

# CENTENNIAL HIGH:

## A School for Hope and Growth

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Architectural Design for Mental Wellbeing  
in High School Students



# CENTENNIAL HIGH:

## A SCHOOL FOR HOPE AND GROWTH

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

By:  
Augustina M.Teuber

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

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Primary Thesis Advisor  
Dr. Ganapathy Mahalingam

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Thesis Committee Chair  
Dr. Ganapathy Mahalingam

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# Thesis Abstract

In this paper, high school design is evaluated in order to better support the mental health of its occupants. The alarming rise in anxiety, depression, and violence among youth over the past few decades demonstrates the importance of changing society's current trajectory. Thus this paper aims to clarify the extent design impacts users and how educational buildings can benefit adolescent mental health. Literature analysis from a diverse range of fields guides these conclusions. Additionally, case study analysis and logical argumentation are employed to identify practical solutions. Ultimately, an example design for a mental health conscious public school is purposed.

# Narrative of the Theoretical Aspect of the Thesis

‘Hope’ is a trite word for an indispensable virtue. It represents both expectations and desires, presenting a potential future wherein positive change is possible. With it, an individual may grow to make the world a better place, not to mention living an enjoyable life. Without it, staying alive is little more than a time consuming and resource draining burden. Yet despite its importance, hope is often overlooked until it is tattered and contributing to negative consequences such as mental illness.

The high school age range is a particularly crucial time for hope. Between changing biology and shifting social roles, children become adults taking their first independent steps toward an undetermined future. Uncertainty can inspire anxiety in the firmest of individuals, let alone those who have little experience in being alive. In addition, the high school age range has not yet fully developed their brains, especially in the prefrontal cortex areas that control judgment and planning. This can lead to rash decision making and difficulty in seeing the bigger picture. Thus, between lack of experience and unfinished maturation, high school students are particularly vulnerable to a weakening sense of hope. They may feel that their circumstances will never improve or that they will never achieve a meaningful life due to difficulties they are currently facing. In retrospect, the complications of teenage years may seem small. Nonetheless, the struggles and emotions of these adolescents are both valid and Herculean in the context of their lives.

In the last few decades, high schools have seen an alarming rise in mental illness and violence. The events that unfold in academic spaces increasingly hold literal life and death consequences. When combined with advances in technology and easier access to information, schools can no longer be

spaces designated to pure memorization of facts. Instead, these institutions must help educate their charges on how to learn, thrive, and problem solve. This demands a space that is safe and responsive to the needs of those within. However, many of the existing public schools were designed with prison-like ideologies dedicated to efficiency, standardization, and authoritarian control. Although these used to be seen as the necessary evils of public institutions, a reassessment of their effects have led many to consider alternatives. If the goal of a high school is to set students up for a better future, the design must support a wholesome approach to wellbeing and growth. Since secondary education serves as society's last mandated 'quality control' effort on youths' lives, such questions are important for the entire community.

It is said, "if you can only do a little, at least do that much." (unknown). Although an architect may not be able to change an adolescent's home life, genetic circumstances, or academic curriculum, they can help create a more positive future through intentionally designing a space for growth and hope. This thesis seeks to clarify architecture's impact on high schoolers and to identify methods of improvement. In order to do so, the intersection of built environments, psychology, and culture is thoroughly examined using the burgeoning field of neuro- architecture and the lessons gained from institutional histories.

Ultimately, the question is asked: can a school be designed in a way that nurtures growth, wellbeing, and hope in addition to its usual educational functions? And if so, how?

# Typological Research

The building typology for this project is a public high school, also referred to as a public secondary education facility. In order to enable students with the greatest number of opportunities, subject areas will range from the information based knowledge of classrooms to the more skill based knowledge accumulated through art, technology, wood shop, athletic, and performance departments. Due to site and economic restrictions, some departments may be outsourced to neighboring, preexisting facilities.

The second main typology influencing the design is that of mental health facilities. Though the whole school will be designed with emotional wellness in mind, special attention will be given to the counseling offices in the administration department. This is to be a space for group therapy, individual therapy, and academic counseling.

## Case Studies: Educational Facilities

- 1.) The School of Environmental Studies in Apple Valley, MN
- 2.) Williams Jones College Preparatory High School in Chicago, IL

## Case Studies: Mental Health Facilities

- 3.) BMRI Youth Mental Health Building in Sydney, Australia



Figure 1. [Entrance to SES]. (n.d.). [Photograph]. Eastview Community Foundation.

# School of Environmental Studies

12155 Johnny Cake Ridge Road  
Apple Valley, MN 55124

## Overview

The School of Environmental Studies is a magnet school in Apple Valley, Minnesota for high school juniors and seniors. The building is two stories tall with a total of 68,000 square feet and was built on land donated by the Minnesota Zoo. The school was designed by Bruce Jilk of KKE Architects and opened in 1995. Since its conception, SES has been dedicated to diversified learning styles and an integrated curriculum. Their unique educational structure is physically represented in the form of houses and pods. As of April 2019, the school is officially LEED Gold certified.

My perspective on this particular case study is influenced by my two years as a student here. This enables me to reflect on how it actually functioned and influenced my educational experience. Personally, I was a member of Rose and Green houses before graduating in the spring of 2016.

## Research Findings

Many of the basic design features of the School of Environmental Studies are common to all high schools. For example, there are bathrooms, classrooms, laboratories, a library, an art room, teacher offices, a counseling office, a nurse's office, a principal's office, administrative offices, a teacher lounge, a kitchen, a cafeteria, a computer lab, storage, custodial closets, a bus drop off location, and a parking lot. It is clearly a suburban public school.

On the second floor, the distinguishing design innovation becomes most apparent. There are four 'houses' - Rose and Blue for the juniors; Green and Gold for the seniors. Each house consists of about one hundred students. Inside each house, there are ten 'pods'. The pods are groups of ten student desks in a C shaped half wall corral, with their open side facing the central house work space. Two classrooms and a shared teacher office are located between each house. Students split their day between the large group space with all one hundred of their housemates and the classrooms with about twenty students.

The School of Environmental Studies is well integrated in its context through its structure, programming, and culture.

Structurally, SES encourages indoor- outdoor education in several ways. First, there is a disconnected outdoor classroom adjacent to the library. The open air wooden construction serves as a transition between the pond and the brick school building. With a roof and picnic tables, this permeable room enables teachers to host class outdoors. Second, a main feature of the cafeteria is a hydroponic wall visible from the entryway. Third, eating areas are established on the front and side patios so that students may spend their lunch hour outside. Fourth, the school owns and operates a windmill on site. Students have access to its monitoring data reports on performance.

SES further contextualizes the school through its curriculum and programming. The south side of the site borders the Minnesota Zoo and across the street to the east is the Lebanon Hills Regional Park Campgrounds. Various class assignments involve exploring and observing these two neighboring

facilities. For example, during the animal behavior intensive theme, students are required to visit the zoo everyday for about a week in order to observe animals in the exhibits. Similarly, at several points during the year students visit the campgrounds in order to obtain quantitative and qualitative analyses of the native Minnesotan environment. Within the school property itself there is a small woods, a pond, and a community garden. Once again, the curriculum encourages students to get involved in these spaces through various units. Students are offered the chance to help remove invasive species. During the winter unit, students are taught how to dig trenches and sleep under the stars in below freezing temperatures, and this skill is put to the test in the woods during a supervised overnight experience (if something goes wrong, students are allowed to sleep inside the building instead).

Culturally and philosophically, SES has been connected to its site from the very beginning. For starters, the building is located on land that was donated by the Minnesota Zoo for the purposes of an environmentally conscious school. Consequently, the School of Environmental Studies is sometimes



Figure 2. Teuber, A. (2015). SES outdoor classroom. [Photograph]. Private collection.



**Figure 3. [Aerial view of SES with windmill]. (2020). [Photograph]. School of Environmental Studies.**

but could be strengthened. The back wall curves in order to allow more space for windows, but the depth of the floor plan requires a large number of electric lights to illuminate the building. The open plan of the cafeteria- auditorium and library allow for a similar level of daylighting.

referred to as simply “the Zoo School”. The partnership, as demonstrated by the curriculum activities, has remained strong between the two institutions. The unique recruitment pool aids in regional awareness, as all of the students originally begin their high school experience at other District 196 facilities. This results in a mix of Minnesotan cities being represented. Finally, students are encouraged to engage the site and building. For example, it was a group of students who lead the LEED certification process.

Daylighting needs are met,

# School of Environmental Studies



Figure 4. SES pod empty. (2012). [Photograph]. The Journal.

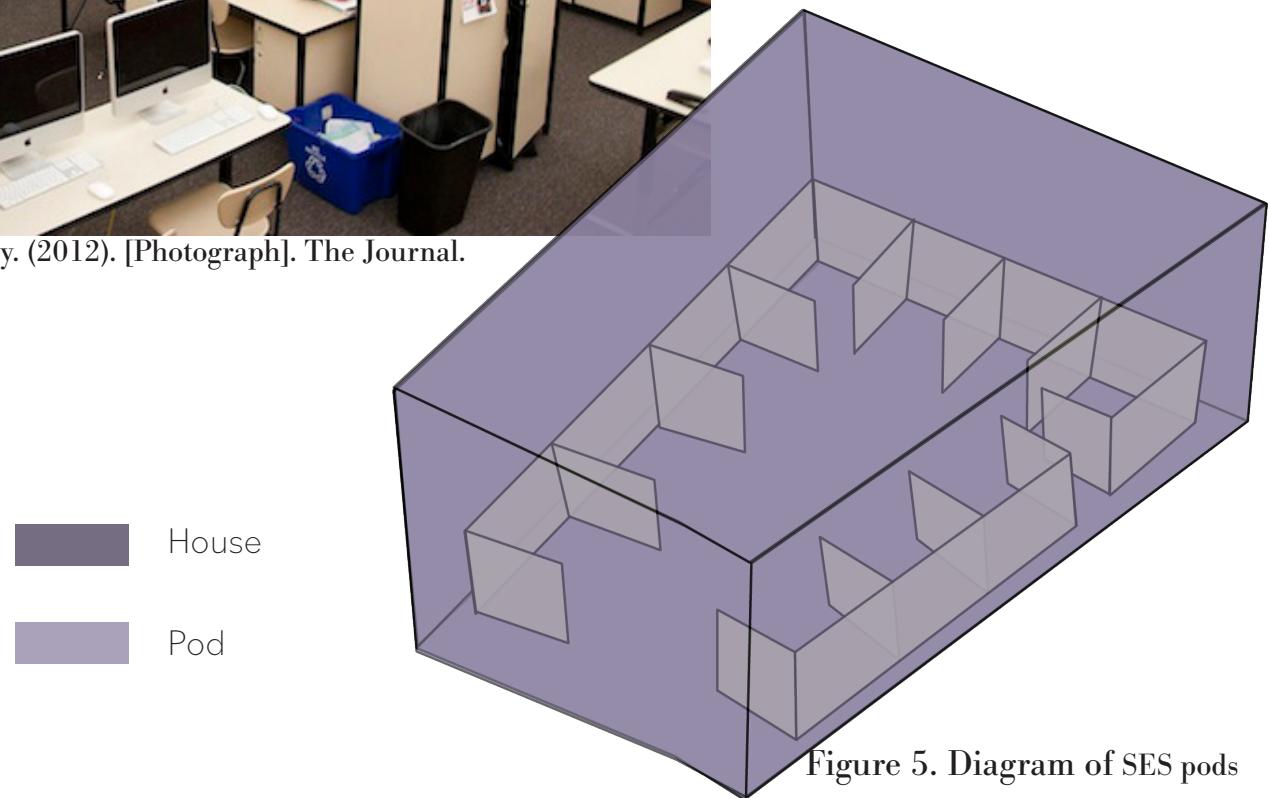


Figure 5. Diagram of SES pods

# School of Environmental Studies

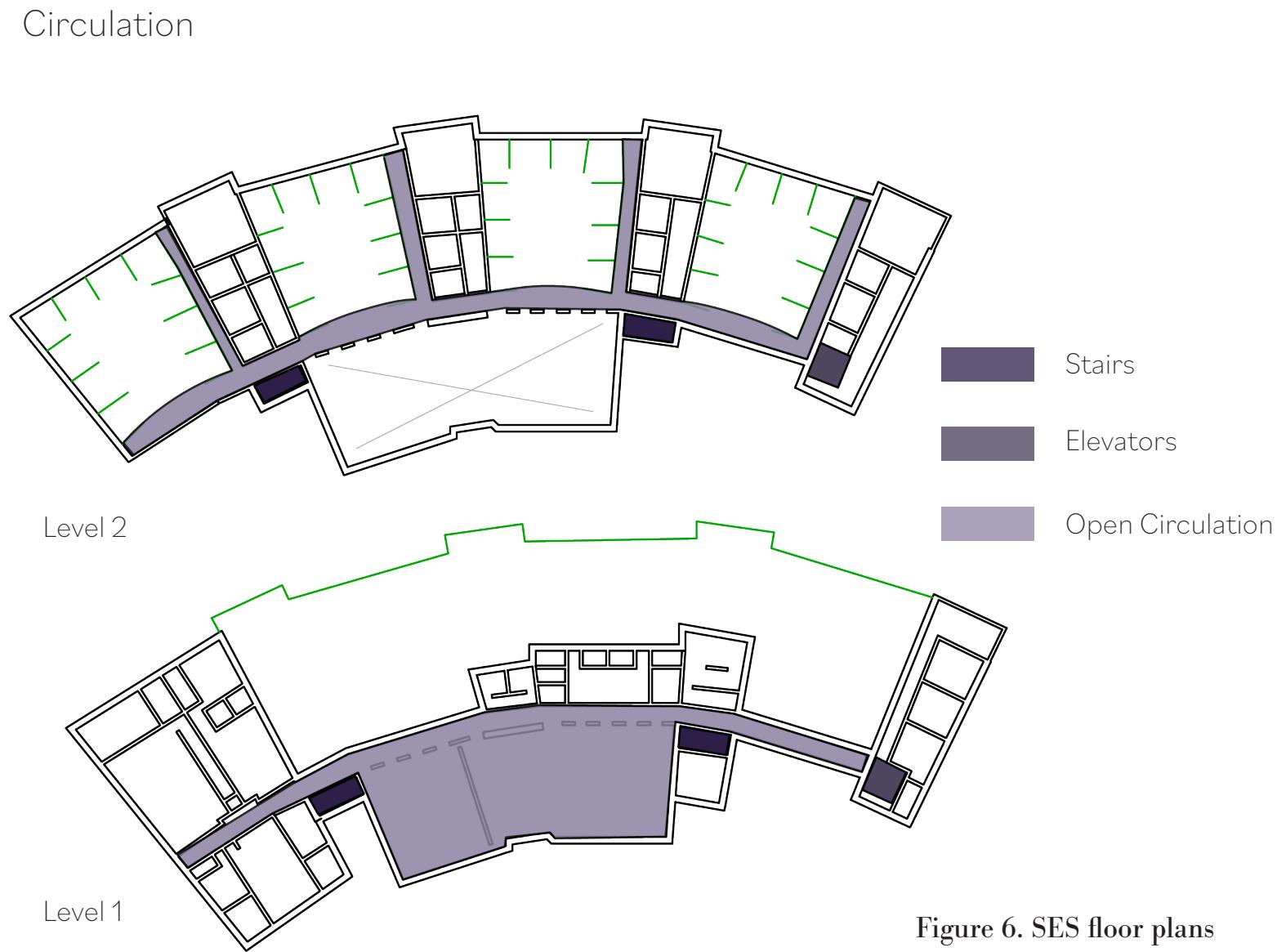


Figure 6. SES floor plans

## Spatial Arrangements

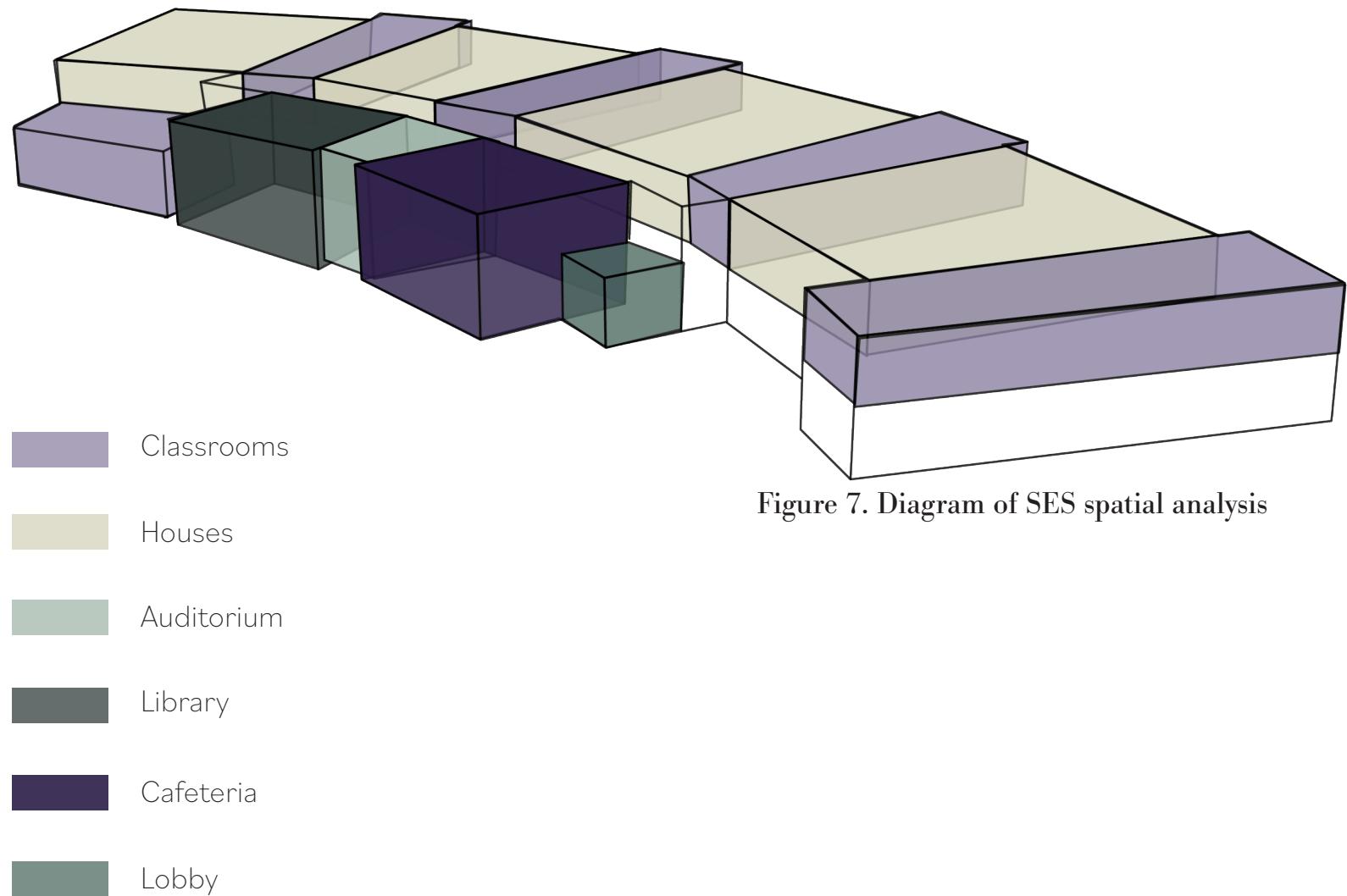




Figure 8. Steinkamp, J. (n.d.) [ William Jones College Preparatory High School western facade]. [Photograph]. ArchDaily.

# Jones Preparatory High School

700 S State St,  
Chicago, IL 60605

## Overview

William Jones Preparatory High School, also called Jones College Prep, is a public high school in Chicago. The firm Perkins & Will designed the southern campus which opened in 2013. This building is seven stories tall with a total of 278,000 square feet. Approximately 1,200 ninth to twelfth grade students attend classes here. As of August 2014, this building was certified LEED Gold.

## Research Findings

Williams Jones Preparatory High School contains all the basic elements of a public school, however this case study focuses on the southern building. This includes a lobby, a theater, administration offices, a cafeteria, a computer lab, lobby, restrooms, break out spaces, a terrace, a gym, and a pool.

Unlike a lot of other educational facilities, the southern campus extends upward instead of outward. Due to its location in downtown Chicago, the site was limited to approximately 100' by 400'. The resulting seven story building even boasts a seventy car garage beneath it. Another interesting note is that the swimming pool and gym are located on the seventh floor instead of at ground level as may be expected.



Figure 9. Steinkamp, J. (n.d.) William Jones College Preparatory High School, Chicago, by Perkins+Will. [Photograph]. Architect Magazine.

## Research Findings

The William Jones Preparatory High School integrates nicely with its downtown context environmentally, visually, socially, and culturally.

In response to the need for more sustainable cities, Perkins & Will designed this building to be LEED Gold. Part of their strategy involved a rainwater system which temporarily collects runoff so that the city storm water system isn't overwhelmed (Bey 2014). They also employ a green roof over the pool and gymnasium. The school is next to the 'L', Chicago's elevated rail, which encourages students to make use of public transportation.

Visually, the Jones Preparatory looks like many other new downtown buildings. Due to the extra floor to ceiling height, the school appears to rival Chicago's ten story high rises (Bey 2014). Considering that many of the structures on Printer's Row, located just west of the school, are ten to fifteen stories, the height of the building is not out of scale. Additionally, the sides of the school feature red-tinted precast panels designed in tribute to the red brick of their historical neighbors. Windows frame views of the historical district for students to consider.

An interesting note is that the northern building of the Jones Preparatory is noticeably different in aesthetic. This older building is perhaps two thirds as tall as the newer campus, despite being six stories. Although both buildings make use of concrete finishes, the northern building looks distinctly modern with its boxy, slotted, concrete facade.

From a social standpoint, the southern building was designed with after hours functions in mind. The ground floor theater can seat nearly five hundred people and flows directly into the lobby. This enables the school to rent the auditorium for public use while preserving security and limiting access to the other facilities. The curriculum also encourages students to visit the neighboring museums.

The school building encourages a healthier student culture through its balance of city views with natural respites. Extensive yet strategic use of windows allows daylighting to fill the main circulation paths. The western facade's push and pull design creates little terraces. On the seventh floor, the



**Figure 10.** Steinkamp, J. (n.d.) [William Jones College Preparatory High School lobby]. [Photograph]. ArchDaily.

outdoor terrace is accessible to students as a reading garden with a view of the city. Additionally, the staircases were widened to encourage students to walk instead of using the elevators. Considering the selective enrollment exams and general academic pressures of high school, this push for student well being was much needed.

An intentional emphasis on daylighting led to a good amount of natural light in the circulation and socialization spaces. The three story atrium of the lobby is flooded with light, creating a welcoming and polished entry and informal space. Additional windows in the north and south stairs adds views and sunlight to further infiltrate the building. Light truly makes a difference in this space.

# Jones Preparatory High School

Massing

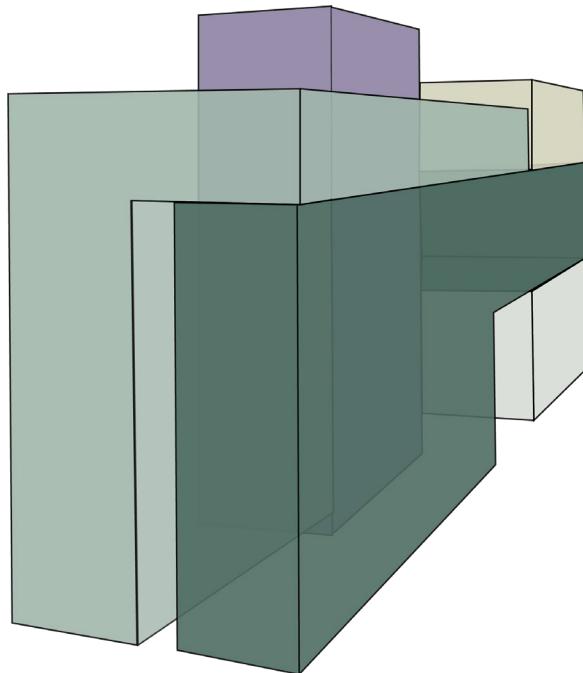


Figure 11. Diagram of Jones College Prep massing

Mass and Void

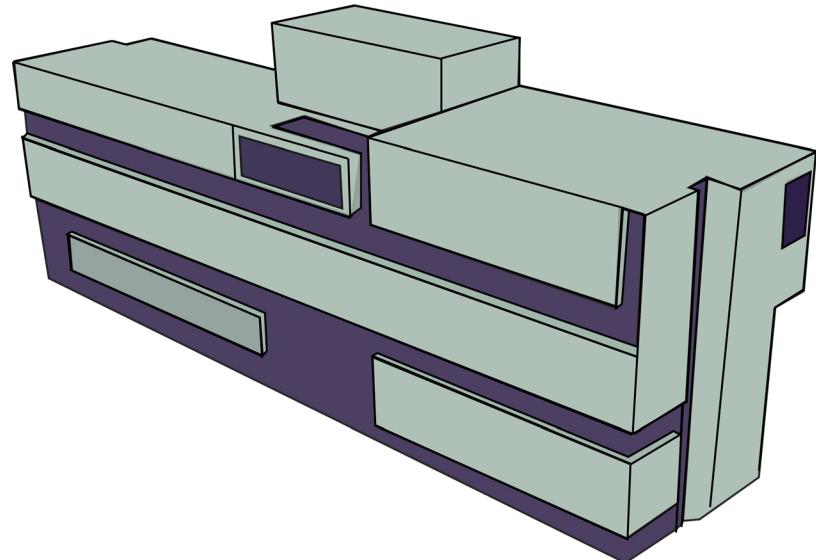


Figure 12. Diagram of Jones College Prep mass and void

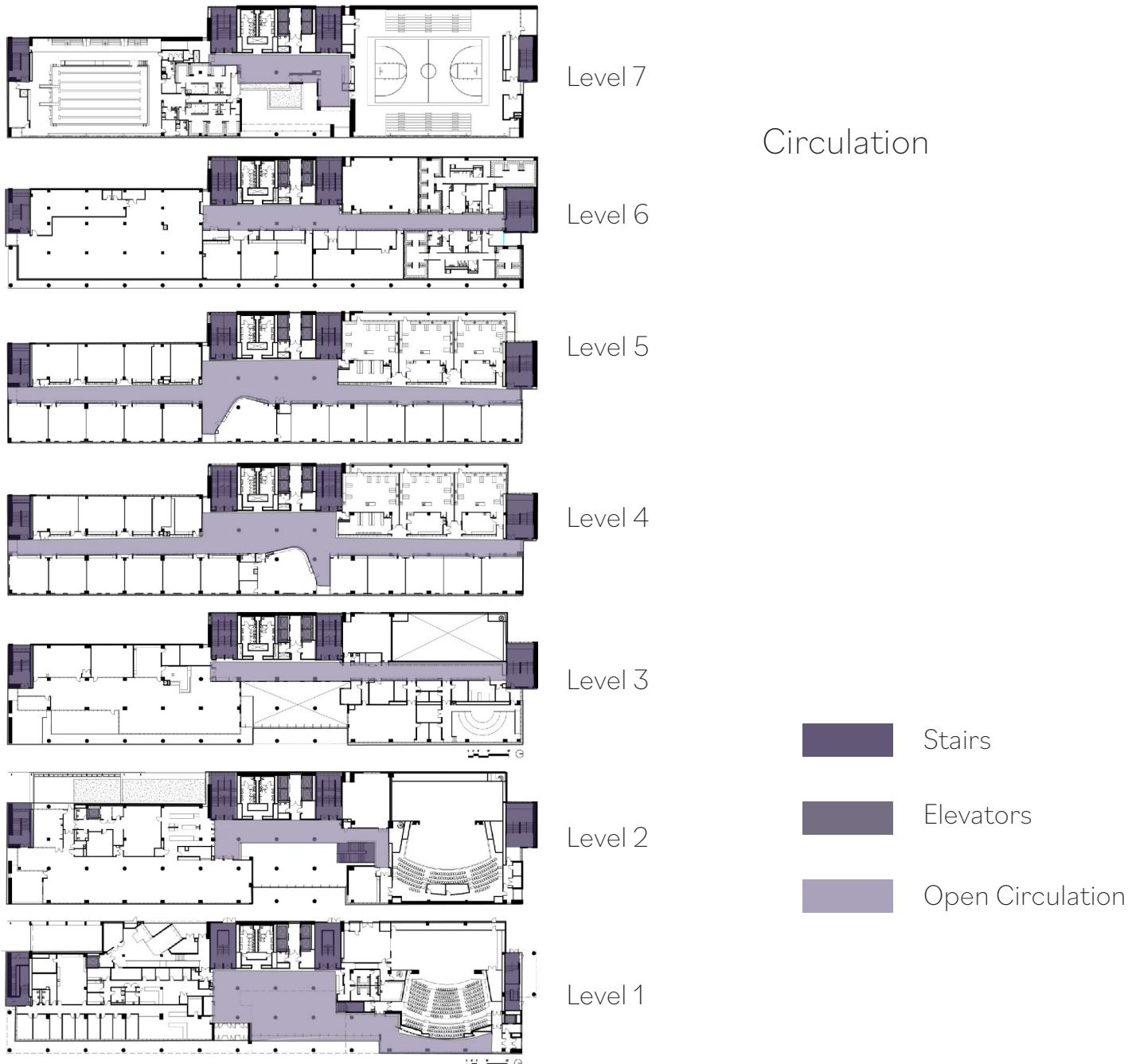


Figure 13. Jones College Prep Floor Plans

# Jones Preparatory High School

## Spatial Arrangements

- Pool
- Classrooms
- Media Center
- Cafeteria
- Administration
- Lobby
- Gym
- Auditorium

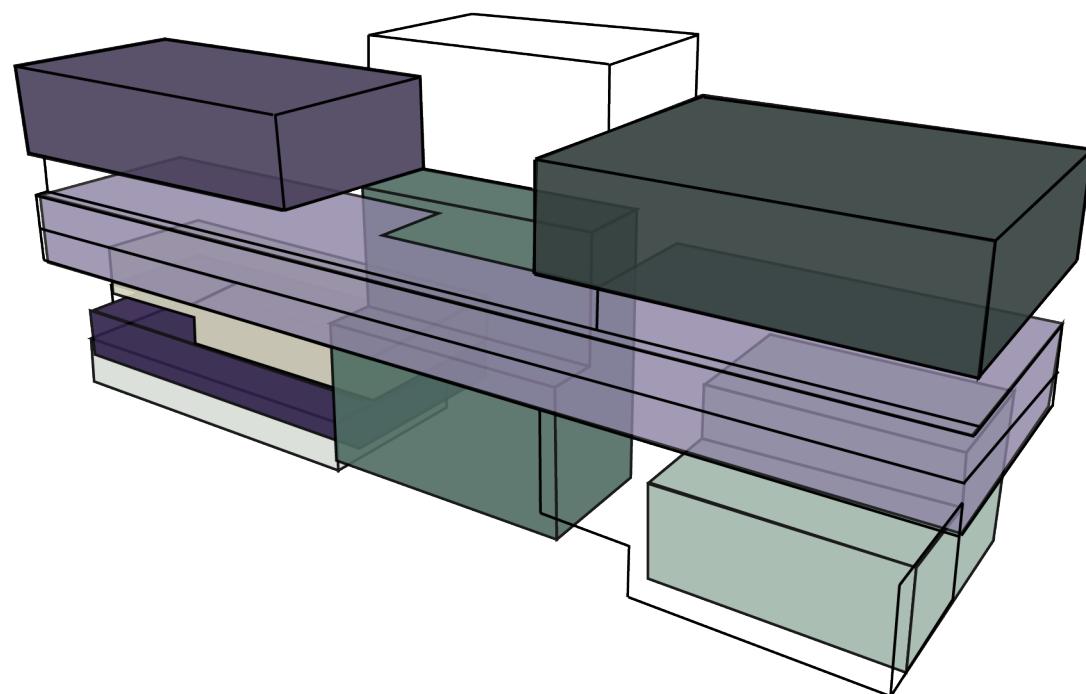


Figure 14. Diagram of Jones College Prep Spatial Arrangements



Figure 15. BVN Architecture. (n.d.) [Front facade of the BMRI Youth Mental Health Building]. [Photograph]. Arch Daily.

