

badlands agriculture and environmental research center

DESIGN THESIS

badlands agriculture and
environmental research center

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

By

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This project, titled Badlands Agriculture and Environmental Research Center, is an examination of local agriculture and how it can be reconnected to a larger community. This project fits into a research/living/learning center typology that is more agriculture urban, rather than urban agriculture. The idea behind this investigation is that we have lost a connection with food production. There is more concern in recent times about food sourcing and contamination. This investigation seeks to bridge that gap on how communities can reconnect with farmers in the area and source and learn about initiatives, such as farm to table and value added agriculture. The primary clients of this facility are the researchers

and students that will live there. The community at large also benefits from this facility. This facility is situated in western North Dakota, with proximity to Dickinson, but amongst the prairie. The building is also roughly 200,000 square feet. The emphasis of this project is reconnecting people to the source of their food and educating them along the way. This project will proceed by pursuing farm to table agriculture and healthy building environments that foster a sustainable lifestyle and nurture human health. Documentation of this process will be accomplished through research notes and photography at major developments of the project.

ABSTRACT

Keywords

healthy architecture, farm to table, value added agriculture, prairie landscapes, western North Dakota, living/learning center, hands on education, food production and sourcing, researchers, lab work, badlands, agriculture, environmental, research, center

PROBLEM STATEMENT

How does design positively influence human health and nurture a sustainable lifestyle?

STATEMENT OF INTENT

STATEMENT OF INTENT

Project Typology

A living/learning center with hands on education facilities.

Claim

Design is capable of changing the way humans live their everyday lives and contribute to a healthier lifestyle. We are surrounded by the designed environment, and it is able to affect the way we lead our lives. Our built world is always around, in the background, and is able to influence a person through its design.

Actor: Designed environment

Action: Influencing our lifestyle and education

Object Acted Upon: Humans health, lifestyle, and knowledge

Manner of Action: Through design controlling environments, and decisions able to be made in a given area

Premises

Actor: “People spend more than 90% of their lives within buildings” (McCoy, 1998). Our buildings are always around us.

Action: Since we are always surrounded by a built environment, it is able to act on us in plenty of ways through options, features, and architecture.

Object Acted Upon: People are the sole reason for our built environments.

Manner of Action: By changing our built environment into a designed environment where human health, lifestyle, and knowledge is at the root of all decisions made in a design that people will come into contact with.

Theoretical Premise- Unifying Idea

Humans will ultimately lead a longer life and have a more symbiotic relationship with agriculture and buildings through immersion in a designed environment. This environment seeks to assist in everyday rituals by providing designed solutions for our many needs during the day.

Project Justification

Humans are facing an attack from within ourselves. Our consumerist nature is out of control, and not only is it putting our own mental and physical health at risk but also the resources of our planet. By looking at the spaces we utilize most, the architecture can provide a clean slate for education to take place and promote a healthful relationship with each other, and the environment.

THE PROPOSAL

NARRATIVE

What is the impact that local agriculture has on an area? Can it be connected to a larger community in which both prosper and educate? Food production in recent times has come under a lot of investigation into its processes and chemicals. If we can reconnect people with the agricultural world from which our food comes from, we can bridge the disconnect and be educated along the way in wellness.

We are constantly surrounded by the designed environment. It is always present in everything that we do, albeit in the background. Therefore, buildings are able to have a major impact in the shaping of our lifestyles. Through immersion into a designed environment, where well-being is a primary target, real lifestyle change can occur.

These designed environments will have even more of an influence on us than just a standard built environment to accommodate us. A designed environment will accommodate us but not aid in the destruction of our lifestyles and health. Full immersion into a designed environment also has the ability to educate its users through its design. This ability to act upon our human health, lifestyle, and knowledge is what sets apart a truly designed environment. The occupants and users of any such building will ultimately benefit from the experience of such an environment. One may not realize at first, but experiences in such a facility will be able to impact a person's health and lifestyle. It may be done by simply educating people through the building's construction and purpose.

Environments in which the users are

controlled by the design will have the biggest impact on change. Through different strategies implemented, a design will be able to have an active role in the different areas of wellness. A building that promotes the essentials of food, water, and shelter will have a large impact in addressing the consumption that has been traditionally handed down. Actively promoting sustainable consumption of resources, from building materials to food production, will ultimately help humans lead longer lives. There is a more symbiotic relationship to be had with our environment that can be taught through a thoughtfully assembled building. This environment seeks to be in the background, assisting, because change cannot be forced upon anyone; it will always be present in its users, aiding in education of wellness.

USER-CLIENT DESCRIPTION

Area Students

With the research being conducted here, it is important to reach out to area students and educate them in the works of this facility and possibly teach classes. There are also opportunities for events to be held and encourage habitual visits.

Facility Residents

There will be a group of students, faculty, and researchers that will inhabit the building on a daily basis. Because it is a living/learning center, there will be housing for students associated with affiliated programs.

Travelers

This sort of a facility will garner some attention from travelers seeking a place to visit in town that has ties to agricultural background. The kitchen facility also has the ability to bring people in from the region and introduce them to what this facility is all about.

City Residents

This building will be in close proximity to the larger city, encouraging residents to come out. City residents will primarily be there for special events, enjoying the area, or partaking in the kitchen either through job or leisure.

Colleges

Through partnerships with the local college and research center, outreach can be obtained in colleges throughout the state, as a course option in learning about environmental issues and community interaction with the agricultural world.

Library

The library on site will feature books of immediate use to the students and researchers. The library will also be connected to the larger university system, utilizing loans

Large Gathering Space

There will be spaces set up within the building that are capable of becoming a large reception space for meetings, conventions, or events.

Lab and Research

This portion of the building is where the students and faculty spend their time, conducting experiments for different funders, as well as connections with the greenhouse, community gardens, and larger plots.

MAJOR PROJECT ELEMENTS

Storage and Shop

This room is able to store the machinery for the grounds and tools and equipment for maintenance projects and building work.

Residential Area

This is dorm style living for the students using this facility, with shared spaces to form a community. There is also off site residential areas close to the main facility, for families of researchs and faculty.

Conference Room

This space will be primarily used as rentable space for area businesses.

Education Rooms

There will be a number of rooms throughout the facility that can be used as classrooms both for the students who live there and for visiting classes and conferences to utilize.

Kitchen

The kitchen will be shared between a do-it-yourself meal prep education center, and the gourmet restaurant that will cook a varied menu for residents of the city. There will be an auxiliary kitchen for residents of the facility to utilize.

Restaurant

A gourmet restaurant that serves a varied menu of locally produced food.

Community Garden

This is an accessible area surrounding the facility that features rentable garden space for the community.

Greenhouse

An area used for plantings that need year round care or have special climatic issues.

SITE INFORMATION

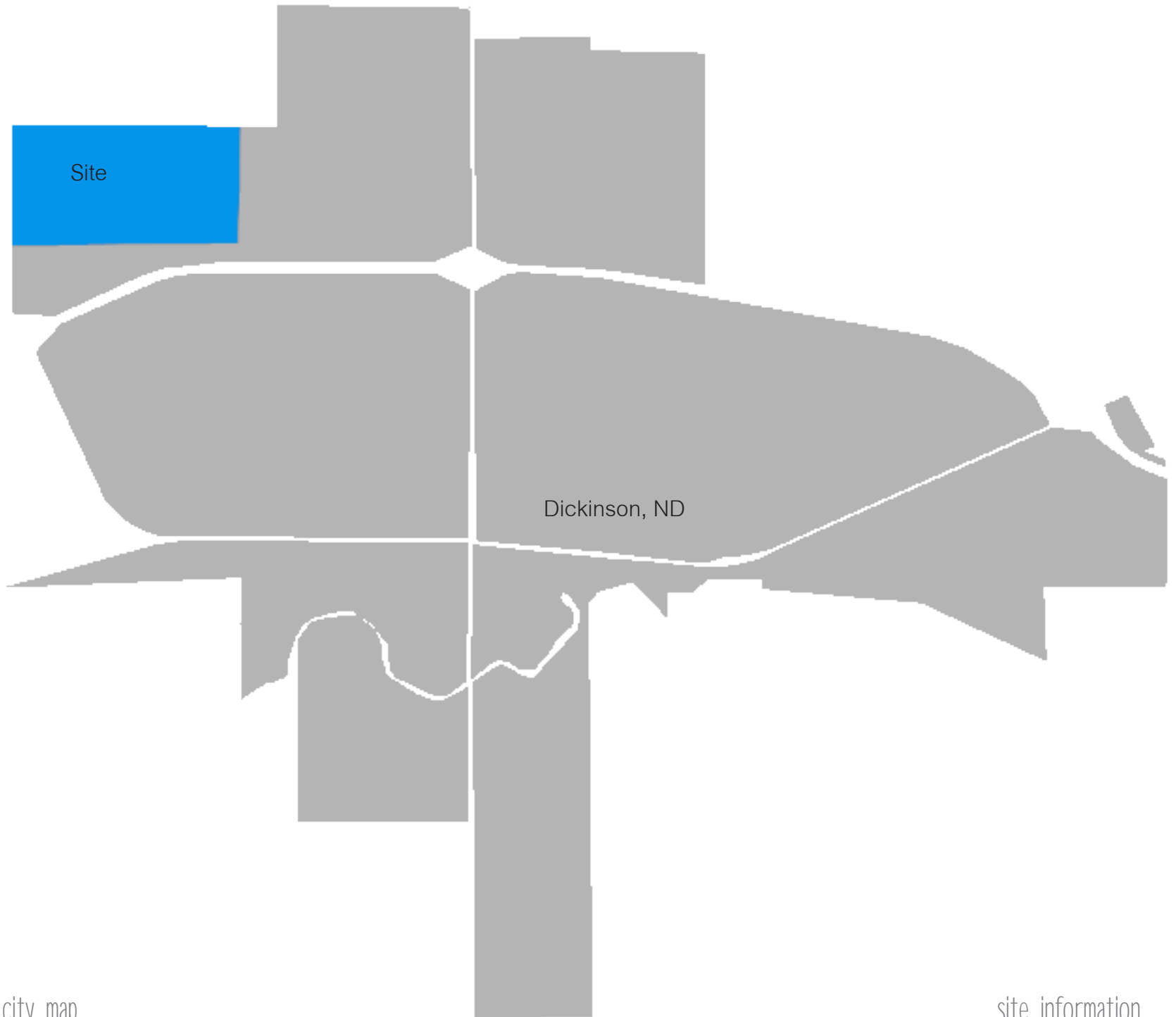
Geographics

This site is connected to the I-94 business loop on the east and south of I-94 in area. There are no transportation links from the site, but it can be accessed by car and other non-motorized forms of transportation. This site is 16 million square feet. The site is close to several important areas within Dickinson. The Dakota Dinosaur Museum is fairly close, as are both high schools and the state college. The site is also near the Dickinson Research and Extension Center, as well as the West River Community Center, both of which would benefit by being nearby. The views around the site are open vistas of the surrounding prairie and an overlook of western Dickinson.



Importance

This site is particularly important because of its location amongst midwest agriculture. It is also located close to a major city in the area, where there happens to be food shortages and inflation of prices, as a result of the influx of people. By providing an education center with emphasis on local and sustainable agriculture in the region, it will help alleviate the problems of the stores and overall help the people of this community lead a much healthier life.



PROJECT EMPHASIS

This project revitalizes our connection with agriculture and the environment through a designed facility that seeks to nurture an educational experience that aids in human healthfulness. Connecting the community with the origins of sustainable food production and the means of cooking with local produce in an encouraging prairie environment will aid in the human experience of changing ones lifestyle. This building has to be accessible to a multitude of people in order to begin effectively making changes.

Data

Quantitative data will be primarily conducted and recorded through archival searches of appropriate journals and books. The qualitative data will be conducted through archival searches as well but will also feature analysis of the site and area, and interviews conducted with a regional expert in the sustainable and local agriculture movement.

Documenting Design Process

The documentation of the project will be conducted bi-weekly by digitizing any hard copies, as well as by backing up digital work done up to that point. The project will be preserved digitally primarily, but hard copies will also be stored. The information gathered will ultimately end up in a digital presentation to peers and faculty. Upon the conclusion of this project, the information will be made public by depositing the work into the Institutional Repository of North Dakota State University.

Design Methodology

A Concurrent Transformative Strategy will be employed in gathering research for this project. The qualitative and quantitative data will be gathered routinely throughout the process and the information that is relevant to the theoretical premise will be furthered along in the investigation. The data will be interpreted through different graphic and digital models and designs. Research conducted on site and through archival search will be done at the same time and represented through text and graphics, as appropriate.

PLAN FOR PROCEEDING

Research Direction

Research will be conducted for the theoretical premise through a look into environmental psychology. The project typology will be further understood by reasearch into similar case studies. The historical context and site analysis will play a large role in understanding the area in which this facility is sited, and the roots to which it will be planted into. Programming requirements will be met through investigations into the field and case studies.

SPRING SEMESTER SCHEDULE

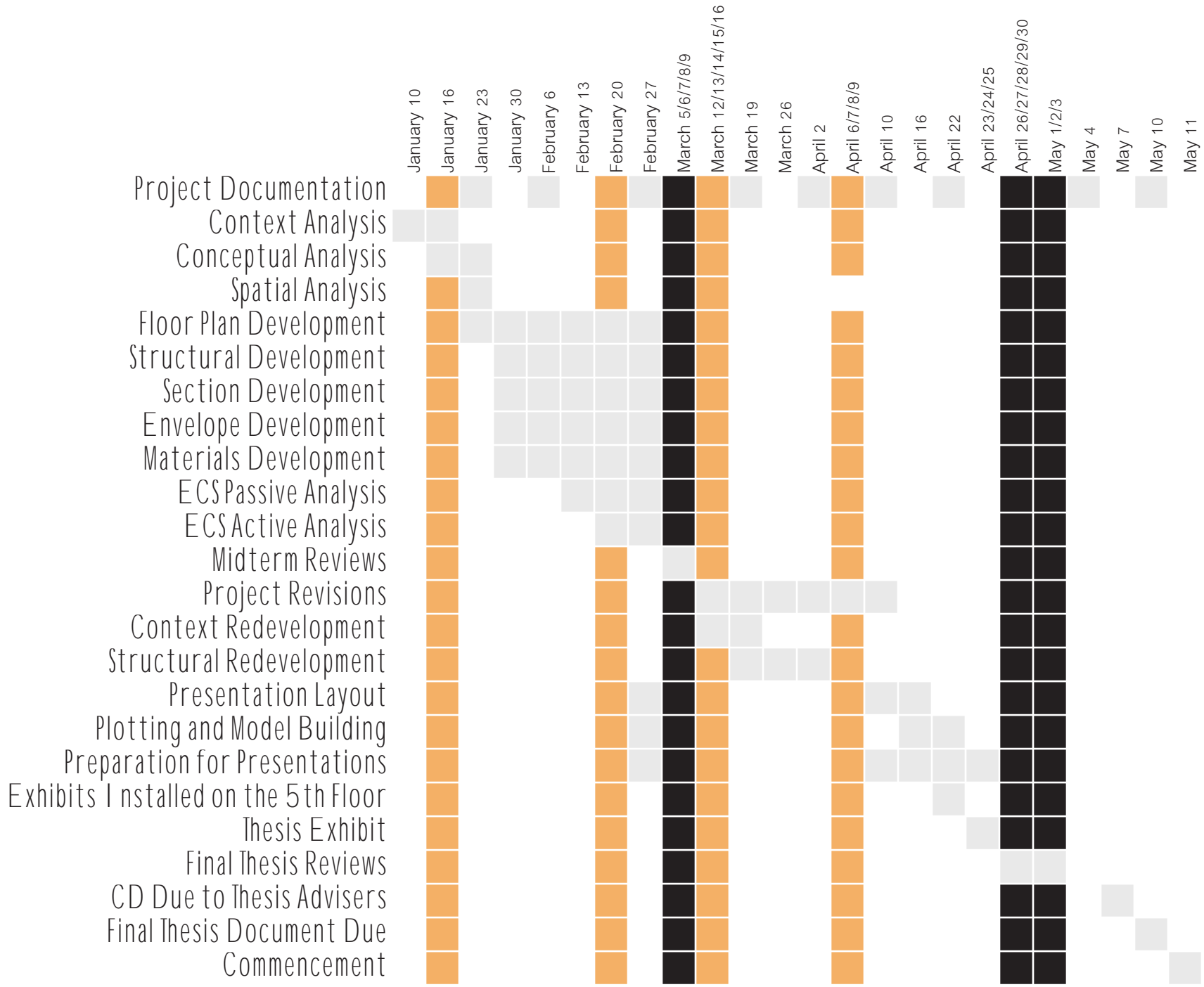


figure 3 schedule

PREVIOUS STUDIO EXPERIENCE

2008

Fall ARCH 271
Second Year

Heather Fischer

Tea House

Meghan Duda

Boathouse

2009

Spring ARCH 272
Second Year

JoanVorderbruggen

Dance Academy

Dwelling

Fall ARCH 371
Third Year

Cindy Urness

Center for Excellence

Wellness Center

Snow Sculpture

2010

Spring ARCH 372
Third Year

Milt Yergens

Ag Research Center

Fargo Infill

Fall ARCH 471
Fourth Year

David Crutchfield

High Rise

2011

Spring ARCH 472
Fourth Year

Malini Srivastava

Passive House Design Build

Fall ARCH 771
Fifth Year

CindyUrness

Minnesota Experimental City

2012

Spring ARCH 772
Fifth Year

Cindy Urness

Thesis

THE PROGRAM

RESULTS
FROM THE
THEORETICAL
PREMISE OR
UNIFYING IDEA
RESEARCH

Doctors and hospitals- no, this is not the title of a new soap opera but a far more likely future for many of us. Humans have been progressively tipping the scales toward an unhealthy lifestyle for many years now, and it is beginning to catch up to us. Problems, such as obesity, heart disease, and mental illness, are on the rise, and people are looking for answers as to why. Is it as simple as a basic lifestyle change?

Immersing ourselves into a designed environment and a new lifestyle that is centered around healthful solutions to the everyday tasks and spaces we come across may be a solution. The designed environment of such a project needs to aid the program by providing a

destination, while at the same time fitting peacefully into the background, providing the means for healthy solutions to be presented. In this case, the healthy options pursued are sustainable agriculture and education. This pocket of healthy choices in essence becomes a livable community, even though it is standalone on the outskirts of town. This thesis revolves around sustainable agriculture and the research and education of the topic. Upon interviewing several professionals, it was found that such a building could prove vital in the sustainable foods movement. Often, the case with the sustainable foods movement is lack of awareness.

Sustainable Agriculture

This movement has been around for a while and has a strong following, but the facilities and means of education just are not there yet. Consumers are frustrated because they know there is something better than most of the stuff they see in stores, but they do not know where to go or who to talk to. Farmers are frustrated because they have plenty of products to offload, which they would prefer to do locally, but they do not have the facility to do such or knowledge of the consumers' demand.

