

permeable education

"creating a culture for learning"



Catherine L. Becker

| PERMEABLE EDUCATION |

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By

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..... | table of contents |

| permeable education |

thesis abstract.....001
problem statement.....002

| statement of intent |

statement of intent.....003-006

| proposal |

narrative.....009-012
user/client description.....013-014
major project elements.....015-016
site information.....017-022
project emphasis.....023
plan for proceeding.....024-026
previous studio experience.....027-028

| program |

unifying idearesearch.....031-039
unifying idea summary.....040
typological research.....041-072
typological summary.....073-074
historical context.....075-080
goals for thesis project.....081-082
site narrative.....083-086
site analysis.....087-102
climatedata.....103-110
program requirements.....111-116

| design solution |

park west center for learning119-120
process121-122
site123-126
floor plans127-134
interior perspectives135-140
sections141-148
display149
model150
references.....151-154
personal identification.....155-156
thank you157-158



figure 1.0: traditional classroom.....10	figure 8.15: massing52	figure 13.2: corner shop88	figure 30.0: cloudiness105
figure 1.1: studio classroom.....10	figure 9.0: Apollo School53	figure 13.3: site looking south88	figure 31.0: wind speed106
figure 1.2: demographics11	figure 9.1: entry56	figure 13.4: site looking north west88	figure 32.0: wind direction107
figure 2.0: user/spacial analysis-weekday.....16	figure 9.2: central atrium as auditorium56	figure 13.5: abandoned building.....88	figure 33.0: air movement108
figure 2.1 user/spacial analysis-weekend16	figure 9.3: entry two56	figure 14.0: site reconnaissance.....89	figure 34.0: sun path109
figure 3.0: Midwest Milwaukee Wisconsin17	figure 9.4: central atrium56	figure 14.1: western sidewalk.....89	figure 35.0: June 21st shade diagram110
figure 3.1: Milwaukee County17	figure 9.5: site plan57	figure 14.2: northwest corner.....89	figure 35.1: December 21st shade diagram110
figure 3.2: City Features18	figure 9.6: section looking north57	figure 14.3: N24th Place.....90	figure 36.0: space matrix115
figure 3.3: Site20	figure 9.7: 2nd floor plan58	figure 14.4: northeast corner.....90	figure 37.0: space net116
figure 4.0: North of Site21	figure 9.8: north elevation58	figure 14.5: eastern sidewalk90	figure 38.0: main entry120
figure 4.1: East of Site21	figure 9.9: geometry59	figure 14.6: looking north90	figure 39.0: process121
figure 4.2: South of Site22	figure 9.10: hierarchy59	figure 15.0: open site.....91	figure 39.1: process121
figure 4.3: West of Site22	figure 9.11: structure60	figure 15.1: shade cover91	figure 39.2: process122
figure 4.4: Hopewell Missionary Baptist Church.....21	figure 9.12: circulation to space60	figure 15.2: green taking back from the built92	figure 39.3: process122
figure 4.5: Residence21	figure 9.13: plan to section61	figure 15.3: N 24th Place92	figure 40.0: figure ground123
figure 4.6: Sidewalk21	figure 9.14: natural light62	figure 16.0: gravel93	figure 41.0: site context map123
figure 4.7: N. 24th Pl.....21	figure 9.15: massing62	figure 16.1: green taking back from the built93	figure 42.0: site plan124
figure 5.0: Plan for Proceeding26	figure 10.0: Multifunctional Center de Boomgaard ..63	figure 16.2: scattered pieces of concrete93	figure 43.0: east entry125
figure 6.0: A Place for Birds27	figure 10.1: entry66	figure 16.3: small flowers94	figure 44.0: amphitheater126
figure 6.1: City Museum27	figure 10.2: central commons66	figure 16.4: mature trees94	figure 45.0: first floor plan127
figure 6.2: High Rise27	figure 10.3: skin66	figure 16.5: mature tree94	figure 46.0: second floor plan129
figure 6.3: #Whyfargo27	figure 10.4: gymnasium66	figure 17.0: neglected mixed use95	figure 47.0: third floor plan131
figure 7.0: school house33	figure 10.5: site plan67	figure 17.1: Hopewell Missionary Baptist Church95	figure 48.0: movement through building133
figure 7.1: school building33	figure 10.6: section looking east67	figure 17.2: neglected residential96	figure 49.0: main entry135
figure 7.2: lean, unlearn, relearn35	figure 10.7: 1st floor plan68	figure 17.3: chain designed building96	figure 50.0: cafeteria136
figure 7.3: movement37	figure 10.8: south elevation68	figure 17.4: 'box' building96	figure 51.0: learning space137
figure 8.0: Gary Comer Collegiate Academy43	figure 10.9: geometry69	figure 18.0: vehicle traffic97	figure 52.0: collaboration138
figure 8.1: entry46	figure 10.10: hierarchy69	figure 18.1: pedestrian traffic97	figure 53.0: the perch139
figure 8.2: classroom46	figure 10.11: structure70	figure 19.0: noise98	figure 54.0: lounge140
figure 8.3: Gary Comer Youth Center46	figure 10.12: circulation to space70	figure 20.0: topography map99	figure 55.0: section141
figure 8.4: natural light46	figure 10.13: plan to section71	figure 20.1: topography section99	figure 56.0: roof detail142
figure 8.5: site plan47	figure 10.14: natural light72	figure 21.0: wisconsin soils 1.....100	figure 56.1: floor detail143
figure 8.6: section looking north47	figure 10.15: massing72	figure 22.0: wisconsin bedrock 1.....100	figure 56.2: foundation detail144
figure 8.7: plan48	figure 11.0: national graduation rates for 2012...77	figure 23.0: zoning 1.....101	figure 57.0: building section145
figure 8.8: south elevation48	figure 11.1: A. O. Smith Interior Plant.....78	figure 24.0: utilities map102	figure 57.1: building section south146
figure 8.9: geometry49	figure 11.2: school segregation protest march...79	figure 24.1: above ground utilities102	figure 57.2: building section center147
figure 8.10: hierarchy49	figure 11.3: freedom day sign80	figure 25.0: temperature103	figure 57.3: building section north148
figure 8.11: structure50	figure 12.0: neglected shop85	figure 26.0: humidity103	figure 58.0: thesis display149
figure 8.12: circulation50	figure 12.1: site upon approach85	figure 27.0: precipitation104	figure 59.0: model150
figure 8.13: plan to section51	figure 13.0: abandoned87	figure 28.0: snowfall104	figure 59.1: model150
figure 8.14: natural light52	figure 13.1: forgotten garage87	figure 29.0: sunshine105	figure 60.0: personal image156

*all tables and figures were created by Catherine Becker, unless otherwise noted

This thesis, Permeable Education, provides insight into the impact that permeable architecture has on the culture in a community when applied in educational spaces. The typology, a 230,000 square foot Center for Learning in Milwaukee, WI, looks to utilize permeable architecture to increase access to life skills education in a community. The project is justified in that students have a desire for knowledge that will be relevant to them after their formal education is over. By making this type of education open to a larger demographic, a greater influence will be had on the surrounding community and their desire to learn. The Park West Center for Learning functions as a 9-12 high school as well as a community learning center with access to traditional education settings, skills labs and shared community space. Research for this thesis will utilize a mixed method approach throughout the academic year and will be documented throughout that time for future use.

Can educational spaces utilizing **permeable** architecture inform a culture of **lifelong learning**?

..... | statement of intent |

.....
*“Try to learn something about everything
and everything about something”.*

-Thomas Huxley

statement of intent

| project typology | Center for Learning

| claim | Permeable architecture increases access to building amenities, when utilized in educational spaces, it has the power to impact the culture of a community.

| supporting premises |
actor

'Traditional students' seeking an alternative learning environment for their 9-12 education as well as 'post-traditional' students with a desire to continue their education through hands on exploration.

action The implementation of a flexible education model that allows students to take control of their education and what they learn.

object The flow of ideas between the built environment and the community through interactions based on a desire to learn. The movement of knowledge is strengthened by "[the] neighborhood's strengths - its people and what they know and can do, its informal and formal associations, its organizations and businesses, its buildings and its open spaces, its vacant lots and "waste," and certainly, its schools" (Kretzmann 1992).

manner of action Through the combination of permeable architecture practices and a flexible education model, interaction between community members will increase, bringing schools back to the center of the community and enhancing the community culture.

| theoretical premise/
unifying idea |

Permeable spaces allow more people to engage and benefit from the amenities offered within a space. A permeable environment allows all community members to come together and recognize their mutual strengths. This recognition of ideas has the power to influence the culture through the physical and intellectual movement between the built environment and the greater community.

| site |

W. North Ave. and N. 25th St.
Milwaukee, WI

| justification |

In a survey by Civic Enterprises, an overwhelming 81% of high school dropouts said that "if schools provide opportunities for real-world learning (internships, service learning projects, and other opportunities), it would have improved the students' chances of graduating from high school" (Bridgeland, 2006). By allowing this type of education to be accessible to a demographic broader than that of the traditional student, the culture of the community will be enhanced as ideas begin to move between the built environment and community.

..... | proposal |

*“Develop a passion for learning.
If you do, you will never cease to grow.”*

-Anthony J. D'Angelo

“Tell me and I forget, teach me and I may remember, involve me and I learn.”
— Benjamin Franklin

We are lifelong learners whether or not we realize it; the question is how do we actively engage this process in order to better our communities? This thesis seeks to explore the relationship that architecture has on the ability to engage all members of a community in lifelong learning through the use of permeable architecture in educational spaces. The means through which this will be explored is through the creation of a Center for Learning in Milwaukee, WI utilizing responsive architecture to increase access to life skills education in a neighborhood. Exposing this style of learning to a larger demographic will significantly influence the surrounding community and their desire to learn.

The act of learning is a continuous process. It is one of the crucial life skills that we never stop practicing; even when we are not actively studying material in a formal setting, we are absorbing information and insight from all around us. We learn in formal academic settings, in the work place, at home, in nature-everywhere! There is always something to learn from and in infinitely different ways. Most of the learning that we do in our daily lives is outside of the traditional classroom and rather in the school of life.

“In the 1990s a new phrase entered our language: ‘lifelong learning’. Learning and living have suddenly become much more closely linked. People learn things in order to live more effectively or more happily rather than just because a trainer tells them to do so or because an examination demands it. Much of this kind of learning happens not in classrooms but in the margins of our lives-valuable know-how that you pick up by reflecting on things you see or hear. Much of it does not fit under the conventional subject headings you are familiar with from your school days. Like mathematics or geography. Yet it is precisely the kind of thing you need to get on with your life and at work-for learning is what you get when you reflect on the experience of living” (Lucas, 2005).

I love that Lucas describes learning in terms of personal reflection on experiences. A reflective person by nature, I believe that you can learn the most about yourself and the world around you by taking a moment to look back at where you have been. I have always considered myself an active learner in all aspects of life. I am an observer of human nature and have a strong desire to help people learn about themselves. Because of these traits, I was always told I would make a good educator or therapist when I grew up. Alas,

there were greater plans for me to become a designer-someone who also studies human nature and looks to serve others. People are truly at the heart of design and I believe there is a way to make them the heart of any building project through thoughtful design initiatives.

This is where my interest in educational architecture developed. I want to know how architecture can aid in helping people learn-not just the traditional curriculum found in academia, but about themselves, their passions and their futures. So many people hear the words ‘educational architecture’ and immediately have flashbacks to their time in formal academia, a four walled classroom where someone speaks at you rather than actively engaging you in the conversation. The truth is that educational architecture can be found in many forms-truly all it means is a space where one can find meaning in material that allows them to better themselves, be it on an academic or a personal level. My favorite educational spaces are the ones I’ve been able to call ‘home.’ In high school this was the CAD Lab and now it is my studio space. These spaces are not the traditional educational spaces one may immediately think of but they are where I have learned the most about my field and myself. I always longed to be in the CAD Lab rather than in my traditional classes because that was the home of what I loved to do, where I could ask questions and uncover answers through hands on discovery. When this is possible in a space the opportunities

for practical and personal growth becomes infinite. I want to create spaces where this is possible. Where people can come to reflect on themselves and their pasts, and walk away having learned something about what they are capable of.



figure 1.0: traditional classroom (see references)



figure 1.1: studio classroom

The direction of this thesis came from reflections on my own educational experience as well as discussions with a relative, Claire Becker, in Milwaukee who works for Teach for America. I attended a traditional public high school and felt thoroughly prepared for the world outside that environment. There are others in this country that are not so fortunate and are not

prepared for life in college or a career after graduation. They lack basic life skills that are essential in order to thrive in the world today. In my discussions with Claire, I found out that what the Milwaukee education system is severely lacking is practical everyday knowledge that students can apply outside of the classroom. Claire gave me insight into the city and educational climate of Milwaukee that I would have otherwise not understood. She explained that Milwaukee is heavily segregated by community-if you choose a location in North Milwaukee you are addressing a strong African American community, if you choose a location in South Milwaukee you are looking at a strong Latino culture. I also discovered that many parents on the north side of the city send their children to schools on the south side because they believe that their children will receive a better education there. When I heard this I was saddened because when this occurs the idea of the school as the center of a community is lost. Students leave their neighborhoods for what they believe to be better situations. With this information I was drawn to a site on the north side of the city where I saw a need to create a place that can bring this community together, in the spirit of knowledge, to be proud of their own neighborhood, history and culture. A center that provides for the community's needs, not just another program trying to make the schools work but a school that actually works to bring people together, has the power to change the future of that community.

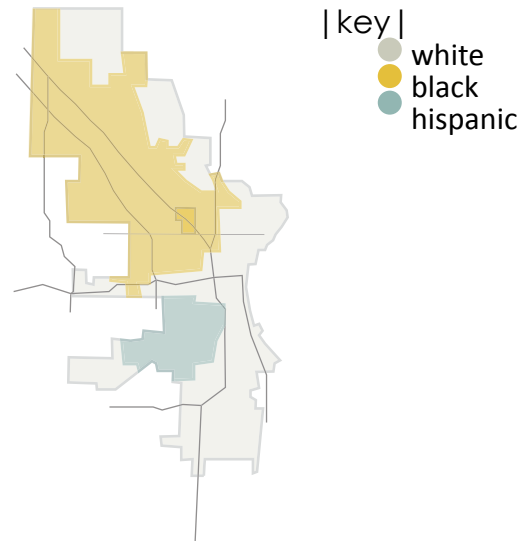


figure 1.2: demographics

Aspace that wishes to engage this philosophy needs to be inviting and flexible, unrestricted to the 'traditional' students that occupy it and the community in which it resides. Permeable architecture allows this to become a reality. The built environment requires adaptability as new needs develop-a necessary attribute in today's ever changing world and in an educational model that thrives on flexibility and student drive. Permeable spaces allow more people to engage and benefit from the services offered within the space and allows community members to come together and recognize their mutual strengths. The building needs a 360 degree relationship with its surroundings so that it not passed by but engages actively with the passersby. The nature of this architecture allows for more

people to connect and benefit from spaces that promote community advancement. Permeable architecture calls for flexibility in the physical movement in and out of the building, but also for the flexibility of ideas.

Imagine, if you will, a place where 'traditional' students can engage in the traditional learning model of education, but also have the opportunity to engage in hands-on activities that they can actively apply outside of the classroom. While these 'traditional' students utilize the space during the academic day-at night and during off hours there is the opportunity for the public and 'post-traditional' students to utilize the space as a way towards personal betterment. This is what a flexible learning model looks like. It motivates through problem-based learning guided by interests and where one is actively engaged and interested in the material. This attitude creates a more interesting environment and thus a desire to learn that continues to grow over time, leading to lifelong learning.

"The 2010 Bruges communiqué and Europe 2020 strategy stress that permeability is a precondition for having education and training systems that encourage lifelong and life wide learning (learning that takes place not only in schools, but also at work and in leisure time)" (European Centre for the Development of Vocational Training (Cedefop), 2010).

Creating an environment where both of these ideas are possible requires a truly permeable environment that is not only so architecturally but also in the ideas that are taught within the walls. Education and schools in general have historically been the center of a community, something that brings people together. It is time to bring back the community into education by making spaces that are accessible in both formal and informal ways where the desire to learn can begin with the youth of a community and radiate back out. There are so many opportunities to learn, and there is so much to learn, that architecture now has the power to shape how and what learning is.

Through the application of a permeable architecture on a permeable education model I believe that a culture of lifelong learning can be achieved. Pairing these two qualities of built environment and learning model works well because it encourages and reaches out to both 'traditional students' and 'post-traditional' students, allowing the establishment of a lifelong learning culture in a community. This way new ideas are going out and being generated through every level of the community. The more educated individuals there are in a community , the more ideas will come into the built environment with the potential for creating a place where all community members gather to celebrate their mutual strengths. This recognition of ideas has the power to influence the future of a community.

| owner |

Independently owned in conjunction with Milwaukee Public School District.

| user groups |

The users of this building consist of two primary groups: 'Traditional' Students and Community Students. Additional users of the building will consist of, but are not limited to, educators, janitorial staff members, administrative staff members, targeted skills professionals, chefs, and facilities management supervisors. The spaces utilized by these users will overlap and be mutually used.

'traditional' students

The 'Traditional' Student user group consists of youth in grades 9-12 (roughly 400-600 students). The students enrolled have a strong desire to create habits for lifelong learning through hands on education that targets skills needed outside of the classroom. They occupy the building primarily from 8am-3pm throughout the year. They have full access to the classrooms, labs and community space while attending school.

community students

The Community Student user group consists of youth and adults in the community who have a desire to learn. There is access to community space throughout the entire year with targeted programs held during the evenings and weekends.

major project elements

| educational spaces |

- classrooms
- offices
- breakout spaces
- social commons
- cafeteria
- health services

These consist of spaces utilized primarily by the 'Traditional' Student user group as well as any other traditional academic occupant. These spaces are utilized primarily 8am-3pm during the year with some use by the community outside of those hours.

| shared spaces |

- culinary lab
- finance lab
- health lab
- media center
- community garden
- auditorium
- gymnasium
- green roof

These are educational spaces to be utilized by all occupants regardless of their primary connection to the facility. Use of these spaces are prioritized by each user group at different times of day and throughout the year. They consist of shared spaces aimed at bridging the gap between user groups.

| community spaces |

- classrooms
- social commons
- breakout spaces
- cafe
- offices

These are social community spaces targeted at the Community Student user group. These spaces are open to all users year round

user/spacial analysis-weekday

| educational spaces |

- traditional students
- community students

6-7-8-9-10-11-12-1-2-3-4-5-6-7-8-9-10



| shared spaces |

- traditional students
- community students



| community spaces |

- traditional students
- community students



figure 1: user/spacial analysis-weekday

user/spacial analysis-weekend

| educational spaces |

- traditional students
- community students

6-7-8-9-10-11-12-1-2-3-4-5-6-7-8-9-10



| shared spaces |

- traditional students
- community students



| community spaces |

- traditional students
- community students



figure 2.0 user/spacial analysis-weekend

| key |

- no access
- low use
- high use



figure 3.0:
Midwest
Milwaukee
Wisconsin

| region |

Located in the Great Lakes Region, Wisconsin is located in the upper Midwest of the United States. Wisconsin is bordered by Minnesota to the west, Iowa and Illinois to the south, Michigan to the north and Lake Michigan to the east.

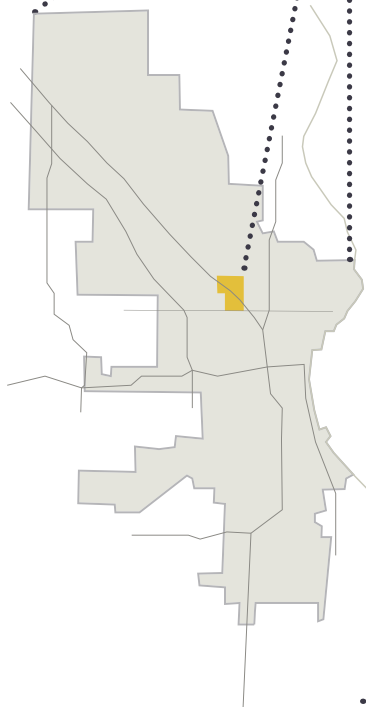
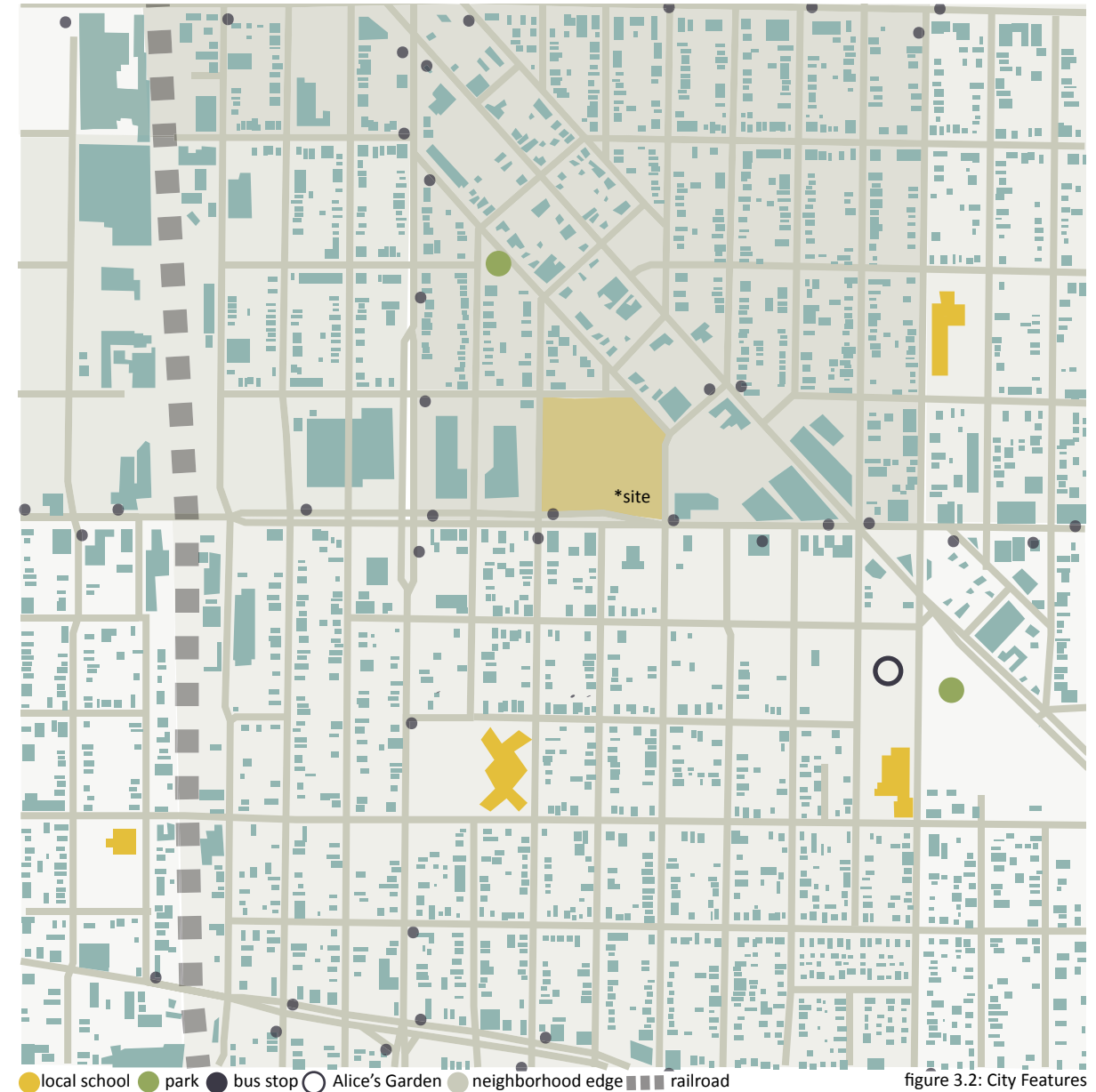


figure 3.1:
Milwaukee
County

| city |

The site is located in Milwaukee, WI within Milwaukee County. Located on the southwest shore of Lake Michigan, Milwaukee is the largest city in the state with an area of 96.1 square miles and an estimated population of 594,833 according to the latest U.S. Census. Milwaukee rose from the settlement of Native American tribes as a trading post. Today, the city is a major Great Lakes Port traditionally known for manufacturing and breweries. In recent years the city has become “a primary cultural and entertainment center of the upper Midwest after years of downturn” (“Milwaukee: Introduction,” 2009).



● local school ● park ● bus stop ○ Alice's Garden ● neighborhood edge ■ railroad

figure 3.2: City Features

| site information |

address: W. North Ave. and N. 25th St.
Milwaukee, WI

neighborhood: Park West Neighborhood

site area: 350,000 sq ft (8 acres)

boundaries: The site is bounded primarily by two family residential areas to north and south with local businesses to the east and west. North Street to the south has heavy to medium traffic flow while all other bounding streets have low traffic.

zoning: Vacant Land- Planned Development

| importance |

The importance of this site comes from its location within the city. Many north families send their children to schools on the south side because they believe those schools are better. By creating a school on north side that appeals to all types of students, we can keep youth at schools within their own neighborhoods. This site provides an opportunity to target many local residents because it lies within a quarter mile of five different neighborhoods. With that, this site has the potential to bring together these and other neighborhoods as a center of the community. The location near primarily residential areas allows for ease of access by residents, while the nearby places of worship offer opportunities for partnership.



figure 3.3: Site (see references)



north

figure 4.0: North of Site



east

figure 4.1: East of Site



figure 4.4: Hopewell Missionary Baptist Church



figure 4.5: Residence

figure 3.4:
Hopewell Missionary Baptist Church sits adjacent to the northwest corner of the site. It is an example of rich local character.

figure 3.5
A residential area to the north of site. Representative of the low character and quality of nearby homes.



south

figure 4.2: South of Site



west

figure 4.3: West of Site

figure 3.6:
Sidewalk on south side of site. Rundown, not taken care of but used by passersby

figure 3.7:
N. 24th Pl. runs north/south through the site. It is a barricaded, unused street that is not well kept.



figure 4.6: Sidewalk



figure 4.7: N. 24th Pl.