# BMRI Youth Mental Health Building

100 Mallett Street,  
Camperdown NSW 2050  
Sydney, Australia

## Overview

The BMRI Youth Mental Health Building is a part of the University of Sydney's satellite campus. It is located in what was formerly a light industrial neighborhood. Consequently, a protected historic facade had to be designed around. The building serves both patients receiving care and scientists studying the brain. The program is divided into four stories, with the upper levels dedicated to the laboratories. In total, it is about 32,300 square feet. The BMRI building was designed by BVN Architecture and completed in June 2010. They received several awards for their work in the following three years.

## Research Findings

To properly serve its dual role, the building included both the requirements of a counseling center and laboratory. This included a lobby, desk space, consultation space, a social gathering space, a central stair, elevators, and laboratories.



Figure 16. BVN Architecture. (n.d.) [Wooden stair in the BMRI Youth Mental Health Building]. [Photograph]. Arch Daily.

Perhaps the most interesting aspect of the design is the use of materials. Glass, steel, and concrete mix with wooden accents. The stair is a beautiful, permeable wooden structure from the first floor to the top. The choice in materiality was determined by the industrial history, the practical requirements of a clinic, and a desire to humanize the sterile nature of medical facilities. The mix of natural, warm wood against manufactured, cold concrete and metal result in a surprisingly relaxed interior. Instead of carrying the intimidation of a warehouse, there is a pleasant balance between grit and warmth.

The BMRI Youth Mental Health Building is integrated socially and culturally.

To its core, the BMRI Youth Mental Health Building is a socially focused building. The goal was to make the building feel open and welcoming so that patients would not be intimidated by the idea of visiting a medical facility. The first floor is at street level so that it is easy to stroll in from the sidewalk. The stairs were designed so that they could be semi transparent, allowing visitors to be able to see what's happening on each floor as they pass by. At the top two floors, the laboratory spaces have glass walls so that the public can better understand the

# BMRI Youth Mental Health

role of the brain and biology in mental illness and treatment. Additionally, the use of transparency in the building helps decrease the divide between the specialist's territory and the patient zone. By doing so, it helps to empower the visitor. Finally, the idea of housing both research labs and counseling in the same building was to bring the two halves of the mental health profession together. This way psychologists and neuroscientists would naturally interact throughout their days, enabling better communication.

The building fits into its cultural setting through its emphasis on the heritage facade and the choice of materiality. As mentioned before, the decision to use steel, glass, and concrete was primarily to reflect the light industrial history of the area. The scale is also relatively modest in order to match the surrounding buildings.

Perhaps one of the greatest strengths of this design was the daylighting. The laboratories are surrounded by glass panels of varying transparencies. This allows natural light to flood deep into the work space. Floor to ceiling windows are employed on the lower levels as well, though not in as great a quantity. Over all, the sunlight adds a lovely, optimistic touch to the space.



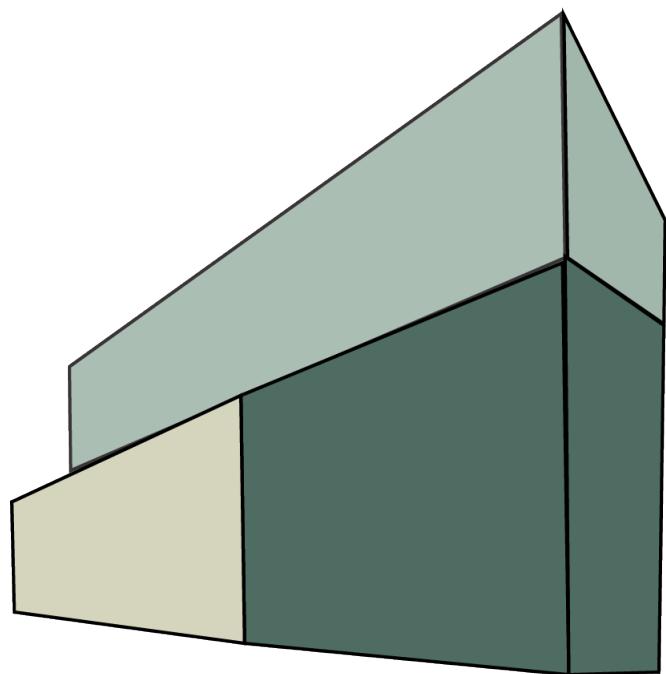
Figure 17. BVN Architecture (n.d.) Elevation. [Photograph].  
Architecture Australia.

# BMRI Youth Mental Health



# BMRI Youth Mental Health

Massing



- Counseling Center
- Laboratory
- Historic Facade

Figure 19. Diagram of BMRI Massing

## Overview

The typological research included three case studies. The first two were high schools from the US: the School of Environmental Studies in Minnesota and William Jones College Preparatory High School in Illinois. The third examined a university owned psychology and neuroscience center, called the BMRI Youth Mental Health Building, in Sydney, Australia. These designs were chosen for a variety of factors. The School of Environmental Studies was specifically created to encourage new ways of learning, making it an interesting comparison to the more standard public school. Additionally, I attended two years of high school there. William Jone Preparatory High School is considered to be a high ranking selective admissions public school in Chicago. It also demonstrates creative ways to design a school in an urban environment with a tight site plan. The BMRI Youth Mental Health Building looks at how counseling centers can interact with other departments in the same space to decrease stigma without losing privacy. After completing these case studies, the theoretical premises of this thesis remain the same. If anything, these buildings demonstrate how relevant the premise is to today's architectural world, as each of them attempt some effort at encouraging well being in the inhabitants.

## Methodology

The case studies were all approached similarly. With the exception of my former high school, all the examples were found through architecture magazine websites, such as ArchDaily. The main strength of this website is its ability to demonstrate many buildings efficiently with both visual and text descriptions. Once the projects were selected, further research was conducted involving the organization's website, the architect's website, and relevant news articles. The NDSU Library databases were also consulted. In the case of the School of Environmental Studies, no digital versions of the floor plans were available. The principal was contacted and gave permission for the building manager to send pictures of their copy of the plans. Special thanks to Sam Firpo for taking the time to obtain them for me. After the information was collected, the floor plans were traced using Adobe Illustrator. Diagrams were assembled to represent the massing, spatial relationships, circulation, and building specific topics.

## Conclusions

All three involved some manner of transparency as a method of creating connections and community. The two schools each had some kind of mezzanine to enable students to watch what was happening on other floors while in passing. In the mental health facility, the stairwell was designed to be permeable so that visitors can see what is happening on each level of the building.

Programmatically, all three buildings were connected to other sites within their community. SES includes trips to the nearby park and is on land donated from the Minnesota Zoo. WJCP rents out the ground floor auditorium to the public after hours and has a sister building next door. BMRI building houses an interdisciplinary approach to the mind between the counseling rooms and laboratories, but also connects through a sky bridge to another campus building.

The two high schools each had a connection to the natural environment. SES has a functioning windmill and hydroponics wall, not to mention an obvious curriculum emphasis. WJCP has a garden terrace and green roof. A special interest was paid to daylighting as well. William Jones College Preparatory used extensive glazing in order to allow natural light deep into the building. Similarly, the BMRI laboratories were completely encased in semi- opaque windows so that diffuse light would fill the space.

All three of these buildings desired health to be a part of the design. Other common underlying ideas were productivity and learning. This fits well with the current theoretical premise. The site played a large role in the ultimate shape of each typology. For example, SES which had a large site and distant neighbors, followed the standard horizontal orientation of high schools in the US. WJCP did not have the luxury of land, so its program had to be vertically oriented. Additionally, the suburban school had two parking lots to itself while the city school had limited underground parking.

In all three buildings, the lobby tended to be located next to the administration offices. Aside from that, there weren't a lot of spatial relationship similarities between the buildings. Additionally, although both schools had classrooms, gathering space, administration space, a cafeteria, and a lobby, they differed in their other features. For example, SES had a library which the later did not, while WJCP had a gym and pool which the former did not.

# Major Elements

## Group Space

Auditorium	Cafeteria
Classrooms	Kitchen
Library	Music room
Computer lab	Stage
Gym	Art room
Locker rooms	Wood shop

# Solo Space

Teacher offices  
Administration offices  
Nurses office  
Counseling office

# Exterior Space

Sports fields  
Recreational space  
Garden landscaping

## Minor Elements

## Group Space

Locker or desk bay  
Before/after school area  
Lobby

## Solo Space

Bathrooms  
Janitor closets  
Electrical room  
Storage

# Exterior Space

Parking lot  
Bus parking  
Flag pole

# User Description

## Peak Usage

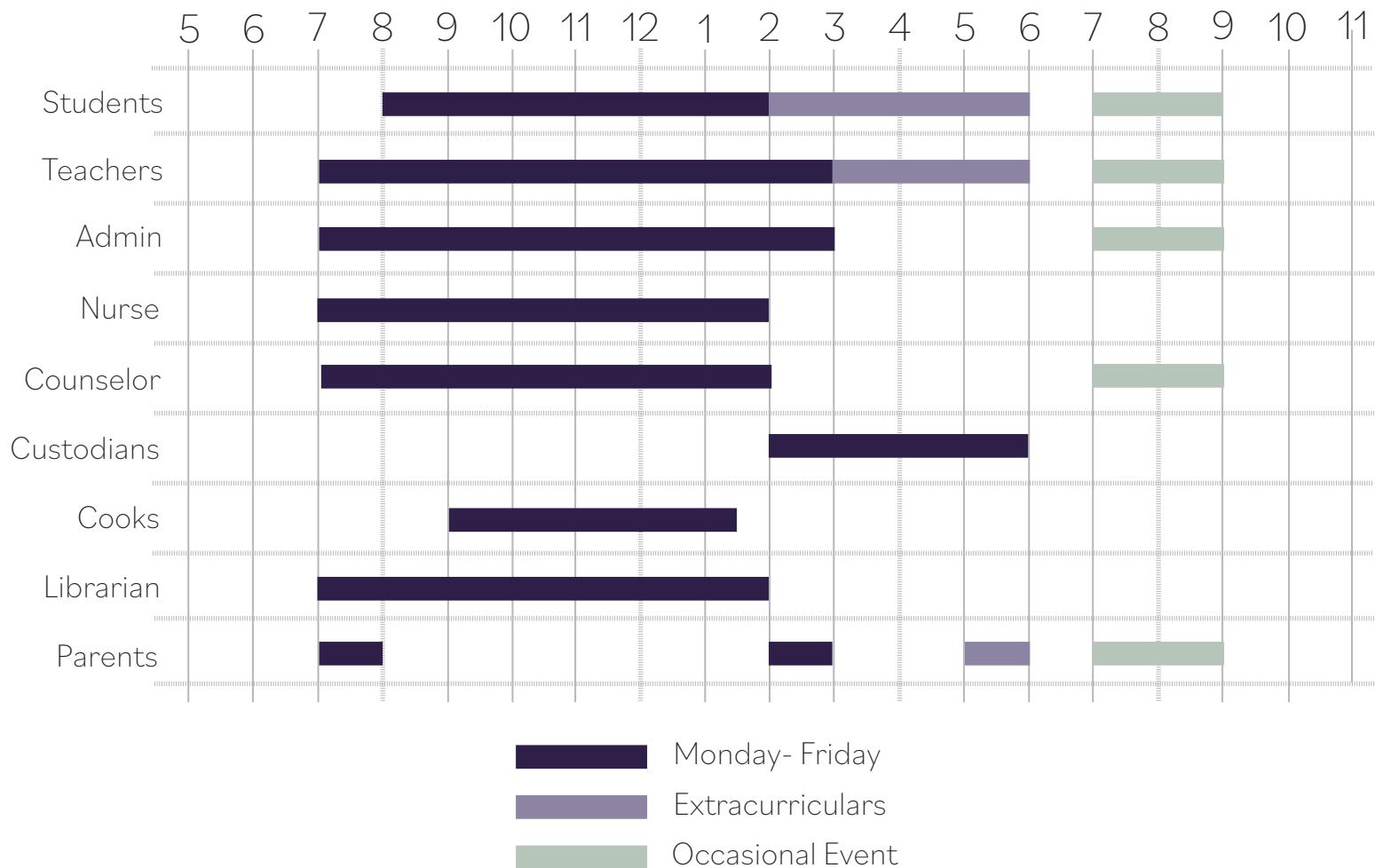


Figure 20. Diagram of Peak Usage

# User Description

Students: ~1,000

Need space to: listen to lecture, put their personal items, study, hang out, charge their computers, wait for carpool/the bus, eat, and express themselves

Teachers: ~50

Needs space to: lecture to large groups, access to screens/ computers/ classroom technology, space to work on lesson plans and grade homework, personal desk, space to hang out with other teachers or discuss privately, and to eat

Administrative Assistants

Needs space to: file storage, a computer, eating, and a spot for personal belongings

Nurse:

Needs a private office for consultations, file storage, medical supplies storage, a computer, a small fridge, a sick bed, a sink, and a spot for personal belongings

Counselor:

Needs a private office for consultations, file storage, a desk, chairs for guests, and a spot for personal belongings

## Custodial Staff:

Needs space to: put their work bags/coats, storage space, cleaning supplies, and an elevator for moving furniture

## Cooks and Cafeteria Staff:

Needs space to: cook, cooking supplies, big fridge, big freezer, loading dock access, heat warmer displays, snack racks, dish racks, big sink, dish washer, dish return area, compost bin, cashier spot, menu board, silverware spot, and a spot for personal items

## Student Organizations:

Needs space to: gather, specific needs depend on type

## Librarian:

Needs space for: file storage, a computer, eating, and a spot for personal belongings

## Parents:

Need space to: pick up and drop off children, may need before or after school care

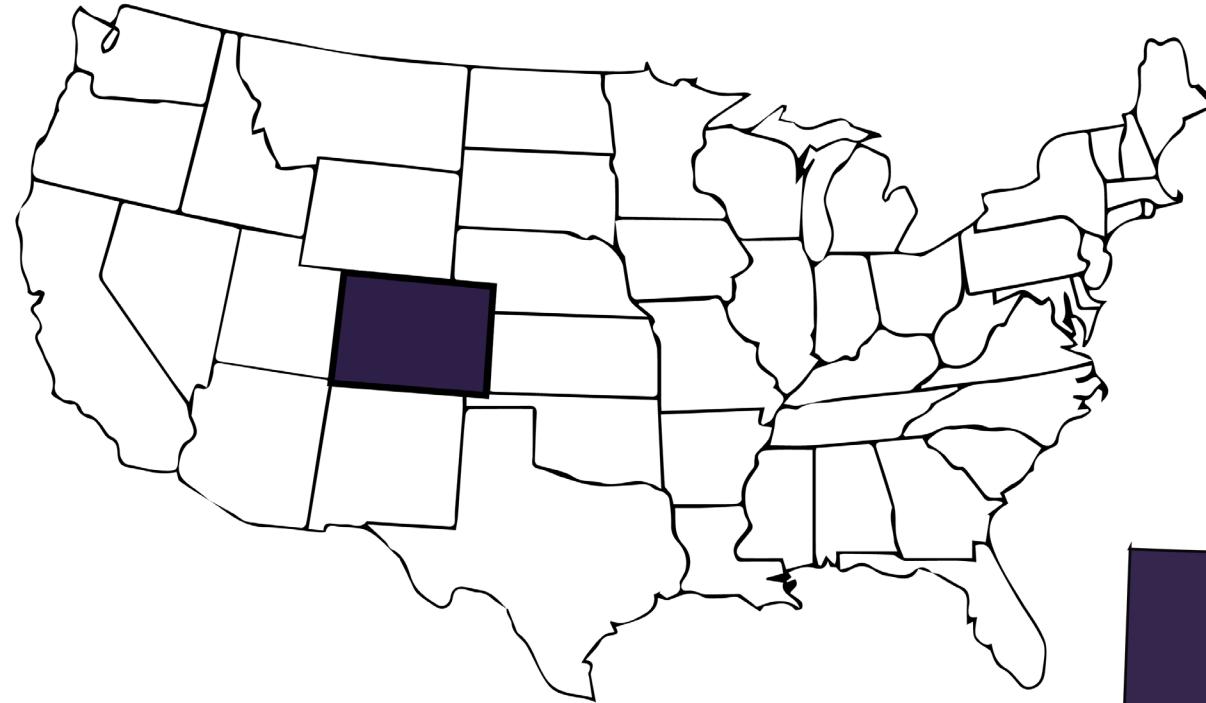
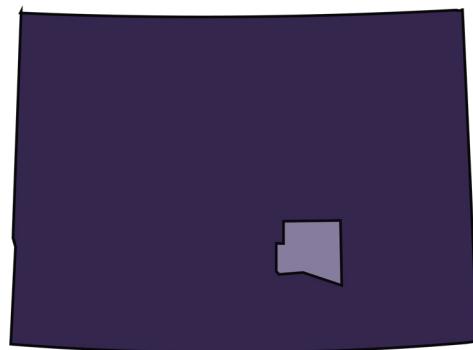


Figure 21. Pueblo County, Colorado, US



## Pueblo County, Colorado

Colorado is one of the top ten states for highest suicide rates. According to the CDC, in 2018 Colorado lost 1,246 people to suicide, or about 21.9 lives out of every 100,000 people (Colorado Department of Public Health and Environment 2019). That puts them in 12th place for the highest number of actual suicide deaths in the United States for that year (CDC 2020). Within Colorado, Pueblo County has had some of the highest suicide rates among youths (Health Management Associates 2018). Due to the mental illness trends in this area and the decent sized population, it seemed like a good candidate for a high school with a mental health emphasis.

## Pueblo

The city of Pueblo is the largest population center in Pueblo County, Colorado. As of 2019, there are approximately 112,361 residents with one fifth of them being under 18. (US Census Bureau 2019). This makes it an ideal space for a high school.

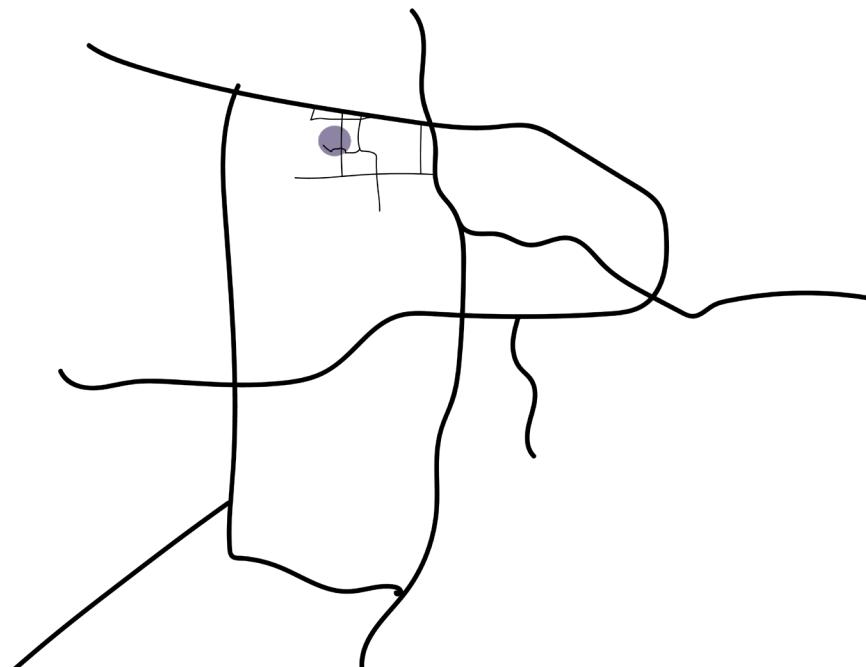


Figure 23: Site in Pueblo

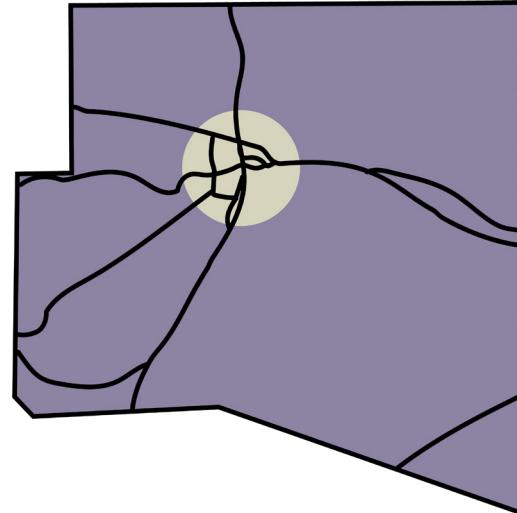


Figure 22 City of Pueblo in Pueblo County

## Mountview Drive, Pueblo, CO 81008

There are four main public high school zones in the city of Pueblo: Centennial, East, South, and Central. Currently, Centennial High School is located on this plot of land.

## Mental- Emotional

The mental- emotional emphasis includes mental illness, mental wellness, and the reciprocal interactions of mind to world. Neuroscience, especially cognitive psychology and environmental psychology, and philosophy from around the world will be employed to elaborate on how humans experience their situations. This in turn will guide research on how the environment affects emotion and mental state. It will also take into consideration the aspects of mental illness that cannot be influenced by the environment. It will demonstrate how design can offer support for those with preexisting conditions.

The mental- emotional emphasis is essential to a project that aims to design a building to benefit its inhabitants' minds and feelings.

## Wholesome Education

The education emphasis includes an understanding of pedagogical methods, curriculum topics, and the real world process of education in the United States. In order to best understand how to design a school, the needs of the school community must be acknowledged. This involves understanding the context and history of education in the United States. Additionally, it aims to understand how to make an ideal school sustainable, both in an environmental and economic sense. Acknowledging that funding is limited for public schools, it seeks to address the pragmatic issues of budgeting.

The educational emphasis is essential to a project that aims to design a school.

## Liminal Age

The liminal age emphasis includes a thorough approach to understanding the wide variety of elements that may be involved in a youth's life. In order to best guide design, an examination of the societal function of teenage years is undertaken. The complex balance of protecting the child while increasing the responsibilities of the adult are analyzed. Additionally, there is an examination of the difficulties emphasized during teenage years such as puberty, sensitivity to appearances, bullying, self discovery, new relationships, uncertainty about the future, increased responsibility, increased autonomy, and increased pressure to perform. Personal factors such as sexuality, gender, race, disability, social disposition, home life, and economic background are considered.

The liminal age emphasis is essential to a project that aims to design for a population inundated by so many new and varied experiences. It is nearly impossible to help this group of people if they are understood to be simply two dimensional, melodramatic child- adults.

## Professional Goals:

By the completion of my thesis, I hope to have a clear and well informed methodology for future educational projects. I hope to have a document able to be referenced in order to improve the future of educational design. I hope to be able to give back to the scholarly community and society in general.

By the completion of my thesis, I hope to be able to demonstrate that architecture can have an impact on mental health for better or worse. I hope to be able to explain how and show data that supports this conclusion. I hope to be able to use this as evidence that architecture is a worthwhile pursuit and important to society. I want to be able to claim that architecture *matters*.

## Academic Goals:

By graduation, I hope to have a completed, decently good, and on time thesis project worthy of a master's degree.

By the completion of my thesis, I hope to have applied research to real world problems in an effective and enlightening manner. I hope to demonstrate this through creating a potential architectural solution.

By the completion of my thesis, I hope to have developed an understanding of the theoretical, historical, and cultural context of education in the United States. Moreover, I hope to understand how this context formed in order to better predict how it might change in the future. I hope to be able to demonstrate my understanding by being able to clearly explain it to others.

By graduation, I hope to have improved my graphic design and presentation skills. I hope to be able to present my thesis in a motivating, engaging, and thorough yet timely manner. I hope to have final display boards that are visually appealing, intriguing from a distance, and able to convey understandable information to the audience even without me there to guide them.

## Personal Goals:

By graduation, I hope to have a physical model or book to be able to show future employers and even further future students. I hope that it may serve both as a boost to my own esteem and reputation. Additionally, I hope it may inspire others to improve on what I've completed.

By graduation, I hope to have a better idea of what the next five years hold for me. I hope to either have an internship, a job, or other opportunity waiting for me. If not, I hope to have a plan as to how to move forward productively.

Throughout the thesis process, I hope to be able to reflect positively on how far I've come over the course of my own education. I hope to be able to see my growth. I hope to be able to feel confident about the skills I have acquired and about my potential worth as a professional.

Throughout the thesis process, I hope to be able to manage my time and my stress well. I hope to be able to help my peers. I hope to be a tolerable, less irritable, and supportive friend.

*By the completion of my thesis, I hope to be proud.*

## Research Direction:

In order to design a high school that benefits students' mental health, a comprehensive research effort must be made of the mind and educational context.

The mind is a complex system of physical and intangible elements. To better understand the biological processes, neuroscience will be examined. For the intangible aspects, psychology and philosophy will be consulted. Special interest will be given to the environmental, clinical, developmental, and cognitive fields of psychology. The main questions to be answered are:

Can a physical environment improve or worsen mental health conditions?

How does an individual's environment impact their mental or emotional state?

The educational context also involves a layered series of physical and intangible systems. To better understand the architecture of school buildings, typological analysis will be conducted. This will also help identify the necessary programmatic requirements. For the abstract aspects, pedagogy, history, and anthropology will be investigated. Special interest will be given to modern educational methods in the United States. Finally, since schools are inextricably located within their communities, careful research will be done into the site. This will also help develop a picture of student backgrounds and home lives. The main questions to be answered are:

How is an educational building best designed to encourage learning, mental health, safety, and growth?

How can this be accomplished within the demands of public school?

How did we arrive at our present situation and where are we headed from here?

## Design Methodology:

In order to answer the questions proposed by my design emphasis, I will employ a mixed method concurrent strategy.

The mixed methods I will be using include historical research, logical argumentation, case studies, and statistical data. The historical research will primarily involve literature reviews on the subjects of education and mental health through the ages. This will also address the question of how the US education system came to be what it is today. Logical argumentation will draw from philosophic literature and rhetorical exercises to help answer the question of what education could, should, and will be in the future. Case study research will help identify what has or hasn't worked for school facilities in the past. Statistical data will aid in identifying where and who is most affected by the current issues in education. This will help paint a portrait of the target audience.