Frank Kutka, a sustainable agriculture researcher at the Dickinson Research and Extension Center, is a big supporter of community supported agriculture, and he had a lot to say about sustainable agriculture and a facility associated with it. Kutka reflected a lot upon issues that have arisen at farmers' markets he has

been to, and, oddly enough, a lot of them can be fixed through design. One of the big aspects he mentioned is that the area has to reflect upon the food. When people are selling their crops out of parking lots, the environment reflects poorly on the good food trying to be sold. There is also the issue of competing with other neighboring facilities, and because the farmers' market is less known, it often loses out. Another key issue Kutka brought up was parking. In most farmers' market areas, parking is a disaster, and it often deters people from the market. In Dickinson as well, he noted that the current food infrastructure cannot handle the people right now, alluding to an option here for another food source to rise up. Kutka echoed that such a place needs to be friendly to visit, with plenty of things to see and buy.

He said one of the major problems farmers' markets face is the initial rush of people to get the food, but after about 30 minutes it is almost completely dead; there is nothing at the market to keep people there. This reveals the opportunities for education revolving around sustainable foods. As Kutka noted, most people do not even know what these crops look like before they are canned or processed, and even more people do not know what to do with them. There is a real possibility of extension work the sustainable foods market. This facility has the ability to educate people from seed to plate. There will be a

process that allows community members to follow the planting of a crop, all the way through harvesting, preparation, and cooking. Kutka agreed that it is one thing to have sustainable foods, but it opens up a whole new ballgame when people can be educated and learn hands on about them; it provides the means for this to stick with people and keep them coming back. (Ringwall, 2011)

In an interview with Abby Gold, a health and wellness professor at North Dakota State University, many of the same topics came up about reaching out to communities and awareness. However she mentioned that North Dakota has always been a leader in sustainable and

organic crop production, and may have even been the start of the organic crop movement. The problem, she says, is that nobody knows this. It is sad that our food shed is as large as it is, when in reality, the majority of it comes from right here in North Dakota. Gold would like to see more education opportunities for the next generation, because more people are going to be coming from urban areas and we are going to lose something as the next generation takes over. By being proactive in the outreach of sustainable crops we have the opportunity to keep a knowledge base alive and further it into different realms. (Ringwall, 2011)

Livable Communities

Many of the points that Kutka and Gold brought up were reflected upon in an issue of *Architecture MN*, dealing with livable communities. This article was written by ten local professionals in relation to the American Institute of Architects' ten points for livable communities.

Sarah Harris, executive director of Walking Minneapolis, writes about the importance of human scale. There needs to be places where people can meet each other, as well as easily navigate and discover options along a pathway. Harris notes that these spaces need to be clean, as Kutka stated as well. No one will care about this place if it is dirty and in disrepair. Clean places allow for discovery and gathering options. People will gather there because they are able to be connected to one another.

Joe Dowling, director of the Guthrie Theater, commented on vibrant public spaces. Dowling experienced firsthand the design process with Jean Nouvel, and sees every day the power great design has on bringing people together. Surrounded by good design and good people, we are often delighted at even the simplest of experiences, such as shopping for food. It takes something that is usually a chore, and turns it into an event, a place where people can gather and enjoy each other's company in a fun and vibrant setting.

Chris Coleman, mayor of St. Paul, advocates choices and variety. Things need to be varied to maintain our interest longer, it cannot look institutional. He also states "I come home with an armful of produce, half of which I can't identify and don't know how to cook."

Those statements show that people have an interest in these sustainable foods, even if they do not know what it is. This speaks largely to an option of educating the community about these foods and what to do with them.

Brenda Langton, a restaurateur, speaks about the neighborhood identity that is developing in the Mill District, largely built around the expanding Mill City Farmers' Market. She quotes "Food is medicine" which is pretty accurate, food is one of the few things that we require to survive and it is quite powerful at bringing people together. Langton mentions that being surrounded by good design definitely

does no hurt the feeling in the neighborhood, showing the power good design can have. When speaking about the green trend and environmental health issues, Langton says that supporting the locally grown foods market is a great way to start a person and neighborhood on the right track of a healthful way of interacting with the environment. Shane Coen, landscape architect, really tied it all together. Coen's writing was the principal of conserving landscapes. Coen states the reality of things, that most landscapes are well on their way to being developed, but it is how we develop them that is important.

He says that because of this, we really have to bring design to the forefront so we are. not just creating waste lands that no one wants to inhabit; we need to conserve what we have left and smartly develop what we have. Coen mentions the power of open space, and that we need to do our best to make sure it stays that way. We need to quit doing faux aesthetics and stick with materials and designs of our time, as they complement each other better. Coen also mentioned that we need to let the professionals in their respective fields do their work. Bridging gaps is great when we have committees; however, let each field do what it is best at.(Carl, 2007)

Marketing Strategies

One of the biggest problems facing the sustainable agriculture movement is exposure. Marketing plays a big role in the success of any business, and it also plays a big role in the sustainable agriculture movement. However, the marketing involved with sustainable agriculture is a little bit more varied and different than what we might be thinking. There are several ways within which farmers can market their products. Several of the big ones are farmers' markets, community supported agriculture (CSA), on farm sales, and agritourism.

Farmers' markets are probably the most common and easiest to get into. The number of farmers' markets has increased to about 4000, which is more than double the levels they were at back in 1994. This

is a reflection of the growing popularity of farm fresh food. There is a loyalty that is established between farmers and consumers at these markets that benefits both. People really want to know the farmers providing their food and really understand more about how it gets to the dinner table. Farmers' markets such as the one in Milton, Florida, partners farmers and Sustainable Agriculture Research and Education (SARE) bringing the market to the attention of people. In this case, while the farmers' market is going on, they have established cooking demonstrations at the market to show people how to cook all the food they can buy. In the future they are looking towards other partnerships, possibly within universities to encourage a wide range of people being involved at the market.

There are a couple of guidelines set forth about farmers' markets and what to look for. According to a SARE Network publication, successful farmers markets should be located in busy, central places and be well publicized. Another point was to not deliberately or drastically undersell the fellow marketers. The reason for this is because the more people that are marketing, the better the success for everyone attending. Another reason for this is that while getting started in the sustainable agriculture movement, a lot of work is necessary that often involves enlisting help and forming co-ops with other farmers. Farmers markets also rely on good market management and firm set of rules that are enforced. This speaks to an organized area, as well as committees that are capable of overseeing the market, and not just a tossed together

event in a parking lot. Lastly, the publication mentioned seeking feedback from your customers. This is similar to the research that needs to be done, mentioned below. Understanding the customer's needs can open up a lot more opportunities and allow for the next year's harvest to be more fruitful.

Another successful venue for marketing farm fresh produce is the CSA, or community supported agriculture. In this instance, members from a community invest in a local farmer's operation, by paying upfront for a share of the crops once they are harvested. This is a really interesting venue for both the farmer and the consumer, because it takes the interaction to a more personal level, and often the consumers can visit and even help out on the farm to which they contribute.

One of the biggest parts of the CSA is deciding on what to do with the harvest. Some farmers have the consumers come out to the farm and pick it up, some make deliveries, and others have a centrally located spot where they make drop offs. Some CSAs are also co-ops, which makes the delivery a little trickier still. The SARE publication is getting at what Kutka mentioned in needing a clean place to operate that reflects the quality of the food.

In a similar vein to the CSA is on-farm sales. This also is capable of being tied into agritourism. Like Kutka said, in order for sustainable agriculture to really catch on, the events that are held have to be widely publicized, held in a facility that reflects that nature of the food, and be a

destination in its own. On farm sales and agritourism try to capture that last one. There is no doubt that people like to see where their food comes from; in many cases though, it is inaccessible for the majority of the public. More likely, most of our food does not even come from the same state we are in, even though it is growing all around us. The on farm sales can be successful, but it is hard to tap into and takes a great deal of investment. People need to have something to do while they are out there too. Farms that do try the on farm sales also have seasonal crops that can draw crowds, like a pumpkin patch. This is a great way to get the family out on the farm and perhaps get some business out of the deal. (Hartenfeld, 2007)

Conducting Research

Sustainable agriculture is not just about proper marketing; research plays an integral role as well. However, research in the case is more than just the typical crop research most expect. Understanding the consumer is critical in the success of the distribution of farm fresh foods.

In a Kansas City co-op, the local farmers solicited area grocers to understand what exactly people were looking for. They already knew people wanted farm fresh produce, but in order to maximize productivity, they started soliciting to find out exactly what was needed. In the end, the farmers were able to find out the cuts of meat and buzzwords people were looking for and were able to bring in more per head than before.

an area in which a lot of people may be stuck in their ways, good crop research is a must. One farmer in Ohio said that “The value in on-farm research is gaining information you can trust”. Research often helps the farmers to cut down on production costs and improve their overall yield. Vicki Stamback, an Oklahoma cut flower producer echoed this. She said “Until you do research, you’re really only guessing.” In Stambacks case, through greenhouse research found she could grow more varieties of flowers year round, and take advantage of the natural heating and cooling of the Earth, so as to not add any more cost to her operation. (Halweil, 2002)

Research Summary

Research conducted for this thesis revolved around finding out more information about sustainable agriculture. More specifically, the research was about finding out if there is a need for an architectural solution in order to bring sustainable agriculture more to the forefront of our society. The main methods of gathering data were interviews with people who had a hand in sustainable agriculture development in the area. From there, going through the information newsletters that the Sustainable Agriculture Network publishes and trying to read between the lines for what might be needed. Throughout all of this research, reflection was needed regarding the effects the research conducted would

have on the theoretical premise. Ultimately, what was sought was the viability of an architectural solution, in line with the theoretical premise, while tackling the issue of sustainable agriculture. Once it was time to begin conducting research, advice was sought from two people within the sustainable agriculture movement about where to begin. The primary information collected was through interviews with Frank Kutka, a researcher at the Dickinson Research and Extension Center, and Abby Gold, a professor at North Dakota State University. The interviews were extremely helpful in getting this thesis project started. Having only seen small farmers' markets and only a handful of sustainable crops, it was informative to talk with people who have seen all sides of the spectrum.

What the research boiled down to in the end was whether or not an architectural solution would be beneficial to the sustainable agriculture movement. In both interviews, the end result was yes. Kutka was very beneficial in attempts to figure out what an architectural solution might be. He reflected upon what sustainable agriculture is and what it means to a lot of people. It was clear that somehow those notions needed to be represented architecturally. Kutka was pretty sure that two of the biggest problems facing the sustainable agriculture movement are venues and education. One of the problems is that if anything that is not the norm is more than a little out of the way or even the slightest inconvenience, people will not bother with it. This was very

beneficial to hear; it really helped focus and narrow down on site selection and begin thinking about a program. Gold echoed a lot of the same information Kutka had presented. She was very concerned with the education aspect of sustainable agriculture as well. This building has to be able to inform and educate people. Education is a big hurdle for sustainable agriculture, but, if it is approachable and understandable, the message may get across. A good way to get this across is through a restaurant. Everyone needs to eat, and we love to make an occasion out of it. This is an opportunity to really educate people without it every really seeming that way. While combing through the newsletters that the Sustainable Agriculture Network puts out, there were

a lot of small articles that mentioned marketing, research, and education. What was picked up in all those articles was that, for the most part, a facility and location should be chosen based on how it will reflect upon sustainable agriculture. Although selling one's product at the livestock yards certainly happens, and works to an extent, it is not going to break through into the public realm.

The research that was conducted backed up the theoretical premise of this thesis. There was a lot of information to dig through to try finding that hidden message and meaning in the publications, but it all seemed to point towards an architectural solution to help gain the awareness that sustainable agriculture needs. The theoretical premise was not changed in the investigation; it was reinforced.

CASE STUDIES

Jean-Marie Tjibaou Cultural Center

The Jean-Marie Tjibaou Cultural Center was designed by architect Renzo Piano. This project is located in New Caledonia, which is to the east of Australia and northwest of New Zealand and was completed in 1998. This building is fairly large, coming in at around 65,000 sq. ft. This building is quite different from this thesis in that it is built in a very temperate climate, but susceptible to very strong winds from time to time. It is also in a very remote region of the world, where one typically would not expect to find such a fine piece of architecture. The Jean-Marie Tjibaou Cultural Center is similar to the other two case studies in that it has a wide variety of spaces. Within the cultural center, there are offices, galleries, and exhibits dedicated to the culture of the people. The building also features multiple terraces,

small courtyards, and a presentation auditorium.

Like the other projects, the Jean-Marie Tjibaou Cultural Center revolves around bringing people in for civic and cultural engagements. It is quite similar to the other two case studies in the diversity of functions, uses, and collection of programmatic elements. Like the other two, this building features terraces and courtyards, as well as plenty of gathering spaces for people to meet at once in the building. This building is also similar in that it employs sustainable design features that are not readily apparent. Piano does a great job here at the selection of materials and the way the building is situated on the site. It might seem like an unnecessary amount of site was taken up for this building, due to its elongated shape.

However, once Piano visited the site, he saw the importance of it and committed to low impact. The site was barren land along the strip shape of the island, and in order to minimize damage to the landscape, the spaces that needed to be fully enclosed are buried in the earth, along the barren patches. This project also differs from the other two in that regard; the others were compact and stacked within essentially a rectangle. Here, the building rarely stacks up and is primarily one story. Therefore, the experience within this building is slightly different than the other two. Within the other two buildings, one was always connected to the central piazza; however, with this cultural center, the ends of the buildings are hundreds of feet apart, which makes a big difference

in what is essentially a small building. This building, similar to the other two case studies, is deeply rooted within its context. The very nature of the building celebrates a momentous occasion of political and cultural movements on the island seeking independence. The underpinnings of this project are very closely tied to that celebration of culture. It does not take much more than a first look to see that this building is a modern representation of the huts, which the island is known for, which also happen to be temporary. Piano studied the anthropology here very well, and it shows through in the architecture. This project is not as closely tied to the theoretical premise as the other two are. This project does maintain some

relevance into its celebration of a historical event in an architectural manner. This was very good to see. Blaser (2001) says it best when he said, "Only an attitude which is made conscious can promote knowledge and education" (Blaser, 2001). The theoretical premise still remains largely untouched from this case study. This project reinforces the notion of an architectural manifestation of a social, political, environmental, and cultural issue. It was very good to see such a deeply rooted example that tackles an attitude and brings it to the forefront of the world, in this particular case. (Blaser, 2001)