This thesis seeks to explore the relationship that architecture has on the ability to engage all members of a community in lifelong learning through the use of permeable architecture in educational spaces. The project will focus on creating spaces that recognize the importance of 'place' and engage learners in a meaningful way in order to create a culture of lifelong learning. Emphasis will be placed on understanding the use of adaptable architecture, student driven learning and community connectivity.

| research direction |

Research for this thesis project will be performed throughout the entire thesis process. Research will be more extensive early on in order to gain greater understanding of the project typology, historical context, proposed theoretical premise/unifying idea, program requirements and site analysis. Resources to be used include books, periodicals, online journals, case studies of existing buildings and interviews with local professionals.

| design methodology |

Throughout the research and design process I will utilize a mixed method approach. This methodology includes the analysis of quantitative and qualitative research and will be conducted by using a concurrent transformative strategy of research. Priority will be given to information based on the requirements of the theoretical premise/unifying idea. The quantitative data will be gathered through interpretation of found statistics and scientific data. The qualitative data will be gathered through direct observation, personal interviews and archival search. The process of analyzing, interpreting, and reporting of results will occur throughout the research and will be presented through text and graphics.

| design documentation |

Documentation of the research and design process will be performed continuously throughout the academic year through biweekly archival scans of produced work. Documentation will be assembled and made available for others through access to the institutional repository.

plan for proceeding cont.

task	work days	dates
project documentation	124 days	1.12.14-5.16.14
context analysis	20 days	1.12.14-2.01.14
conceptual analysis	28 days	1.12.14-2.08.14
ECS passive analysis	13 days	1.19.14-2.01.14
ECS active analysis	13 days	1.26.14-2.08.14
digital model development	83 days	1.12.14-4.05.14
structural development	13 days	2.02.14-2.15.14
floor plan development	34 days	1.12.14-2.15.14
section development	20 days	2.02.14-2.22.14
envelope development	27 days	1.26.14-2.22.14
materials development	34 days	2.02.14-3.08.14
structural re-development	23 days	2.16.14-3.08.14
midterm reviews	7 days	3.09.14-3.15.14
project revisions	13 days	3.09.14-3.22.14
rendering/artistic	20 days	3.23.14-4.12.14
preparation for presentations	34 days	3.23.14-4.26.14
presentation layout	23 days	3.30.14-4.22.14
CD of boards to thesis advisor	1 day	4.22.14
plotting and model building or video	13 days	4.13.14-4.26.14
exhibits installed on 5th floor	1 day	4.27.14
thesis exhibit	20 days	4.28.14-5.17.14
final thesis reviews	8 days	5.01.14-5.09.14
final thesis document due	1 day	5.16.14
commencement	1 day	5.17.14

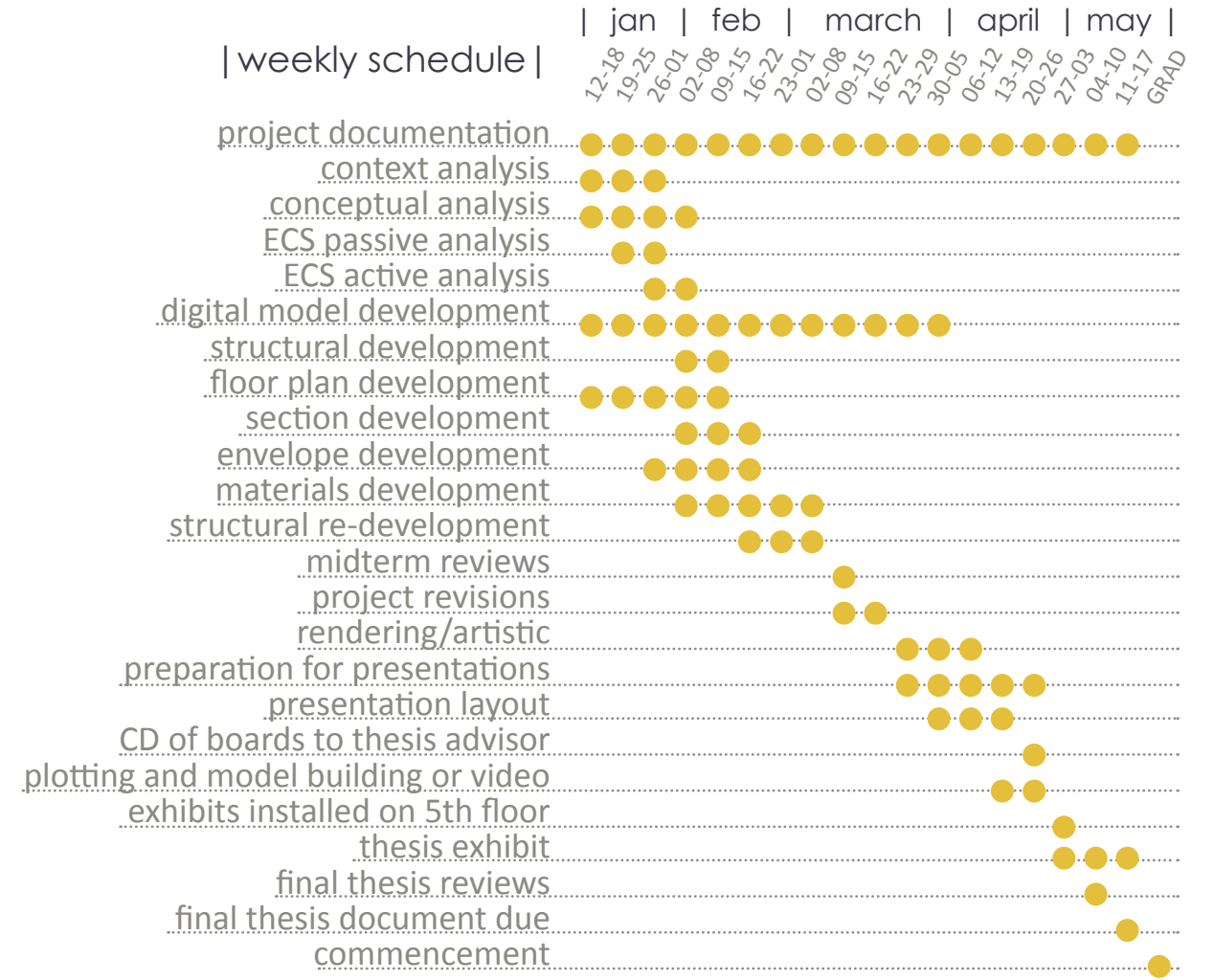


figure 5.0: Plan for Proceeding

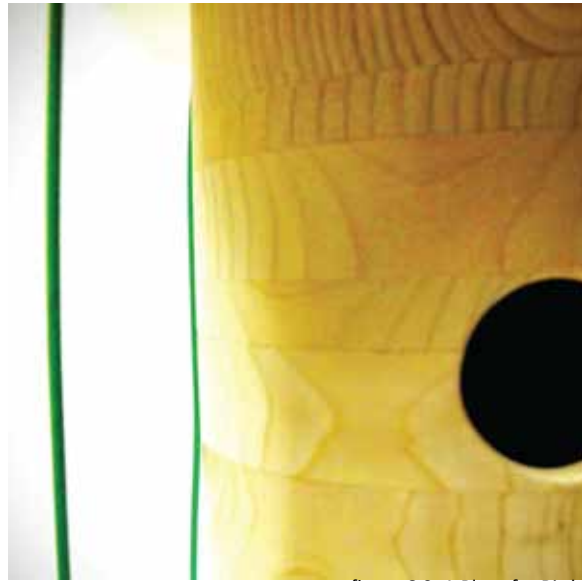


figure 6.0: A Place for Birds

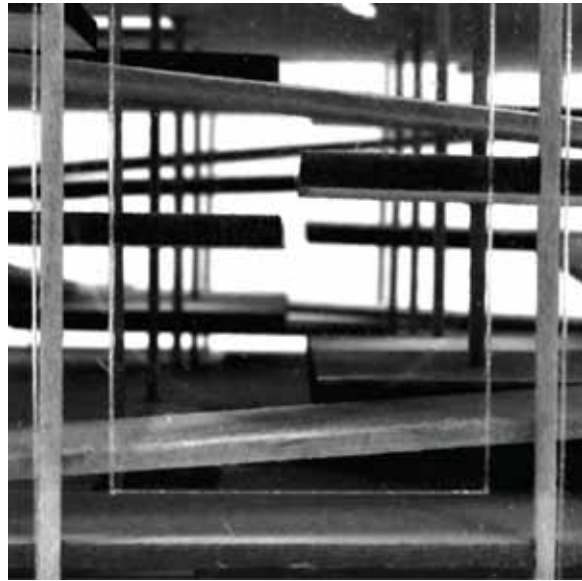


figure 6.1: City Museum



figure 6.2: High Rise



figure 6.3: #Whyfargo

| fall 2010 |

Instructor: Darryl Booker
Tea House
Minneapolis Rowing Club

| spring 2011 |

Instructor: Darryl Booker
A Place for Birds
Dwelling

| fall 2011 |

Instructor: Mike Christenson
Fargo City Museum

| spring 2012 |

Instructor: Rhet Fiskness
Presidential Library
University of Mary Art School

| fall 2012 |

Instructor: Cindy Urness
High Rise

| spring 2013 |

Instructor: Don Faulkner/Frank Kratky
Master Plan for Ghana
#WHYFARGO installation

| fall 2013 |

Instructor: Mark Barnhouse
A Wetlands Research Laboratory

..... | program |

*“Education is the most powerful weapon
which you can use to change the world.”*

-Nelson Mandela

..... | unifying idea research |

.....
“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.”

-Alvin Toffler

The inherent goal of this thesis project is to examine the impact that architecture has on the people and ideas of a community. As such, this thesis seeks to understand the physical and social impact of place in terms of permeability and learning. Research will be conducted to understand how our understanding of place impacts permeability in both the built and intellectual environments.

SCHOOL + PLACE

The physical end product of this thesis is, ideally, the creation of a built learning environment. Since this project deals in the hypothetical we must ask ourselves what it means to be an environment for learning. Many recognize this to be a school, but the question becomes: how do people understand a building to be a school and once recognized what does a school mean to them? For the purpose of understanding this question in the context of this thesis we will only look how school buildings in the United States developed. To begin to understand how society understands the idea of school we must go back to the beginning to examine the school as a symbol. This process begins with the romanticized image of the single room school house. When people picture 'school,' many imagine the little white, or often red, country school house with a bell and cupola where students of all ages sat in rows facing a teacher and blackboard up front. The school was the central focus of the community, where children not only went to

learn but where town meetings and picnics were held. Schools were gathering places that represented identity, tradition and the future. There is a reason it was referred to as the school *house* because it was like a home.



figure 7.0: school house
(see references)



figure 7.1: school building
(see references)

Somewhere along the way this image changed. Schools became more like factories where efficiency ruled and students came in like drones to download information and spit it back out through standardized tests. Schools were not a destination for gathering or even learning, they were a requirement that students passively sat through on their way towards 'the real world.' There is a shift occurring in how schools today are understood. The community is being brought back as the focus of these places and spaces are being created where communities can

hold gatherings to celebrate each others' accomplishments.

This shift begins to address the question of place and the role that a building plays within a community. If we look to understand a building's role in a community we must first ask how we identify a building for what it is and for its role in the community. Do we understand a building for what it is based on its exterior, or by what occurs on the interior of the building? I will venture to say that most buildings in general are defined by what occurs on the interior. This is most certainly true for philosopher Martin Heidegger. For him the answer to these questions is found in human emotion and experiences. Heidegger found human emotion and experience to be "crucial to human identifications of place" and that technology disrupted our ability to connect with a place. (Sharr, 2007) Heidegger proposes an interesting element here in relation to the discussion of 'school' and 'place.' Over the years the ideal image of a school has changed depending on the values of society at that time, but have these images ever accurately reflected what occurs on the inside of the building in terms of learning? If we recognize a school as a place where learning occurs, where occupants grow intellectually and personally through experience and attachment, as described by Heidegger above, then shouldn't the exterior of the building do the same? A building's exterior should reflect its interior, especially in a project that aims to be an icon for learning in a community.

"For Heidegger, building was less about abstract objects than located individuals. And the form of a building could report the ethos of those individuals. Its details could read for their aspirations and ideals. Moreover, the figure of a building dealt in presences and absences; as well as demonstrating the presence of an inhabitant, it could also show their absence" (Sharr, 2007).

By recognizing that design is more about what happens inside the building and what the people who come to the building are doing than the actual building, we can create educational architecture that exudes the same symbolism as the traditional school house. Architecture has the power to engage and shape the lives of the people who experience it, but in the end the success of a built environment comes down to the influence of the people. We must, as architects, look to them for ways to build in accordance with everyday life and their presence and absences in the buildings we design.

LEARNING + PLACE

We have identified traits of learning environments and have begun to understand how they are recognized and what they mean in terms of place in a community. Now we must examine how that understanding impacts how and what we learn. What impact does place have

on lifelong learning? *“Lifelong learning is intentional, purposeful learning that people engage in throughout their lives to gain personal fulfillment and improve the quality of their lives” (as cited in Dunlap, 2005)*. excited about learning again. It stresses the need for learning on any level in any situation and has the ability to change conditions on a personal and local level. If this is so, then the importance of place comes into play in that the space must create meaningful experiences that people can learn from and be engaged with. We must look to place as one form of teacher in learning environments, for we have the ability to learn in every aspect of life, not just in the traditional classroom.

“Enabling and encouraging formal access to education or training, at any level, is important, but it is only a first step. Real permeability must enable learners to transfer and build on all types of their prior learning – formal, non-formal or informal – wherever that learning took place, at school, work or during leisure” (European Centre for the Development of Vocational Training (Cedefop), 2010).

This ability to learn from place and experience is especially vital in today’s world when the world is changing every day. Every second a new technology is being created and every day a new job is created that did not exist five or ten years ago. This is why it is important to recognize that *“learning involves using*

all of your mind and body, engaging your thoughts and feelings. Arguably, learning is the most important of all human activities and learning to learn more effectively is the key skill of this century” (Lucas, 2005). Alvin Toffler supports this idea in stating that *“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.” Lifelong learners are able to learn and adapt because they reflect on the quality of their understanding and seek to go beyond what they know” (as cited in Dunlap, 2005).* Toffler’s description of the future appears to be rather accurate. How are people supposed to ready themselves for this kind of world if they are not adaptable learners or even willing to learn new things? By creating a place where flexibility is emphasized, not only on a physical level but on an intellectual one as well, this ability to “learn, unlearn, and relearn” will become instilled in the students and will better prepare them for the future.



figure 7.2: learn, unlearn, relearn

The ever-changing process and opinions on learning direct us to a discussion on learning and place in terms of the ever-changing

experiences of those who occupy a building. *“Building on the insights of Dewey and Piaget, Kolb considers that knowledge is ‘created through the transformation of experience’ (Kolb 1984), and that experience is a strong organizing focus for learning. Learning and the acquisition of knowledge are, therefore, better seen in terms of processes rather than outcomes” (Portelli & Fildes, 2009).* If we can conclude and accept that learning indeed comes in many forms and develops especially through experience as Kolb described above, then it is reasonable for us to conclude that learning, place and permeability should go hand in hand. We must create dynamic spaces that encourage a place attachment to create experiences around that we can learn from. In “Place and Identity for Children in Classrooms and School”, Ellis states that *“Place evolves, and Thus, the classroom as a place isn’t just the walls and furniture, but rather the whole experience that results from the way people inhabit it, and how they inhabit it is influenced by identities they have already created in other places” (ELLIS, 2005).* With this description of the classroom we can begin to see the role that permeability plays in our learning environments, both physically and intellectually.

PERMEABILITY + PLACE

If the end physical result of this project is a building for learning, then the end theoretical result is to understand what it means to be permeable in both a physical and an intellectual manner. So then, what

does it mean to be permeable and what does it look like? The word permeability initially conjures up ideas of fabric or other porous material that allows liquids to pass through. Think of a drop of water slowly spreading out through each fiber of a material. It conjures up discussions of cell walls in biology class where liquids are able to easily pass in and out of the body of the cell. The dictionary defines permeability as the ability *“to pass into or through every part of,” “to penetrate through the pores, interstices, etc., of” and “to be diffused through; pervade; saturate”* (Online Etymology Dictionary, 2013). By looking at this definition we can begin to understand the role that permeability plays in this thesis project. It is reasonably evident that when you break down the idea of permeability that an essential part of the term resides in the ability to move through a barrier.

Permeability plays a vital role in this thesis in two distinct and connected ways: in terms of the physical and the figurative movement through a barrier. When we apply this understanding to the physical world of architecture the concept becomes one of physical barriers and the portals used to move through them. In this context, one instinctively understands the word barrier to mean ‘wall,’ an object that one must move through by means of a portal, i.e. door, opening, etc. However this can also apply to visual permeability and one’s ability to see through a barrier. It is very important to distinguish between the two, for both

accomplish very different things in terms of connection to place and our ability to learn from said place.



figure 7.3: movement (see references)

Earlier the ever-changing quality of placeness was discussed in terms of learning. The same can be said in terms of the physical movement that occurs when one passes through a building. The need for an ever-changing placeness in a building for learning leads us to address the ever-changing movement that occurs throughout a building. How does this movement impact people's interaction with their surroundings and their attachment to that space? A person who moves rapidly through a space will not develop a place relationship with it. Tanner suggests that *"movement within the school should not consist of a progression of individual experiences but instead be a conscious and perceptible environmental exchange...Movement within a school may be an important supporter of learning"* (Tanner, 2008). Tanner's words support the idea that people learn in a variety of environments and that the building can act as a teacher.

Another application of permeability in the physical sense is in the way in which *"permeability is also being applied to education and training systems. The idea is for learners to be able to move easily between different types of education, (such as academic and vocational) and between different levels (such as upper secondary, or apprenticeship, up to higher education), as they decide"* (European Centre for the Development of Vocational Training (Cedefop), 2010). Here the author describes a need for both a physical and intellectual permeability in educational architecture, something that gives students the ability to move freely physically as well as intellectually.

While there is need to discuss the physical permeability of a building, the concept can be stretched beyond the physical movement from one space to another. Permeability can also be applied in the figurative measure of the five senses: sight, sound, taste, touch and smell. This is the form of permeability I seek to explore in the context of this thesis-permeability in terms of the passage of experience and how architecture can facilitate that through movement and creation of place. In his book *Space and Place*, Tuan regards that *"experience thus implies the ability to learn from what one has undergone. To experience is to learn; it means acting on the given and creating out of the given. The given cannot be known in itself. What can be known is a reality that is a construct of experience, a creation of*

feeling and thought" (Tuan, 1977). Based on this understanding of experience, the ideas of permeable experience must fall in the creation of place and the ability to connect to a space in a way that creates meaning.

"To experience is to learn."

A permeable building not only seeks to be so physically but also in acknowledgement of human presence both physically and intellectually. In reality the two are dependent on each other. Let us revisit Heidegger's concept of the built environment discussed earlier. *"To [Heidegger], building located human existence. He believed that building was set out around human presence, configures by it but also configuring the activities of that presence over time. At best, structure was built by its inhabitants according to their needs and then configured and reconfigured through the ways in which they dwelt. The inhabitants' lives, in turn, were configured by the building. To him, the very fact of a building also stood for human presence"* (Sharr, 2007). Here Sharr notes Heidegger's belief that the built environment is shaped by the physical presence of people but also that people are shaped by the presence of the building through their experiences within it. If we acknowledge this then we can begin to understand how physical and intellectual permeability depend on each other. The creation of physically permeable spaces supports the movement of ideas across physical and mental boundaries.

This concept is reinforced when we consider the movement from inside to outside and vice versa. *"Consider the sense of an 'inside' and on 'outside,' of intimacy and exposure, of private life and public space. People everywhere recognize these distinctions but the awareness may be quite vague. Constructed form has the power to heighten the awareness and accentuate, as it were, the difference in emotional temperature between 'inside' and 'outside'"* (Tuan, 1977). How does this idea of inside and outside apply to permeable architecture? No matter what side someone is on, there is always another side to be perceived better or worse. With permeable architecture the boundary between 'inside and outside' becomes less clear as to where one starts and the other ends. What does it mean to be in and out in terms of educational spaces and permeability? In terms of education, my mind immediately goes to the school setting stereotypes where some people are 'in' and others are 'out.' Does this analogy translate into architecture as well? Do certain types of buildings cater to 'the in crowd' and repel the 'outsiders'? I believe this can be the case in many buildings. We feel like we can not enter this building or that building because of X, Y, Z-be it security, social or physical reasons. Certain buildings cater to a specific crowd and seek to keep out others. This concept is very important to this thesis, for the project seeks to be a place where everyone is welcome and where everyone can have the opportunity to learn. This is accomplished through the use of permeability by making

a space a place where everyone is 'in.' A question that comes from this, that I cannot begin to answer, is can applying this model in a school setting relieve our culture of those 'in' and 'out' stereotypes we have been plagued with?

How does this discussion of inside and outside impact our understanding of boundaries in terms of permeability in a built environment? Heidegger expressed that space is understood *"as the context within which we're able to identify boundaries around places,"* and thus *"places are made particular by individuals-in complex and ever shifting ways-within the generality of space."* For Heidegger this point was crucial in a persons ability to understand the world around them-especially the built world. *"In his scheme, when we identify a place..... we do so by putting a boundary around it in our mind. It is as if we lasso a somewhere out of the generic nowhere of space. in Heidegger's model, the edges of the places we define are more likely to be precise if they align with physical boundaries.however there are some boundaries that it's less easy to be exact about"* (Sharr, 2007). In a permeable environment, as mentioned above, boundaries still exist because our human nature is to set up boundaries and limits for ourselves. However, they are just more blurred and pliable, they are receptive to stretching and straining as new needs develop. They exist in both physical and relative states of mental boundaries, social boundaries and physical boundaries. Can we

utilize physical and intellectual permeability to pass through or break through all of these forms of barriers that we create?

By looking at the elements of the built environment, learning and permeability in terms of place we can begin to see how they connect throughout this thesis. Our ability to move through physical and intellectual barriers depends on how we relate to and identify the boundary in which we aim to pass through. Edward Casey said it well when he said, *"The more we reflect on place, however, the more we recognize it to be something not merely characterizable but actually experienced in qualitative terms"* (Casey, 1997).

Through the above research, as well as undocumented research, an understanding of the impact that architecture has on the people and ideas of a community is achieved. As such, the previous research examines the physical and social impact of place in terms of permeability and learning. In pursuit of this understanding, the research revealed three distinct areas: how we understand the idea of a 'leaning space', the impact of place on lifelong learning, as well as what it means to be permeable in both a physical and intellectual manner.

Understanding how people have identified learning environments (from a one roomed school house that was the center of a community to the factory like setting of efficiency in later years), it becomes clear that how we experience a building and what is going on in society influences how that building is understood for what it is. A shift back towards community centered learning is returning and only positive repercussions can come from this, for there is more value in what we learn when we learn from that which surrounds us, be it people or place.

In creating a better understanding of place and learning environments it became evident that a greater understanding on the impact of place on the act of life long learning was necessary in order to continue. In today's world it is essential that every moment be viewed as an opportunity to learn something. Learning does not only take place in a one roomed school house any more but rather

in any place and any time, whether one seeks to learn or not. We must recognize place as a form of teacher in our everyday lives. By recognizing the vast number of opportunities to learn, society will be more open to *'learn, unlearn, and relearn'* and thus more equipped for the rapidly changing world outside the classroom.

The ability to recognize these opportunities in everyday life is possible in part to the ability to move through the physical and intellectual barriers created by society. Our ability to move through physical and intellectual barriers depends on how we relate to and identify the boundary in which we aim to pass through. By recognizing that permeability exist in both physical and intellectual forms, we are better equipped to move through the barriers created. This movement if vital for our ability to grasp a greater sense of the world because it allows us to accept knowledge from new experiences and new people.

The research for this thesis demonstrates the necessity for identification of place and permeability in our learning environments. in a world where there are opportunities to learn all around us we must seize those opportunities in order to create a culture of life long learners in our communities. The people and places in our communities shape who we become and what we do in this world, shouldn't they be an integral part in our formal education system as well?

..... | typological research |

“A school is something that comes about as a result of the passion, vision, and dedication of a few extraordinary people.”

.....
— Guy Comer, President, Comer Science and Education Foundation



figure 8.0: Gary Comer Collegiate Academy (see references)

| Gary Comer Collegiate Academy |

architect	John Ronan Architects
location	Chicago, IL, USA
typology	College Prep School
size	45,000 square feet
year completed	2010
major program elements	School Main Entry Administrative Offices General Classrooms Lecture Hall Literature Classroom Science Classroom Youth Center (associated) Educational Garden (associated)

| research findings |

The Gary Comer Collegiate Academy is the second component of a community complex in the south side of Chicago, IL inspired by the ideals of the late Gary Comer. The Gary Comer Youth Center opened in May of 2006 with the mission “to provide the support for all of its students to graduate from high school, prepared to pursue college and careers” (The Noble Network of Charter Schools, 2013). Two years later in 2008 classes began in the youth center as part of Gary Comer College Prep, and in 2010 the building welcomed its first freshman class.

The combination of both a youth center on site and a high school is what made this an interesting study for this thesis. The two separate buildings respond to each other in form, material and daily use. The bright colors on both buildings bring life to the surroundings characterized by single family homes, vacant lots and abandoned buildings in need of repair.

Shared space is another key factor in this project, both buildings utilize shared spaces on a daily basis, such as the cafeteria, auditorium and gymnasium. Architect John Ronan says that “this sharing [of facilities] allows the newer building to be “lean,”.... The steel-frame and precast-concrete structure encloses about 45,000 square feet for a population that is expected to top out next fall at 600 students in grades 9 through 12, almost all from the South Side,” (Gonchar,

2013). The site becomes a beacon for learning in the community with these joint facilities.

The design is centrally focused with a core of support spaces surrounded by classrooms on either side. This organization allows for easy circulation and for visibility within the building. Comprised of two stories, this LEED Silver building also promotes environmental awareness and user comfort through the design decisions made throughout the building. The two stories of classrooms allow for all classrooms to receive light from two directions, on the exterior but also through interior light wells. The metal screen on the South West facade of the building serves dual purpose in the filtering of light but also in the filtering of views from the outside. The screen works to camouflage the students inside the building as a means to prevent them as being targets of drive by shootings, an unfortunate reality in their neighborhood.