Additionally, I hope to employ qualitative means such as interviews, surveys, and direct observation. However, due to COVID 19 related issues I am unsure if I will be able to gather quality data. Many schools are employing distance learning or hybrid models, so there are few 'normal' school settings this year.

## Documentation:

In order to document my thesis properly, I will keep an organized notebook of sketches. I will also save my rough drafts for papers, annotate readings, and write research summaries. I will update my thesis book monthly. If I create physical models and artifacts, I will photograph them as I make them and when they are 'done'.

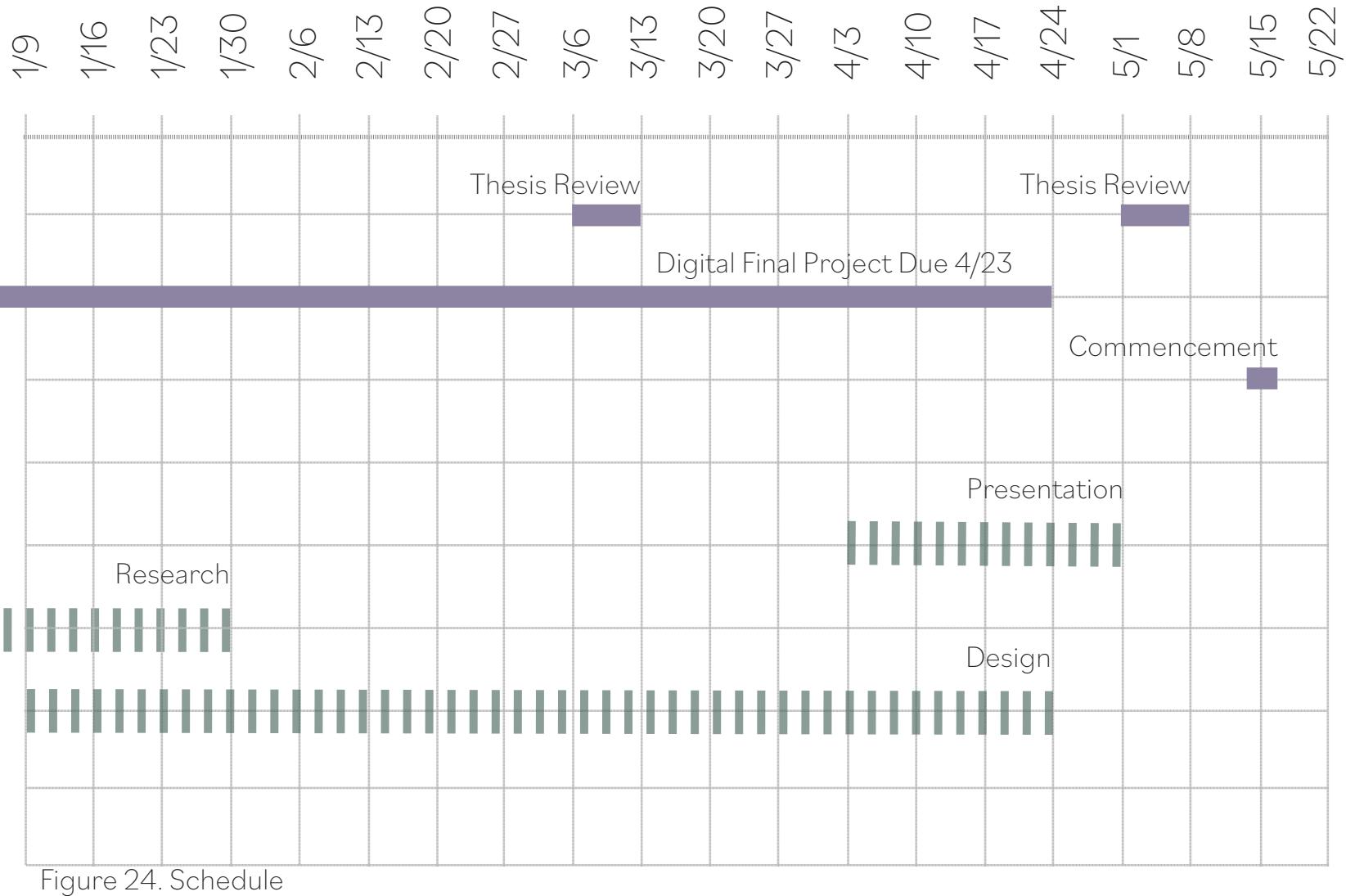
# Work Schedule

Fall Semester 2020



# Work Schedule

Spring Semester 2020



# Results from Theoretical Premise

# Literature Reviews

# The Eyes of the Skin: Architecture and the Senses

by Juhani Pallasmaa

## Abstract

The Eyes of the Skin is a manuscript published in 2005 by Finnish architect and philosopher Juhani Pallasmaa. His work is worthy of mention in regards to this thesis for the insight into how space can impact a person's neurological functioning and for the demonstration of how architecture, science, and experience can inform each other. Throughout the course of the essay, he uses both neuroscience and lived experience to explain perception. It serves to flesh out his beliefs on the role the body plays in experiencing architecture and how perception should be taken into account by designers.

## Review

Juhani Pallasmaa (2005) summarizes the essence of his manuscript in a single line: "an architectural work is not experienced as a series of isolated retinal pictures, but in its fully integrated material, embodied, and spiritual essence." (p.12). He then goes on to break down the world as it is received through each sense.

Part one of the piece discusses vision. Historically, Western culture has shown favoritism towards the sense of sight. Pallasmaa traces this phenomena back to the Greeks who indicated as much in their own writings. Even today, many phrases use vision as a metaphor for knowledge or wisdom. With the

rise of technology, even greater emphasis has been put on sight for entertainment, education, and interaction. Although this dependence on sight is natural, the shift away from other senses may lead to feelings of detachment. Additionally, technology has led to a blending of space and time. Through the Internet, people are now able to ‘be’ in various places around the globe at the same time. Pallasmaa seeks to demonstrate that “the current industrial mass production of visual imagery tends to alienate vision from emotional involvement and identification, and to turn imagery into a mesmerizing flow without focus or participation.” (p. 22). In turn, this affects architecture by shifting the focus from designing for a well rounded experience to designing for a magazine photo shoot.

Despite the consistent dependency on sight, the other four senses have a significant role to play in the world of architecture so much so that sight itself becomes infused with them. Pallasmaa identifies a “tactile ingredient in vision,” (p.26) where seeing a texture stimulates a feeling or memory of that texture in the viewer. Unfortunately, increasingly these materials are inauthentic and cater only to the eye. They also do not wear the same over time. In fact, modern glass facades hardly show any trace of time unless they need repair. Just as with the space- time compression of the Internet, Pallasmaa argues that “buildings of this technological age usually deliberately aim at ageless perfection, and they do not incorporate the dimension of time, or the unavoidable and mentally significant processes of aging.” (p. 32). This supports further disconnect between mankind and its natural environment, not to mention the realities of life. Since “architecture connects us with the dead,” and the rest of human history, the modern disconnect seems especially unfortunate (p.52).

At the conclusion of part one, Pallasmaa suggests architects follow the lead of those who “are attempting to re-sensualise architecture through a strengthened sense of materiality and hapticity, texture and weight, density of space and materialized light.” (p.37).

Part two examines the role of the other senses and non-visual aspects of architecture in contextualizing human experience. Pallasmaa explains that “the eye collaborates with the body and the other senses,” and “one’s sense of reality is strengthened and articulated by this constant interaction,” (p. 41). Humans understand the world around them through their body. Wherever there

is a body, there must be some sort of space or void associated with it. This is why there is no “purely cerebral architecture that would not be a projection of the human body and its movement through space.” (p.45). He also reminds the reader that “we remember through our bodies as much as through our nervous system and brain.” (p.45).

Pallasmaa next turns his attention to the role of light and shadow. Further expanding on the idea that vision is a “distancing sense,” he highlights the phenomena of closing one’s eyes during strong emotional situations, such as kissing. He attributes a sense of comfort in dim lights and an irritation to overly bright artificial lighting. Most important is a balance, as “in great architectural spaces, there is a constant, deep breathing of shadow and light; shadow inhales and illumination exhales light.” (p.47). Thus Pallasmaa is disappointed by attempts to reduce light quality to quantitative specifications. Similarly, he feels that windows have lost their poetic meaning and are now “a mere absence of the wall.” (p. 47).

After luminosity, Pallasmaa identifies the nature of sound. He finds this sense to be more interactive than sight as “the eye reaches, but the ear receives... buildings do not react to our gaze, but they do return our sounds back to our ears.” (p.49). The philosopher points out that even if it goes unrecognized, audio plays a large role in how people make sense of their surroundings. Noise can help identify the actions occurring even if they are behind a door or otherwise out of sight. Reverberations (or lack thereof) can help the visitor make sense of a volume’s scale. Thus Pallasmaa mourns the modern trend of constant artificial noise in public space. He ends simply with “our ears have been blinded.” (p.51)

Pallasmaa then analyzes the role of scent. Although it is not something most architects have a direct hand in designing, it would be hard to deny that scent does not play a large role in experience and memory. Pallasmaa says “a particular smell makes us unknowingly re-enter a space completely forgotten by the retinal memory; the nostrils awaken a forgotten image, and we are enticed to enter a vivid daydream.” (p.54). He cites the 10,000 different odors the human nose can detect as the cause for such specific associations with certain blends.

Touch is next on his list. Unlike the diversity of scent, touch is limited to the categories of “texture, weight, density, and temperature of matter.” (p.56). Yet even with a smaller palette, the combinations can reveal more about the environment a person is in than detached vision. It also creates a feeling of connection to one’s surroundings, especially when dealing with warmth. Additionally, building textures create a desire to be touched.

The most obscure sense involved in an architectural experience is taste. Pallasmaa explains that “certain colours and delicate details evoke oral sensations... our sensory experience of the world originates in the interior sensation of the mouth, and the world tends to return to its oral origins.” (p. 59).

After describing each sense in detail, Pallasmaa reconsiders the body as a whole. For as long as people have been building, designs have been fashioned by the dimensions of the body. Yet good architecture is a balance of practicalities and mysteries. In the philosopher’s view, “the significance of architecture is found in the distance between it and function.” (p. 62). On the flip side, architecture inherently implies a capacity to be used and “initiates, directs, and organizes behavior and movement.” (p.63).

In the conclusion, Pallasmaa reminds the reader that “the timeless task of architecture is to create embodied and lived existential metaphors that concretise and structure our being in the world.” (p.71). Thus, integrating multiple senses can help to create a healthier architectural design and a more cohesive experience of reality.

# Utopian Knowledge: Eidetics, Education, and the Machine

by Jonathan Powers

## Abstract

Utopian Knowledge was written by Jonathan Powers, who earned his doctorate of philosophy in architecture from McGill University in Montreal. His work is relevant to this thesis as it sheds light on one cultural foundation for the modern Western education system. His essay analyzes the language used in the first Utopian novels of European history. Powers then examines what the communicated ideas mean for the fields of education and architecture.

## Review

The first Utopia was written in 1516 by Thomas More. Powers criticizes the idea that an utopia is a literary idea, instead suggesting that they are a social hypothesis about ideal society and the extent that politics or regulation would have control over it.

Powers then describes the City of the Sun by Tommaso Campanella, written in 1623. In this book, the architecture of the city is built in such a way that it physically reflects the structure of the cosmos, or at least the orbits of the planets, though it is accepted by the citizens that it is an imperfect representation. He describes seven circles, one for each planet, enclosing a city with a street pointing in each of the four cardinal directions. The very center of this complex is the temple of the sun, which is a dome painted with all the stars and supported by columns. Another key feature of the city is that all knowledge is painted onto the walls in the forms of murals, so children's education takes place in the form of teachers guiding them through the city and elaborating on the images shown. That being

said, even without a guide children pick up on subtle lessons gained merely by being around the images. The city claims to be full of experts, but only what can be presented eidetically is considered knowledge. Ultimately, social hierarchy is also arranged by this form of knowledge.

The word “eidetic” comes up a lot in the reading, as apparently teaching through images was considered standard at the time and during the Renaissance in general. These images were more of ideals than specifics, like Plato’s forms. For example, Powers says “Solarian murals do not depict particular oak trees... rather, they depict the general concept of an oak tree.” (p. 235). The ultimate goal of Campanella’s utopia was to create a city that functioned purely on eidetic knowledge.

John Amos Comenius was an intellectual descendant of Campanella and wrote his own Utopian world. This man was also considered revolutionary in the world of education as he advocated “for truly universal education (irrespective of gender, class, or age), an insistence that curricular content be connected to the pupil’s life experience, and a universal method based on graduated complexity and empirical contact between the student and the subject of learning.” (p. 236). Comenius also believed that knowledge must be thought through and about things that make an impression on the senses, particularly the visual or in other words, “knowledge, for Comenius as for Campanella’s Solarians, consists essentially of named images.” (p. 237). Things that we can imagine with our inner eye also counts. Thus the utopia in education was considered not just complete factual knowledge, but also a moral perfection or perfection of human nature.

Comenius’ focus on visually communicated knowledge led him to create *Orbis Pictus* or *Orbis sensualium pictus: hoc est Omnia principalia in mundo rerum, et in vita actionum, pictura et nomenclatura*. It is essentially the first Renaissance pedagogical children’s picture book. He begins by trying to represent the Latin alphabet and its pronunciation visually. Then *Orbis Pictus* consists of woodcuts of animals and objects that are labeled with their name.

Not unsurprisingly, he carries his pedagogical beliefs into his own depiction of an ideal society, or more accurately, he drew his passion for eidetic knowledge after having designed his utopia. Although he is more famous for *Orbis Pictus*, published in 1658, his original foray into the literary world was his

Utopian novel *The Labyrinth of the World and the Paradise of the Heart* in 1623. Unlike Campanella's utopia, Comenius' organizes his city around the human life cycle. The city is still rounded, but on closer inspection proves to be disorderly until the narrator looks into his heart. Then he sees the world as interlocking gears powered by God.

In Comenius' utopia the world is a machine, which Powers calls "the secret dream of utopia" (p. 244) because automation is the manifestation of order. Powers goes on to say that although "Comenius imagined only the world as a machine, but after him the entire process of education became automatable, mechanical... a shaping of young humans into 'perfect cogs for the perfect social machine.'" (p. 244). It is because of his utopia that the metaphor of society being a machine is birthed. However, Powers cautions that an essential part of machines is that they can function without interference, like a habit, and may therefore over time allow us to disregard its initial purpose. Powers says "Comenius' great machine, like all machines, continues to accomplish its purpose, despite the fact that its maker has died, that no one can remember why the machine exists, and that the cultural framework that made it possible to imagine and desire the machine in the first place has evolved." (p. 245). He goes on to say "although we often speak of machines as performing work for us, it is more accurate to say that machines perform work as us," (p. 246) which is like Heidegger's suggestion that we become part of the machine cycle as another standing reserve.

Ultimately, Powers is skeptical of whether the early Utopian dream, focused on visual knowledge, is ultimately truly the ideal. He says "at every step, we prepare our world and our lives for the arrival of utopia—any day now, surely—by liquidating our world, our knowledge, our society, and our minds into the currency of images." (Powers 246). Yet despite what is seemingly a human trajectory towards the Renaissance utopia, the world is still far from the perfection imagined by More, Campanella, and Comenius. Strangely, it seems positivistic science has almost worked against utopia.

# Chora Before Plato: Architecture, Drama, and Receptivity

by Lisa Landrum

## Abstract

Chora Before Plato is an essay by University of Manitoba professor Lisa Landrum, who earned her Architecture History and Theory Ph.D. from McGill University. In this essay, she discusses the original Greek usage and meaning of the word ‘chora’. By establishing its practical context prior to Timaeus, Landrum demonstrates how Plato’s usage of the word would have been received by his peers. Attention is next turned to the potential to create chora through words and architecture.

## Review

Landrum begins by analyzing some of the Greek words used in place of or with relevance to the word ‘chora’. The first consideration is ‘hypodoche’. Directly translated it means ‘receptacle’, however it is often used as the word ‘reception’ in the sense that a festival may be a receptacle for the gods. Plato first describes “chora as an ‘all-receiving’ hypodoche,” suggesting it is also flexible as both place and event or as both physical and metaphorical. (Landrum, 2016, p. 327).

Landrum examines the usage of chora in Plato’s Timaeus as well. Plato’s narrator explained how the cosmos came to be by dividing the various workings into two initial categories. The first is ‘being’, described as “that which is eternal, unchangeable, and apprehended only by reason (the stable realm of ideas, from which the creator- demiurge draws ideal patterns),” and the second is ‘becoming’ or

“that which is ephemeral, corruptible, and apprehended by imperfect opinion and sensation (the fluctuating realm of physical reality and human experience),” (Landrum, 2016, p. 329). After some discussion, the narrator Timaeus decides there must be a third category to house the in between, fluctuating yet eternal, realm of making. This realm is known as ‘chora’. Although various metaphors are used in an attempt to explain it, the word remains somewhat ambiguous.

Here Landrum returns to some of the common usages of the word ‘chora’ to re-examine why Plato might have chosen the name. The most frequent usage of chora in Plato’s time was “as an inhabited ‘region’, ‘territory’, or ‘land’,” (Landrum, 2016, p. 330). More specifically, chora often implied a somewhat unified society or a true community that was connected both by the land they lived on and the sociocultural ties they shared with their neighbors. This in turn played into the usage of chora as a festival, where the whole community would gather to help maintain the social ties, political loyalties, the religious functions, and other group practicalities. Naturally, such interpersonal maintenance contributed to better cities. Landrum continues “acknowledging that Plato was writing in a politically charged time due to prior regional turmoil, it is likely that Plato modeled his cosmic chora on a regional chora, thereby appropriating what had been commonly accepted as the socio-political precondition for good cities and citizenry, and recasting this common *topos* as the originary ground for the human cosmos as a whole,” (p. 334). Ultimately, chora is less of a separate third category, but rather the fluid receptacle for the reciprocal, interdependent interactions of the world of ideals and ideas with the ordinary, imperfect world of human life.

Having established a basis for understanding chora, Landrum turns to an explanation of its relevance to dramatic representation. All theatrical performances rely on situational layers—the events of the play are depicted as happening in a certain place at a certain time, however, frequently they are not actually occurring in said place or time. Thus there is a space for interaction between the ‘here’ of the story and the physical ‘here’ of the theater, “whereby a great variety of real and imagined places were made tangibly present, less through changes of scenery (which were always minimal and typically negligible) and more by the performers’ suggestive words and interactions.” (Landrum, 2016,

p.339). This enables the audience to mix the mythopoetic occurrences of the play and apply them to the current issues of their own city. Often, instead of referring to a place as ‘here’, they referred to it as ‘this chora’. Thus the relatively mundane meaning of chora mixes with its theatrical usage as a narrative device. As Landrum explains:

“such comparative layering of partially present, partially obscured situations— dream like situations always coming into being, appearing and vanishing in the persistently present theatre and chora of Attica [the region where Plato lived]— would have been palpably experienced and remembered by a receptive audience, even if the meaning of such fleeting impressions and correspondences may have remained (like those of Plato’s chora) apprehensible only through a ‘spurious reasoning.’.” (p. 339).

Here, the ultimate connection between Plato’s chora and architecture is revealed:

“the regional preconditions essential for good cities (and good architecture) are not stable conditions that take care of themselves, but are precariously volatile ecological, geopolitical, and mythopoetic conditions, demanding continual reinterpretation, measured cooperation, and risky proportional adjustments... in other words, understanding architecture’s tenuous bond to the vexed social and situational milieu that sustains it,” (Landrum, 2016, p. 345).

# The Crisis in Education

by Hannah Arendt

## Abstract

The Crisis in Education was published in 1954 as a standalone essay, then republished as part of political theorist Hannah Arendt's 1961 essay collection. In this piece she discusses the role of education in general as well as in the process of how the United States turns children into adults.

## Review

Hannah Arendt begins her essay by echoing the newspapers of her time in announcing an obvious decline in educational standards. She first toys with the idea of whether or not this issue may be confined to a specific place, as it is sometimes portrayed, or a more general issue spanning recent history. Arendt says "one can take it as a general rule in this century that whatever is possible in one country may in the foreseeable future be equally possible in almost any other," but also "it is nevertheless impossible ever to isolate completely the universal element from the concrete and specific circumstances in which it makes its appearance," ( pp. 174-175). For example, although education everywhere is designed to guide children into adulthood, in the United States it also serves as a method of assimilation for immigrants.

Arendt then delves into the idea of the 'new' that American culture seems to be infatuated with. Although it has always been a part of Western culture, "this pathos of the new" was developed more

completely in the 1700s at the same time that “there was derived at the start an educational ideal, tinged with Rousseauism and in fact directly influenced by Rousseau, in which education became an instrument of politics, and political activity itself was conceived of as a form of education.” (Arendt, 1961, p. 176). Thus the two thoughts became intertwined: in order to create a new order or society, it begins with children’s education. Yet this is somewhat deceptive as “the world into which children are introduced... is an old world, that is a preexisting work, constructed by the living and the dead, and it is only new for those who have newly entered it,” (Arendt, 1961, p177). This is further complicated by the attempt to cast off older traditions of education in favor of new theories. In her opinion, the crisis “is not, unfortunately, simply that this country is young and has not yet caught up with the standards of the Old World but, on the contrary, that this country in this particular field is the most ‘advanced’ and most modern in the world,” (Arendt, 1961, p.179).

Arendt then continues to look at some of the specific cultural influences on the American educational system. The first of these is the value of equality, which guarantees the right to at least a public education for all civic participants. Due to this view, the United States cannot have benefit from meritocracy, as “meritocracy contradicts the principle of equality, of an egalitarian democracy no less than any other oligarchy,” (Arendt, 1961, p. 180). She also identifies three assumptions which have contributed to the modern crisis. The first assumption is that the child’s world is separate and adults should only “prevent the worst from happening” while they govern themselves (Arendt, 1961, p. 181). This results in either “conformism or juvenile delinquency, and is frequently a mixture of both,” (Arendt, 1961, p. 182). The second assumption is that a teacher should be able to teach anything, as opposed to having a specific subject, which means “it not infrequently happens that he is just one hour ahead of his class in knowledge,” (Arendt, 1961, p. 182). The third assumption is that education should “substitute, insofar as possible, doing for learning... not to teach knowledge but to inculcate a skill” (Arendt, 1961, pp. 182-183). This results in trying to turn learning into playing, which is the opposite of helping children become autonomous adults. In turn, this places the adolescent in a difficult position as although childhood is a temporary phase, they are debarred from entering the adult world at their

preferred time. These three assumptions had already been identified by society, but rather than improving the situation, Arendt explains that the crisis worsened when America attempted to switch back to the old system.

Hannah Arendt then turns to the role of education in general, saying “education belongs among the most elementary and necessary activities of human society, which never remains as it is but continuously renews itself through birth, through the arrival of new human beings... [who] are not finished but in a state of becoming.” (p.185). She argues that children must be protected from the world to some degree, as wherever life “is consistently exposed to the world without the protection of privacy and security its vital quality is destroyed,” (Arendt 1961, p. 186). This does not mean children will function better in a world of their own however, rather the privacy takes place in the family. In contrast, school “is rather the institution that we interpose between the private domain of home and the world in order to make the transition from the family to the world possible.” (Arendt, 1961, pp. 188-189).

While children are being made ready for the world, the world continues to be run by adults. Therefore, it is the adults who must take responsibility for how the world is, which in turn grants them authority over the newcomers and requires the educator to “mediate between the old and the new,” (Ardent, 1961, p. 193).

Towards the end of the essay, Hannah Arendt looks toward new principals to improve the current trajectory. In her own words, “the problem of education in the modern world lies in the fact that by its very nature it cannot forgo either authority or tradition, and yet must proceed in a world that is neither structured by authority nor held together by tradition,” (Arendt, 1961, p. 195). Thus she recommends that schools instruct students on matters of the past, acknowledge that adults and children must be treated differently without isolating childhood as a permanent state, and to be aware of the required specialization.

Arendt finishes with a final memorable statement that essentially summarizes the underlying atmosphere of the work. She says:

“Education is the point at which we decide whether we love the world enough to assume responsibility for it and by the same token save it from that ruin which, except for renewal, except for the coming of the new and young, would be inevitable. And education, too, is where we decide whether we love our children enough not... to strike from their hands their chance of undertaking something new, something unforeseen by us, but to prepare them in advance for the task of renewing a common world.” (Arendt, 1961, p. 196).

# Literature Review Summary

## The Eyes of the Skin

Although the mundane spaces of our lives often become nearly invisible due to our habits, Juhani Pallasmaa's analysis seems to ring home when thinking of my experiences in foreign places. He says that "every city has its spectrum of tastes and odours," (p. 55), a suggestion that rings true. Sometimes a scent will transport me to a street corner in Korea after the monsoon rain. An iced Americano makes me think of the street on the way to class and the people I met there. Sometimes I can't even identify what it is, but the world poses in just the right way and suddenly I'm there.

Another travel related experience that hit home relates to Pallasmaa's descriptions of architectural memory. Our bodies remember and "we keep constructing an immense city of evocation and remembrance, and all the cities we have visited are precincts in this metropolis of the mind." (pp. 67-68). In my dreams, the streets of Korea will meld into the streets of Belgium. Additionally, I spent three years living in various apartments on 12th avenue in Fargo. Now I live a few blocks further back and I still forget how long it takes to walk the extra quarter mile. In terms of the greater issues involved in my thesis, Pallasmaa's work suggests that a person will feel more integrated into their lives if they can connect to their environment through multiple senses. This reminds me of mindfulness meditation, which encourages the practitioner to take note of all the information one's body gathers as it happens. Just as mindfulness has been shown to decrease anxiety and disassociation, the potential for a phenomenologically sensitive building to improve mental wellbeing seems plausible.

## Utopian Knowledge

We have indeed become a society where children can be educated through their surroundings without actively seeking it and where we can access the knowledge of experts from around the world without leaving our homes. The lofty, impossible ideal of a man four hundred years ago is now a commonplace reality. What matters in this is not whether Comenius was right, but the fact that we did not end up where we are today by accident. Whether you deem it success or failure, our culture has relentlessly navigated toward the goals of our forefathers. If nothing else, it demonstrates how much power we have over our destiny as a people.

Jonathan Powers, a man who extensively studied the Renaissance utopias of Thomas More, Tommaso Campanella, and John Comenius, warns that perhaps the biggest difficulty lies in controlling this force. Comenius may have saw the machine as the ideal state of society, but Powers points out that “with its capacity for independent function and purpose, the machine uncannily resembles the basic human capacity for habituation—that is, the capacity to develop a reflex, reaction, or attitude that forgets its original purpose.” (Powers 245). Though we may have stayed true to a surface level version of the Renaissance utopia, it seems we may have forgotten the initial intention of an excellent and fair society.

Many modern education movements fight the idea of seeing children as pieces of the societal machine. It enables efficiency through reduction, but it is much easier to accomplish in the imaginary world of a novel than it is with real children. Ultimately, each individual will be somewhat different and no one will fit the proper ‘shape’ of the ideal child. This perhaps accounts for why in practice, although people may fill the same role or do the same job as one who came before, no one is absolutely replaceable. Rather than seeing this as a hindrance, it can be a great strength.

What the Utopian machines best offer insight into is the idea of systems. Though a school may not operate with the repetitive exactness of automation, it can be said to run on a series of independent actions that contribute to an interwoven series of semi-planned events. This is known as systems

thinking.

As far as eidetic knowledge, we seem to still be pursuing the Utopian goal of ultimate knowledge represented in two dimensional form. I doubt we will ever achieve it. Regardless, although it may be helpful to first introduce an idea in a simplified form it is important to step back and remember that it is more than that. Switching between modes of learning can help create greater understanding.

## Chora Before Plato

Just as architecture and drama are in flux with its physical and cultural surroundings, so too with education. Schools are designed to enable children to draw parallels between their ‘book learning’ and their experience of life. This is further layered by an attempt to teach them how to go about understanding or learning on their own, often championed as ‘critical thinking’. All the while, the students themselves are undergoing many changes both physically and mentally. They are in the process of becoming adults while also becoming themselves.

The architecture of the building is also caught in a multi-layered, chora- like situation. Just as the word ‘chora’, the word ‘school’ has a rather mundane meaning of a specific building, a community based meaning referring to a group of people with shared ideas, and an even more ambiguous cultural concept. On one hand, it must serve as the ‘school’ in the sense that has been standardized and has a nationwide prescribed curriculum. At the same time, it must respond to the specific context of its physical location and the local needs.

## The Crisis in Education

Although Arendt takes some of her arguments further than I would, her general ideas on education and its role in both society and politics bear heavily on the thesis. If nothing else, it demonstrates how reactionary measures clearly have not benefited the school system in the past. She also extrapolates on the tricky position adolescents are in socially.

One area I directly counter with my thesis is her suggestion that schools should no longer worry about teaching their students how to live. If we are to solve the new crisis of mental illness in education, students must be introduced to coping mechanisms and other life skills even within the realm of their education.

# Architecture and Mental Health

I.

