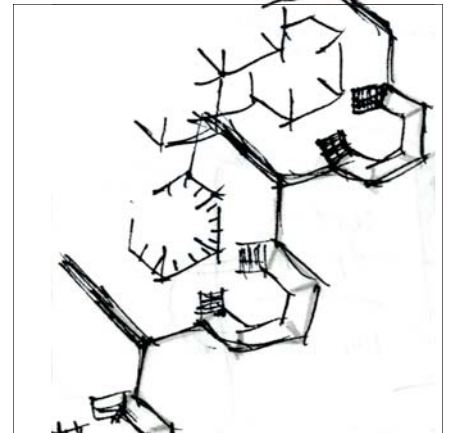


**educative  
junction**



Jason Lee Sumner

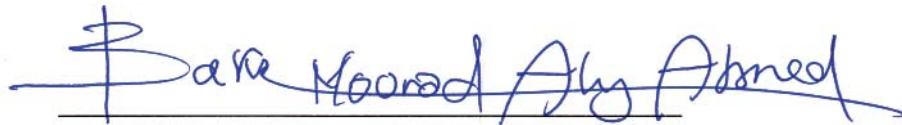
# Educative Junction

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

By

Jason L. Sumner

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



Primary Thesis Advisor



Thesis Committee Chair

September 2010  
Fargo, North Dakota

# Non-Exclusive Distribution License

By signing and submitting this license, I, Jason L. Sumner, grant to North Dakota State University (NDSU) the non-exclusive right to reproduce, translate (as defined below), and/or distribute my submission (including the abstract) worldwide in print and electronic format and in any medium, including but not limited to audio or video.

I agree that NDSU may, without changing the content, translate the submission to any medium or format for the purpose of preservation.


I also agree that NDSU may keep more than one copy of this submission for purposes of security, back-up and preservation.

I represent that the submission is my original work, and that I have the right to grant the rights contained in this license. I also represent that my submission does not, to the best of my knowledge, infringe upon anyone's copyright.

If the submission contains material for which I do not hold copyright, I represent that I have obtained the unrestricted permission of the copyright owner to grant NDSU the rights required by this license, and that such third-party owned material is clearly identified and acknowledged within the text or content of the submission.

If the submission is based upon work that has been sponsored or supported by an agency or organization other than NDSU, I represent that I have fulfilled any right of review or other obligations required by such contract or agreement.

NDSU will clearly identify my name as the author or owner of the submission, and will not make any alteration, other than as allowed by this license, to my submission

  
Signature

5-11-11  
Date

# Table of Contents

|    |                                     |    |                      |
|----|-------------------------------------|----|----------------------|
| vi | Abstract                            | 56 | Site Reconnaissance  |
|    |                                     | 60 | Program Requirements |
| 1  | The Statement of Intent             | 63 | Design Documentation |
| 2  | Problem Statement                   | 64 | Process              |
| 3  | Statement of Intent                 | 66 | Final Design         |
|    |                                     | 70 | Reference            |
|    |                                     | 73 | Personal             |
| 5  | The Proposal                        |    |                      |
| 6  | Narrative                           |    |                      |
| 7  | User/Client Description             |    |                      |
| 8  | Major Project Elements              |    |                      |
| 9  | Site Information                    |    |                      |
| 11 | Project Emphasis                    |    |                      |
| 12 | Plan for Proceeding                 |    |                      |
| 13 | Studio Experience                   |    |                      |
|    |                                     |    |                      |
| 15 | The Program Document                |    |                      |
| 16 | Theoretical Premise / Unifying Idea |    |                      |
| 22 | Research Summary                    |    |                      |
|    | Case Studies                        |    |                      |
| 24 | 1 Open Air School                   |    |                      |
| 26 | 2 Lick-Wilmerding High School       |    |                      |
| 28 | 3 Delft Montessori School           |    |                      |
| 30 | Typological Summary                 |    |                      |
| 32 | Historical Context                  |    |                      |
| 38 | Project Goals                       |    |                      |
|    | Site Analysis                       |    |                      |
| 40 | Narrative                           |    |                      |
| 44 | Soils                               |    |                      |
| 45 | Water Table                         |    |                      |
| 46 | Site character                      |    |                      |
| 48 | Utilities & traffic                 |    |                      |
| 49 | Site Character                      |    |                      |
| 50 | Topography & vegetation             |    |                      |
| 52 | Base Map                            |    |                      |
| 53 | Climate Data                        |    |                      |

# Abstract

**Educative Junction:** A new model for public high school education. Sioux Falls, South Dakota. To inspire a greater value of mandatory public education in the eyes of students, a school built to accommodate that education should evoke, in a poetic sense, imagination and an aspiration for knowledge. Education is the foundation of virtually all facets of society, rippling its efficacy in tandem with societal development. The inspiration of students toward seeing the value of their own education and self-improvement is pivotal in the progression of the educational system and the infinite implications of that progress. The typology of this project is a public high school without lecture-focussed classrooms.

Key words: **Education, Public High School**

the  
statement  
of intent

## Problem Statement

How can a built environment provoke students' *desire* for educational, cognizant, and imaginative development?

Typology:

A public high school without lecture-focussed classrooms.

## Statement of Intent

Claim:

Built environments intended for education have the capacity to instill in students, by way of poetic suggestion, a desire for knowledge and imagination.

Premises:

Public schools in particular are the built environments in which a majority of students are influenced on many physical and metaphysical levels.

Those environments have the capacity to inspire students beyond a knowledge of objective format.

When students genuinely *desire* to learn and seek self-improvement, education assumes a much greater value.

By means of poetic evocation, those environments should yield that desire in students.

Conclusion:

To inspire a greater value of mandatory public education in the eyes of students, a school built to accommodate that education should evoke, in a poetic sense, imagination and an aspiration for knowledge.

Justification:

Education is the foundation of virtually all facets of society, rippling its efficacy in tandem with societal development. The inspiration of students toward seeing the value of their own education and self-improvement is pivotal in the progression of the educational system and the infinite implications of that progress.

# the proposal

## Narrative

While the foundation of compulsory education is of good intent, an unbalanced emphasis falls on active lecture rather than active students and environment. Well-rounded education and objective results are highly regarded. However, those values are insignificant with regard to the value *students* place on their own education. The goals are to graduate and receive high marks. A more valuable goal would be for students to learn and understand how to utilize what they've learned.

The built environments meant to accommodate learning often rely entirely on a passive containment of lectures and activities. Rigidity and monotony of those environments could be substituted by captivation and imagination to activate a learning aspiration in students.

The near completion of my own education has triggered an assessment of effective learning. My personal finding is that a *desire* for the education is crucial. It is in the desire of learning itself that education takes on personal value to students. While compulsory education may leave little room for desire, such a suggestion could be key in motivating students of public schools.

## User/Client

User:

The primary users of the school will be the enrolled public students and the associated faculty and administration. Typical usage of the facility will occur during designated school operation hours and perhaps evenings for special events.

The following are estimates of the number of student and faculty users of the facility:

|                         |               |
|-------------------------|---------------|
| Students: grades 9-12   | 120 per grade |
| 480                     |               |
| Faculty                 | 15:1 ratio    |
| 32                      |               |
| Approximate total users |               |
| 512                     |               |

Client:

The South Dakota State Board of Education and the residents of downtown Sioux Falls will be the primary clients of the project. They will have democratic governance over the operation of the school through the election of a school board.

## Major Project Elements

### Library

An extensive library of mixed media resources and associated reading spaces will serve as the major hub of student research and individual activity.

### Communal Spaces

For purposes of group discussions and collaborative projects, multiple common spaces will be available.

### Green Space

Expansive green space will encompass the environment of the school, melding exterior and interior reading and communal spaces.

### Studios

Studio spaces may be utilized for messy or loud creative activities.

### Auditorium

Theatrical, musical, and guest assemblies may all be accommodated in the auditorium.

### Kitchen/Cafeteria

Nourishment of students and faculty will be accommodated in the cafeteria.

### Administration

Offices will exist for administrative and faculty personnel and associated duties.

### Support Spaces

Various mechanical spaces, restrooms, storage closets, and circulation will serve and maintain the passive and active functions of the school.

The elected site for the project is located in Sioux Falls, South Dakota, Midwestern United States. The city is distinguished for the falls of the Big Sioux River, which was the feature that drew the city's earliest settlers.

Sioux Falls resides within Minnehaha County as its county seat. As the most populous city in South Dakota, Sioux Falls is also the most cultural diverse.

## Macro Site



Images from Google Earth



## Micro Site



From Google Earth

On a more focused scale, the site is currently the location of the Great Northern Railway Depot and associated tracks running through downtown Sioux Falls. The railway has recently been scheduled for removal to pave the way for long-awaited downtown redevelopment.

The Big Sioux River lies just west of the site, with 8th Street and 6th Street bridges spanning it. The aforementioned historic falls lie just to the north.

## Project Emphasis

This thesis will explore the relationship between public student education, aspiration and poetic suggestion of the built environment. Close attention will be paid to how students respond to particular case study environments. An holistic understanding of the methods by which students acquire knowledge will be a primary focus for investigation.

## Plan for Proceeding

### Research Direction

Mixed-method research for the project will be conducted with emphasis on a qualitative and quantitative approach. The project typology, theoretical premise/unifying idea, supporting premises, chosen site, various case studies, and the system of education will be the fields of inquiry.

### Design Methodology

This research will be gathered by various means though always concurrent with the theoretical premise/unifying idea. Relevant graphic, textual, and verbal information will all be collected from available sources. Analysis of the collected research will be continually weighed in relationship to the thesis project.

### Documentation of Process

All research materials, information, and conceptual ideas relating to the design process shall be documented by means of digital images and records, sketches, physical artifacts, and models. All sources will be cited for convenient reference and influence toward the final thesis project.

## Studio Experience

Fall 2007 - ARCH 271

Darryl Booker

Tea House - Fargo, ND

Rowing Club - Minneapolis, MN

Ecologist Dwelling - Bear Lake, CO

Spring 2008 - ARCH 272

Stephen Wischer

Threshold Design - Downtown Fargo, ND

Music-Inspired Dwelling - Fargo, ND

Fall 2008 - ARCH 371

Ron Ramsay

Spirit Casino - Agincourt, IA

Public Library - Moorhead, MN

Spring 2009 - ARCH 372

David Crutchfield

Performing Arts Center - Austin, TX

Hotel/Boutique - AZ

Fall 2009 - ARCH 471

Don Faulkner

Mixed-Use High Rise - San Francisco, CA

Instrument Creation - KKE Competition

Spring 2010 - ARCH 472

Booker, Kratky, & Gleye

Viable Community - Santo Domingo, DR

Livingston School - Tanzania, Africa

Housing Design - Santo Domingo, DR

Fall 2010 - ARCH 771

Steve Martens

Town Hall Preservation - Florence, SD

Former American Legion HQ - Fargo, ND

Former Pence Auto Building - Fargo, ND

Spring 2010 - ARCH 772

Bakr aly Ahmed

Public High School - Sioux Falls, SD

**the  
program  
document**



“Progress in knowledge...involves more than the accumulation of objectively valid cognitions; it means the growth of a subject progressively better equipped to know and to be the validating source of the knowledge it has or acquires.”

(Rogers, 1983)

## Theoretical Premise/ Unifying

Learning is a natural process, both existentially ingrained in our human growth and a necessity in the functioning and maintaining of our civilization. Why then should any student be reluctant to engage in such an activity? The individual capacity for knowledge is virtually unlimited, yet evident and ulterior motives always drive the particular ways in which students learn and seek to learn.

Distinct subjective motivations affect the outcomes of education both quantitatively and qualitatively. Noel Entwistle identifies three broad classes of student motives: (1) the need to demonstrate self-worth paired with the assumption that one will fail (to avoid being “the fool”); (2) the need to demonstrate self-worth paired with the assumption that one will succeed (striving for praise and high grades); and (3) pure interest in learning (as in self-actualization). These motives are further distinguished with the former two being extrinsic while the latter is intrinsic, describing students’ learning for the sake of the goals of others or for their own personal development (Schmeck, 1988). Understanding these motives is integral in understanding the ways in which students approach the tasks set before them.