An element of this project that I can incorporate into this thesis project is primarily the relationship of the two buildings to each other and to the community. The two buildings allow for movement between each other in space use and information while each being independent entities and symbols for education in the community. This plays into the building organization, a secondary element of this project to bring into this thesis.



figure 8.1: entry (see references)



figure 8.2: classroom (see references)



figure 8.3: Gary Comer Youth Center (see references)



figure 8.4: natural light (see references)

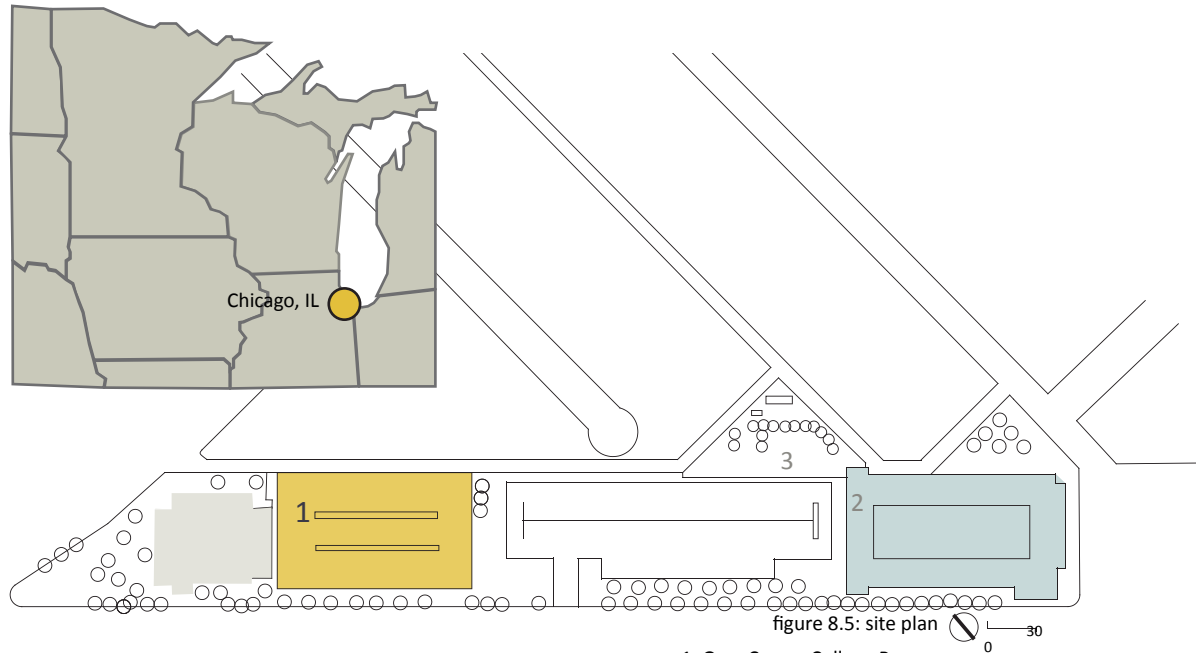


figure 8.5: site plan
 1. Gary Comer College Prep
 2. Gary Comer Youth Center
 3. Education garden

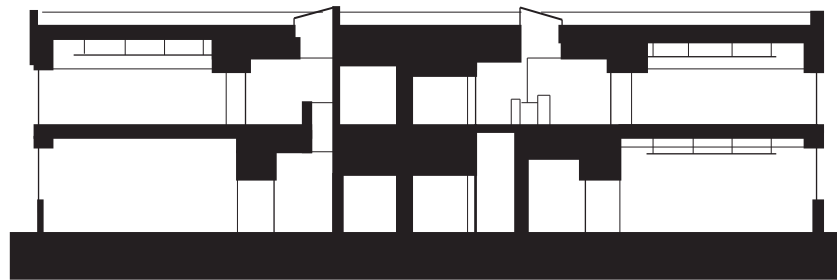


figure 8.6: section looking north

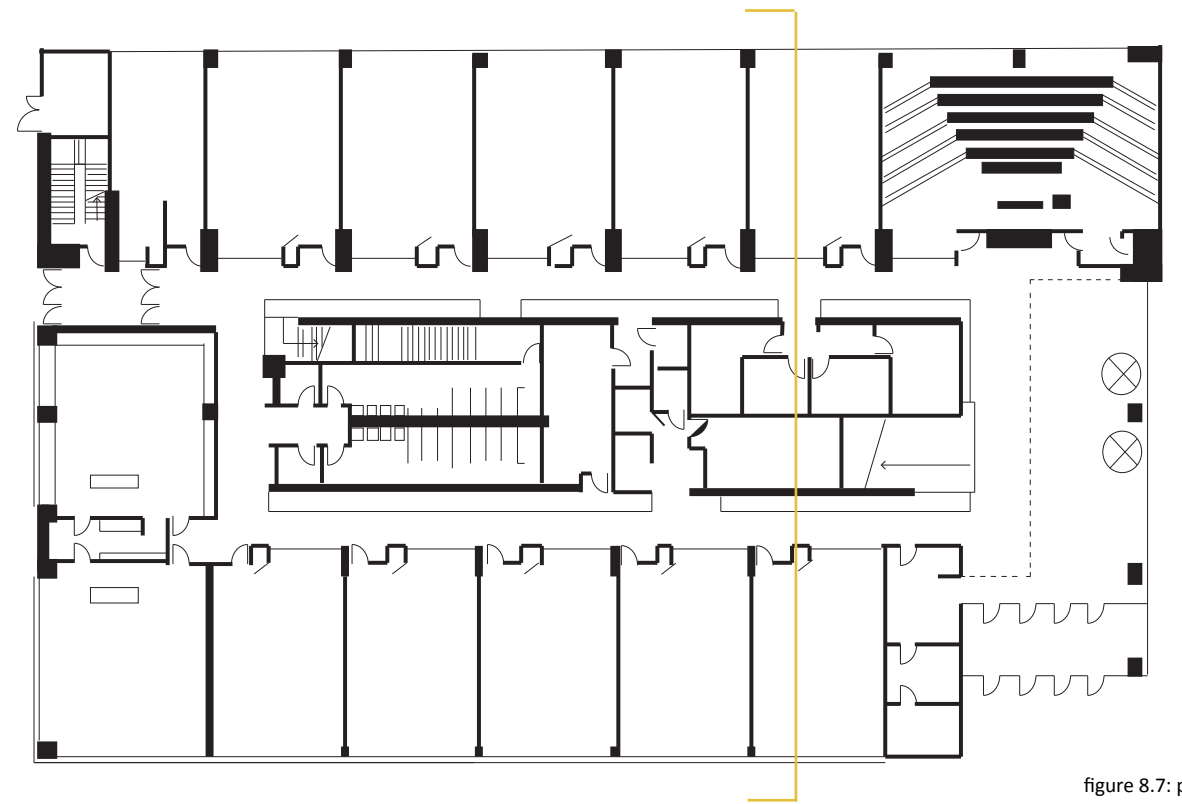


figure 8.7: plan

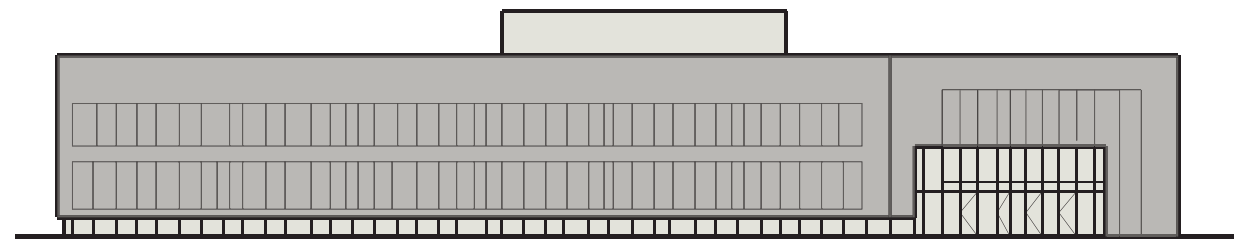


figure 8.8: south elevation

| geometry |

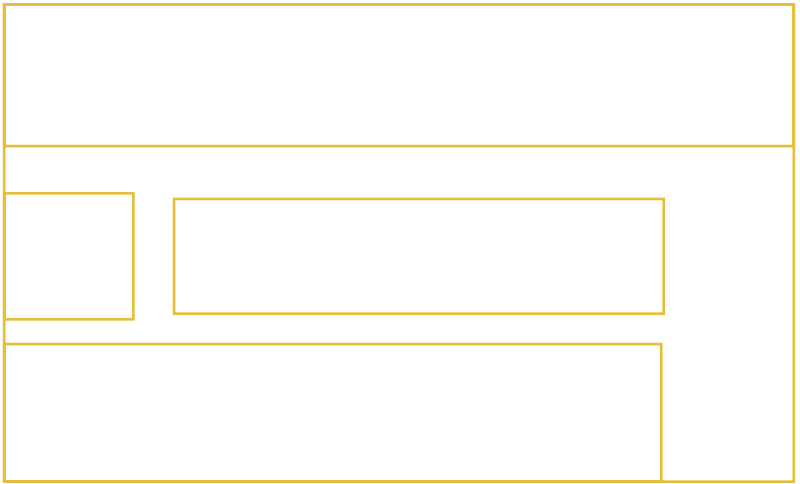


figure 8.9: geometry

| hierarchy |



figure 8.10: hierarchy

| structure |

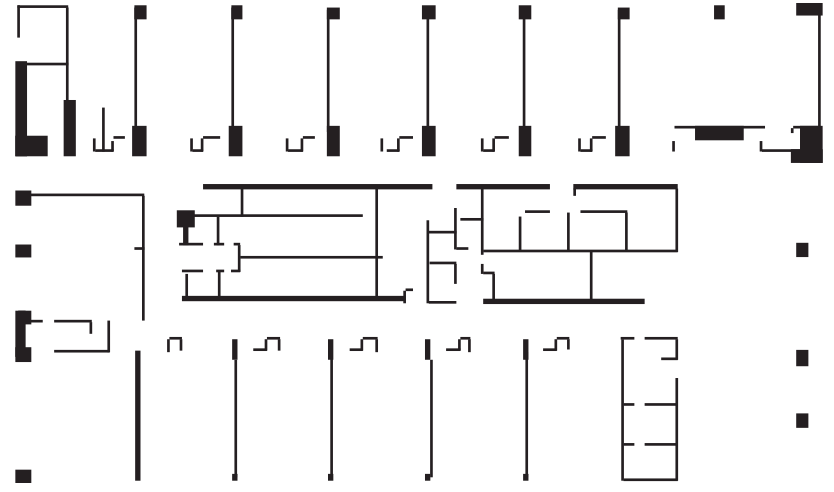


figure 8.11: structure

| circulation to space |

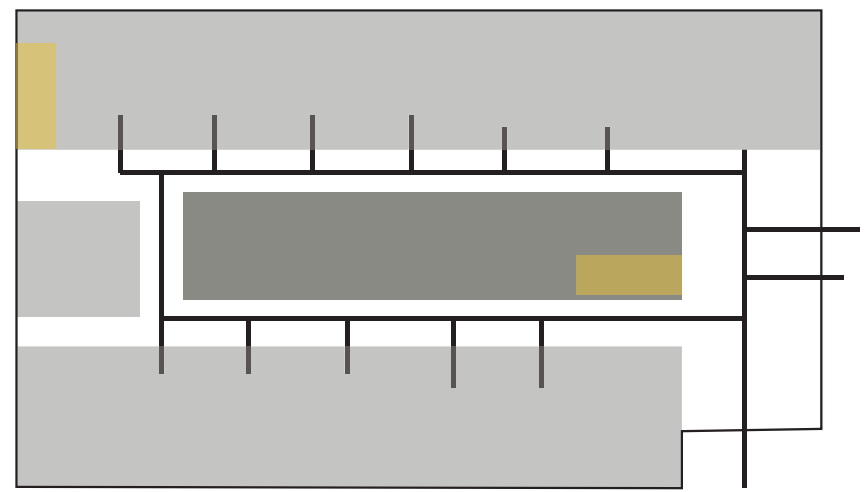


figure 8.12: circulation

| plan to section |

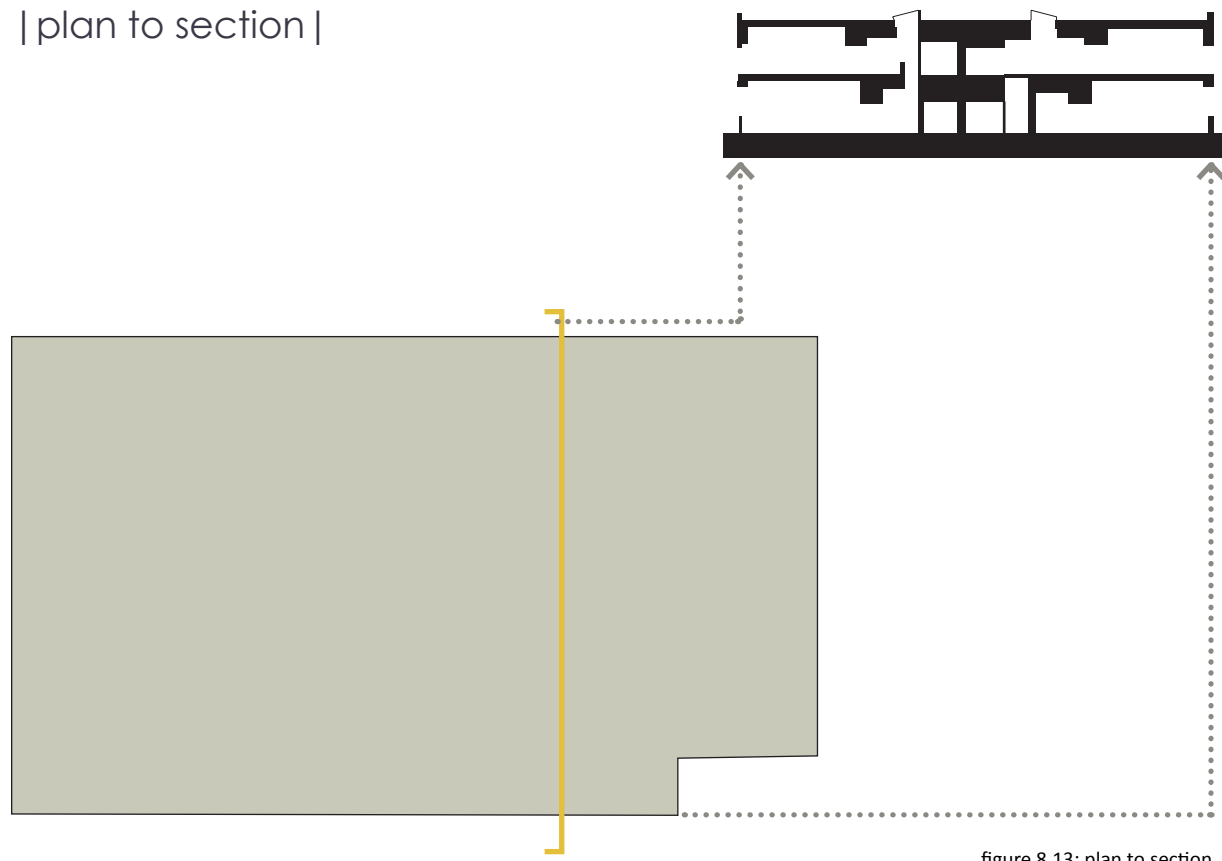


figure 8.13: plan to section

| natural light |

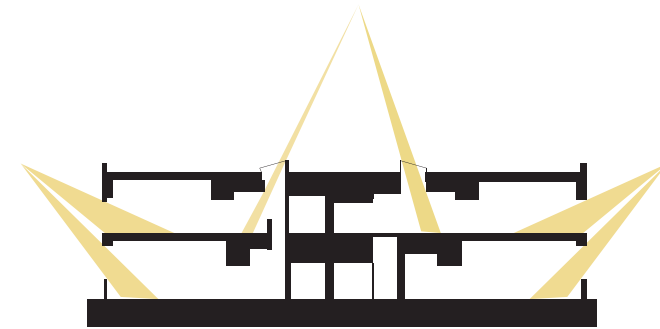


figure 8.14: natural light

| massing |



figure 8.15: massing



figure 9.0: Apollo School (see references)

| Apollo School |

- | architect | Herman Hertzberger
- | location | Amsterdam, Netherlands
- | typology | Primary School
- | year completed | 1983
- | major program elements |
 - General Classrooms
 - Central Atrium
 - Transitional Spaces

| research findings |

The Apollo School in Amsterdam is a two building Montessori school complex. The only function of this project is as a school, without a community-specific space, unlike the other two studies that are explored here. However, this does not mean that the school was designed without the community in mind. In fact, it was designed to a scale that fits the surrounding community and responds to community needs. Looking at the placement of the two buildings on the site it is evident that they compliment each other well, not only in form but in the spaces between buildings.

The functionalist-inspired building is centrally organized with an open atrium at its heart. The atrium allows for an abundance of natural light to be let into the primarily concrete and block worked building. On the main floor this central space boasts seating that serves multiple functions for the building and acts as a gathering space for the occupants. On the floors above are balconies hosting breakout spaces for students to use as they wish and connect with what is happening in the spaces below. This was very intentional on Hertzberger's part. In an interview, Hertzberger pointed out that this flexible space allows users to interpret the space as they wish, "[his] shapes and objects try to call up feelings and possibilities: similar to Montessori's idea of presenting materials" ("Apollo Montessori School," 2007).

This was a key aspect of all of Hertzberger's school designs and is especially evident in his Apollo School design. Hertzberger's "use of open plan layouts and incidental sitting and meeting places, allowed the children to use and interpret the spaces available within and around the building to their maximum extent" ("Herman Hertzberger -," 2012). This is a concept that will be important to bring into the design phase of this thesis. A space that intends to be permeable required the ability for spatial interpretation by the user.

The architect had many opinions on the design of schools for proper education, specifically how educational buildings posses polarizing dynamics in the desire for concentration and at the same time collaboration with peers. Hertzberger states that "modern education asks for a completely different type of space – more open and articulated so there are many places where people can do their work, not be distracted or look at a nice girl. At school I always wanted to do what the others were doing because I always thought what I was doing was dull. You are inspired by what others are doing" (McLachlan, 2012).

The key elements here that I wish to bring into the design phase of this thesis project are the values of flexible and interpretable spaces expressed by Hertzberger throughout the design. The creation of spaces where students and community members can interact will be crucial to my design.



figure 9.1: entry (see references)



figure 9.2: central atrium as auditorium (see references)



figure 9.3: entry two (see references)



figure 9.4: central atrium (see references)

