, cabinets, countertops, mirrors, toilets, light switch plates, window and door trim, and similar items are removed (Hughes, n.d.). Next are the interior doors and jambs, and nails are removed with a derailing gun from

wood flooring and moldings (Hughes, n.d.). DeConstruction Services LLC has a 90 percent salvage rate of wood flooring (Hughes, n.d.). Drywall is then removed but cannot be reused(Hughes, n.d.). Shingles are next. Asphalt shingles can be removed melted, have nails removed with magnet and that asphalt can then be used on roads and the like (Hughes, n.d.). “All ferrous, aluminum, and copper metal” (Hughes, n.d.) can also be separated and recycled. Rafters and joists are then saved for reuse and insulation is put in bags to be saved. After this point all that should be left is the foundation and bricks which can be used for gravel or even reused as landscaping or an accent in a project (Hughes, n.d.). This type of process recycles 80% of the building (Hughes, n.d.).

Deconstruction, school design, school mergers, the emotional well-being of students, engaging the community, our connection with history, how we think, working with what we are given, are all key components to this thesis. A thesis that through creative use of its site will reduce the depletion of our non-renewable resources in a way that will engage the community and instill a sense of sustainability in the generations to come. It is the application of the knowledge of the past, the processes involved and human reactions that we can create designs that will accomplish this thesis. We need to know where we have been to know where we should go. Our pasts have meaning in our lives and we will carry those things with us and memorable bonds will be formed with those elements that engage a sense of history and our roots. A sense of community brings belonging, care, contentment, and creates connections that will help towns to thrive. Through knowledge of processes and details we can design on a new level, a deeper level and will therefore be able design more and have our designs do more. These aforementioned statements are why the topics in this research were analyzed, all of which leading to the formation of a holistic thesis design.

the Summary

Research builds a plan of action and promotes thought and analysis. All the discussed research topics are connected to the idea that through creative use of site this thesis will reduce the depletion of our non-renewable resources in a way that will engage the community and instill a sense of sustainability in generations to come. One unique thing about architecture is that it has the power to influences unimaginable amounts of people's lives and can impact generations. The architecture an architect designs becomes the places we live, work, and learn in. Every moment we have an experience that can become a memory. Memories will be taken with us for as long as they can be remembered. Yes, some moments will be more easily remembered than others, just the same as we are inclined to certain spaces when others are not. We are all different, but what if our architecture could make those memories positive and stronger than others?

Some places are more inclined to memories than others, and one of those is the schoolhouse. With the schoolhouse being an icon and our interaction with the space taking place in our youth, a time we sometimes forget, we cherish those memories we make there. In the schoolhouse we make friends, interact with others, and begin to understand society and community. These moments and experiences will help develop our self image and no matter what will have an influence on who we become someday. School is a critical point in our lives. As architects we can strive to make that the best experience possible and we can help create positive memories in the spaces we design, for those that are our future.

The things we are inclined to are also connected to our memories. When our parents or grandparents use a brand of product we are more inclined to also use that brand of product. By incorporating the history of the towns a sense of that connection and history shall be present and hopefully encourage a sense of welcome and belonging. With each town being equally represented the once rivalry will change and along with that will come camaraderie and individuality which in turn will promote the social and psychological health of each individual student.

Students are our future and that has always been a prominent concept. We need students to be filled with hope for a

better tomorrow. It is through positive thinking that the world can become a better place. How we perceive the world is developed so much when we are young and in school that we need schools to be a welcoming place with a sense of community so that each student can reach their fullest potential.

A sense of community has always been an important part of these farming areas. From the grange movement we can see that the farming community is willing to work to build places that promote community activity, this in turn promotes a sense of community. A sense of Community is what makes a town stronger and is something that people are drawn to. Community is what small towns such as Roscoe, Hosmer, and Bowdle thrive on. Much like culture and society, community is something each individual needs to grow. Strong and successful schools can add to that sense of community and bring people together through events and activities.

The Patrons of Husbandry used what they were given to build these activity centers. They made the most of what they had. This can still be done today and it can better our future by preserving resources. We can reuse materials. Materials can be reused in so many multiple different ways. There is so much potential. A staircase or structural element in good condition can be fixed up and reused as is. Wood studs can be salvaged as lumber or broken down into wood chips for a playground, accessories such as door knobs can be removed from doors and used in different ones, and one can even look to the door itself, which can be reused as a door, made into a divider, piece of art, or table. There are so many possibilities when one starts to think about reuse. Reuse can present a challenge for designers and through creativity and design unique and wonderful things are possible.

With reuse we need to allow things to be deconstructed. With deconstruction, simplicity is crucial. With deconstruction in mind one should avoid secondary finishes. Without secondary finishes how will you enliven a space? Could you instead create warmth with texture? Through a combination of brick and wood one can create texture and warmth. Instead of paint could you use unique light fixtures that fill the room with color and promote creativity? The options are endless, we just need to push our design to new levels in order to create a project that will successfully and creatively use its site to reduce the depletion of our non-renewable resources in a way that will engage the community and instill a sense of sustainability in generations to come.

project *Goals*

INTRODUCTION

The formation of a thesis acts as a way to become more aware of one's self. Self awareness as discussed earlier pertains to each of us being an individual and unique. I believe goals personal, academic and professional are part of what makes a person unique. They are the things that inspire us and give others an inclining into who you are as a person. What pieces of my identity will you gain from this thesis? What are my goals?

ACEDEMIC

Academically, I am in graduate school and completing my thesis for a master of architecture degree. This is exactly where I want to be. When you start school you have a plan and don't really know what will happen next. At that time, I knew that when growing up I could spend more time trying to create my own doll house in my closet or Barbie house out of table and chairs then actually playing with the dolls themselves. I knew I loved art, math, nature, sports, and enjoyed taking pictures. When I dreamt of some day I saw myself in a large skyscraper apartment building in a white suit and blank walls just waiting to be designed. Maybe it was premonition

but my self-identity wasn't as clear to me then as it is now. Every year at school I enjoy architecture more. Architecture fits all those quirks about myself I never knew had a rhyme or reason. I am right where I want to be. This thesis has further let me express and come to understand myself over the past few months. I enjoy details, sites, challenges, making something out of what someone else would destroy, I see the importance of sustainability and want it to be possible for everyone. I want a chance to show that architecture can make a difference; subtle design choices can impact people's lives and preserve the world we live in. I want this thesis to do that. I want this thesis to help express who I am to future employers to see my passion, work ethic, individuality, empathy and design capabilities and consider me. I want this thesis to help me attain my masters of architecture and make all the other goals a possibility. Therefore I attain to take this project to an award ascertaining level and make it my best project and have it truly exemplify me.

Professional

Professionally, I want to complete my IDP and become a licensed architect. Having interned for two summers I know I want to work and experience as much as I possibly can. I would love to work in impoverished communities to make their lives better. I want to work in a large city where anything is possible. I would love to work with constraints and extreme demographics. I want to design details and think of everything. I want to learn as much as possible. I want to work in a firm that is concerned about sustainability and the community, a place that dares to be a little different but yet is extremely conscientious and functional. These are my goals, write now the world is an open book and I am ready to start writing and sketching.

Personal

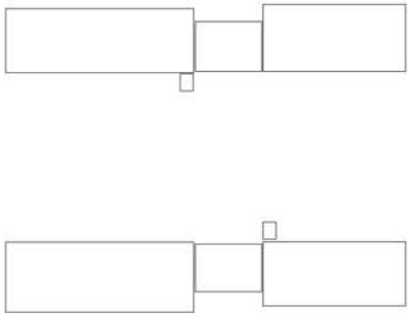
On the more personal level I want to make the most of my life. I want to do my best in school and really be proud of this thesis. I hope I am able to leave as few rocks unturned as possible. I have enjoyed how this thesis research

is putting those elements that I enjoy in writing and therefore it has really made me realize who I am and where I want to be someday. As mentioned before, the world is an open book what is to come and where it will take me I do not know, but at least I'm starting to realize who I am. I want to continue to do all those elements of architecture that I enjoy in this profession in some way in my life. But mostly, I want to find a way to make a difference. Architects have the power to make a difference. There is no limit to design. So let's do it! I want to build a school for a child in Haiti or anywhere in need. I want to design places people will truly connect to where the best possible memories are formed. I want change even just one person's mind about the way we use our resources. Or even change someone's mind about how we approach schools merging, or the importance of memories, or even what should be kept or destroyed. Think of how much we can reuse, and what if we actually did reuse more? If we reused more could that create more jobs? I want to make the future seem brighter again. I want to design functional, smart spaces that improve lives. They don't even have to know who I am; just the knowledge that lives where improved would be enough for me.

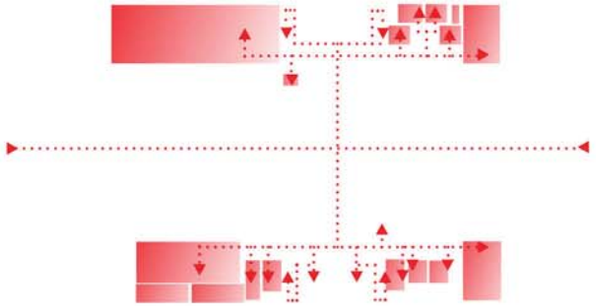
Closing Remarks

Finally, I would just like to say thank you for a wonderful experience here at North Dakota State University, and for helping me grow and discover so much about myself. This has been a wonderful experience that I am truly grateful for. Also, none of this would be possible without the love and support of my family, who are the most important people in my life, so I would just like to thank them too. Thank you!

Case *Studies*



Geometry



Circulation to space

Wiess Manfredi
architects
harlem project
harlem, new york

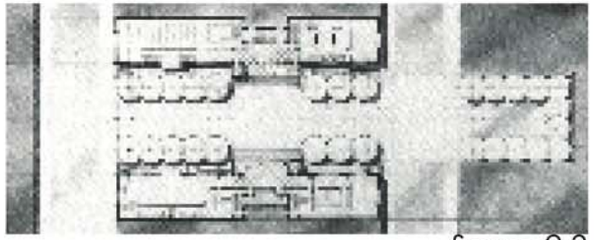


figure 2.3

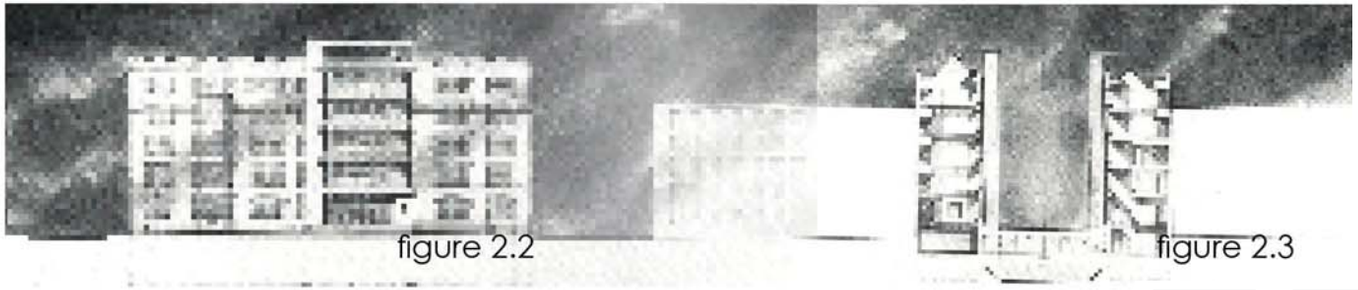
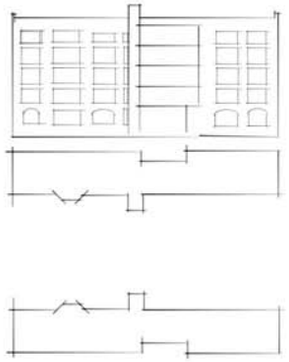


figure 2.2

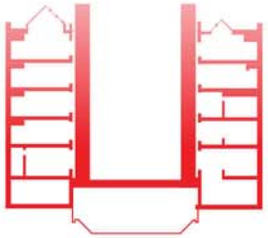
figure 2.3

The original 5-story, H-shaped school building in Harlem, NY, was designed by C. B. J. Snyder (Cutler, 1989). This school was designed to allow light and fresh air into all areas of the school. This design also included movable furniture in large kindergarten classrooms. This began a new age in the school design thought process. But this school aged and over the years needed a change that would better serve the community. The school was to become a community center. The community center project was taken on by Weiss Manfredi Architects and was to include "day care facilities, social service offices, adult education facilities, a health clinic, a branch library, as well as an alternative high school for 250 students " (Architectural League of New York, 1992).