The question ‘how can architectural design positively impact the mental health of high school students’ must be dissected before it can be appropriately addressed. It must first be determined:

Can the architecture of a building actually make a difference in a person’s life beyond the physical benefit of shelter from the elements?

Does a school facility have a significant enough impact on a student to allow any potential mental influence to manifest?

Is there a need for high schools to plan with student mental health as a consideration?

II.

*Can the architecture of a building actually make a difference in a person’s life beyond the physical benefit of shelter from the elements?*

This question has been answered by the architectural community with a resounding ‘yes’. Throughout history, architecture has been seen as a way to intimidate others or display power, create a sacred space for religious purposes, and move people emotionally. Understanding the how and why of these impacts is a much more complicated question and is still in the process of being answered.

In the early 1900s, the philosophical movement known as phenomenology began to gain momentum, the central essence being an attempt to qualitatively explain phenomena as experienced in life (Spiegelberg & Biemel, 2017). The goal was not to understand why these events occurred, but to describe what happened and how it impacted the individual’s experience in the moment. By the 1940s, philosophers such as Maurice Merleau-Ponty had begun applying these principles to architecture. One famous example of this approach is Juhani Pallasmaa’s *The Eyes of the Skin*, in which the architect-philosopher details how several aspects of design impact the senses and therefore affect the mood or experience of a space.

In 1953, the attempt to explain architecture’s metaphysical effects led designers to partner with

psychologists under the Architectural Study Project shared by the American Psychiatric Association and the American Institute of Architects (Ramsden, 2018). More specifically, this project was meant to identify ways that mental hospitals could improve the wellbeing of inmates through the design of the building. In such facilities, the “environment was of critical importance because mental patients were unusually sensitive, and this was compounded by the fact that their stay would last for months, even years; it could not afford to be ‘dingy, forbidding or bleak.’” (Ramsden, 2018). The last three adjectives, “dingy”, “forbidding”, and “bleak”, are of special significance as they refer to atmospheric or emotional effects created by the physical space. This study was also unique in that the hospital setting created a somewhat controlled experiment, allowing for a more scientific approach to interpreting architectural influence. Ultimately, the Architectural Study Project struggled to completely satisfy its original goals, however it helped pave the road to a broader field of environmental psychology (Ramsden, 2018). Essentially, this field is dedicated to understanding and measuring how the space an individual is in affects them mentally— in other words, dedicated to answering the current question.

In recent decades, efforts to define architectural influence in a scientific manner has led designers to study the brain itself. Sprouting from a 2002 AIA Legacy Project, the Academy of Neuroscience for Architecture supports and organizes research into how the built environment can apply such knowledge (Academy of Neuroscience for Architecture [ANFA], n.d.). As technology advances, new methods of research are made possible. For example, mobile electroencephalogram (EEG) devices are able to monitor brain function while participants explore architectural spaces. This technique has already been used in conjunction with virtual reality (VR) to explore various spaces within a controlled setting (Baneai et al. 2017).

Only time can tell what will be discovered in the next few decades.

### III.

*Does a school facility have a significant enough impact on a student to allow any potential mental*

influence to manifest?

The short answer is yes, but to a small degree.

Social scientists as far back as psychologist B. F. Skinner have theorized about environmental impacts on behavior. In the 1980s, Albert Bandura developed the Social Cognitive Theory, stating that human behavior was influenced by both personal and environmental factors (Sharff et. al., 2012). The work of these scientists has contributed greatly to the concept of ecological models. In general terms, these models examine human behavior as the product of a nested series of influences. These are described by M.E. Sharff (2012) as:

- (1) intrapersonal factors (including characteristics and developmental history of the individual);
- (2) interpersonal processes and primary groups (such as social networks and support systems);
- (3) institutional factors; (4) community factors; and (5) public policy.

(p. 13)

Each tier within this model has both physical and social components comprising the environment.

Such ecological models offer a practical opportunity for public health interventions. In order to maximize exposure and therefore influence on an individual, each level of the environment must be addressed. When each group helps reinforce the change in behavior, it seems rational that the new behavior or idea would be further cemented. Epidemiology frequently employs a similar analysis.

In this model, a high school would fall under the third tier as an institutional factor. M. E. Sharff (2012) elaborates on this environmental influence further:

These represent settings and structures in which children may spend significant amounts of time and through which rules, norms, and beliefs are shaped and enforced. Within these settings, there are opportunities to teach, promote, and support healthy behaviors, as well as to design healthy environments in which children can thrive, remaining safe and healthy." (p. 14)

Thus, institutional environments are not the strongest influence on a child's behavior and well being, but they still hold a significant place in the hierarchy.

At a glance, this conclusion makes intuitive sense. In the United States, school is mandatory

at least until age sixteen, which is usually around the sophomore year of high school. The minimum official working age is fourteen, with legal limitations on hours and activities which discourages many businesses from hiring those under age sixteen. Sixteen is also the youngest age at which a person can get a driver's license. So for most youths, until they turn sixteen, they are pretty limited to their homes, schools, and extracurriculars (which frequently also happen on school grounds). Thus school becomes both the social and the physical structure of their lives— it is both setting and plot device in their reality.

Yet has it been proven that school design can impact mental health? New technology and methods will better answer this question, but for now the 2011 study by researchers Ellaway, Sweeting, and Young can shed some statistical insight. The paper begins by identifying the individual and contextual factors involved in suicide, such as pre-existing mental illness, community moral norms, and the heightened risk caused by the physical and cultural transitions of the teenage years. Afterwards, they outlined the pre-existing research demonstrating that context does have an effect on suicide, at least through the form of compositional factors. For example, access to firearms in a specific region can impact the rate of suicide (Young et al, 2011). Additionally, they found “a systematic review of multi-level studies estimated that, after accounting for individual and family characteristics, neighborhood determinants explain approximately 10% of the variance in child and adolescent health outcomes,” (Young et al, 2011). At the school level, the “percent of variance attributable to contextual influence never exceeded 8% and most were below 4%” and the researchers concluded that “it is likely that the contribution of school in relation to suicidal behavior is small, but nonetheless important given the severity of the outcome,” (Young et. al., 2011).

Based on this research, they tried to define three main variables that impact student perception of a school. The first two are fairly similar: ‘school connectedness’ and ‘school ethos’. Both refer to the quality of involvement and teacher-student relationships, but the first is referencing such factors on an individual level while the second addresses the general school culture. Previous research shows that the physical school building, feeling of belonging in the school, student engagement, and teacher-student connections are all correlated with substance use patterns; this study aimed to identify if

they additionally impact mental health. In order to examine these variables, the researchers looked at data from roughly 1700 students spread out between 43 different schools in Scotland. The data was collected at age 11, 15, and 19. The goal was to analyze how school environment and culture affected suicide risk after taking into consideration background factors.

Ultimately, they concluded that the school environment overall has a low effect on a pupil's mental health. However, adjusting certain variables could create a measurable impact. Young states, "after adjustment for confounders, pupils attempted suicide, suicide-risk and self-harm were all more likely among pupils with low school engagement (15-18% increase in odds for each SD change in engagement)." (Young et. al. 2011). School connectedness seems to have the biggest positive impact, but mismatch in ethos or religious views has the biggest negative impact.

To summarize, behavior, culture, and built environment are involved in continual, complex interactions. In isolation, a school building itself does not have a large impact on its students' mental health, however, its ability to shape behavioral patterns in conjunction with cultural change could result in improved outcomes.

#### IV.

##### *Is there a need for high schools to plan with student mental health as a consideration?*

Ultimately, what are schools for? If they are to foster growth and provide a safe space to learn, then yes, architects must now include mental health aims in their school design plans.

According to the National Institute of Mental Health, 31% of people aged 13 to 18 have an anxiety disorder with 8% of those being severely impaired by it (National Institute of Mental Health [NIMH] 2017). In terms of depression, 13% of the 12 to 17 year old age bracket in the US had reported at least one episode in a 2017 study (NIMH 2019). Suicide rates have been on the rise over the last decade and are one of the top ten causes of death in America according to the CDC (Heron 2019). Although suicide rates are actually higher for middle aged people, it is still the second highest cause of death in people aged 10 to 34 according to the Suicide Prevention Resource Center (Suicide Prevention Resource

Center 2020).

Additionally, school shootings have been on the rise. Data from the Homeland Security website documenting every publicly available case where “a gun is brandished, is fired, or a bullet hits school property for any reason, regardless of the number of victims, time, day of the week, or reason (e.g., planned attack, accidental, domestic violence, gang-related)” lists over a hundred cases each for 2018 and 2019. Two decades earlier, there were a total of fifty cases if 1998 and 1999 were added together (Naval Postgraduate School).

Adolescents spend most of their time at home or at class, making the school building and educational system a central structure in their lives. Therefore it would seem that schools are the greatest opportunity for public architecture to impact youth behavior and health. This conclusion seems in line with the ecological models outlined above. If a building can only create a small impact, then it should at least do that much.

The idea that a school should play a role in positive change is not particularly original. In 2013, California passed a law requiring all public school districts with students in 7th to 12th grade to develop a suicide prevention policy with the assistance from mental health experts (Walker 2018). Similarly, a 2018 press release by the American Institute of Architects announced a call to action. Carl Elefante, the AIA president at the time, stated “architects have a role to play in addressing school violence,”(Schneidawind 2018).

# Prison and School Design

Based on the following description, guess the facility indicated:

This is an institution where people are mandated to spend a certain period of time in. This time period is determined legally. They are not allowed to leave their designated location outside of free times without permission. They are usually under direct supervision and their activities are restricted. Notably, phone usage is limited to specific times. This process is considered a way to improve the character and potential for societal contribution of those in the system.

Is it a prison or a school?

Though easy to dismiss as classic teenage melodrama, the institutionalized atmosphere of many public schools has drawn criticism and sparked debate. Architect Frank Locker suggests that “in the US, many of the same people who designed prisons also designed schools,” and argues that the overlap results in a rigid, detrimental learning environment (Valencia 2020). Other architects, such as those at the TowerPinkster firm, look at prison design as a method of increasing security in a society where school shootings are a potential risk (Horton 2019). Essentially, it boils down to the age old debate over control versus freedom and fear versus trust. Although it is safe to assume that the answer is balance, a thorough examination is necessary for well-informed school design.

*How similar are schools to prisons?*

Aside from the long hallways and controlled inmates, the prison and the high school have a common denominator in their categorization as institutions. According to the Merriam- Webster online dictionary, an institution is:

- “a: an established organization or corporation (such as a bank or university) especially of a public character...
- b: : a facility or establishment in which people (such as the sick or needy) live and receive care typically in a confined setting and often without individual consent...
- c: a significant practice, relationship, or organization in a society or culture...” (n.d.).

Perhaps the most important takeaway from this is the twofold nature of society’s most recognizable

establishments—the material and the sociocultural. As such, there are two dimensions to be analyzed.

### I. *Sociocultural Elements*

The sociocultural elements referred to include the practices and public beliefs connected to an institution. For example, a prison is more than just a building. It is a space to confine and convert wrongdoers into contributing societal members or to punish and permanently separate those deemed a danger to society. Though intangible, these cultural ideas have a profound impact on the physical space of the building. Yvonne Jewkes (2018) article elaborates:

Within criminological studies, it is well documented that prison architecture is inscribed with meaning (Evans, 1982; Hancock & Jewkes, 2012; Jewkes & Johnston, 2007; Pratt, 2002) ... in other words, we can infer from a prison's facade and internal organisation what the particular philosophical stance on punishment was at the time it was commissioned, designed and constructed." (p. 321).

Philosophy turns into design intent, which in turn shapes the features deemed necessary for a building. In this manner, the designers and commissioners essentially use the physical building as a megaphone for their thoughts, engulfing the visitor in a message received through each of the five senses. Jewkes (2018) summarizes the research of environmental psychologist Mayer Spivack, noting:

that every building, room and space has a 'personality' that makes a statement to its occupants about what the institution, and society at large, thinks about them; a statement which each occupant internalises and acts on accordingly. So, 'hard architecture' (bars on windows, concrete walls, hard-surface floors, drab colours, indestructible and uncomfortable furniture) not only destroys the prisoner's (or patient's) self-esteem and influences the ways in which staff think of and behave towards the people in their custody and care but may also determine certain types of identity and behaviour. (p. 321)

Jewkes draws the comparison between hospitals and prisons, stating that the architecture has a direct impact on the thoughts of those inside through subtle environmental cues that add up to create a

pervasive atmosphere. Furthermore, within those walls a visitor becomes a ‘prisoner’ or a ‘patient’ regardless of background, occupation, or character. Thus one’s personhood is surrendered to the institution.

The same can be said for school environments. In places where the educational model relies on fear-based respect, the message is enforced both in “the layout of the desks, [and] the irrefutable authority and knowledge of the teacher,” (Valencia, 2020). The standardized classrooms and nearly indistinguishable hallways in a typical high school echo the principles set forth by the ‘factory model’ of education. No individual is essential—so long as the school has students in general, it doesn’t matter who they are; they are as replaceable as gears in a machine. Therefore no personalization is needed and creativity is limited to what fits inside the rigid design. Unlike in prison design, where the messages of punishment and isolation stem from negative cultural feelings towards the inmates, the uninspired factory-school is not born out of malice. Instead, it falls victim to the mantra known as ‘the necessities of large populations’ and a limited budget. However, by the same principle of translating institutionally agreed upon ideals through design, school buildings could actively encourage growth and connectivity. This in turn could support better mental health.

### *Institutional Ideologies*

Several sociocultural ideals seem to be common to almost all forms of institutions. These include a hierarchy of control, security, efficiency in operations, and cost-effective design. Their prevalence in society demonstrates the value and importance of these concepts, however the treatment and execution of each ideal can vary greatly and thus result in different overall impact on user experience.

### *A. Control*

The hierarchy of control describes the power dynamics and authority relationships both within the organization and to society in general. As elements of the social landscape, these establishments have an authority granted by societal respect. This is known as ‘institutional power’ and is defined as:

the power wielded by entities like governments, churches, and corporations to control people and direct their behavior through the use of rewards and punishments. Entities with institutional power and their agents have the official authority or the ability to decide what is best for others and to allocate resources. (Fenner, 2016)

Essentially, the members of an institution gain authority in exchange for accepting the responsibility of making the best decision. This power is based largely on trust and not legal coercion, however it can be held to legal scrutiny at times. For example, in most situations a hospital cannot prevent a patient from leaving. However, if a doctor deems it to be medically unsound for hospital discharge but the patient decides to leave anyway, they will most likely be required to sign a form releasing the medical institution from legal responsibility for any health issues that may arise from leaving early (Torrey, 2020). This demonstrates the unique situation of institutional power— on one hand, the hospital cannot legally suspend the rights of a patient by restraining them, however, socially the hospital may be viewed as holding responsibility and therefore face a lawsuit. Thus, it can be said that institutional power is a mixture of formal or legal- based authority and social or perceived authority based on communal expectations.

In many ways, institutional power seems to be an expression of the social contract theory proposed during the Enlightenment by philosophers such as John Locke and Jean-Jacques Rousseau. In brief, the social contract is formed “by submitting our individual, particular wills to the collective or general will, created through agreement with other free and equal persons,” (Friend, n.d.). By doing so, people can protect their personal possessions without relying on physical force. Locke would go on to argue that if the group or person in authority no longer provided for the communal good, then they should be removed from power by the community. In practice, this is complicated by disagreements

about what truly is the communal good and how much control should be surrendered.

Institutional power influences the control hierarchy significantly. It creates a division between those who are considered part of the organization, such as staff, and those who are under their charge, such as inmates or students. In her comparison between hospitals and prisons, Jewkes acknowledges the imbalance by highlighting how “in neither setting do most occupants usually have control over egress, and in both, they are infantilised by the fact that they must depend on staff for almost everything that is vital to their existence,” (Jewkes 2020). This is true of those in secondary school as well, given that they must ask permission to use the bathroom, speak, eat food, or leave the building. Under usual circumstances, this minor subjugation is considered a practical means of maintaining order and safety. However, as previously mentioned, it can be difficult to balance an individual’s freedom and community good in real life situations.

If the balance between freedom and communal good is perceived to be skewed, frictions between the two castes arise. This exaggerates the power division and can cause the groups to “become relatively isolated and assume logically extreme positions, the members of each group responding to the other as stereotypes,” (Weinberg, 1942). At times this results in a perceived inferiority of the ‘controlled group’ by the ‘controlling group’ either due to social reasons (like criminal history or student age) or training (like medical knowledge). As a result, the personhood of those involved is challenged. Personhood, or the various aspects of an individual that grant them social or legal standing as a human person, is often one of the dearest ‘possessions’ of an individual. Perhaps it is in keeping with the social contract theory that when one’s personhood seems under attack, they may lash out at the institution in an effort to regain or defend their agency and narrative. A study on prison social dynamics from the 1940s suggested that “the inmates as a subordinate group oppose, negate, and even nullify the ideology and symbols used by the officials. They tend further, as has been indicated, to denounce and to deride the officials as they converse among themselves,” (Weinberg, 1942). The description is not unlike that of how a rebellious student may respond to a strict teacher.

In educational settings, the hierarchy of control tends to be adults over children. Naturally, this

idea becomes somewhat strained in respect to high school students given their ages. Teenagers are not quite children, nor are they truly adults, yet they are faced with a mixture of the social expectations from both. Technically, they would be considered ‘adolescents’ if between age ten and nineteen (World Health Organization, n.d.). Nonetheless, that definition does not consider the aspect of social roles—for example, an eleven year old is seen as having less personal responsibility than an eighteen year old. The changing social circumstance of teenage individuals combined with their efforts to discern and establish their personhood makes high school a unique transitional period. As adolescents become more self-aware, personal agency and authority begin to take on a new significance. Unsurprisingly, issues related to disobedience may arise between teachers and students more frequently and as such, high schoolers are often perceived as one of the most rebellious age groups. Herein lies one of the greatest similarities between the institutional ideologies of control in a prison versus a high school: in both, there tends to be an assumption that when given too much freedom, the inmates will cause havoc of some sort. This is not true of every institution. Still, it can be seen in the philosophy of many common school policies, including assigned seating, dress codes, and hall pass requirements.

#### *B. Security and Safety*

A second category of ideas seemingly common to all types of institutions includes security and safety. This involves protecting the inhabitants from any danger, ranging from natural disasters to accidents to violence. This category is often closely associated with the hierarchy of control for several reasons. It represents the other end of the authority bargain, in other words, what is supposed to be gained in exchange for subjugation. This means both that a.) many people feel that centralized control leads to greater safety and b.) that anyone with authority should ensure the safety of those below them.

Safety and security are important beyond the physical benefits of staying alive and relatively undamaged. Psychologist Abraham Maslow theorized that in order for people to achieve their true potential, a series of needs must be met and maintained. From the bare minimum to those required for the best life possible, his original needs hierarchy ran: 1) physiological, 2) safety, 3) love and

belongingness, 4) esteem, and 5) self actualization (McLeod, 2020). . According to this theory, people must be able to ensure their safety in order to live a fulfilling life. When people do not feel safe, stress increases and mental health worsens.

Institutionalized safety takes many forms. Fire drills, occupation limits, and building codes help prevent accidents. Many places employ security guards or police and use cameras to monitor the building. Increasingly, mass shooter protocols and de-escalation training are becoming part of the discussion. Both institution staff and the inmates must feel safe in their environment.

#### *C. Efficiency*

Efficiency is a modern day obsession. Although it can be practical to focus on how to transport people from one place to another in the least amount of time, when proper regard isn't given to the experience it results in a sterile environment.

#### *D. Low Cost Design*

As many institutions are run on a tight budget with limited funding, cost- effective design is necessary. Life cycle costs or long term maintenance issues are not always considered and may be considered secondary to the initial cost.

## *II. Design Elements*

The second portion to be analyzed for the school- prison comparison is the physical design elements as seen in the architecture of the two spaces. Though more readily available to the eye, it is not truly separate from the ideologies that created it. As such, the architecture can be examined through features of control, security, efficiency, and cost- effective design.

### *A. Control and Security*

Control is often seen as a method of increasing safety and security is often seen as an expression of control. Unsurprisingly, their design features tend to partially overlap.

The connection between safety and strict authority may be clearest in the design of prisons. Although the practice has varied greatly, “architecture’s ability to express and enhance relationships of power might never have been more obvious than in Jeremy Bentham’s concept of the Panopticon, a prison typology which he designed in the late 18th century,” (Stott, 2013). Essentially, the Panopticon involves a central tower with a three hundred and sixty degree view of all the cells surrounding it. Prisoners are constantly on display to the guards, eliminating all privacy, to deter or quickly identify any misbehavior or threat.

In the 21st century, security cameras offer an alternate method of keeping an eye on every cell in a building. Steketee-Fox reported that “according to the National Center for Education Statistics, more than 80 percent of public schools—and more than 94 percent of high schools—in the U.S. used security cameras to monitor students during the 2015-2016 school year,” (Steketee Fox, 2019). As with the Panopticon, the cameras are both a symbol used to deter disobedience and as a method of identifying threats.

Bentham’s presence in most schools is more metaphorical than literal, however, in recent years some developers have re-examined the idea in the light of school shootings. Fruitport High School in Michigan was remodeled with intentional parallels to the prison environment in an attempt to reduce the harm a potential attacker may cause. One strategy involved “an educational Panopticon — an office

administrator who will have views of the main approach, the vestibule and some of the hallways from one seat,” (Horton, 2019). The front office also has the ability to remotely lock classroom doors as needed. Additional safety features included curved hallways to shorten the line of sight for shooters and classroom blind spots so that students can take shelter without being seen from the door or hallway. The innovative high school was designed as a place to educate dangerous individuals while keeping them safe from each other.

## B. Efficiency and Low Cost Design

Many public institutions end up architecturally similar due to the materials and methods used to create them.

In the United States, public high schools and prisons both tend to be relatively short, flat, box like buildings with horizontal emphasis. This creates a need for the stereotypical long hallways and endless rows of doors. In order to satisfy safety measures such as fire codes, these pathways tend to be relatively direct. The rigid floor plans are seen as a practical and efficient building organization.

Additionally, these facilities tend to be made with robust but cheap materials like concrete, though steel structures are also fairly common. Most furniture is made of hard materials in order to make cleaning easier. Just as prisoner beds are bolted in place, student seating frequently consists of a chair that is inseparable from the desk. A similar situation is present in the cafeterias of both institutions. For practical purposes, this furniture is standardized, meaning that the user must accommodate the dimensions of the chair. If they happen to deviate from the ideal size in height or width, they must adjust their seating posture to the best of their abilities or contact the administration for permission to use other furniture. Representatives of authority, like wardens or teachers, may be granted adjustable and unrestrained fabric chairs.

### *III. Balancing Utopia and Dystopia*

From the intangible sociocultural elements to the final architectural features of an institution, designers must balance ideals against fears to create facilities that function in the world as it is today. The comparison between prisons and schools can help identify areas of strength or needed improvements in educational facilities. It is by no means an easy task, nor is there a single correct method for all situations.

The hierarchy of control is not, in itself, a bad element in an institution. As demonstrated above, it can serve to maintain order and preserve communal good within an organization. Instead, it is when the goals of each party no longer align or when the gap between the agents and the recipients grows too large. In the case of high schools, it tends to be the later issue. The social perception of teenagers as troublemakers can create a self fulfilling prophecy, especially within disadvantaged populations. Additionally, enforcing a strict division between child and adult is not necessarily a good method for a mentally healthy community. Philosopher Hannah Arendt argued that when the child's world is isolated from the adult sphere, it results in "conformism or juvenile delinquency, and is frequently a mixture of both," (Arendt, 1961, p. 182). It is not enough for students to be in the same building as teachers, the two groups must have some middle ground to interact as people, not merely as categories. A 2019 research study examining the relationship between school environments where students identified trusted adults and suicidal thoughts or attempts found that

student isolation from adults specifically increased vulnerability to SA [suicide attempts]. A difference of 10% fewer students isolated from adults (1 SD) was associated with 1.41 fewer attempts per 100 students, a 20.1% reduction in the average rate of attempts (7/100). Students with trusted adults at school are more likely to seek help (Pisani et al., 2012), and students lacking access to adult support may be vulnerable to transitioning from ideation to an attempt. (Wyman et al., 2019, pp. 1072- 1073).

Thus an architectural middle ground between teachers and students may be a design strategy for wellbeing in school settings. One potential example of this is a democratic courtyard, where the

emphasis is on the public presence instead of individual authority figures. This is essentially an antithesis to the Panopticon— instead of few people monitoring the group for misbehavior, each member of the group is close enough to those around them and the simple number of potential witnesses deters misbehavior.

It is important to remember that staff often remain at an institution longer than the inmates or students, meaning they have greater exposure to the facility's design. How staff are treated affects how they in turn treat those under their control. Nice staff lounges may help calm and re-energize after a difficult interaction. Additionally, teacher offices must balance privacy with accessibility in order for students to reach out if they are not comfortable doing so during class time.

As previously mentioned, safety is a crucial feature for any facility and for the wellbeing of its occupants. Centuries of observation have helped identify methods to guard against natural disasters and accidents. Proper attention to building codes and construction can help avoid many of these problems. The increase in violence in school settings is a more difficult issue. Is an open floor plan a democratic landscape or a shooting range? Should hallways be curved like war trenches or kept straight for efficiency? Will shooter blind spots create bullying zones? Does designing a high school like a jail add safety or create a space where students are seen as dangerous individuals? These questions have yet to be answered, though they must be considered. More than enough blood has been shed to require violence protocols as part of the school fabric.

Authority presence and control are a powerful tool, but not enough on their own to combat this issue. As so aptly demonstrated by dystopian fiction such as George Orwell's novel 1984, ultimate surveillance is neither practical nor desired. The right to privacy is acknowledged by several US laws, including the fourth amendment to the constitution. The modern world of technology is still navigating what this means. Even security camera usage, a widely accepted practice, has legal limitations and gray areas as a result of privacy lawsuits (Steketee Fox, 2019).

Bathrooms and locker rooms are infamous as spaces that require some degree of concealment by nature of their use, which enables them to be misused more freely than other public spaces. High

schools bathrooms in particular have a cinematic reputation as hotspots for illicit substance use or bullying. For obvious reasons, increasing bathroom security requires ingenuity. Some educational facilities, such as Korea University's Woodang Hall in Seoul, have added emergency help buttons to the bathroom stalls in case of attempted violence. Although it may not prevent consensual illicit interactions, the ability to contact help may decrease personal attacks like bullying or rape.

Many criminologists emphasize a need for cultural change in addition to any design changes. For example, the National Institute of Justice found that school violence could be reduced by "communication and reinforcement of clear, consistent norms," "teaching of social competency skills," and "coaching of high-risk youth," (Sherman et al., 1998). As mechanisms of culture, educational facilities may play a significant role in reducing violence overall.

Overall, it is important to remember the unique position the architectural profession holds as the mediators between culture and the physical landscape. For example, studies have demonstrated that even a few simple design features can change how well a prison is able to rehabilitate its inmates (Frieden, 2018). The Halden Prison in Norway is often presented as counter- image of the traditional desolate correctional facility. Though it is not without its flaws, the existence of alternative designs like Halden demonstrate how adaptable many of the necessary functions and ideologies of institutions can be. As new technology and more research enters into the equation, better solutions for prison and school design will continue to develop.

## *Conclusions:*

Ideologically and architecturally, prisons and high schools from the last couple centuries are noticeably similar. It is important to remember that these institutions are run by and created for society, meaning that society in turn can decide how future establishments function. The large population numbers of today and the methods of old do not inherently signal a dystopian future. When design and culture partner, new alternatives appear.

# Project Justification

## Personal Justification

This thesis project is beneficial to me in several ways including for poetic closure, academic development, and hopefully professional development. I say poetic closure as I was once a high school student struggling with mental illness and it seems very fitting to be able to reflect on that experience as I end the main course of my formal education. I also watched my friends and family endure similar struggles. It can be difficult to learn how to live a life worth living. If I am able to find methods that help others through these difficulties, it would be a fitting way to show my gratitude to the ones who helped me endure.

Academically, this thesis project helps me apply my own experience of the educational system, demonstrate the knowledge I've gained, and give back to the cultural system that has taken the majority of my time for the past decade or so. It also helps transition from the "spoon fed" era of my learning to the "independent" era of learning.

Professionally, it helps me explore an avenue of architecture that I didn't previously know much about. This enables me to explore a possible career specialization, which seems to be the point of a graduate level degree. If I can learn successful methods of increasing mental health through design, it would give me the skills to design better buildings for my clients regardless of the building use. I don't think I've ever done a project on a school facility before either, so it would give some insight into that sector of the market.

## Public Justification

When considering whether this project is justifiable, we must bear in mind that this thesis can be viewed through two lenses: the real world in which this is a hypothetical exercise and the imaginary world in which this is a proposal for an actual school. For obvious reasons, the answers are quite different, though there is merit in discussing both.

Although this project could be and to some degree is left to others in the profession, I should be one of the many to review and contribute to research in neuroscience simply because it is something I

am genuinely interested in. This curiosity combined with my previous experience creates a passionate attitude towards the efforts which is generally helpful for any project. There is no one solution to the issue of mental illness in youth or academic necessities of a community. The last few decades have seen a growth of interest in the intersection of neuroscience and architecture. We've also begun to question what counts as a successful or sustainable building. All the while, mental illness rates have increased. Although money and aesthetic are undeniably important to architectural design, at the end of the day we must remember that we are designing for people and communities.