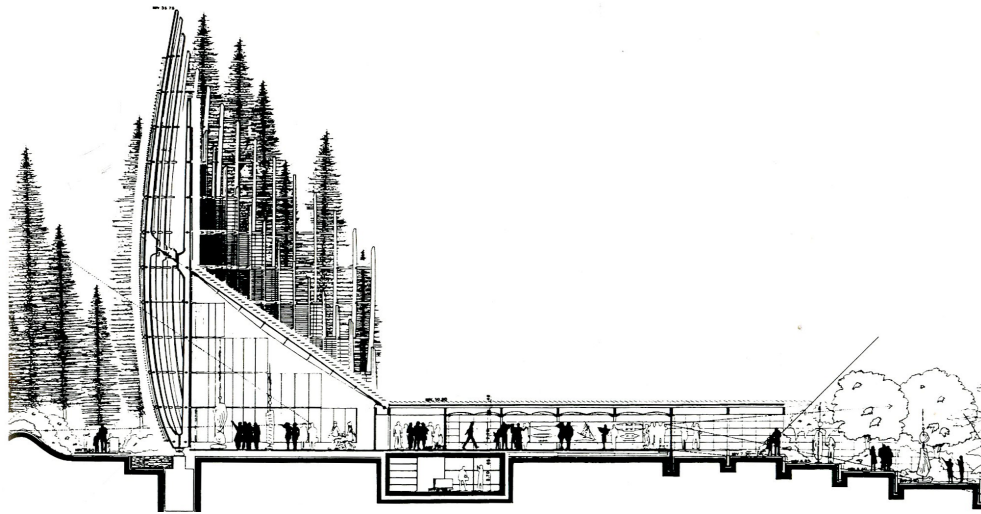


figure 4 kanak section

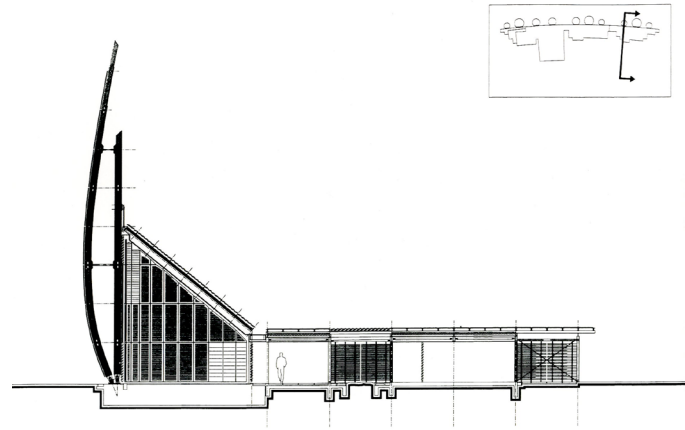


figure 5 kanak section 2

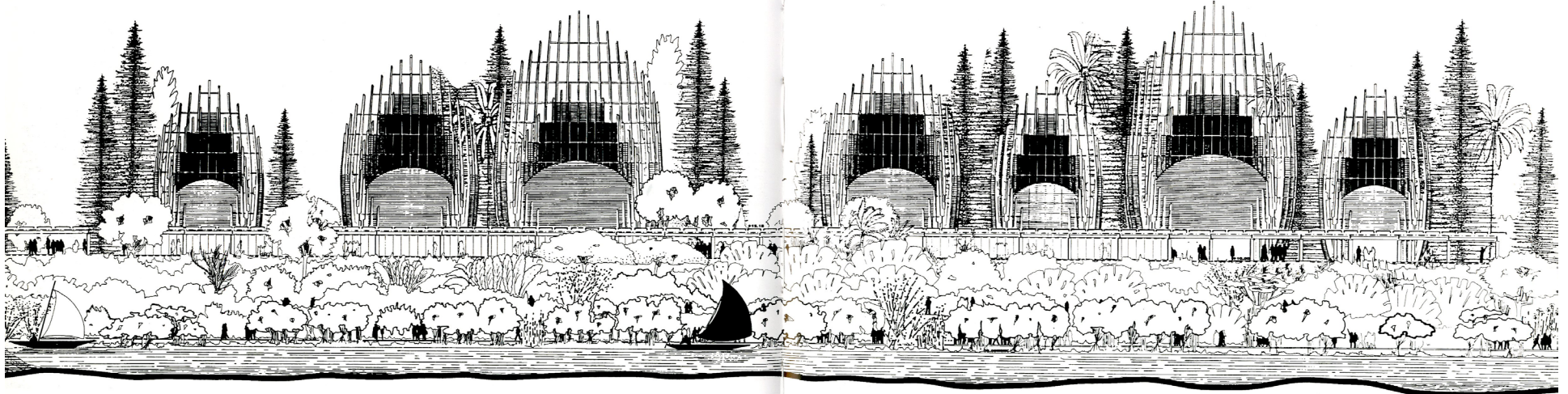
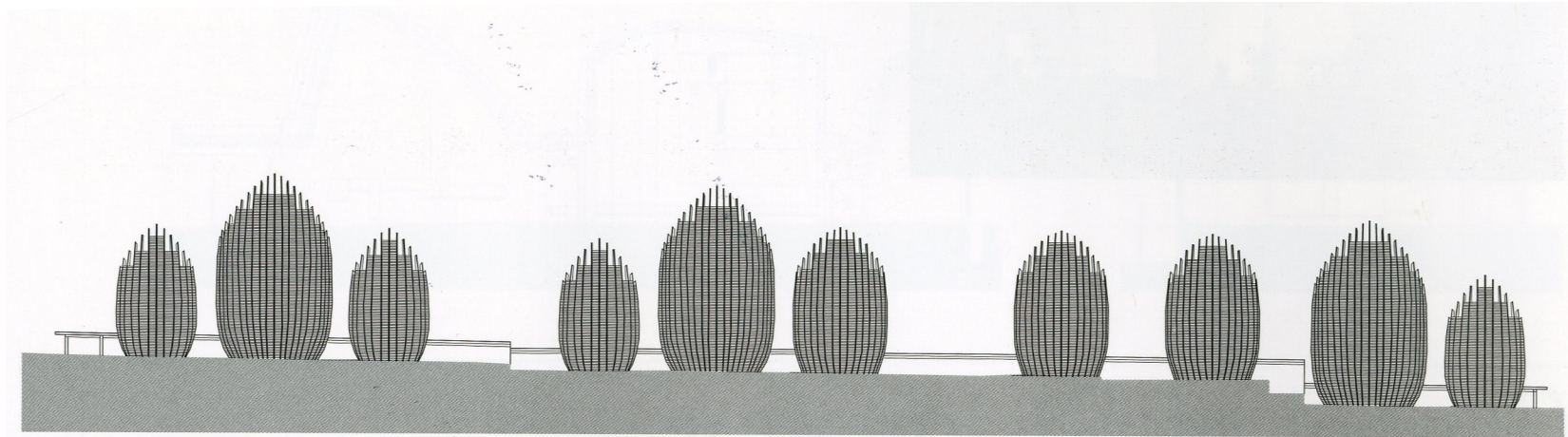
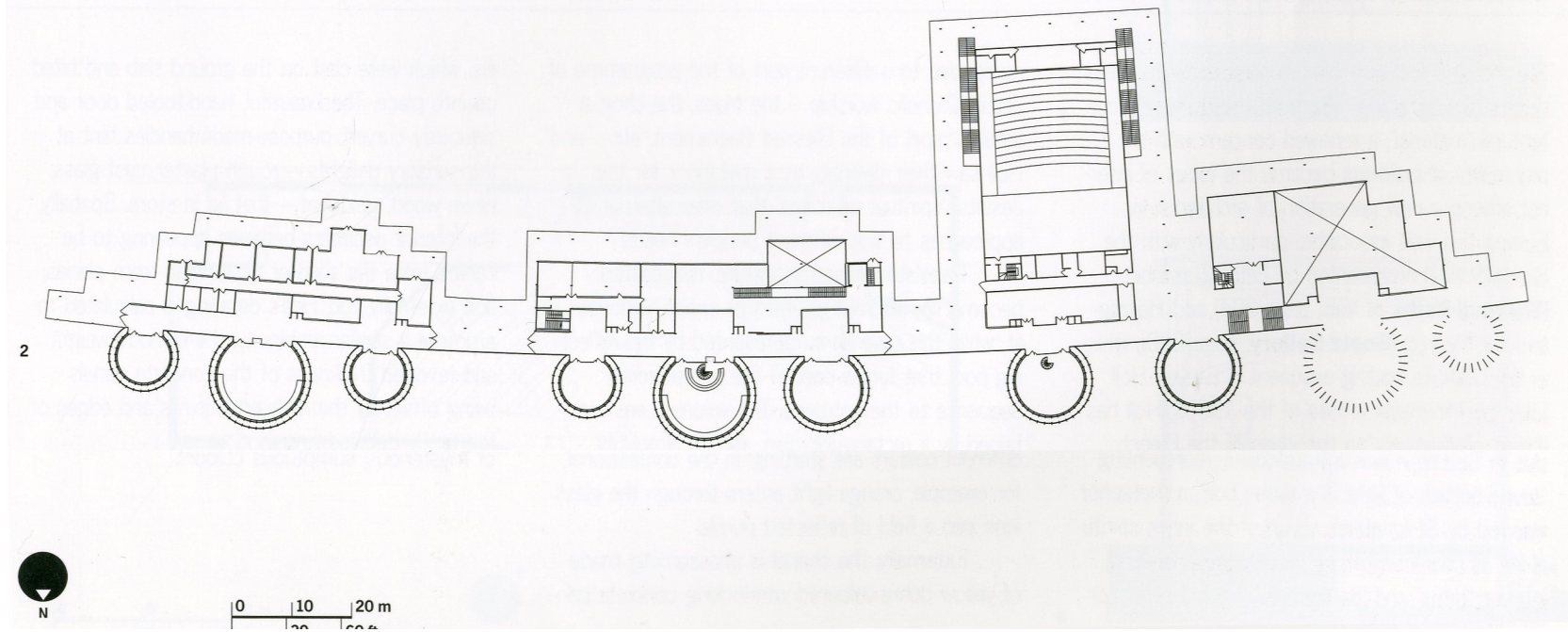


figure 6 kanak elevation



1

figure 7 kanak elevation 2



2

figure 8 kanak plan

figure 9 geometry

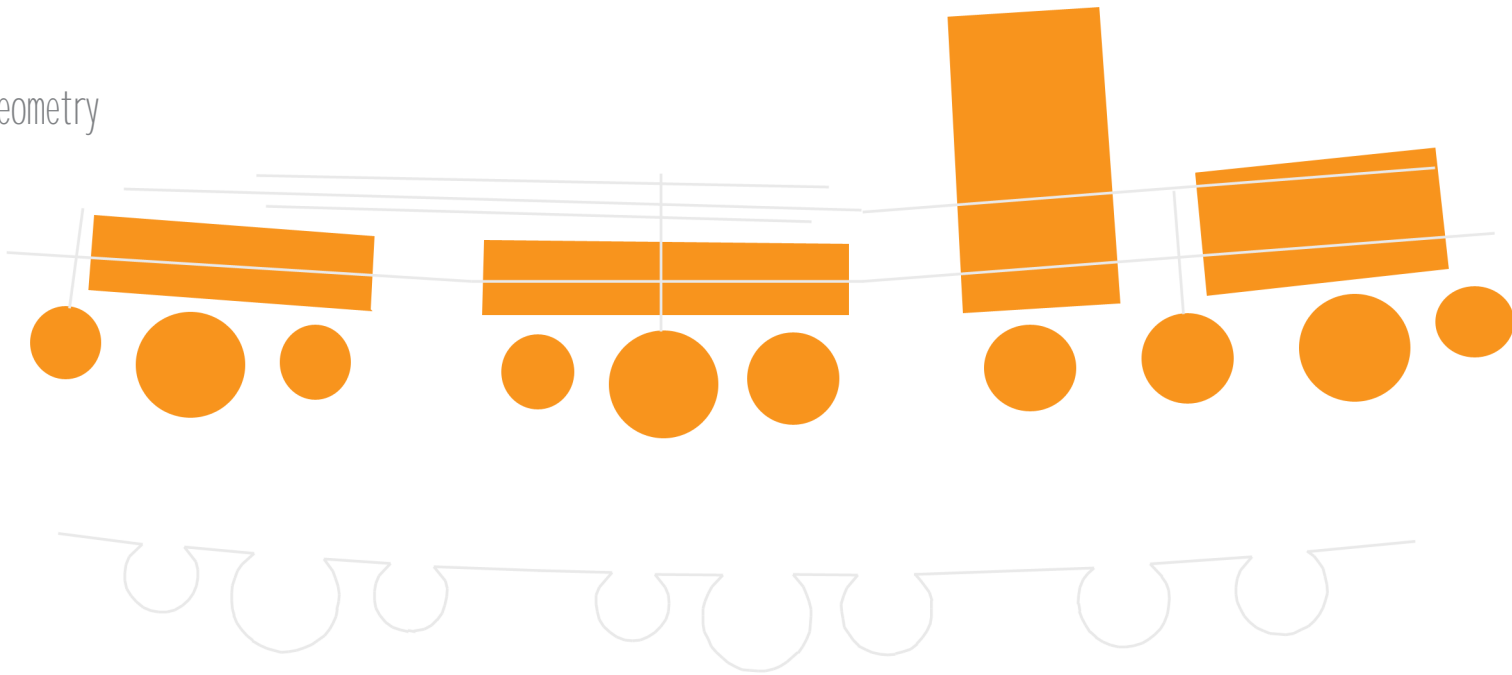


figure 10 plan to section



figure 11 structure

figure 12 natural light

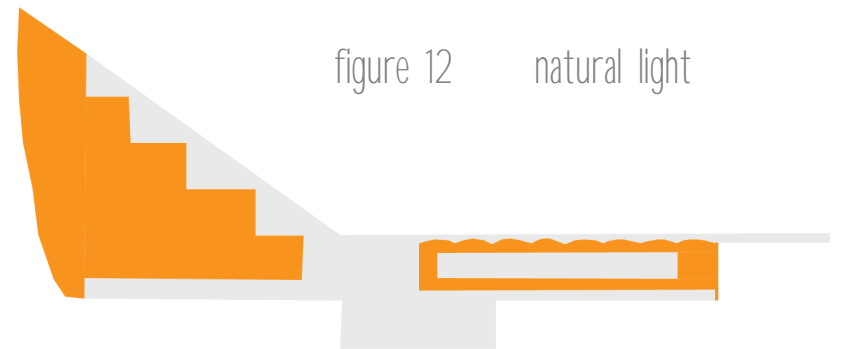


figure 13

circulation

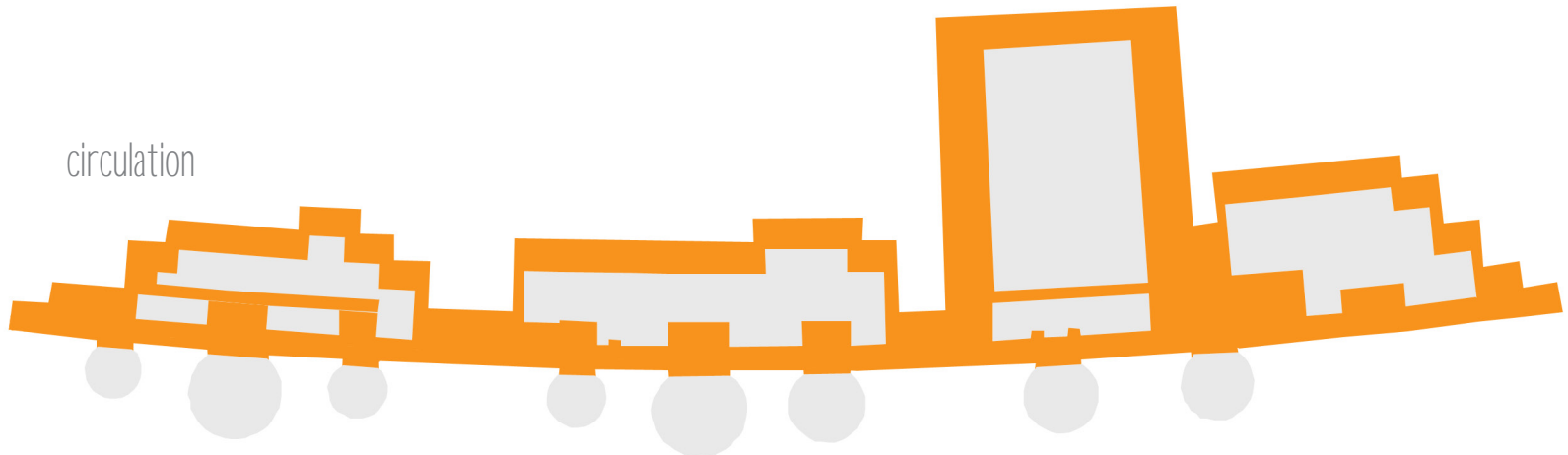


figure 14

massing

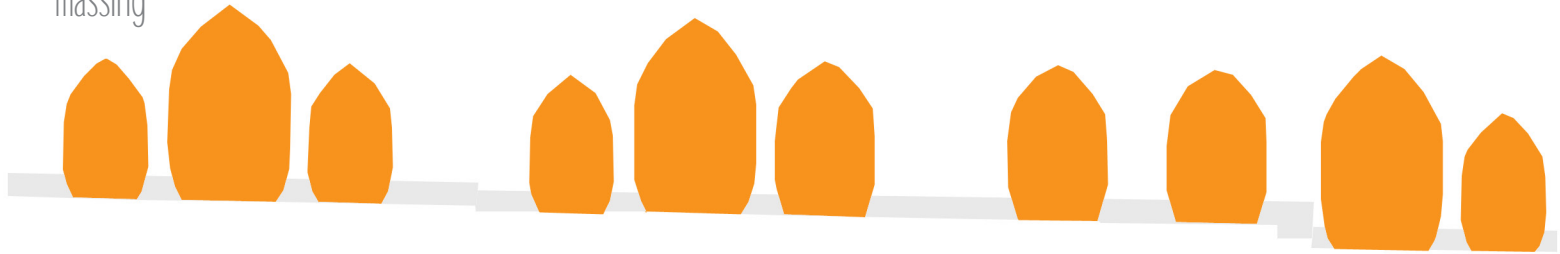
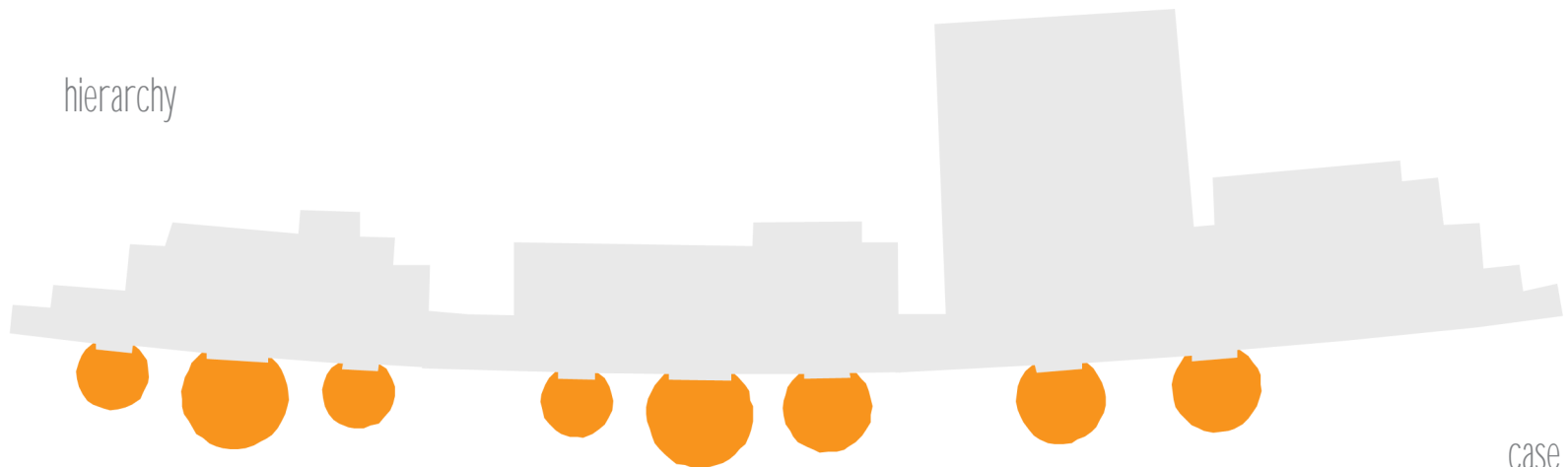


figure 15

hierarchy



Saynatsalo Town Hall

The Saynatsalo Town Hall is a civic project designed by Alvar Aalto. This project is located in the town of Saynatsalo, Finland and was constructed in 1952. The project type of this building is a little hard to define, because similar to this thesis, it is a collection of spaces that are at times buildings on their own. There is this city center plaza feel to this building. The building is a collection of several spaces that total up to around 9000 sq. ft. The programmatic elements that it included were varied. It contained several different areas and styles for living, including bedrooms and apartments. The building also featured a collection of offices, libraries, and some study and reading rooms. There was a primary chamber where the council would meet, and storage. The initial design had a couple of shops located on the ground level

under some of the civic functions, but it did not prove to work out, so they are now a part of the council. This case study is a unique collection of spaces, gathered around a central plaza, trying to accommodate a lot of different functions in a small, modern building. It is hard to say what brought this collection of spaces together in the first place, but in a similar vein to this thesis, it is trying to bring different backgrounds of people together in a common way.

This case is similar to the other case studies in that all three buildings are unique collections of programmatic elements handled in different ways. The three projects also have different methods of sustainable and regional design attached to them. This case is different from the others because of its use of the central courtyard.