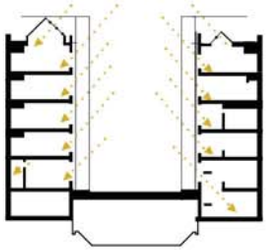
Hierarchy



Plan to Section/ Elevation



Structure



natural light

massing

This created an interesting arrangement design situation for Weiss Manfredi Architects, how was he to arrange the spaces to include completely private, public and mixed use facilities? They also needed to consider how to allow different age groups to use the building effectively. The design they came up with involved altering the H-shape to become two separate buildings that were connected underground by an auditorium. The entrances were moved to where the horizontal portion of the "H" was removed, which created a common street like path between the two buildings to which a standard of security needed to be maintained. To solve these public and private space issues, the following floor-to-use delineation was decided upon. The community center occupied one side of the building and the lower level while the school occupied the second building. Underground was the auditorium and sports center which included a basketball/ multipurpose space, auditorium, dressing/ audio-visual, mechanical, and lockers. The first floor on the community side included the library, senior center, and dance/ lockers; whereas the school side included administrative offices and dance/lockers (Architectural League of New York, 1992). The second floor on the community side included the library and senior service and the school had shop, and science/ language (Architectural League of New York, 1992). Next was the health clinic and social services with classrooms in the other building. While classrooms also extended to the fourth floor the community side had the infant toddler and early childhood center (Architectural League of New York, 1992). Then at the very top to allow for a playground on the roof there was also the early childhood center, a parent/ teacher room on the community side and art center classroom on the school side (Architectural League of New York, 1992). This is how Weiss Manfredi Architects chose to balance the spaces and he also intended that by day the school would be the alternate high school and by night it would serve as the adult education facility.

As with the other projects, this school involves mixed use and is slightly different than a standard school. This project involves renovation, which is one aspect that makes this project different. I appreciate the simplicity of the removal of connector of the two buildings to create new entrance and common outdoor space to add a sense of entrance.

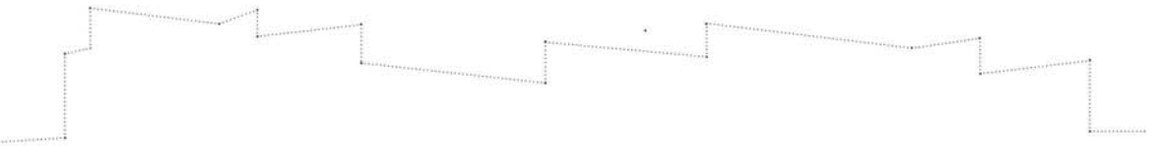
With the development going on around the school, a vacant lot was proposed to become a park and low income housing developing the dynamics of the community would absolutely change. The new facility discussed here seems to be the result of a thoughtful decision fits well with the changes occurring. I believe community was truly at the forefront of this design and was at the basis of the concept for this building. This building was desired to serve as the heart of the community and bring the community together. The careful consideration as to how to lay out the spaces seems highly beneficial and an appreciated aspect of analysis for this project. This project is a jumping off point for space planning, site development, renovation or reuse, and mixed use spaces.

This project exemplifies how a building if carefully planned can be a positive addition to a community. Carefully considered spatial arrangements can allow for both public and private areas within a building. It also shows how you can use design elements that exist in ways that will serve new purposes. Elements of an old school can be used to create or, in the case of this thesis, used in the creation of a new school.

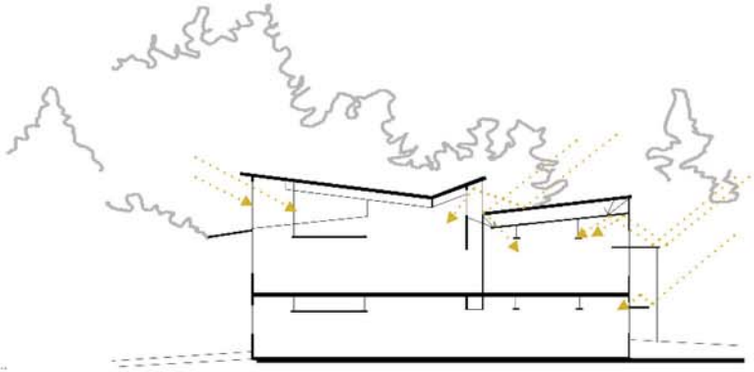
Benjamin Franklin Elementary

kirkland, washington

Benjamin Franklin Elementary is a 56,000 square foot school in Kirkland, Washington, that was designed by Mahlum Architects (Ford, 2007). While this project is sustainable like previous case studies, this project stands out the most programmatically and through its spatial composition. Being a k-6 elementary school its program is equivalent to that of this thesis. But what stands out even more than that is its inclusion of clusters of classrooms with common activity space. These clusters of classrooms allow for more of small community feel rather than an overwhelming large school.



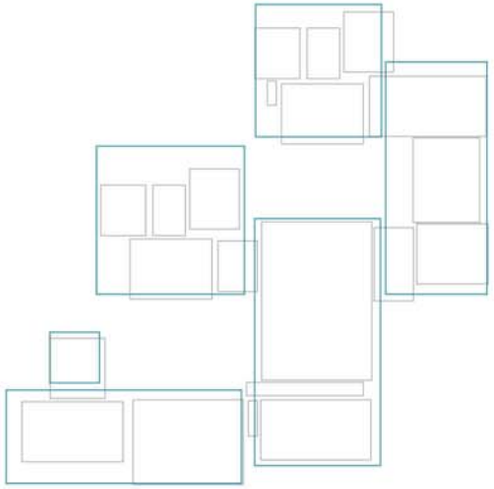
Hierarchy



natural light

mass

circulation to space



geometry

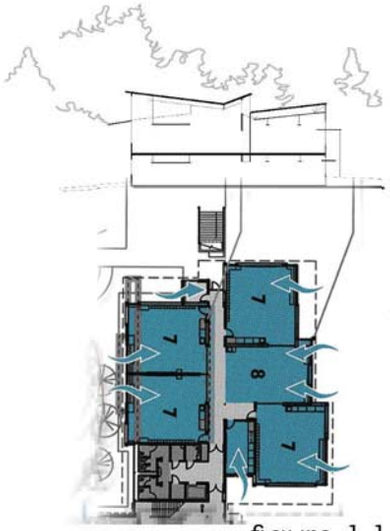
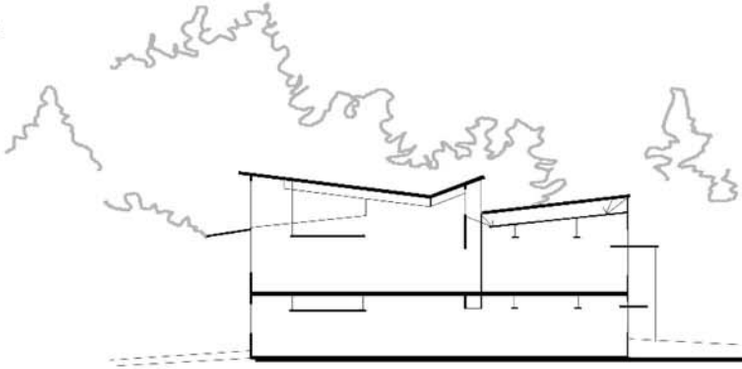


figure 1.1

Plan to Section



structure

In addition to the activity space, I appreciate the carefully considered shape of the school. The shape is sprawling, but in doing so opportunities are created in both the areas of sustainability and academia. The sprawl creates classrooms with access to as much daylight as possible, much like what the H-shape school was designed for. Additionally, the floor plan creates courtyards that allow the classrooms to have a direct connection to the outdoors, so the learning can be both indoors and outdoors. Nature is then allowed to be a learning tool which makes this school unique and can serve to draw students to this school.

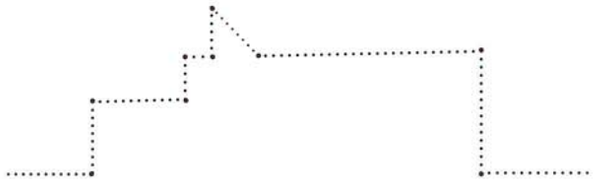
The program of Benjamin Franklin Elementary includes a rainfall sculpture, outdoor learning courtyards, community park, connections to wooded areas, library, administration, kindergarten, early childhood, gymnasium, commons, classrooms, activity area, food service, music, resource, technology, and science/artspace (Ford, 2007). Particular attention was paid to glazing, lighting by having lights that dim automatically, low-flow fixtures, and plants to be used for storm water management (Ford, 2007).

This school served as a model. With a sustainable mandate in publically funded schools, sustainability was at the forefront and was a promoted aspect of this design (Ford, 2007). While sustainability is promoted now, this political push makes this project more unique. It is the start of a movement and causes it to be a lot like one of the goals of my thesis, which is to create a school that can be a starting point or example for future school development in the areas of sustainability and by providing a different approach to school mergers.

This project provides insight for my theoretical premise in how to keep a small school feel with a larger number of students. It also shows how sustainable systems can be fun and interactive. The ways in which this school connects the wooded area to the school exemplifies the possibility of successful site incorporation to make a school unique and involve the heritage of the community.

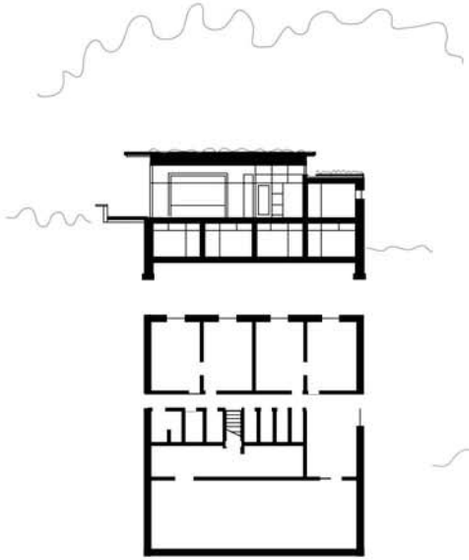
Walasee BioHaus

concordia language villages, bemidji, minnesota

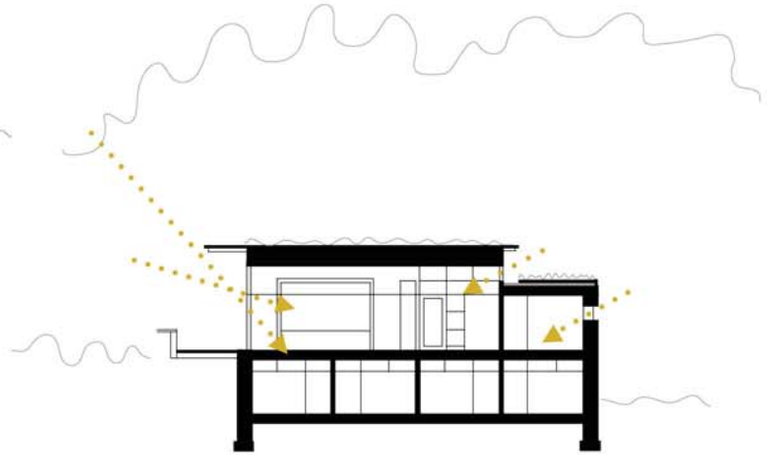


heirarchy

elevation



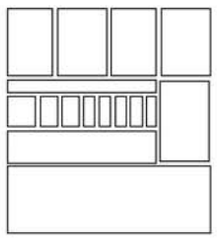
Plan to Section



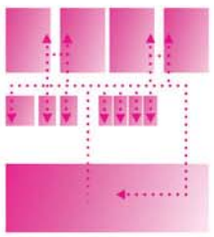
Natural daylighting

The Waldsee BioHaus Environmental Living Center located in Bemidji, MN and designed by Stephen Tanner is two stories tall and approximately 5000 square feet in size (re-Arch, 2008). This building serves both as student dormitory/apartment and classroom facilities for 28 students (re-Arch, 2008). This project also is a more non-traditional school approach to education and is PassivHaus-certified which is one direction people are looking for creating more efficient or sustainable structures.

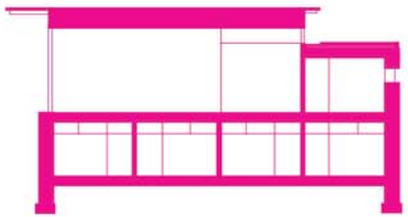
When visiting this school one really gets the sense of the mixed use and dynamic functions possible in such a small space. While the presence of conscious material choice is evident, one also sees the space specific details and the interactive aspect of the space. There are tiles on the floor specially designed for language learning and expansive windows that really



Geometry



Circulation to space



Structure

mass

emphasize the light in the room and the time of the day when shade is needed to help cool the room. The large classroom space also serves multiple functions by being more of a blank slate. Whether that approach is always applicable is another consideration but it is a good thing to think about and seems to serve them well.

This building also is PassivHaus-certified and therefore involves many sustainable strategies one should consider when designing. Another benefit is that this school is in Minnesota, which has approximately the same climate as South Dakota; unlike the case studies of schools that are in different extreme climates, this project is more applicable. Some of the sustainable strategies included in this school are as follows: low volume to surface ratio, implementation of daylighting and passive solar gain, overhangs and blinds for cooling, building envelope with a high r-value, a high efficiency heat recovery system, ground to air heat exchange system, implementation of natural insulation, and efficient mechanical equipment and appliances (re-Arch, 2008). Under the grade the walls have an r-value of 55, above grade they are R 70, and the roof has an R of 100 (re-Arch, 2008). This house also has an extensive mechanical monitoring system. Finally, it also has a green roof, used low emission building products, native plants where used in the landscaping, used a percentage of locally manufactured products, and was done by Bemidji contractors (re-Arch, 2008).