What is learned and how it is learned are two inseparable aspects of learning (Schmeck, 1988). Consequently, that relational nature be-

tween the context of the learning process and learning outcomes should be of primary focus for the improvement of learning.

In the education system today, a particular type of learning is dominant in which students are intended to improve their understanding of some phenomenon in the world by means of symbolic representation of that phenomenon, usually in the form of text. This dominance does not coincide with the world outside of the

## Research Results Idea

educational system. Bridging this gap requires an understanding from the student beyond a surface approach to learning. It is only through this bridging that learning embodies valid meaning in individuals beyond the educational environment.

Adaptation is a key concept in the relationship of the educational context and the learning outcome. Students must not only adapt to what is expected of them, but also to their environment and the context of phenomena they are asked to understand. However, adaptation itself does not necessitate that learning occurs (Schmeck, 1988). One primary way in which students adapt to context is in attempting to deliver what the teacher is likely to reward (Baird & Lutkus, 1982). Again, this motive is extrinsic, and does little in the development of self.

Many different studies have been conducted with the goal of distinguishing different learning “styles.” The intent of determining these “styles” is to better target and respond to the ways in which students approach learning. Judging from the myriad resulting “styles,” the fact remains that all students are individuals. To attempt to classify individuals is to limit them unnecessarily. Reflecting on my own personal education and attitudes toward learning, I fail at classifying my particular “style” (Unless this is a revelation of my nature as a non-

conformist). I change and adapt. In my youth, I tended to prefer mathematics, science, and other analytical studies with singular objective solutions. Over time, I have become more comfortable with the ambiguous, the intersubjective, and the aesthetic studies of literature, the arts, and naturally, architecture. Regardless of the notions of “learning styles,” individual self-awareness of the ways in which learning occurs can open the doors of self-actualization.

## Theoretical Premise/ Unifying

“The self establishes both understanding and meaning. Meaning does not inhere in immanent or transcendent things; it is a dynamic relationship between self and its experiences.”

(Husserl, 1960)

Self-reflection, self-awareness, and self-expression are keys to the integration of knowledge in the lived world. Emotions such as shame, self-doubt, feelings of helplessness, and general fear and avoidance of evaluation can be detrimental to individual growth (Schmeck, 1988). The educational environment should be sensitive to such vulnerabilities related to low self-esteem. Students’ psychological states have a profound effect on their learning. The determinates of those states can be anything and everything from home life, relationships, and peer attitudes, to environmental stimuli. It is the effects of the environment that are often unconscious to the students, but greatly influential nonetheless.

Feelings about one’s self influence learning primarily under stressful conditions. Teachers need to consider all forms of motivation and all forms of social influence. The essential difference between supportive and non-supportive settings is acceptance of the student (Schmeck, 1988). Students should always feel respected as individuals whether or not their answers are correct.

Introducing self-expression with course content can immediately improve the performance of students, provided that it is encouraged (Schmeck, 1988). Often, educators may fall into the habit of simply “catching” students in the act of making errors. More emphasis should be placed on rewarding rather than criticizing self-expression.

## Research Results Idea

In *Child Mind Architecture* (Baird & Lutkus, 1982), Kaj Noschis identifies a key concept in the relation that students draw with their environment. Students either have an active or reactive understanding of their physical context, as in determinism opposed with freedom. Either they act according to their representations reducing the environment to a setting where activity occurs, or the environment determines their activity. It is most often acknowledged, though, that these two perspectives must have a reciprocal dependency.

The balance between freedom of the individual and ability to collaborate in group is pivotal in socialization. Too much freedom could mean chaos, while uniformity, imposed by adults, could lead to impersonal conformity or rebellion (Montessori, 1976). A learning environment must specifically encourage social development with both engaging materials for the individual and spaces for interaction.

Traditional models of space are seeing a dissolving of meaning as space becomes less specialized. Educational space can be shaped around patterns of human interaction and the needs of particular subjects for particular activities, but rather, the focus has been on flexibility. Designing “flexible” space is too often used as an allowance for a subsequent lack of design focus and specificity.

A particular lack that I have found in educational environments is opportunities for creative interaction with the environment. The environment itself is what should be seen as flexible. Empty space is inactive space unless the built elements suggest an activity conducive with that malleable environment.

Montessori schools are one such environment that I have discovered through case studies. Ac-

ording to the Montessori method (although the exact definition of that is disputed), educators must act more as careful observers than dictators. Children naturally instigate their own sort of development. The recommended approach then is to manipulate the environment so as to suggest the development of social, individual, and intellectual skills (Montessori, 1976).

Criticisms of the Montessori method often revolve around the false idea of “auto-learning.” The Montessori environment is in fact heavily structured. Home-schooling is actually somewhat of an offspring of method, reliant upon the influence of the parents. The only form of punishment used in Montessori Schools is a brief separation of the misbehaved student from the group. This social banning is a rather ingenious method of affirming the value of socialization.

One other criticism is of Maria Montessori’s lack of thorough description of the method itself. It was often thought that the method revolves around her personality alone and that the method had no practical applications to a larger scale implementation. The survival and growth of the Montessori school may provide the best counter argument.

The study of learning paradoxically highlights the importance of individuals’ decisions and previous experiences in understanding learn-

## Theoretical Premise/ Unifying

## Research Results Idea

ing processes and outcomes. Some individuals reveal a capacity to adapt to or shape the environment of learning more effectively than others, and this capacity appears to be learnable as it is in professions and academic disciplines. Variability in strategies to suit contexts is an important component of this capacity. Students who are aware of their own learning strategies and others available can be said to be responding metacognitively (Schmeck, 1988).

While flexibility in learning styles is educationally desirable, such strategic study behaviors are less so, often because of the extrinsic motives. Attempting to teach general learning skills often fails in this manner. Such attempts are themselves part of the context of learning. They do not exist separately from the remainder of the student’s experience; they are interpreted, just as learning tasks are interpreted in their educational context.

The ever-present gap of interpretation is rarely so clear as when we fail to recognize that others *must* interpret us. What we say is not directly understood. What we teach is not directly absorbed. It is interpreted. Our actions, our abstract language and text, and all of our creative efforts are subject to perception. It is perception of the individual and the development of self which must be cultivated in the context of the educational environment. In this way, the built environment in which learning is to occur must suggest itself an engagement with perception and the interpretive nature of the individual to which it responds.



## Theoretical Premise/ Unifying summary

One of the primary conclusions that I have drawn from my research is the necessity of creating an educational environment which echoes the activity of learning itself rather than constructing space to contain it. Students respond to their environment psychologically as well as physically which directly affects their capacity to learn. As stated previously, what is learned and how it is learned are two inseparable aspects of learning (Schmeck, 1988).

It is essential to understand the motives of students and perhaps for them to even be aware of their own motives in order to appreciate the shortcomings in education. Self-actualized learning of the subject should be the ultimate goal. The values of the educational system are insignificant next to the value that students place on their own learning.

Self-reflection, self-awareness, and self-expression are keys to the integration of knowledge in the lived world. These traits have to be encouraged and perhaps even provoked by the educational environment.

Students must adapt to their context in a perpetual search for and establishment of meaning between themselves and the world. As Husserl (1960) says, "The self establishes both understanding and meaning...It is a dynamic relationship between self and its experiences."

## Research Results Idea summary

The balance between individual freedom of self and the ability to collaborate in group is pivotal in socialization. Excessive freedom becomes chaos, while uniformity, as may be imposed by adults, could lead to the impersonality of conformity and consequent rebellion of individuals.

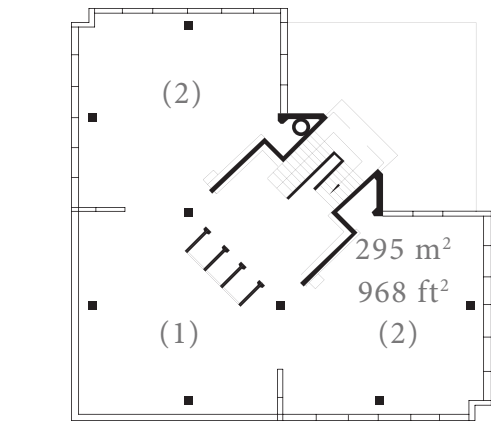
In summation of the theoretical premise, it is the goal of this project/research to inspire a greater value of mandatory public education in the eyes of students. Perception of the individual and the development of self must be cultivated in the context of the educational environment. In this way, the built environment in which learning is to occur must suggest itself an engagement with perception and the interpretive nature of individuals.

## Open Air School Amsterdam

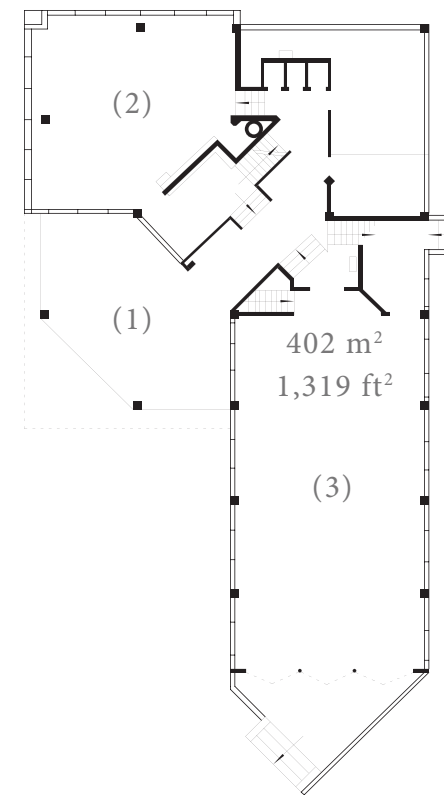
Located in the Netherlands, The Open Air School has functioned in its urban setting as a pre-school and primary school since its completion in 1928. It was designed by Johannes (Jan) Duiker and Bernard Bijvoet shortly after the formalization of the 'open air school movement' in Amsterdam, of which the project is exemplary. The project was originally intended for an expansive greenfield setting in a suburb of the city but was relocated to what was a housing block courtyard. Despite this relocation, the principles of the design remain focussed on light and air (Weston, 2004).



Photography: Roy Hyde



## Case Study Series

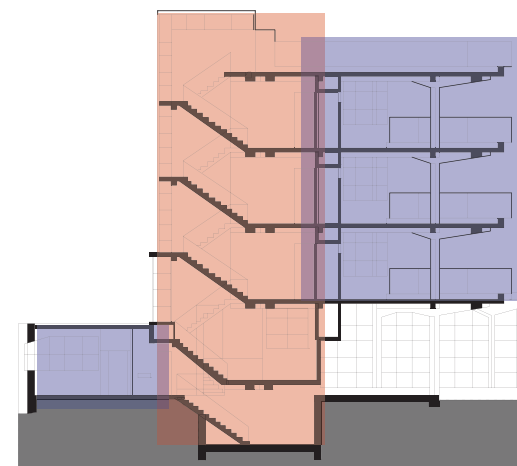


Photography: Roy Hyde

Its light, four-story structure accommodates approximately 220 students in about 4,223 square feet of indoor space (excluding the exterior classrooms). The most distinguishing characteristic of the architecture, though, is its stacked exterior "open air" classrooms (1) which align with its themes of lightness and openness. The primary structural columns are pulled away from the corners, double-cantilevered, and tapered for those emphases (Weston, 2004).

The open air classroom on each floor is juxtaposed with two interior classrooms (2), apart from the main floor, which holds one interior classroom and a gymnasium (3).

The primary motivations of Jan Duiker toward this case emphasize the social over aesthetic. In a way, its environmental and educational sensibility is the particular aesthetic.