The courtyard is a unique feature that is reminiscent of city centers and plazas; this is why it is interesting to find such a feature in a small building. This building responds environmentally with its site because it features local bricks, and the built up grass courtyard. It responds nicely to the immediate vegetation in the area and fits in quite well. One of the primary features of this building is the courtyard, modeled after similar areas seen in Italy. There is an inherently social aspect about the courtyard that encourages the formal and casual meetings of people, as well as the possibilities of events being held. The building was also involved on the cultural side of the area by featuring a couple libraries, one for children and

one for adults. Libraries are important parts of any town, because they are representations of the collection of knowledge. This building grouped the libraries initially with shops and politics and based them around the courtyard. The political side of this building should be considered the other primary space. The highest point on the building is the representation of the council chamber. This is a place for residents to meet and discuss issues about their town. This building is seemingly trying to capture the uniqueness that many town centers, plazas, and downtowns have. It is an amazing attempt at collecting such a unique collaboration of spaces into a fairly small building. This case does not

change the overall unifying idea. Rather, it encourages more exploration into this unique attempt of organizing diverse programmatic elements. The initial shops that were a part of the original design failed. This building shows that it is possible to try recreating a city center within a small building complex that is not at the heart of a city. It clearly involves a unique collection of spaces to bring a diverse group of people together in order for a building of this type to prosper. The theoretical premise is left unchanged after this case study. However, new conclusions can be drawn about the sizes necessary for this thesis, as well as seeing a case where too much mixed use did not quite work out as intended. (Weston, 2004)

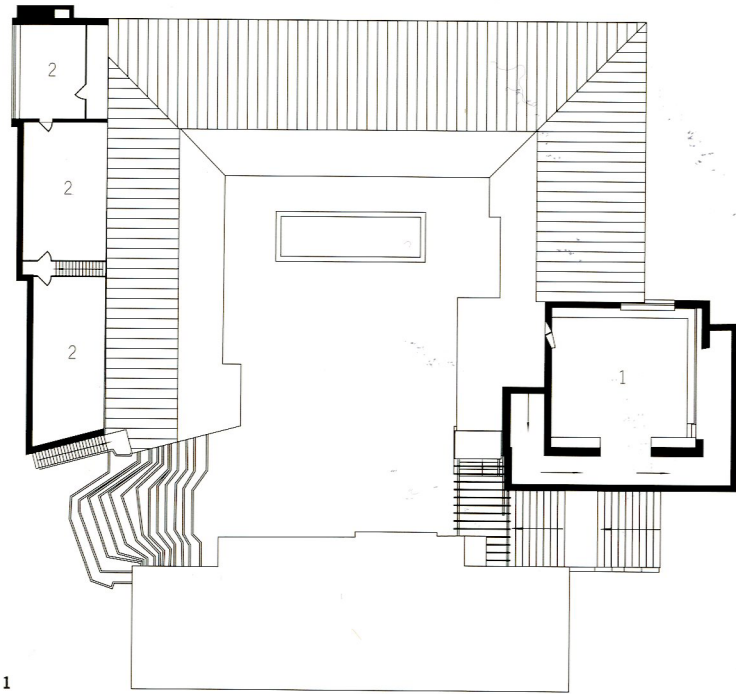


figure 16 plan

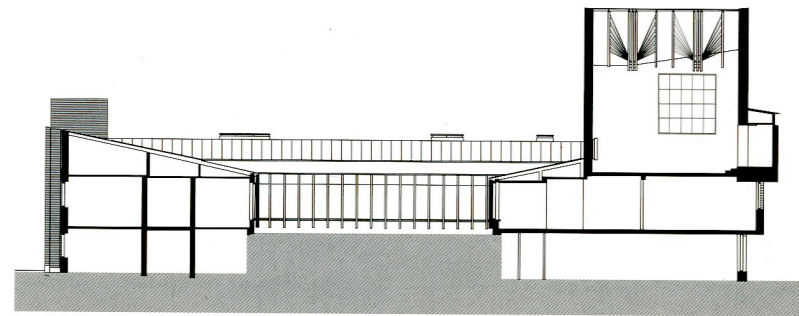
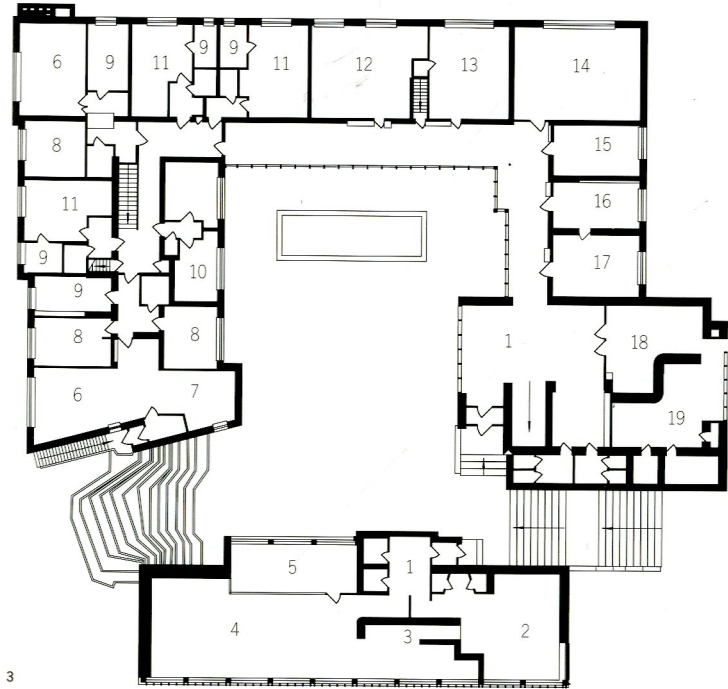


figure 17 section



0 5 10 m
15 30 ft



figure 18 plan 2

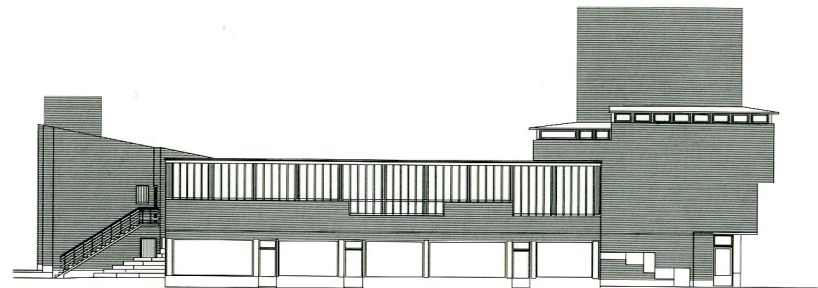


figure 19 elevation



figure 20 circulation

figure 22 plan to section



figure 21 natural light





figure 23 geometry

figure 25 massing



figure 26 hierarchy

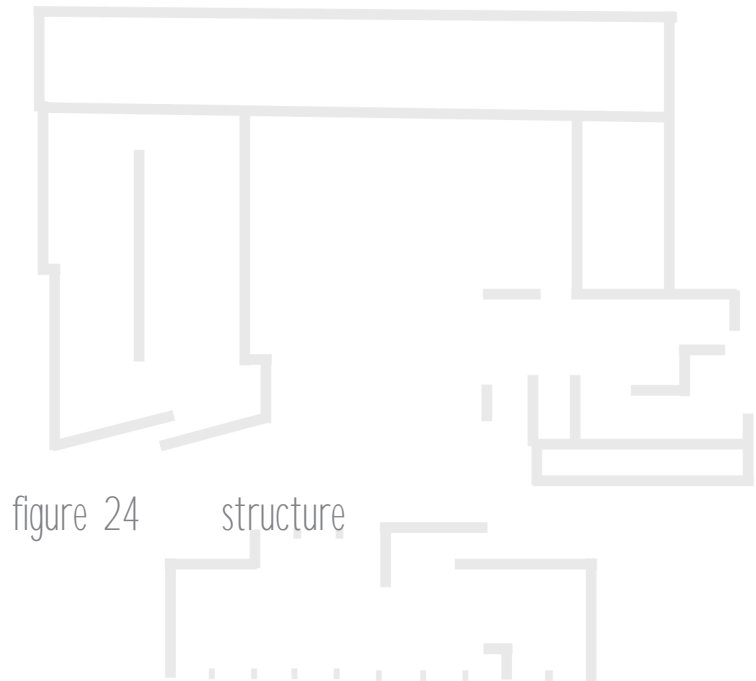


figure 24 structure

California Academy of Sciences

The California Academy of Sciences building was designed by Renzo Piano. This building is situated across from the DeYoung Museum in Golden Gate Park in San Francisco, California and constructed in 2008. This building's footprint is massive, coming in around 530,000 sq. ft. However, the actual building's square footage is higher than that, because it has multiple areas where levels are present. For this thesis purposes though, the majority of the building and its relation to this thesis is on the main floor. This building is distinguishable, partly because it is the most modern of the case studies, as well as being massive. The program here again is very diverse, featuring quite an array of different spaces collected under one roof. Similar to the Saynatsalo Town

Hall, this building revolves around a central piazza. It is interesting that Aalto's design was based around Italian piazzas and here we have an Italian architect's building in which the main feature is the piazza. Other spaces within the Academy involve different exhibit halls, ranging in size, as well as a large aquarium. The building's primary spaces are adjacent to the piazza, and that includes the planetarium and the rainforest exhibits. This building also has lab and workshop space, a café, restaurant, administrative offices, and functions that the Academy needs.

This case again is very similar to the others because of its mixed function and odd collection of spaces. This building shares a lot of similarities with the Saynatsalo Town Hall, especially the use of the piazza, but both buildings handled this feature differently.

In Aalto's building, the functions seemingly wrap around the outdoor courtyard, which has been built up, such that it seems it is secondary to the spaces that surround it. In the Academy, the courtyard is the primary space of the building. Similar to Saynatsalo, everything revolves around it. Piano, however, utilizes the piazza as a daily gathering space within the Academy, and as such it takes on a whole different role as a space of its own and not just an informer of surrounding spaces. As mentioned earlier, this building is uncommon with the other two because of its scale. It might be as big as it is because of the population that surrounds the Academy.

In both of the other two case studies, the surrounding population is not very big, which obviously plays a

role in determining square footage. In the Academy's case, the surrounding population is an interconnected metropolis. Also in the Academy's case, the exhibits that it displays are fairly large as well, and perhaps that goes hand in hand with the population. The Academy may be able to secure larger exhibits and research projects because it has a wider population base with which it can educate. This project responds very well in educating its users. The whole building revolves around the education of patrons of the facility.

The building is environmentally responsible through its sustainable strategies, as well as through its site selection and collection of spaces into one building. The Academy also hosts plenty of events to cater to both the

social aspects of a place, but informing the public culturally about what goes on at the Academy. The site is also part of a large park, which also includes a large museum of art.

This case study contributes quite a bit to the theoretical premise. This building focuses on involving the public with research going on and informing them along the way, which is very similar to what this thesis seeks to do with sustainable agriculture. This building is also very environmentally responsible and sustainable and keeps the ideals visible to educate the public. This thesis' theoretical premise is still left unchanged after examining this building. It is very similar to Saynatsalo, but shows a very modern understanding of what such a large collection of spaces can accomplish. (Futagawa, 2009)

figure 27 plan

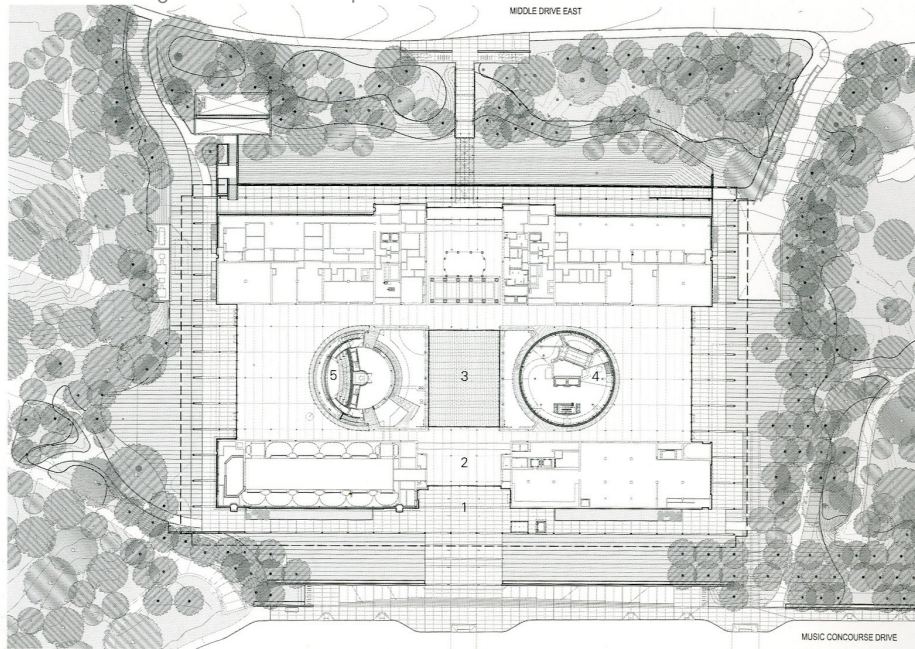


figure 28 plan 2

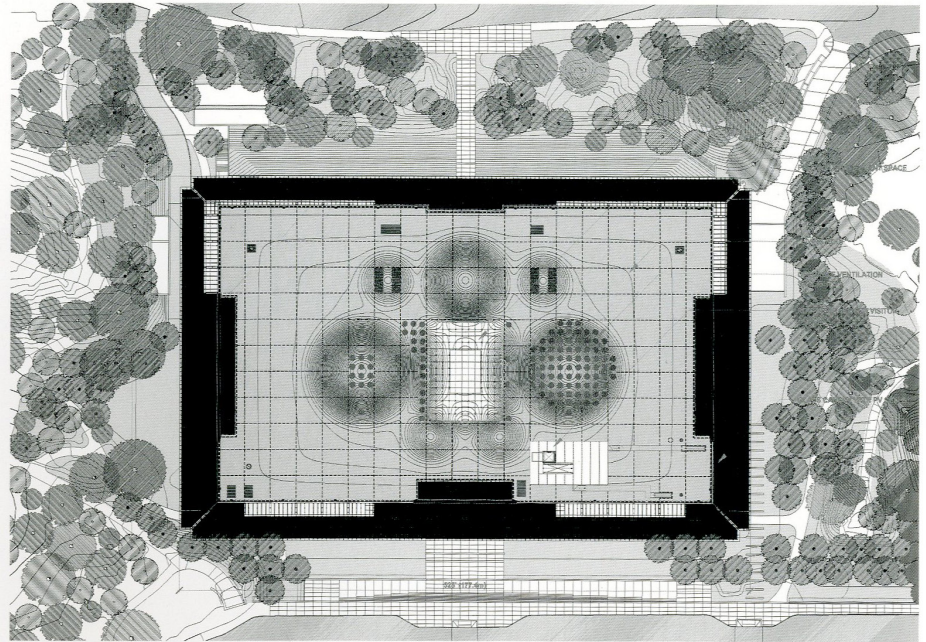
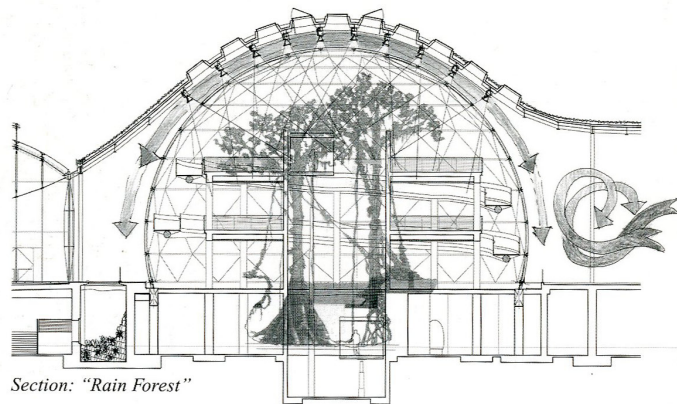


figure 29 section



- 4 RAIN FOREST
- 5 PLANETARIUM

figure 30 section 2

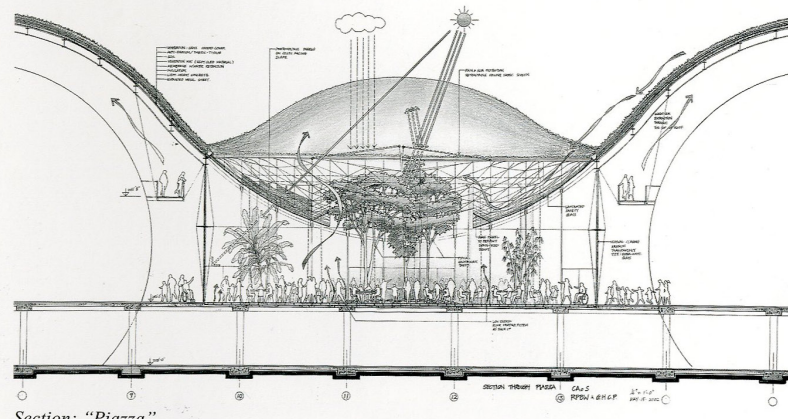
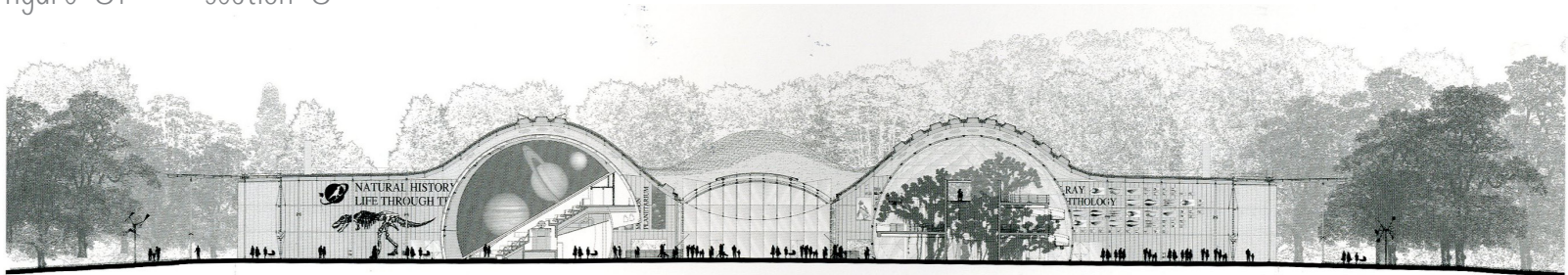
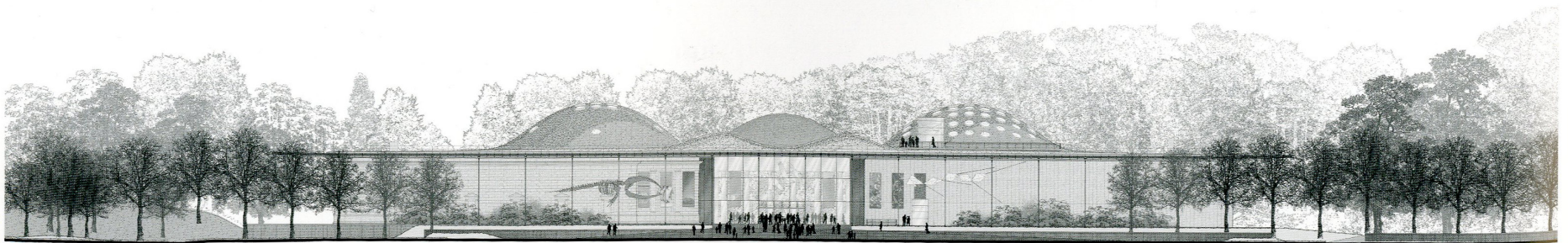


figure 31 section 3



Section



North elevation

figure 32 elevation

figure 34 structure



figure 33 plan to section



figure 35 circulation

figure 36 hierarchy

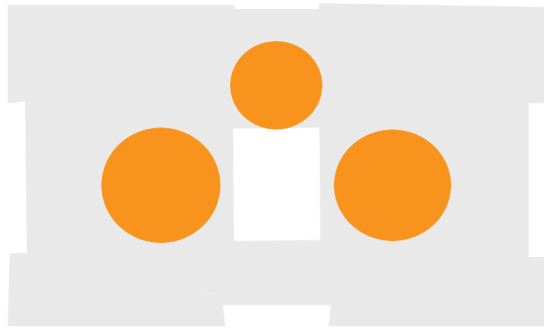


figure 37 geometry

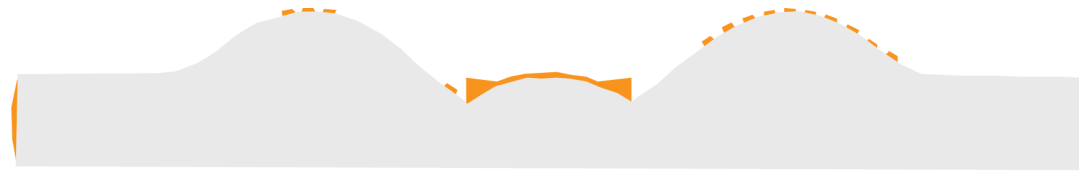
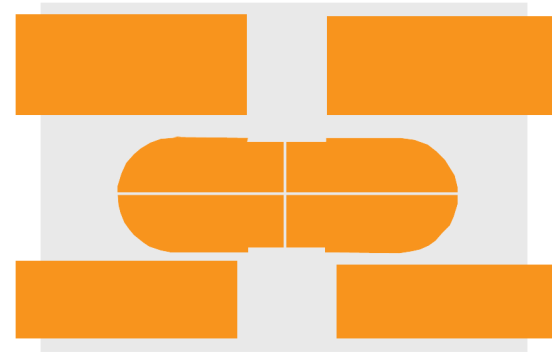


figure 38 natural light



figure 39 massing

figure 1 blah blah

Case Study Series and Typological Summary

The three case studies that were examined were, in part, an attempt to understand what a building program might resemble for a sustainable agriculture research and education center. The three case studies were the Saynatsalo Town Hall, by Alvar Aalto; the California Academy of Sciences, by Renzo Piano; and the Jean-Marie Tjibaou Cultural Center, also by Renzo Piano. After examining these three primary case studies, it was clear that such odd arrangements and collections of programs is quite possible and often quite successful. Since the three case studies contained such an array of programmatic elements, each of which was handled quite differently, it became clear that further analysis will be needed into specific elements of the building.