This project, like Benjamin Franklin Elementary School, implements sustainable strategies and is a non-traditional school that has a mixed use, whereas the others where for community activities, this one involves dormitories and educational tours. Environmentally this project seeks to conserve energy. Socially it seeks to educate the public and its students on passive design. Culturally it seeks to provide facilities that will make its residents feel at home as much as possible and to educate. Those things are also a part of its conceptual goal. Its conceptual goal is along the lines of to highlight the Minnesota woods, provide perspective, a view of the future, and learning (re-Arch, 2008). While its program is a little small and passive strategies may be a little overdone or expensive, it provides a new view on schooling and introduction to sustainable/efficient strategies.

This study supports the theoretical premise of my project by exemplifying how the implementation of sustainable strategies can result in less energy use and how a sustainable structure can be a learning tool, a learning tool that can be inherent in the design and also inform the community and fit into its surroundings.

the *Summary*

One word comes to mind when looking at the series of case studies analyzed here and that word is “collage.” According to Merriam Webster Online Dictionary a collage is “a creative work that resembles such a composition in incorporating various materials or elements” (“Collage”, 2011). While this thesis is a collage of elements, materials, backgrounds and students of different schools it is will also be a collage of the analyzed cases studies. Each of these case studies provides an element that alone is not enough, but careful collaboration and metamorphosis of these elements when applied to the situation at hand can create an inspirational basis for this thesis.

We start in New York with the building that once was the H-shaped school, a

stepping stone away from the one-room schoolhouse and beginnings of design. This was a design that thought about light and air movement which promotes the health of the students and some passive strategies, both of which are really at the heart of sustainability. We need sunlight for heat and air to reduce the stress on ventilation systems, but we also need ventilation to help us breath better and sunlight for our psychological well being. But this case study wasn't just the H shaped design, it was a renovation. It was a renovation in response to changes in the community. Communities in Edmunds County are decreasing in size and schools are forced to merge which aids some communities and depletes others. This project shows that through mixed use and by appropriately arranging public/private spaces a successful building can be created and it can function as a heart of the community.

A sense of community is a key component of small schools. As stated by a senior at Bowdle High School, Kaitlyn Sandmeier, her favorite part of BHS is that "everybody within the school knows each other" the small size and community feel is what she believes creates this environment that discourages the formation of cliques that are sometimes seen in larger schools. But even beyond this a small school means a smaller student to faculty ratio. As Kaitlyn states, "[in Bowdle High School] teachers know you at a personal level so you can have more one on one attention." That is a quality I believe most schools strive for and small schools are able to inherently posses. Things like that should be held on to and not lost with these depleting small towns.

It is those small school qualities that the elements of Benjamin Franklin Elementary come into play. Benjamin Franklin follows suit with the more modern version of sustainable design but also has a more dynamic floor plan that involves clusters. Clusters with break-out spaces will help maintain a small school feel while more students attend. Edmunds County is also a farming community. Some students even go on to take over their family farms when they grow up. While most of this learning probably takes place at home, why could it not be also highlighted through the school? Benjamin Franklin Elementary was built in such a way that it took advantage of

the wooded conditions and then used them as subtle learning tools. Why can't this thesis truly showcase the heritage of the community by incorporating the farming and prairie aspect area? Let the beauty of the place be embraced and not destroyed.

Finally, the BioHaus case study guides the sustainable principles of this thesis by relating directly to the climate type and principles of this thesis. While it guides the sustainable principles it also pushes this thesis to find new ways to accomplish an air tight envelope, solar gain and shading in ways that can reuse local materials, promote new jobs in deconstruction and/or in the modification of reused materials in the area, and make the project less expensive in order to make sustainable design more accomplishable.

When combined these case studies expand the theoretical premise that states through creative use of its site this thesis will reduce the depletion of our non-renewable resources in a way that will engage the community and instill a sense of sustainability in generations to come. These case studies expand the project into a design that is not only sustainable but one that has guidance from a built school in a northern climate. With the addition of these case studies, not only will it evoke a sense of community like the New York project it will also have a program to look to for guidance on how to arrange spaces to be both public and private. Finally, there is also a program of outdoor learning spaces, a community park, connection, library, administration, kindergarten, early childhood, gymnasium, commons, classroom, activity area, food service, music, resource, technology, and science/art space that comes from the Benjamin Franklin school. Not only will this thesis school be sustainable and community orientated it will seek to keep that small school feel through clusters, it will have a strong connection to its site and will use the site to the best of its ability to obtain passive solar gain and natural ventilation. It is only with all the elements and things learned from these case studies that a successful thesis collage can be obtained.

Let the beauty of the place be embraced and not destroyed.

Where did it all begin? It is through the study of the past we can truly understand where we should take the future to make lives better for those individuals this thesis involves. Anthropology is "the study of humankind in all times and places" (Haviland, Prins, Walrath, & McBride, 2007). It is then from anthropology that we delve into culture. It is the culture that really impacts a person's life. Culture is "a society's shared and socially transmitted ideas, values, and perceptions, which are used to make sense of experience and generate behavior and are reflected in that behavior" (Haviland, Prins, Walrath, & McBride, 2007). Culture helps us survive and better ourselves. We learn culture from those around us. "Culture is learned" (Haviland, Prins, Walrath, & McBride, 2007) and it is taught to us by our relatives and peers. Culture changes but it is something originates in our past due to its inherent passed-down from generation to generation qualities. Culture helps us become self aware. It is through self-awareness we are able to become an individual, and then from that we attach "positive value to one's self" (Haviland, Prins, Walrath, & McBride, 2007) which will motivate us. Motivation is how change and better futures can begin. This thesis will connect the individual to their culture, memories, and perceptions and then motivate change, a change toward sustainability and education, to improve the lives of the community.

Before there were the residents of Bowdle, Hosmer, and Roscoe, there were their German ancestors. German ancestors that knew a thing or two about moving and staying true to their beliefs and heritage. More specifically most ancestors of the inhabitants of Hosmer, Roscoe, and Bowdle are considered Germans from Russia. Germans from Russia were citizens and "highly skilled farmers and tradesmen" of Germany that faced "religious strife, political chaos and economic hardship" (History and Culture, 2011). These Germans were then offered "autonomy and farm land in Russia" (History and Culture, 2011)by Russian Czarina Catherine the Great, who happened to be a former German princess. Many Germans took Catherine up on her offer and moved to Russia where they became known as Volga Germans and Bessarabian Germans (History and Culture, 2011). While in Russia they kept to their ways and heritage and were able to do as they pleased up until the Crimean War. After the Crimean war the government began to change, and these Germans were faced with changing their German

ways to follow the Russian way of life or leave. Many chose to leave and ended up in North America, residing mainly in the Plains (History and Culture, 2011).

But how these immigrants ended up in the plains is also an important piece of history, for it played a role in how each resident's ancestors ended up where they did and how each of these towns came to exist. The towns of Bowdle, Hosmer, and Roscoe, came to exist with the assistance of the railroad and with the implementation of The Homestead Act. The Homestead Act of 1862 allowed adult citizens to claim 160 acres of surveyed government land with the only stipulation being that they had to "improve the plot by building a dwelling and cultivating the land" (U.S. National Archives & Records Administration, 1998). The land then could be theirs after 5 years and a small registration fee (U.S. National Archives & Records Administration, 1998). This no doubt intrigued those skilled farmers of the German Russian heritage. It was then that many bought tickets to board the passenger trains to go west. Trains had existed for transporting goods for quite some time, but it was with the passenger train that people were more easily able to venture west to colonize and begin a different life. Many of the passengers traveled to Eureka, a nearby town, and then continued on to join family back in the Hosmer, Roscoe, and Bowdle areas. With each of these towns there is a story. With these stories this thesis will gain roots, fit into the culture ,and better the community with the implementation of some of the elements that exist or may slipped away over the years.

The town of Roscoe was named after a friend of Charles Morgan, in 1892 (Roscoe 125th Book Committee, 2008). Roscoe's origins actually begin with the railroad and a tent, a tent that served as a hotel for travelers going between Aberdeen, LeBeau and surrounding towns. The tent was called the Cottonade Hotel and was placed by Morgan on his way through when moving supplies (Roscoe 125th Book Committee, 2008). As the years passed Roscoe became a transportations center and with that came settlers and a business boom. Over the years the residents of Roscoe worked to improve their city by creating cement crossings or planting trees, and they even worked with the Bowdle Stone Company to make it possible. When new buildings where built it brought hope to the town. When times were tough and filled with drought C.R.P. programs and no till laws were passed. Not

only have there been droughts but there have also been blizzards, which took power lines down for days, killed thousands of animals, and forced students to miss 18 days of school (Roscoe 125th Book Committee, 2008). But, if there was a problem the community made it through. When children needed to get home from an event in the blizzard they all came together to send out the train and rescue the kids from bus and bring them safely home (Roscoe 125th Book Committee, 2008). Roscoe is and was a town with a strong sense of community.

The stagecoach passed through the town of Bowdle even before its existence. Where the stagecoach passed through Bowdle is actually not far from the current school sits (Schumacher & Geier, n.d.). But, Bowdle's first school was a little different than it is today. The first school of Bowdle was just the second story of one of the first business shops (Schumacher & Geier, n.d.). While it may not have been much and was used for multiple functions, it still was a place for schooling and it still existed. So many of that generation saw the importance of school. They wanted every opportunity to be a possibility for their children. That importance of the future and education was evident as time passed and new schools were built, rebuilt, and added on to. The school even started bussing its students and built agriculture shops and athletic fields for its students so that their students could learn and build a better future.

Finally there is Hosmer, which is named after "the townsite railroad agent's wife Stella A. Hosmer" (Centennial History Book Committee, 1987). As with the other towns Hosmer too survived great hardship and tough times with the perseverance and farming skills picked up from the German's time spent in the rough conditions of Russia. Despite what can be seen today in the town, the town was once thriving with businesses and had the "best meat market in the county" (Centennial History Book Committee, 1987) which still gives Hosmer a name in South Dakota today. But, somewhere Hosmer got lost over the years. The town is depleting, and the once lively school stands cold and desolate. Hosmer students now have to attend Roscoe's school some 20 miles away and is now called Edmunds Central. But schooling was once too at the heart of Hosmer. It all started in a one-room school house in 1888 (Centennial History Book Committee, 1987). The township had had only been

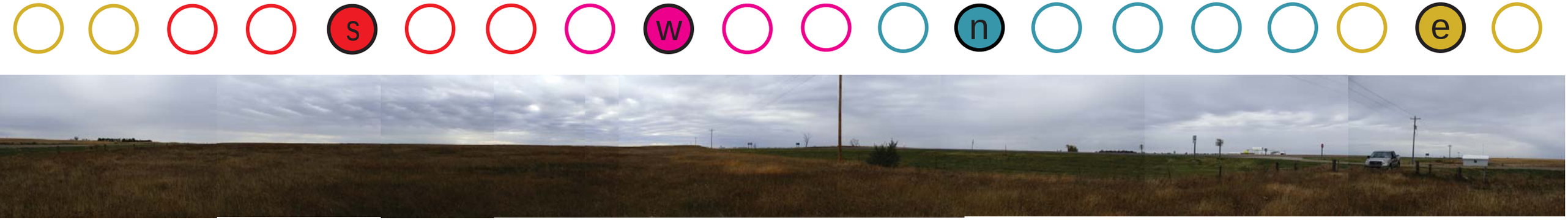
platted for a year when the school came about (Centennial History Book Committee, 1987). The bells rang and students would hurry in. With time the town put the children first and built schools out in the more rural areas to accommodate children that lived on farms. Schooling was a great success. With time the rural schools needed more facilities and therefore a brick structure was built in town for schooling. At that time only grade school was offered in Hosmer and for a high school education a commute to Aberdeen or Eureka was needed. But parents wanted more for their children and with time Hosmer gained a high school (Centennial History Book Committee, 1987). They too wanted the most for their children. They believed in a brighter future and education was the key to that in their minds. It was the strong push, faith, and sense of community that allowed this town to grow and make the most of itself and it is hard to see that fade.

It is amazing what a little willpower and faith in the future can produce. If there is a will there is a way. A strong sense of community and willpower allowed these towns to thrive in their prime. As time goes on and farming becomes less and less prominent these towns diminish, but that great character and strength can still reside there. These towns have something that isn't found in larger cities. Let's bring life back to these communities. What better way than with a bright view of the future, a future with sustainability to preserve resources. Let's bring a design that highlights the character and history of the farming community, instills memories that are irreplaceable, provides education, brings the community together, and gives them something that will build hope and provide new insight into what happens to diminishing towns and how to save them.

Site Analysis

There has always been something about being out in the prairie as golden flecks glisten along a horizon line that never ends. The nights are crystal clear with the stars clearly seen up above. A simple sunrise and sunset can be viewed for miles in all their drama. Days begin in shades of red, yellow, orange, and blue. But even on a cloudy day one can see the vast sky where the simple act of a ray of light making it through the clouds seems as if you are witnessing a work of art. Being on the prairie is truly a serene experience for anyone who is not used to the complete openness and who enjoys nature. These are all experiences that are possible in Edmunds County, where this site is located. When at the site it is just you completely exposed to the elements with the only thing to ground yourself in reality is the familiar buzz of cars driving by. But, if you turn your back to the road and let the sound of the wind overcome your senses there is a moment where everything else disappears, and it is then that you can experience a rush that can make you feel so minute and yet so alive at the same time.