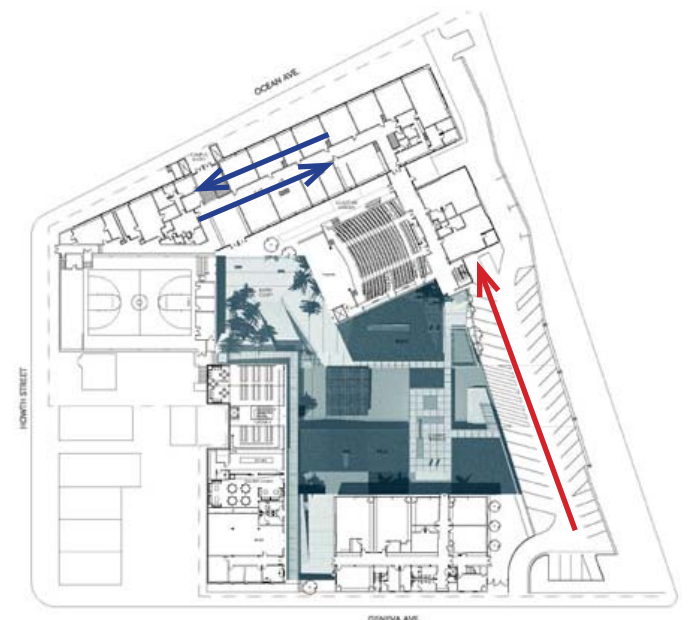
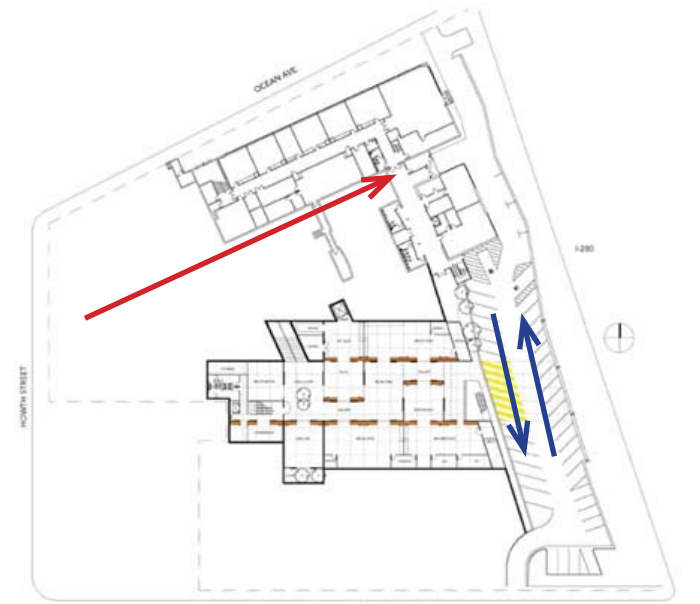
Lick-Wilmerding High School is a non-profit, independent, college preparatory day school located in San Francisco. The invitational-competition-winning renovation was designed by Pfau Architects. The formal intention of the project was to fully integrate the landscape design with the building form, making them essentially one and the same. The facility houses 380 students, and had outgrown its existing dining, performance, and shop facilities.

## Lick-Wilmerding High School San Francisco

The central, single-level configuration of the new shop spaces allows them to orient towards one another, defining a shared work area between them and encouraging student interaction. Shops surround an outdoor courtyard, creating a new centralized campus center out of a previously unused field. A new cafeteria, also at the heart of the campus, creates a positive relationship with both the north courtyard and the new shop core. The landscape design incorporates a terrace into the roof of the shop, and a new, centralized student terrace links the library, shops, and theater/classroom lobby.



## Case Study Series





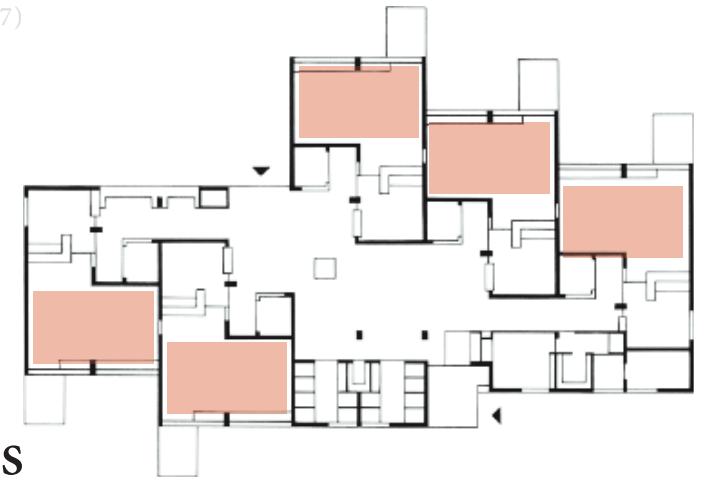
The Dutch architect Herman Hertzberger described his ambition to create “the possibility for personal interpretation by making things in such a way that they are indeed interpretable ... Not only do we interpret the form, the form simultaneously interprets us; it shows us something of who we are.” His 1960 design of the Montessori School in Delft, Holland, brought this idea into fruition (Worthington, 2007).

## Montessori School Delft

Montessori education is particularly concerned with education through individual decision-making. Emphasis then falls on self-directed activity on the part of the child and observation on the part of the teacher (often called a director or guide). It stresses the importance of adapting the child’s learning environment to his or her developmental level, and of the role of physical activity in absorbing abstract concepts and practical skills (Hainstock, 1997).



(Worthington, 2007)



## Case Study Series



(Polyanna, 2005)



(Polyanna, 2005)

The particular sensibility of Hertzberger was to suggest a structure to the environment while still allowing for the indeterminate actions of students. In *Lessons for Students of Architecture*, he describes the floor in the hall of the kindergarten section that has a square depression in the middle which is filled with loose wood blocks. These can be taken out and placed around the square to form a self-contained seating arrangement. The blocks are the scale of low stools, which can be moved by the children all around the hall or piled up to form a tower. The children also use them to make trains. The square hollow where they are kept then could invite a semi-secluded space for further imagination (Hertzberger, 1991).



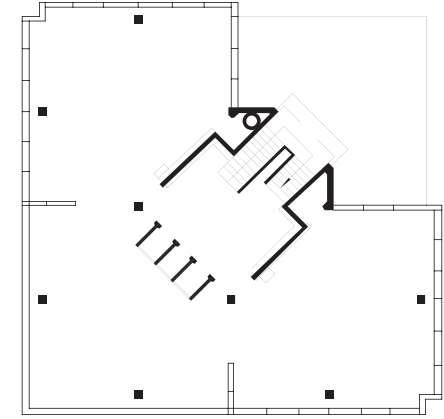
Open Air School  
Amsterdam  
Lick-Wilmerding  
San Francisco  
Montessori School  
Delft

## Case Study Series

These particular cases were chosen for their relation to the theoretical premise/unifying idea. They each respond to the social environment called for in their respective circumstances, each with innovative and environmental-minded solutions. The Montessori School and its associated method called for additional research in relation to the theoretical premise/unifying idea for its social, educational, and environmental implications.

The Open Air School in Amsterdam shares some similarity with the Hertzberger-designed Montessori School in Delft in that they could both be considered part of the Dutch Structuralist movement. The emphasis of both designs fall on social interaction, minimalism, and a strong dialogue between interior and exterior environments. Both cases are quite particular in their detailing so as to facilitate learning while allowing adequate flexibility. The Lick-Wilmerding High School also had a strong dialogue of interior/exterior space and formal unity.

These case studies have both supported and further informed my theoretical premise/unifying idea research.



## Typological Summary



## Historical Context Social Context

Dating back to Thomas Jefferson's proposal for a public education system and even before, our method of learning in the United States has developed with due diligence and time. The basis of our traditional system roots in the late 18th and early 19th century, where schools were often built upon religion tenets. The influx of different nationalities and associated faiths often weakened these church-built models. Jefferson's idea was one of government control, free from religious bias, and his thoughts were sustained and built upon (Thattai, 2001).

By the end of the 19th century, free public education at the elementary level was available to all youth. It was in the 20th century that secondary high school education burgeoned with attendance raising from about 6% in 1900 to approximately 85% in 1996 (Thattai, 2001).

Many historic events have shaped and altered the perspectives and methods of public education, but at the core, the traditional classroom model has remained. A notable exception has been developed by Maria Montessori through her research of natural child development throughout the 19th century. The Montessori method takes a nearly opposite approach to the traditional teaching method. Students are allowed to actively seek and process their own natural methods of learning, while teachers (or rather, directors) observe and maintain relative

## Physical Context Social Context

order and passive influence. Social and intellectual growth is facilitated by the individual, the suggestion of the built environment, and the necessary tools (Montessori, 1976).

Our recent social trends have had seemingly minimal impact on the traditional model classroom and the definitive approach to public education. Technology advancement gradually splices into the scene, but the teacher-student-desks-face-front model is rarely challenged and re-explored. To that end, this thesis will suggest change within the context of the social learning environment. Technology is not an automated means for the facilitation of learning, but rather is itself a craft of interaction with environmental things themselves.

In summary of the social context of this thesis, the American public education system has seen patient development, though rapid increase in attendance since the late 18th century. Traditional classroom environments based on the earliest regimented model remain the rule with few exceptions. Those regimented models were built upon values in religion, unwavering discipline, and conformity of task and manner. It is my view that such a model requires renovation based upon new a philosophy of environmental influence, cultivation of originality, and a new social outlook of the present-day world and the requirements of today's education.





## Historical Context

### Social Context

The city of Sioux Falls was born of and named by the cascades of the Big Sioux River. The distinguishing falls were created by glacial movement some 14,000 years ago, exposing the Precambrian quartzite bedrock. It was the attraction to the site of the falls, now Falls Park, that led early land speculators to found the city. Sioux Falls was chartered in 1883 (City of Sioux, 2010).

Arrival of the railway marked a decade-long period of population growth which transformed the city. Following a depression in the early 1890's came the establishment of the John Morrell meat packing plant in 1909 and an airbase and military radio and communications training school in 1942. In 1955, the city voted to

*Downtown Sioux Falls in 1908, facing west:*



consolidate the neighboring incorporated city of South Sioux Falls. Completion of the interstate highways occurred in the early 1960's. The city has seen much growth and development throughout the 20th century (City of Sioux, 2010).

As the largest and most populous city in South Dakota, Sioux Falls is considered also its most culturally diverse.

## Historical Context

### Physical Context

Much of the growth of Sioux Falls in the first part of the 20th century was fueled by the agriculturally-based industry, such as the Morrell plant and the nearby stockyards (one of the largest in the nation). Sioux Falls has grown at a rapid pace since the late 1970s, with the city's population increasing from 81,000 in 1980 to a 2009 estimate of 158,008.

The area is rich in agricultural, geological, and political history as evidenced by these findings. While South Dakota may not be the most progressive state for the context of this thesis proposal, success of the proposed educational environment would have a profound and lasting impact.



## Historical Context Physical Context

Not long after visiting my initial proposed site near the Washington Pavillion, I came across an editorial in the Sioux Falls newspaper, *The Argus Leader*, about the downtown railroad tracks being scheduled for relocation. This relocation will be monumental for downtown, paving the way for the redevelopment of a vital and extensive area in the heart of the city. My own project, already focused on the downtown setting, quickly shifted to the opportunities offered by this site (Wagner, 2010).

The timeline listed in the article marked an environmental study to take place in June 2011, redesign in 2012-2013, construction of a new switchyard in 2013-2014, and removal of the present tracks to take place in 2014. Funding for the project has long been secured (Wagner, 2010).



## Social Context Physical Context

An interesting note in relation to the physical context is that Sioux Quartzite, like that seen in the falls, has been quarried in various locations near the city over the years. The stone has a hardness of 7 on the Mohs scale, which is extremely hard and suitable for many types of construction. Many buildings in Sioux Falls and area towns, consequently, bear the distinguishing pinkish stone, including the Washington Pavillion, formerly Washington High School.



## Project Goals

### The academic environment

With this thesis, my intention within the academic environment will be to demonstrate an intellectual curiosity, with the goal of inspiring such a curiosity in others following this project. This final document will be my contribution to the body of knowledge in physical form to the NDSU Architecture Library and in digital form for anyone. May it aid others in the conducting of further research of architectural and educational knowledge.

### The professional environment

The goal of this thesis directed toward the profession will be to complete it with the utmost professionalism and to demonstrate my diligence, thoroughness, and abilities in research and design.