The economic freedom of this project, which by practical standards is imaginary, helps to expand the current research without costing anything but my time and the tuition fee. In exchange, it hopefully uncovers enhanced knowledge and realistic solutions to actual problems while furthering my personal education. It would seem that this project is as economically justifiable as the rest of my time at NDSU has been. If we were to examine it as if it were real, it would still be economically justifiable as it would create a necessary space for the community. Since it is a public school, the resources would come from taxpayers in the city of Pueblo. They recently voted to design two new schools in the district so I assume they find the expense to be worth it. The investment returns would be primarily intangible, as it deals with quality of life, but that is not to say worthless.

Technically, there is nothing that says I have to do this particular project. Although doing a project is an imperative to get a master's degree at NDSU, there is nothing saying that I must get a graduate degree from here or elsewhere. All that being said, the research topic of designing to improve mental illness in high schools is essential to society's future. As mentioned, the depression and anxiety rates among today's youth continue to increase. Although society has begun to address the issue of mental illness and bullying, we must continue to work across disciplines to make any real change. This is especially important in Pueblo, Colorado, where youth suicide rates are abnormally high. In a community that is still trying to understand the loss of several children, it is crucial to look toward a more stable future.

# Cultural Site Analysis

# Historical Narrative

## Overview:

*Homo sapiens* is a young species, but what it lacks in years it makes up for in content. The history presented here is not intended to be an exhaustive representation of how the world came to be as we know it, but rather an overview of a few central moments that have shaped the course of education, mental health, and the city of Pueblo.

## Education

Our story begins at the time of the first Renaissance Utopian novel in 1516 by Thomas More. This sparked several other authors to describe their own ideal societies, leading to Tommaso Campanella's 1602 City of the Sun and John Amos Comenius' 1623 The Labyrinth of the Mind and Paradise of the Heart. Both stories emphasize eidetic knowledge, referring to visually represented information, and eidetic reductions, referring to the philosophical idea of a thing's general essence (Britannica 2017). For example, to teach a child what a rabbit was they might have a drawing of a rabbit next to the word for rabbit. This would not depict a specific individual, but a paragon example that shows the general features that most rabbits have. It is worthwhile to note that both stories portray the ideal society as a machine (Powers 2011). Just as Comenius' picture book style learning remains within our pedagogical methods, so too has his mechanized utopia. Little could the Czech author know that just about a hundred years after his death, the industrial revolution would begin.

Although Comenius advocated for universal education, the academic arena of his time was primarily populated by well- to- do children, especially boys. The first compulsory education law requiring all students in a nation to attend classes in Europe appeared in 1717, when Prussia's king

established mandatory attendance. [Previously, there were provinces within states with similar regulations, or prerequisites for certain societal groups]. This was not an act of goodwill, however. The original goal of the Prussian education system was to create a more cohesive state with a not so subtle emphasis on obedience (Guzman 2019). As explained by Ramirez and Boli, due to the military tensions and territory issues at the time, Prussia needed a way to make its citizens feel more like Prussians than like a member of a particular village or social group. State managed education allowed a patriotic message to be carried to all classes, though there were concerns about the disruption to the social hierarchy that education may bring. (Ramirez 1987).

A similar pattern of establishing public education for political purposes repeats itself throughout Europe and eventually into America. In her analysis *The Crisis in Education*, Arendt identifies the ways in which the political situation of the United States as a nation of immigrants created a need for “Americanization” (Arendt 175). Thus the public education system was designed partially to assimilate newcomers whether they be new to the country or new to life in general. Perhaps it also helps tie the states into a cohesive nation.

If the political climate of the era provided the motive for the initial public education movement in Europe, then the technological developments of the time inspired the methods. Despite Prussia’s initial mandates in the early 1700s, it wasn’t until the early 1800s that the practical system we think of as the Prussian Model really began to blossom into its full shape. This coincides with the Industrial Revolution— perhaps contributing to the nickname “the factory model”. It is here that we first see a glimpse of home, as it is this model that we based the American public education system on (Noer 2012). Governmental departments were formed specifically to decide educational policy, children were grouped by age range, each age group progressed to the next ‘grade’ on a yearly basis, and taxes financed schools. Many people compare this to items on a conveyor belt moving forward at a fixed rate without regard to differing individual needs.

In the 1840s Horace Mann brought this system to the United States, hence why so many schools bear the name. Interestingly, the precursor to digital education appeared in 1873 when Ana Eliot

Ticknor established “the first official correspondence education program, called the ‘Society to Encourage Home Studies’,” (Online Schools 2020). This system utilized the postal system to establish long distance education in the United States.

The next big revolution in the American education system occurred in 1892, when a committee formed to establish standardization across all schools regardless of state or city. It is here that the United States officially decided on a twelve year program and a controlled curriculum. Thus hypothetically every graduate of high school would know the same things regardless of whether they were from a big city or a rural community— or in other words, standardization allowed for quality control.

In 1953 the first televised college classes were offered (Online Schools 2020).

On May 17, 1954 the Brown v. Board of Education ruling officially ended segregation in schools, though the actual desegregation process took many decades (Domonoske 2016).

Beginning in the 1960s the Internet was dreamt up and by 1972 a rough version of what would become email was in testing (Leiner 1997). By 1985 the Internet was beginning to see more use outside of researchers and developers but it wasn’t until 1990 that the World Wide Web officially began (Andrews 2019). In 1996 the first fully online university appeared. Online learning platforms have only increased in the years since.

This is, of course, a very abridged history of education restricted to a few cultural highlights, but even from this bare bone account we begin to see some interesting themes emerging. First and foremost is the imagery of education as a machine. Powers describes Comenius’ Utopian education as “a shaping of young humans into ‘perfect cogs for the perfect social machine’,” via imaged based knowledge (Powers 2011). Though he didn’t have a direct hand in establishing the ‘factory model’ of education, it isn’t hard to imagine he would have approved of such a mechanized societal institution. And now almost four hundred years later, it would seem we live in his mechanical utopia where a world’s worth of knowledge is accessible to anyone. And yet, as Garrison points out, beginning in the 1900s dystopian novels have increased in number. Perhaps the words themselves shed some insight

into society's direction: although the word 'utopia' has been used since 1516, 'dystopia' wasn't coined until 1868.

## Pueblo City, CO

As with many locations, the original inhabitants of Pueblo, Colorado, are hard to date. People of the Apishapa culture, a group who researchers currently know relatively little about, seem to have been in the region from about 1050 to 1450 AD (Colorado Encyclopedia). By the 1500s, when the Spanish claimed it as a territory, the Ute people were living in the area. Additionally, the Jicarilla Apache lived along the Arkansas River, which crosses through present day Pueblo City.

These early years were characterized by territorial disputes between various tribes and the Spanish. By the mid 1700s the Comanche formed an alliance with the Utes against the Spanish. Then a few decades later the Arapaho began a rivalry with the Utes by claiming the land of modern day Pueblo City for their own. During this time relatively few colonists lived on the land that would become the actual city. However this would change entering the 1800s.

In 1806 Zebulon Pike reached the joining of Fountain River and the Arkansas River (Colorado Encyclopedia). In the 1830s and 1840s this region began to attract a few people for its situation connecting the American trade routes to the Mexican trade routes. The primary goods traded here were fur, buffalo hides, and liquor. In 1842, George Simpson and Robert Fisher officially established the 'El Pueblo' trading camp, sometimes called 'Fort Pueblo'. Due to the territorial disputes between Native Americans, the United States government, and the Spanish, it was not a very peaceful or populated region. When the US won official ownership of Pueblo after the Mexican American War in 1848, the town was nearly abandoned (Colorado Encyclopedia).

The 1858 Colorado Gold Rush reinvigorated the area. The town served as a useful connection to

northern gold sites. Even as the gold rush cooled, Pueblo remained viable. In 1862 a one room adobe building served as the first school (Pueblo City Schools). During the course of the later 1860s, several treaties removed the Native Americans from the area. This includes the 1867 Medicine Lodge Treaty forcing the Cheyenne and Arapaho into Oklahoma and the 1868 Treaty forcing the Ute people further west (Colorado Encyclopedia).

In 1870, the four small communities of colonists merged into one formal town known as Pueblo (City of Pueblo). The year prior, Charles Goodnight brought cattle grazing to the county and William Palmer connected the town to the railroad in 1872. These two industries would grow to become a major portion of Pueblo's economy for the next century. In 1873, the northern side of Pueblo's 'District One' school district was separated from the southern half's 'District Twenty'. In the 1870s Centennial High School would be built for the northern side while Central High School opened in 1882 on the southern side (Pueblo City Schools).

Starting in 1881, William Palmer's Colorado Coal & Iron Company began operations. Pueblo quickly became a transportation hub and processing town for gold, silver, and carbonate ore. They smelted extensively. In 1892 they merged with John C Osgood's Colorado Fuel Company to form Colorado Fuel & Iron (CF&I). They also began to export large amounts of steel, eventually earning Pueblo the nickname "the steel city". Rockefeller took over in 1904 and by 1909 CF&I employed about 5,000 workers (Colorado Encyclopedia).

During this time, the community of Pueblo expanded. On October 9, 1872, the Colorado State Fair took place in town. It has become a staple event for the city with one hundred and two acres of land permanently allocated and fourteen historically significant structures. This area is used for community events and concerts during the off season (City of Pueblo). Originally the fair was a way to celebrate Colorado's agricultural industry. During the fall of 1892, the two high schools hosted their first football game, beginning the "Bell Game" feud. In 1910, farming gained new prominence in Pueblo's economy.

Perhaps the greatest natural disaster on record for the city, the Great Flood of 1921 left a significant impact on the town's memory. Beginning on the evening of June 3rd, both the Fountain and

Arkansas rivers began to flood. Over one thousand five hundred people died, not to mention the large loss of animal life and over twenty million dollars in damages (City of Pueblo). Socially, the 1920s were also a period of strife. By 1923 the Ku Klux Klan had risen to nearly one thousand members in Pueblo, including the sheriff (Colorado Encyclopedia).

In March 1946, the two school districts merged into Pueblo School District 60, which would eventually become known as Pueblo City Schools. In 1959 two additional public high schools were built, named East High School and South High School.

In the 1950s ranching surpassed farming in the economic arena, though agriculture in general continues to have a large influence on the region. Meanwhile the CF&I continued to play a large role until the collapse of the steel industry in 1979. By 1990 the CF&I had gone bankrupt leaving only two small steel mills to continue in Pueblo. Although the economic benefits no longer support the city, there is a large slag deposit with high concentrations of lead from this industrial fervor that continues to cause environmental concern.

In 1993 Pueblo earned a second nickname, the “Home of Heroes”. This was taken from a congressional speech referring to the fact that four Pueblo veterans have received the Medal of Honor. They are honored in a memorial in the city’s downtown plaza (City of Pueblo).

## The COVID 19 Pandemic

There are some reformers who celebrate the way the Internet is better able to adapt to individualized pacing and lessons. Indeed, the COVID 19 pandemic has demonstrated the strength of the digital teaching method. Yet at the same time, COVID has reminded parents and administrators of just how much we have come to rely on a physical public school system. As it turns out, there is no digital equivalent to food. Many schools continue to oversee free and reduced lunch options for

their students, even if it is delivery style, as the relief we rely on our schools to offer is still necessary. Additionally, experience tells us that there are different demands on students when they are in their homes as opposed to in school. Although home stressors still weigh on the mind, the physical separation changes the responsibilities a student is called away for. For example, a student at home may have to juggle keeping an eye on their younger siblings or to help a healing or sick relative on top of their classes.

Pueblo, like many communities across the globe, has been hit hard by the COVID 19 pandemic. They are currently attempting to adapt through hybrid education models. Previously they had an online high school called GOALS Academy; now all of the high schools are at least partially online.

# Environmental Site Analysis

2525 Mountview Drive  
Pueblo, CO 81008

Figure 25. Site Map

# Qualitative Narrative

## Former Site of Centennial High School

The site for this project is the grounds of Centennial High School in Pueblo, CO. Currently, the high school building is still on the site, but the city has decided to build a new facility. Thus for the purposes of this project I will imagine that the current building was demolished and the site is empty aside from the outdoor spaces such as the track, baseball field, tennis courts, and football field. One other important note is that due to the COVID-19 pandemic I am unable to visit the site in person. Thus the observations listed here are restricted to visual features seen through sources such as Google Maps, Google Earth, and online images.

The school grounds are bordered by Mountview Drive on the southern side. Here the sidewalk hugs the curb of a two lane traffic. Across the street, the neighborhood begins. Many of the houses with a direct view of the high school are only one story tall. Their sidewalks are also pushed to the furthest edge of the property. A few have chain link fences outlining their backyards. The telephone poles and streetlights are on the neighborhood side of the road, though there is a bench near the school sidewalk.

On the eastern side of the site, a row of houses separates the school parking lot from Baltimore Avenue. These residential units seem to be primarily two story houses, most with chain link fence yards and tired grass lawns. Through the houses, glimpses of the school can be seen. A second entrance to the eastern parking lot appears about a block into Baltimore Avenue. A few trees cluster at the corner. A short church with a pointy spire sits kitty-corner to the second drive. The private landscaping visible along the street consists of patches of lawn and patches of sandstone colored rocks. A few trees or shrubs interrupt the flat ground. Further north on Baltimore, the houses turn into apartment

complexes. These have no noticeable yard space, with semi-permeable parking lots. The running track is on the school side, though the view is mostly blocked by apartments.

The northern side of the school grounds is marked by a dirt trail and a couple hundred feet of uncultivated land. On the other side of the stretch of brown, a few parking lots and commercial buildings hug Kachina Drive. Similarly, the western border of the school consists of a rough half mile of dirt before the railroad tracks. The northern and western borders are marked by the end of the green lawn instead of by a road.

The school grounds look much like any other suburban public high school in the United States. A green lawn with balding patches surrounds the school. White sidewalks cut through to various entrances and cracked asphalt parking lots host an assembly of cars. A few trees cluster near the edge of the lawn and planters decorate the back plaza.

Probably the most exciting portion of the outdoor planning is the Centennial High School pride plaza, complete with the mascot painted on the pavers. A few picnic tables rest in the shade. It seems to be fenced in to prevent public access, but it is hard to tell. It is also unclear whether students are allowed to use this space normally or only on special occasions.

It is worth noting the variety of sports fields present, which easily take up the entire northern half of the plot. A small access road divides the football field from the baseball/softball grounds and passes alongside the track. Most of the fields have a few bleacher seats available for fans.

The current, soon to be former, school building consists of a clump of blocks protruding from a large central rectangle. This central mass is slanted, with the shorter sides facing north west and south east. The building is made primarily of red brick. A few facades feature a paler, almost peach shade. The raised central portion of the school features a partially exposed T-beam roof. These T-beams are white concrete atop red brick columns. A few recessed windows are visible between them.

## Views





# Topographic Section

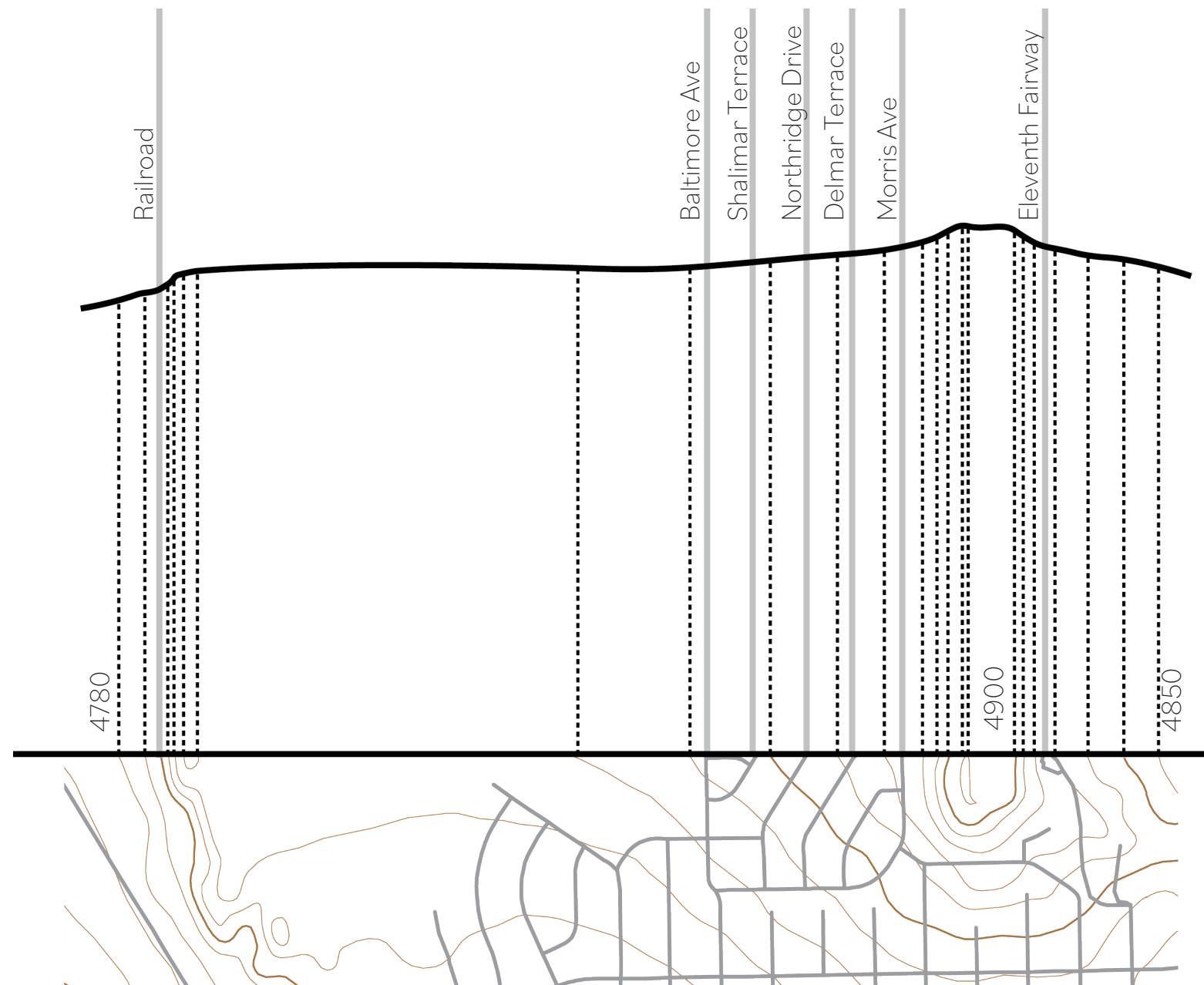
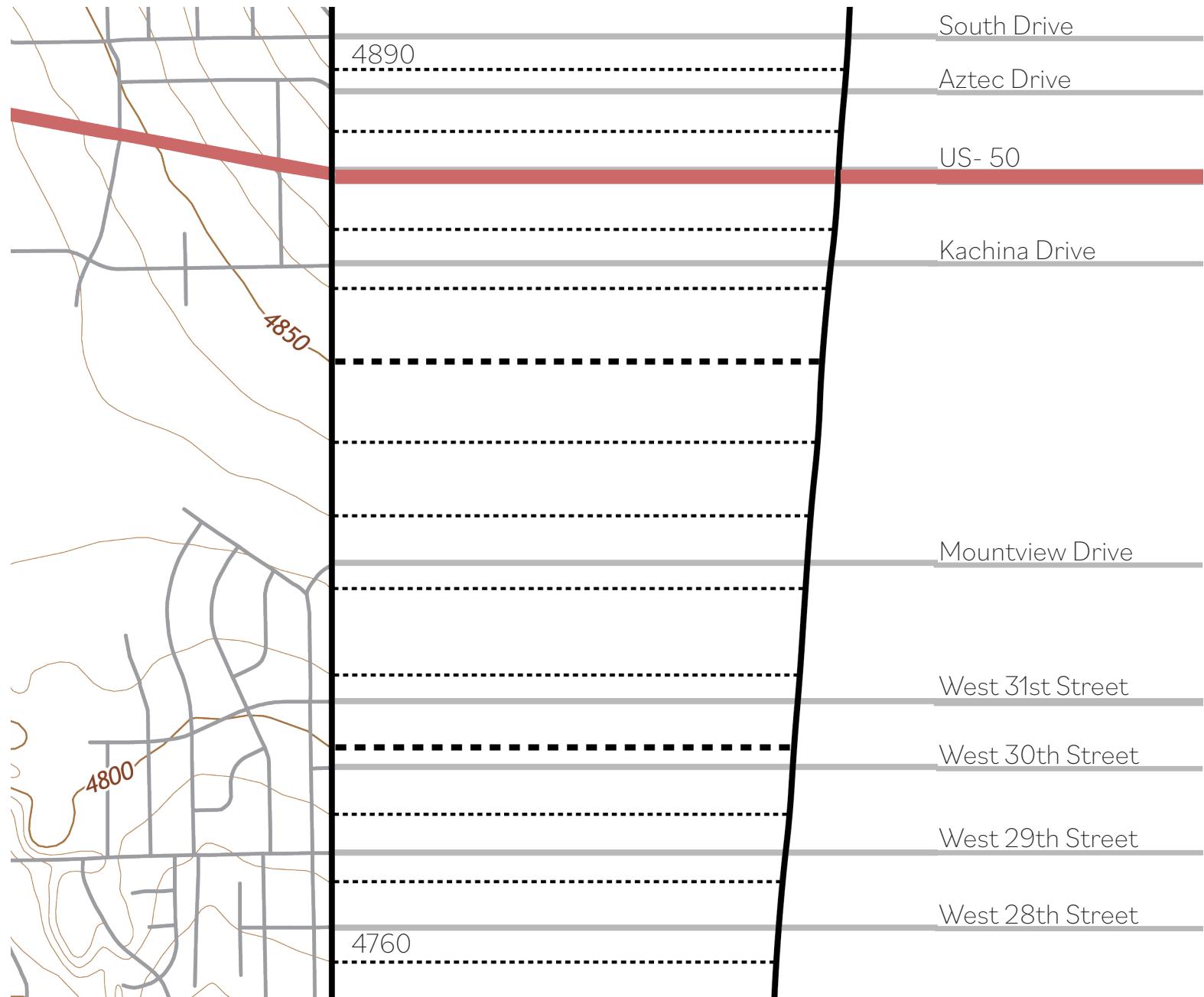


Figure 27. Topographic Sections



## Building Density



# Vegetation



Trees



Planters



Grass



Patio



Pavement



Building



Figure 29. Vegetation

## Human Intervention

The entire site has had human intervention. The land has been flattened for ease of use. The surface of the ground has either been paved over, built on, or manicured into a lawn. The lawn must require regular irrigation as the region is fairly dry and nearby lots are unable to sustain it naturally.

Being that it is still in use as a high school, people are constantly coming and going. Admittedly the grounds are a bit emptier this year due to the COVID 19 pandemic.

## Distress

The site itself seems to be in decent condition. The lawn has some yellow patches but remains mostly green. The nearby land to the western and northern sides is in far worse shape. It looks rather desolate and desert like. However, in this case looks are quite deceiving. It is actually the sparse plains grasses that are better suited to the area and the lawn grass that requires constant effort to relieve distress.