The site is mainly flat pastureland with a slight incline in its backdrop and after the incline becomes cropland. According to the slope analysis there isn't much of a slope greater than two percent, which is considered flat, making it suitable for activity. Even though the slope is not much more than two percent, the soil present in this area can be anywhere from two to six percent slope (United States Department of Agriculture, 2011). The areas where the slope is increased are areas where water tends to settle. This past year there has been an excess of rain which increased the amount of sitting water, and therefore intermittent sloughs have developed. These sloughs will change over the years depending on the climate, but they are also to avoid and consider when designing. There are two such sloughs currently in the general vicinity of the site. One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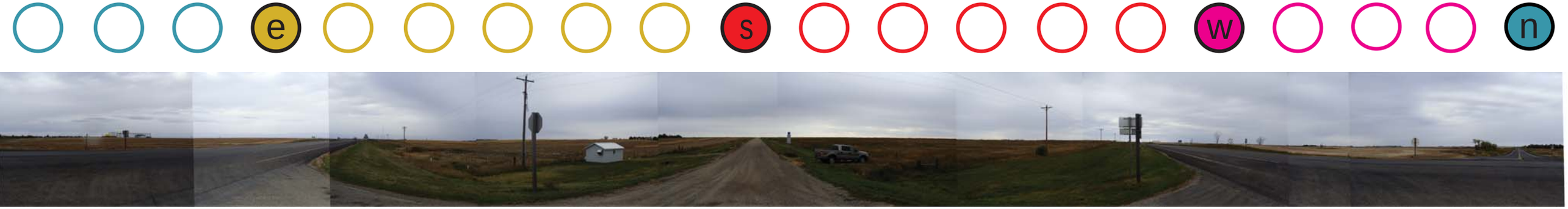
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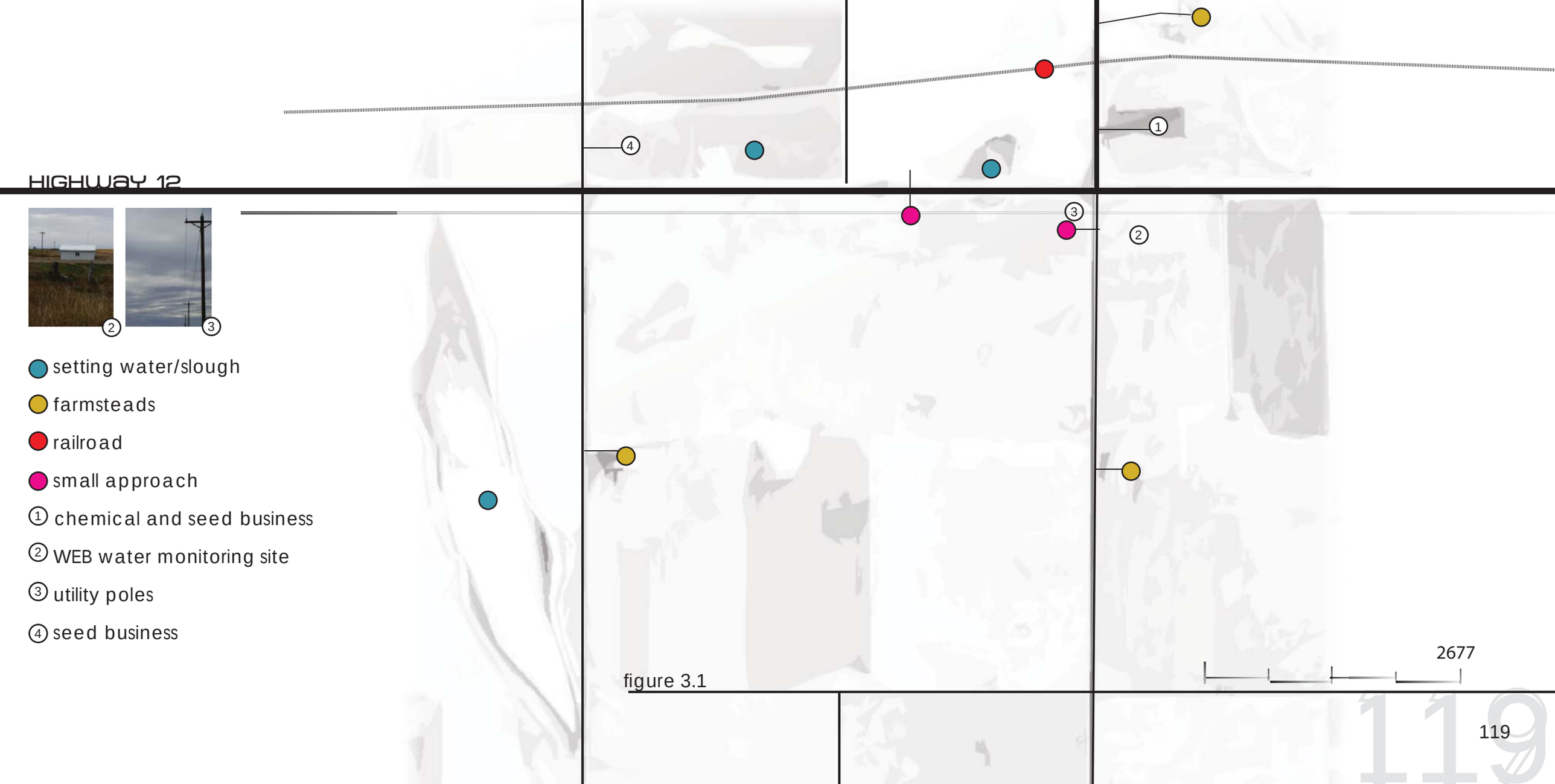

HIGHWAY 12
2
3
setting water/slough
farmsteads
railroad
small approach
① chemical and seed business
② WEB water monitoring site
③ utility poles
④ seed business
2677

figure 3.1

exists in the low area to the west of the site and is a more stable than one that resides near the highway in the middle of the square mile east to west. It is north of Highway 12 that more extensive sloughs have arisen which makes this site to the south more ideal. Because of its higher elevation it will allow water to drain away from the building.

When you are out in the countryside the established grid is in increments of miles with section lines at varying grid intervals. It is not uncommon to find a combination of gravel and paved roads in this area. 336th Avenue leading into

vehicular traffic

Hosmer and Highway 12 are both paved, with 336th Avenue being newly refinished. Other such roads as the one to the south of Highway 12 are gravel, whereas section lines, paths and approaches may consist of tire-worn prairie grass.

The traffic in this area depends on the season. During planting and harvest season you will see combines, tractors, grain semis, and trucks. Also during this time you will have extra dust and debris to deal with from the working of the fields. In the winter the traffic is more reserved. Being alongside a large highway presents a fair amount of traffic, but also provides access to the site, for these roads will be well maintained during poor weather conditions. Speed limits are higher in these areas and with the exception of the highway there is not much of a shoulder on the paved roads, therefore there is not much pedestrian traffic. If there is pedestrian traffic it will be the casual long-distance runner, biker, surveying farmer, or seasonal hunter. Hunting season brings more traffic to this county as a whole.

n

w

e

Wildlife is free to roam in this area, which provides a unique situation. It is not uncommon to find white-tail deer, coyotes, jack rabbits, prairie dogs, pheasant, eagles, owls, snakes, ticks, bees, and field mice in this area. Therefore how do we celebrate the natural beauty, allow for it to be used as habitat, and keep the students safe?

The soils that exist here are viable for farming therefore have been used in the growth of crops and as pastureland over the years. Therefore this soil has been altered by humans but not in the ways we would normally think of because it is not altered with sidewalks and city blocks.

Farming has altered the site in such a way that may have exposed it to more erosion as a result of the equipment used on it and its exposure to the elements.

This land is vacant of trees, but windbreaks are used quite often in this area. Therefore, it would not be out of place to add trees to protect the area from the direct exposure it has to all the elements, such as the sun, wind, precipitation, and noise.

Plants of this area tend to be of the golden and green variety. Native plants to this area and soil include, Green Needlegrass/Western Wheatgrass (HCPC), Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass, Blue Grama/Sedge, Kentucky Bluegrass (United States Department of Agriculture, 2011).

The soils on the site mainly consist of William-Bowbells-Nishon (WtB) with Parnell (Pa) also evident in low lying areas (United States Department of Agriculture, 2011). The landform of WtB consists of plains being the Williams, swales being Bowbells, and Potholes being Nishon. Williams is a well drained soil with its depth to the water table being more than 80 inches. Bowbells is more moderately well drained with a depth of 42-60 inches to the water table. Nishon on the other hand is poorly drained with about 0 inches to the water table. Williams and Bowbells are both a loam, clay loam, clay loam at corresponding depths. Nishon on the other hand is a silt loam, clay, and clay loam (United States Department of Agriculture, 2011.

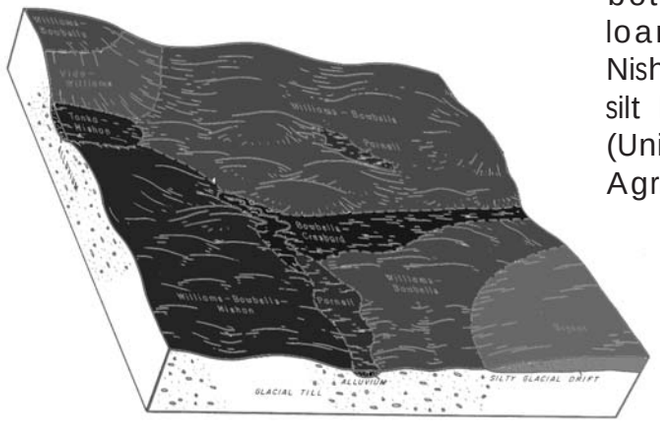
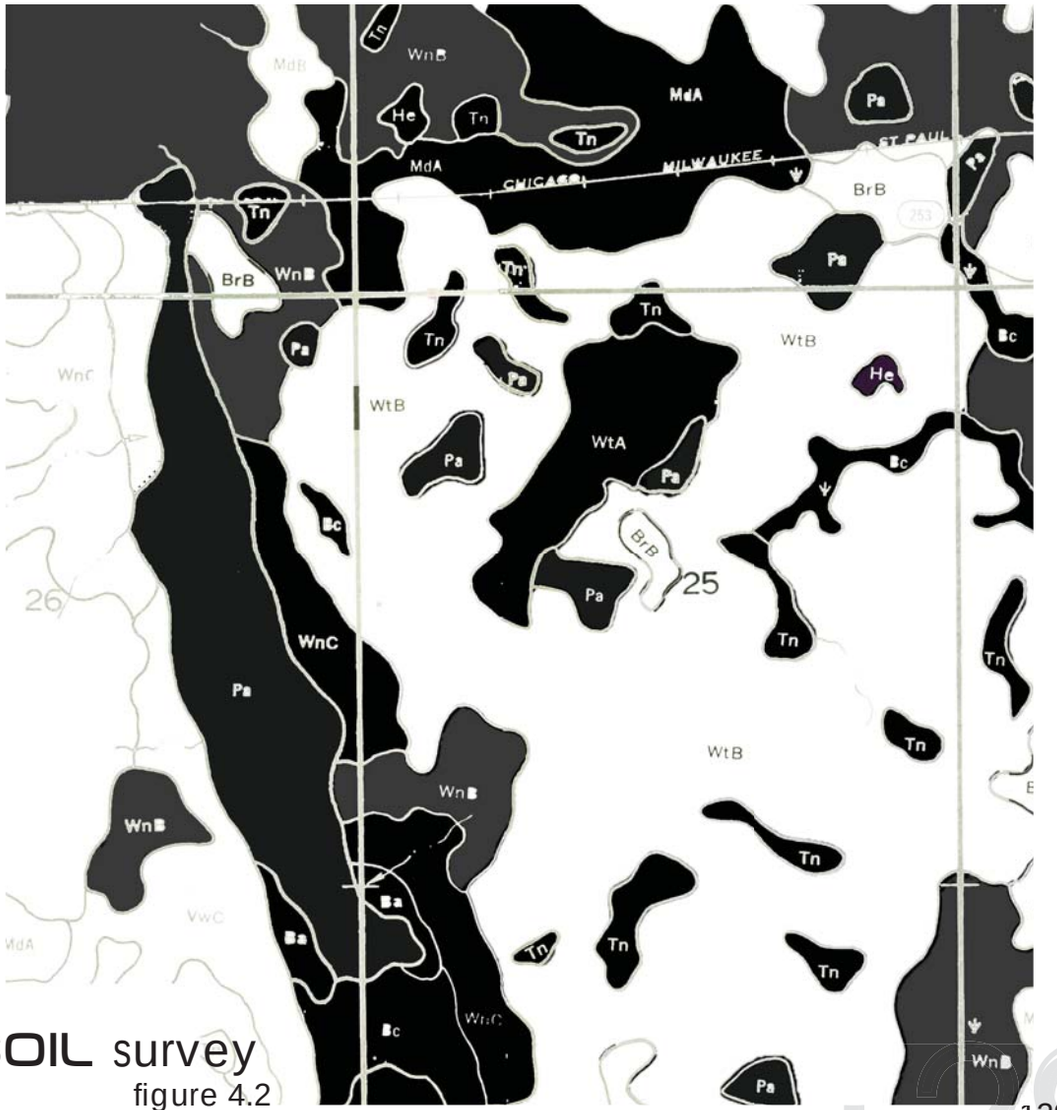


figure 4.1



SOIL survey

figure 4.2

This site is also in perfect location to utilities. Along the northern side of the site lie utility poles for electricity. Also, to east of the site resides a WEB water monitoring station. WEB water is the water of choice in and around these communities.