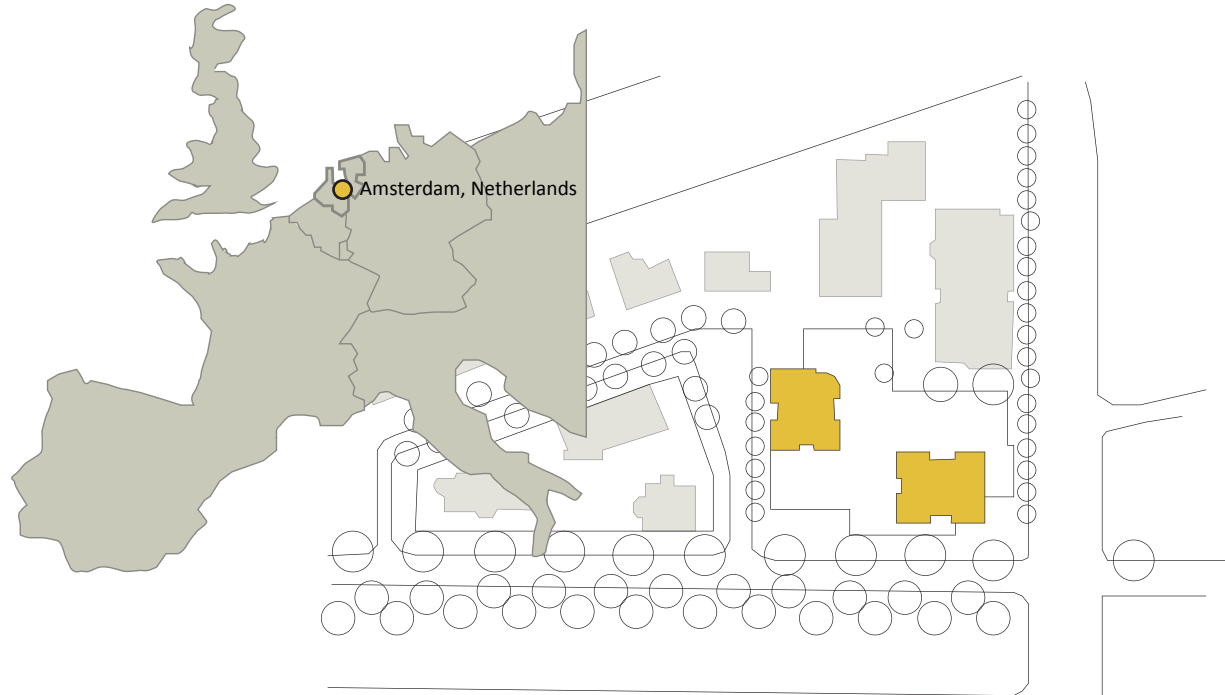


figure 9.5: site plan

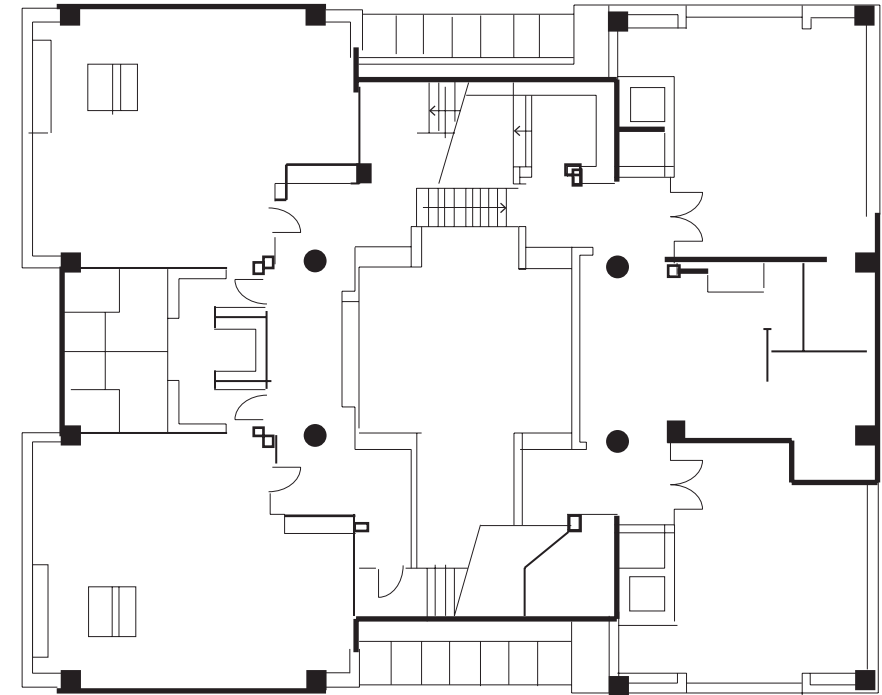


figure 9.7: 2nd floor plan

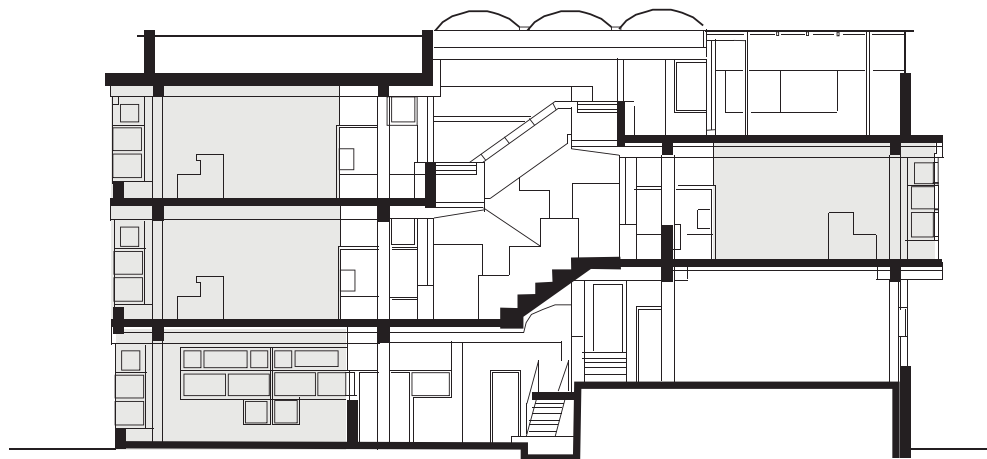


figure 9.6: section looking north

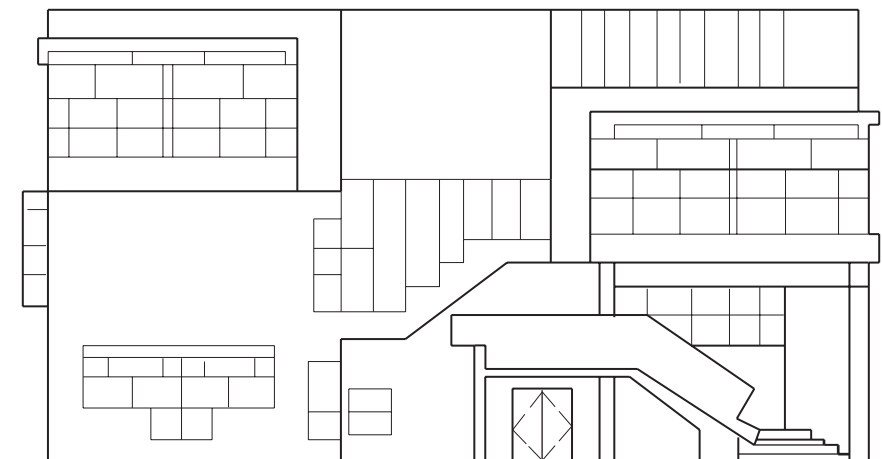


figure 9.8: north elevation

| geometry |

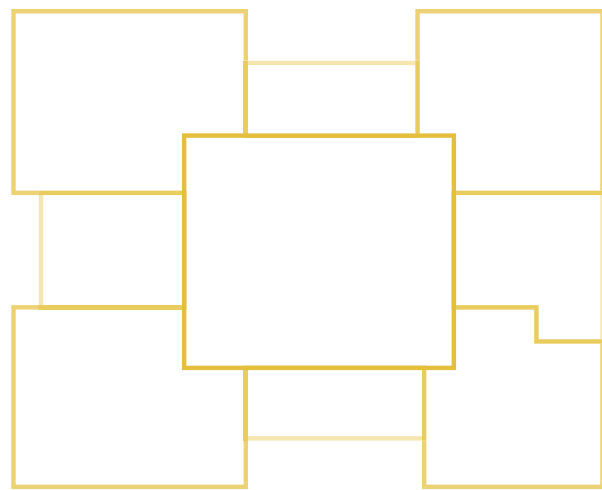


figure 9.9: geometry

| structure |

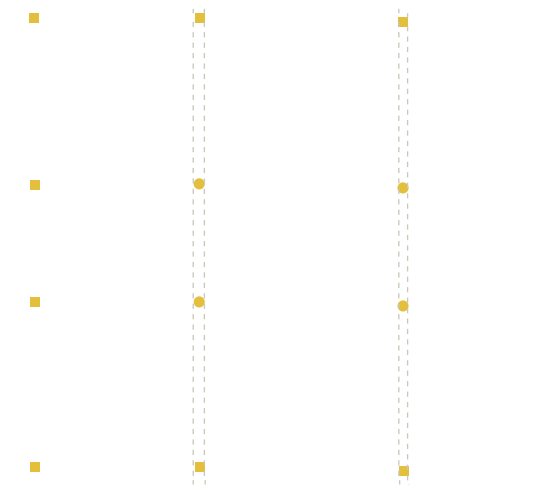


figure 9.11: structure

| hierarchy |



figure 9.10: hierarchy

| circulation to space |

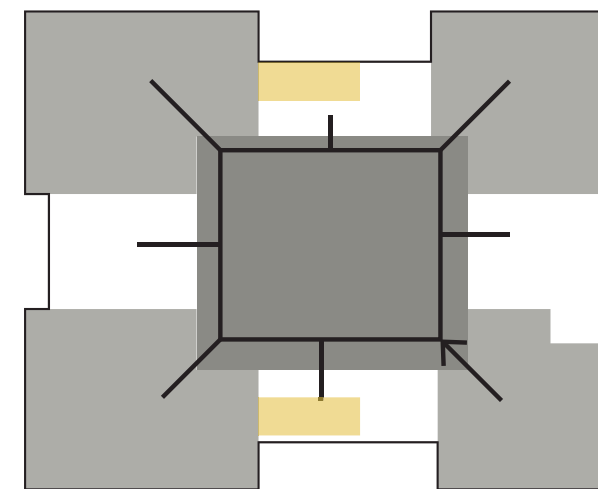


figure 9.12: circulation to space

| plan to section |

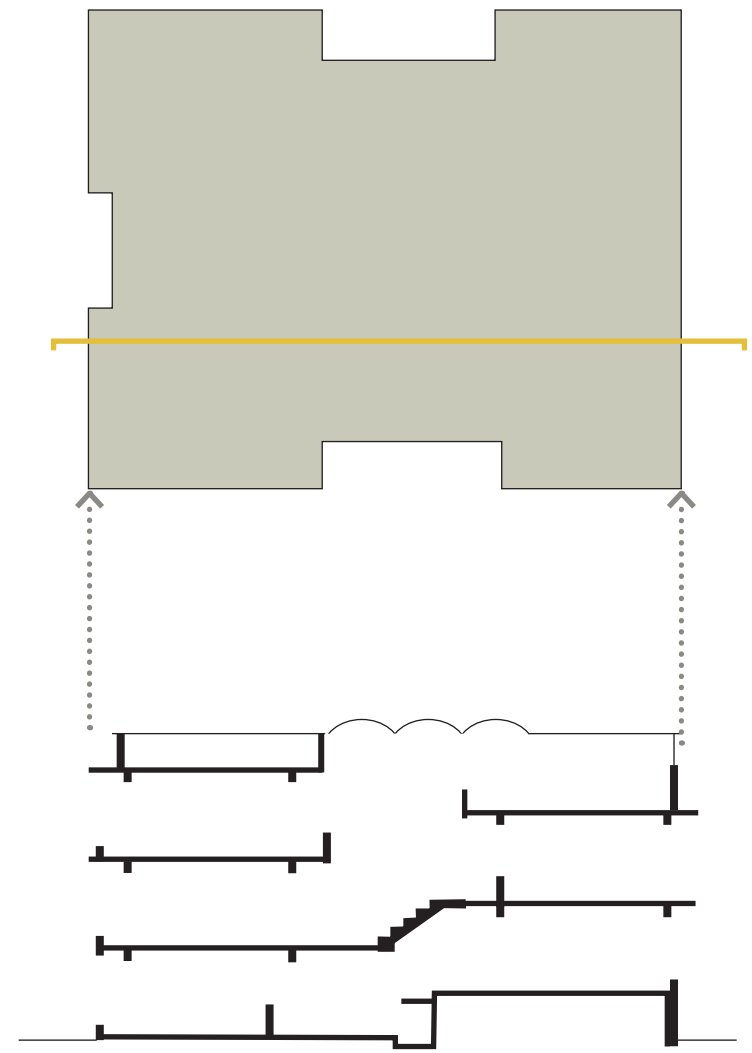


figure 9.13: plan to section

| natural light |

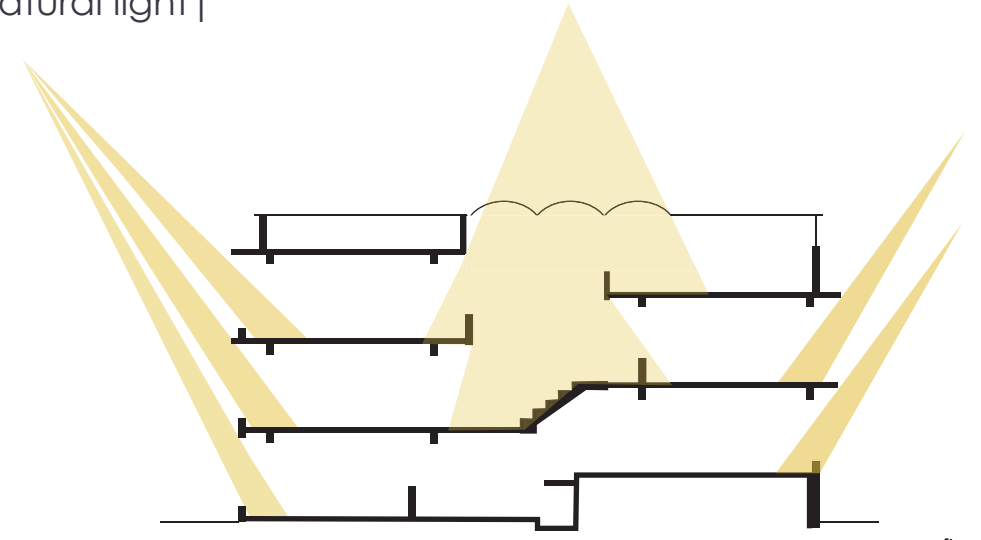


figure 9.14: natural light

| massing |

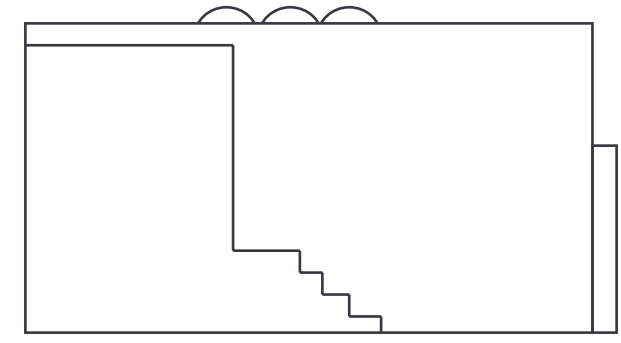


figure 9.15: massing



figure 10.0: Multifunctional Center de Boomgaard (see references)

| Multifunctional Center de Boomgaard |

| architect | Bastiaan Jongerius Architecten

| location | Zuidoostbeemster, Netherlands

| typology | Community Education Center

| size | 4,200 sqm

| year completed | 2009

| major program elements |
Community Center
Nursery
Gymnastics Club
School
Gymnasium
Classrooms
Commons

| research findings |

On the outskirts of Amsterdam lies the small gardeners village of Zuidoostbeemster, the home of the Multifunctional Center de Boomgaard. This village is set to experience rapid population growth in the next decade and is beginning to prepare through the construction of new community-oriented infrastructure. The center is comprised of both a school and a community center, much like the Gary Comer study presented earlier, except this project is located within one building complex. With all spaces under one roof many spaces, as well as interactions between occupants, become shared experiences where people look after each other. The center, commonly known in the village as “The Orchard” has been described as “a home for the entire community, from the toddler on the tree house to the card player in the Community Center” (“Multifunctional centre,” 2013).

A key element in the creation of these shared spaces is in the elegant and unique facade of the building. The transparent facade creates an interesting dynamic both inside and outside of the building. The facade “gives expression to [the] sense of community showing the public functions behind the transparent glass facades accessible for everyone” (“Multifunctional centre,” 2013). This sense of transparency is continued within the building as “sight lines between the different levels and different parts of the building stimulate contact and

meeting each other. The floorfields are different in height and thus strengthen the dynamics of the sight lines and the visibility of the floors themselves” (“Multifunctional centre,” 2013).

Being a single building, unlike the previous studies presented, this building is much larger and presents a much more unique form. Even so, the project possess several characteristics present in the other studies such as centralized circulation, stadium like seating in central social areas (Figure X) and varying interior heights utilizing balconies and sight lines to lower floors.

The key element of interest in this project comes from the unique facade and geometry. The facade is transparent at a micro level but from farther away views to the inside are protected. Compared to the heavy appearance of the Apollo School, this building appears to be very light and airy when set in its context. The manner in which the skin is developed is highly intriguing and worth further study as I also seek to create a facade that engages the passersby. In regards to form, the previous two studies possessed strong rectangular geometries in plan and elevation. This study breaks the mold and introduces exterior forms that reflect the changes in elevation on the interior. This reflection of the inside on the exterior is another element to examine and bring into the design of this thesis project.



figure 10.1: entry (see references)



figure 10.2: central commons (see references)



figure 10.3: skin (see references)



figure 10.4: gymnasium (see references)

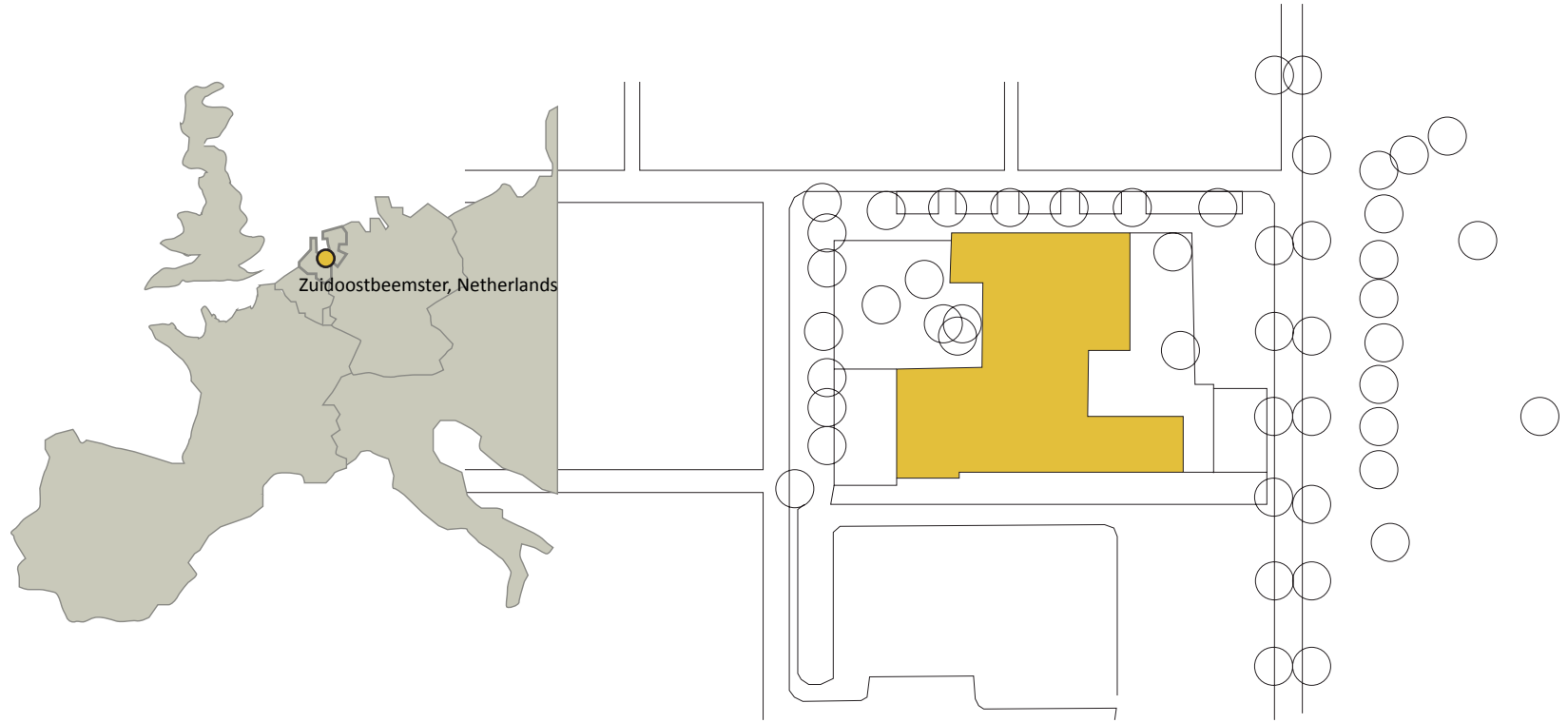


figure 10.5: site plan

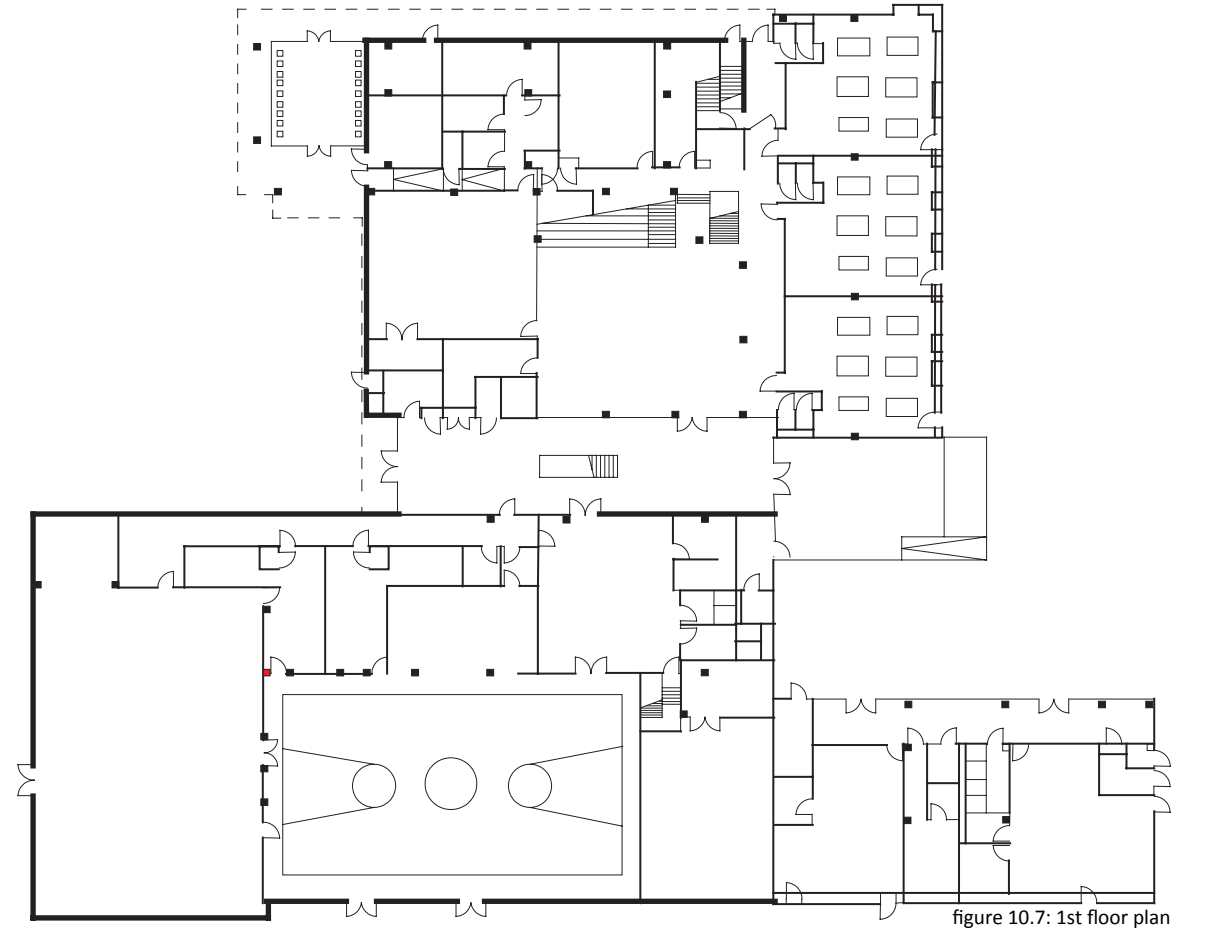


figure 10.7: 1st floor plan

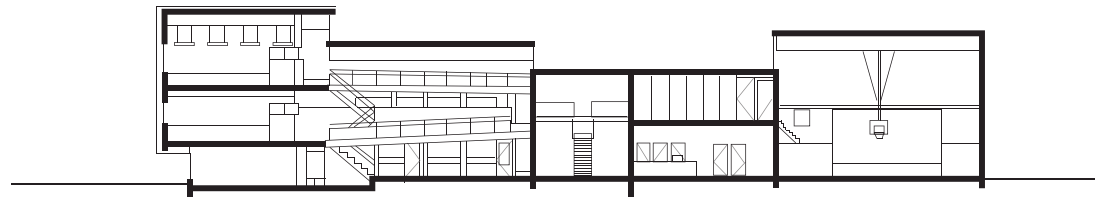


figure 10.6: section looking east

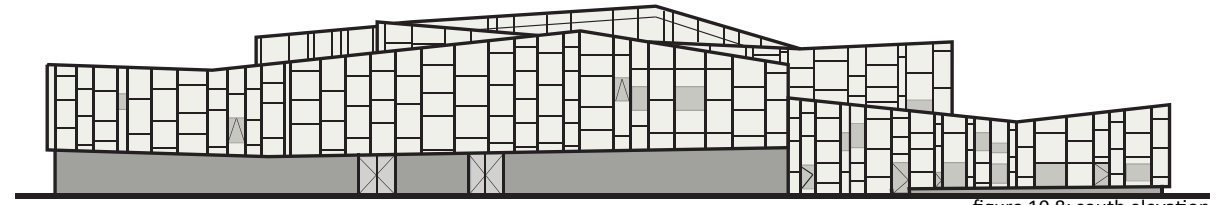


figure 10.8: south elevation

| geometry |

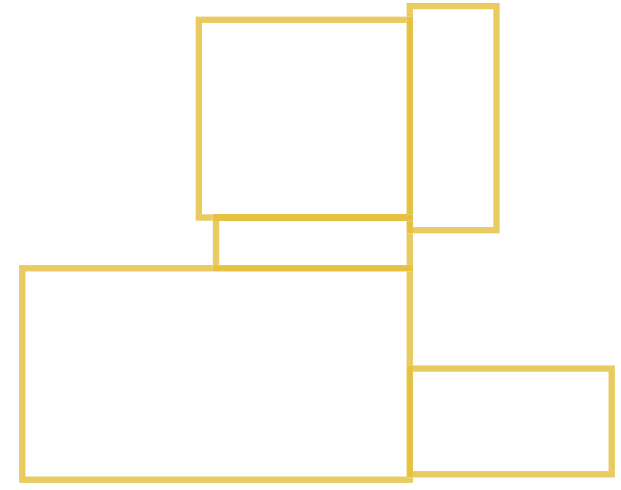


figure 10.9: geometry

| structure |

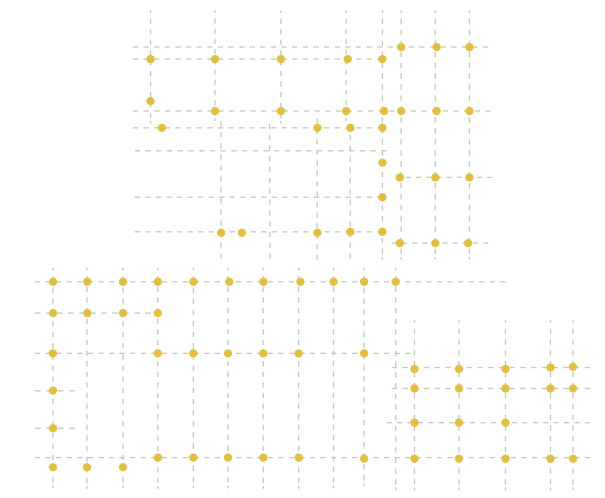


figure 10.11: structure

| hierarchy |



figure 10.10: hierachy

| circulation to space |

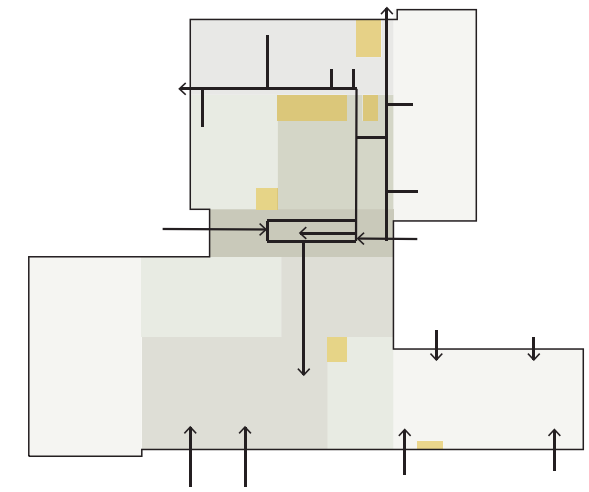
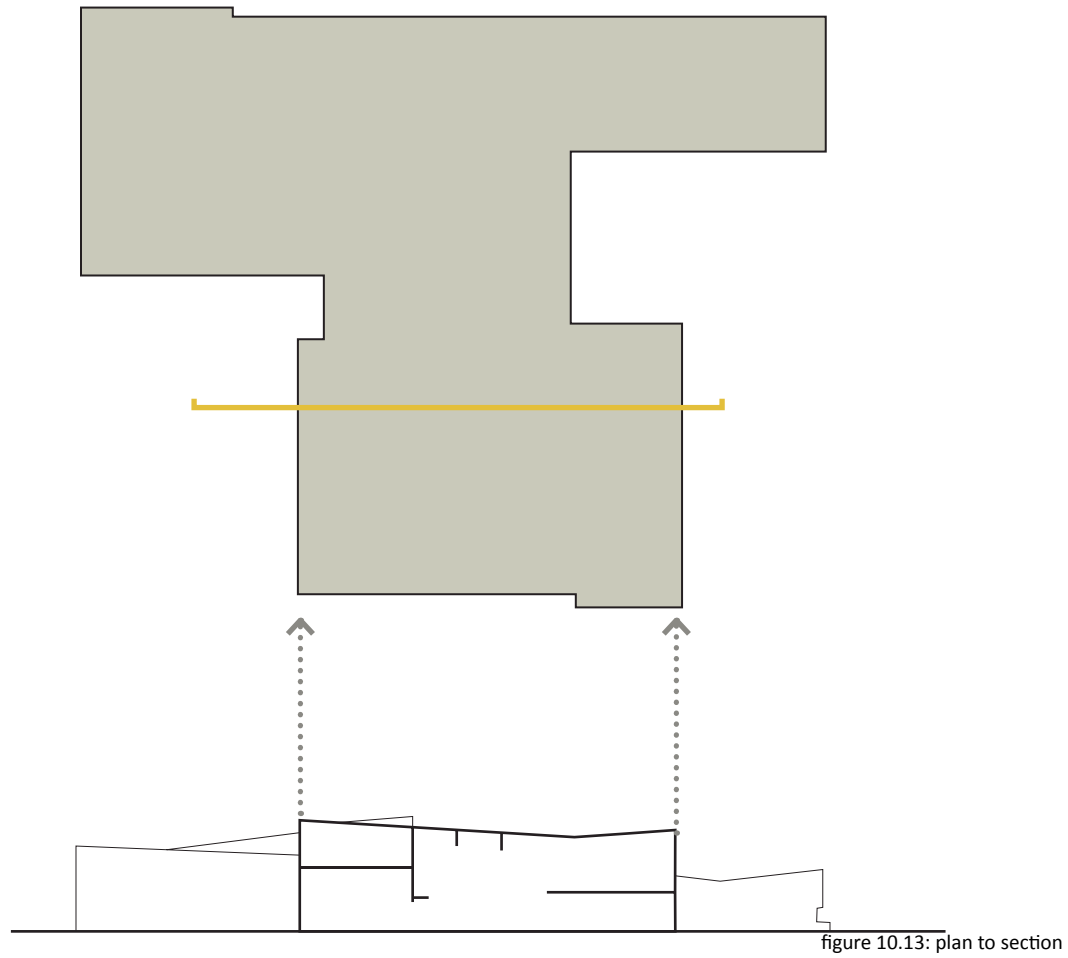


figure 10.12: circulation to space

| plan to section |



| natural light |

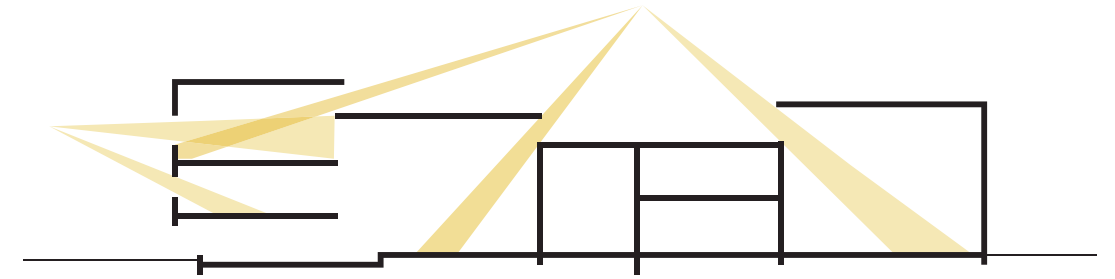


figure 10.14: natural light

| massing |



figure 10.15: massing

The three projects that are presented as typological studies for this thesis; the Gary Comer Collegiate Academy, the Apollo Schools, and the Multifunctional Center de Boomgaard, present meaningful insight into the needs of educational and community-oriented design. Each study examines the typology in different ways and yet all contain similarities that emphasize the necessities for excellent educational and community-orientated design.

The first study presented, the Gary Comer Collegiate Academy by John Ronan Architects, conveys the importance of how two separated and related buildings, in this case a school and community center, should relate to each other regardless of build time. Even though these two buildings were constructed years apart, they relate in a way that allows the exterior barriers to disappear. The connection between the two buildings becomes more about the spaces inside, and allows users of either building access to shared spaces. This is most certainly a characteristic to admire and translate into my own project.

The second study, the Apollo Schools by Herman Hertzberger, is similar to the first in that it is a multi-building complex. However it differentiates itself from the other studies in that there is no distinct community space, solely focusing on a school environment. This study shows the importance of informal gathering spaces that take on different meanings and uses depending on the

interpretation by the user, an element that will be important in creating an environment capable of being ever-changing.

The final study presented, the Multifunctional Center de Boomgaard by Bastiaan Jongerius Architecten, is the only study presented as a single building. It is similar to the Gary Comer project in that it contains both a community center and a school environment. By comparing these two studies the strengths and weaknesses in each method become apparent as an element to celebrate or avoid. The unique element of this study is its facade. The transparent facade allows for visual cues to occur both inside and outside of the building while still protecting occupant privacy. This facade stands out from the other more traditional facades of metal panel and concrete, and allows for the examination of alternatives in building skin design.

As mentioned above, of the three studies presented, two explore how the blending of educational and community typologies work in a multibuilding complex rather than within the boundary of a single building. It is interesting to see these typologies presented in both a multi-building complex and in a single building. Examining the similarities and differences in spatial layout will help inform the organization of the final design for this thesis. There are certain benefits in each technique and careful consideration will need to be made in terms of site analysis and response to the surroundings.

Although all of the studies contain unique differences, upon analysis, each project revealed a centrally organized plan. This commonality suggests that this form of spatial organization is necessary for quality educational spaces and should be translated into my own design. This also speaks to the importance of movement throughout the project and reinforces ideas presented in the unifying idea research earlier.

In each project presented it is evident that thoughtful attention was paid to how the users of each building would interact with the spaces in and around it. This is the strongest commonality between all projects and the leading motivation for their examination in relation to this thesis project. There are many examples out there of good school designs or good community center designs, the important element to find is good design that creates moments of meaning for occupants. What I will take away from each of these projects is how meaningful organization of active and passive spaces has the ability to shape how one learns and interacts with others.

..... | historical context |

*“Live as if you were to die tomorrow.
Learn as if you were to live forever.”*

-Mahatma Gandhi

Our nation's education system is facing an epidemic of mass proportion. The number of high school dropouts in our country is astounding and is impacting those students of low income, minority, urban and single-parent family background more than ever before. These students typically attend large public high schools in the inner cities. Looking at the graduation rates on a national level, almost one-third of all public high school students are failing to graduate at a percentage between 68%-71% (Bridgeland, 2006). This percentage is even lower for minority students, with a graduation rate of approximately 50% (Bridgeland, 2006). These statistics demonstrate just how in trouble our education system is. This problem is not restricted to certain states or only major cities; it impacts every state and region in the country differently and radiates from the inner cities into the suburbs, towns and rural areas. For every Wisconsin, Vermont or Minnesota, there is a Nevada, Mississippi or New Mexico where students are graduating at astonishingly low rates.