At this point, the theoretical premise has been largely untouched. Nothing was come across within the three primary case studies that required the theoretical premise to be rethought. However, each case study did help to further understand the theoretical premise and what it may allude to architecturally.

The three case studies were all quite similar in that they contained varied programs, and all featured use of sustainable strategies and connections with people and the environment. In all three cases the environmental impact was always intended to be minimal. The three buildings also employed a varied selection of materials, all sustainable to their site, and utilized several passive strategies for energy savings. The three buildings also all revolved around people. In two of the case studies, large piazzas were employed to define space and be

the center of the building. In the third case study, smaller courtyards and terraces were used throughout the building for the same purpose. The building was so elongated though, one primary courtyard could not be utilized. In the review of these case studies, they each contained several unique spaces that will require further investigation. These spaces were small living quarters for temporary residents and more long-term apartments. There is also the need to investigate a kitchen and restaurant.

What the three case studies demonstrated most about the theoretical premise is that it is possible to represent collective thought architecturally. The three case studies were all very unique, but once they were broken down, it was possible to see that although they had fairly unique and varied collections of spaces, connections were used to tie everything together.

These connections were with people primarily but also with the environment and the culture. Where they differed on the theoretical premise was how to achieve that architectural solution. The three case studies were all uniquely different from each other and how they handled their programs. The underlying conceptual ideas of the case studies were also very similar. They all seemed to be about bringing about a togetherness of people, as well as an educational, cultural, or civic aspect that was trying to manifest itself through the architecture. The sites played a large part on the projects. In the smaller areas, the buildings were also small. In the area that is a metropolis, the building was also massive. In one case study however, the building took on an elongated form through the site. This was done to preserve the site, much like it was in the other two case studies, where consolidating was key so as to not spread out unnecessarily over the land,

damaging the site and consuming unnecessary materials. The way in which the materials and overall building form took place was also very rooted into its context. The three buildings could not be moved to one another's sites. Very specific information was utilized on all three projects to fit into the social fabric they were joining in on. The relationships between the spaces were hard to establish. For the most part, the relationships all seem to be based around meetings in the piazza. Aside from that, the spaces did not seem to have too much relationship to one another. The technical issues the projects faced were similar in all three case studies. For the most part, all the technological issues dealt with sustainable strategies and innovative ways of including them. This was very good to see because all three case studies had tackled similar strategies but were handled with very different techniques.

THE
HISTORICAL
CONTEXT OF
THE THESIS

This project is of a mixed-use assortment of programmatic elements. As seen through the case studies, projects like this have existed in the past and been highly successful. What is different about this thesis project is the specific assortment of programmatic requirements. In this case, awareness of sustainable agriculture is being brought to the forefront. This has not been done much in buildings presently. The most typical forms of this are farmers' markets, and perhaps, even Whole Foods could be thrown in as well. These are both projects that are involved with sustainable agriculture but could be taken further to involve the public. Sustainable agriculture has been around since we started growing food; however, it has often lacked the venue to promote its message. This project will be examined how it relates

to similar projects throughout history. It will also seek an understanding of its relation to social trends and developments within our society. Lastly, an examination of the physical and social context within which this project is set will occur. Although this project is of a relatively unknown typology, it does relate to other projects in similar ways. As seen in the case studies, the collection of very separate programmatic elements into one building is nothing new. Those case studies also showed how they can vary in size and success. What the case studies did not show was how a certain collection of programmatic elements can make for a successful building and what those elements may be. Looking at sustainable agriculture, it is hard to determine what those elements will consist of, and whether or not they will be successful.

Within the sustainable agriculture realm, this project seems to draw parallels to farmers' markets, and the Whole Foods chain stores. This project is trying to bridge the gap from farm to table in an architectural manner.

First, let us look into farmers' markets. The farmers market is in one way, the simplest form of this project. At the root of this thesis project, it involves establishing connections with area farmers and getting a supply of farm fresh food. There are no intentions to reinvent the wheel here farmers' markets work. Ever since the initial gathering of a couple farmers with produce in their trucks, people have flocked to them, even if just to see what it is about. The problem facing many farmers markets is venue choice. The

venue is critical in the success of market, and if it can reflect the values of the farmers and food, even better.

How Whole Foods started up is also worth noting. Whole Foods is the premier grocer in the natural foods arena. Although they are not solely dedicated to sustainable agriculture, they do a good job in promoting more natural foods. Whole Foods started up in Austin, Texas originally under the store title of Safer Way Natural Foods, a spin on the Safeway grocery stores. Eventually that store merged with another, officially creating Whole Foods in 1980, at a time when there were less than half a dozen natural food supermarkets. The most interesting part of the history is the community that developed around the store.

In 1981, less than a year after opening, the most devastating flood Austin had seen in 70 years washed through, taking the whole foods with it. The amazing thing was that the community and patrons of the store rallied in support of getting the Whole Foods back up and running. In 28 days, the store had officially reopened, due to its dedicated customer base, volunteers, and donations. From there the company has met success, acquiring other stores and expanding at a surprising rate. It is interesting to see how the development of this large chain has gone from a 10,000 sq. ft. initial facility, to the stores they have today.

By combining both of those results in a new typology, a building that is trying to stay grassroots, while receiving the exposure the large chain stores are

capable of. This thesis project is seeking to fill that gap. However, in the process of combining the two, auxiliary spaces are needed for the necessary education of the consumer about what is possible with sustainable agriculture. A good example of combining several of these elements is the restaurant in Duluth, At Sara's Table Chester Creek Café. This is a local restaurant that has been pursuing 100 percent local food sourcing, while ultimately promoting sustainability along the way. The owners of the restaurant have also noticed the local and sustainable movement growing throughout the town. Is this growth attributable to them? Hard to say. Mattila says, "[Local] is like a buzz word now; everybody is saying local is the new thing for this year. And we look at it and say, 'This year?'" (Faust, 2010)

That quote shows that this movement has really begun to pick up some steam; however, it has been running for quite some time.

Sustainable agriculture is something that has been around since the land was first used for cultivation. However, it is something that has been quickly forgotten with the exponential increase in technological advancements. Suddenly, sustainability was not a concern because of the ability to maximize production in every way. As of late, more and more people are beginning to grow concerned about where their food is coming from. In recent times, there have been an increasing number of contaminations of our processed food. Most recently a batch of cantaloupes ended up

taking several lives. Businesses that do not conceal their ingredients and where the ingredients come from have found themselves doing quite well, in spite of a down economy. Now more than ever, it seems that sustainable agriculture is able to finally push its way back into the view of society. It is worth taking a look at what the sustainable agriculture movement has done in the past and what it might be capable of in the future.

Caring about where our consumables come from is nothing new. It has always been a concern for some and is becoming a concern for others, as our resources are depleting, costs are going up, and quality in some cases is dropping. Recently, there was a disturbing cantaloupe outbreak that was only officially closed by the Centers for Disease Control December 9, 2011. (Booth, 2011)

In this case, cantaloupe from Jensen Farms in Colorado was found to have the deadly bacteria listeria contaminating it. All in all, 30 people died, one miscarriage happened, and 146 people fell ill. It was found that the bacteria were on old equipment that was recently purchased by the farm. Certain aspects of the case still remain unknown, but it definitely reinforces the idea of understanding where your food comes from. This is said to be one of the deadliest food outbreaks since the 1920's.

Food poisonings sadly are not the only thing recently in the news. In another case, animal cruelty was found to exist on farms that supplied eggs to two major chains. Both McDonalds and Target dropped their egg supplier and pulled remaining inventory after the disturbing images were released. (Hart, 2011) The video was a bit of propaganda for a

website and movement, but it illustrates the point of finding out what you are eating, and where it is coming from. These are not the only cases of this type. There are plenty of examples throughout time where, in spite of all the standards, technology, and regulations, contaminations happen. What they illustrate though, is that these stories were immediately brought up into national news. Word gets out quite fast when events like these happen. Coverage of such events really helps to promote understanding, and, at the very least they initiate awareness or concern about where things come from; food does not just appear on people's plates.

This project is set out in western North Dakota. The site, more specifically, is on the northwestern edge of Dickinson. The land on which this project is set is currently owned by the Dickinson Research and Extension Center (DREC).

Dickinson has always been a fairly quiet town, where in spite of its large population everyone seems to know everybody. The population of Dickinson, as of July 2009, was 16,265. This number does not accurately portray what is happening in the area. Dickinson is part of a large oil boom that is happening in western North Dakota. To say Dickinson is a part of the oil boom might be saying too much, it is more like being overrun by the oil boom. With the influx of people and large equipment, Dickinson is struggling to keep up. The infrastructure in Dickinson is just about right for 16,000 people; however, that number has grown drastically in the last couple of years. What that number does not reflect is the workers living out of hotels, trailers, vehicles, and everything

in between. Several people in the area are expecting these towns in the west to rise to a population of 60,000 people in no time at all. The problem is that the growth is happening too fast, and the workforce to keep up with this growth is not there. No one is willing to work small jobs when there are jobs in the oil sector paying so much more. In Dickinson's case, the town is collapsing in on itself. In spite of the massive growth it is experiencing, it just cannot handle this many people very quickly. Buildings are going up at alarming rates, with little planning being done to try and control where business and residences are opening. Dickinson is now an area where there is a food shortage, the stores cannot keep the shelves stocked and there are not enough grocery stores to supply the demand.

However, there is still a lot of land around Dickinson; lots of land already being farmed and capable of producing a wide variety of food.

The site that this thesis project is set on is perfect for what Dickinson is facing. The site is owned by the Dickinson Research and Extension Center (DREC), and they also have the majority of the surrounding land, preventing bad development from moving in. However, this is not stopping the development; developers simply skipped over the DREC land and started up on the other side again. Here we have a site that, in the near future, will remain prairie grass, and continue to get surrounded by developments and commercial properties. It is opportune that a whole area will be able to develop around this native prairie land, with the sustainable agriculture building situated on it as a destination.

One of the biggest concerns for the success of farmers' markets is that they have to be in an area where people are. This is soon the case on this site. With the land a part of the DREC, there is room to grow and expand operations, eventually to include more hands-on areas, and even testing plot sites that are accessible to the people. This site is also overlooking one of the busiest roads in the city; States Avenue, a great means of capturing people's attention. Dickinson is often the town where everyone will drive by a construction project to see what it might be; they even allowed the high school band and cheerleaders to help open the Super Wal-Mart when it came to town. The history of the site will be prolonged by creating a piece of architecture that is helping bring the sustainable agriculture movement in view of the city.

GOALS FOR THE THESIS PROJECT

This thesis project has goals in three different environments: the academic, the professional, and the personal. All three are intertwined throughout the thesis, and there is plenty of overlap between them. The end result is ultimately to have a successful project that I can say accurately represents my standpoint on design and perhaps can be expanded upon as my career expands.

Personal

The personal goals for this thesis project are the most important. The issue of sustainable agriculture and awareness was chosen because it is something that matters to me quite a bit. It is also something that in my mind will become more of a concern in the future. With recent outbreaks of food poisonings, people, myself included, have begun to care a lot more about where our food is coming from.

Growing up around agricultural research played a big role in deciding on the topic as well, although it was largely taken for granted. It has all gone full circle though, and now, when it came time to pick something of interest to myself, it only seemed natural that it involved my upbringing. More than anything, this project is something that I can be proud of. It is my master's thesis project and it will always be something that can be reflected upon later on in life as a representation of my time spent in college. This project needs to be an accurate representation of my design process. It needs to show the values that will not be compromised. That is why awards are not a concern of this project. The best this thesis could do is allow me to be satisfied with the end result and to be expandable as I further my career and education.

Academic

The academic goals of this project are many. Of course, in order to obtain my master's degree, this project has to meet the requirements put forth by my professors and advisor. Beyond that, there is the safety that the academic world permits. This project will be able to test experimental methods, technologies, and assemblies that may not yet be the norm in the professional world. Awards are of no personal interest to myself, as long as the project meets the requirements put forth in discussions with my advisor, which will be more important. This project will also be displayed within the digital repository at North Dakota State University. This is an important aspect of the project, as it

means it will have an endless life span, reflecting myself, our year, and the time in which it was designed. This is something that needs to be taken seriously. If the project were to be too focused on its time, it may date itself and become irrelevant for future students. That is why it is more important to explore certain ideas and methods of doing things. Students after this year will be able to then reference these projects to see how we handled the design process and the issues we solved along the way.

Professional

Professionally, the goals should align largely with my personal goals. Ideally, some of the underlying notions that will be established in this thesis will be

picked up upon by firms with similar values. This thesis does not necessarily have to land me a job but it should be an accurate representation of myself and what I'm capable of. Such an accurate representation will enable it to be good starting point for finding firms to work with, and it will be a valuable resource for the interview process. If I am able to have something that I can reference with firms about my values in design, it will make that professional transition a little easier. This project should also be able to be picked up in different forms professionally. When that ideal client comes along, this project should be able to manifest itself in different forms in which the values and goals initially explored are able to be furthered and expanded upon.

SITE ANALYSIS





figure 40 site panorama





figure 40 site panarama





figure 40 site panorama





figure 40 site panorama





figure 40 site panorama



Built Features

Built features are few and far between on this site. There is currently nothing located on this site. However, neighboring sites to the west have houses in random spots, but nothing too close to the site to bear any reference too. The closest feature to the site is the water tower to the southeast. The tower is slightly distracting to the overall feel of the area. The site across the road to the north also features similar characteristics to this site, with the exception of a gravel road and a couple of sheds.

Vegetation

The vegetation on the site is that of native prairie. The grass is reminiscent of wheat. There are a few variations of plants, but nothing too colorful or that stands out. The overall color of the site is very neutral, as most vegetation is dry. The textures and patterns of the vegetation suggest that it is windswept. The long grass appears silky but upon closer inspection is a little rough. The few plants on the site are also quite rough, appearing hardy and untouchable.

Light Quality

The lighting on the site is all natural. The slopes are slight enough such that no shade is cast on the site. The whole site is also completely sun drenched in both the winter and summer. The only worry about lighting is in the winter with the slope, where long shadows will be cast.

Descriptions, Characteristics, and Underlying Abstract Ideas

This site is located on slightly elevated hilly area, just to the northwest of Dickinson. The majority of Dickinson is able to look up towards this site. Certain areas to the east of town have blocked views, but most of Dickinson can see the area. From the site, there appears to be an almost endless vista of prairie to the north. Looking east from the site, one overlooks the town of Dickinson. The southward views are all up the gently sloping site, and the further one gets to the south, the better the overlook. The western views are blocked by shelter belt trees on the neighboring site across the road. Looking down on the site, one is able to make out the old terraces that once formed the land. Currently, the site is all sloped and consists of dirt patches, long prairie grass, and signs of cattle grazing. This site is one of the highest in

the area. When on the top of the slope, one has nearly endless 360 views of the area. One of the only things higher than this site is the neighboring site to the southeast. On that site a water tank is also located, standing above this site. Looking out around the region, several geometric patterns emerge as farmland and crops are visible. The site really has no relation to them other than views towards them. The immediate context of the site features a crop to the east but does not share any pattern with this site because it has been left to its own devices for some time now. The topography of this site is gentle slopes and hills, nothing that is too steep, except when the peaks are approached. The lighting is intense, the sky is big, the shadows nonexistent, and the wind strong. While walking the site, it suggests to the users to maybe slow the pace down a bit, take in the views and air, and feel the natural prairie.

Water

There is no water on the site. However, based on the sloping terrain, it appears any heavy rain water will also shed off the site, collecting off the site in the drainage ditches along the roads. This can explain the dry look to the site, and perhaps why it was once terraced.

Distress

There are signs of distress on the site. It is most likely attributed to the openness of the site and the grazing. There are patches of barren land, where the wind has most likely uprooted whatever vegetation was there. The majority of the distress is micro in scale. It is spotty in general and seems correctable. The lack

of water collection on the site is also a matter for concern. Most of the vegetation is of hardy types and appears very dry. If this site is able to produce productive crops, terrain management will have to be implemented to avoid erosion and run-off.

Wind

The wind is clearly one of the key aspects of this site. The terrain does not appear too windswept, but the vegetation suggests that the wind may be a concern. There is nothing to shelter from the wind. In all seasons, wind is constantly flowing through the site. The gentle slopes carry it around without any real shelter from it. With proper building planning and

vegetation planting, it is possible that the wind on the site can be controlled and even mitigated in certain areas. Some areas on the windward northwest are missing vegetation.

Human Characteristics

The site has signs of human presence. There are signs on the site that it was once terraced suggesting certain plantings and studies must have been done on the site. Presently, the only signs of activity on the site are tire tracks of vehicles that come and go patrolling the area and a few cattle trails. There are a couple paths carved into the landscape, where the cattle travel. There are also signs of grazing on the site, but it does not suggest frequency or duration.

Utilities

There are currently utility hook ups on the site, but they have not been used in quite some time and will require being brought up to code.