# Transportation

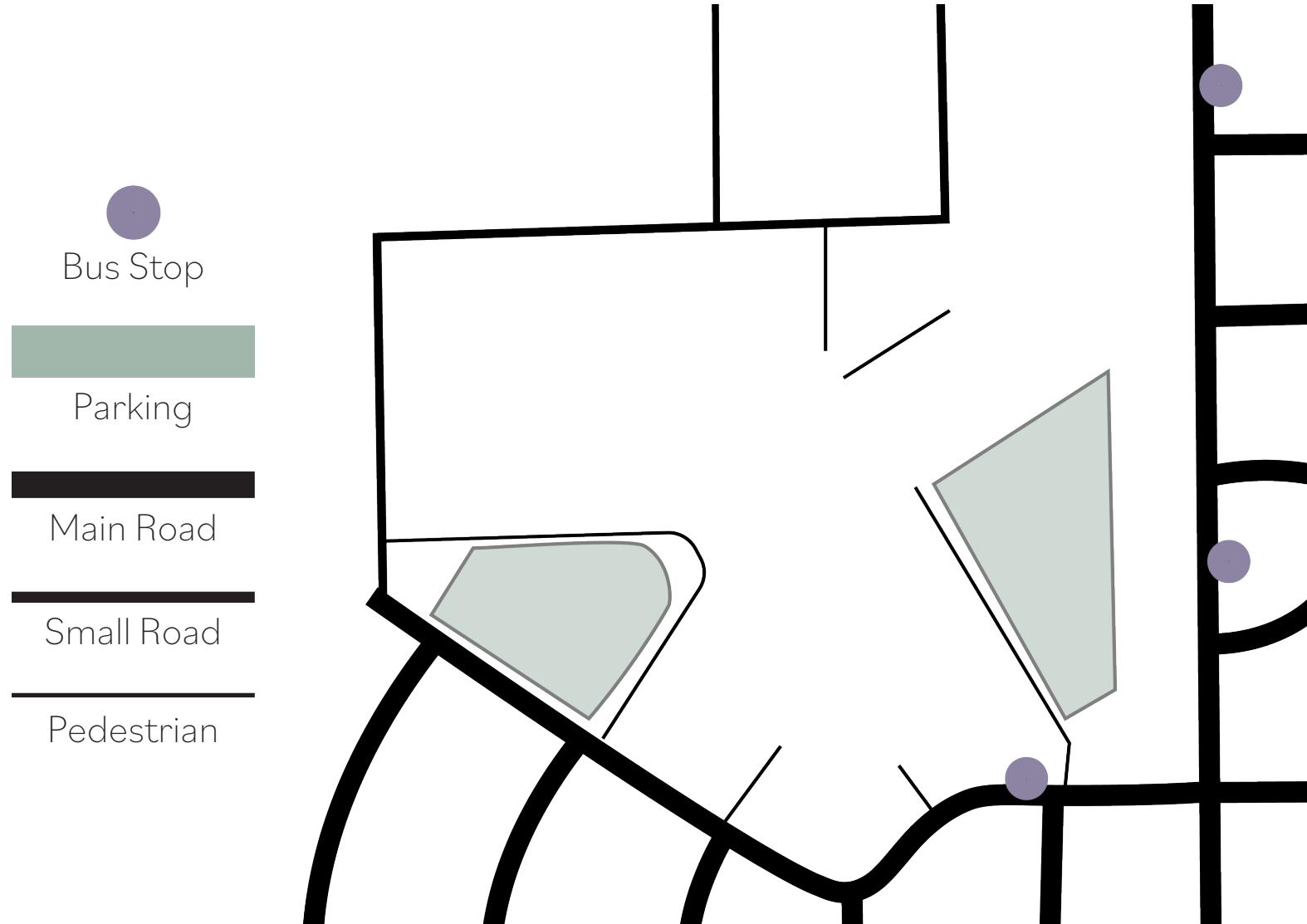


Figure 30. Transportation

June

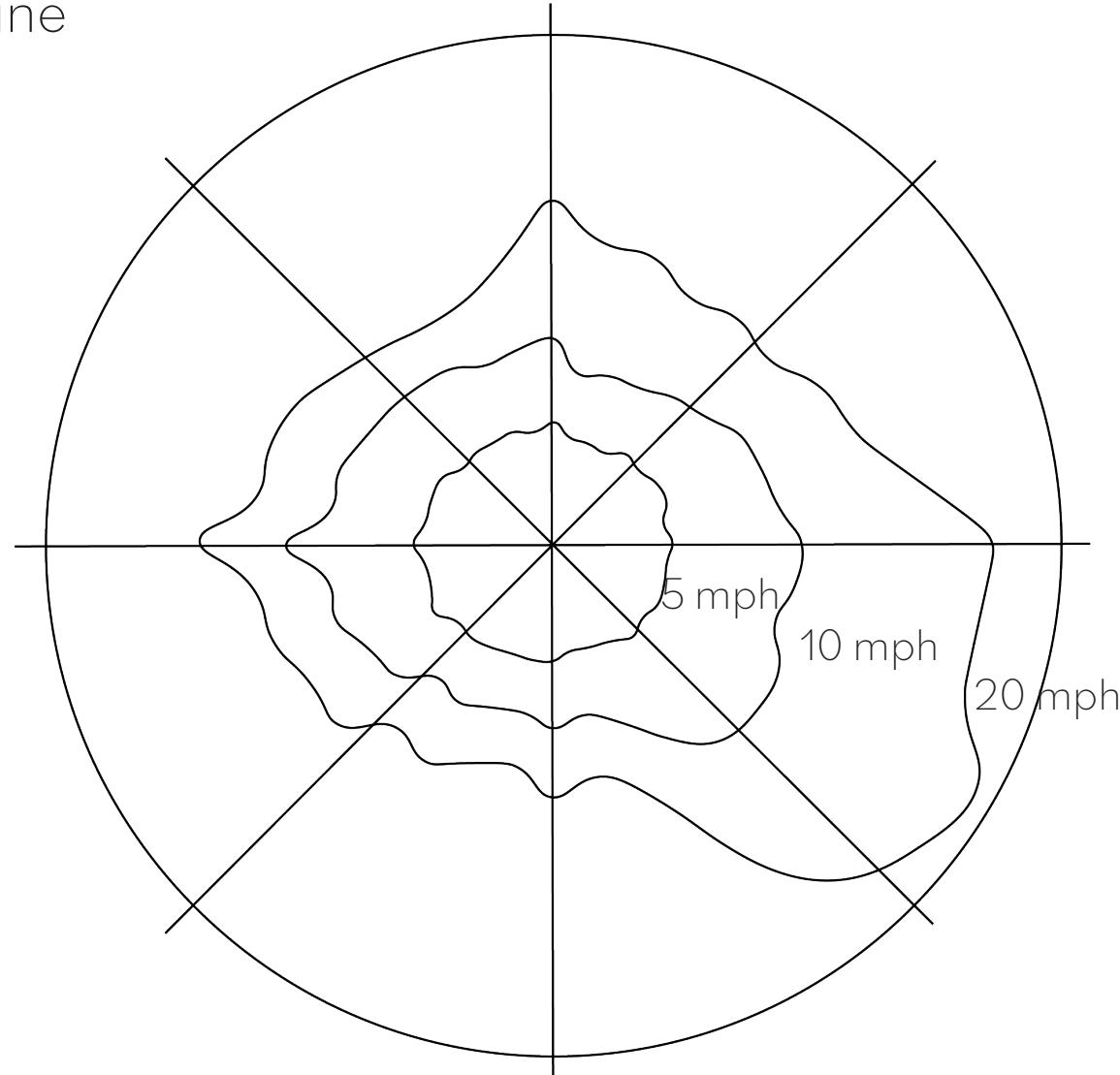
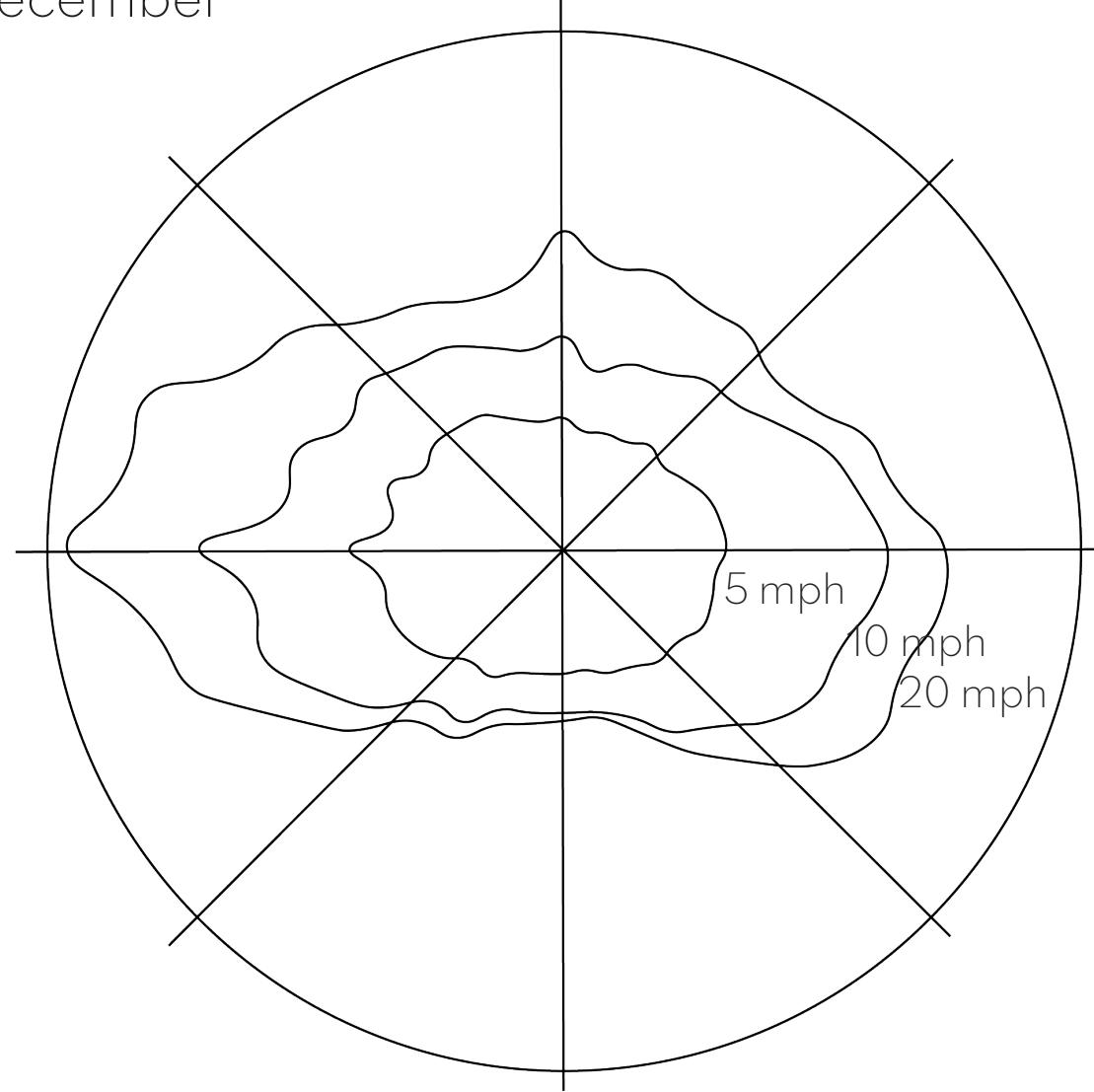


Figure 31. Wind Diagrams

# Wind

December



# Light

June

Sunset  
8:25pm

Sunrise  
5:35am



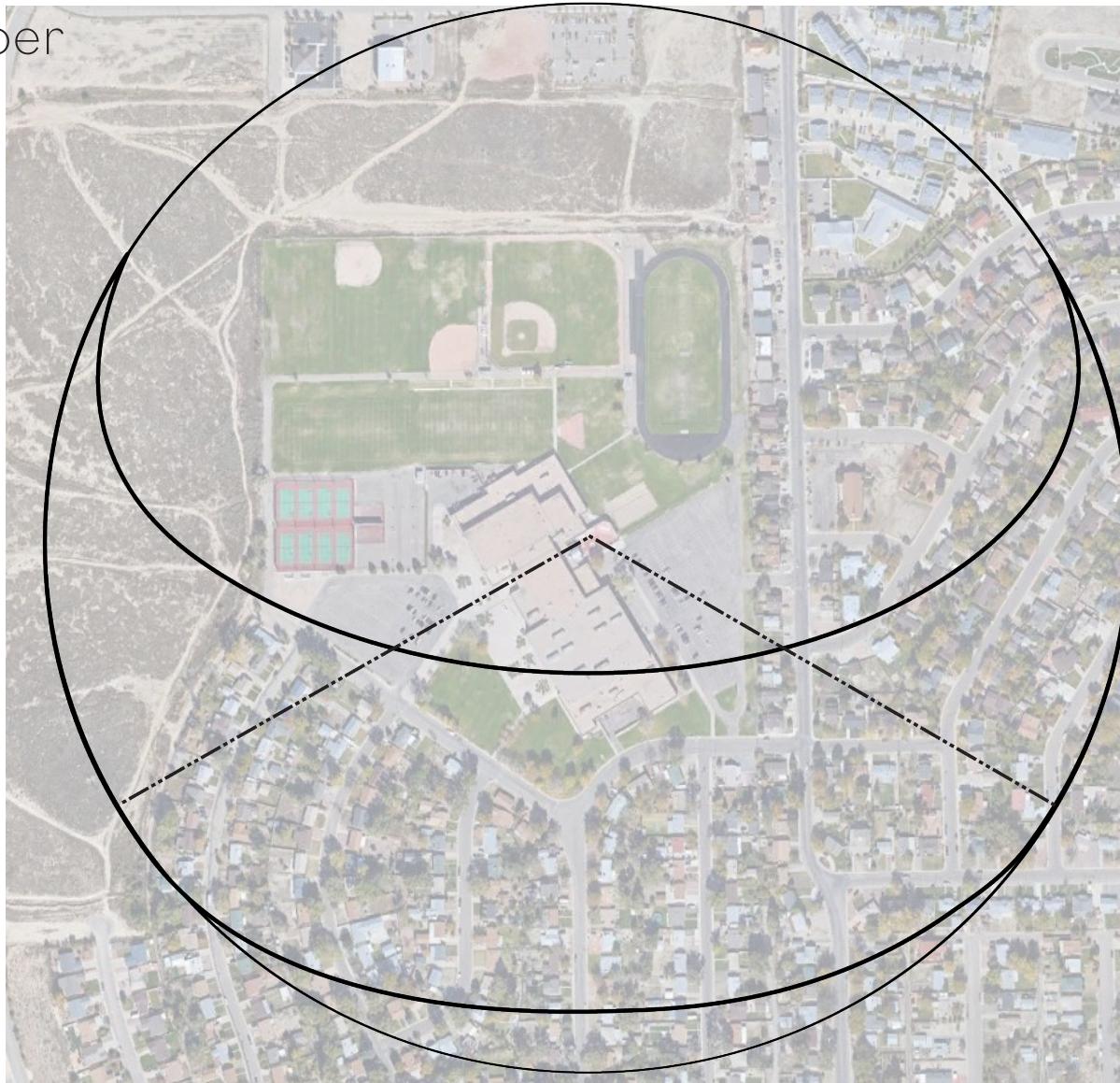
Figure 32. Sun Diagram

# Light

December

Sunset  
4:42pm

Sunrise  
7:11am



## Surface Water

There is no surface water on the site.

## Ground Water

The nearest access point is an inactive well dug at 1501 feet deep in an area with an elevation of 4,832 feet. Further northwest there is another inactive well dug at 1395 feet in an area with an elevation of 4,830 feet.

## Soil

The soil types present on the site consist of “calcareous disintegration residuum” from the Holocene epoch and “sandy clay disintegration residuum” from the Holocene or Late Pleistocene (USGS 2002). In layman’s terms, this means the soil is primarily a mixture of clay and sand like soil.

# Performance Criteria

## Space Allocation Table (Square Feet)

Room	Number of People	Small sqft	Large sqft	Number of Rooms	Total Small	Total Large
Auditorium	400	2,584	4,000	1	2,584	4,000
Cafeteria	250	2,500	12,500	1	2,500	12,500
Library	60	1,800	6,000	1	1,800	6,000
Classrooms	30	646	750	36	23,256	27,000
Science Lab	30	750	969	4	3,000	3,876
Computer Lab	30	750	969	2	1,500	1,938
Gym: basketball court	x	(94x50)	4,700	2	9,400	9,400
Gym: bleachers	400	1,600	3,600	1	1,600	3,600
Locker Rooms	30	1,500		3	4,500	
Kitchen	15	750	2,250	1	750	2,250
Music Room	30	900	1,050	2	1,800	2,100
Stage	x	300	750	1	300	750

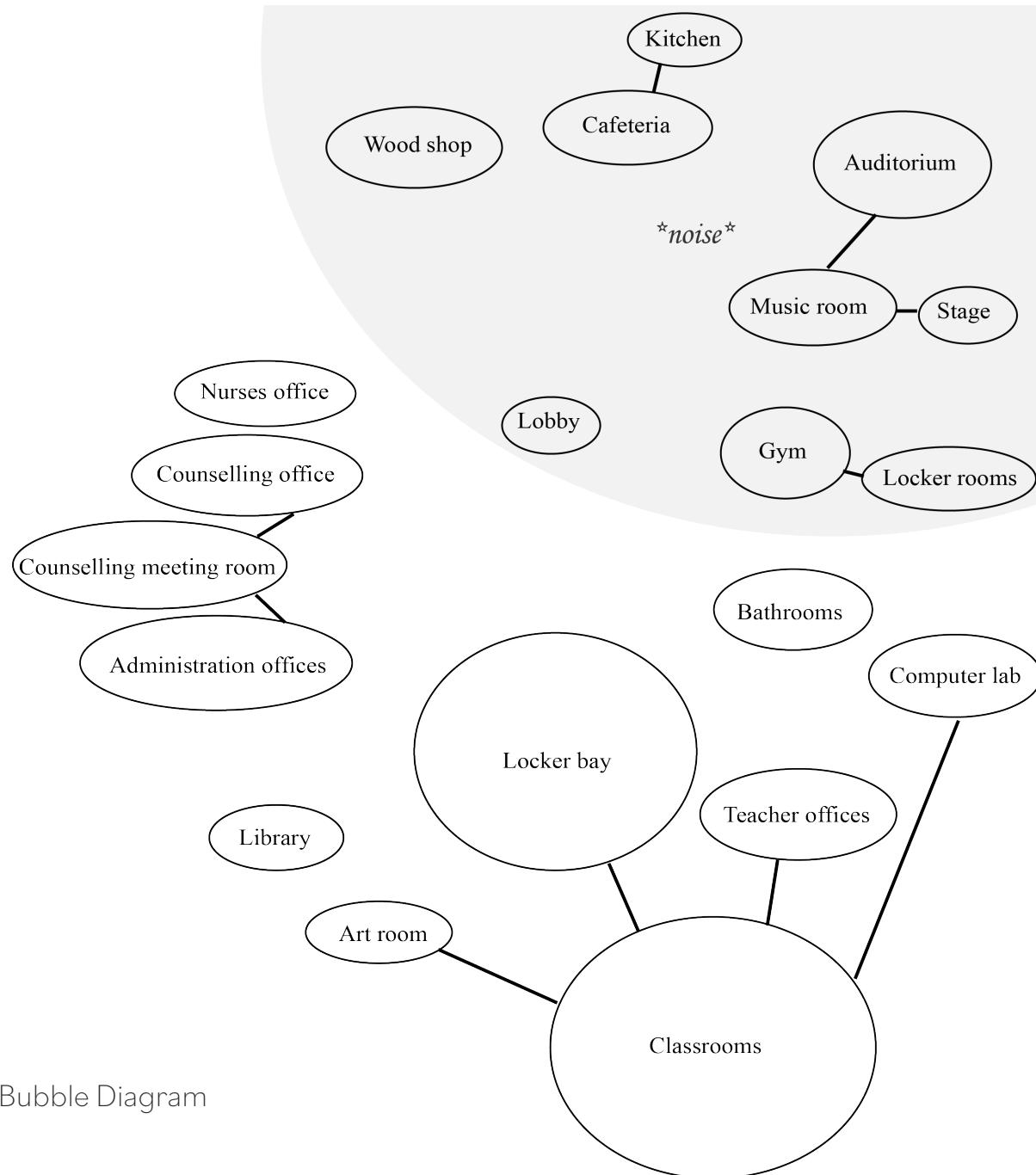
Figure 33. Space Allocation Table

## Space Allocation Table (Square Feet) Continued

Room	Number of People	Small sqft	Large sqft	Number of Rooms	Total Small	Total Large
Art Room	30	750	969	1	750	969
Wood Shop	20	1,000	3,000	1	1,000	3,000
Locker Bay	1,000	7,000	10,000	1	7,000	10,000
Desk Bay	1,000	60,000	110,000	?		
Lobby	60	300	420	2	600	840
Teacher Offices	5	750	1,000	8	1,500	2,000
Administrative Offices	1	100	150	5	500	750
Nurse's Office	5	250	750	1	250	750
Counselor Offices	1.5	150	225	5	750	1,125
Meeting Room	20	550	1,100	1	550	1,100

# Space Diagram

Figure 34. Bubble Diagram



# Space Matrix

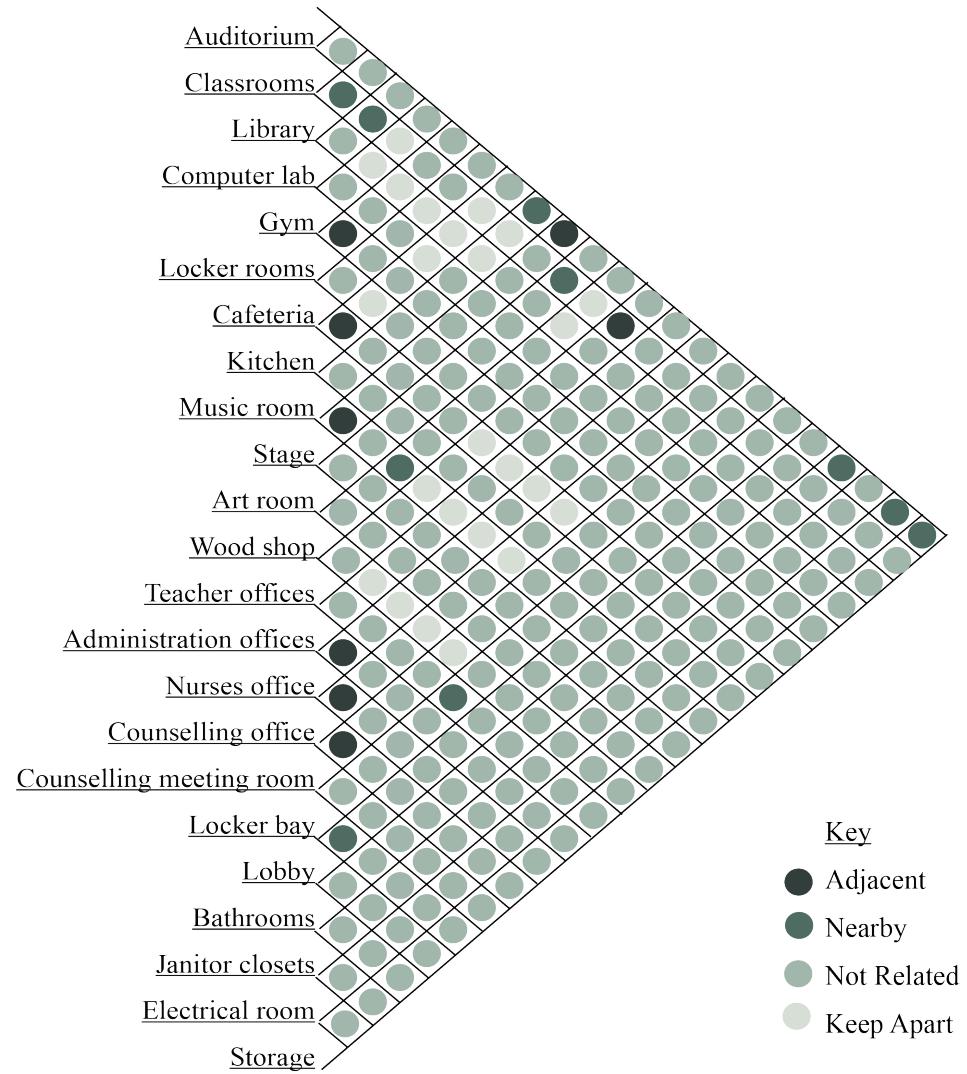


Figure 35. Space Matrix

## 1. Space Allocation

Performance Measure: The proportions of space created. Looking at area data.

Measure Source: The space allocation table.

Performance Analysis: Revit floor plans will be used to calculate the area of various spaces.

Performance Judgment: Either the area will match the listed allocation or it will not. If it has greater than a 10% difference, I will consider it to have not met performance criteria.

## 2. Energy Consumption

Performance Measure: The amount of energy used during the average school day.

Measure Source: The ideal energy consumption for my school will be based off the energy consumptions of the existing local high schools.

Performance Analysis: Computer simulations or a rough estimation based on data of average school appliances.

Performance Judgment: If my energy consumption is equal or lesser than the average of the other schools in the region, I will consider it a success. If it is more than 10% greater I will consider it to not have met performance criteria.

## 3. Behavioral Performance

Performance Measure: Student academic performance and graduation rate

Measure Source: Student enrollment records and average GPA

Performance Analysis: This is a very hard thing to measure in an imaginary building. Instead, I will have to estimate based off the qualitative responses from the psychological impact volunteers

Performance Judgment: If my design leads to an increase in depression or anxiety, I will assume that it decreases the academic success of students and thereby fails the performance criteria.

## 4. Environmental Performance

Performance Measure: Lighting levels, heating and cooling levels, and sound control.

Measure Source: The ideal lighting and sound levels will be decided based off standards set in the studio manual. The heating and cooling standards will be decided based off recommendations from the local area.

Performance Analysis: Computer simulations or a rough estimation based on daylighting, heat gain, and heat loss calculations.

Performance Judgment: If my school is capable of providing adequate lighting and sound control as set in the standard, it will be a success. If my school is able to function without unusual heat gain or heat loss, I will consider it a success.

## 5. Psychological Impact

Performance Measure: Student experience and sense of community in school.

Measure Source: Depression and anxiety rates among students based off self reported tests.

Performance Analysis: This is a very hard item to measure through digital simulations. Instead, I will have to rely on qualitative descriptions from willing participants.

Performance Judgment: If my design makes people feel worse or struggle to focus, it will be a failure. If people find the space to be pleasant and encouraging, it will be a success.

## 6. Environmental Impact

Performance Measure: Whether the building meets LEED sustainability criteria

Measure Source: The list of LEED criteria

Performance Analysis: Using the list of LEED criteria and standards, I will evaluate the number of successfully met requirements.

Performance Judgment: If my project meets LEED Certified or LEED Silver requirements (40-59 points), it will be adequate. If my project gets LEED Gold or LEED Platinum (60-80+ points) it will be excellent. If my project score is 39 or fewer points, it will not have met criteria.

## 7. Code Compliance

Performance Measure: Whether the building obeys local and federal design recommendations, including but not limited to ADA standards.

Measure Source: Revit floor plans and elevations with dimensions

Performance Analysis: I will compare the dimensions of my building space to the dimensions required by code.

Performance Judgment: If my building is not suitably proportioned as listed by the code, it will not meet performance criteria. If my building meets or exceeds what is required by code, it will meet performance criteria.

## 8. Cost

Performance Measure: The cost of building design and construction.

Measure Source: The total of labor and materials cost for the school.

Performance Analysis: Rough calculations involving researching the average market price of goods in the area and multiplying them by how much was used for the project.

Performance Judgment: If my design exceeds the budget set by the city, it will be a poorly managed project. If my design exceeds the budget by more than 10%, it will have failed. If my design is less or equal to the budget, it will be a success.

# Design Process

During the fall semester, several iterations of artifacts were created to better explore the theoretical aspects of the situation and potential solution. Artifacts are intended to be built metaphors-- creative works that enable a corporal thought process engaging multiple senses to deepen understanding. This involved researching all four high schools in the district and the town in general by combing through old news articles, city websites, the social media of the local suicide awareness groups, and memorial pages.



Figure 35. Yearbook (artifact)

The first artifact was a hand drawn yearbook for a fictitious class of high schoolers. This would be placed inside a small tin keepsake box with other mementos such as messages written on gum wrappers and diary entries.

The second artifact was a series of short, disjointed stories that collectively exemplify the city of Pueblo. Although the characters are made up, they are set in the real city and reference actual events. The objects and places include accurate historical data. This was inspired by the works of John Hedjuk.

### **ASPEN**

Aspen is a freshman and aspiring outdoors woman. But she's not a woman, just a kid. She can't even drive. Now that her brother's in college, she's confiscated his well loved mountain bike. It's gained a few new dents in the last two years; she's had to get stitches twice. Her tricks rival any of the neighbor boys' though. It's not an official school club, but Aspen and a couple of her classmates get together regularly for meets in the plaza. They take turns filming each other. Her goal is to start a YouTube channel next summer.

### **CADE**

Cade is a freshman at East High School. He doesn't have his license, but he's already saving up for his first car. So long as it can play loud music and get him the heck out of dodge, it's all he needs. He wants to move to Denver. He wants to move away. He meant to start the year off on a good note, but ended up in a fight. Only one. It branded him as a troubled kid though and no one treats him the same. Troubled kids are wild cards.

### **HARPER**

Harper is a freshman at Centennial. She's a part of Cheer & Dance, Girls Cabinet, and the volleyball team. Mrs. Smith says her outgoing spirit will take her far in life. The third stall in the second floor girls bathroom says she's an attention whore. Bouncing between two homes is tricky. She keeps her makeup kit in her locker so that she doesn't forget it at the wrong place. Her parents are glad that she's adjusting well to high school. They each make a point of attending her performances. It's a relief to know that in three years she'll move into a place of her own.

## EMILIO

Emilio is a sophomore. He spends most of his school day filling up his notebooks with doodles and rough sketches for his grunge comic. It doesn't have much of a plot yet. He probably would have joined the art club if he didn't have to babysit his sister. She's in elementary school. He helps her with math and occasionally spelling, but mostly scrolls through his phone until his mom gets off work. Sometimes he gets up before dawn and tags the city. No one knows who he is, but his graffiti designs are decently popular. Among kids, that is—he can't imagine how mad his mom would be if she found out.

## RYKER

Ryker is in his second year at Central High School. He works part time at a restaurant on the Riverwalk. It's just a twenty minute walk from school. He likes those walks. They give him a chance to clear his head. He takes finals weeks off but works extra on holidays. Prom night is always a busy time. Groups get together for dinner at the restaurant and then split into couples to take photos by the river. Sometimes he overhears the girls comparing how they were asked to the dance. He's become well educated on the subject. He isn't interested in any of the girls at school, but if he were, she would have the coolest prom proposal story ever.

## SOUTH HIGH SCHOOL

South High School is located on Hollywood Drive. The entry is accented by a large horse shoe statue in the front plaza. The students, known as colts, are represented through the colors black and white. Like East High School, it was built in 1959 and features a raised central mass with curved walls. The building is broken up by a central outdoor courtyard enclosed on three sides and marked by a sky walk on the fourth. This respite looks out onto the sports fields behind the school.

## EAST HIGH SCHOOL

East High School counts as an International Baccalaureate or IB school, meaning it follows guidelines prescribed by the global organization of the same name. The aim is to increase cross-cultural understanding and broader awareness in addition to the typical curriculum. East High School itself, located on MacNeil Road, is much less grander than the ideals it subscribes to. Like South High School, it was built in 1959 and features a raised central mass with curved walls. The students are designated as eagles and color themselves in gold and white.

## CENTRAL HIGH SCHOOL

Central High School is the second oldest of its kind in Pueblo, Colorado, having been established in the early 1880s. The institution resides in a historic building with a proud facade on Orman Avenue. Classical columns and rigid symmetry greet the visitor as if it housed a museum or political center. In reality, students known as wildcats tramp through the halls pursuing their STEM- emphasized education. Of the thousand kids within, at least a few are bound to be showing their pride through blue and white paraphernalia.

## CENTENNIAL HIGH SCHOOL

The public institution known as Centennial High School is older than its building on Mountview Drive, having been one of the original two secondary education options created in the 1870s. The most recent building is fairly unremarkable aside from the handful of tall windows that peak out of the center of the building. These are wedged beneath blocky T-beams emphasized by their pale beige coloring against a primarily red brick school. Along the southern and eastern borders, the neighborhood edges in close; meanwhile the northern and western sides are flanked by sports fields and then pasture. The vague silhouette of distant mountains stands no bigger than an ant hill in the background. The students are known as bulldogs who show their pride in hues of red and white.

## THE BELL GAME TROPHY

The Bell Game Trophy is a repurposed CF&I railroad bell passed between Centennial and Central High Schools based on an annual football game. The victors are allowed to paint it their school colors— red for Centennial and blue for Central. This football rivalry is considered one of the oldest in the western US and has been ongoing since 1892, with the exception of a few years suspension due to riots. Since 1950 when Mr. Rhoades donated the bell, the annual match has been referred to as “The Bell Game” and attracts up to 15,000 fans.

## WHEELS

Wheels come in many different forms including bicycles, skate boards, roller skates, roller blades, and cars. These forms of transportation can be used for convenience, to show status, or as a recreational activity. The primary appeal is the potential for self determination and independence. In general, cars are considered a symbol of freedom and maturity. In Pueblo, BMX and street biking are favorites of the youth. Although wheels are mundane devices, they can be quite dangerous.

The third artifact was a freeform series of poems, art pieces, and prose. This included the adjacent poem and painting, as well as the essay ‘On the Five Basic Atmospheres’ featured later.

IT'S SCARY TO THINK  
THAT IN OUR GREAT LAND  
THE SECOND CAUSE OF YOUTH DEATH  
IS BY THEIR OWN HAND

PAIN DOESN'T MEAN MUCH  
AGAINST TV DRAMA AND GORE  
I CAN SAY THERE'S A PROBLEM  
BUT UNDERSTANDING TAKES MORE

FOR NUMBERS, OH NUMBERS  
HOW LITTLE THEY MEAN  
UNTIL IT'S YOUR LOVED ONES  
INVOLVED IN THE SCENE

DO YOU KNOW HOW IT FEELS  
TO FIND THAT YOUR FRIEND  
HAS ONCE MORE CUT SKIN  
BEFORE IT COULD MEND?

HAVE YOU STAYED UP LATE  
BLOWING UP SOMEONE'S PHONE  
BECAUSE IT'S UNSAFE  
TO LEAVE THEM ALONE?

HAVE YOU EVER BEEN ASKED  
TO WATCH OVER A CHILD  
BECAUSE THE PARENTS FEAR SUICIDE  
THOUGH THE CHANCES ARE MILD?