As mentioned above, this epidemic has not hit Wisconsin as hard as it has other regions of the country. In fact, Wisconsin boasts one of the highest graduation rates in the country with a graduation rate of nearly 90% and a matriculation rate that has steadily ranked in the top three in the nation for the last two decades. Adversely, the state also holds one of the highest achievement gaps between white and African American students in terms of earning a diploma, especially in

the state's largest district-Milwaukee. "The achievement gap between races in the state is staggering, as 86 percent of white students earn high school diplomas while only 44 percent of African Americans and 48 percent of Hispanic students graduate" (House, 2009). This gap puts minority students at an even greater risk than other students in obtaining a high school diploma. This statistic is even more disheartening for the city of Milwaukee when nearly 60% of the cities students are minorities.



figure 11.0: national graduation rates for 2012

It is clear that there is still room for improvement within the state's education system, especially in their largest district of Milwaukee where graduation rates are a staggering 62.8%. With over one hundred and forty schools in the district, Milwaukee Public Schools is the largest and one of the oldest districts in the state of Wisconsin. Milwaukee schools were once a source of pride for the state of Wisconsin, but ever since WWII it seems that the schools have been in a continuing state of crisis. This state of crisis plaguing the schools is rooted in the historical changes that occurred around the time of WWII. Discord developed within the district regarding desegregation and

equity in education. Around that same time, movement of families to suburbs outside of the city only deepened the tension and began to change the look of urban education. Urban centers became synonymous with 'failing schools' at the heart of rough neighborhoods. The effects are still seen today, even years after WWII.

The city reached its economic peak in the years after WWII; even so this was also the beginning of problems that would plague Milwaukee's schools for the next 50 years. In the 1950s the city was a source of pride for the state of Wisconsin and the nation. The city was seen as a symbol of industrial power and the land of economic and career promise. During the 1950s only 25% of Milwaukee students were dropping out of school, an incredibly small percentage compared to today's numbers. Between 1950 and 1960 Milwaukee Public Schools saw the largest student growth in their history, with numbers nearly doubling during those ten years. The growth can be largely attributed to the annexation of neighboring towns on the outskirts of the city during that time. With the large amount of growth, high schools at this time were mainly comprehensive neighborhood schools with little option for charter or specialty schools. The city also had a strong vocational and technical educational community, in line with the city's image as an industrial and manufacturing center. This translated into positive job placement for residents. In the 1950s jobs were plentiful in the city, even for

those without a high school diploma. Most job seekers found success at industrial jobs in the local factories. Milwaukee was at its best and was a stable place to raise a family; little did the city know that the years ahead were to be plagued by crisis.



figure 11.1: A. O. Smith Interior Plant (see references)

Milwaukee's culture changed in the 1960s with issues of segregation at the forefront. During this time, Milwaukee was one of the most segregated cities in the nation. The separation within the city developed through the distinct cultural communities within the city emphasized by the presence of the 16th Street Bridge that divided the African American neighborhoods to the north and the predominately white communities to the south. With neighborhood segregation intact, the separation translated into the Milwaukee School District with the policy for 'neighborhood schools' as a stimulus. The make-up of these neighborhood schools reflected the demographics of the surrounding neighborhoods and therefore propagated the separation. This placed the schools at the forefront of Milwaukee's civil rights movement with the schools' segregation rooted in the housing segregation.

As the African American population began to grow within the city, white families on the south side of the city fled for the suburbs. When members of the city began to raise concerns about the separation in the schools, the school board refused to accept responsibility for its role in causing the segregation. In his 1963 visit to Milwaukee, Martin Luther King Jr. addressed the segregation issue by saying “residential segregation should not be used ‘as an excuse for perpetual de facto segregation’ in the schools” (Lessons from the Heartland). The national pressure on Milwaukee continued to grow when Milwaukee attorney and civil rights leader Lloyd Barbee established the Milwaukee United School Integration Committee (MUSIC) in March of 1964. “MUSIC’s primary goal was to eliminate segregation in Milwaukee’s public schools. MUSIC attempted to accomplish this goal by conducting a series of high-profile demonstrations designed to bring the issue of de facto segregation to the public’s attention, and pressure the Milwaukee school board to alter their policies” (University of Milwaukee Libraries, 2013).



figure 11.2: school segregation protest march (see references)

By May of that year MUSIC began sponsoring boycotts to bring attention to the segregation in the schools. The first boycott occurred on May 18th, the day after the 10th anniversary of the Supreme Court’s *Brown vs. Board of Education* ruling that declared segregation in schools to be unconstitutional. That day was deemed ‘Freedom Day’ as nearly 11,000 students, of both races, went absent from school and in turn elected to attend ‘Freedom Schools.’ These ‘Freedom Schools’ operated out of local churches and community centers that opened their doors in equal protest against school segregation. They were taught by local teachers, clergy, and parents with a curricular emphasis on freedom, brotherhood, justice and equality. MUSIC would conduct three riots between 1964 and 1965 where these ‘Freedom Schools’ were utilized.

By June of 1965, Barbee had had enough with the school board’s denial of responsibility for the city’s segregation. In response he charged the school district with intentionally segregating the schools. The school board never denied that the schools were segregated, instead insisting that the schools were that way due to the housing patterns within the communities. Any measure made by the school board to alleviate the problems only strengthened the issues at hand instead of improving them. In response Barbee’s team conducted research that proved neighborhood demographics were not the cause of the city’s segregation but rather the policies of the school board. Eventually

the courts did issue a decree in 1976 that ordered the desegregation of Milwaukee’s schools. The courts found the segregation to be the fault of the school board, claiming that they intentionally maintained the separation within the schools. The district responded with the creation of specialty schools across the city that were meant to appeal to all students, regardless of race, earning them national recognition.



figure 11.3: freedom day sign (see references)

Milwaukee Public Schools gained national attention again in 1990, with the establishment of the Milwaukee School Choice Program. This program was the first one of its kind when Milwaukee adopted a school voucher program in 1990. According to the program’s website, “the growth of this program in Milwaukee has fueled more than \$126 million of spending on new schools and remodeled facilities in some of the city’s most distressed neighborhoods” (School Choice Wisconsin, 2007). The program concentrates on making parochial and other private schools available free of cost to students. The program has spread to the

rest of the state with the creation of School Choice Wisconsin, “a nonprofit organization that seeks to ensure an honest debate about school choice by providing accurate information on the impact of school choice on families, communities, and schools” (School Choice Wisconsin, 2013). The voucher program has caused controversy within the state regarding its effectiveness. To some the program has become a symbol for the abandonment of the public education sector in favor of directing public money into private and religious schools. Wisconsin Governor Scott Walker heightened the controversy in 2011 when he cut over \$800 million from public school programs in order to expand the voucher program.

Today, the Milwaukee Public School district continues to expand its options for students by offering a wide range of programs and opportunities for families to choose from. There are eight different types of education offered to students of Milwaukee, including: neighborhood schools, neighborhood specialty schools, citywide specialty schools, comprehensive middle and high schools, charter schools, alternative schools and partnership schools. The variety of options still has not created the outcome the district hoped for in 1965. While unintentional, schools and neighborhoods are still vastly segregated by the 16th St Bridge. Neighborhoods on the north side of the bridge are still predominately African American, while the Southern side of the city is predominantly Latino.

goals for the thesis project

| academic |

This thesis marks the end of my formal architectural education and is a reflection of myself at this stage in my life. My academic goal for this thesis is to create a project that allows me to explore my potential as a designer while creating a realistic, people-centered design. As my final academic project I hope to take all that I have learned as a student and apply it to my thesis project. My ultimate goal is to create a comprehensive design that I believe in and that is an accurate representation of my skills as a student, designer and professional.

| professional |

My goals as a professional architect contain both short and long term aspirations and the components of this thesis were chosen with those goals in mind. For the near future I want to go out into the workforce and work in a firm that is highly engaged in their community and that has a focus on projects in the public realm, i.e. libraries, education facilities, museums etc. My hope is that through the exploration of ideas addressed in this thesis, I will gain a better understanding of the needs required of these types of projects and therefore be able to bring that knowledge into a professional setting. My long term aspiration is to at some point in my life teach. My thesis is applicable to this long term goal in that I hope my research will provide me with better insight into how individuals learn and what environments create a desire to engage in learning.

| personal |

Architecture became a personal thing for me in high school. Along the way my passion for architecture has allowed me to grow as a person and my personal goals for this thesis come from my passions. I am inherently passionate about people and the ability to understand them and for them to understand themselves. It is my intention to keep this in mind throughout the entire design process. A thesis is the time to really put yourself into a project and explore your passions. This thesis allows me to design a space for people to be able to learn in all aspects. I must acknowledge that this includes myself. Throughout the design process I recognize that I will learn more about myself as a designer and about how I learn. I welcome this new knowledge about myself because it is the only way in which to grow throughout life. Many of my personal goals are integrated with my academic and professional ones because they are all centered around what I am passionate about.

..... | site analysis |

“Be sure you put your feet in the right place, then stand firm.”



-Abraham Lincoln



figure 12.0: neglected shop

As you come into Milwaukee from the west on Interstate 94, you enter the city through a 'toilet bowl' of ramps. You become disoriented in the loops of concrete and cars as you make your way into the city and towards the lake. On my first night in the city I was guided on a tour of the city by a local resident. She took us from the south end to the north end and I was amazed at the varying level of living conditions that existed across the city, with two vastly different lifestyles mere blocks from each other. The further east into the city you go towards to the lake, the ritzier the architecture and lifestyle becomes. Step away from the lake and you are surrounded by pockets of poverty and segregation emphasized by the presence of boarded up and neglected buildings.



figure 12.1: site upon approach

The site for this thesis is located in the Park West Neighborhood on the north side of the city. The neighborhood contains some of the oldest housing stock in the city of Milwaukee. An overwhelming majority of residences were constructed prior to 1939. With over 50% of the population living below the poverty line, the neighborhood and surrounding neighborhoods are undergoing a substantial move towards change and community redevelopment.

Upon approach towards the site, you experience a pocket of poverty on the north side of the city. Coming to the site from the east off of Fon Du Lac Ave, onto North Ave (the anticipated most used route to the site) you drive by a mix of abandoned, boarded

-up buildings that have been neglected, with some commercial buildings that contain little architectural prowess. The site and surrounding area show clear evidence of abuse and neglect. This area has been forgotten and abandoned in search of new spaces outside the city, as evident in the buildings that remain despite the historic past of the neighborhood. There is a sense of sadness and lack of community spirit as you approach the site. Very few people are walking about and the sidewalks are poorly kept. Those walking are doing so out of necessity and not out of a preferred method of transportation.

A lone green space along North Avenue that is not being utilized, this abandoned lot with well-kept grass littered with a mix of battling textures of hard and soft, stands out a place that desires to be transformed. One can sense the story of the site by the presence of what once was a functioning street, N 24th Place, that runs north/south through the middle of the site. It is unclear for how long this street has been barricaded but it speaks to a time when this land was once divided into two functions. Being a lone vacant, unbuilt lot in the area, the site feels disconnected from its surroundings in a good way. Although relatively small, when immersed in the center of site it is easy to forget that you are surrounded by a neglected environment. The trees and green space are something to keep; they are something to celebrate in the neighborhood.

The site lacks any form of magic or mystic, due primarily to its surroundings. The care shown to the west side compared to the east suggests newer construction in that direction. The age of trees also suggest this, with younger trees on the west side and more mature ones farther east. The heavy vehicular traffic and evidence of setback pedestrian traffic suggest a desire for pedestrians to stay back from the busy street. This is accentuated through the high volume of noise off of North Ave compared to the other bounding streets.

The importance of this site in relation to this thesis lies in its location within the city. Through typological research it is clear that a site for a community focused building is crucial for success. This site provides an opportunity to target many local residents because of its proximity to five different neighborhoods. With that, this site has the potential to bring together these and other neighborhoods as a center of the community. The location near primarily residential areas allows for ease of access by residents, while the nearby places of worship offer opportunities for partnership. The plans for new development along Fon du Lac and North Ave as central commercial corridors within the city also adds value to the potential within the site.

| views & vistas |

Located on the north side of Milwaukee, the site lacks any breathtaking views. As you approach the site there is a decrease in the quality of buildings. Many are abandoned, neglected and boarded up, showing signs of not only physical distress but community distress in the area. The views and surroundings around the site lack any sense of wanting to linger in the vicinity. There are few views of any green space or natural environment in the approach to the site and from within the site. Views from the site include boarded up residential and commercial properties, a beautiful old church and general lackluster surroundings. The lack of desirable views and areas surrounding the site poses a design challenge for this thesis. The challenge will be to create a space that inspires the community to look beyond the distress and make positive changes to their community in both personal and physical ways.



figure 13.0: abandoned



figure 13.1: forgotten garage



figure 13.2: corner shop



figure 13.3: site looking south



figure 13.4: site looking northwest



figure 13.5: abandoned building

| site reconnaissance |

In taking analysis of the site it is evident that the quality of care varies depending on the location on the site. The west side of site is noticeably more kept then the other three, as evident in looking at the adjoining figures. The could be due to the (relatively) newer construction on that side of the site. The biggest thing to take notice of is neglected sidewalk that runs through the middle of the site. This sidewalk is utilized more frequently as opposed to the one right next to North Street, suggesting a desire for pedestrians to be removed from the busy street. Also important to note is the barricaded remains of what once was N 24th Place.



figure 14.1: western sidewalk



figure 14.3: N 24th Place



figure 14.4: north east corner



figure 14.0: site reconnaissance



figure 14.2: northwest corner

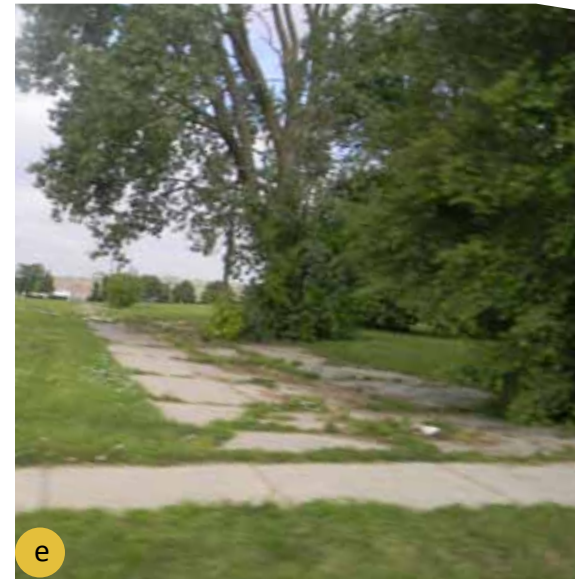


figure 14.5: eastern sidewalk

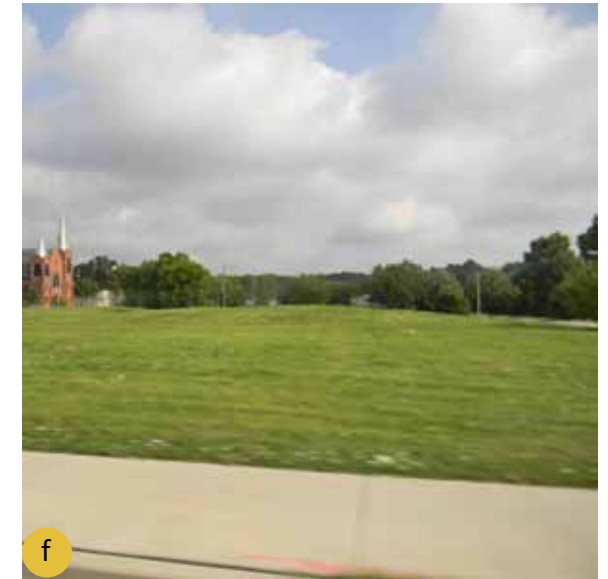


figure 14.6: looking north

| site character |

The character of the site is lush and open in comparison to the surroundings. The site is covered in kept green grass and minimal vegetation. It stands out from the surrounding environment in that it is the only green space in sight. Recognizing this character of the site in comparison to the surroundings plays a role in the design of this thesis project. Even though there will be a built environment established on this site, the intention is to maintain a sense of openness on the site and maintaining, as well as adding to, available green space. Another quality of the site to take note of is the previously mentioned remains of N 24th Place. This street divides the site into two distinct lots. This is a character trait to address through the project design; either through celebration of the two sites or through joining the two into one.



figure 15: open site

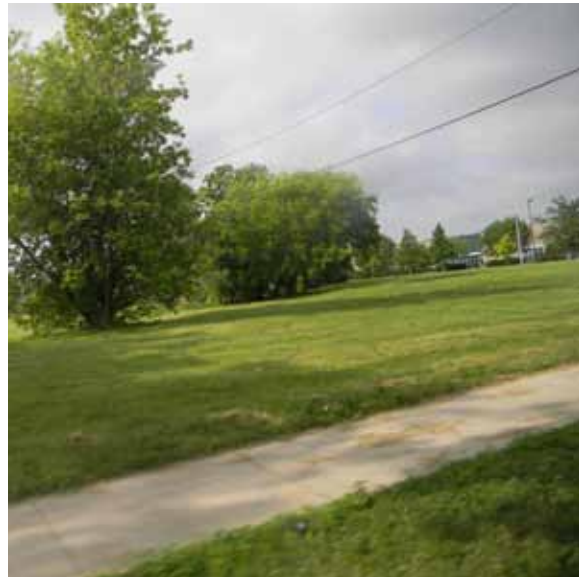


figure 15.1: shade cover

| light quality |

With minimal buildings surrounding the site, and no structures above two stories, there are no shadows cast on the site from surrounding buildings. The site does receive minimal cast shadows from the aged vegetation on the north side, adding nice character to the site. The site receives plenty of sunlight, due to the low surrounding buildings, which will allow for the utilization of passive solar design strategies.

| human characteristics |

Human influence is evident throughout the site in terms of previous human interaction. This is evident in the presence of what used to be a functioning street as well as a warning sign stating 'No Parking, Dumping or Trespassing.' The presence of this sign suggests that these acts may have previously been an issue on the site and the sign was placed there in an attempt to preserve the site. Human presence is also noticeable in the garbage found on the site, the kept grass and the movement of people through the site on the bordering sidewalks.



figure 15.2: green taking back from the built

| distress |

There is much distress evident on this site and its surroundings. Much of the distress that is present comes from neglect. The previously functional street has been barricaded and unused. Weeds and grass are breaking through the concrete sidewalks and the previous N 24th Place taking back the natural. Distress is evident in the surroundings of the site in the presence of abandoned and bordered up buildings. A design challenge that will need to be overcome is how to create a place that acknowledges the surrounding distress and motivates the community to make community improvements to heal the existing distress to become a healthy, thriving community.



figure 15.3: N 24th Place

| textures |

Textures on the site consist primarily of grass and soft vegetation. This gives the site a soft feel in contrast to the harshness of the surroundings that consist primarily of concrete and other hard materials. The harder textures on the site exist where there once was a street and where the grass is now creeping through and merging the soft and hard textures. Being that this site is in some ways a jewel in its environment, being a green space with soft edges, it is important that this texture quality continue through the design of the project's site layout.



figure 16.1: green taking back from the built



figure 16.0: gravel



figure 16.2: scattered peices of concrete

| vegetation |

Vegetation on the site consists primarily of green grass that appears to be well cared for with patches of smaller, native flowering weeds throughout. The site also consists of several mature trees on the north side and relatively younger trees on the west side.



figure 16.4: mature trees



figure 16.3: small flowers



figure 16.5: mature tree

| built features |

There are five main types of built features surrounding the site: neglected mixed use, a classically designed church, neglected residential, 'box' buildings and chain designed buildings. All are low rise and typically under three stories. Most of these built features add little to nothing to the quality of the site and actually become a hindrance to the site. Others offer the possibility for opportunity to change and for partnership. Figures 17.0 & 17.2 below depict examples of the neglected mixed use and residential structures to the southwest and north of the site, respectively. These structures are clear examples of the community distress apparent around the site. This is an example of a surrounding

built feature that brings little to nothing to the quality of the site. However, it can also be viewed as an opportunity for change. The structure seems to be intact and could be a possible opportunity for renovation and community renewal. Figure 17.1 depicts one of the only built features that is an asset to the site. This church is beautifully constructed and adds a great sense of character to the site and its surroundings. This is an example of the quality of design that needs to be brought back to the area. Figure 17.4 shows a neighboring mixed use building to the west of the site. I refer to it as 'box' architecture because of its low stature and material use. Constructed mainly of concrete, it

contributes very little to the character of the area and resembles architecture that could be found in any location around the country. Figure 17.3 is another example of the built features surrounding the site that could be found anywhere in the country. The pictured AutoZone and a Popeyes restaurant to the south, are examples of 'chain designed buildings' that add little to the character of the site and the surroundings. The biggest asset to the site is the potential held within the site and the neglected buildings that surround it. There is a need to bring back character to the community through the built environment.



figure 17.0: neglected mixed use



figure 17.1: Hopewell Missionary Baptist Church



figure 17.2: neglected residential



figure 17.4: 'box' building



figure 17.3: chain designed building

| pedestrian & vehicle traffic |

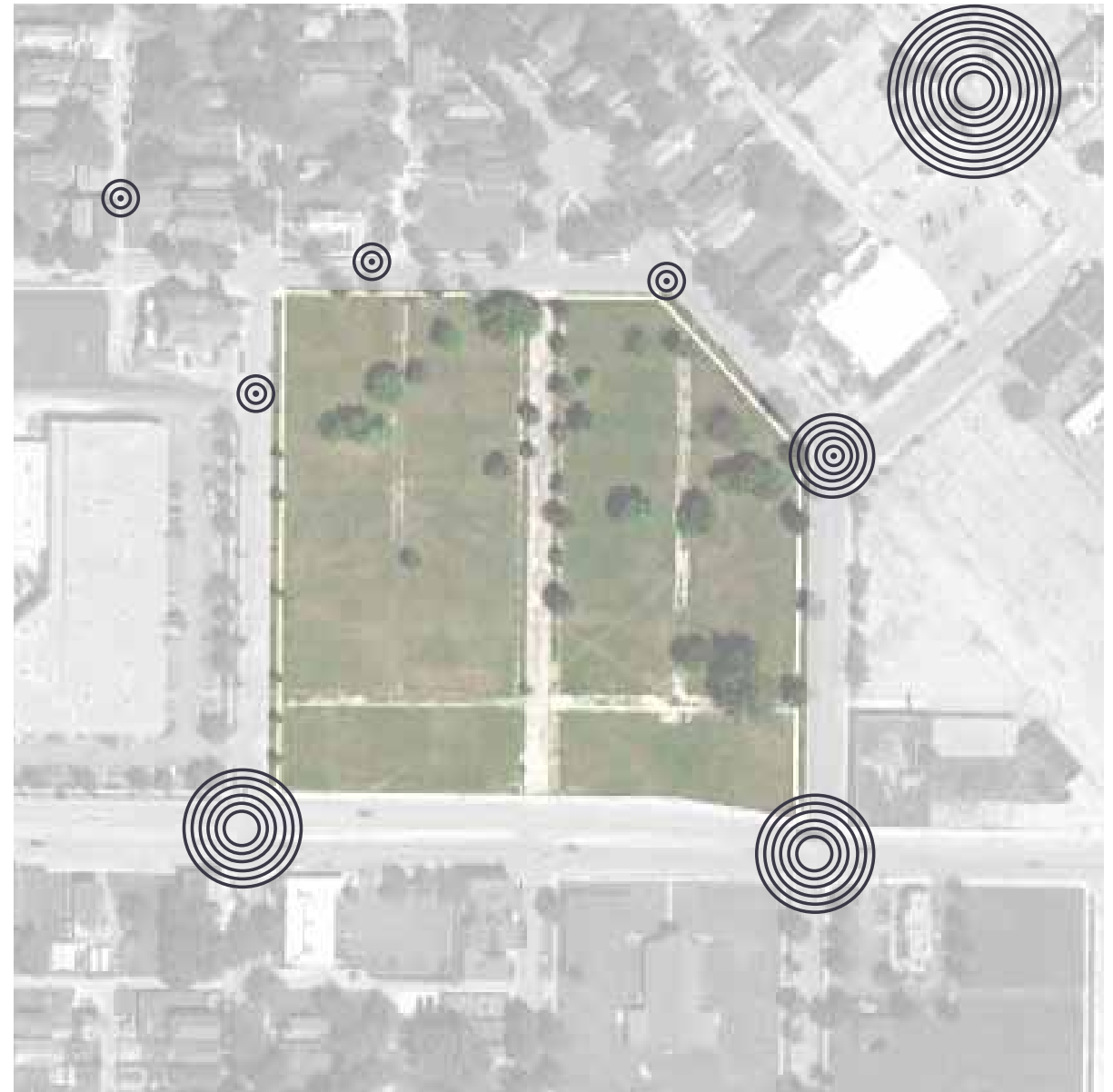
The site for this thesis is located within an area that predominately utilizes vehicular transportation. A relatively low percent of the neighborhoods population owns their own car, so public transit use is very high throughout the neighborhood. The site is located on a principal arterial street and is only one block southwest of a second. All other surrounding streets are non distinguished streets with low traffic counts. North Ave directly south adjacent to the site has the highest vehicular traffic of any bordering street with an average traffic count of 18,000-20,000 cars a day. Public transportation is primarily through the local bus system which has over twenty stops within walking distance of the site.



Pedestrian traffic is low around most of the site, with the lack of place destination as a contributing factor. The majority of pedestrian traffic along the site occurs on the neglected sidewalk that is set significantly back from North Ave. This action implies the preference of the pedestrian to walk safely back from the busy street and should be taken into account in the final design of the project. With little personal vehicle ownership in the community, it is important to develop this neighborhood into a more walkable area. The site is located in such a place where it is easily accessible by foot from both residential, commercial and industrial areas of the neighborhood.



| noise |



| site analysis |

| topography |

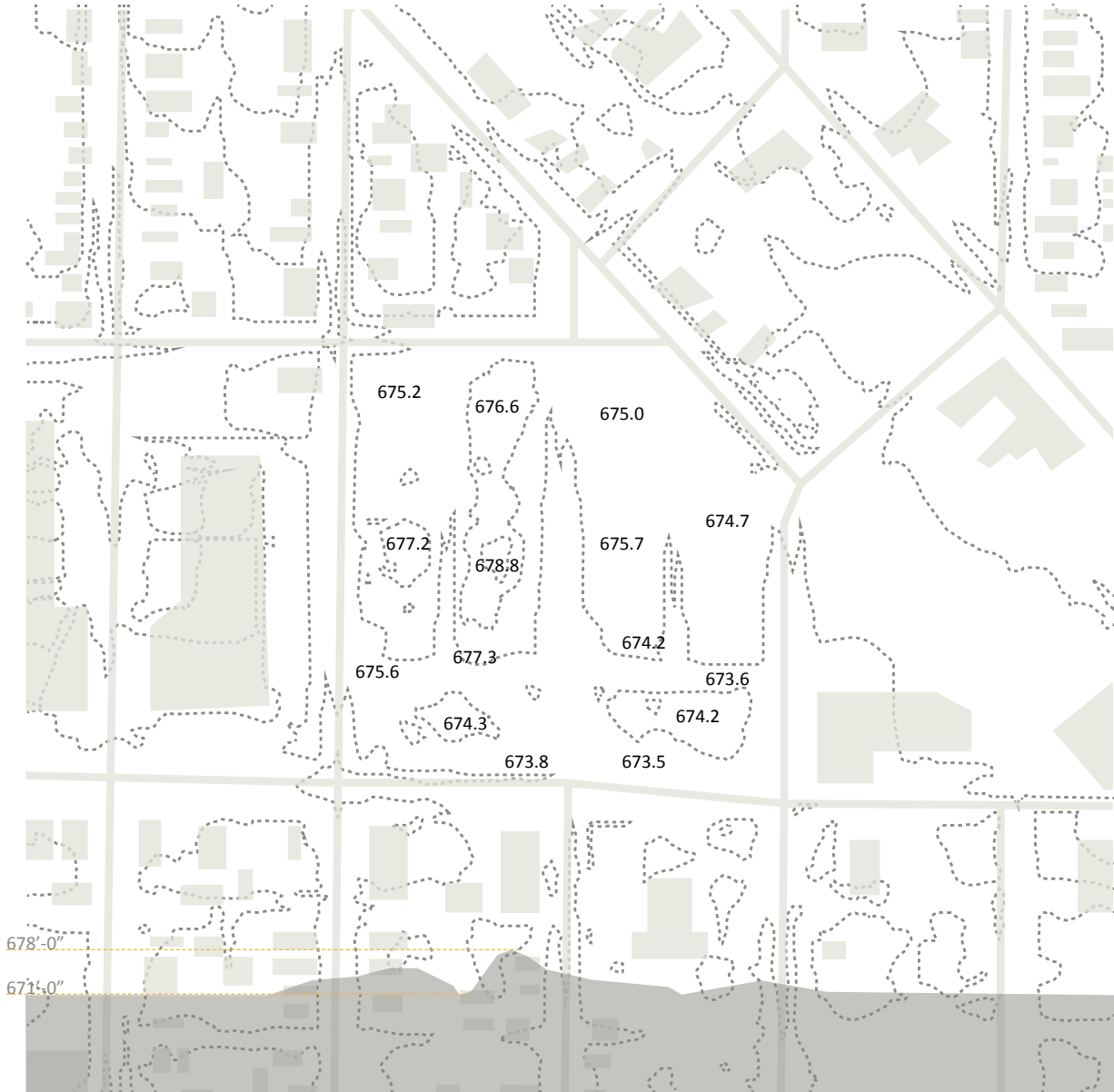


figure 20.0: topography map
figure 20.1: topography section

| soils |

The primary soil type for the city of Milwaukee is a clayey soil underlain by limey till.