## Project Goals

### The personal environment

With this project, I fully intend to motivate myself to explore what I have yet to explore in writing, design, and all of my creative abilities. My goal is to be able, upon the fruition of the project, to know that this is my best work and that it will stand as a personal testament of my capabilities and an inspiration for my future creative growth.







## Site Analysis Narrative

Immediately upon reaching the site, I was struck with several auditory perceptions. An airplane was either departing or landing near the airport to the northwest. The bells of one of the railway track crossings was chiming, lights flickering, with no moving train in sight. Saturday vehicular traffic at the eighth street crossing was moderate. I explored the areas along and between the planned-for-removal tracks, cautiously ignoring several 'no trespassing' signs. I observed static rail cars marked with spraypaintings, and also the grey cover-ups of taggings below the tenth street overpass. The freezing wind made me reluctant to remove my gloves for many photographs, and so I relied on my senses. Shortly before I left, I witnessed a city trolley making a stop just west of the site.



## Site Analysis Narrative

Further north along the tracks, I found more expansive open areas of the site just off sixth street. The tracks approach the river very near the historic falls in Falls Park. It was there that I saw the incredible potential that the site offered and my imagination began to run. I had had one previous experience visiting Falls Park when the water levels were at near record levels last summer. That vision of the fierce cascade highlighted with the characteristic pink quartz stone was unforgettably affecting. The city was founded upon the attraction of the falls, the unchanged and the always changing, and the always moving.





## Site Analysis Narrative

### Views & vistas:

The primary sightlines and views of the site naturally follow the railway, in particular to the North toward Falls Park (further described on p.42-43). The texture of primary downtown is to the West and residential patterns to the East. (see also section below).

### Existing structures:

Only one structure is located on the site, which is the Great Northern Railway Depot (shown above). Various other building types are located in its vicinity.

### Light quality:

See photograph grid, p. 60-63.

### Vegetation:

See vegetation map on p. 4X.

### Water:

The ever-running clear water of the Big Sioux can be seen only at the far north end of the site.

### Wind:

The relatively low built features of the area have only moderate impact on wind micro-climates.

### Human characteristics:

The site has seen much use and some abuse over the years in the railway right-of-way. Few pedestrians.

### Distress:

Distress from 'tagging' is most apparent on rail cars.

Great Northern Railway Depot



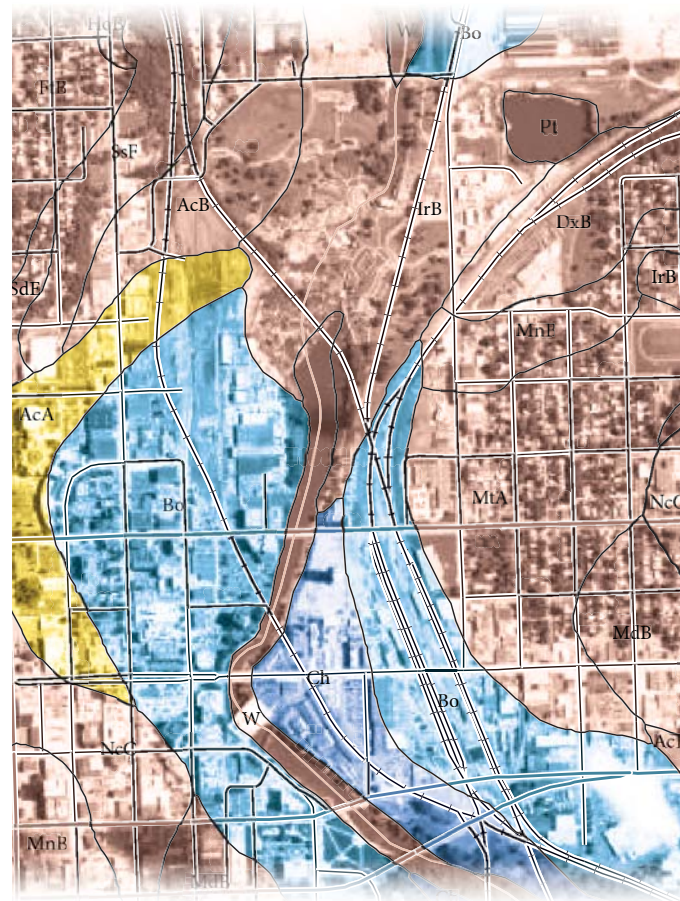
## Site Analysis Narrative



From Google Earth

Great Northern Railway Depot





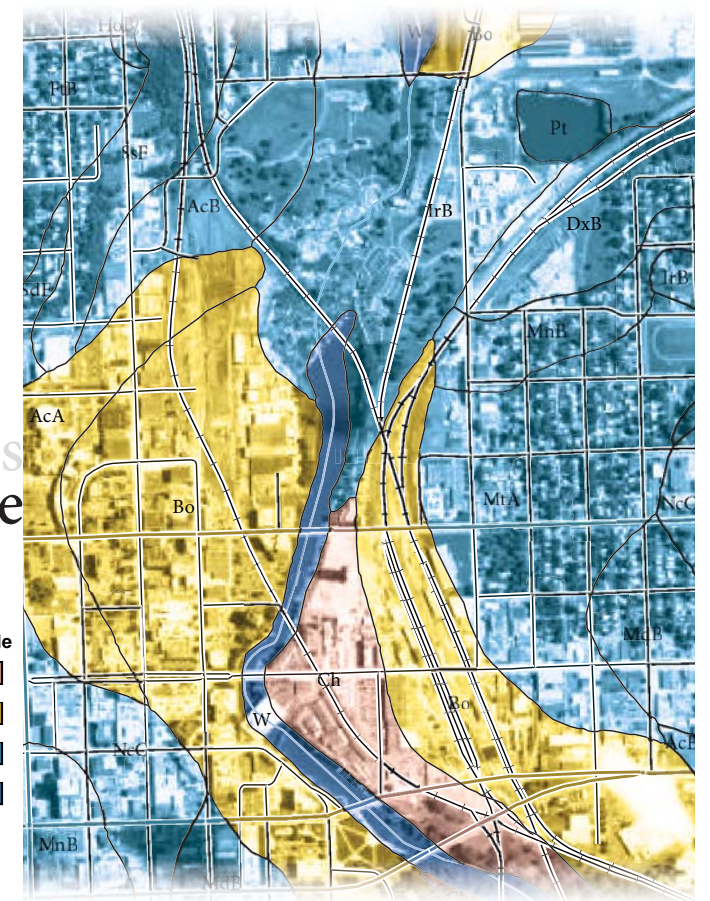
## Site Analysis Soils

Soil Ratings: Flooding Frequency Class

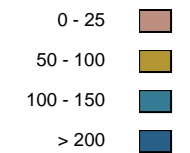


| Map unit symbol | Map unit name  | Rating     | Acres in AOI | Percent of AOI |
|-----------------|--|------------|--------------|----------------|
| AcA             | Alcester silty clay loam, 0 to 2 percent slopes        | Rare       | 31.9         | 5.1%           |
| AcB             | Alcester silty clay loam, 2 to 6 percent slopes        | None       | 32.8         | 5.2%           |
| Bo              | Bon loam, 0 to 2 percent slopes                        | Occasional | 167.5        | 26.7%          |
| Ch              | Chaska loam, channeled                                 | Frequent   | 35.5         | 5.7%           |
| DxB             | Dobalt loam, 2 to 6 percent slopes                     | None       | 25.2         | 4.0%           |
| FtB             | Flandreau-Thurman complex, 2 to 6 percent slopes       | None       | 21.0         | 3.3%           |
| HoB             | Houdek clay loam, 2 to 6 percent slopes                | None       | 1.7          | 0.3%           |
| IrB             | Ihlen-Rock outcrop complex, 0 to 4 percent slopes      | None       | 94.0         | 15.0%          |
| MdB             | Moody silty clay loam, 2 to 6 percent slopes           | None       | 25.8         | 4.1%           |
| MnB             | Moody-Nora silty clay loams, 2 to 6 percent slopes     | None       | 32.7         | 5.2%           |
| MtA             | Moody-Trent silty clay loams, 0 to 2 percent slopes    | None       | 71.3         | 11.4%          |
| NcC             | Nora-Crofton complex, 6 to 9 percent slopes            | None       | 28.8         | 4.6%           |
| Pt              | Pits, quarry   | None       | 5.6          | 0.9%           |
| SdE             | Shindler-Houdek clay loams, 15 to 40 percent slopes    | None       | 4.0          | 0.6%           |
| SsF             | Steinauer-Shindler clay loams, 25 to 60 percent slopes | None       | 26.3         | 4.2%           |
| W               | Water  | None       | 23.4         | 3.7%           |

## Site Analysis Water Table



Soil Ratings: Depth to Water Table



| Map unit symbol | Map unit name  | Rating (centimeters) | Acres in AOI | Percent of AOI |
|-----------------|--|----------------------|--------------|----------------|
| AcA             | Alcester silty clay loam, 0 to 2 percent slopes        | 137                  | 31.9         | 5.1%           |
| AcB             | Alcester silty clay loam, 2 to 6 percent slopes        | >200                 | 32.8         | 5.2%           |
| Bo              | Bon loam, 0 to 2 percent slopes                        | 122                  | 167.5        | 26.7%          |
| Ch              | Chaska loam, channeled                                 | 61                   | 35.5         | 5.7%           |
| DxB             | Dobalt loam, 2 to 6 percent slopes                     | >200                 | 25.2         | 4.0%           |
| FtB             | Flandreau-Thurman complex, 2 to 6 percent slopes       | >200                 | 21.0         | 3.3%           |
| HoB             | Houdek clay loam, 2 to 6 percent slopes                | >200                 | 1.7          | 0.3%           |
| IrB             | Ihlen-Rock outcrop complex, 0 to 4 percent slopes      | >200                 | 94.0         | 15.0%          |
| MdB             | Moody silty clay loam, 2 to 6 percent slopes           | >200                 | 25.8         | 4.1%           |
| MnB             | Moody-Nora silty clay loams, 2 to 6 percent slopes     | >200                 | 32.7         | 5.2%           |
| MtA             | Moody-Trent silty clay loams, 0 to 2 percent slopes    | >200                 | 71.3         | 11.4%          |
| NcC             | Nora-Crofton complex, 6 to 9 percent slopes            | >200                 | 28.8         | 4.6%           |
| Pt              | Pits, quarry   | >200                 | 5.6          | 0.9%           |
| SdE             | Shindler-Houdek clay loams, 15 to 40 percent slopes    | >200                 | 4.0          | 0.6%           |
| SsF             | Steinauer-Shindler clay loams, 25 to 60 percent slopes | >200                 | 26.3         | 4.2%           |
| W               | Water  | >200                 | 23.4         | 3.7%           |



## Site Analysis Physical

The site, having been long utilized by the Great Northern Railway, has seen moderate degradation over the years. The lack of any green cover on the site leaves a good chance for soil erosion. The relatively low slope has probably minimized water erosion, but not wind erosion. Despite its low maintenance, the location is prime for a revitalizing project in support of downtown Sioux Falls.

As with many urban contexts, spraypaint vandalism is not uncommon on surfaces in and around the site. Efforts to cover these up are clear, though, and damage is kept to a minimum.