There is usable slope, a mix of soil from well drained to poorly drained but with the majority being well drained this site is acceptable. The site is also on a slight incline which allows for drainage away from the site. There is no shelter from the winds but it could easily be fixed with a windbreak or planting of trees, which is common in this area. There has been alteration of the site from farming and cattle grazing which could alter the soil and expose it to erosion, but according to the soil survey that does not seem to be much of a problem, most of the site is considered to have little erosion issue. Utilities are conveniently present, there are beginnings of civilization with businesses, farms nearby and towns not far away and there is easy vehicular access to the site from all communities.

Slope analysis

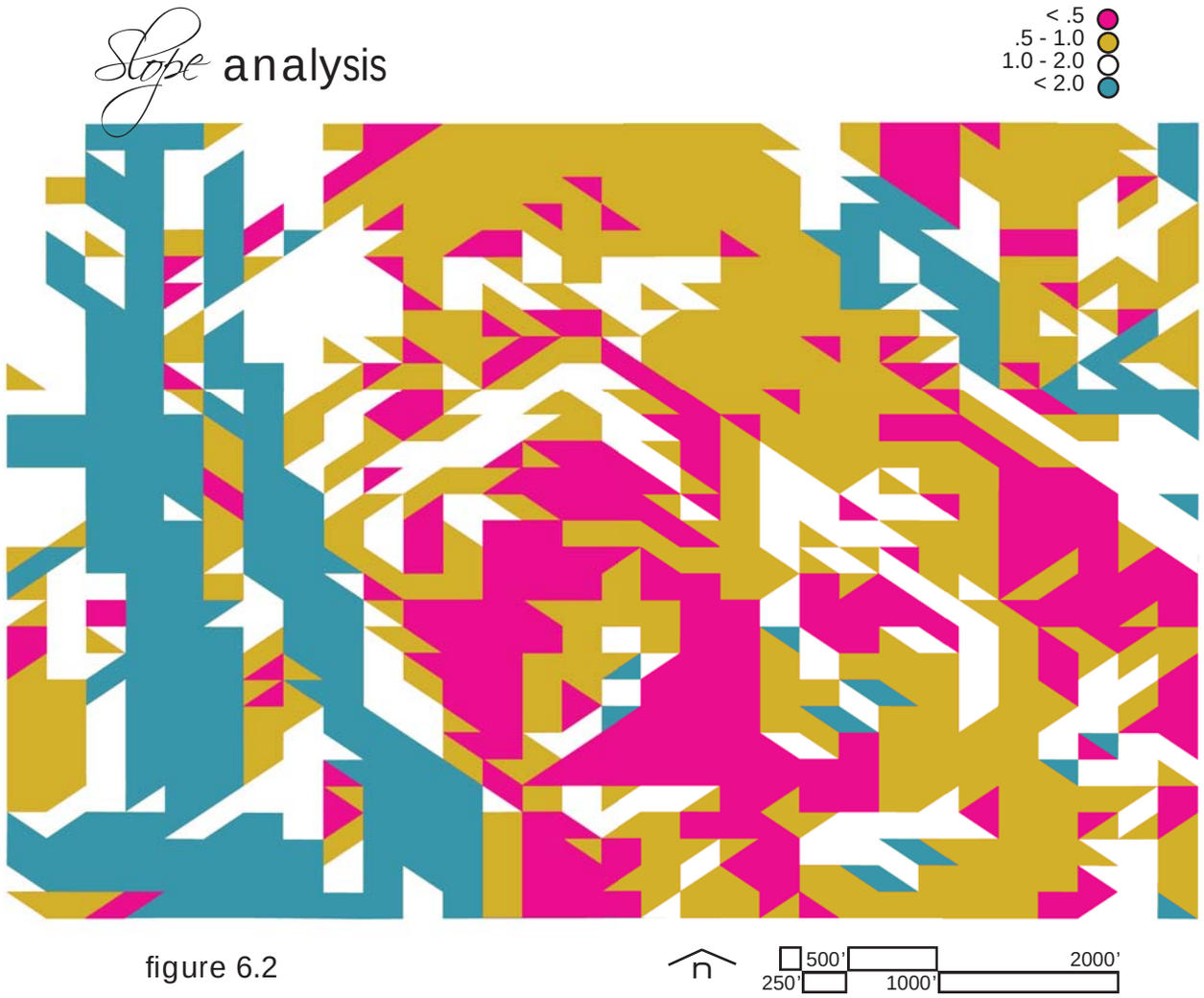


figure 6.2

By combining the water table map with the risk of concrete erosion, playground feasibility area, crop productivity, wind erosion and irrigation potential maps, I was able to determine areas most suitable for building and the results can be seen in the graphic to your right.

figure 7.1

- non-buildable conditions
- problematic conditions
- good conditions
- optimal conditions

Not far from this site you will find small towns still surviving and you will find small towns dying. This area is so different from what one sees in larger cities filled with concrete, asphalt and bricks. Out here it isn't out of the ordinary to witness a majestic sunrise or sunset, find a lone famer just parked out checking his crops. Sure there is hustle and bustle, but it is a different kind. It is almost like stepping back in time. Have you ever dreamt of experiencing the days of the past? But why can't we have the benefits of the past today? This project will allow its students to enjoy the beauty that they are surrounded by, and have all the opportunities larger cities have. A school here should be quite and smart, it shouldn't be loud and intrusive. It should just "be" as one feels is possible out in the country, it is a strong hard working community, but it also has character and a peacefulness. A design should capture that on this site.

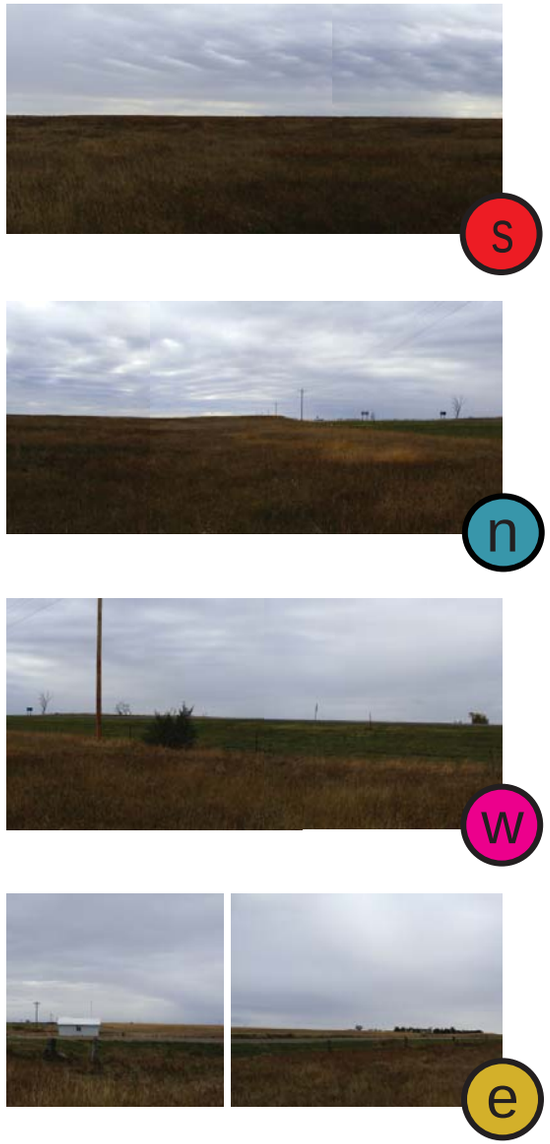
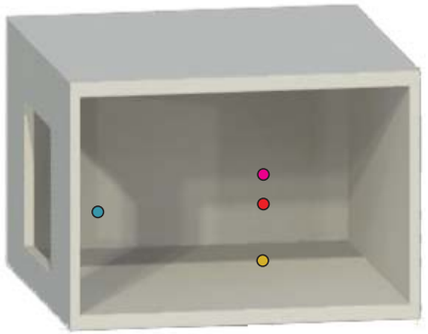
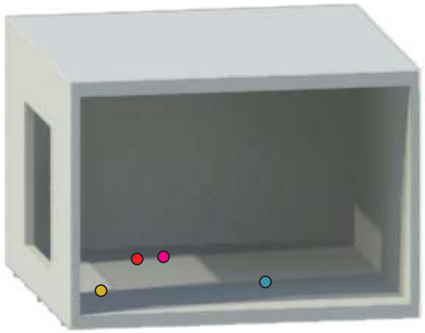


figure 3.3



9:00 am



12:00 pm

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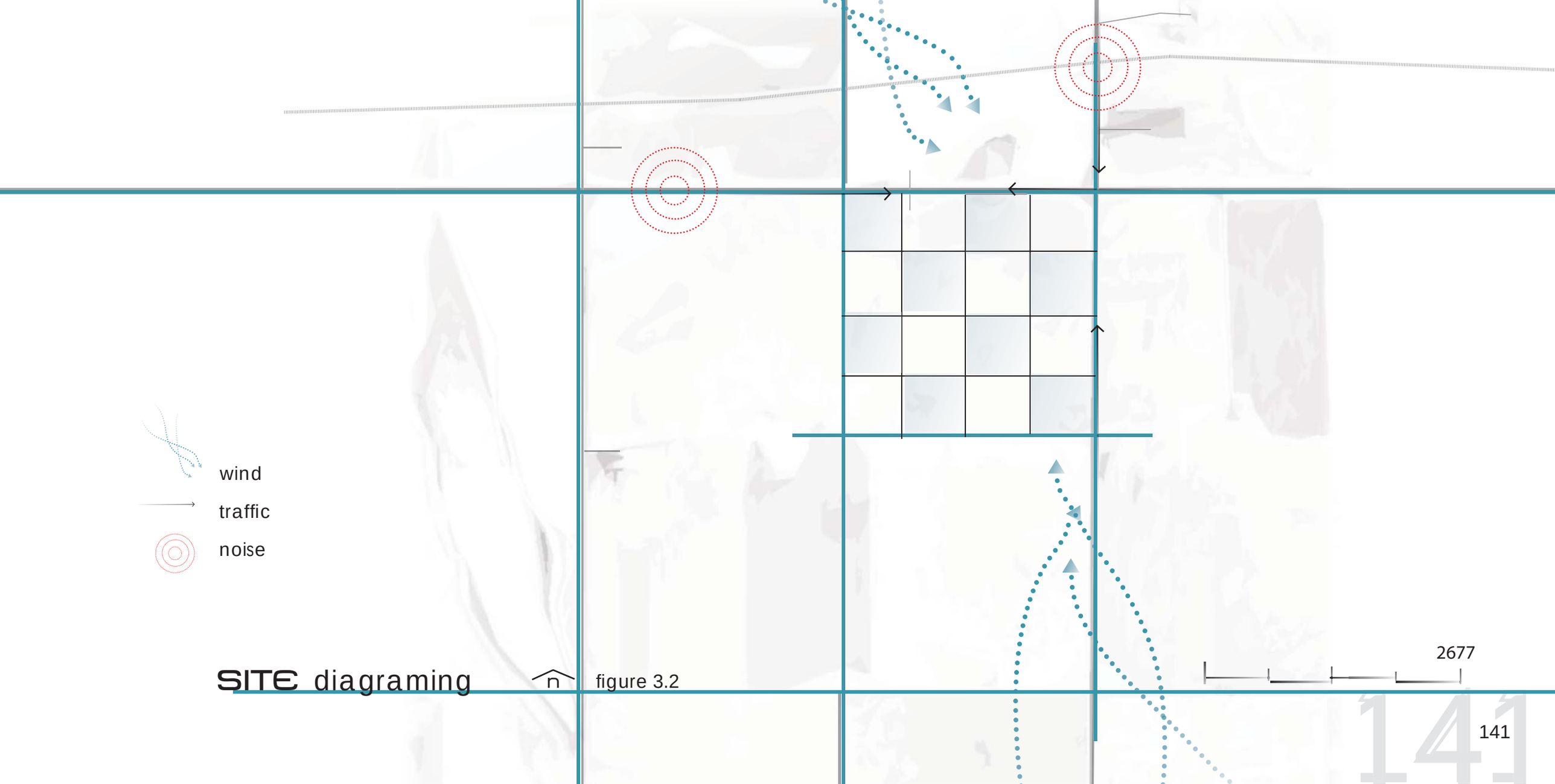
figure 5.1