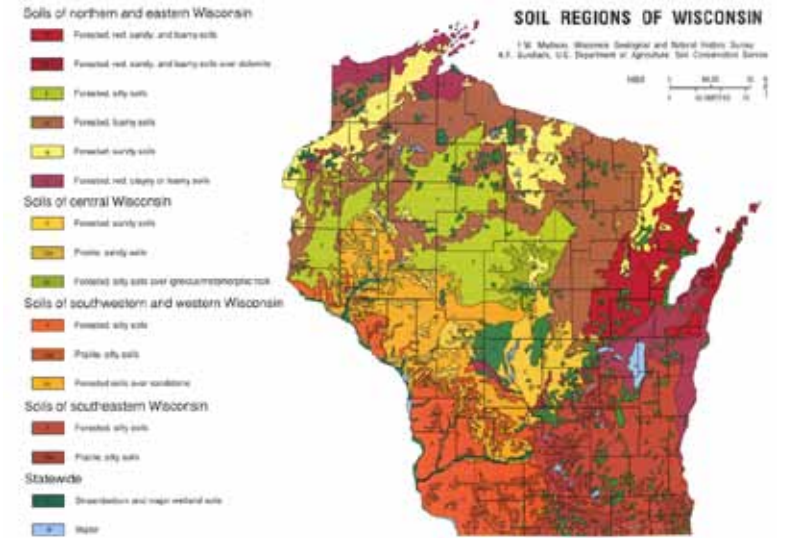


figure 21.0: wisconsin soils (see references)

| bedrock |

The primary bedrock geology for the city of Milwaukee is Silurian Dolomite with areas of Devonian Dolomite and shale.

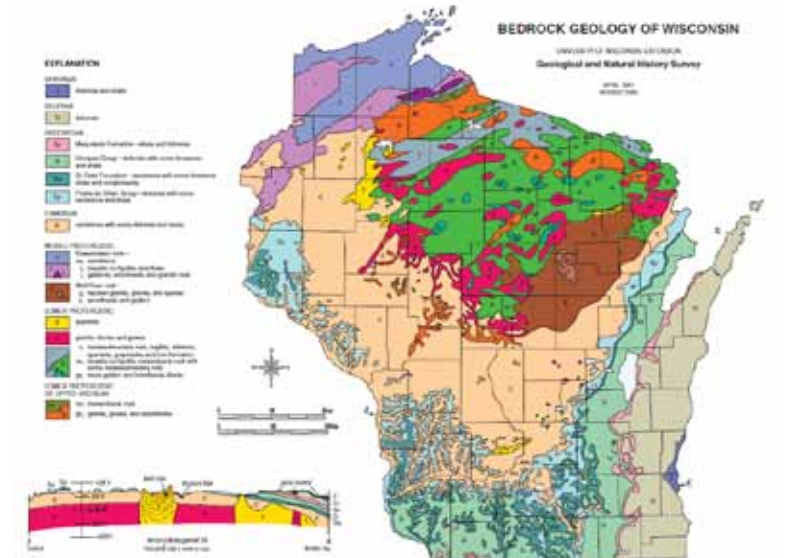


figure 22.0: wisconsin bedrock (see references)



● residential
 ● commercial
 ● manufacturing/transportation
 ● exempt with building
 ● exempt open space
 ● vacant land

figure 23.0: zoning

| utilities |

The site currently has power utilities located above ground on the north edge of the site, projecting southward. The plan would be to bury these lines during the construction phase of project development. While the city of Milwaukee offers an opportunity to access underground steam and cooled water from nearby plants to heat and cool the building, this location is outside of the service boundaries.



figure 24.0: utilities map



figure 24.1: above ground utilities

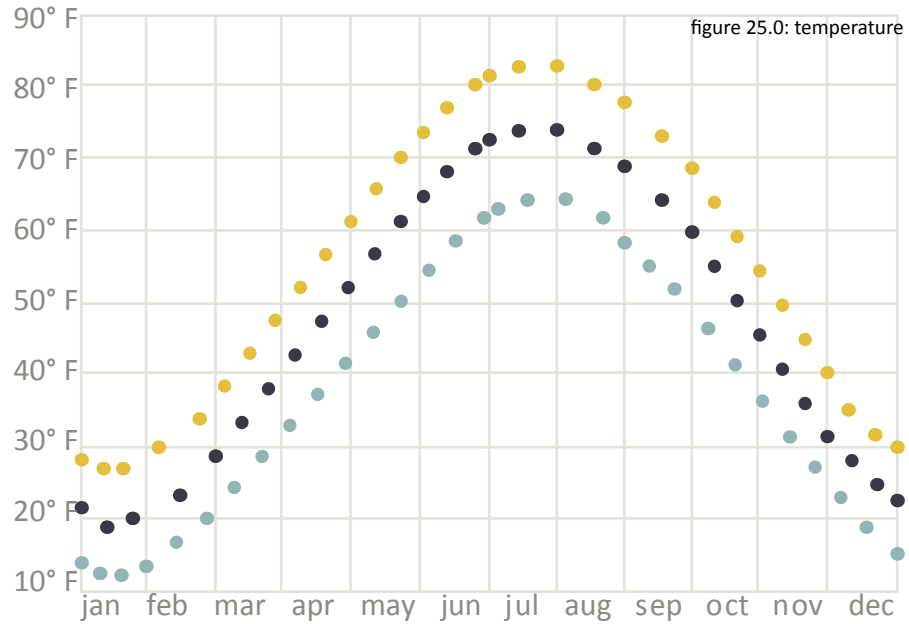


| climate data |



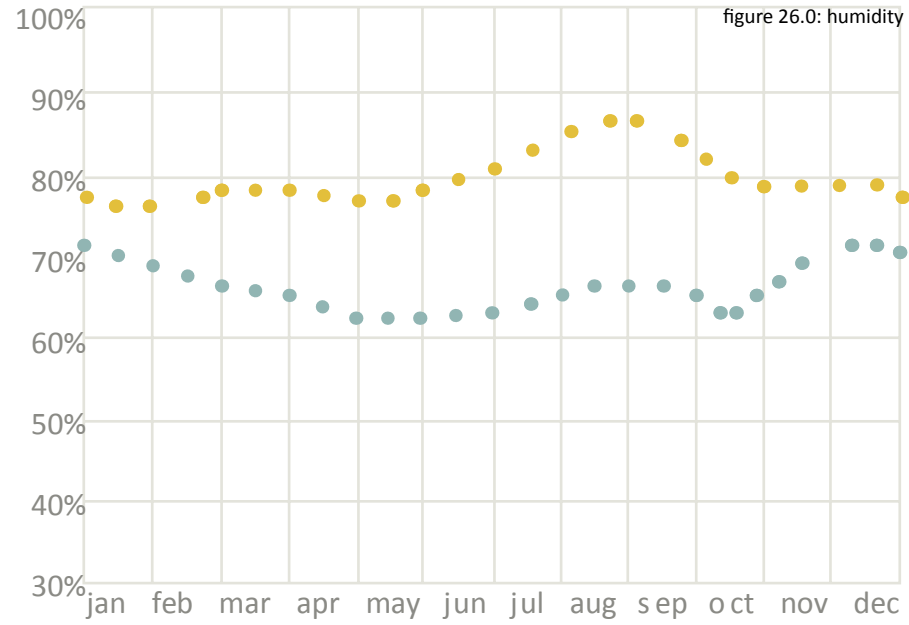
| temperature |

- daily high
- average
- daily low



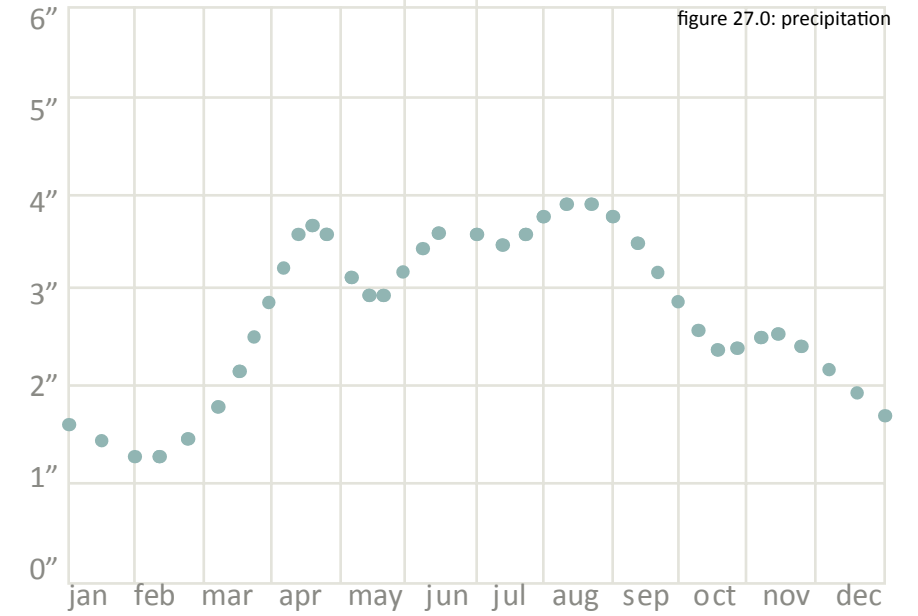
| humidity |

- city morning
- city afternoon



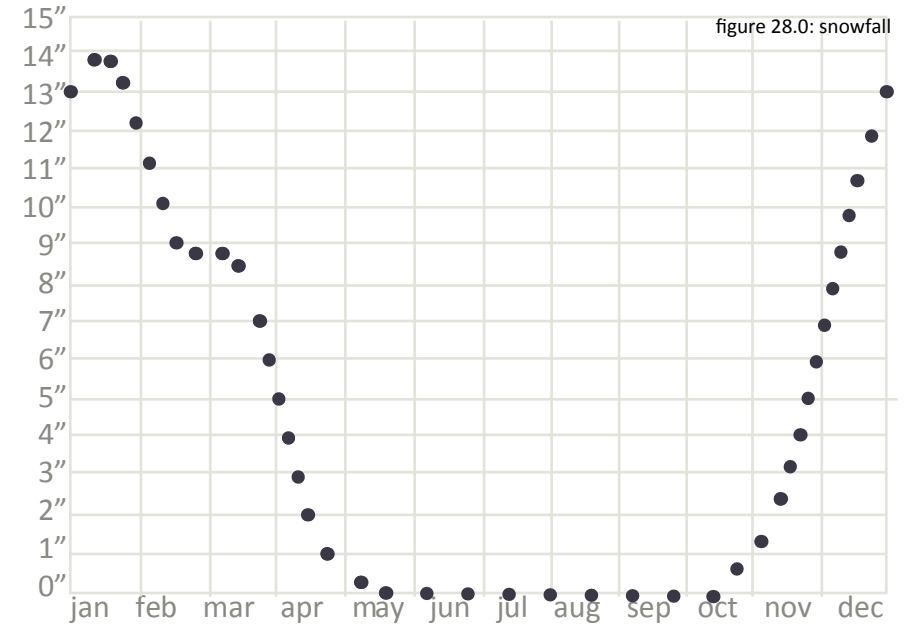
| precipitation |

- city average

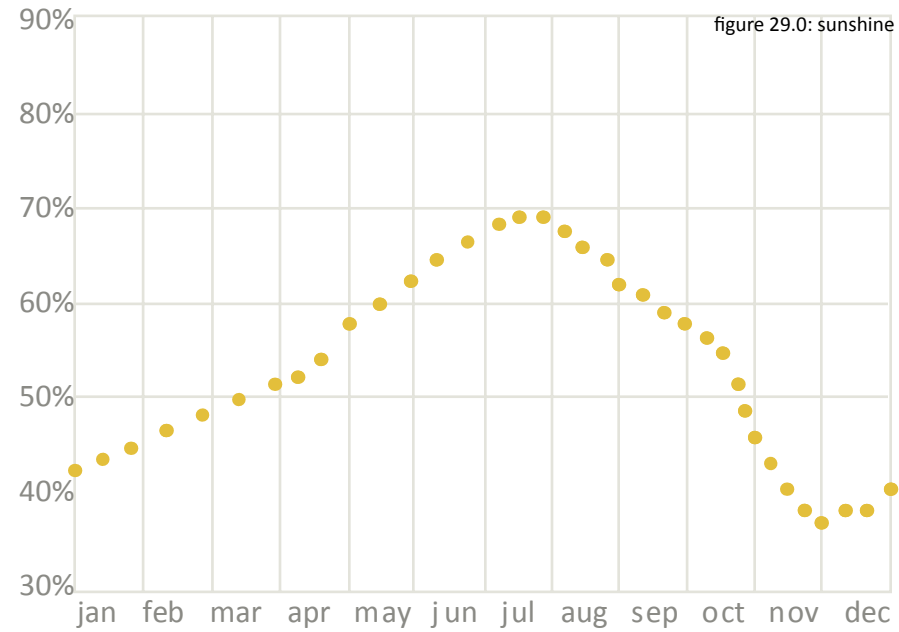


| snowfall |

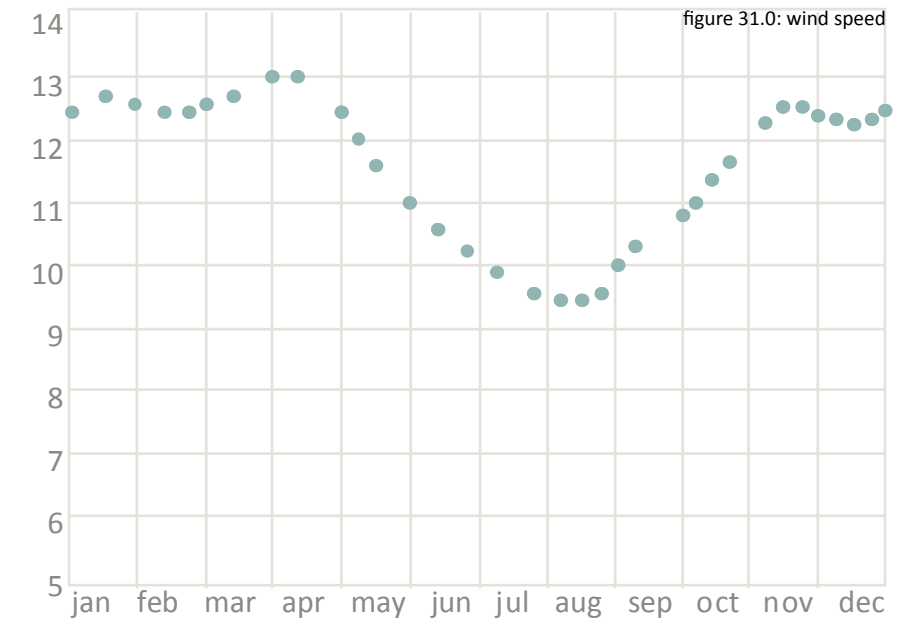
- city average



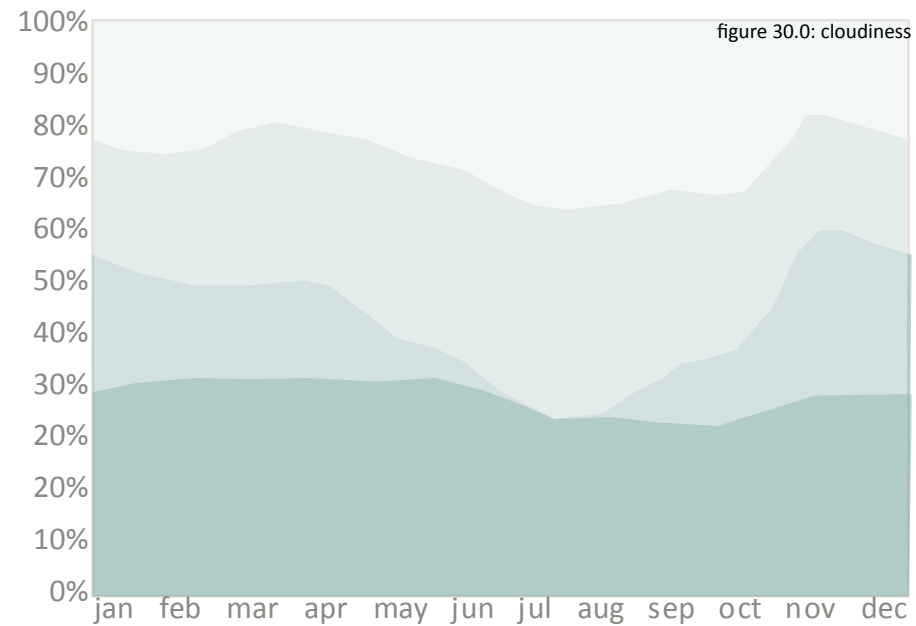
| sunshine |
● city average



| wind speed |
(mph)
● city average



| cloudiness |
● days clear of clouds
● partly cloudy days
● cloudy days
● days with precipitation



| wind direction |

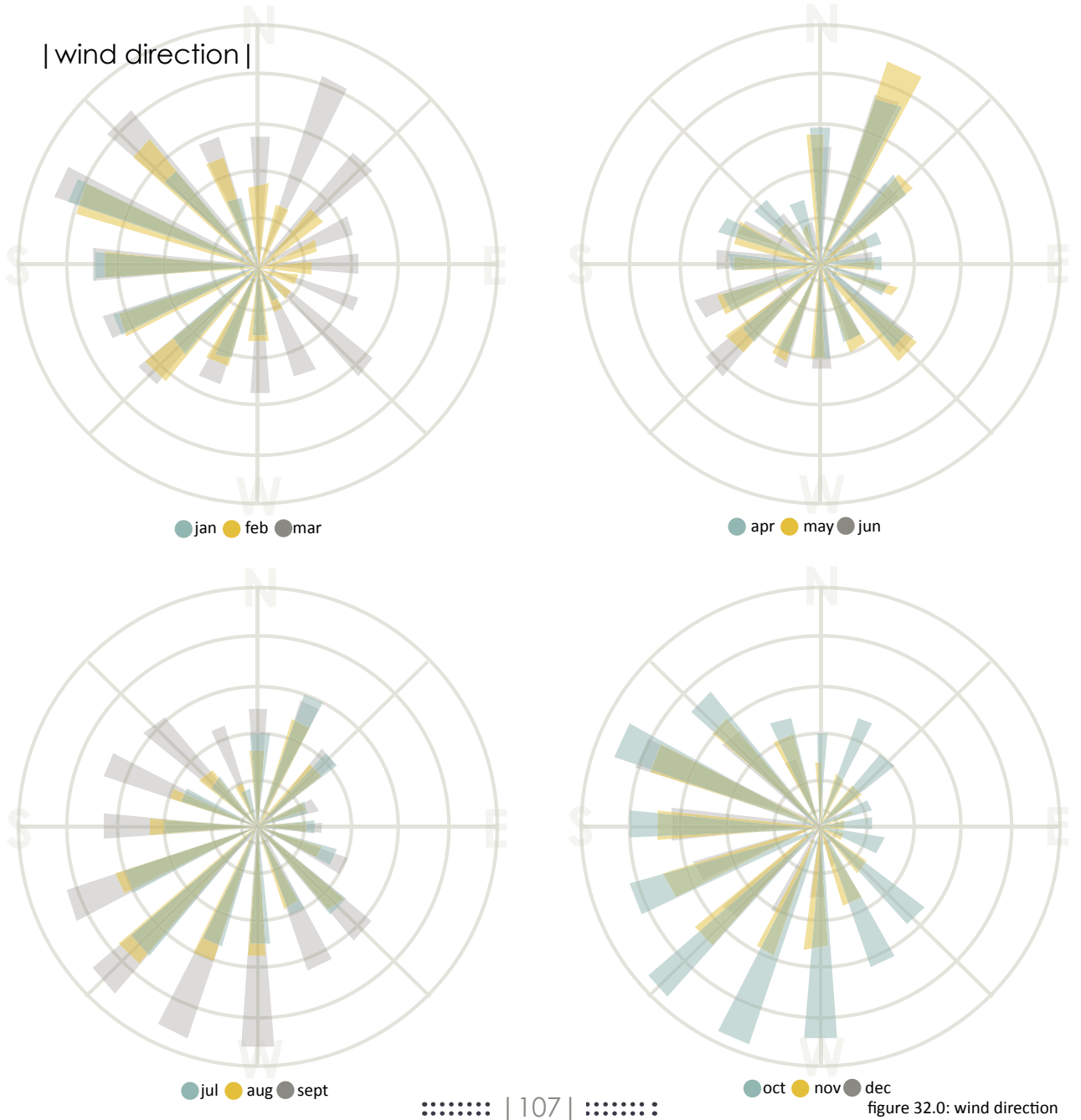


figure 32.0: wind direction

| air movement |

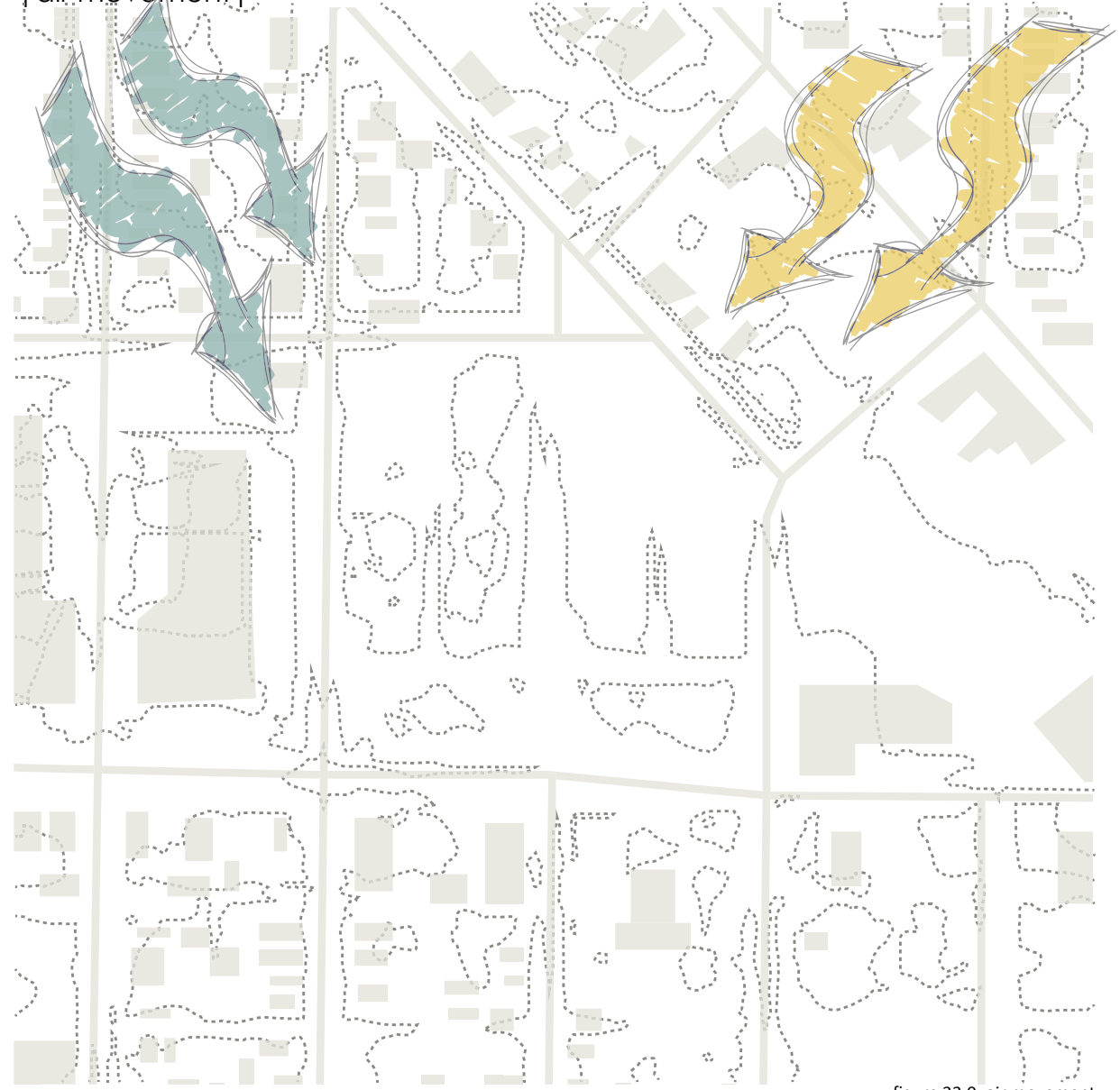


figure 33.0: air movement

| sun path |

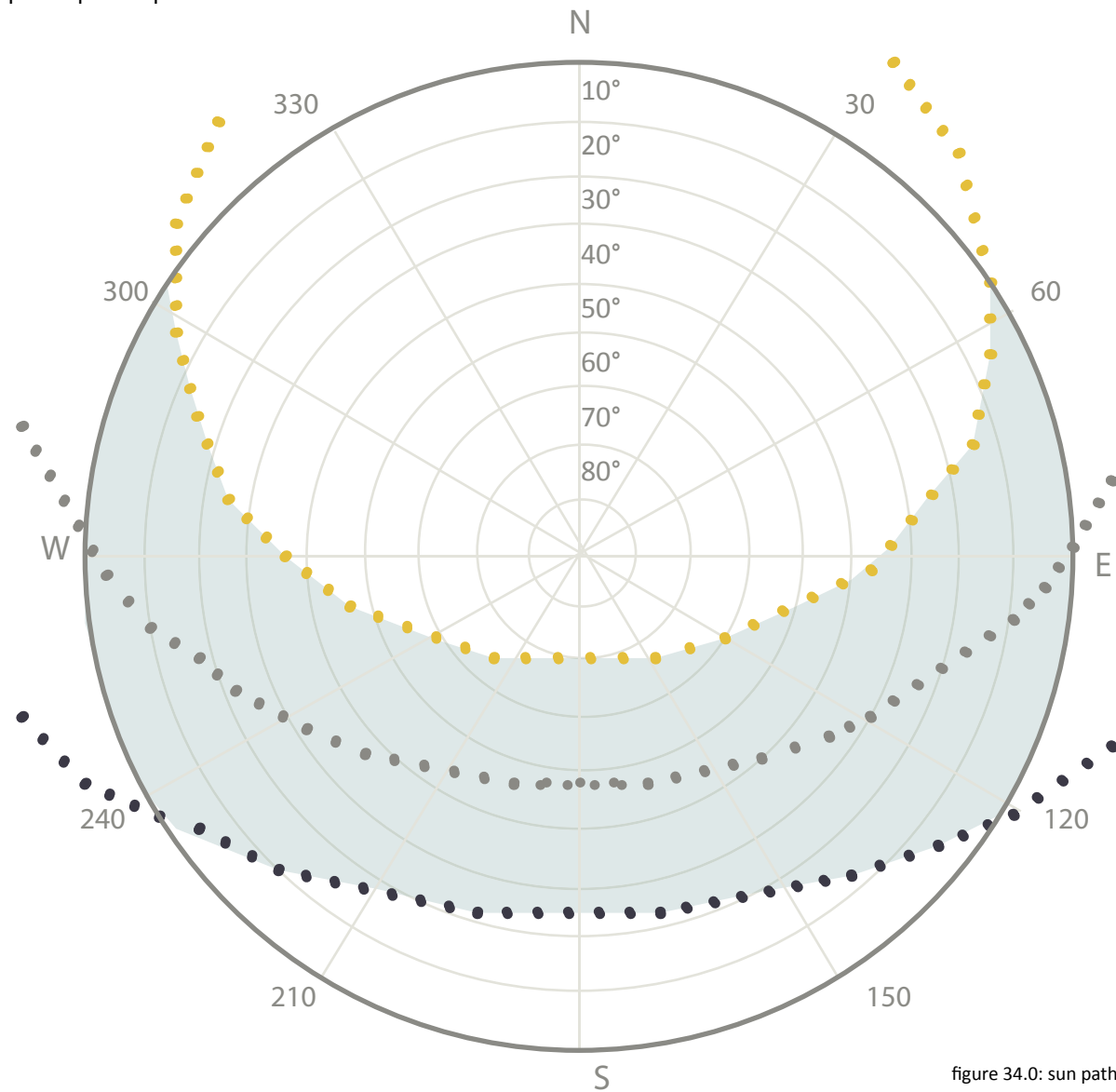


figure 34.0: sun path

| shading |

With all of the surrounding buildings under three stories in height, and few shade trees, there are few cast shadows on the site from the surroundings. It is important to note the shade patterns created by the building when determining planting locations and in utilizing passive solar techniques.