Vehicular Traffic

Vehicular traffic is essentially nonexistent on the site. On the southwest of the site, there is a gravel road entrance to oil property. Aside from that one entrance traffic is limited on the site. There are a couple of instances where it is visible that vehicles have driven about the site, but these instances are few and far between and cannot really be counted towards the traffic. The site does have two roads adjacent to it; one

runs along the north, and the other runs along the west. These will have to be the primary access points onto the site. The roads have a pretty slow stream of traffic on them at the moment, mostly trucks bypassing the town and residents of the area.

Pedestrian Traffic

There is no pedestrian traffic on the site currently. There are a couple of paths carved into the site, but these are old cow trails. The site is currently fenced off from adjacent properties. Due to the site's nature, pedestrians are not prone to walk to it or on it. However, if there is a reason to come out to this site, it can be walked quite enjoyably.

Site Character

The site character is that of windswept prairie. It is clear that the site is very open to both winter winds out of the northwest and summer winds out of the southeast. There are signs that some areas have been uprooted, and now they are barren patches of dirt. There are no signs of erosion on the site. The slopes all are fairly gentle and encourage drainage away from the site. There are signs that the site was once terraced, most likely for water retention. This seems like it would be necessary if anything of substance was to be grown on the site. The majority of the vegetation appears dry and the slope of the site suggests that water will not collect. The plants appear hardy, but could benefit from some water retention.



figure 41 site character



Soils and Topographic Survey

Soil Survey Geographic: Mollisols

Map Unit Name Vebar-Parshall fine
sandy loams, golden valley, 3 to 6 percent
slopes

Map Unit Acres 8,442

Dominant Order Mollisols

Dom. Cond. Order % 86

Dominant Sub-Order Ustolls

Dom. Cond. Suborder % 86

Dom. Cond. Hydrologic Group

Soils in this group have moderately low
runoff potential when thoroughly wet.
Water transmission through the soil is
unimpeded.

Dom. Cond. Hydrologic Group % 86

Dom. Cond. Drainage Class W e I I
drained

Dom. Cond. Drainage Class % 89

Dom. Cond. Hydric Rating No

Dom. Cond. Hydric % 0

Dom. Cond. Non-irrigated Capability
Class Erosion - severe limitations that
reduce the choice of plants or require
special conservation practices, or both.

Stark County, North Dakota (ND089)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
E1625B	Vebar-Parshall fine sandy loams, 3 to 6 percent slopes	31.4	14.7%
E1823A	Parshall fine sandy loam, 0 to 2 percent slopes	7.7	3.6%
E2107A	Arnegard loam, 0 to 2 percent slopes	11.6	5.4%
E2601C	Amor-Cabba loams, 6 to 9 percent slopes	3.4	1.6%
E2801A	Amor-Arnegard loams, 0 to 3 percent slopes	5.7	2.7%
E2819B	Reeder-Farnuf loams, 3 to 6 percent slopes	19.8	9.3%
E6131C	Vebar-Cohagen fine sandy loams, golden valley, 3 to 9 percent slopes	10.1	4.7%
E6143F	Flasher-Vebar-Parshall complex, golden valley, 9 to 35 percent slopes	12.5	5.9%
E6153D	Lefor-Cohagen fine sandy loam, golden valley, 6 to 15 slopes	21.1	9.9%
E6163B	Vebar-Parshall fine sandy loams, golden valley, 3 to 6 percent slopes	55.6	26.0%
E6181B	Lihen-Parshall complex, golden valley, 0 to 6 percent slopes	5.7	2.7%
E6183A	Parshall fine sandy loam, golden valley, 0 to 2 percent slopes	7.4	3.5%
E6217A	Arnegard loam, golden valley, 0 to 2 percent slopes	4.7	2.2%
E6267F	Cabba-Amor loams, golden valley, 15 to 50 percent slopes	12.4	5.8%
E6289B	Reeder-Farnuf loams, golden valley, 3 to 6 percent slopes	4.3	2.0%
Totals for Area of Interest		213.4	100.0%



figure 45 soil map

Temperatures

Normals

Normal Max Temp: 33 °F / 1 °C

Normal Avg Temp: 22 °F / -6 °C

Normal Min Temp: 11 °F / -12 °C

Normal Accumulated HDD: 7518 °F /
4177 °C

Normal Accumulated CDD: 425 °F / 236
°C

Extremes

Highest Daily Max Temp: 108 °F (42 °C)

Lowest Daily Max Temp: -21 °F (-30 °C)

Highest Daily Min Temp: 76 °F (25 °C)

Lowest Daily Min Temp: -34 °F (-36 °C)

Highest Daily Diurnal Temp: 53 °F (29
°C)

Lowest Daily Diurnal Temp: 1 °F (0 °C)

Highest Daily Dew Point Temp: 75 °F (24
°C)

Lowest Daily Dew Point Temp: -34 °F
(-37 °C)

Lowest Daily Wind Chill Temp: -54 °F
(-48 °C)

Wind

Highest 5-Second Avg Wind Speed:

84.9 mph (37.9 m/s)

Highest Avg Hourly Wind Speed: 42.0
mph (18.8 m/s)

Highest Avg Daily Wind Speed: 33.1
mph (14.8 m/s)

Rainfall

Highest Daily Rainfall: 3.84 inch (97.6
mm)

Most Consecutive Days with:

Rainfall \geq 0.01 inches: 11 days

Rainfall \geq 0.10 inches: 5 days

Rainfall \geq 1.00 inches: 2 days

Solar Radiation

Maximum Daily Solar Radiation: 764 Lys
(32.0 MJ/m²)

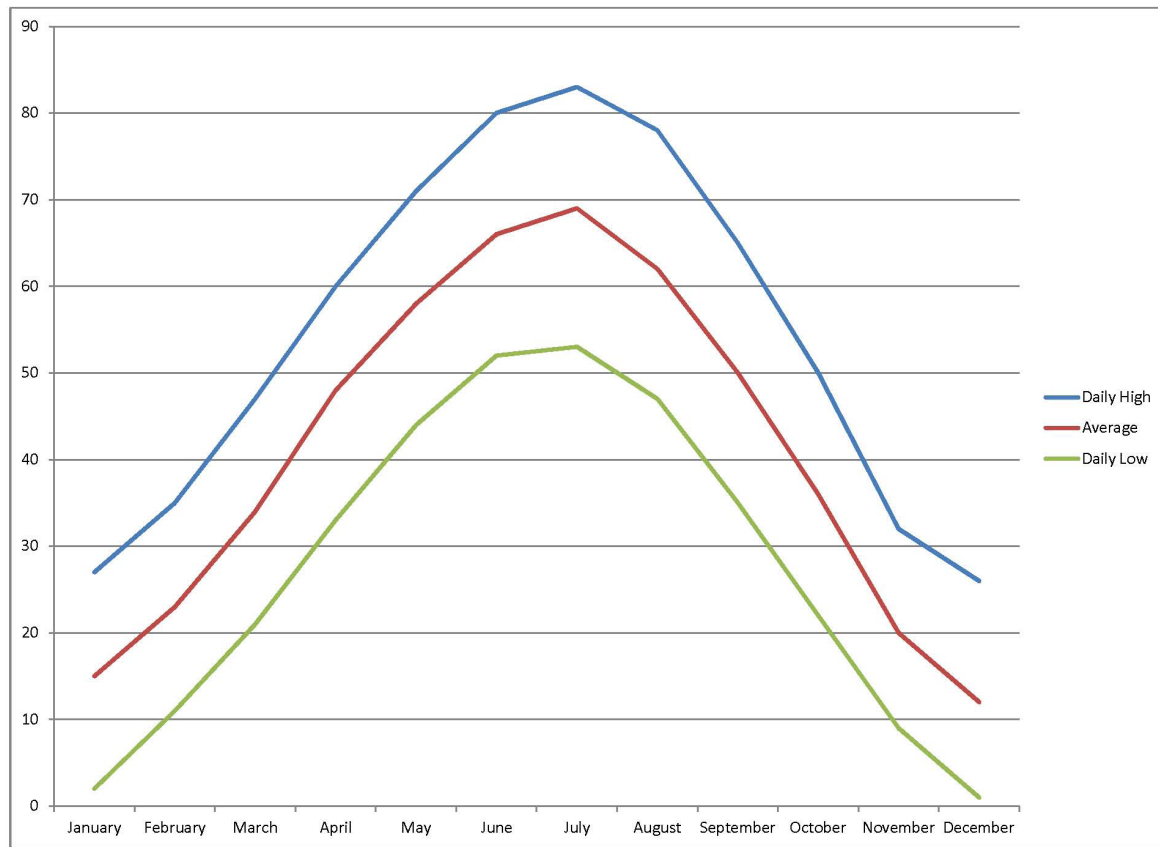
Potential Evapotranspiration

Maximum PET (Penman): 0.49 inch (12
mm)

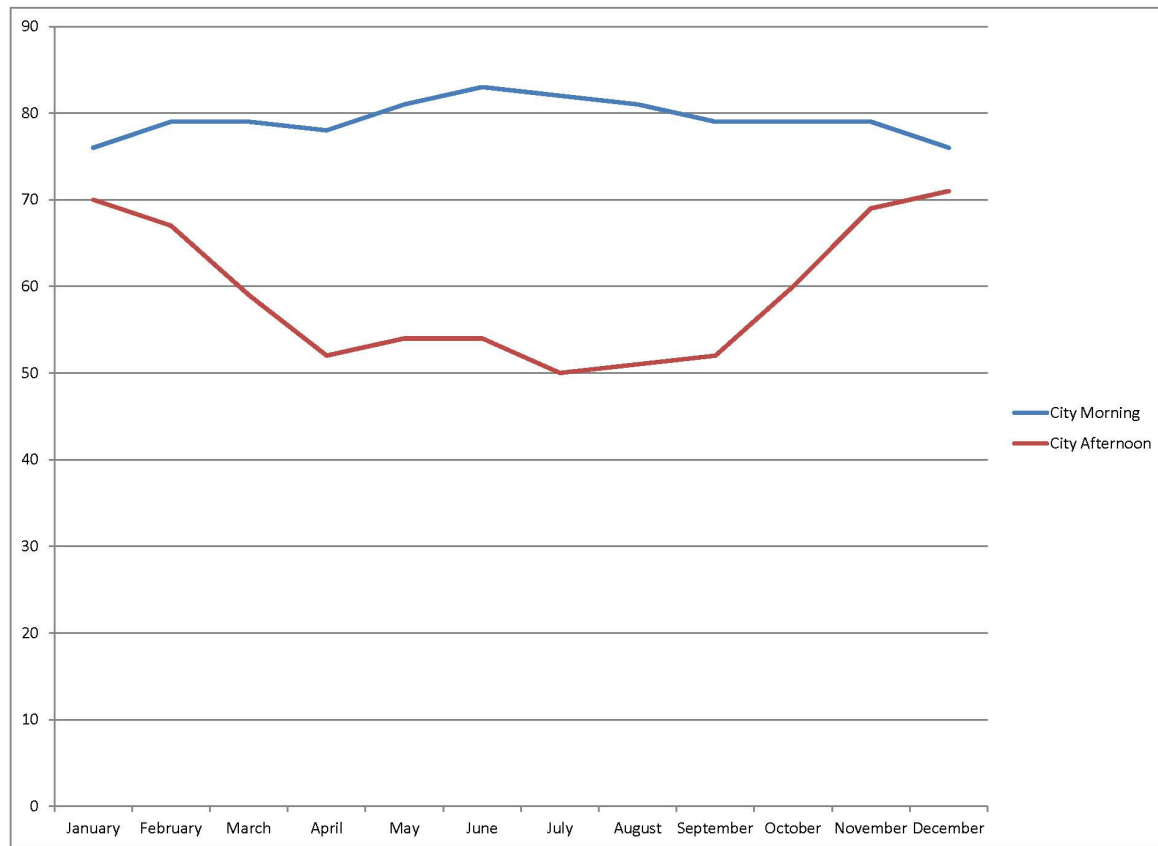
Maximum PET (Jensen-Haise): 0.40 inch
(10 mm)