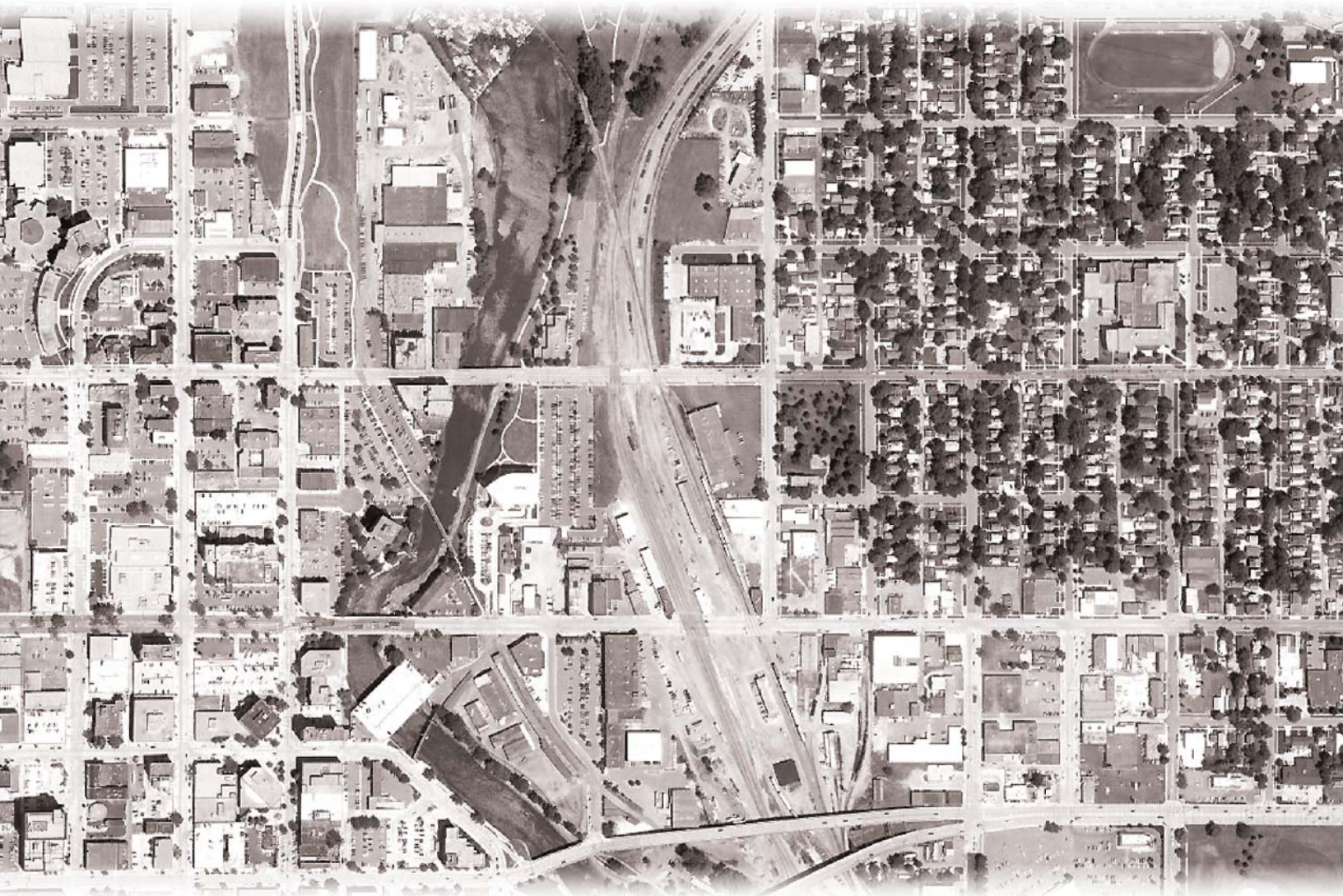
The character of the site, from my point of view, is purely one of opportunity. Though many challenges can and likely will arise, I am confident that this context will inspire and ground the final thesis design.

## Site Analysis Character

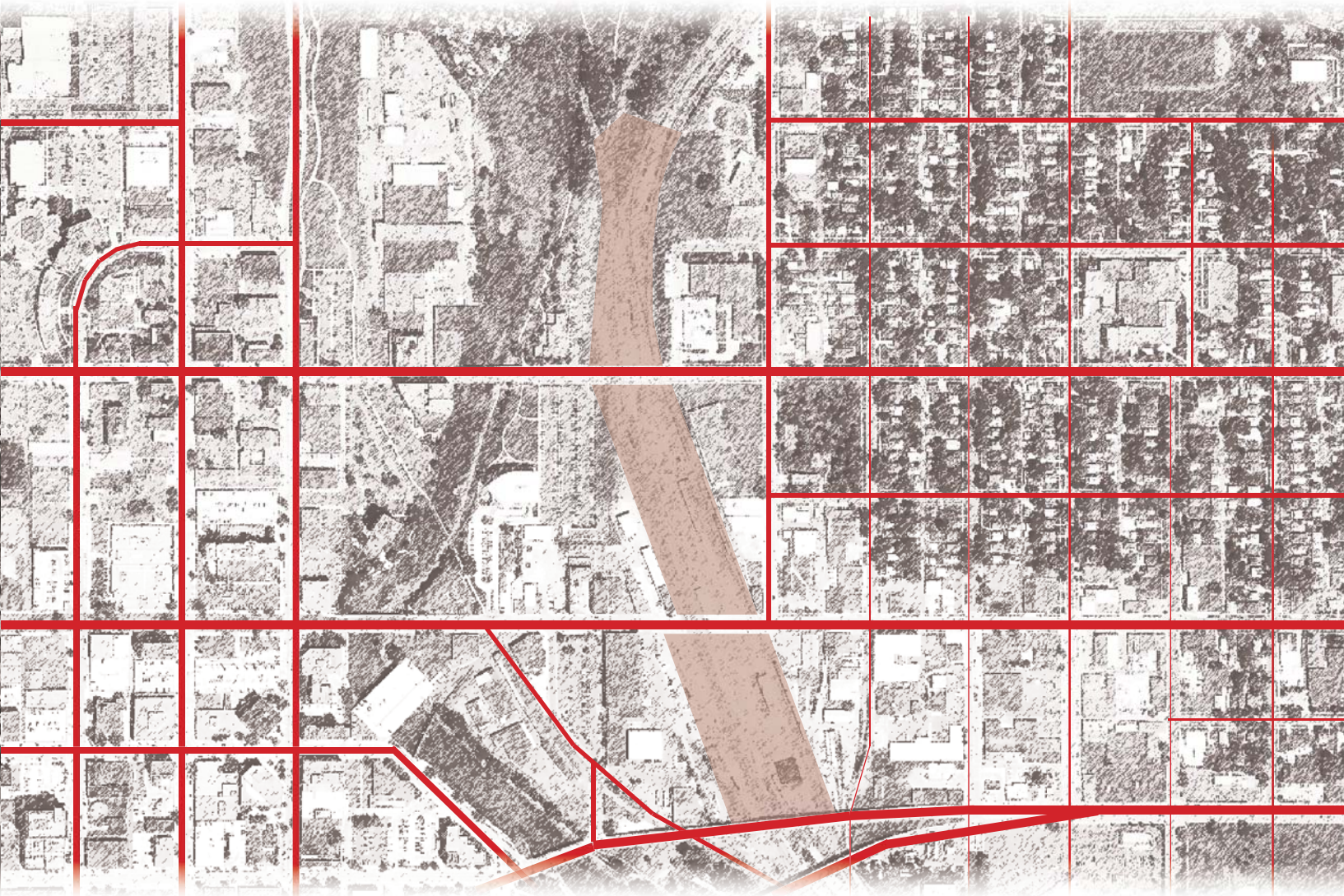




Site Analysis  
Utilities



Site Analysis  
Traffic





## Site Analysis Topography

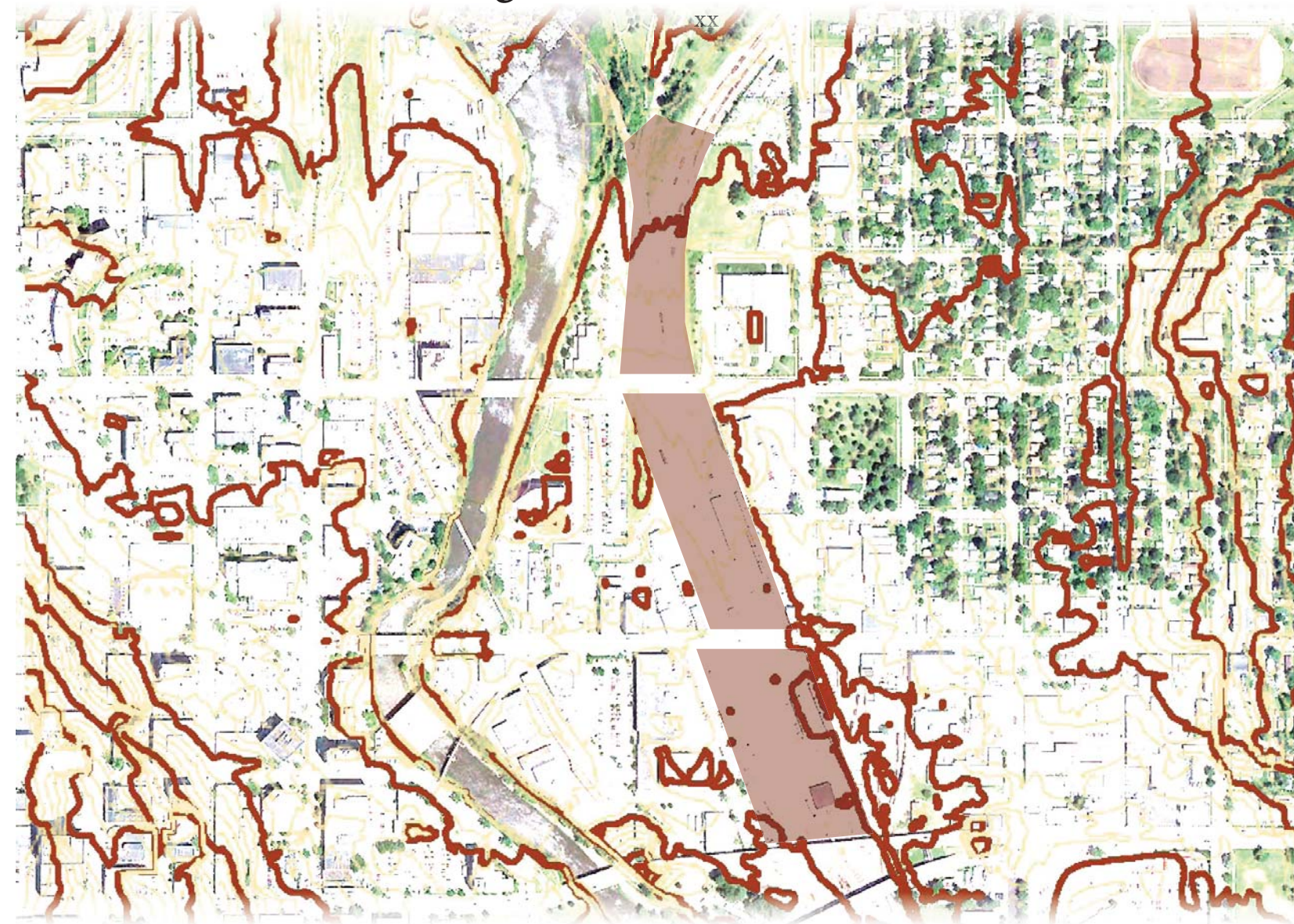
### Vegetation

Very little vegetation exists on the site. Only in the far north does the site open up into any perceivable green space. The residential areas to the East of the site have considerably more tree cover and vegetation.