HAVE YOU HEARD A FRIEND CONFESS  
THROUGH THEIR BROKEN VOICE  
ABOUT HOW YOU ALMOST LOST THEM  
TO AN ATTEMPTED LETHAL CHOICE?

EVEN IF HOPELESSNESS  
DOESN'T LEAVE MANY DEAD,  
HOW HEAVY IT IS  
TO HAVE SUCH THOUGHTS IN YOUR HEAD

NOTHING I CAN SAY,  
NOTHING I CAN SHOW  
WILL BE ABLE TO CONVEY,  
COULD LET A PERSON KNOW

THE FULL WEIGHT YOU FEEL --  
HOW HARD IT IS TO MANAGE--  
WHEN MENTAL ILLNESS BECOMES REAL  
AND THERE'S BLOOD ON THE BANDAGE



Figure 36. Hope of Morning ( painting)

## ON THE FIVE BASIC ATMOSPHERES

### BEFORE SCHOOL:

If zombies bothered with the tediums of civilization, it would look something like a high school before first hour classes. Most of the faces are restrained to minimal emotion and drooping eyelids. A few “morning people” may be hyper—it is probably best to avoid them. Some students devour their first meal in the hallways. Many are guided by muscle memorization to their first class. Excess items are shoved in lockers or heaped near desks. Hair is adjusted in the reflections off classroom windows or in the bathroom mirror.

The hallways are dim, but brightening in a way that tires one’s eyes. Up until the warning bell, shuffling is the primary mode of transportation. The final bell may sound over the panting of late students attempting to sprint up stairwells. During winter months, the floor darkens with water and sediment brought in on shoes. The outside world is blue with yellow streetlights; the inside world is dingy gray with flickering white lights.

As soon as the bell sounds, the school clock gains authority over time itself.

### DURING SCHOOL:

If it is true that a creature is happiest when pursuing its purpose, then these hours provide the building with its greatest joy. This is what the school was made for and it is never more alive than during class.

Among the students, emotions are more varied. Some emotions, such as pressure or short term anxiety, tend to accumulate in groups such as wherever there is an exam. Sadness tends to hide in the bathroom. Certain rooms have consistent emotion; for example, do not head to the public speaking room to feel calm.

The population is primarily adolescents between fourteen and eighteen belonging to the nearby

geographic region. It is worth noting that the majority of these people have not been granted societal autonomy— perhaps seventy five percent are not considered mature enough to make decisions on their own behalf. Accordingly, they may not leave the building before the final bell without permission or will receive some sort of punishment. Approximately half of the population cannot legally operate a vehicle. Much of the population is essentially stranded between the bell rings.

The population above eighteen is primarily made up of adults referred to as “teachers”, “administrators”, and “staff”.

Technically, the school power hierarchy goes:

administrators > teachers and staff

From the perspective of the students, the power hierarchy goes:

teachers > administrators and staff

Teachers are the direct handlers of students, trained specifically to interact with adolescents and impart knowledge. Administrators are in charge of rules and logistics. They also plan for hypothetical students and deal with irregular students. Irregular students are those who break the rules, fall below expectations, or have a doctor’s label. Hypothetical students do not exist, but are the only ones who schools can be designed for. Staff are those who deal with the practicalities. All non- hypothetical students are animals. As such they require food, access to water, suitable temperatures, safety, and hygienic shelter. All non- hypothetical buildings require maintenance and repair. The staff address these issues.

Administrators are the only ones to wholly abandon the property at the final bell.

The physical school surrenders its identity to the occupants.

#### EARLY AFTER SCHOOL:

It is no longer government mandated for students to stay, but some do either because they wish to participate further with their peers, they must wait for a ride, or have been detained by the administration. Students are no longer primarily grouped by age, but instead form groups based on

interest or friendship. If these groups are formally organized and have an adult supervisor, they are referred to as “extracurricular organizations”. The groups which do not have formal organization are referred to as “loitering teenagers” and are asked to move their activities outside or off school grounds. The first is considered an advertising asset, the second is considered a hazard to property. The custodial portion of the staff becomes more visible and gains more authority.

The school’s pulse slows, but does not flatline. The building itself becomes golden with afternoon sunshine. The air relaxes and the school clock is no longer dictator. The constant drone of conversation settles into a dichotomy of sound— either somewhat quiet isolated chats or loud shouts of cheers and laughter. Students meander or walk as the large crowds have gone and there is no need to shuffle. Knowledge is still disseminated, but it is typically more social or vocational than it is academic. The sources vary, but it is often more casual than a teacher or book.

#### EVENING AND SUMMER VACATION:

The school becomes a patchwork of light and shadow. Even though there are fewer people, one feels eyes all the more. Humans turn into moths and flock to what lights remain on. Navigation can be accomplished by following sound.

Despite the smaller crowd, the age distribution is at its most varied. Families come to watch performances and parent volunteers assist in potlucks. Most of the student activities are done, but certain groups remain for evening meetings or continue throughout the summer. Staff may reprimand those who stray from their designated areas yet there is a general sense of increased freedom. Most people chose to stay with their associated group anyway, as it is eerie to be alone.

#### NIGHT:

The school flatlines— machines beep, but breathing is out of place. The atmosphere is surreal. Unexpected noises or movements are blamed on illusion or imagination. Any students present are

in the process of developing “The Tale of a School Overnight”. It is usually either a story of rebellious covert missions or giddy school sanctioned events. Myths are born—ghost stories become rumors, disregarded yet somewhat believed, and mutate throughout the student body.

The building is not accustomed to having students at this hour. Vending machines are hunted down. Classrooms become hiding spots and floors become beds. No one is able to sleep, though they may doze. Students do not concentrate or worry about logic; they primarily feel and act. Almost no one speaks of fact; it is irrelevant. Everyone is connected by an electric anticipation of what they do not know, and it creates temporary comradery. Secrets flow. Secrets are overheard. The true face of a classmate may be unveiled.

We discover we are all human, for better or for worse.

The fourth and final artifact was the sculpture of a student. This creation is a mix of wax mould, plaster, polymer clay sculpture, wire, fabric, and cement. The figure is attached to the backpack. The backpack is suspended via a rope wrapped through its zippers. The weight of the sculpture and the way it is hoisted mean that the backpack cannot be opened until the rope is removed. However, at that point the figure will no longer be self supporting and will fall. Inside the backpack are various journal entries, poems, and other indications of the struggles the student is enduring; however, as in real life, one doesn't know what thoughts are held inside until the crisis moment when the individual becomes untethered. Originally, this artifact included a base beneath it depicting the city of Pueblo. Pegs set on popular areas in town allowed for yarn to be weaved through to create a safety net to catch the falling youth.



Figure 37. The Hanging Student (sculpture)



The spring semester focused more on the actual school design itself. Administration and guest areas like the auditorium were allocated to the southern side, near the main parking lot. The gym was placed in the north western corner to connect to the existing sports fields. The classrooms were primarily located in the north and east to allow for morning and indirect light.

At mid-semester reviews, the design was essentially a stacked cube with the main emphasis on the center courtyard. This building was only two stories tall, utilizing double loaded corridors to increase the number of classrooms on each floor. It also included a second smaller courtyard, portrayed in the section view below. After receiving feedback, an elongated version with three floors was developed in order to improve daylighting. By adding a third floor, the school maintained thirty classrooms while removing the double loaded corridors.



Figure 38. Mid Crits Section View

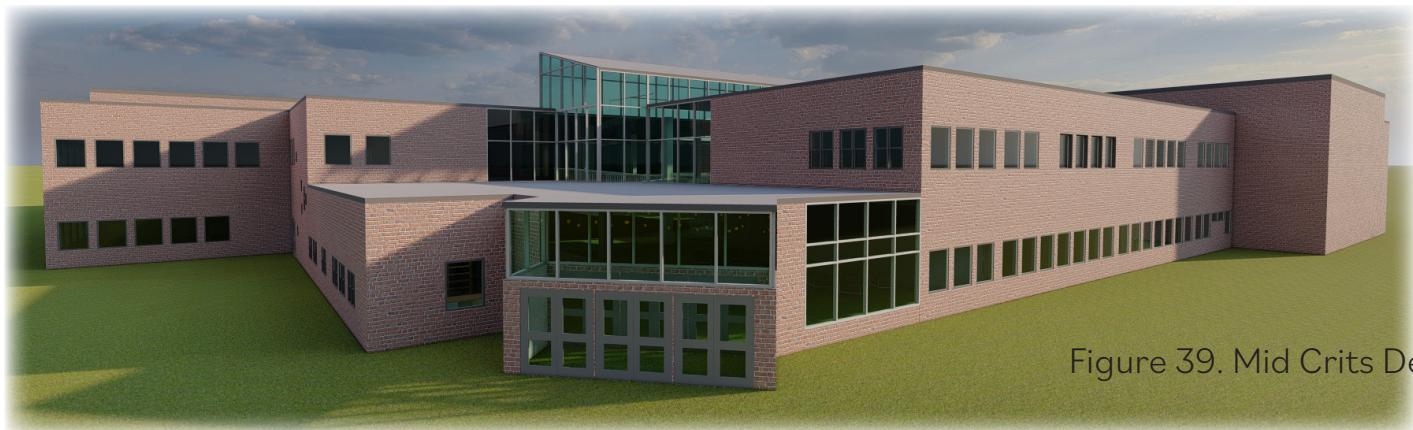


Figure 39. Mid Crits Design

# Design Solution

“When a flower doesn’t bloom, you fix  
the environment in which it grows, not  
the flower.”

-Alexander Den Heijer



Figure 40. Exterior Entry View



## Floor Plans



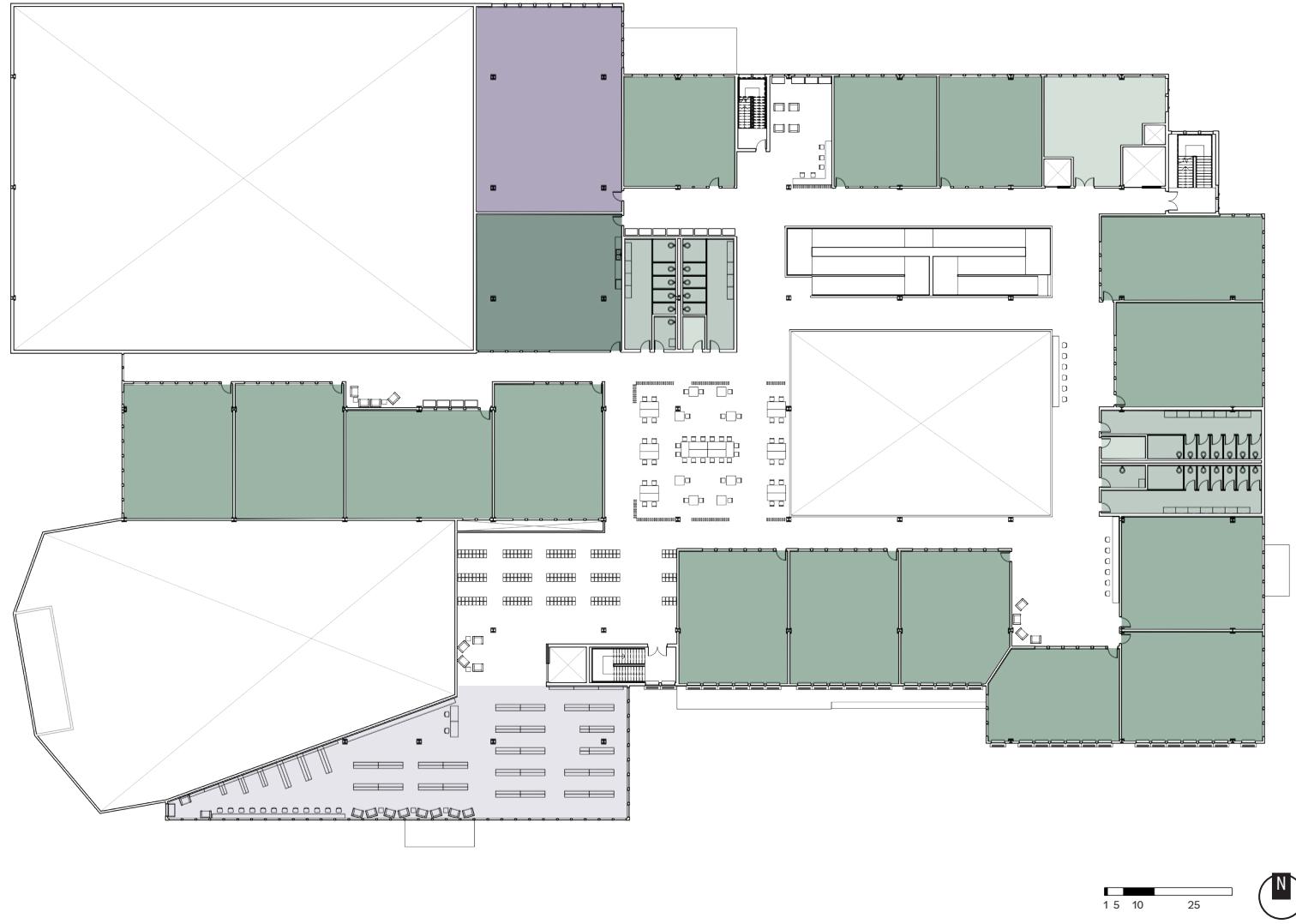
In total, there were:

- 30 undesignated classrooms
- 1 gym complex with weight room and locker rooms
- 2 music rooms
- 2 teacher staff areas
- 2 meeting rooms
- 4 counselor offices
- 3 custodian rooms
- 5 custodian closets
- 5 restroom units with a total of 72 toilets
- 30 moveable planters
- 248 cafeteria seats
- 1,104 lockers

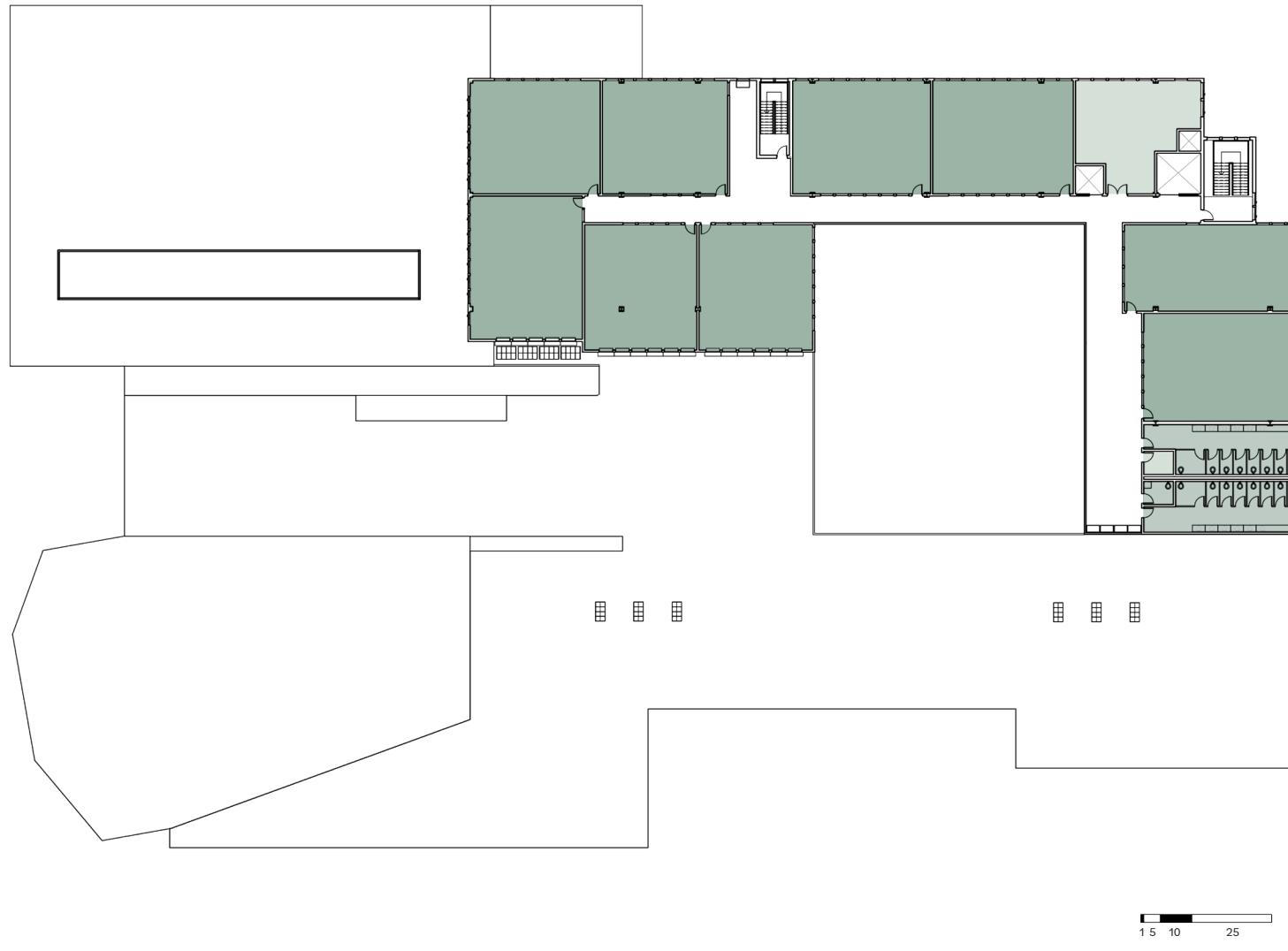
# First Level



## Second Level



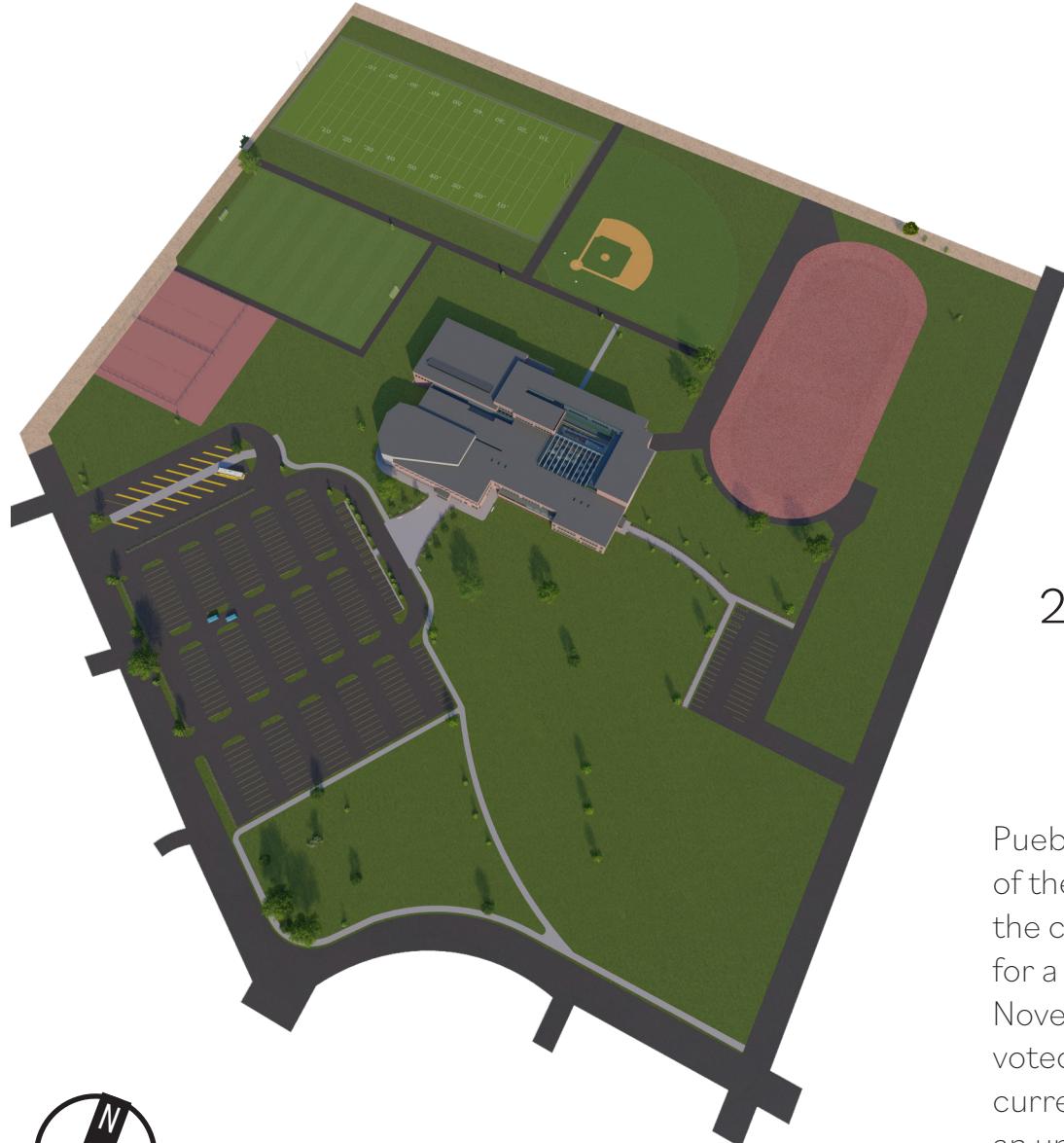
# Third Floor



## Site Plan



Figure 44. Tilted Site Plan



2525 Mountview Dr,  
Pueblo, CO 81008

Pueblo county in Colorado has some of the highest youth suicide rates in the country, making it an ideal place for a mental health intervention. In November 2019, the City of Pueblo voted to demolish and replace the current Centennial High School with an updated facility.

# Sections

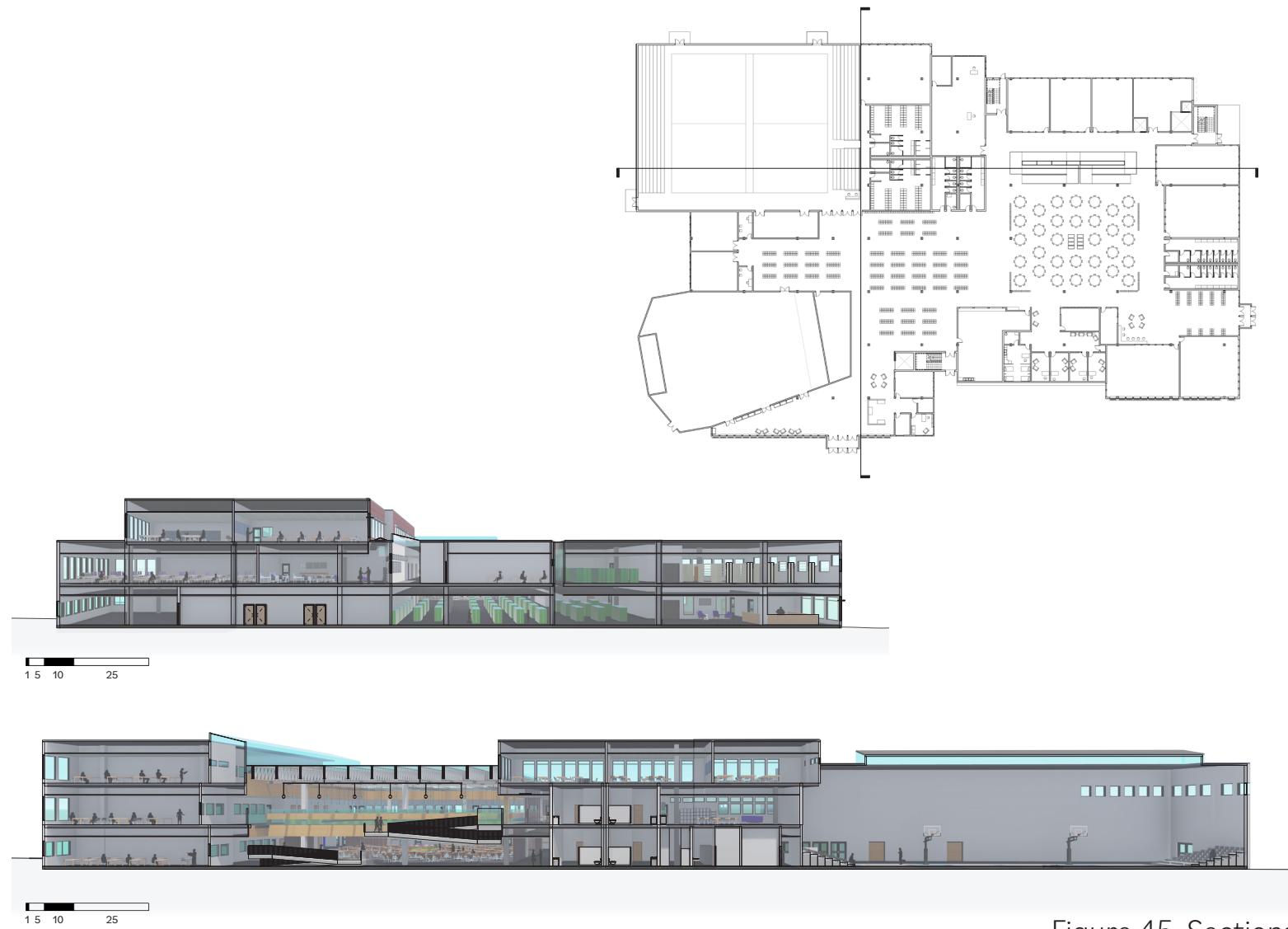


Figure 45. Sections



Figure 46. Classroom View



Figure 47. Counselor Office View

# Elevations

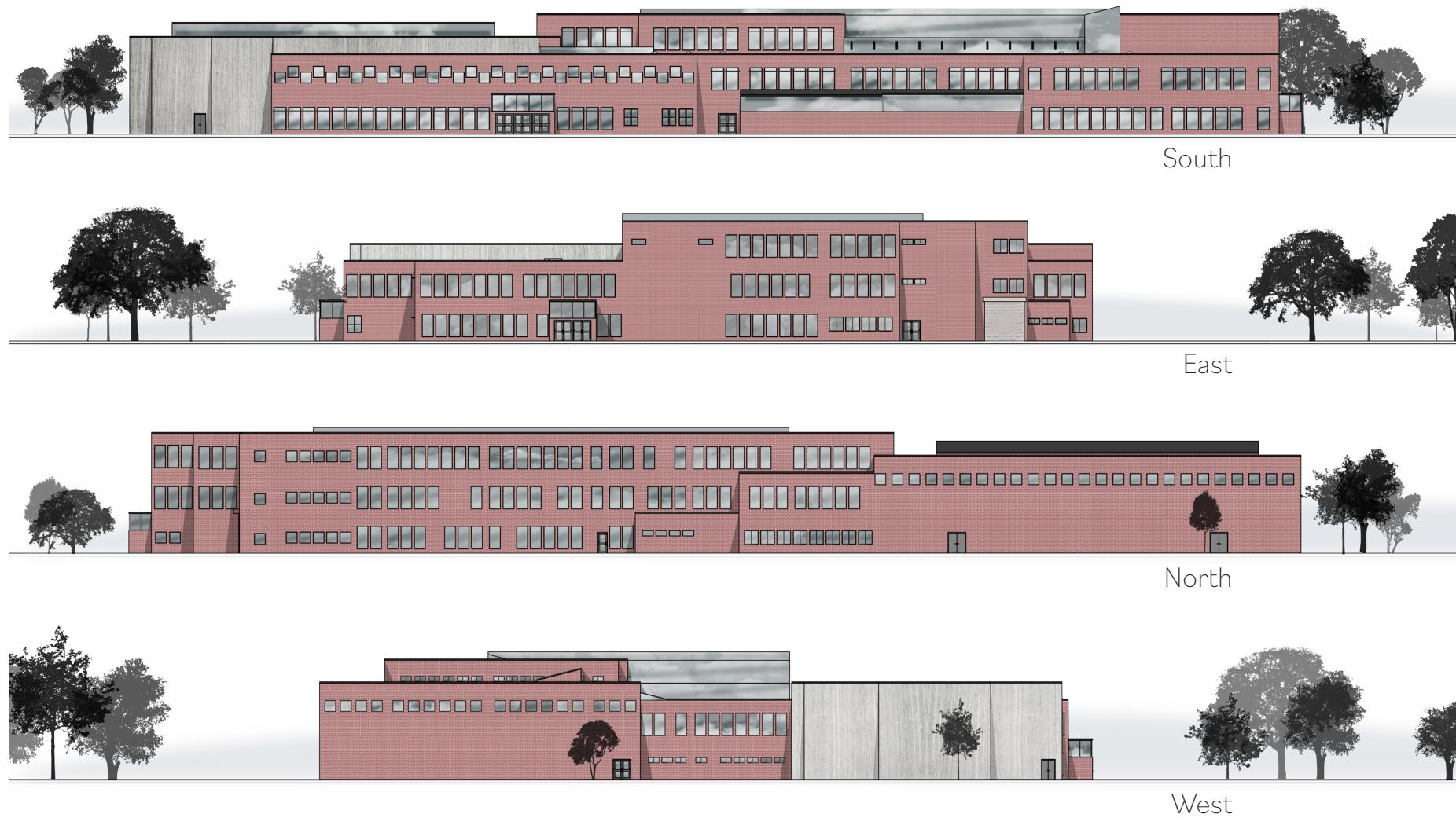


Figure 48. Elevations

15 10 25

# Circulation

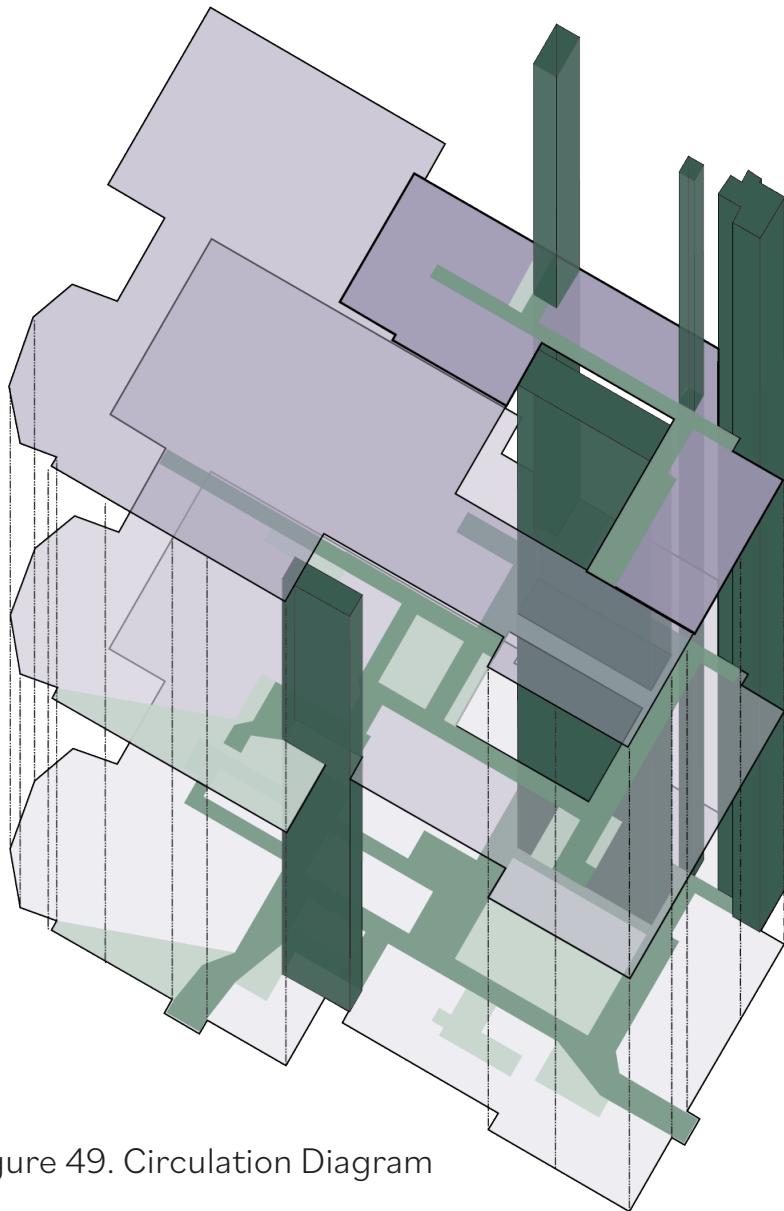


Figure 49. Circulation Diagram

In the school, there is one staircase and one elevator that service the first and second levels. The courtyard ramp also connects the first and second floor.