CLIMATE DATA

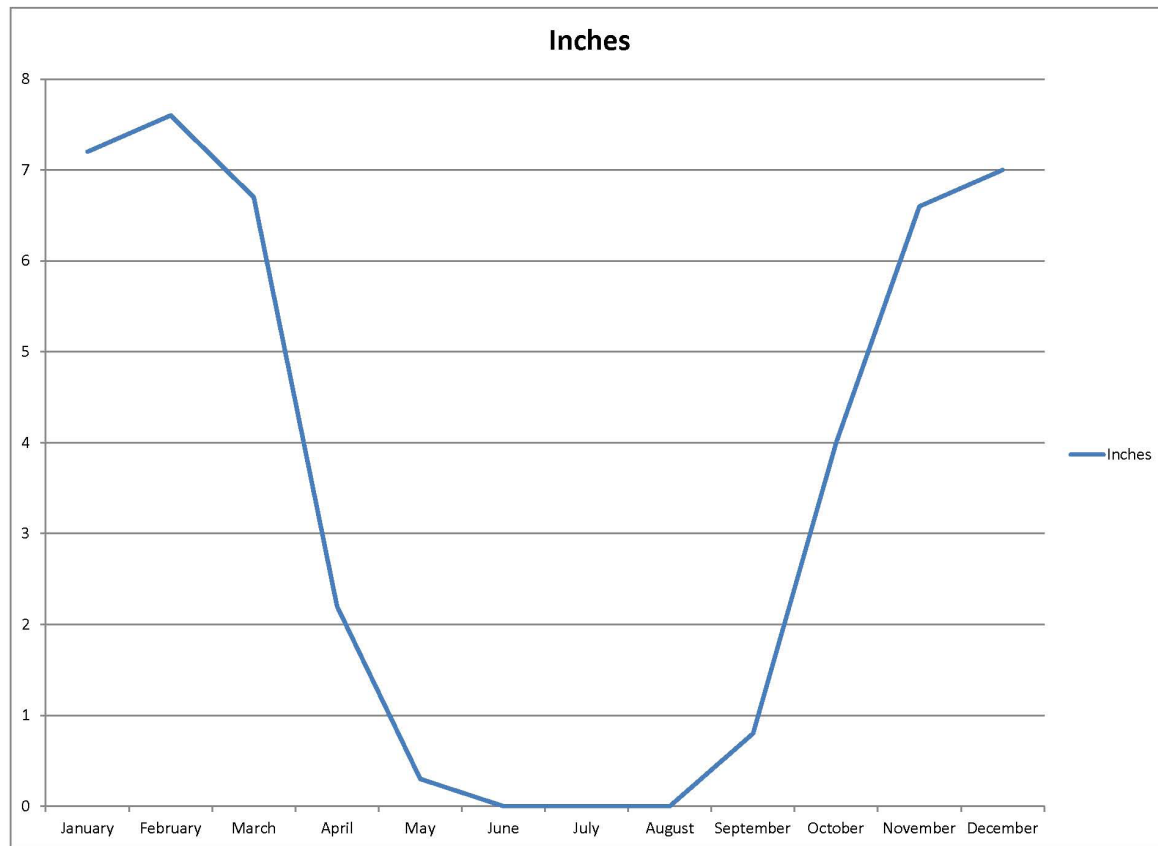
Temperature



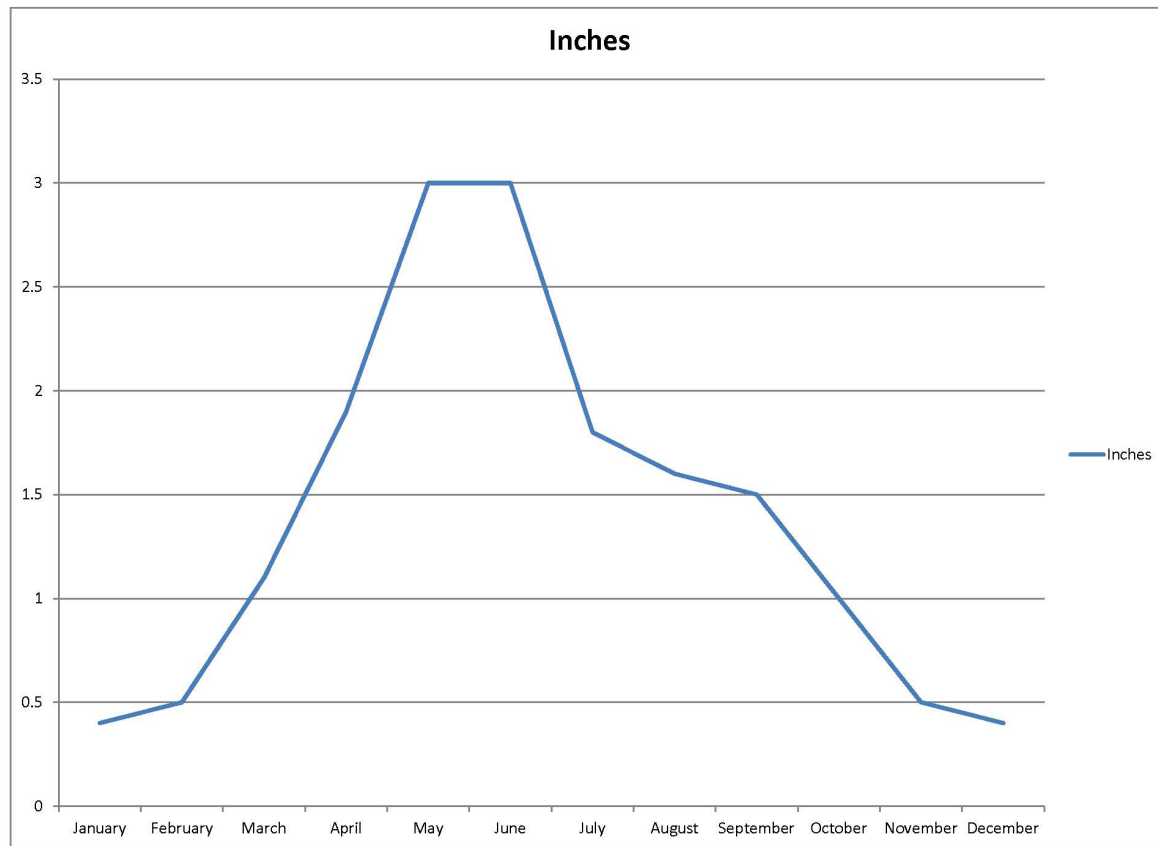
Humidity



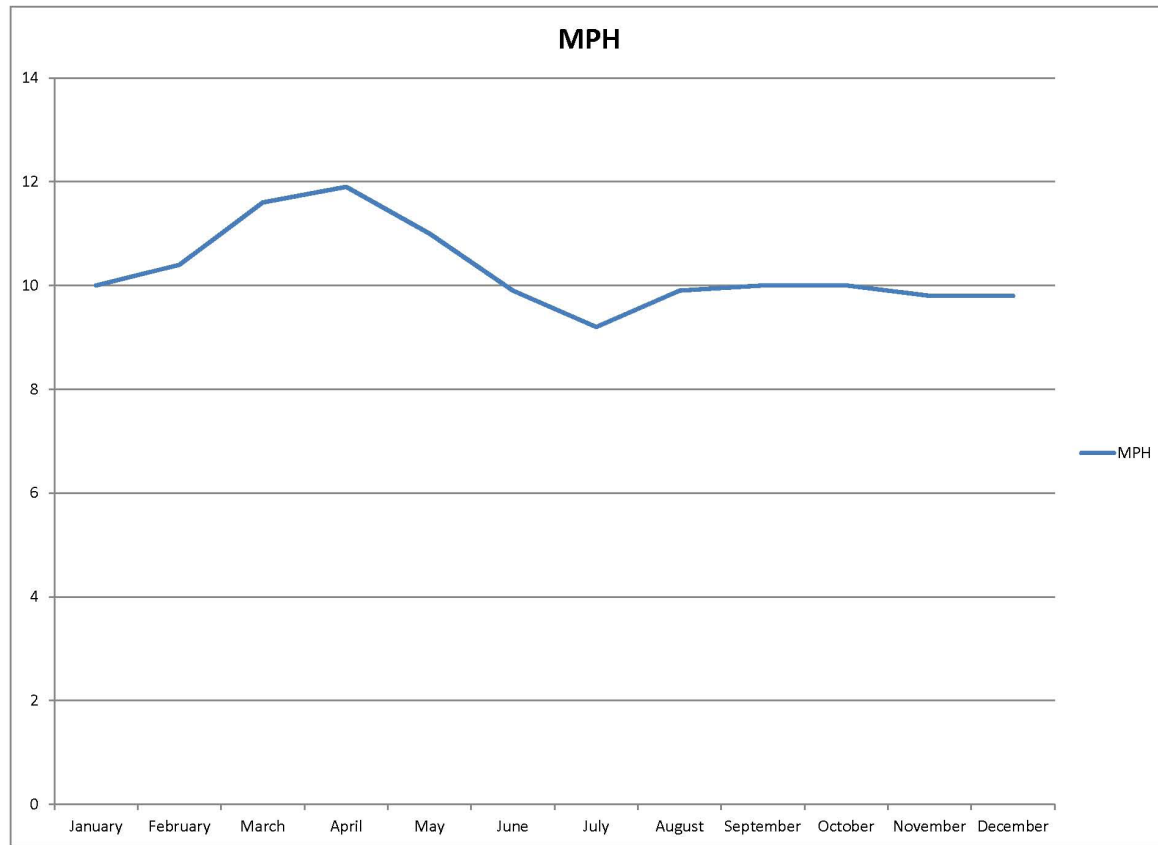
Snowfall



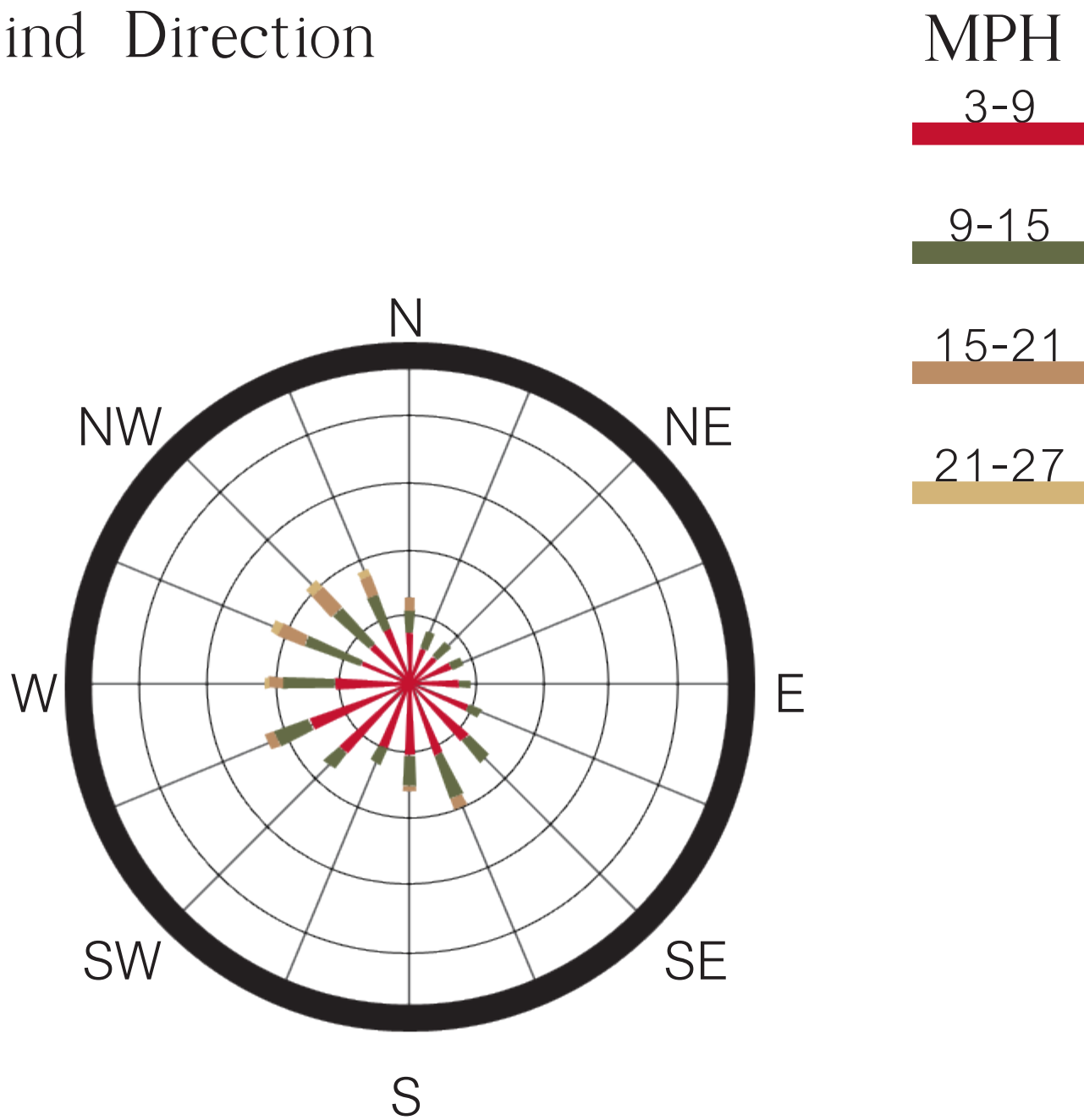
Precipitation



Wind Speed



Wind Direction



Topography and Air Movement

Noise

Slope Cuts

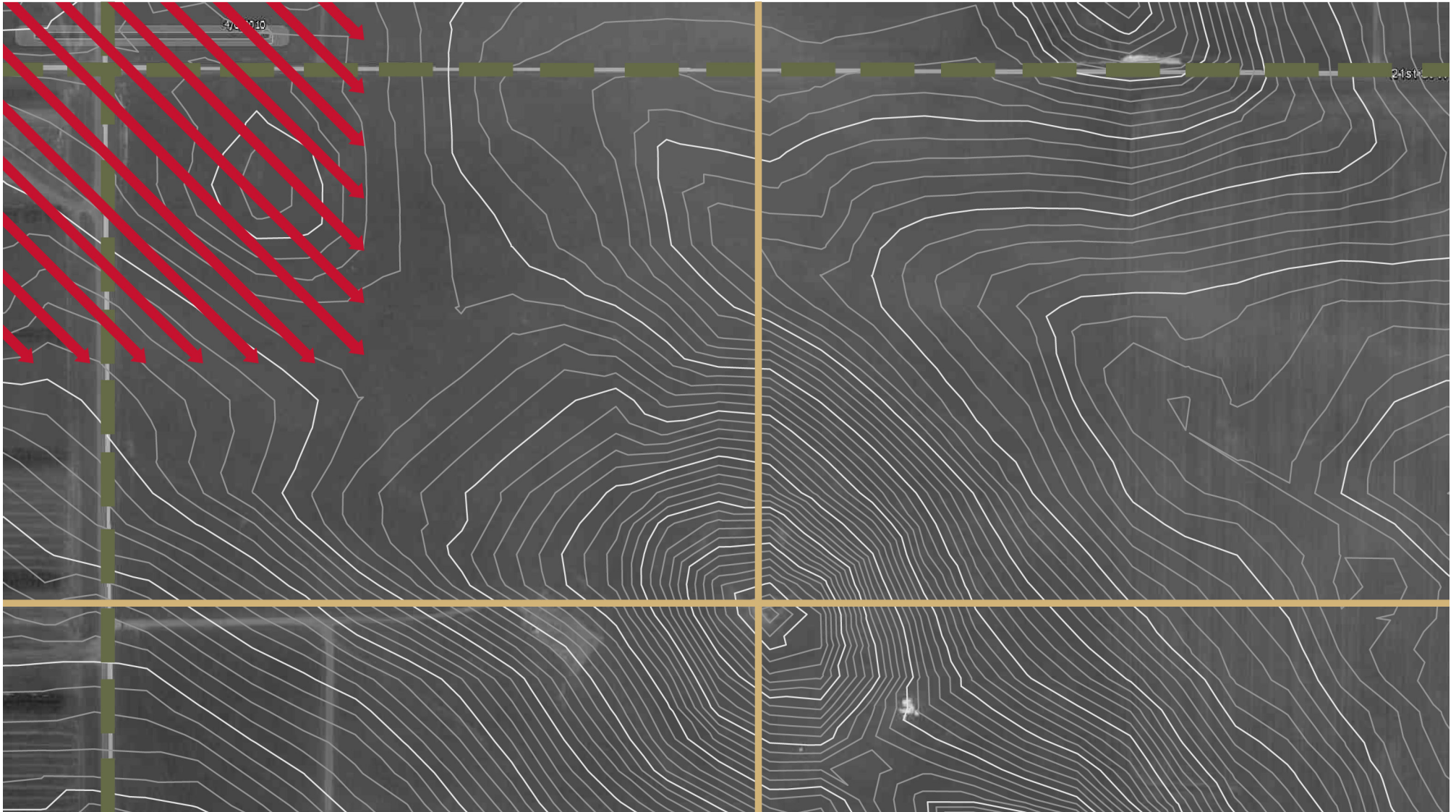


figure 53 topography

Slope and Climate

The slope of the site is very gentle, peaking at about the center of the site. The slope is easily walkable and from all vantage points from the eastern side of the site one can overlook the city.

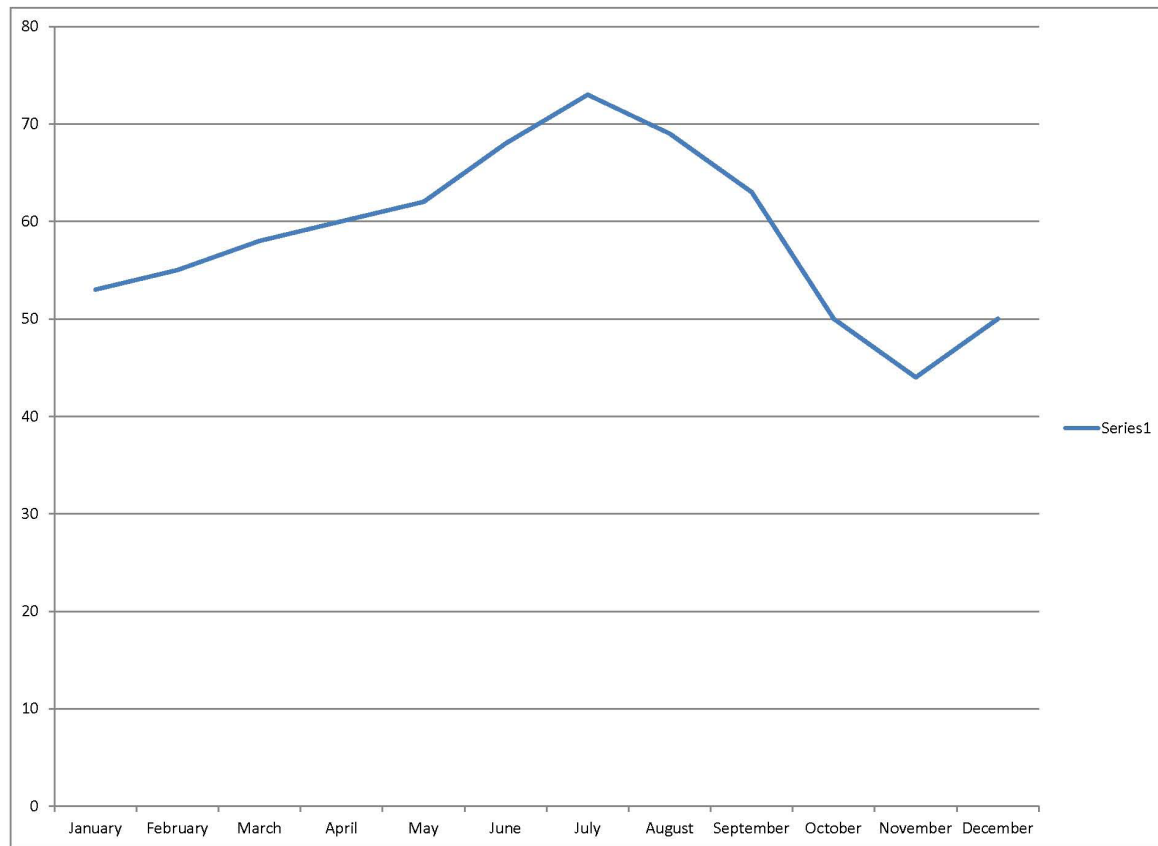
Shading

Shading is not an issue on this site. The site is currently open prairie grass with

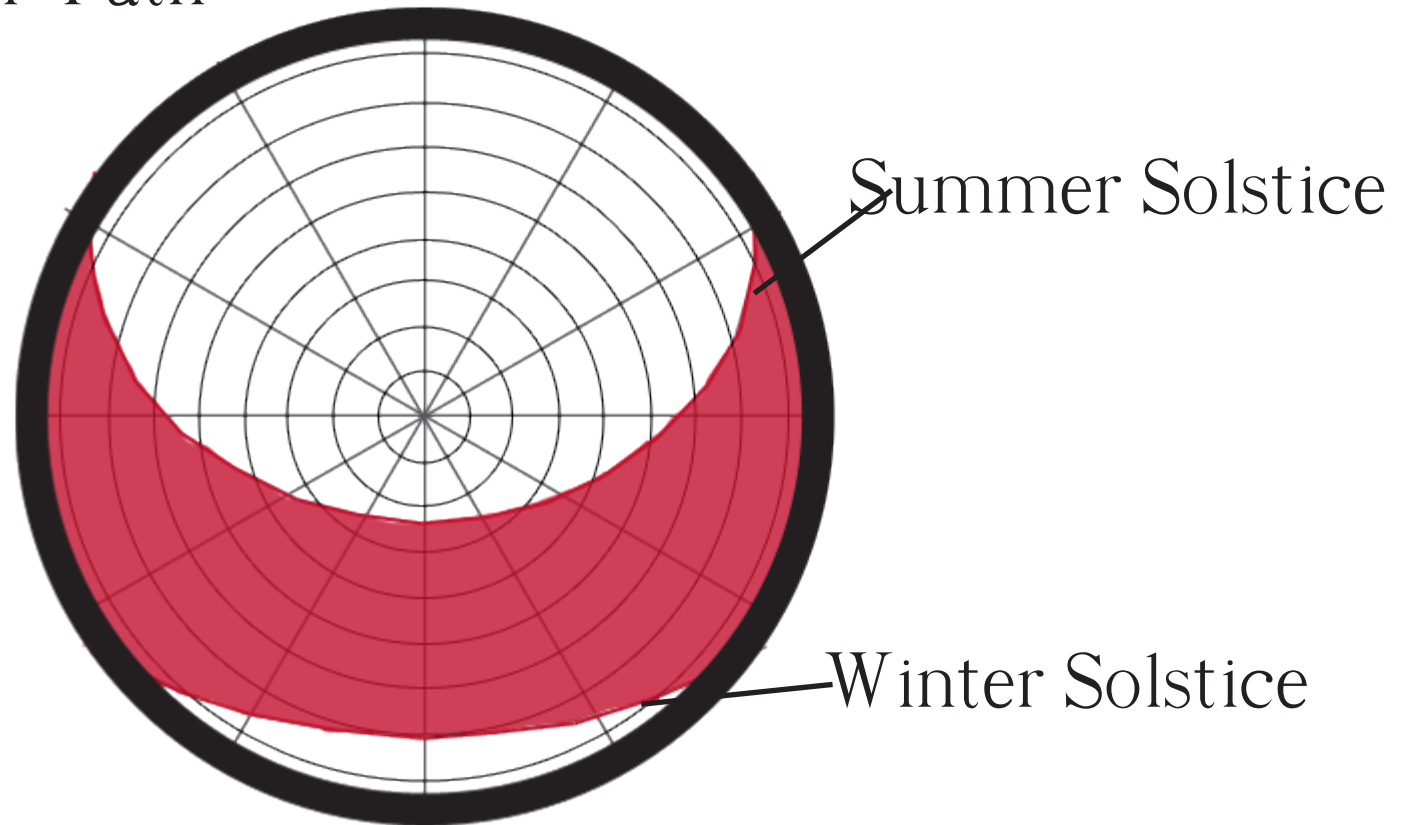
a gentle slope up to the center of the site. From all points on the site, there is never a shadow cast. The only concern is if buildings are layed out from south to north. Due to the downward slope, sun angle studies would have to be conducted to determine the appropriate distance the buildings should be spaced apart.