### Topography

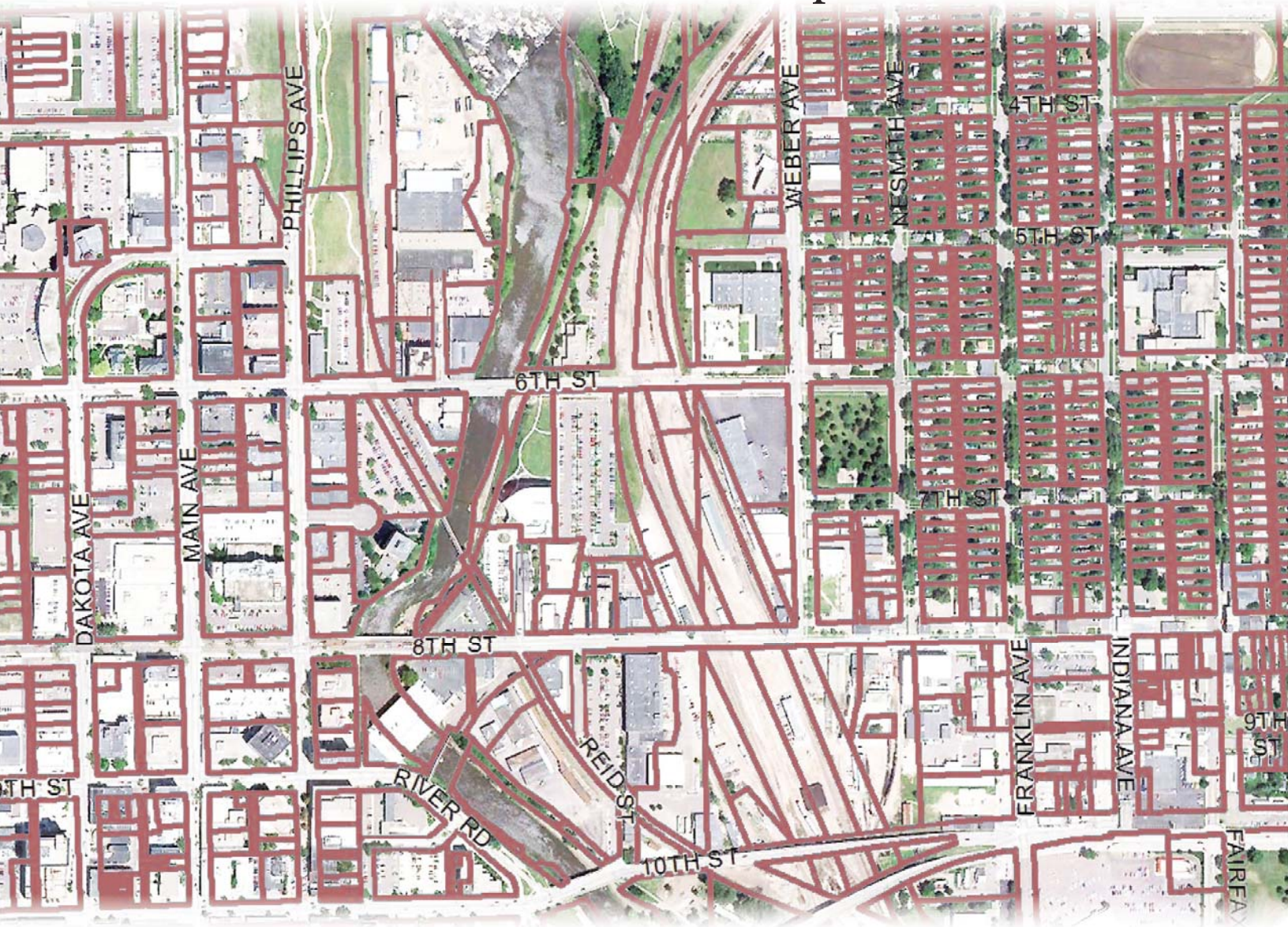
The southern sections of the site have a slope of less than 2% while in the north it varies from less than 2% to approximately 6%. These low slopes are suitable for nearly all purposes, provided there is adequate drainage in areas with a slope less than 1%.

## Site Analysis Vegetation

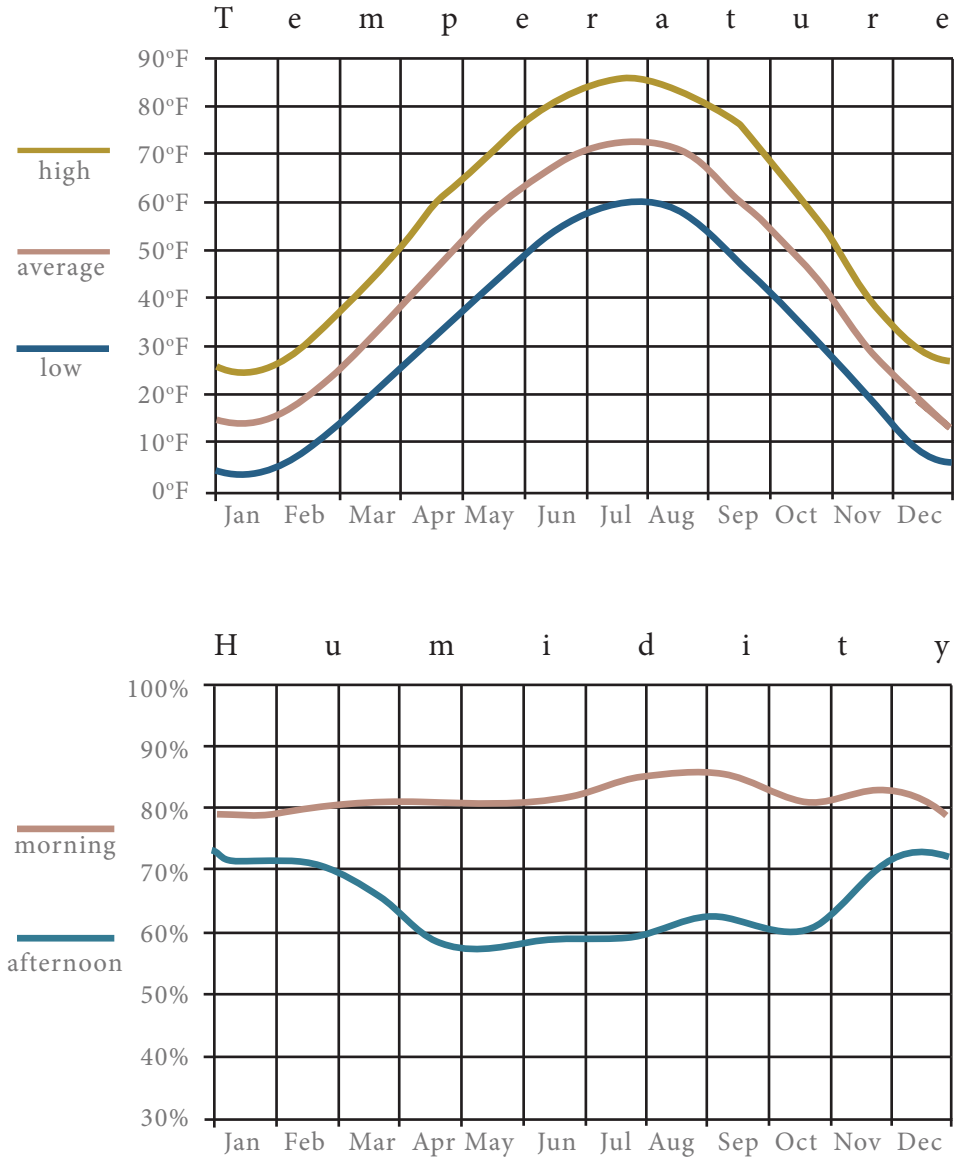




# Site Analysis Base Map

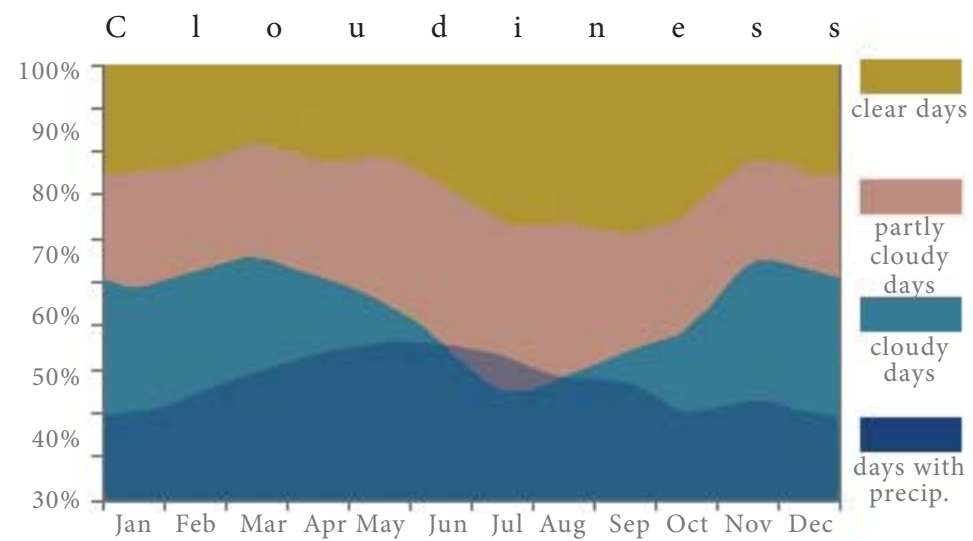
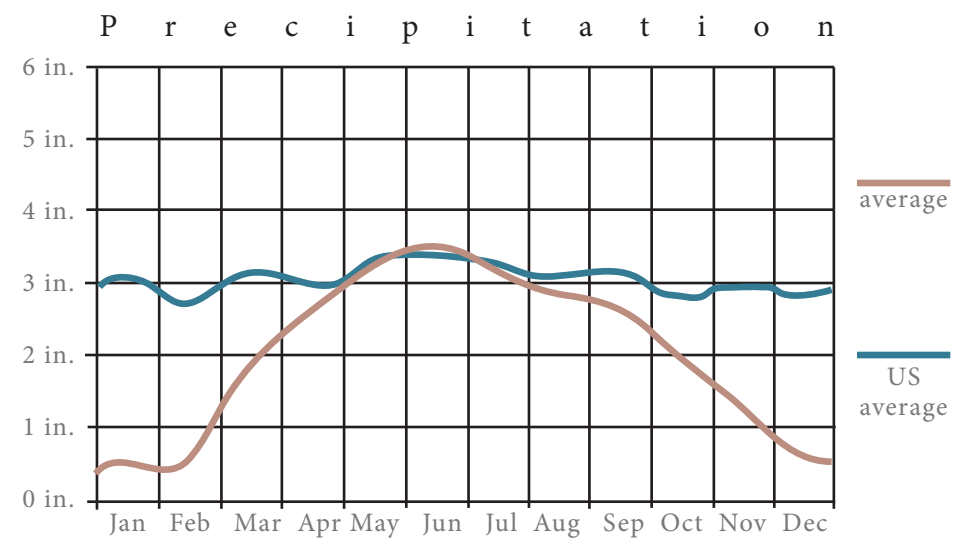


# Site Analysis Climate Data

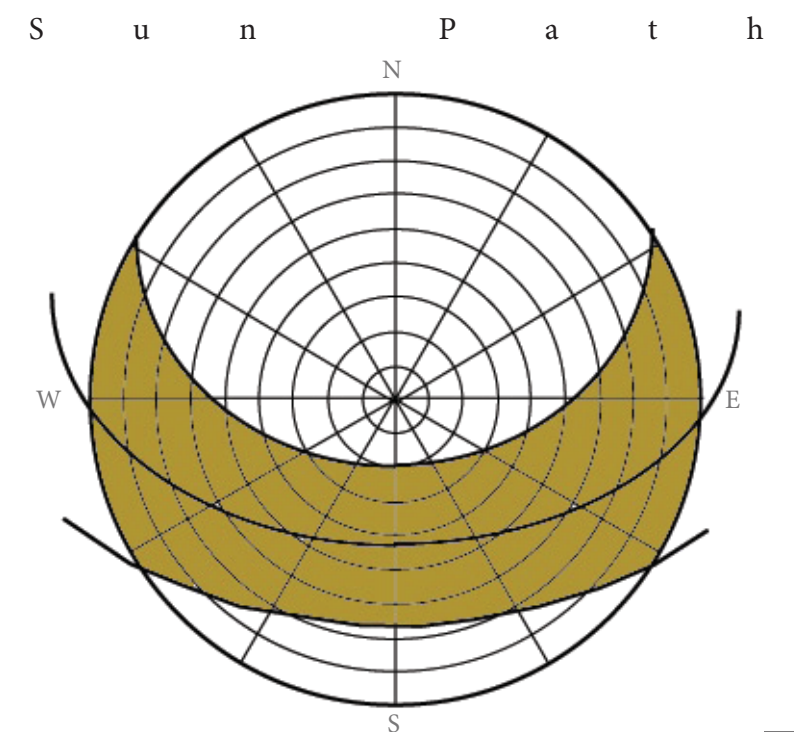
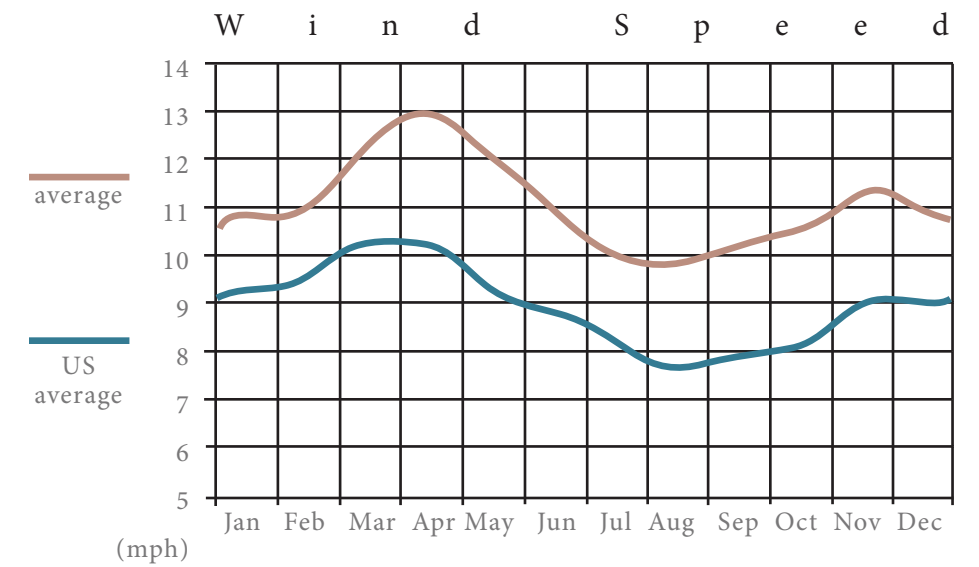