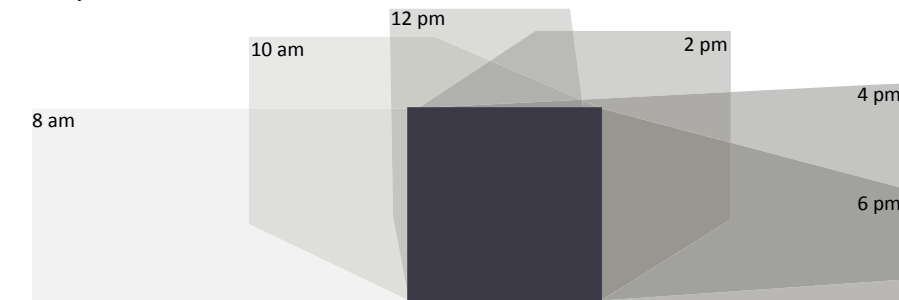


figure 35.0: June 21st shade diagram

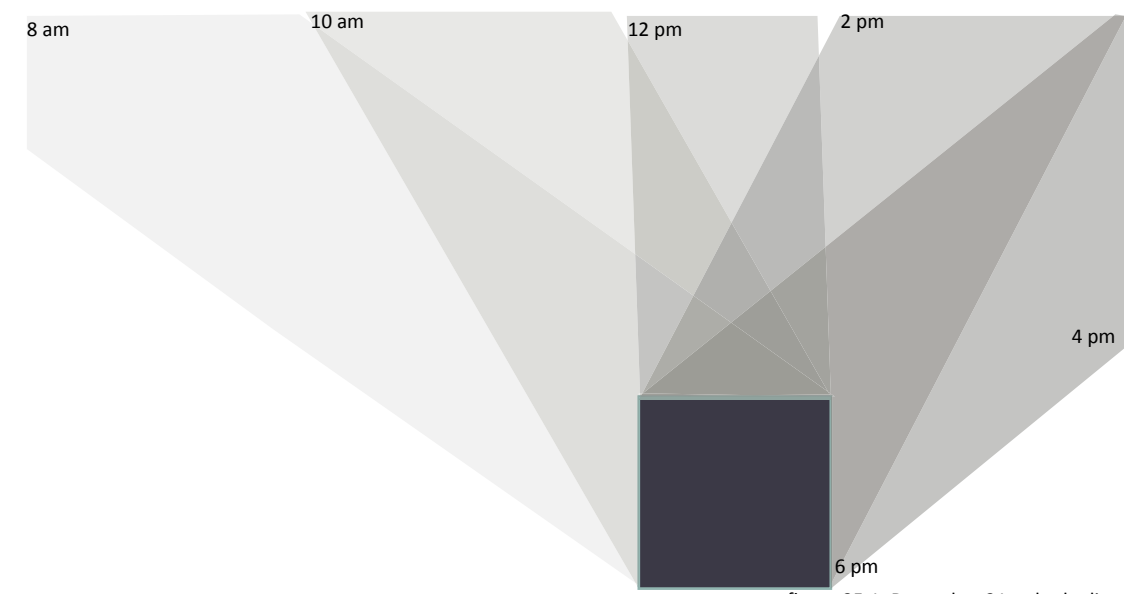


figure 35.1: December 21st shade diagram

..... | program requirements |

"Learning never exhausts the mind."



-Leonardo da Vinci

space allocation

| types of spaces |

- administration**
 - reception
 - assistant principal
 - board room
 - principal
 - work room
 - flex office
 - counselor offices (4)
 - storage
 - record storage
 - career center
- health services**
 - reception
 - nurse/treatment
 - cot room
 - storage
- faculty offices**
 - shared offices per area of study (~4)
 - staff lounge
- community staff offices**
 - counselor
 - head coordinator
 - staff offices (3)
- general classrooms**
 - divided among areas of study (20)
- cafeteria**
 - seating
 - servery
 - kitchen
 - storage
 - a la carte
- cafe**
 - seating
 - kitchen
- social commons**

breakout spaces

divided among space in varying sizes

- culinary lab**
 - lab space
 - cold storage
 - dry storage
- finance lab**
 - lab space
 - storage
- health lab**
 - lab space
 - cold storage
 - dry storage
- media center**
 - reading rooms
 - group meeting space
 - technology lab
 - storage
 - reception
- auditorium**
 - seating
 - stage
 - light control
 - audio control
 - storage
 - dressing room
- gymnasium**
 - locker rooms
 - workout space
- restrooms**
 - 1/50 occupants
- parking**
 - 2 levels (1-1.5/classroom + .25/driving age student)
- green roof**
- community garden**
- mechanical/electrical**
- custodial**

| educational spaces |

- administration 4,000 sq ft
- faculty offices 3,200 sq ft
- health services 900 sq ft
- general classrooms 18,000 sq ft
- cafeteria 8,000 sq ft
- breakout spaces 5,000 sq ft
- social commons 6,000 sq ft
- restrooms 3,600 sq ft
- mechanical 6,000 sq ft

| community spaces |

- offices 1,200 sq ft
- cafe 1,000 sq ft
- social commons 4,000 sq ft
- restrooms 3,600 sq ft
- mechanical 1,500 sq ft
- breakout spaces 2,000 sq ft

| shared spaces |

- culinary lab 1,200 sq ft
- finance lab 1,200 sq ft
- health lab 1,200 sq ft
- media center 4,000 sq ft
- green roof 40,000 sq ft
- community garden 40,000 sq ft
- parking 80,000 sq ft
- auditorium 6,000 sq ft
- gymnasium 6,000 sq ft

| total |

~80,000 sq ft



figure 36.0: space matrix

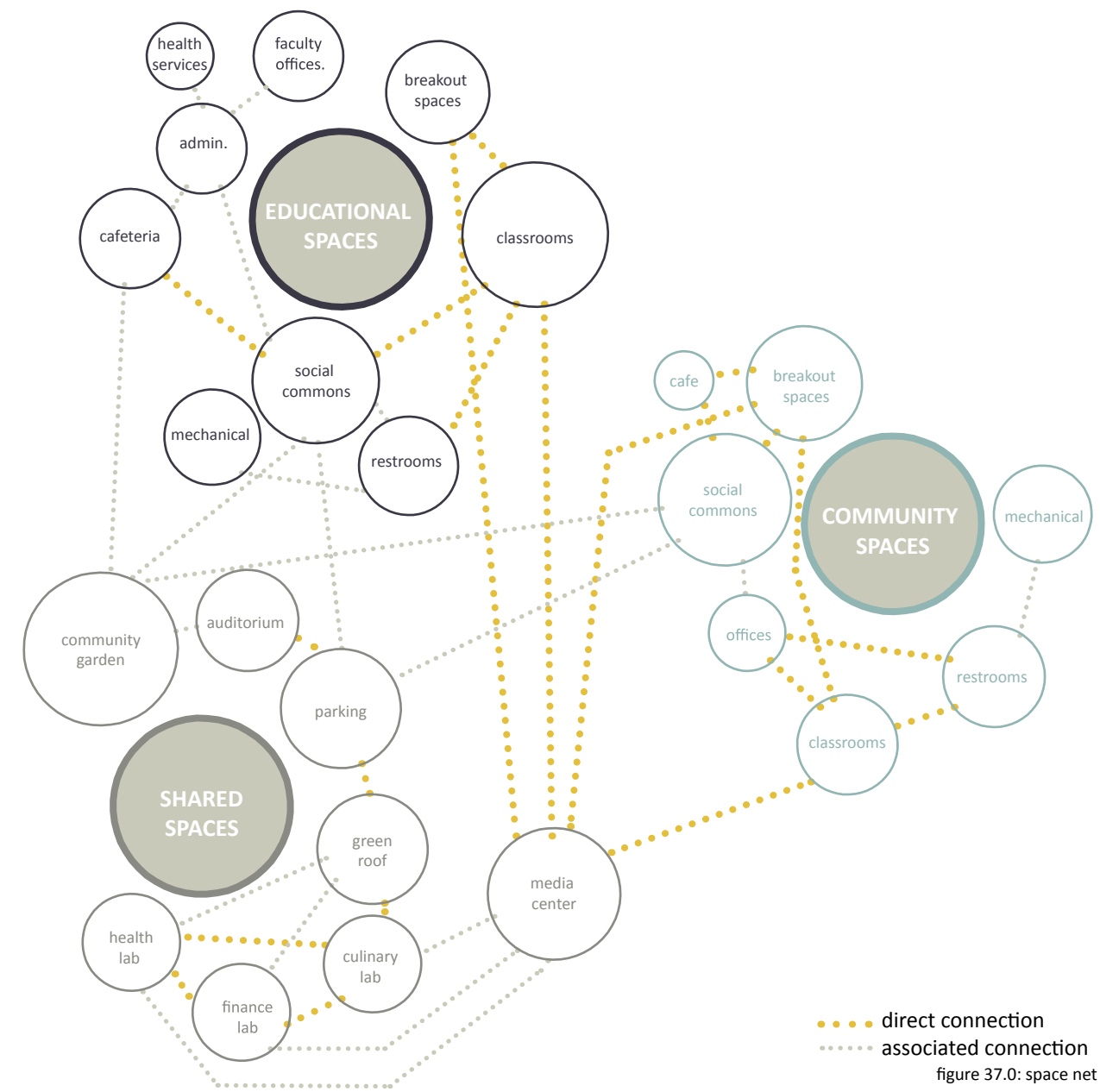


figure 37.0: space net

..... | design solution |

"It is today we must create the world of the future."

-Eleanor Roosevelt

Park West Center for Learning



figure 38.0: main entry

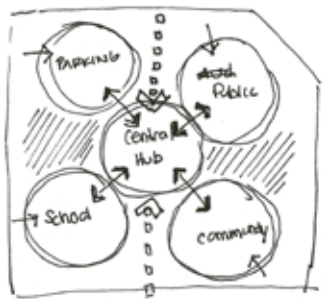
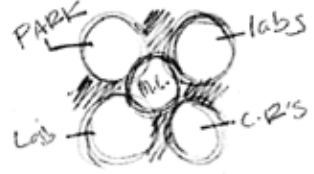
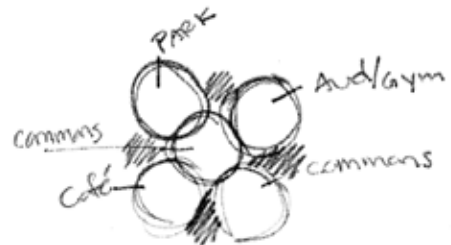


figure 39.0: process

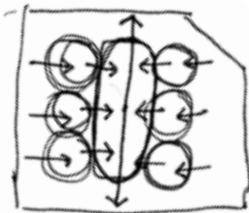
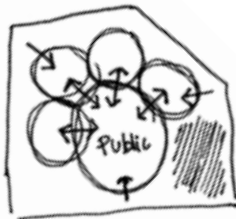
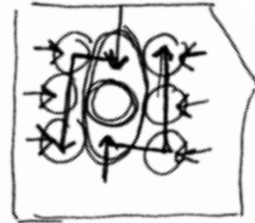
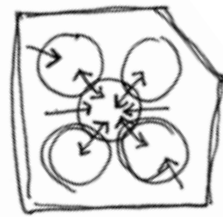


figure 39.1: process

Analysis of case studies revealed that a centrally organized plan is crucial in education design. With that in mind, and the character of the site, process began in the form of bubble diagrams. This allowed for exploration of space relationship in accordance to the site.

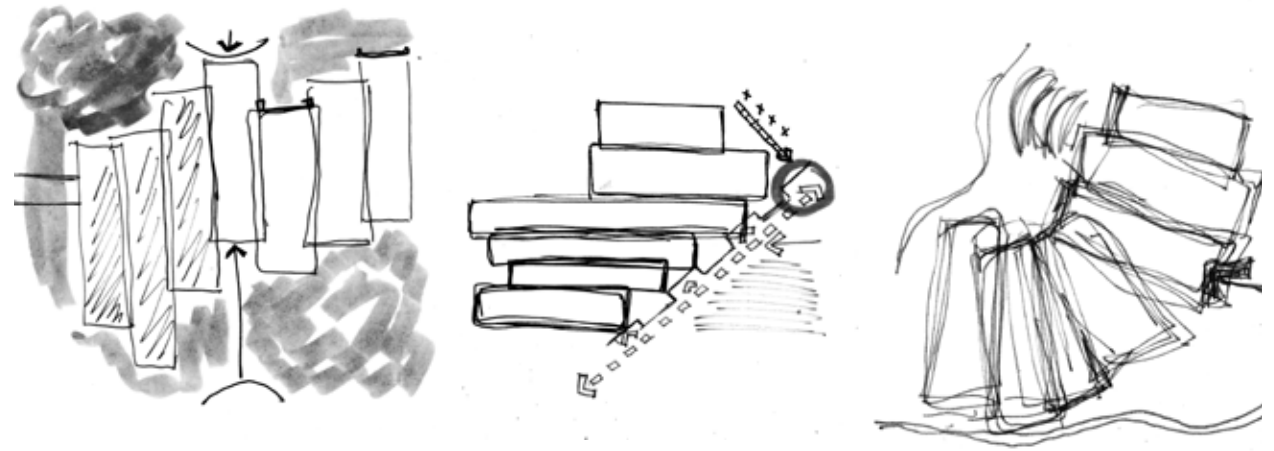


figure 39.3: process



figure 39.2: process

From a desire to create a more dynamic form that implied movement, a sketch emerged that carried throughout the design process. While the form became more linear in appearance the circulation of the building is still very much centrally organized as in the original sketches. Several variations were tried, taking into account movement through the site, passive strategies and building organization before the final form was resolved.



Located in Milwaukee, Wisconsin, Park West Center for Learning is located just under three miles from the shore of Lake Michigan. The built program spans two lots on North Ave.

figure 40.0: figure ground



figure 41.0: site context map

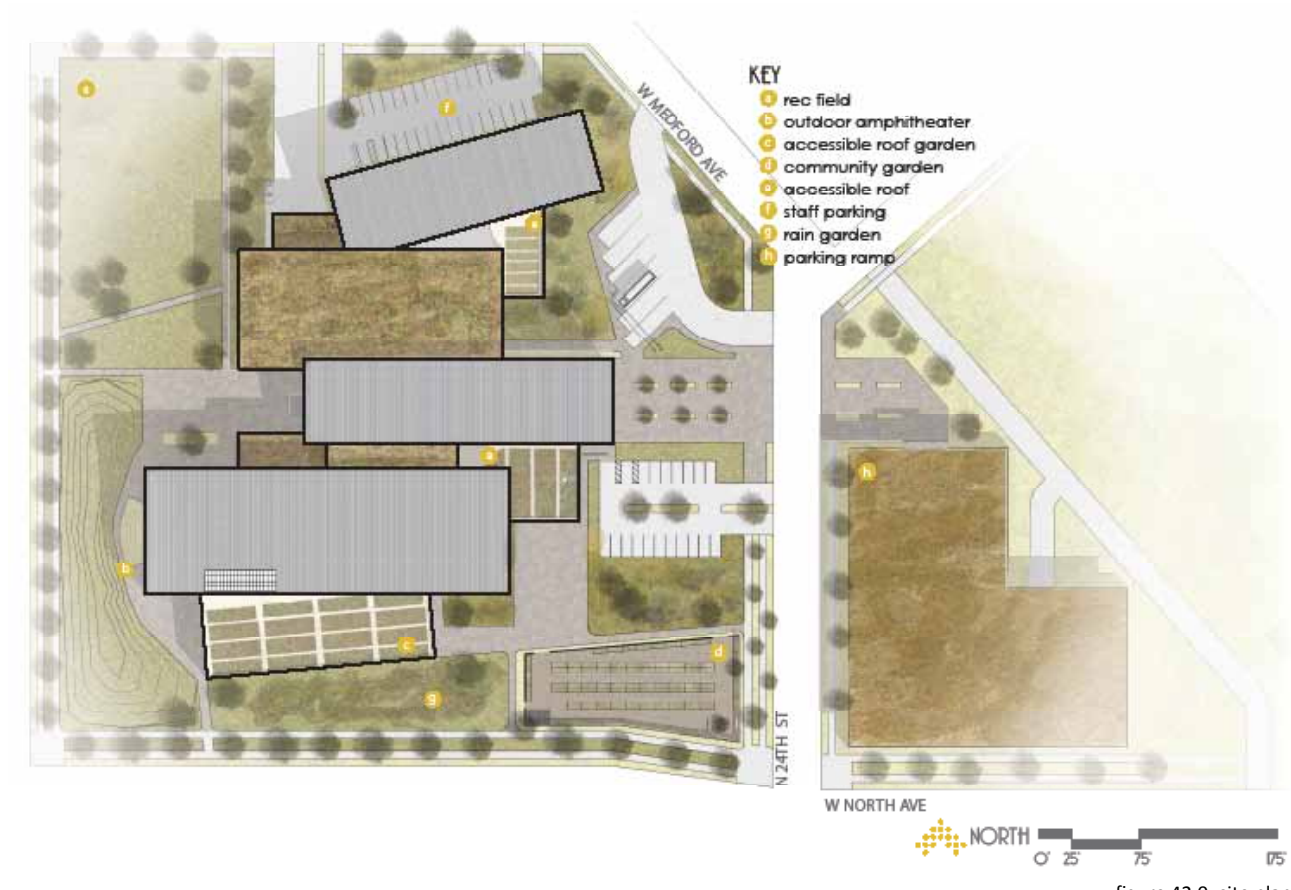


figure 42.0: site plan

The building site consists of several areas for occupants to utilize. The abandoned parking lot to the east was replaced with a parking garage to serve the needs to the learning center and future public use along Fond du Lac Ave. Amenities on the site also include a community garden, rain garden, outdoor amphitheater and rec field. The site was designed for a balance between public and private use; making it inviting to the public while at the same time keeping security of occupants in mind.



figure 43.0: east entry

Main entry on the east side of the building. Building materials consist of a grey brick with glazing and metal panel facade. During the development of the metal panel facade, the relationship between what was happening on the interior of the building and the exterior of the building became pronounced. Where more private spaces exist within the building there are more solid panels, and where there are more public spaces on the interior there is more glazing.

The outdoor amphitheater is adjacent to the interior auditorium allowing for dual use of the stage from either venue. The built up berm on the west side of the site allows for an extension of seating in the amphitheater and also provides for privacy from vehicular and pedestrian traffic.



figure 44.0: amphitheater



figure 45.0: first floor plan

COLOR KEY

- educational spaces
- community spaces
- shared spaces
- circulation
- service spaces

1ST FLOOR

- ① cafeteria
- ② auditorium
- ③ gymnasium
- ④ college/career center
- ⑤ main office
- ⑥ learning space
- ⑦ courtyard



COLOR KEY

- educational spaces
- community spaces
- shared spaces
- circulation
- service spaces

2ND FLOOR

- ① learning space
- ② media center
- ③ staff area
- ④ mechanical

figure 46.0: second floor plan

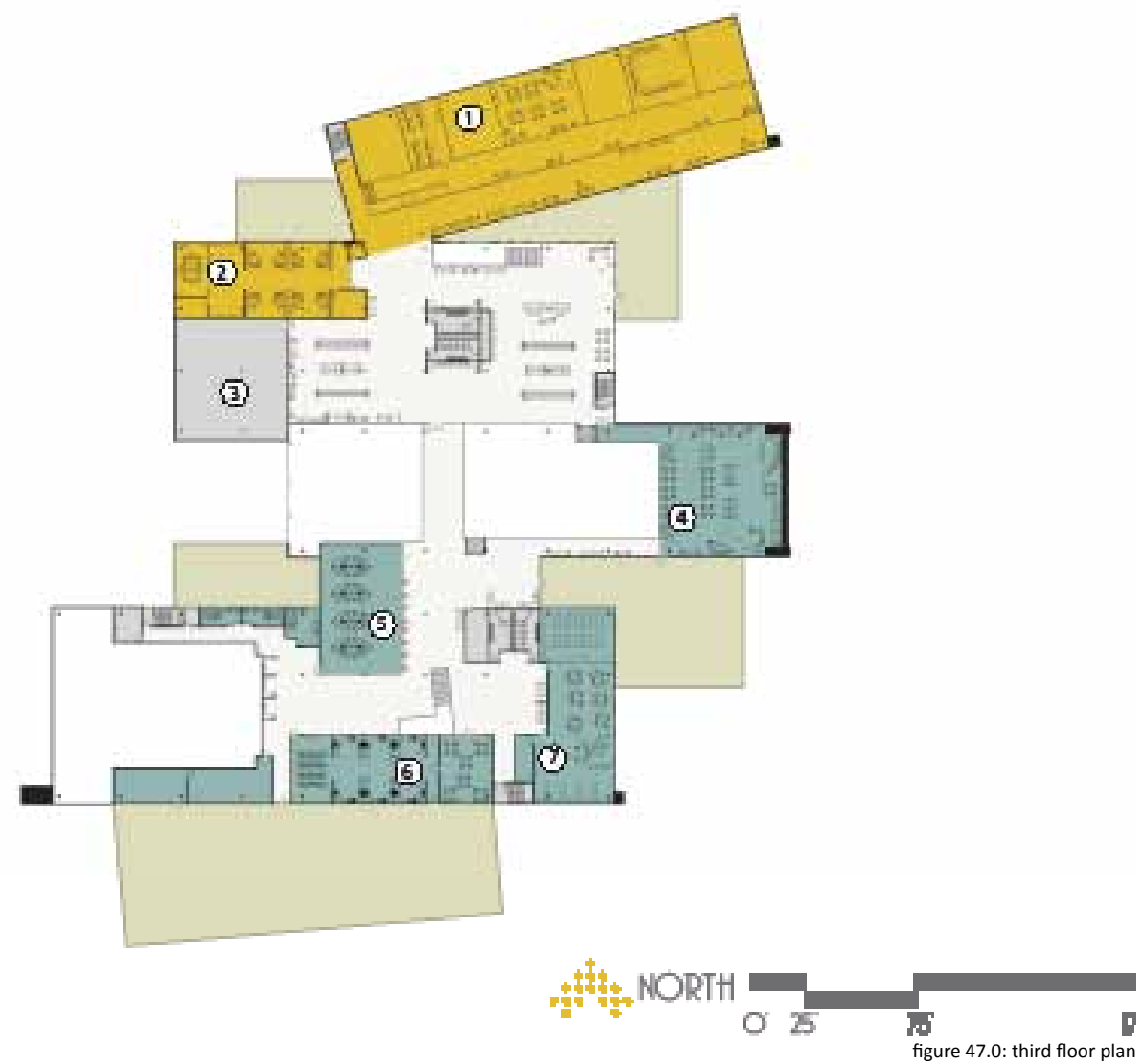


figure 47.0: third floor plan

COLOR KEY

- educational spaces
- community spaces
- shared spaces
- circulation
- service spaces

3RD FLOOR

- ① learning space
- ② staff area
- ③ mechanical
- ④ the perch
- ⑤ finance lab
- ⑥ culinary lab
- ⑦ family health lab

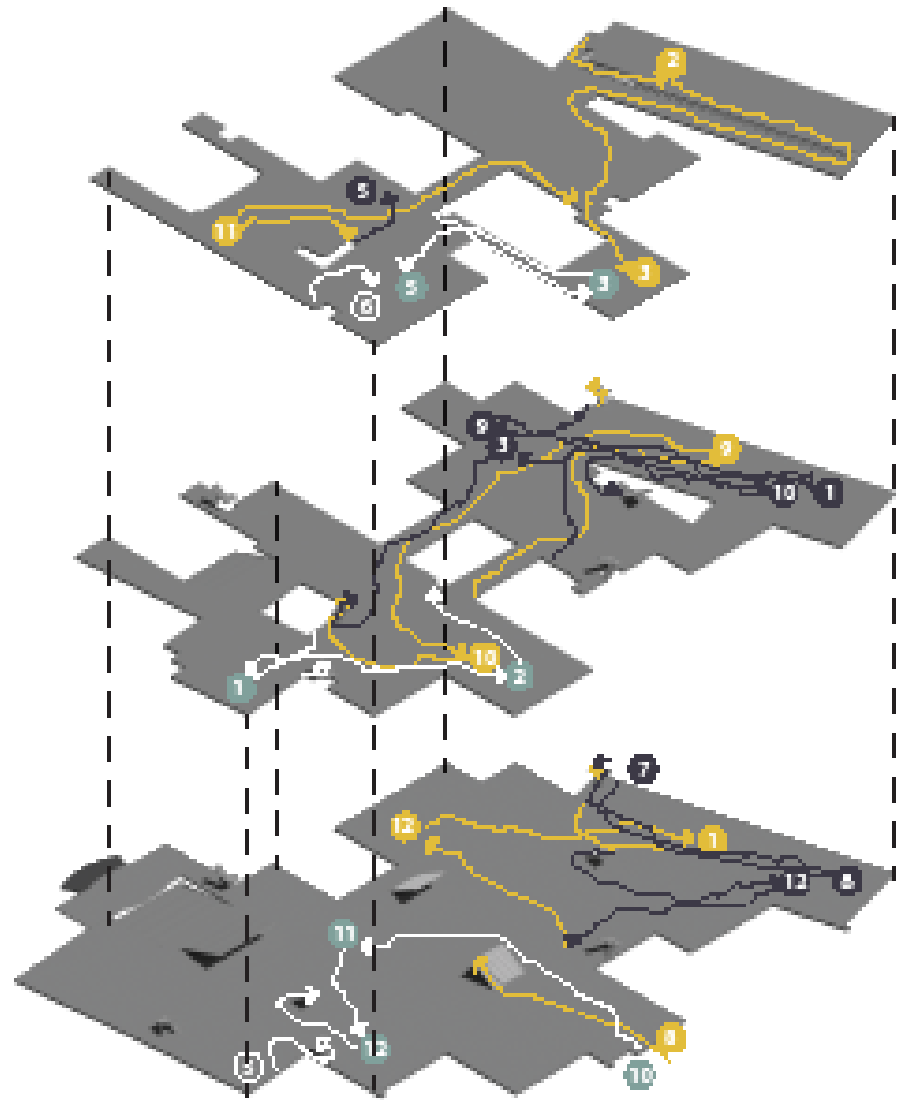


figure 48.0: movement through building

Movement throughout the building became an important element of the design process. The desire was to create paths throughout the building with nodes where interaction between the two demographics would join in collaboration. The image on the left depicts four paths taken through the building on a typical day: education staff, traditional student, community student during the day



figure 49.0: main entry

Interior entry on the east side of the building. Depicted above is the main atrium that runs east west through the building. This space is the crossroads and heart of Park West Center for Learning, it is the primary space where both demographics come together to socialize, collaborate and learn from one another.