- fall
- spring
- summer
- winter

SHADING studies

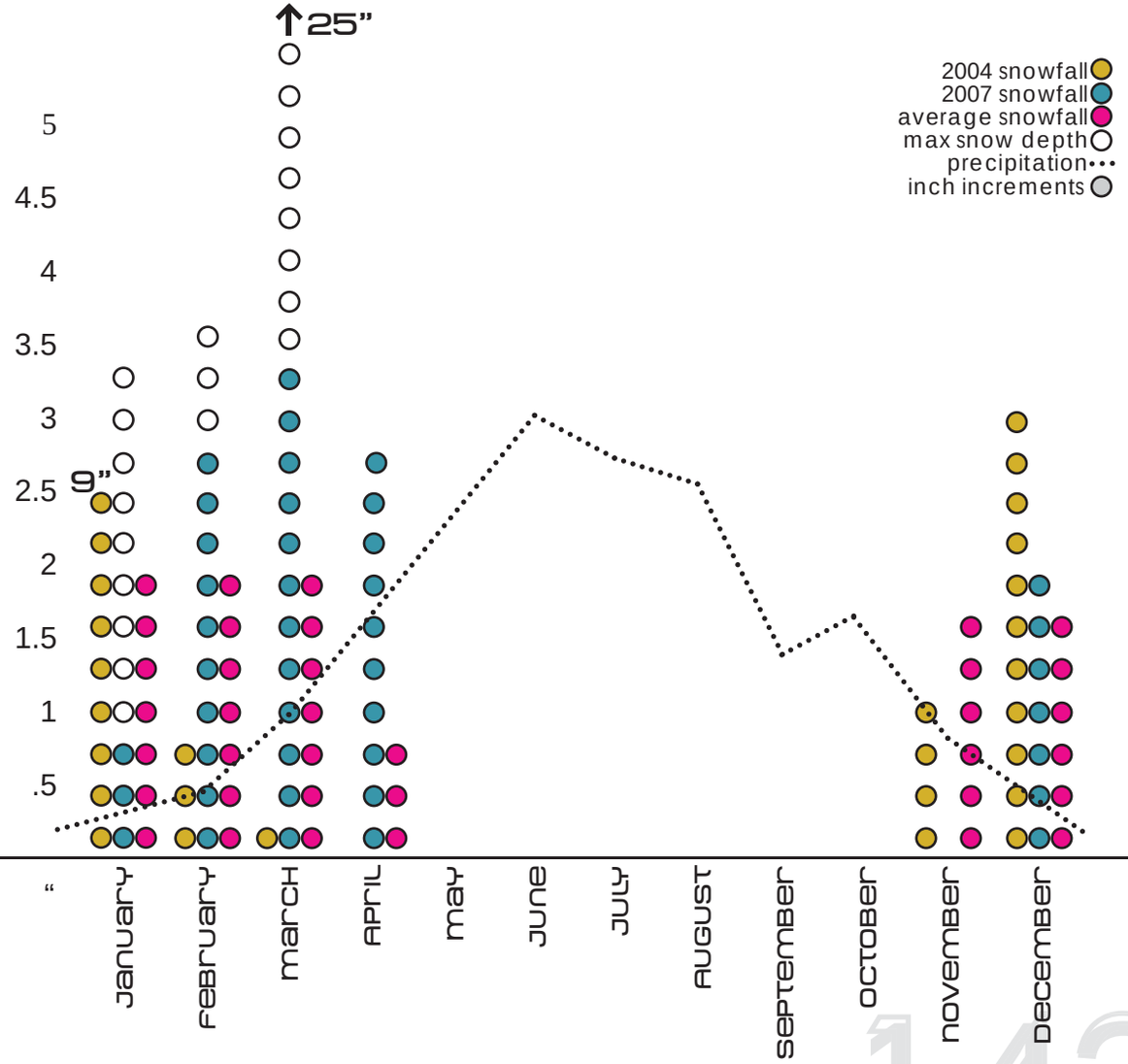
site Topography

figure 6.1



SITE diagraming

figure 3.2


25”
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2004 snowfall
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figure 8.1

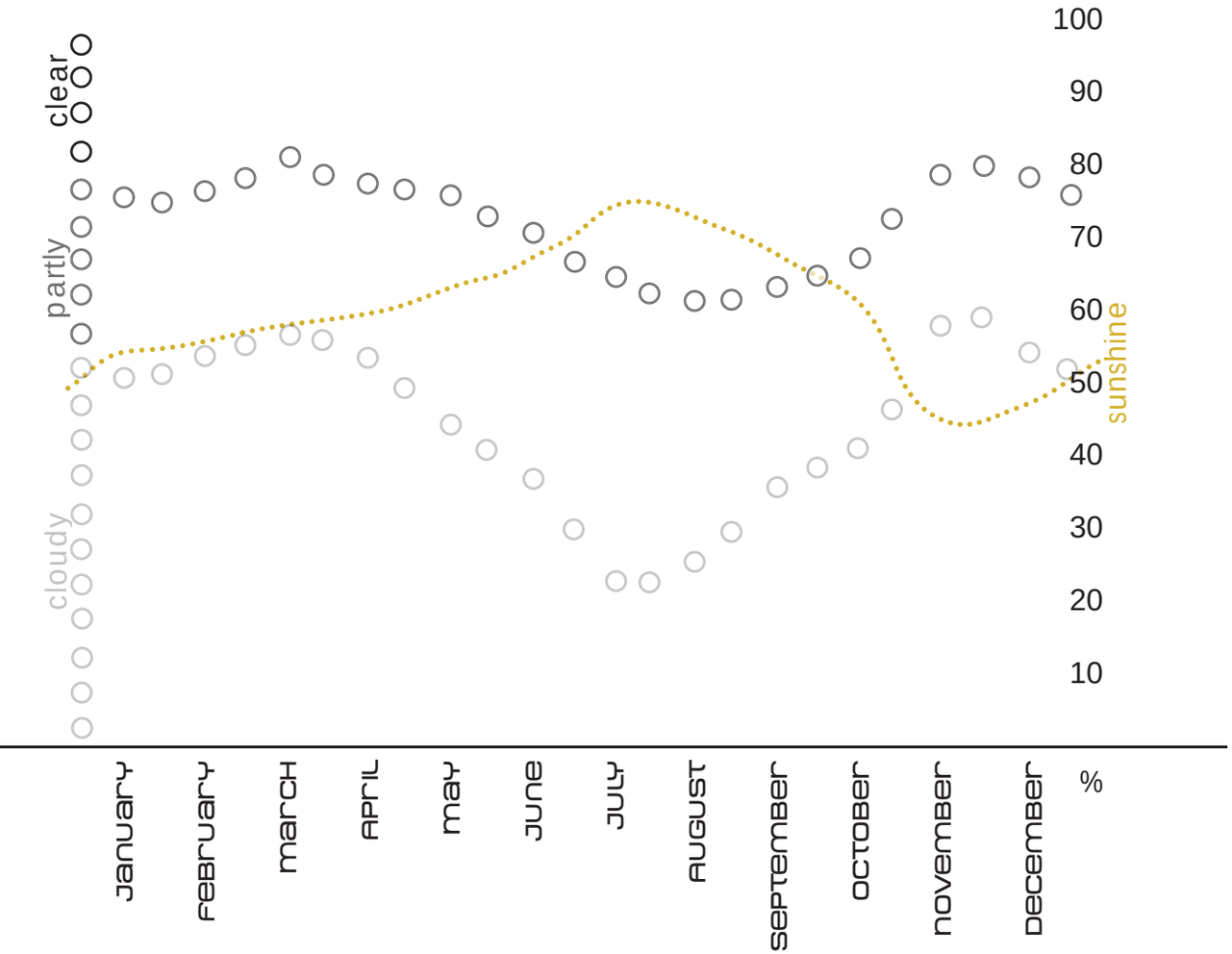


figure 9.1 **CLOUDS & SUNSHINE** diagram

Sun Path diagram

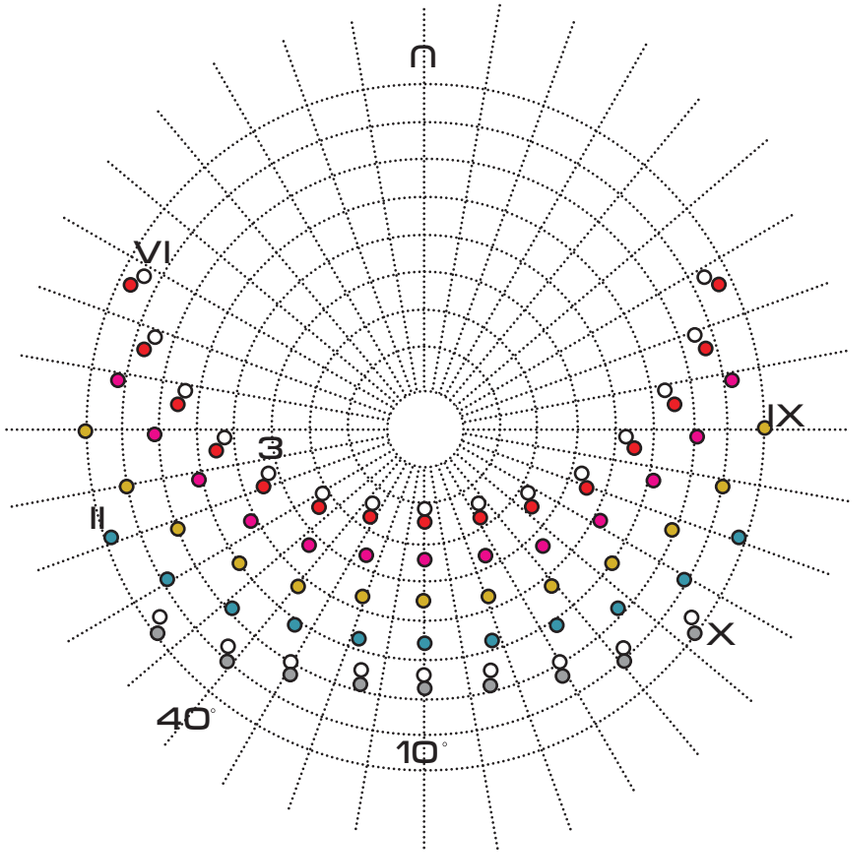
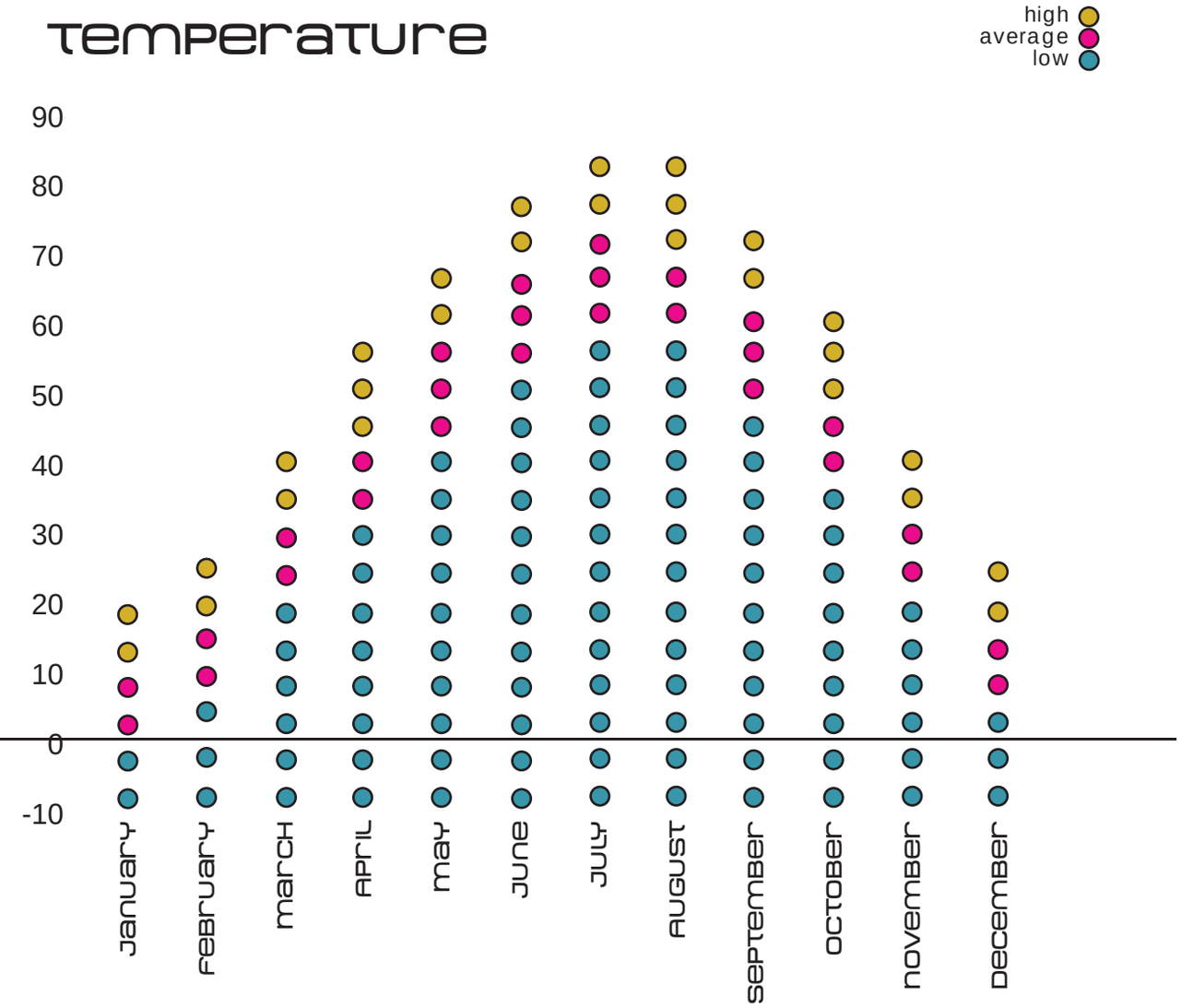