## Site Analysis Climate Data



## Site Analysis Climate Data





N o r t h



Site Reconnaissance

S o u t h



W e s t



E a s t



N o r t h



Photograph Grid

S o u t h



W e s t



E a s t





## Site Reconnaissance

## Panoramic Views



## Program Requirements

|                       |                             |
|-----------------------|-----------------------------|
| Library               | 8,000 s.f.                  |
| Communal Spaces       | 48 @ ~200 s.f. = 9,600 s.f. |
| Studios               | 32 @ ~48 s.f. = 1,536 s.f.  |
| Auditorium            | 9,050 s.f.                  |
| Kitchen/Cafeteria     | 13,030 s.f.                 |
| Administration        | 10% = 5,888 s.f.            |
| Support Spaces        | 20% = 11,776 s.f.           |
| Total proposed space: | 58,880 s.f.                 |

## Space Allocation

|                         |             |                   |
|-------------------------|-------------|-------------------|
| Students: grades 9-12   | 480         | 120 per grade     |
| Faculty                 | 32          | 15:1 ratio        |
| Approximate total users | 512         |                   |
| Total proposed space    | 58,880 s.f. | 115 s.f. per user |

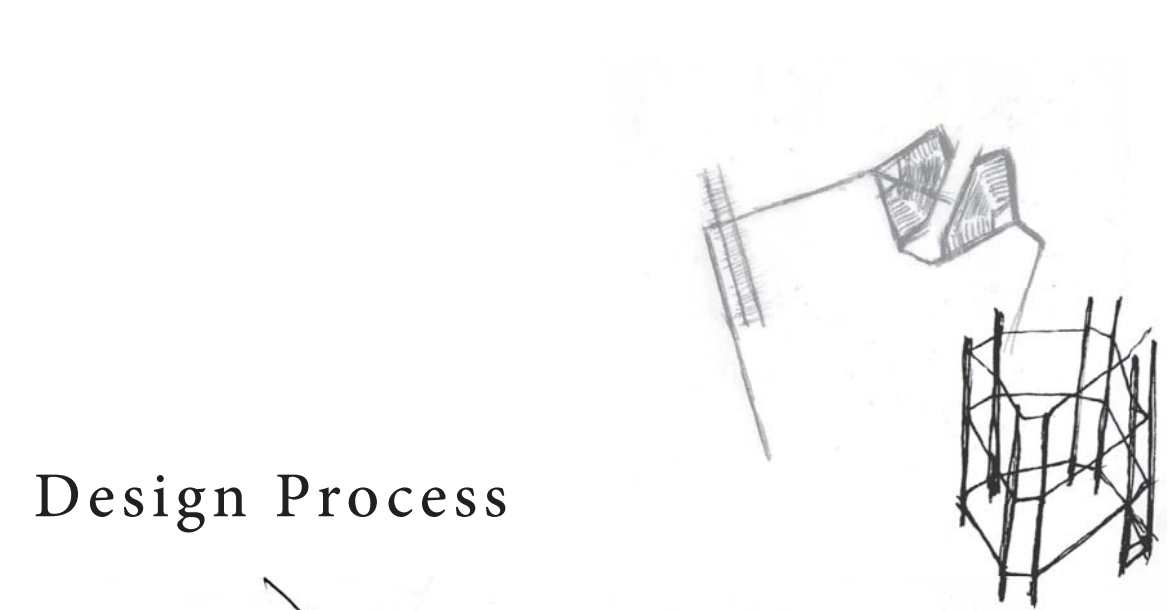
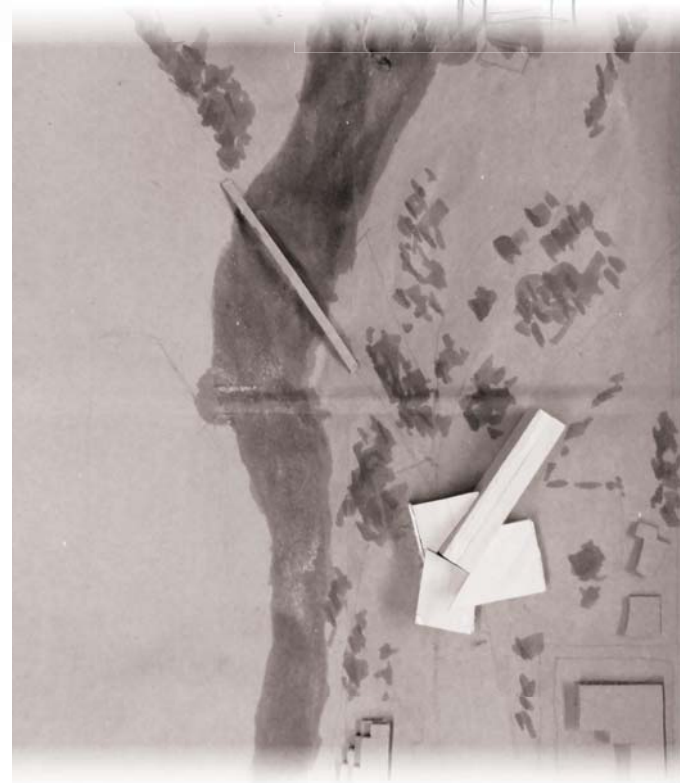
**design**  
**documentation**