Located on the north side of the first floor, the cafeteria is one of the main socializing and gathering spaces within the building. Ample daylight and vibrant colors make this a destination space for students.



figure 50.0: cafeteria



figure 51.0: learning space

The learning space is the epitome of flexibility and collaboration. The paneled walls and moveable furniture allow for re-configuration of the space to fit the needs of the class and class size. These adaptable walls also allow for the panels to be interchanged depending on the class being taught in the space.

In a desire to make the building's circulation about more than moving from place to place, collaborative spaces have been incorporated into the circulation space outside of the learning spaces. These spaces allow students the freedom to choose where and how they learn best. The transparent interior wall of the learning space allows for a connection between the spaces and allows this space to become an extension of the classroom.



figure 52.0: collaboration



figure 53.0: the perch

Located on the east side of the third floor, the perch, is the largest collaborative space within the building. The space overlooks the entire central atrium and provides plenty of seating options for both demographics to come together and socialize and collaborate.

Breaking away from the traditional school hallway where lockers line the walls and the sole purpose is in moving from place to place, the lockers have been placed into a lounge setting on the second and third floors to create more dynamic spaces throughout the building.



figure 54.0: lounge

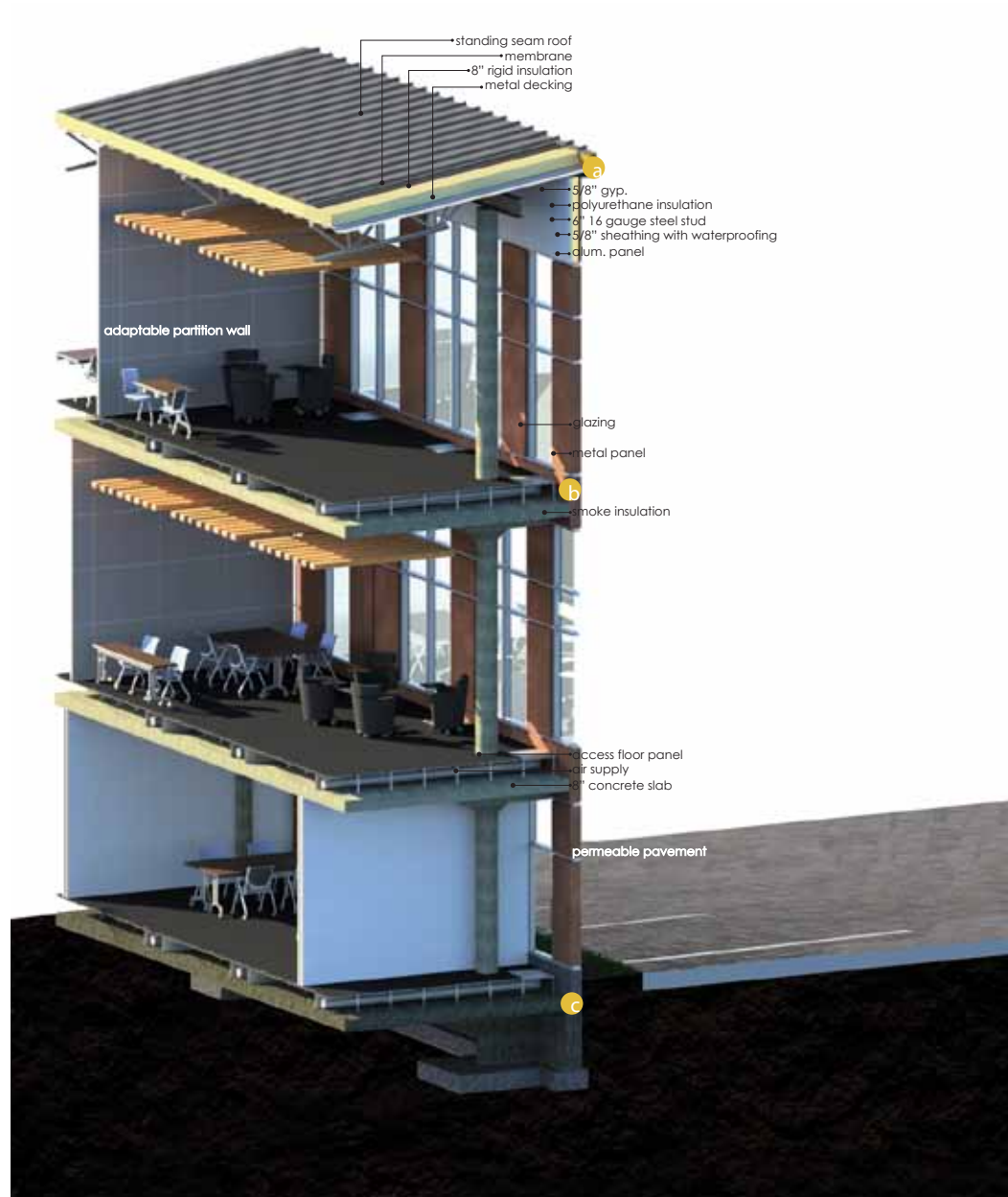


figure 55.0: section

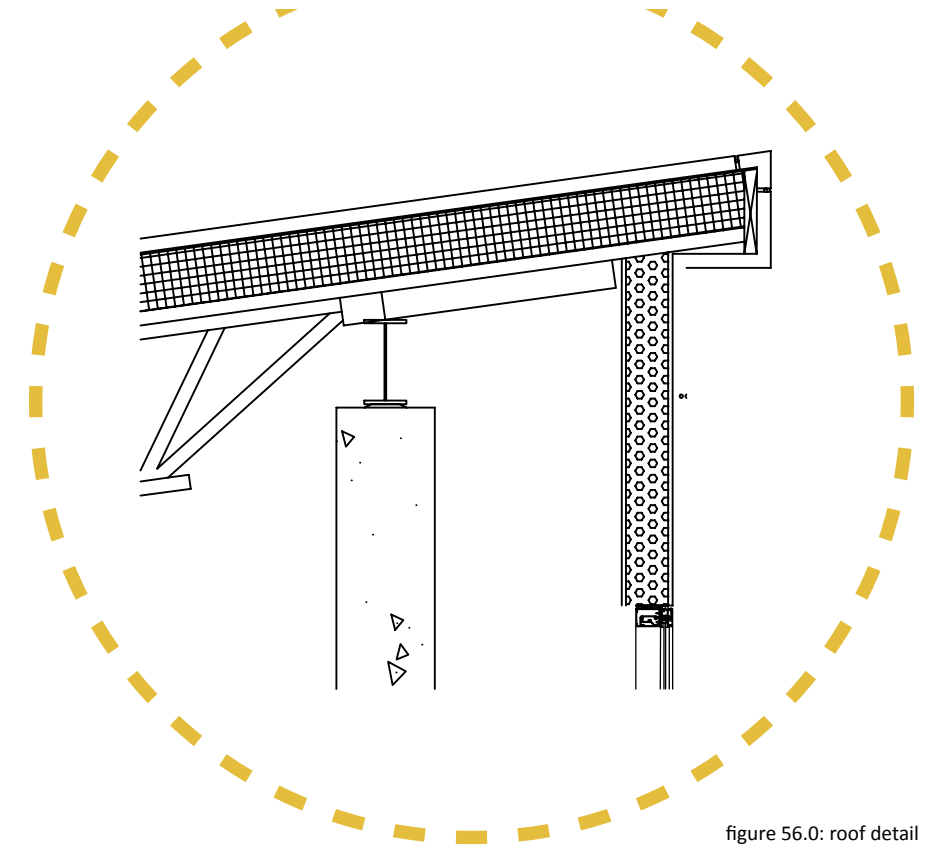


figure 56.0: roof detail

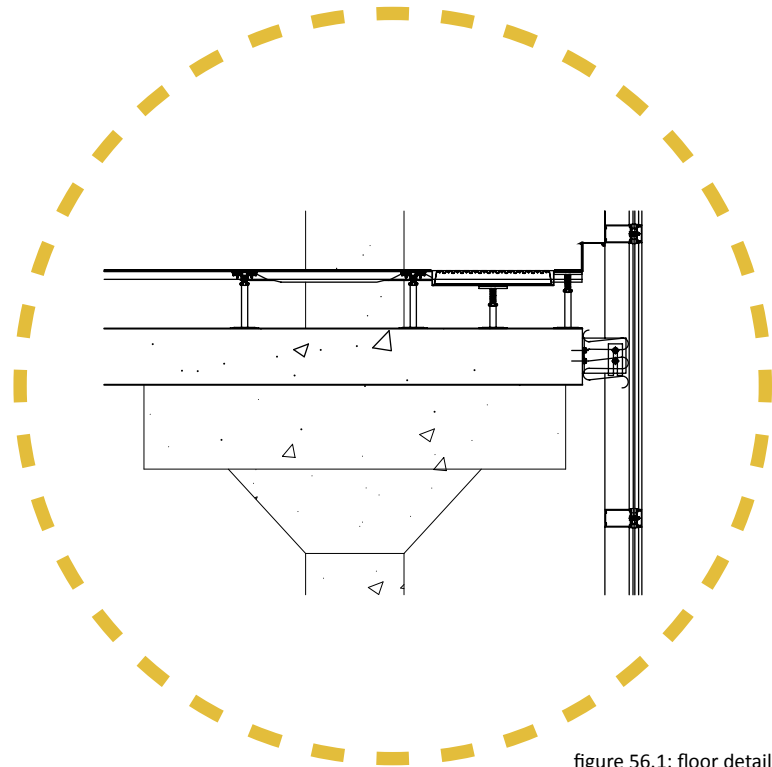


figure 56.1: floor detail

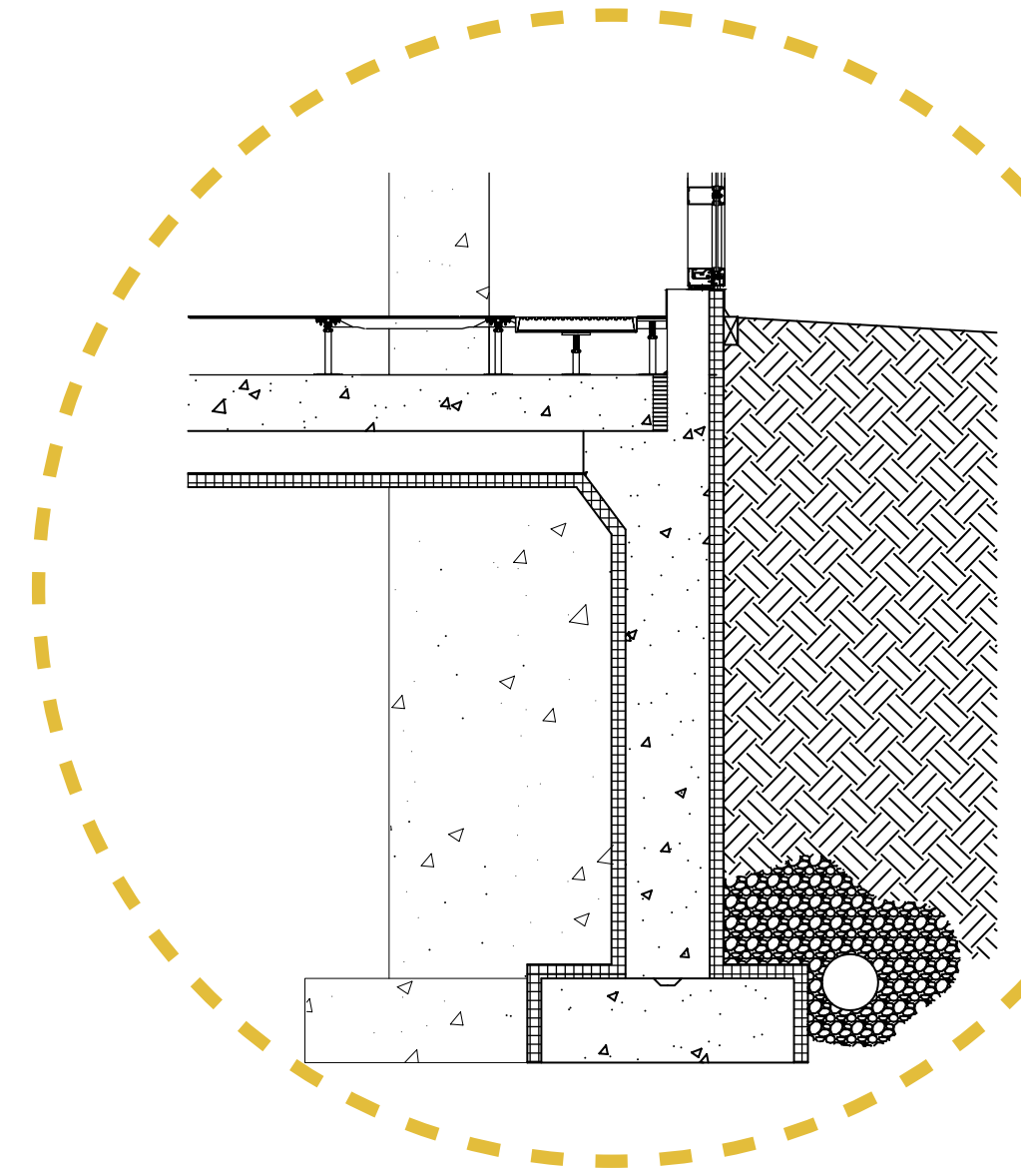


figure 56.2: foundation detail



figure 57.0: building section



figure 57.1: building section south

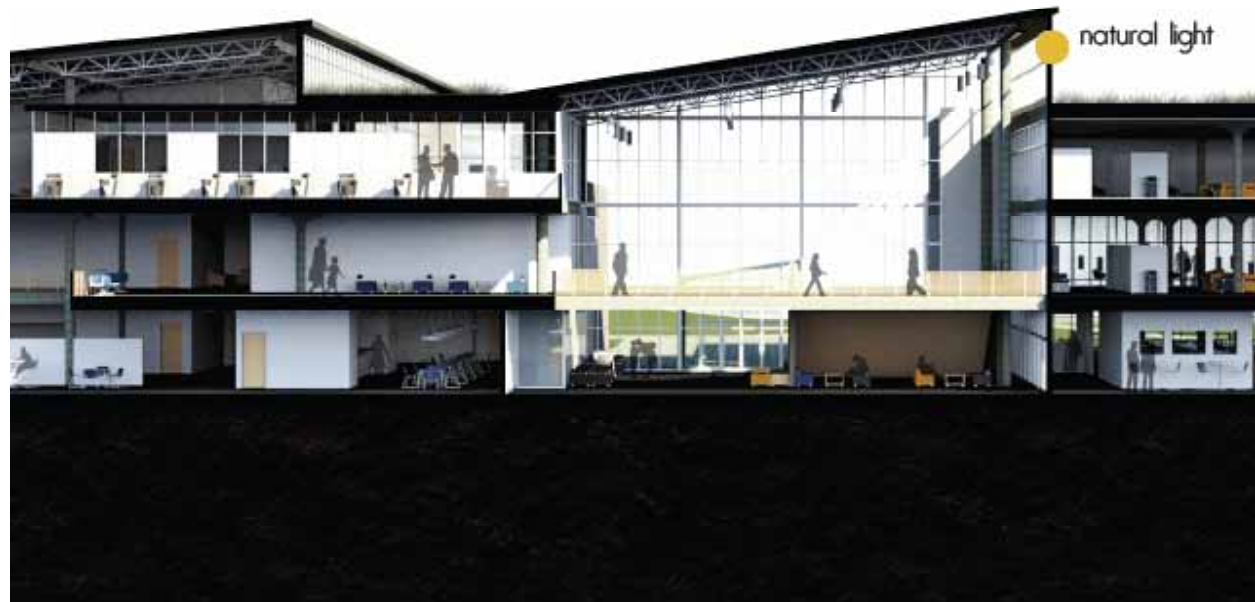


figure 57.2: building section center



figure 57.3: building section north

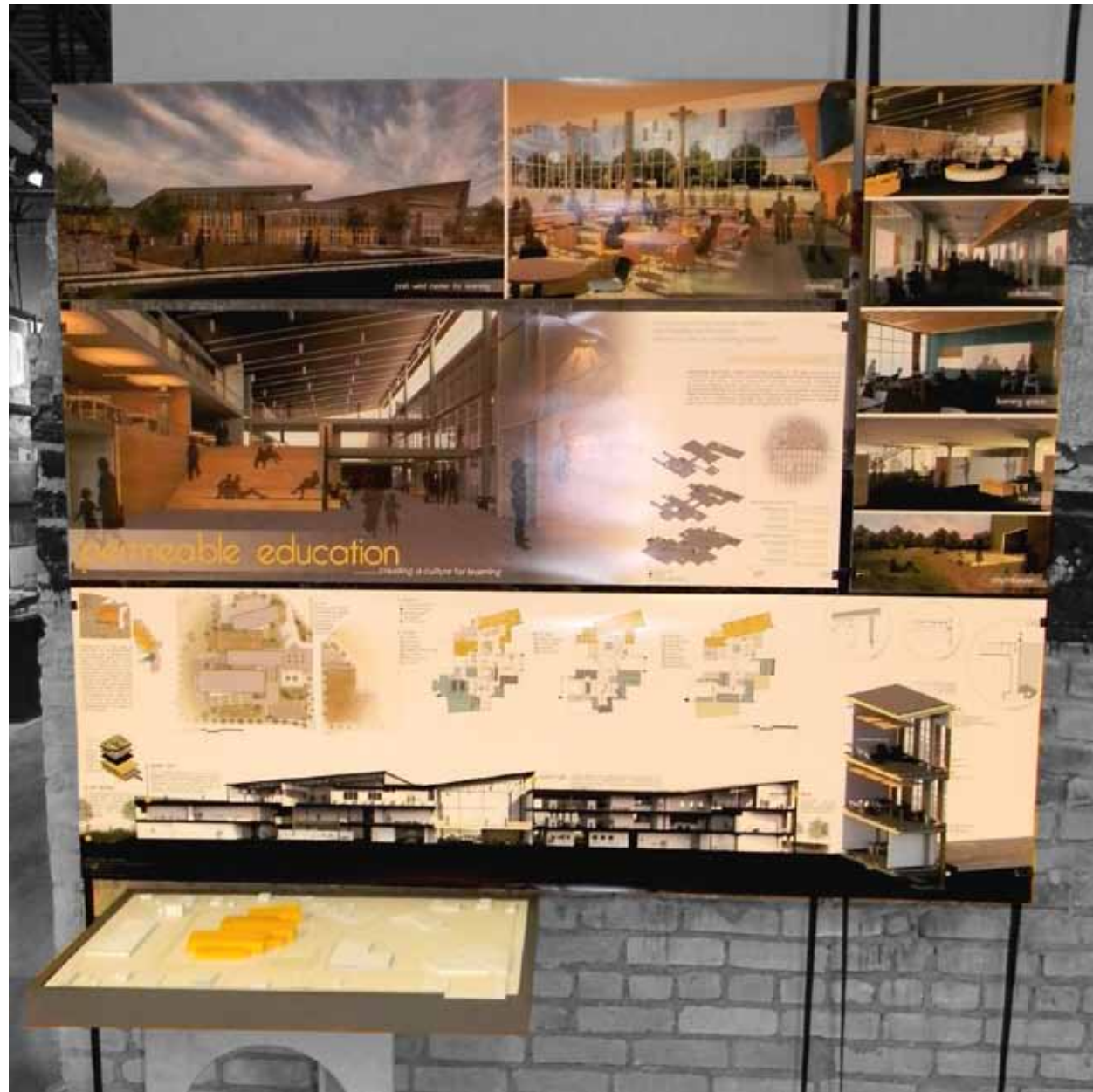


figure 58.0: thesis display



figure 59.0: model

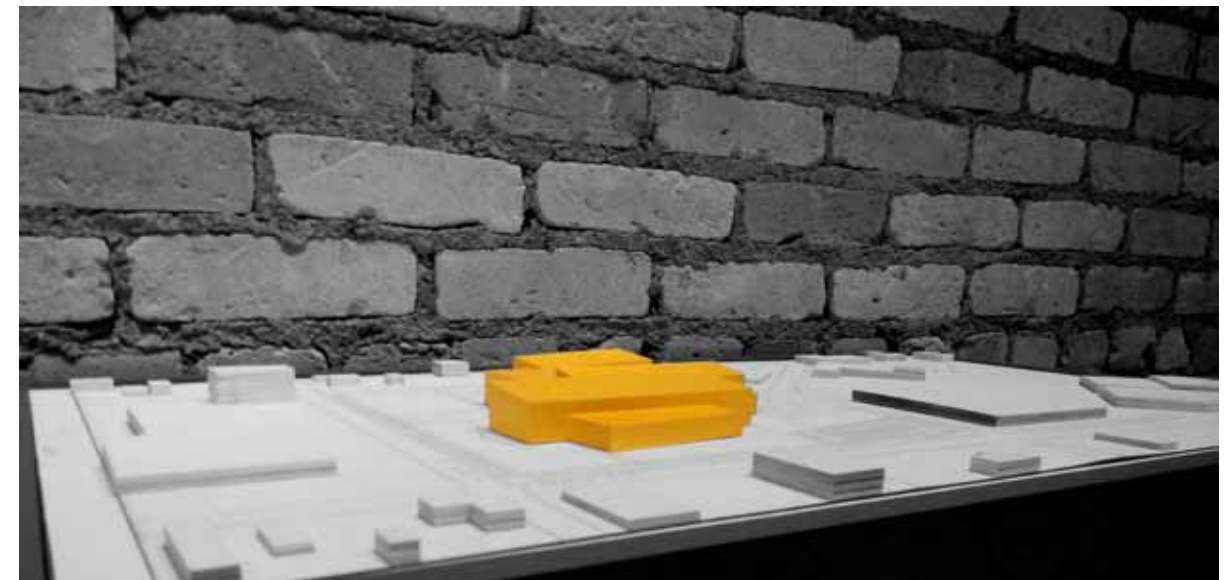


figure 59.1: model

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*listed in order of appearance

⋮⋮⋮ | personal identification | ⋮⋮⋮

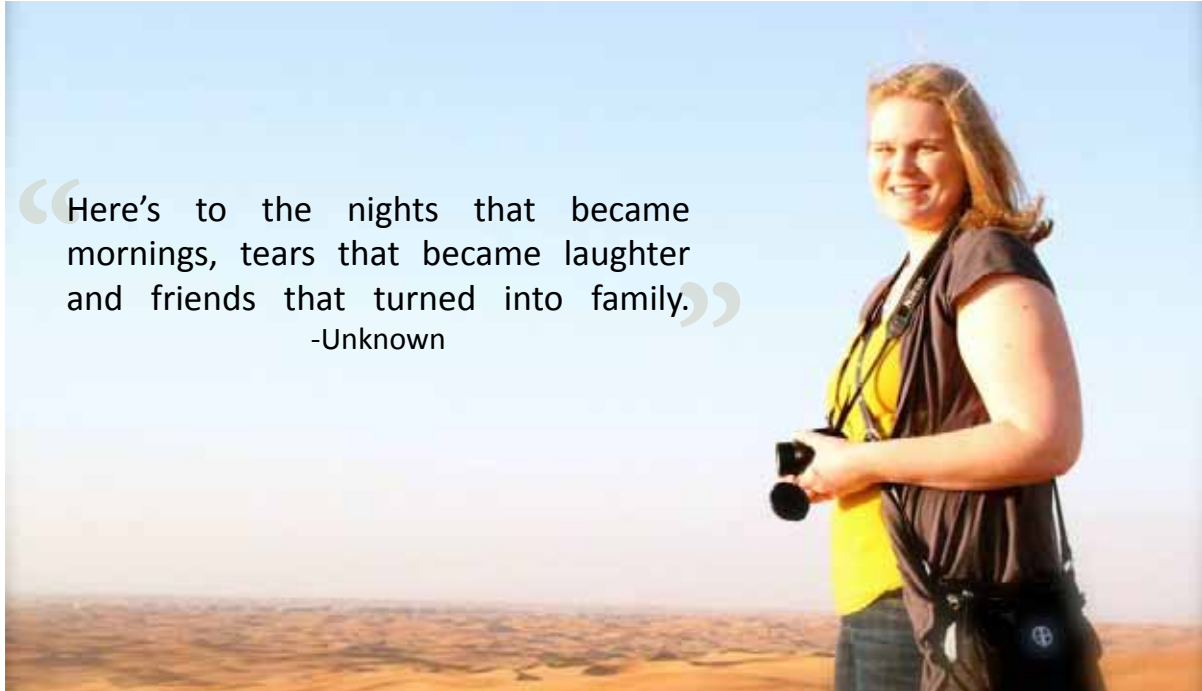


figure 38.0: Personal Image (see references)

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I dedicate this work to all of those who have always believed in my dreams and have helped shape me into the person I am today.

To my family, for always believing in me, even in hard times, knowing that my dreams would one day become a reality. To T, whose encouragement early on inspired me to pursue architecture as a passion and taught me that in the end it's all about love and peace. To my professors at NDSU who have nurtured my passion and allowed me to explore architecture on a deeper level, and To my friends who became family. I came here alone and now I leave with a family who are my strength and have changed my life in ways they do not even know.

Without all of these people I would not be the person I am today, and for that I cannot thank them enough.

..... | *thank you* |