figure 10.1



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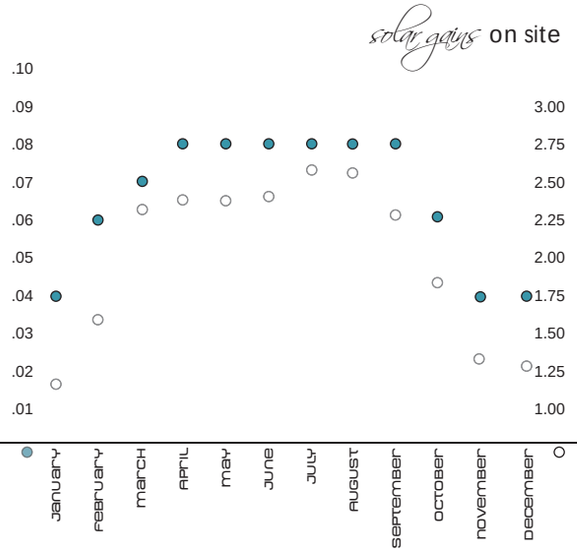


figure 11.1

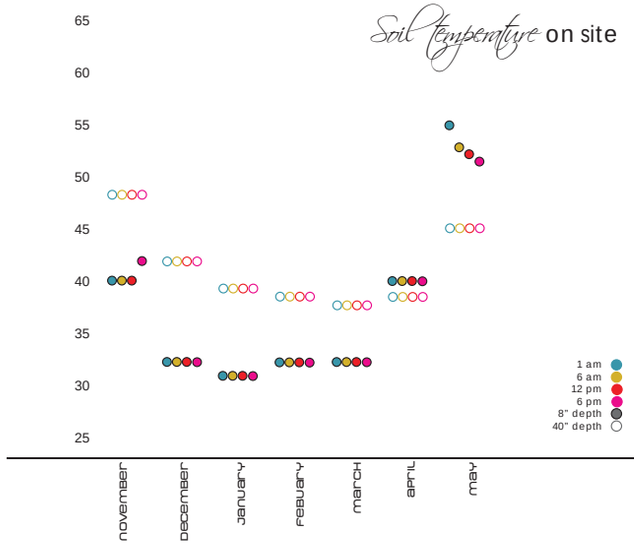


figure 12.1

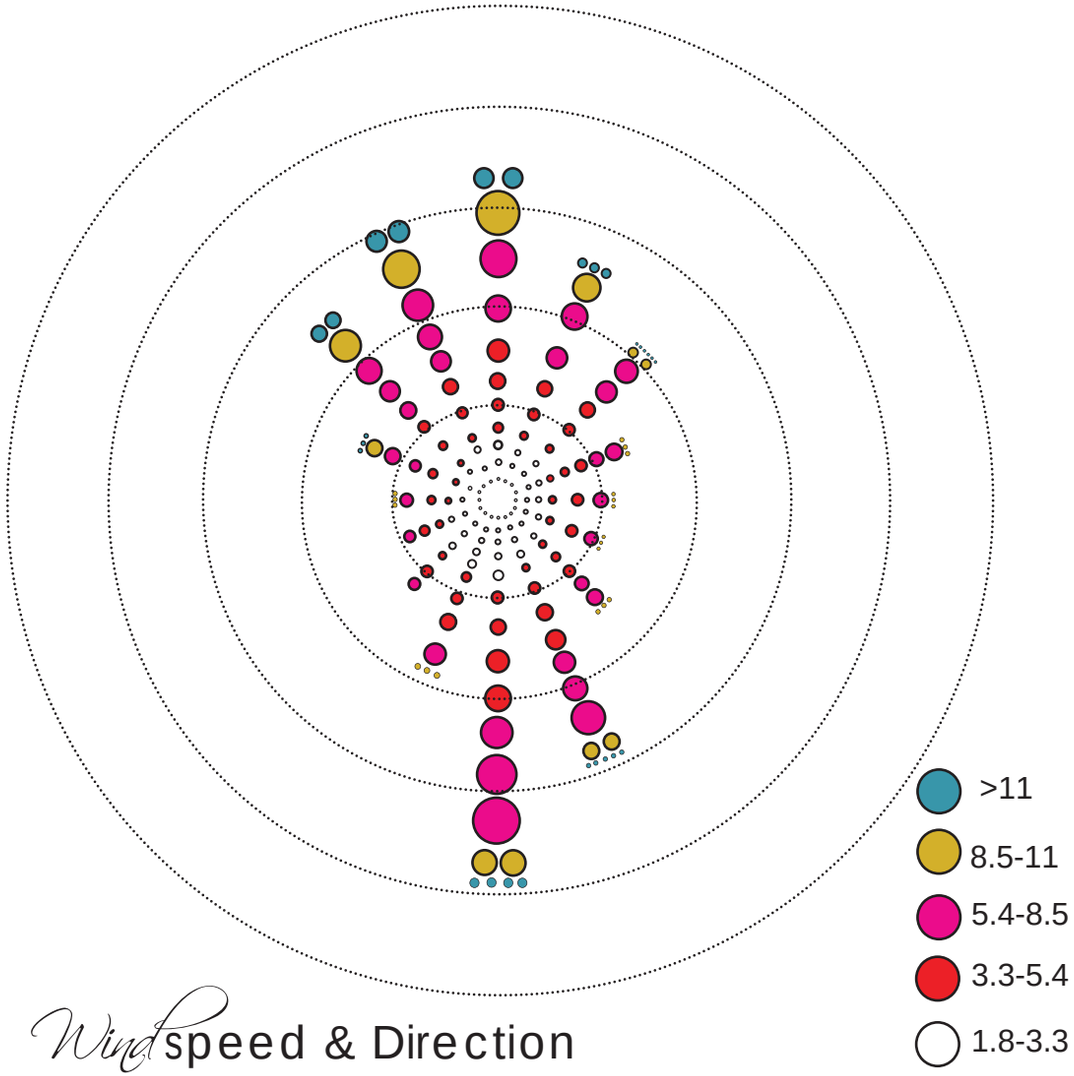
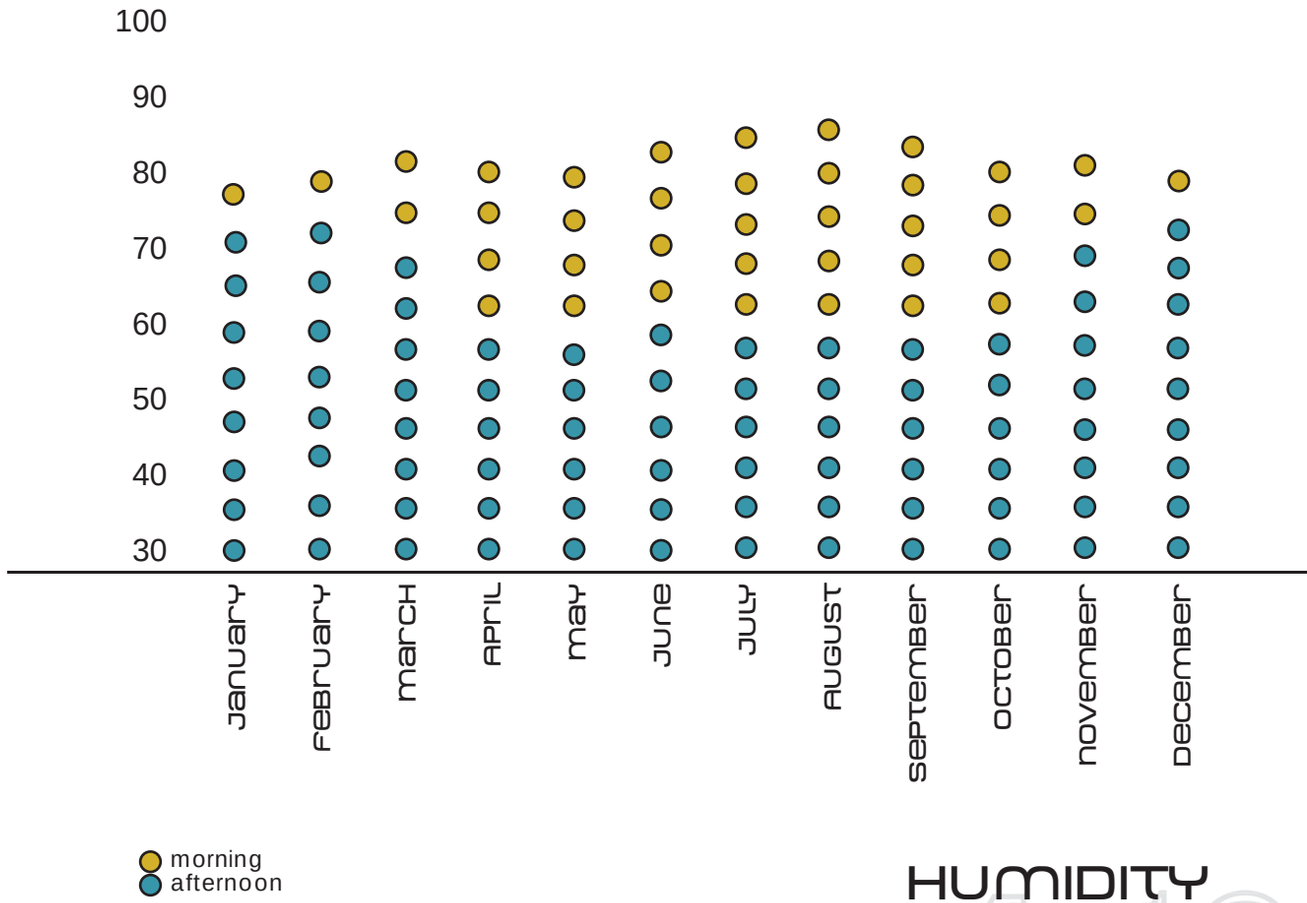


figure 12.1



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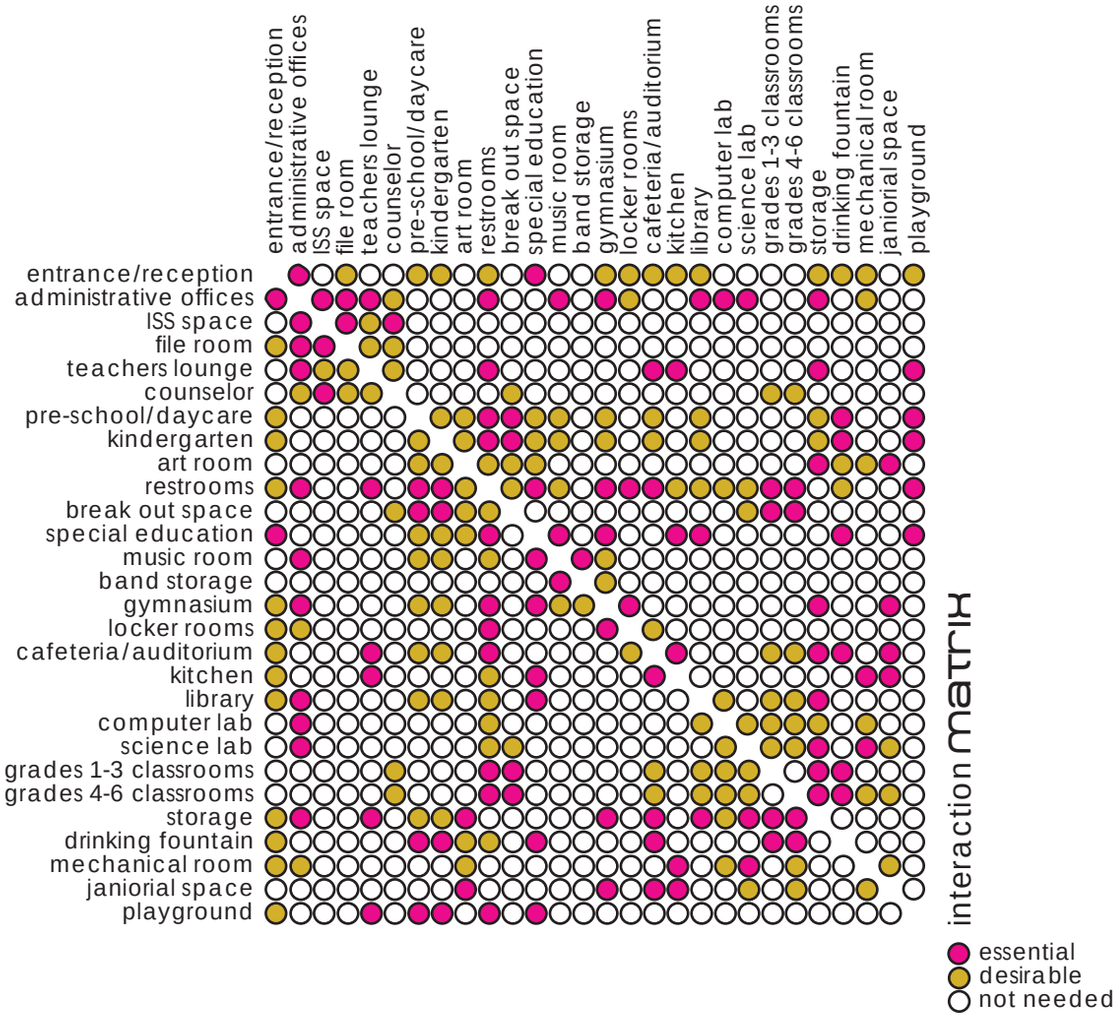
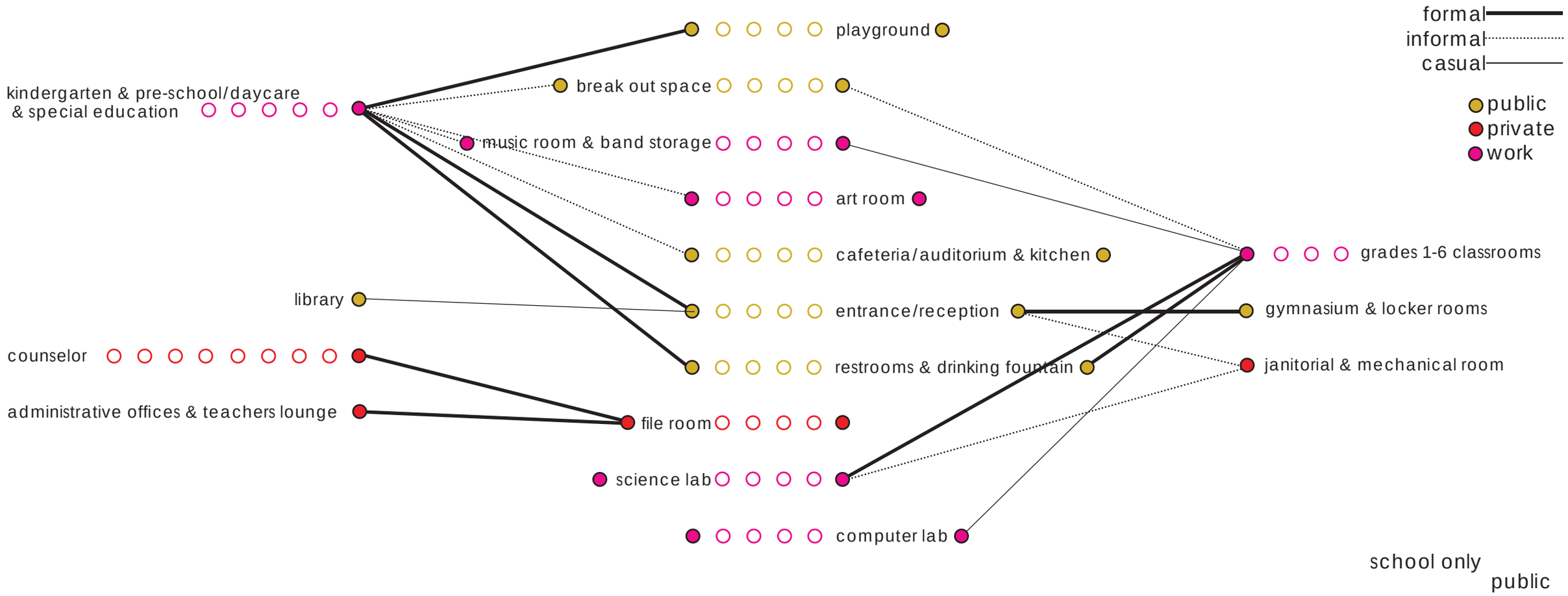