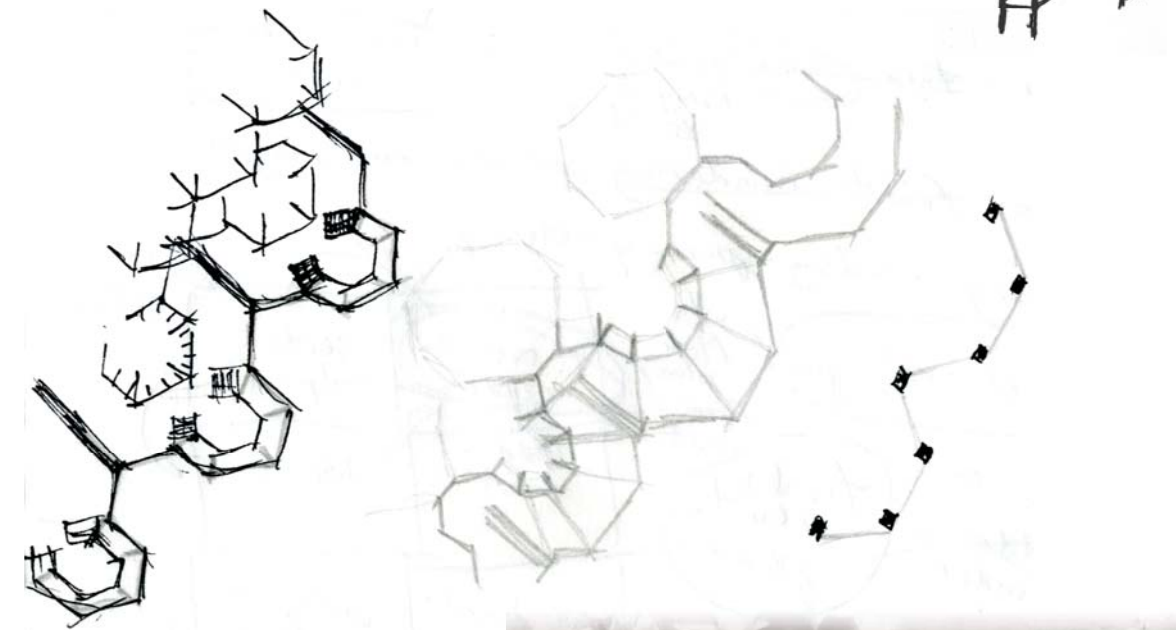




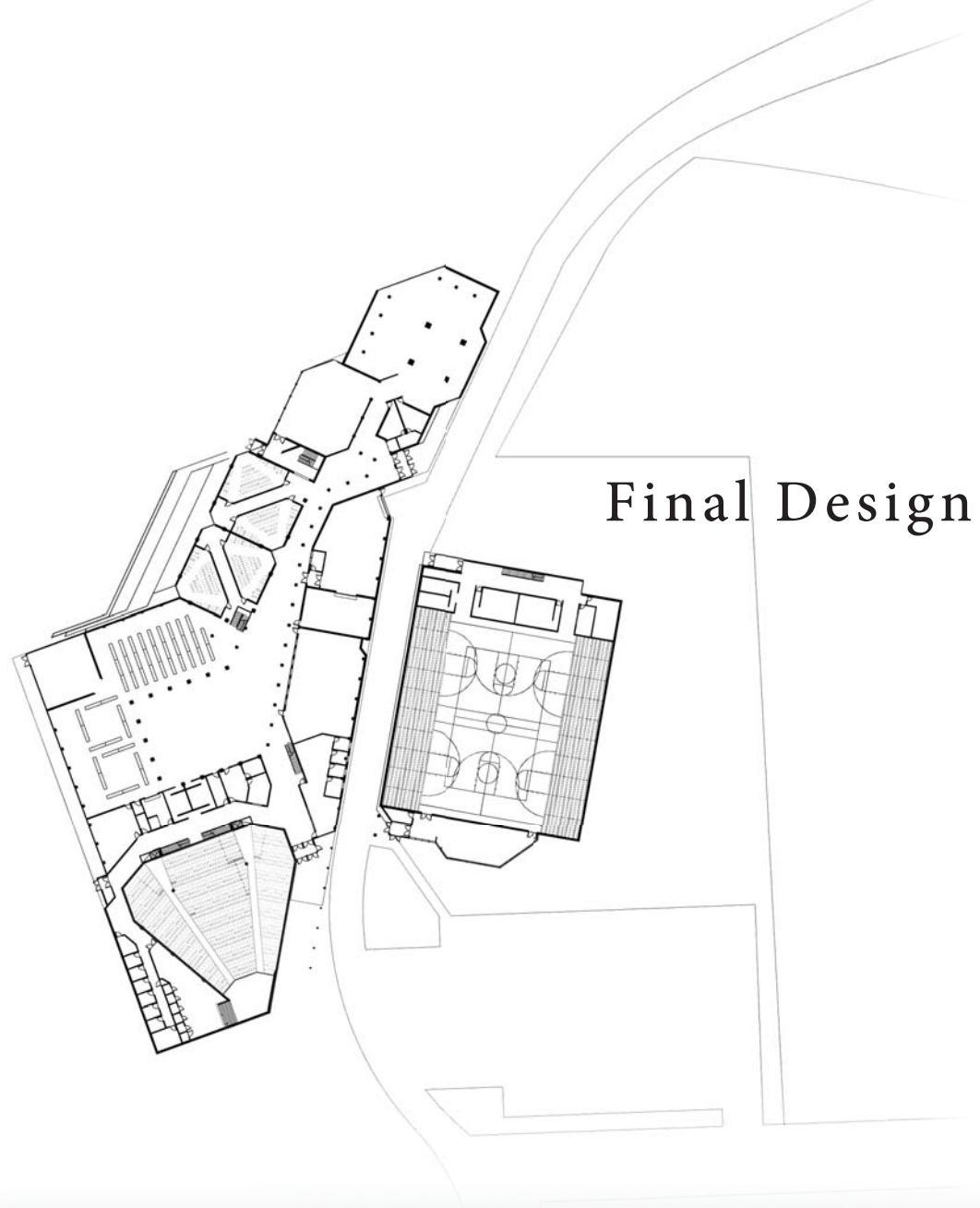
Design Process



Design Process



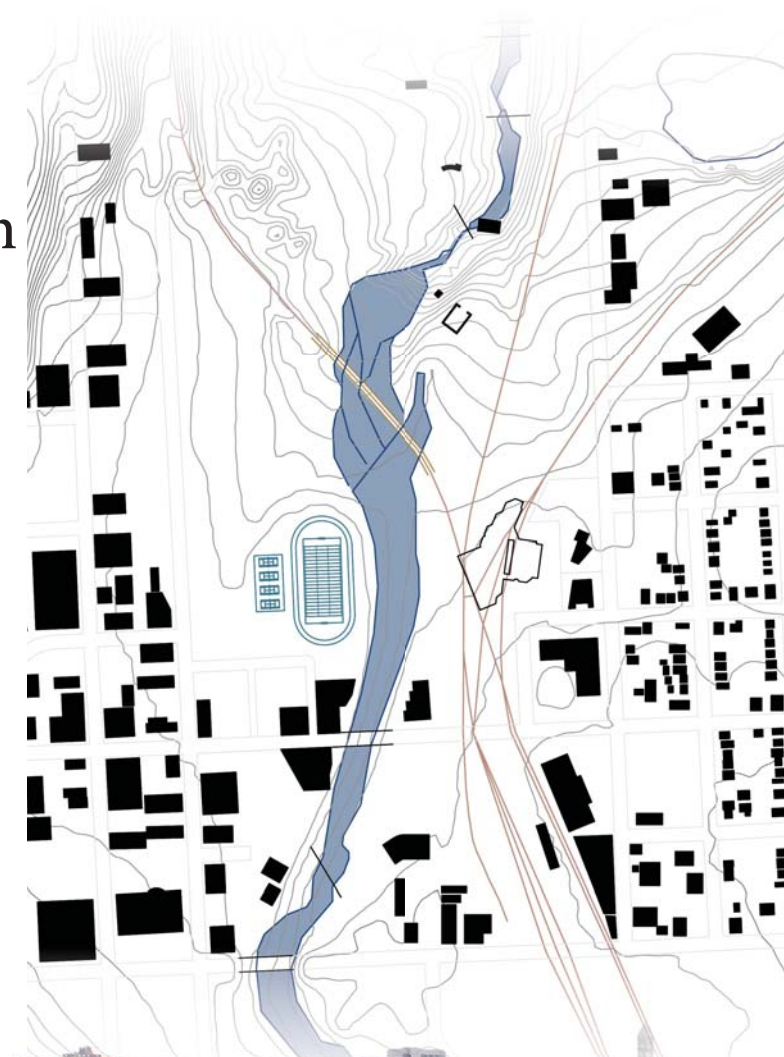




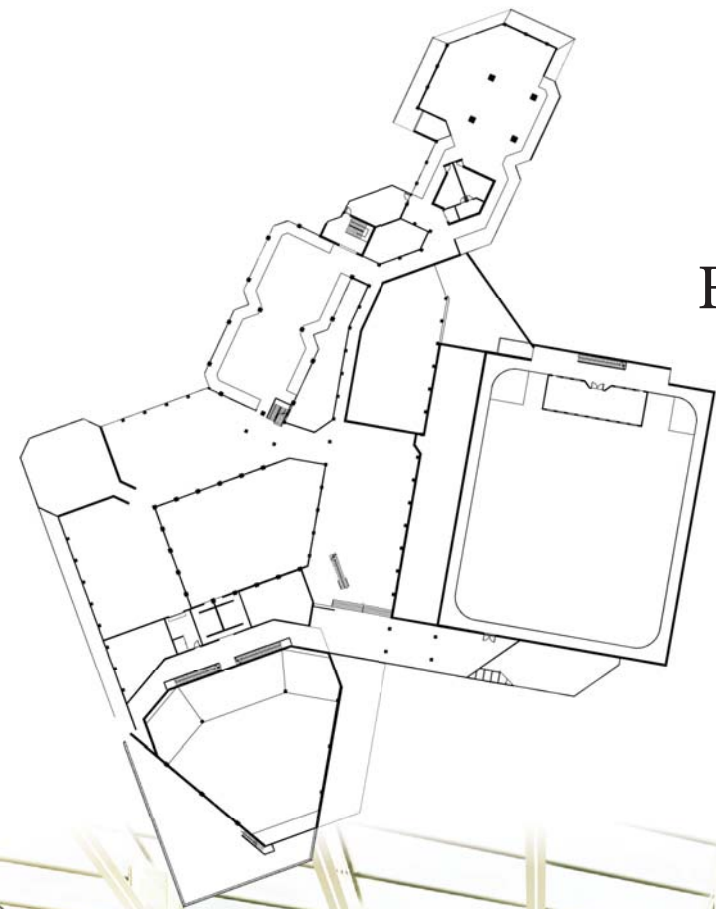
Final Design



Final Design



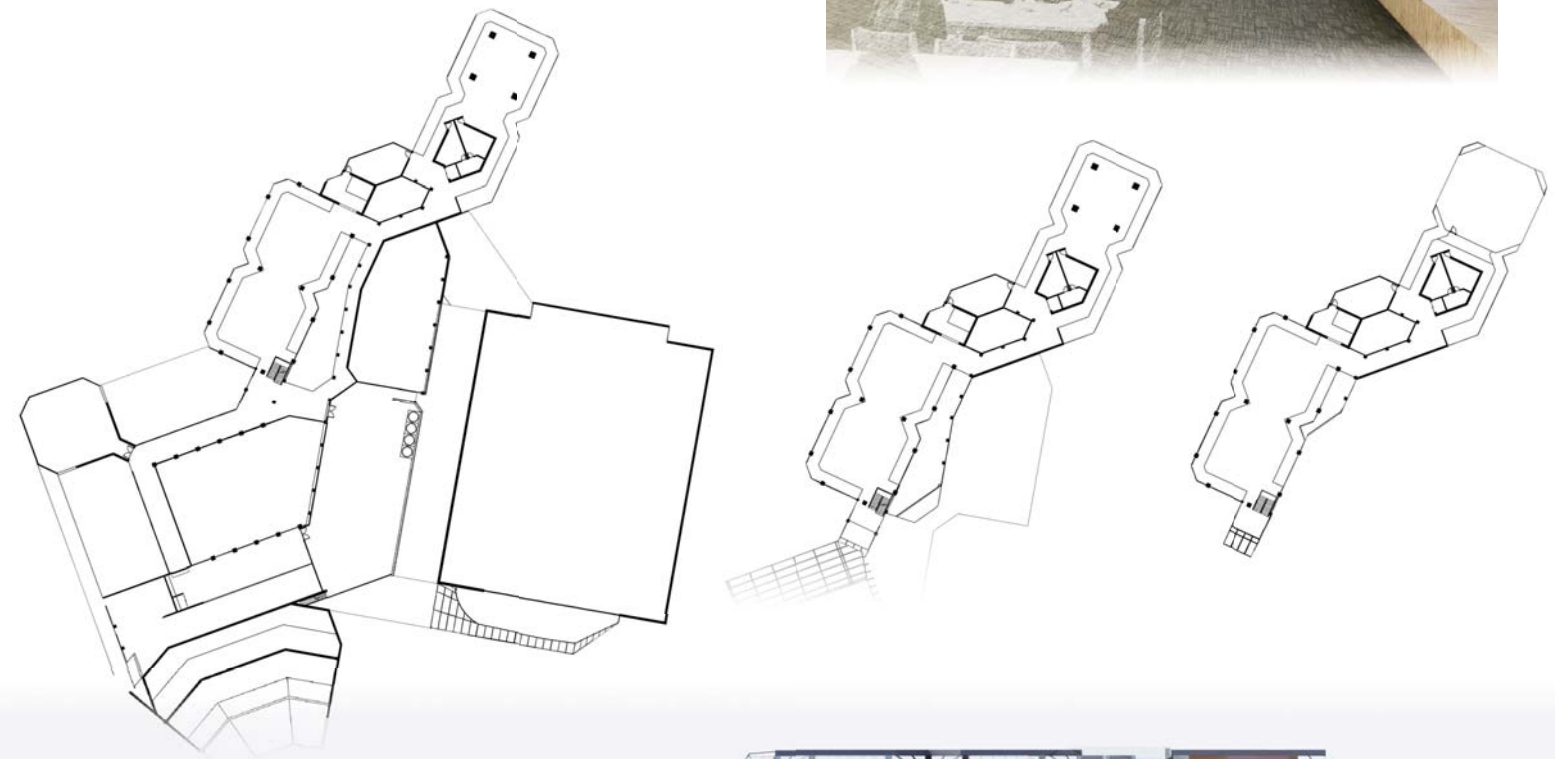




Final Design



Final Design



## Reference

- Baird, J. C. & Lutkus, A. D. (Ed.). (1982) *Mind Child Architecture*. Hanover, NH: University Press of New England.
- City of Sioux Falls, (2010). *History of Sioux Falls* Retrieved from <http://www.siouxfalls.org/Information/history/siouxfalls>
- Dale, E. (1972). *Building a learning environment*. Bloomington, IN: Phi Delta Kappa, Inc.
- Dunn, R. S. & Dunn, K. J. (1978). *Teaching students through their individual learning styles: a practical approach*. Reston, VA: Reston Publishing Company, Inc.
- Hainstock, E. (1997). *The essential montessori*. New York, NY: Plume.
- Hertzberger, H. (1991). *Lessons for students in architecture*. Rotterdam, The Netherlands: 010 Publishers.
- Husserl, E. (1960). *Cartesian meditations: An introduction to phenomenology*. The Hague: Martinus Nijhoff.
- Kuhn, D., Garcia-Mila, M., Zohar, A., & Andersen, C. (1995). *Strategies of knowledge acquisition*. Chicago, IL: University Of Chicago Press.

- Montessori, M. M. (1976). *Education for human development*. New York: Schocken Books.
- Polyanna, A. G. (2009, October 15). Herman Hertzberger: school buildings - theory and criticism of architecture [Web log message]. Retrieved from <http://hertzbergertca.blogspot.com/2009/10/montessori-school-delf.html>

## Reference

- Rogers, M. F. (1983). *Sociology, ethnomethodology, and experience*. Cambridge: Cambridge University Press.
- Schmeck, R. R. (Ed.). (1988). *Learning strategies and learning styles: perspectives on individual differences*. New York, N.Y.: Plenum Press.
- Thattai, D. (2001). A history of public education in the united states. *J-LEDS Digital Library*, Retrieved from <http://www.servintfree.net/~aidmn-ejournal/publications/2001-11/PublicEducationInTheUnitedStates.html>
- Wagner, D. (2010, November 17). Track removal helps unleash downtown's land potential. *Argus Leader*, p. 1B.
- Digital photograph retrieved from: <http://www.argusleader.com/apps/pbcs.dll/article?AID=201011170313>
- Weston, R. (2004). *Key buildings of the twentieth century: plans, sections and elevations*. London: Laurence King Publishing Ltd.
- Worthington, J. The Scottish Government, (2007). *Enabling place-making: the role of the school in supporting the community* Retrieved from <http://www.scotland.gov.uk/Publications/2007/12/14115428/5>