There are two staircases and one passenger elevator that service all three floors. Additionally, there is one freight elevator that extends from the first to third levels.

- Main Vertical Circulation**
- Main Horizontal Circulation**
- Open Circulation**

# Structure

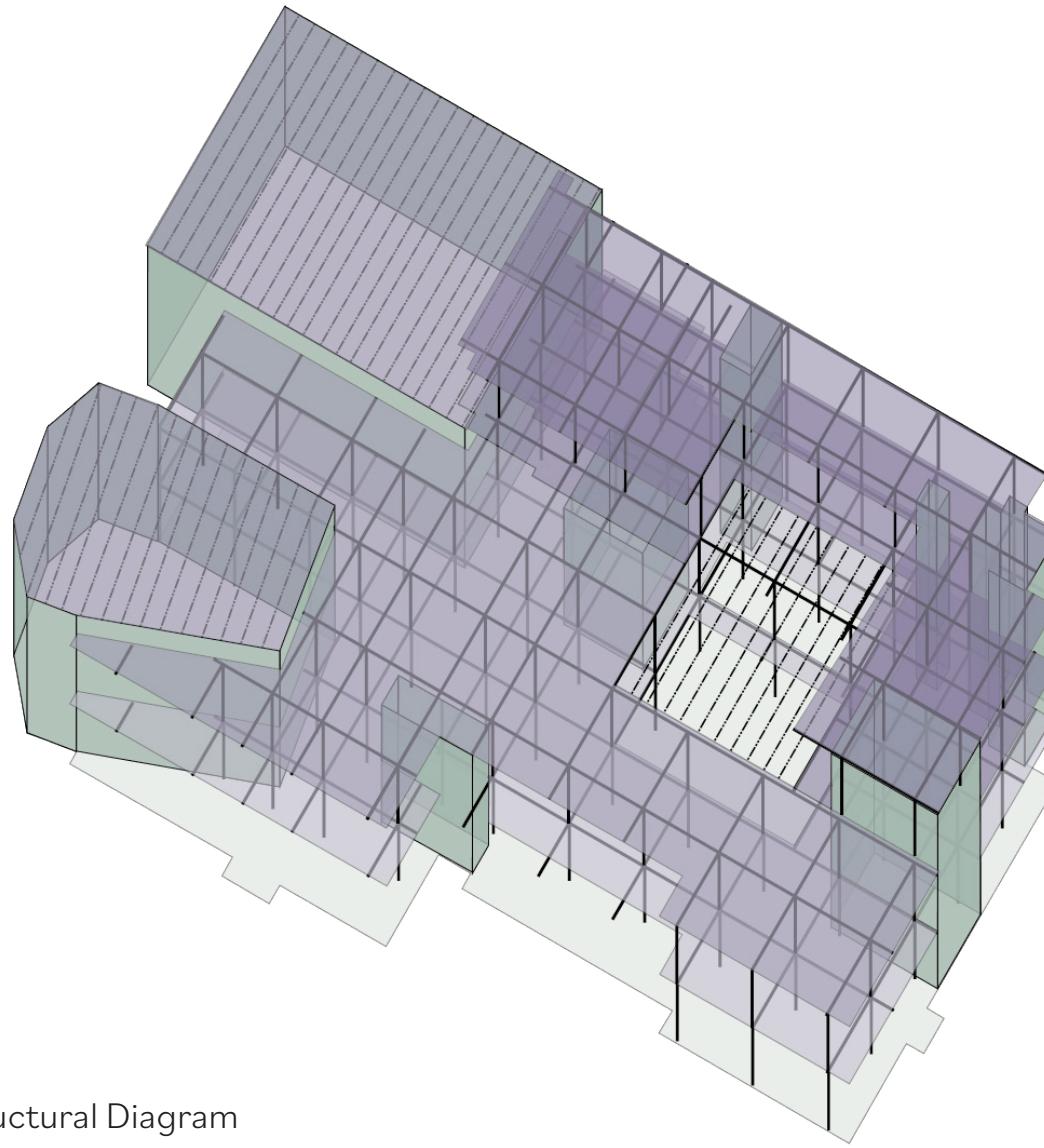
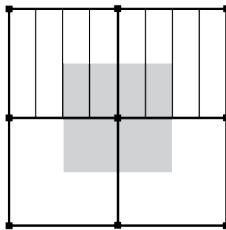


Figure 50. Structural Diagram



### Tributary Area

(36' x 36' column bays) x 2 levels (second floor & roof)

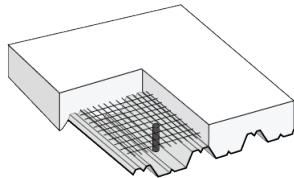
Tributary Area = 2,592 sq ft

### Primary Beams

Steel beams 36' span at 30" deep every 36'

### Secondary Beams

Steel beams 36' span at 24" deep every 9'



### Floor

8" deep concrete on steel decking

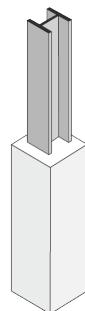
Carpet covering for acoustic benefits

Current level height: 14'

Current floor to ceiling height: 10'

Current ceiling cavity: 4'

Total structural ceiling space used: 3'2"



### Columns

W10 at 11" x 10" x 14' plus fireproofing

### Irregular Structural Roof Areas:

#### Gym

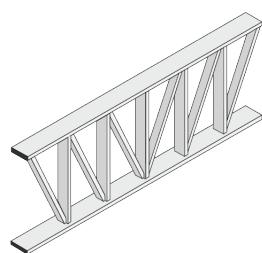
Column-free area: 115' x 152'

Open web steel joists 115' span at 72" deep every 8'

#### Courtyard

Column-free area: 65' x 80'

Open web steel joists 60' span at 48" deep every 8'



#### Auditorium

Column-free area: 70' x 108' to 90' x 108' at most

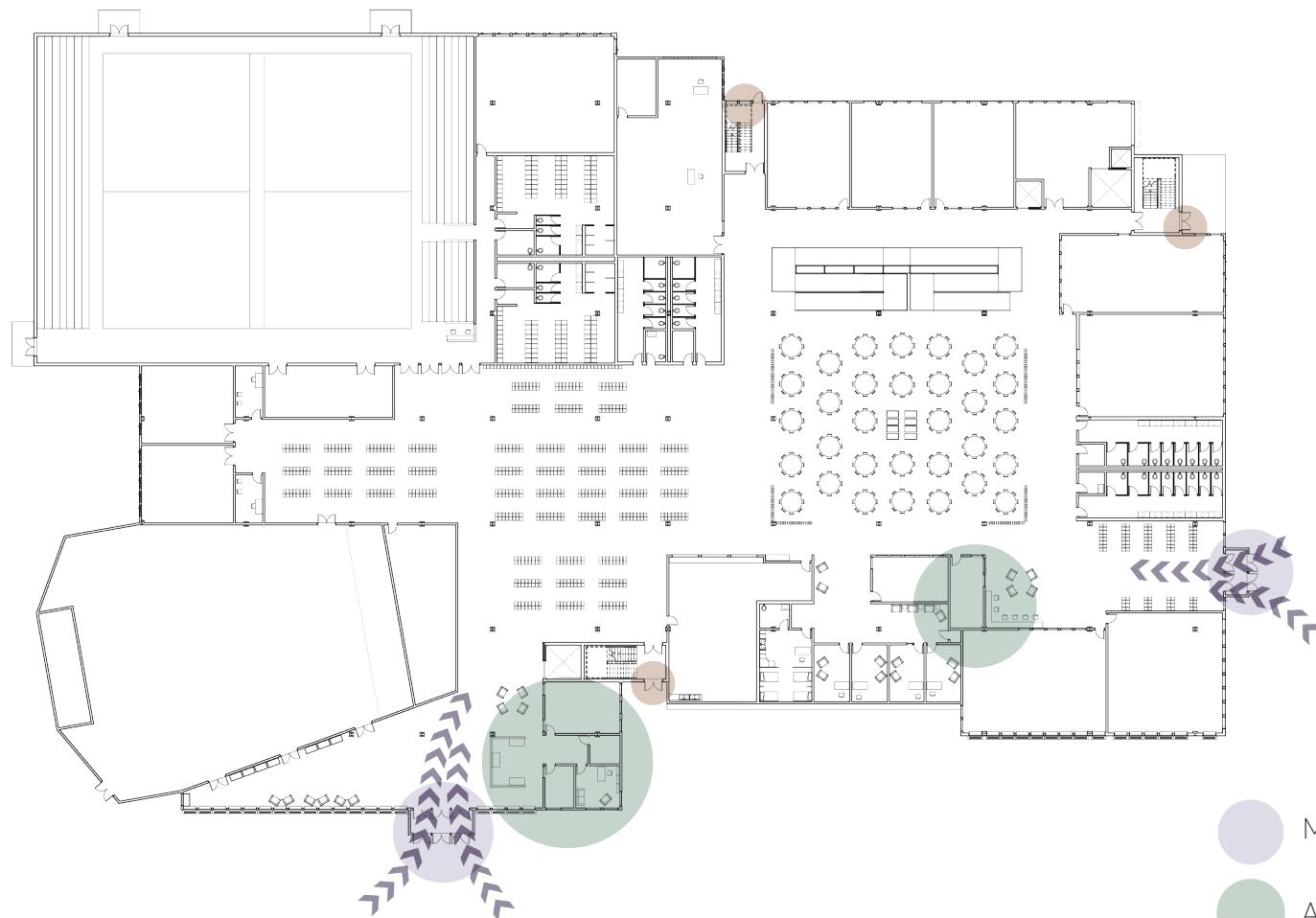
Open web steel joists 90' span at 60" deep every 8'



In addition to the physical benefits of staying alive and relatively undamaged, safety and security are second on the list of essential requirements for achieving one's best self according to psychologist Abraham Maslow (McLeod 2020). Yet treating students as potential dangers or inherent troublemakers can create a distrustful, negative community and self fulfilling prophecies. Herein lies an excellent example of the difficulty in designing a mental- wellness based school. In an age where mass shootings and school violence are increasing, it is important to design academic facilities that are equipped for such situations.

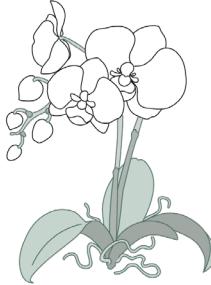
To help deter crime, both entrances to the school funnel visitors past administrative personnel. This creates a natural surveillance that both discourages bad behavior and enables staff to note irregularities or threats as they enter. Additionally, the main open areas and hallways are designed to always provide some screening to enable students to hide in a worst case scenario. For example, the main locker bay has staggered locker groupings in order to disrupt the line of sight. In order to prevent a sniper situation in the courtyard, the second floor includes five foot tall glass half walls.

Perhaps the most notable security flaw with this design is that the open nature of the first floor makes it hard to lock areas off, as was noted during the final jury review.



- Main entrance
- Administration
- Emergency exits

Figure 51. Entrance Security Diagram



Exposure to natural environments is a common recommendation for improving mental health. Studies suggest that humans are inherently biophilic and work better when plants are incorporated into their environment.

With this in mind, the Centennial High School design includes several green interventions. Permanent elements include windows with views of the surrounding schoolyard and the ramp's modified wall rail. This half wall is topped by a sixty eight by two foot area of inset planters to provide year round access to vegetation. In response to the unique nature of high schools, which typically see staff and occupant reductions during summer months, transportable green interventions were also incorporated. Thirty raised planters with a four by two foot growing surface are distributed around the school. These can be emptied over the summer to reduce demands on staff. The planters have enough clearance beneath to pass accessibility standards, enabling students to tend to their gardens while seated or standing.

Externally, efforts were made to reduce the number of site disturbances caused by the new design. The majority of preexisting trees were kept and only drought resistant plants were added.

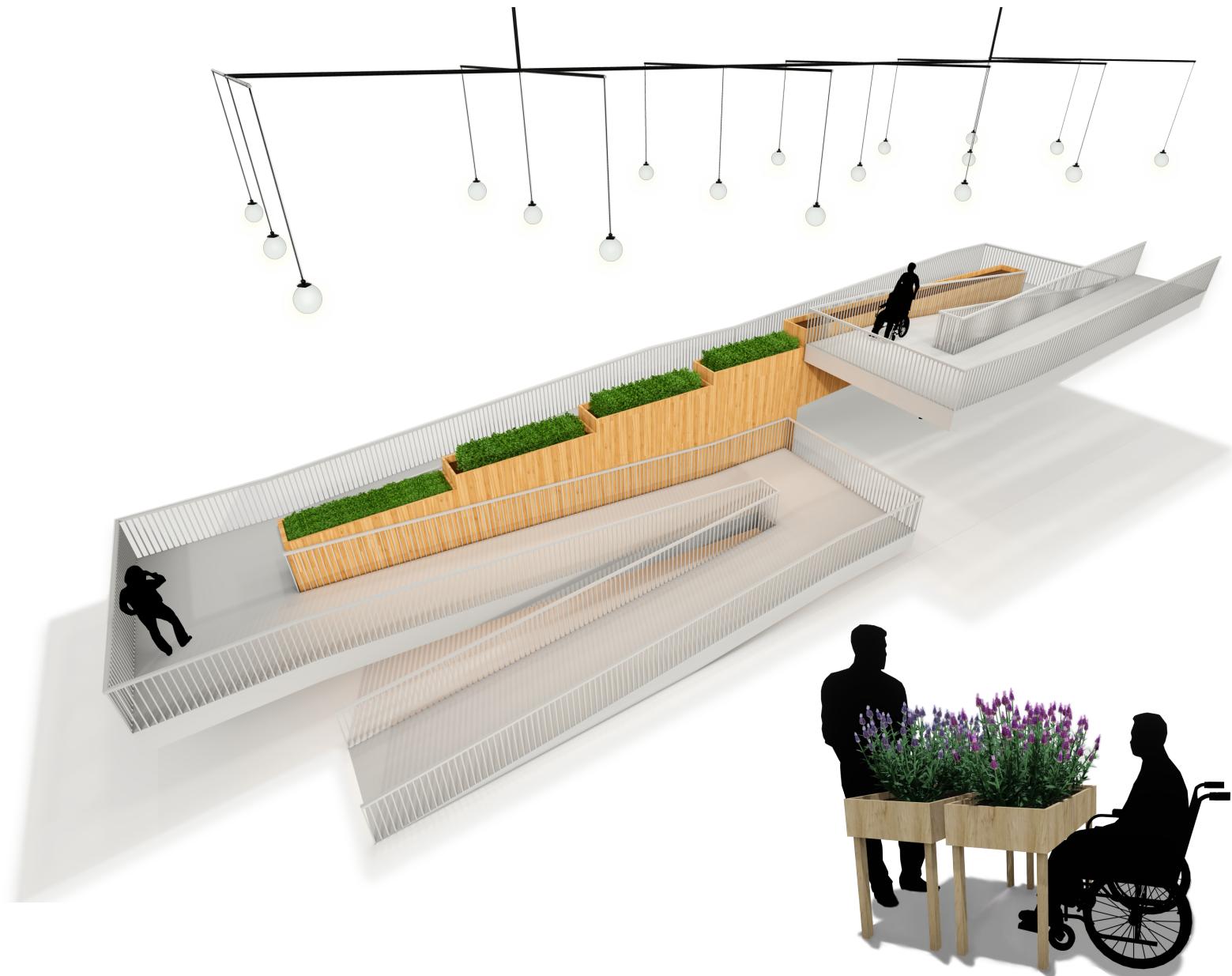
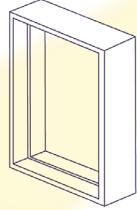


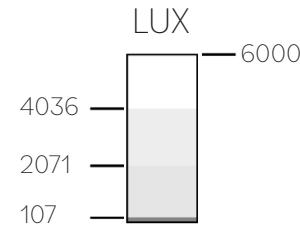
Figure 52. Green Ramp and Planter



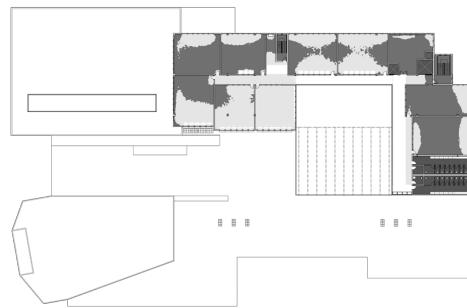
Natural lighting is a tenement of psychology centered design. Studies suggest that daylight can improve a person's mood and help with being alert. Depending on the subject, classrooms require between thirty and seventy five foot candles of luminance or about three hundred to eight hundred lux.

Careful consideration was given to ensuring all classrooms had access to natural light either through an exterior wall or skylights. The basic window used in the Centennial High design was an eight by four foot fixed window at a sill height of eighteen inches. This enables light to penetrate deeper into the school. To reduce summer heat gains, the southern facade incorporates shading devices which extend both outward and inward to double as light shelves. The central courtyard has a glass roof to pull light to all levels. Similarly, skylights increase light to the second floor and a light well brightens the locker bay of the first floor.

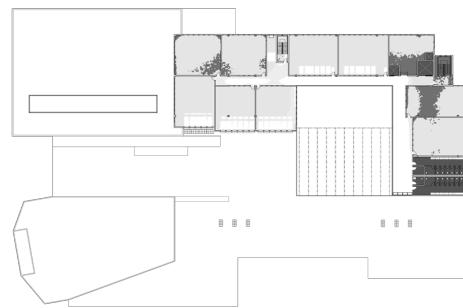
Lighting analysis completed using the Insight add-in to Revit found several different zones of daylighting in the design. Below are illuminance maps demonstrating the reach of natural light in the building.



September 21



December 21



June 21

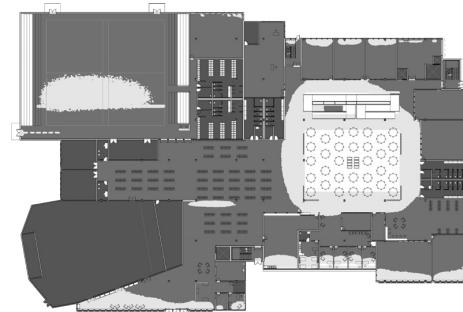
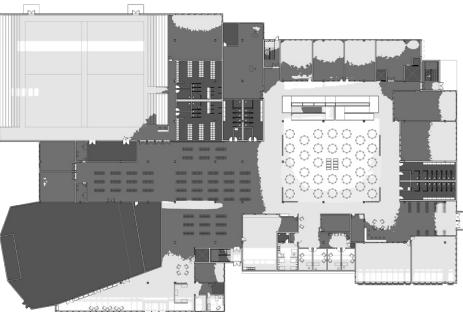
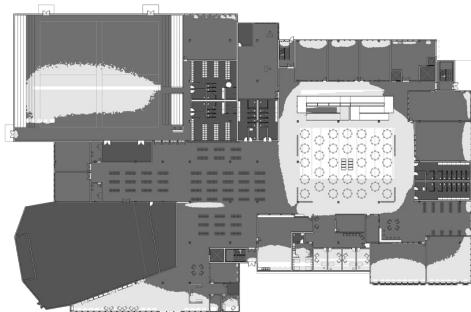
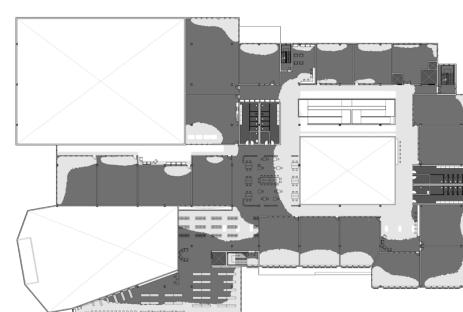
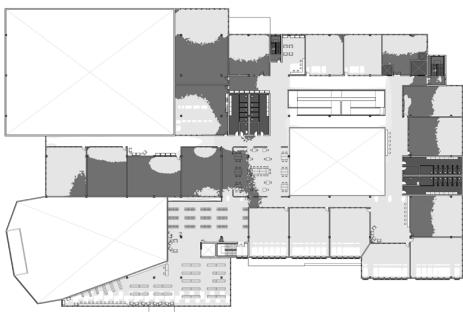
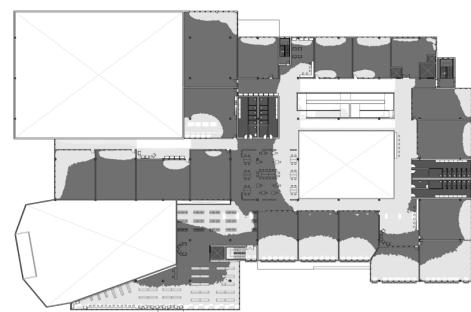
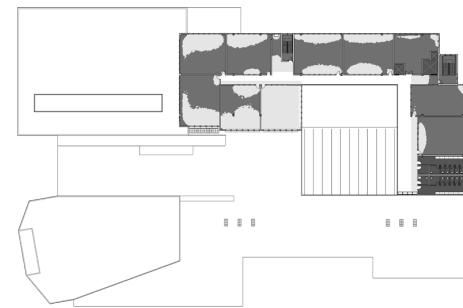
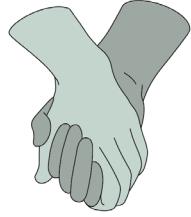


Figure 53. Insight Illuminance Diagram



Figure 54. Library View



In institutional settings, there is a tendency to divide the occupants between those with power and those who are merely inmates. Although beneficial in some situations, this can be overdone to produce a dehumanizing effect. In some such instances, a high school can become little different from a jail, where prisoners are considered mitigated dangers who must be controlled. Architecture can reinforce this mentality by removing literal common ground, limiting students and teachers to classrooms where there tends to be a default authoritarian power structure.

Enforcing a strict division between child and adult is not necessarily a good method for a mentally healthy community. Philosopher Hannah Arendt argued that when the child's world is isolated from the adult sphere, it results in "conformism or juvenile delinquency, and is frequently a mixture of both," (Arendt, 1961, p. 182). It is not enough for students to be in the same building as teachers, the two groups must have some middle ground to interact as people, not merely as categories. A 2019 research study examining the relationship between school environments where students identified trusted adults and suicidal thoughts or attempts found that

student isolation from adults specifically increased vulnerability to SA [suicide attempts]. A difference of 10% fewer students isolated from adults (1 SD) was associated with 1.41 fewer attempts per 100 students, a 20.1% reduction in the average rate of attempts (7/100). Students with trusted adults at school are more likely to seek help (Pisani et al., 2012), and students lacking access to adult support may be vulnerable to transitioning from ideation to an attempt. (Wyman et al., 2019, pp. 1072- 1073).

Thus an architectural commons between teachers and students may be a design strategy for wellbeing in school settings.

In response to this, the new Centennial High design incorporates democratic spaces such as the cafeteria and second floor study station. These are areas which rely on their public visibility to deter bad behavior instead of direct supervision by an authority figure and have flexible seating. This is essentially an antithesis to the Panopticon— instead of few people monitoring the group for misbehavior, each member of the group is close enough to those around them and the simple number of potential witnesses deters misbehavior enabling a fluid social climate and becomes a physical expression of trust.

Additionally, if a student's locker represents their home and the classroom represents their work, then these democratic areas represent the creation of a 'third space'. As such, it creates an opportunity for belonging in the larger community which is beneficial to mental wellness. It also creates a space for students to work on their own before or after school, as many teachers lock their classroom doors when not in use.



Figure 52. Study Space View



Figure 56. Cafeteria





Figure 57. Exterior Bird's Eye

Whenever we speak of the future, we speak of hope for a new morning. As we design facilities that will continue to serve for decades onward, let us create shelters that can withstand the hurricanes of teenage years without smothering their light. By partnering design, culture, and support, we can create a brighter future for generations to come.

# Thesis Appendix

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# Previous Studio Experience

## Second Year

Fall 2017	Spring 2018
Milton Yergens	Daryl Booker
Tea House and Boathouse	Tiny Home, Bird House, Mixed Use

## Third Year

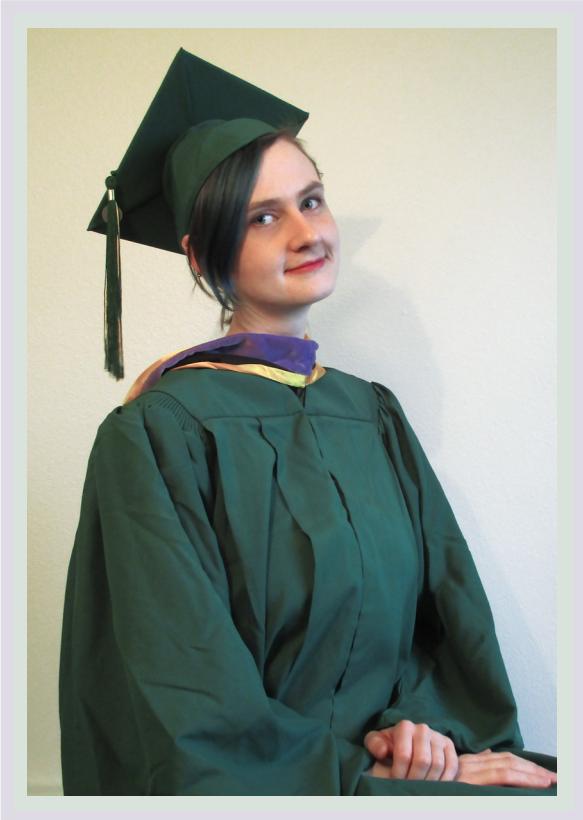
Fall 2018	Spring 2019
Mark Barnhouse	Ronald Ramsey
Entomology Lab and Industrial Firm	Boutique Hotel and Native Museum

## Fourth Year

Fall 2019	Spring 2020
Amar Hussein	Paul Gleye
High Rise	Urban Community Space

## Fifth Year

Fall 2020	Spring 2021
Stephen Wischer	Ganapathy Mahalingam
Thesis	Thesis



Hope is a fragile necessity that we often try to inspire in others in order to rekindle the embers within ourselves. Though hard to keep, it is easy to share; so why not try?