interaction matrix
entrance/reception
administrative offices
ISS space
file room
teachers lounge
counselor
pre-school/daycare
kindergarten
art room
restrooms
break out space
special education
music room
band storage
gymnasium
locker rooms
cafeteria/auditorium
kitchen
library
computer lab
science lab
grades 1-3 classrooms
grades 4-6 classrooms
storage
drinking fountain
mechanical room
janiorial space
playground
essential
desirable
not needed


formal
informal
casual
public
private
work
kindergarten & pre-school/daycare & special education
library
counselor
administrative offices & teachers lounge
playground
break out space
music room & band storage
art room
cafeteria/auditorium & kitchen
entrance/reception
restrooms & drinking fountain
file room
science lab
computer lab
grades 1-6 classrooms
gymnasium & locker rooms
janitorial & mechanical room
school only
public

square Footages

Total **55,000 SQ. FT.** (with program and additional circulation space)

400	reception
	administrative office
	ISS space
	file room
	work area
300	teachers lounge
1,600	pre-school
1,125	daycare
1,600	kindergarten
540	break-out art room
1,450	restrooms
540	break-out reading room
1,125	special education
1,360	music/band/drama room
	office
520	storage
10,000	gymnasium
150	concessions
1,000	stage
1,000	locker rooms
150	coachs' office
3,450	cafeteria/gathering space
700	kitchen
2,700	library
	computer lab
	break-out reading area
	libarian
700	break-out science lab
3,375	grades 1-3 classrooms
3,375	grades 4-6 classrooms
1,450	mechanical room
230	janitorial space
2,350	coat/dressing space

final Boards


classrooms
pre-k to sixth grade + special education
mechanical
coats and boots
shared science room
art room
break out room
outdoor learning space
office
principal/file/work/front desk
restrooms
music/band/drama room
storage
locker rooms
kitchen
teacher's lounge
gym teacher office
concessions
cafeteria
janitor
stage
gymnasium
library/computer lab
elevator
fire escape
336TH avenue
Patterned geothermal system
with stone makers.
Each student has their own stone and
can paint it however they desire.
Also a reminder of the systems at use.

Everyday towns are dying, resources are disappearing, and memories are fading. Memories and experiences are what make us the unique individuals we are and they develop what we are accustomed to. They affect our future. What does our future hold? Our future is in those that are young. What experiences and memories will make them who they will become?

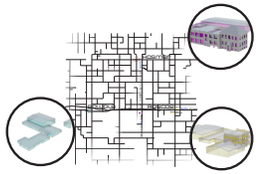
In rural areas schools are merging and towns are dying. The children in those towns, our future, are being displaced from their communities and they are losing their roots. The communities they once loved die and the places they once enjoyed become abandoned and fall to pieces. The heart and soul of a small town is in its sense of community and as the towns die one can see that sense of community struggle to hang on. While disheartening, there is nothing like the twinkle in the eye of someone who is able to relive for a second a memory of a time and community that is gone.

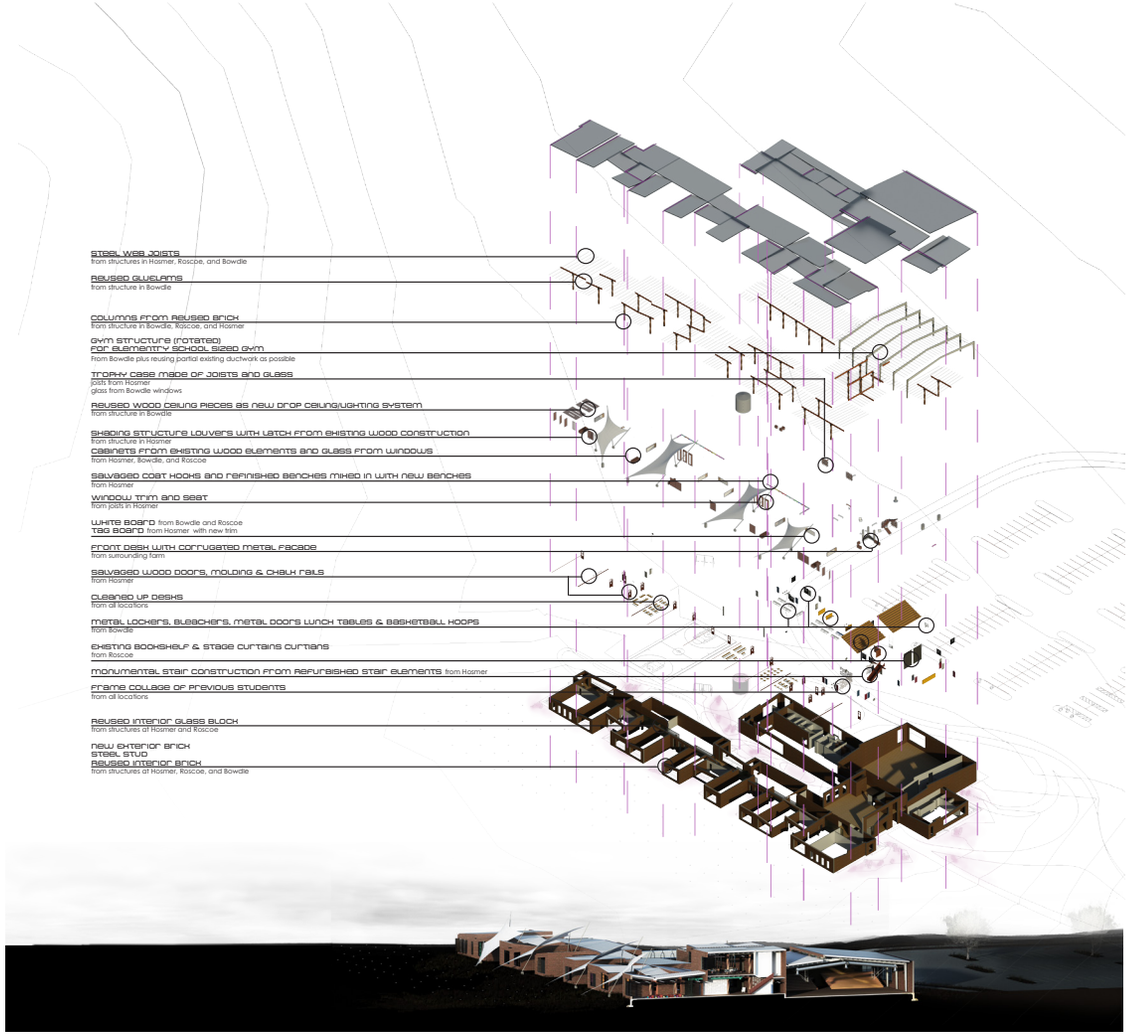
Hosmer, South Dakota is such a town and its school has become abandoned. Much like Hosmer, the surrounding towns of Roscoe and Bowdle will inevitably face another merger leaving more children and their memories displaced

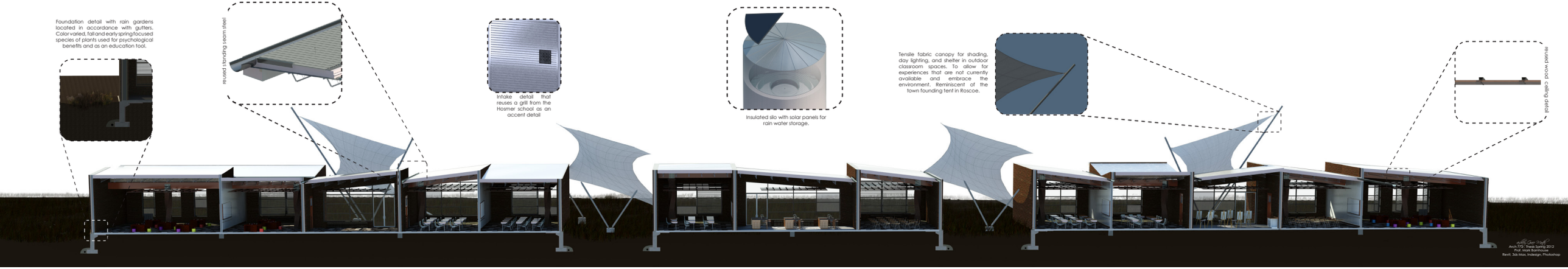
What if we could change that, protect the environment, improve student life, embrace the land, and celebrate the strong, hardworking & forward thinking roots of these small towns? This new school seeks to accomplish this and create the sense of memory, community, and opportunities they deserve.

This school takes Hosmer, Bowdle and Roscoe and brings them together in a centrally located school. A school made out of the materials of the existing schools. These materials are located in close proximity to the location of the new school, will instill a sense of memory, and put to use many materials that would become waste. By centrally locating the school it will promote a new holistic community while also keeping alive each town. This school will surpass each existing school's amenities and promote a more interactive school setting with outdoor spaces and prevalent systems. This school will promote a small school feel and ignite memories of the old while embracing sustainable reuse. Hopefully the students now will be proud to call this area home, a home with an even stronger sense of community through aesthetically pleasing spaces that promote community activity. Deconstruction of the buildings will take work but strong work ethic is what these communities thrive on and is what is needed for a brighter future.

As architects we can make a difference and impact generations to come by preserving our most precious resources and the natural beauty of the world around us, enriching people's lives, instilling positive memories, renewing a sense of community, and reusing what is around us by rethinking design.






Foundation detail with rain gardens located in accordance with gutters. Color varied, fall and early spring focused species of plants used for psychological benefits and as an education tool.
reused standing seam steel
Intake detail that reuses a grill from the Hosmer school as an accent detail
Insulated silo with solar panels for rain water storage.
Tensile fabric canopy for shading, day lighting, and shelter in outdoor classroom spaces. To allow for experiences that are not currently available and embrace the environment. Reminiscent of the town founding tent in Roscoe.
reused wood ceiling detail
Arch 572 | Thesis Spring 2012
Prof. Mark Bomhouse
Revit, 3ds Max, Indesign, Photoshop

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*"No better place than here.
No better time than now."*
- Unknown

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