Sunshine



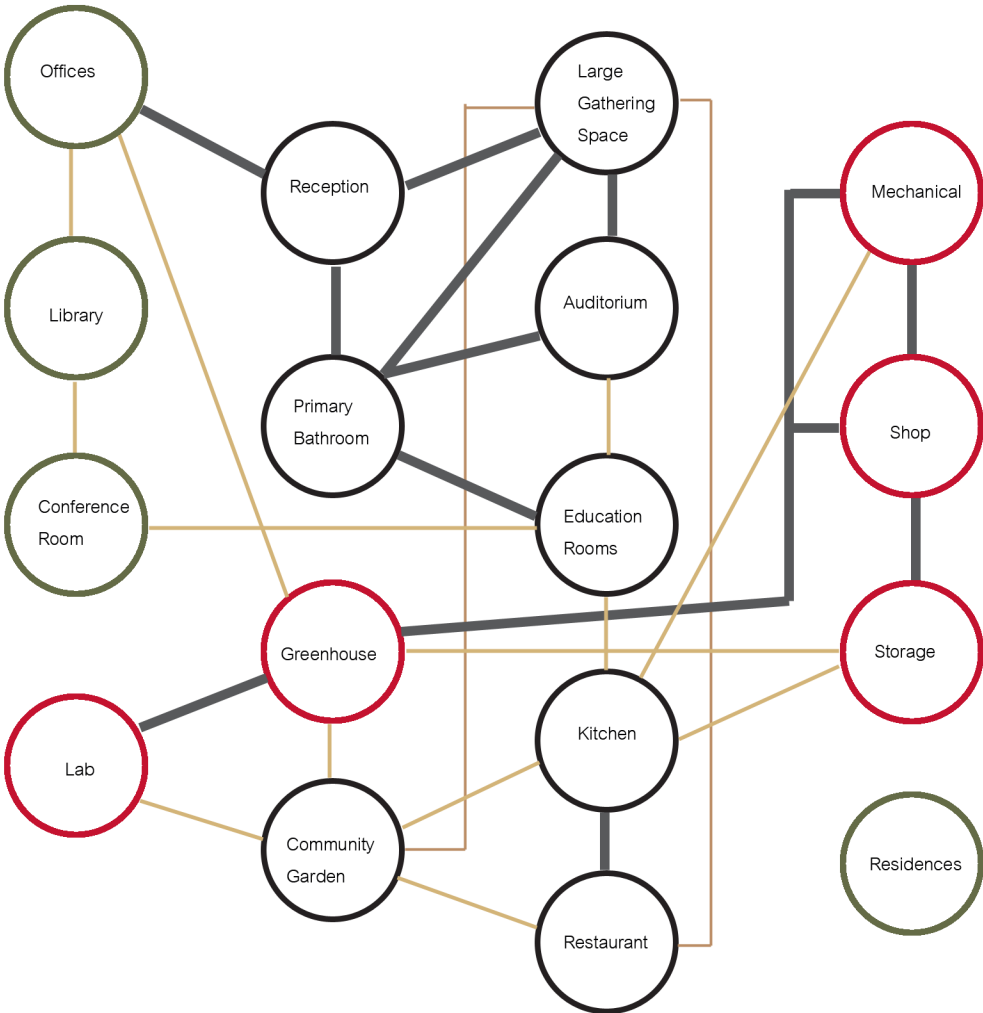
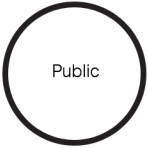
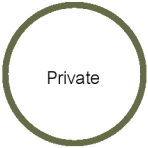
Sun Path



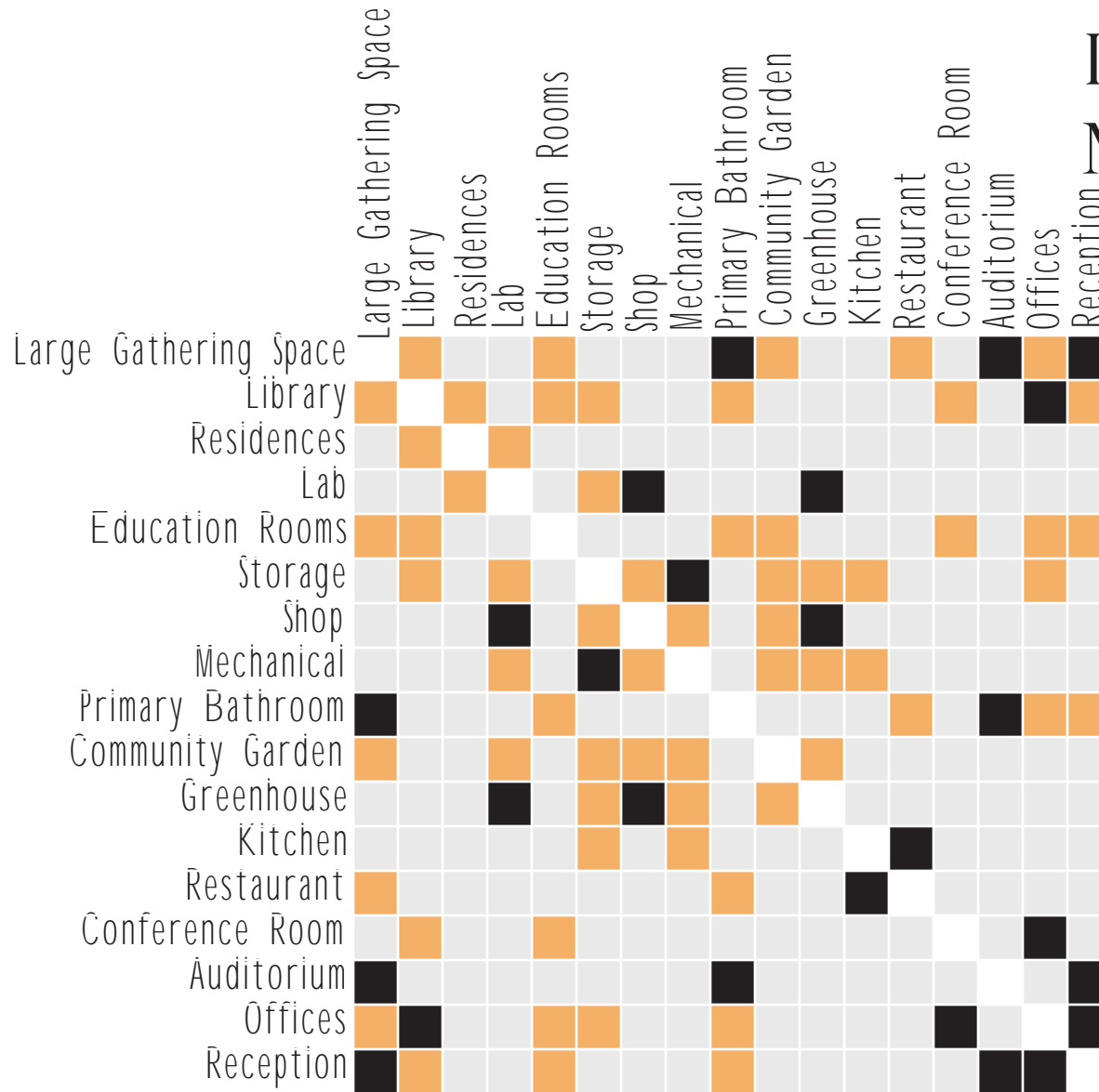
Cloudiness



INTERACTION NET



INTERACTION MATRIX



Desireable ■
 Not Needed ■
 Essential ■

PROGRAMMATIC REQUIREMENTS

Large Gathering Space	5000 sq. ft.
Library	1000 sq. ft.
Residences	5000 sq. ft.
Education Rooms	2400 sq. ft.
Storage	500 sq. ft.
Mechanical	1000 sq. ft.
Shop	1800 sq. ft.
Primary Bathroom	1000 sq. ft.
Greenhouse	1500 sq. ft.
Community Garden	Outdoor
Kitchen	1000 sq. ft.
Restaurant	4000 sq. ft.
Conference Room	500 sq. ft.
Auditorium	7500 sq. ft.
Offices	1000 sq. ft.
Reception	400 sq. ft.
Total	33600 sq. ft.

Design

Concepts

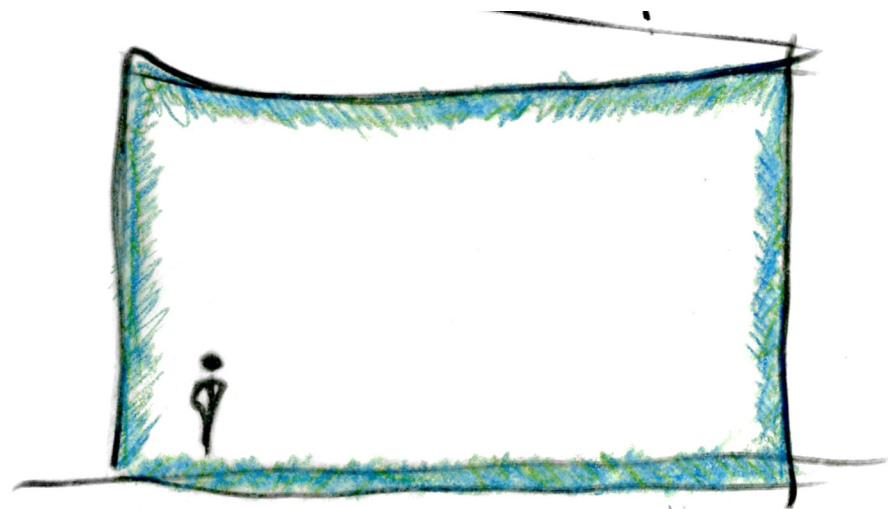
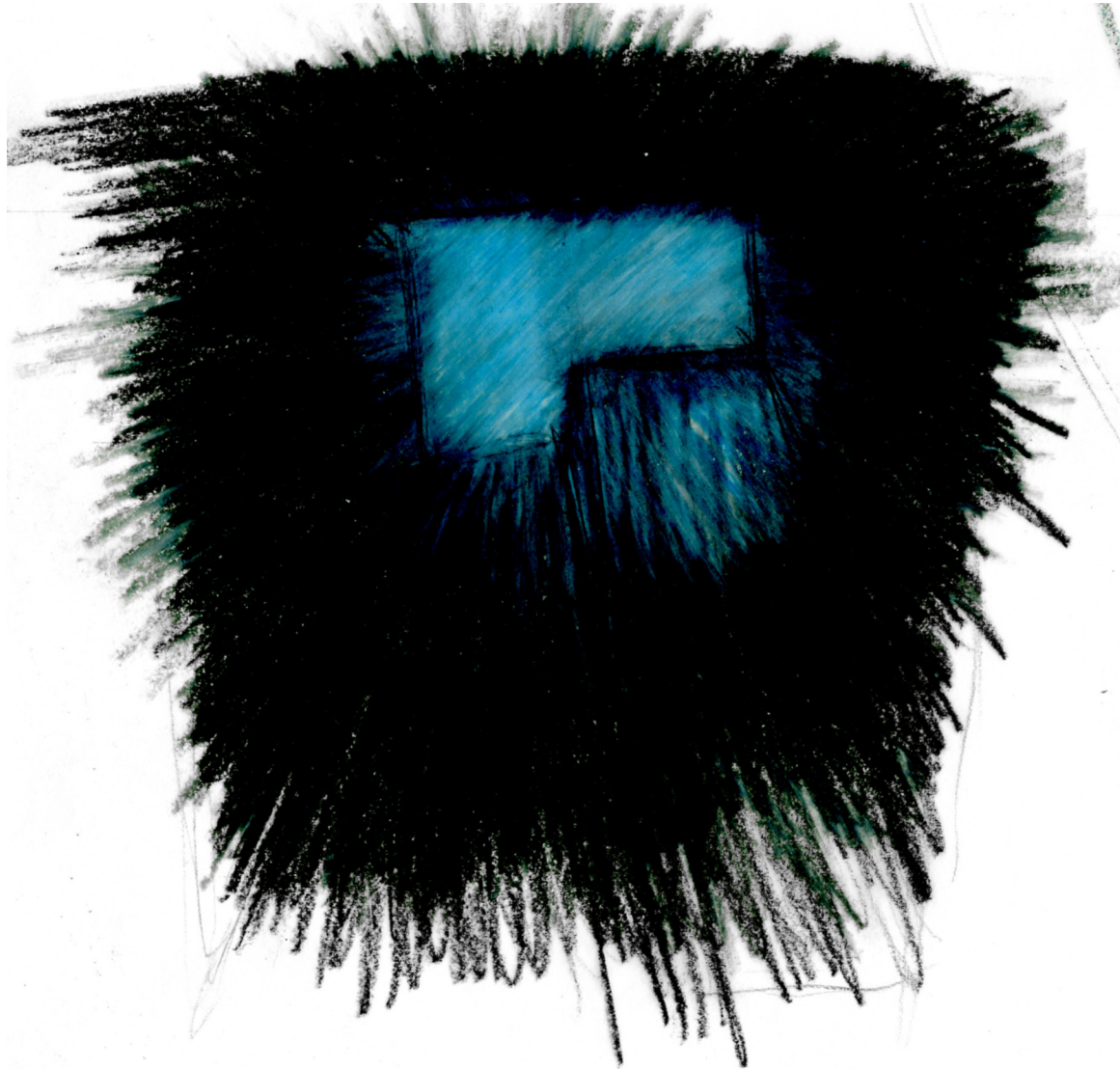


figure 61 lightness concept



Process

TOWNSCAPES
JULLEN
SERIAL VISION

east/west
greenhouse



EMHOUSE
GREEN ROOF

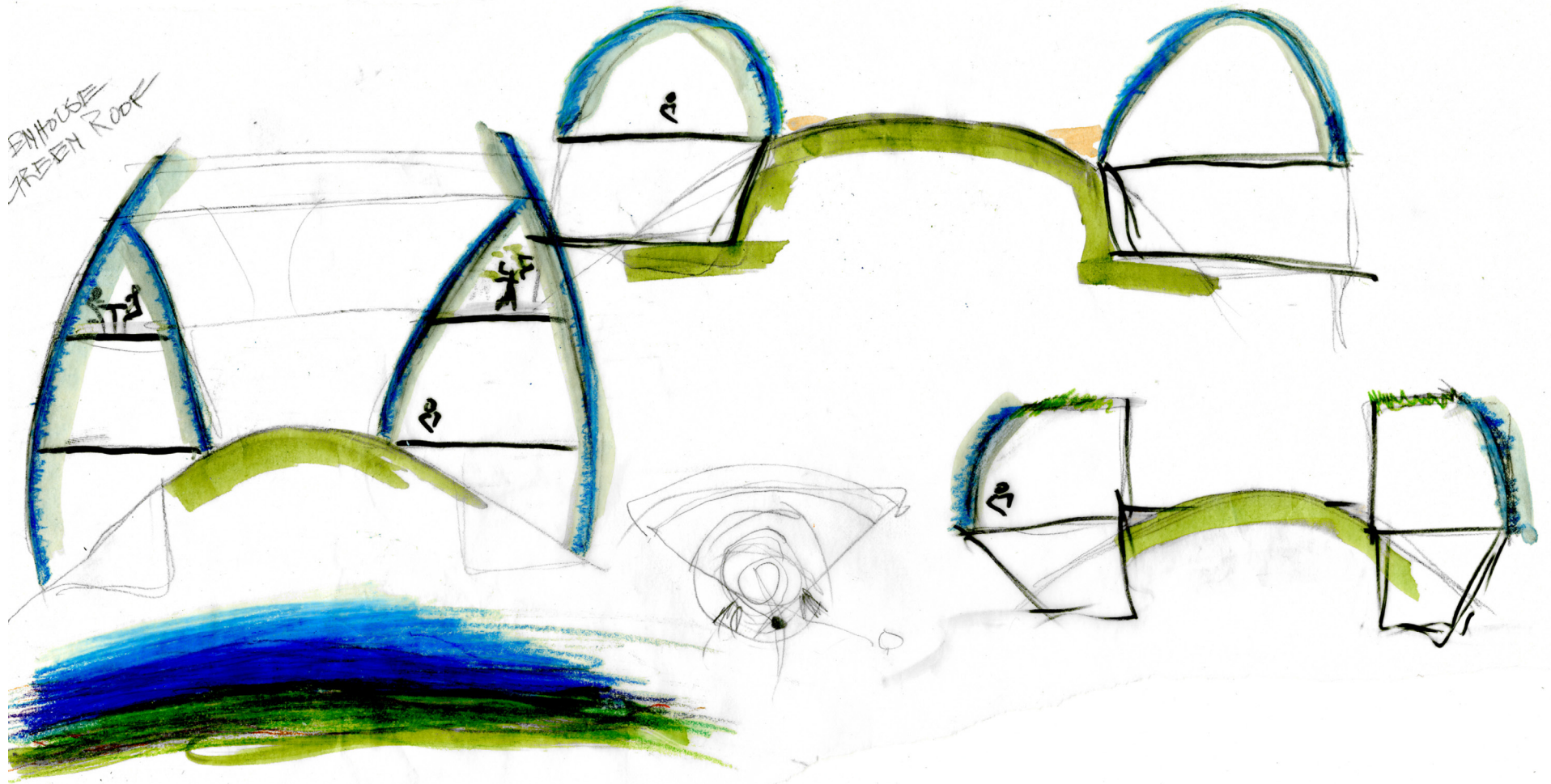
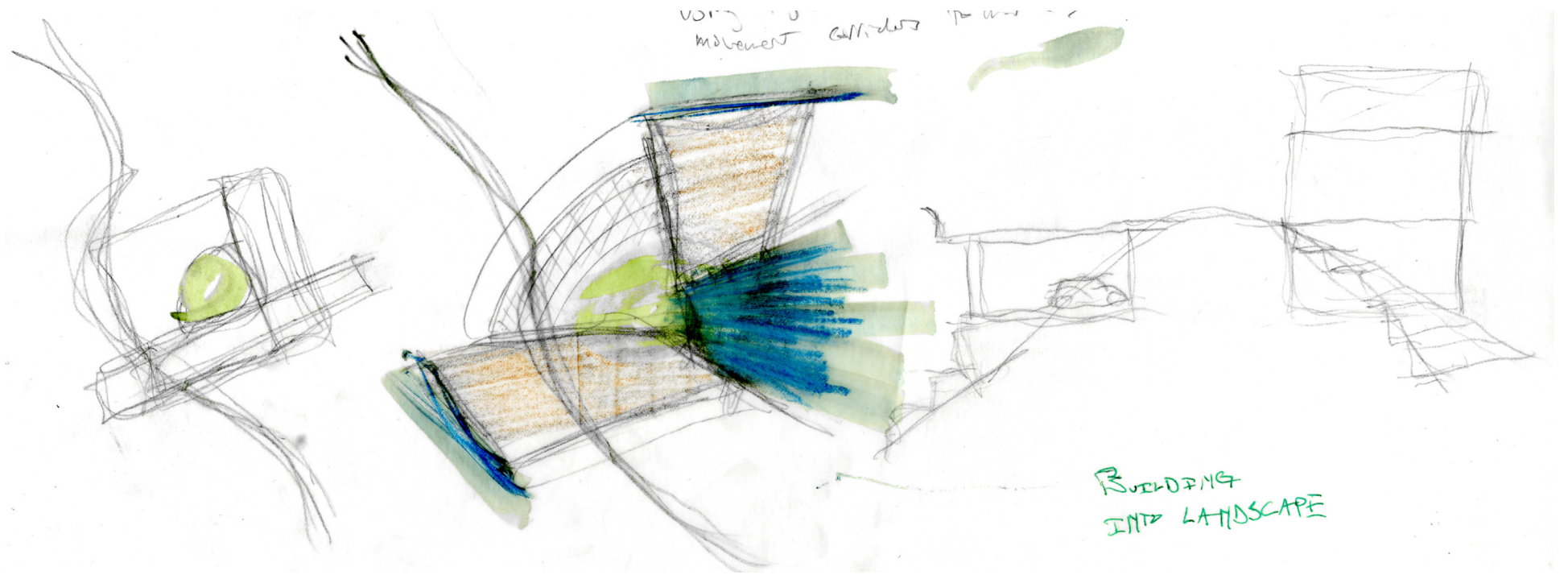


figure 64 process



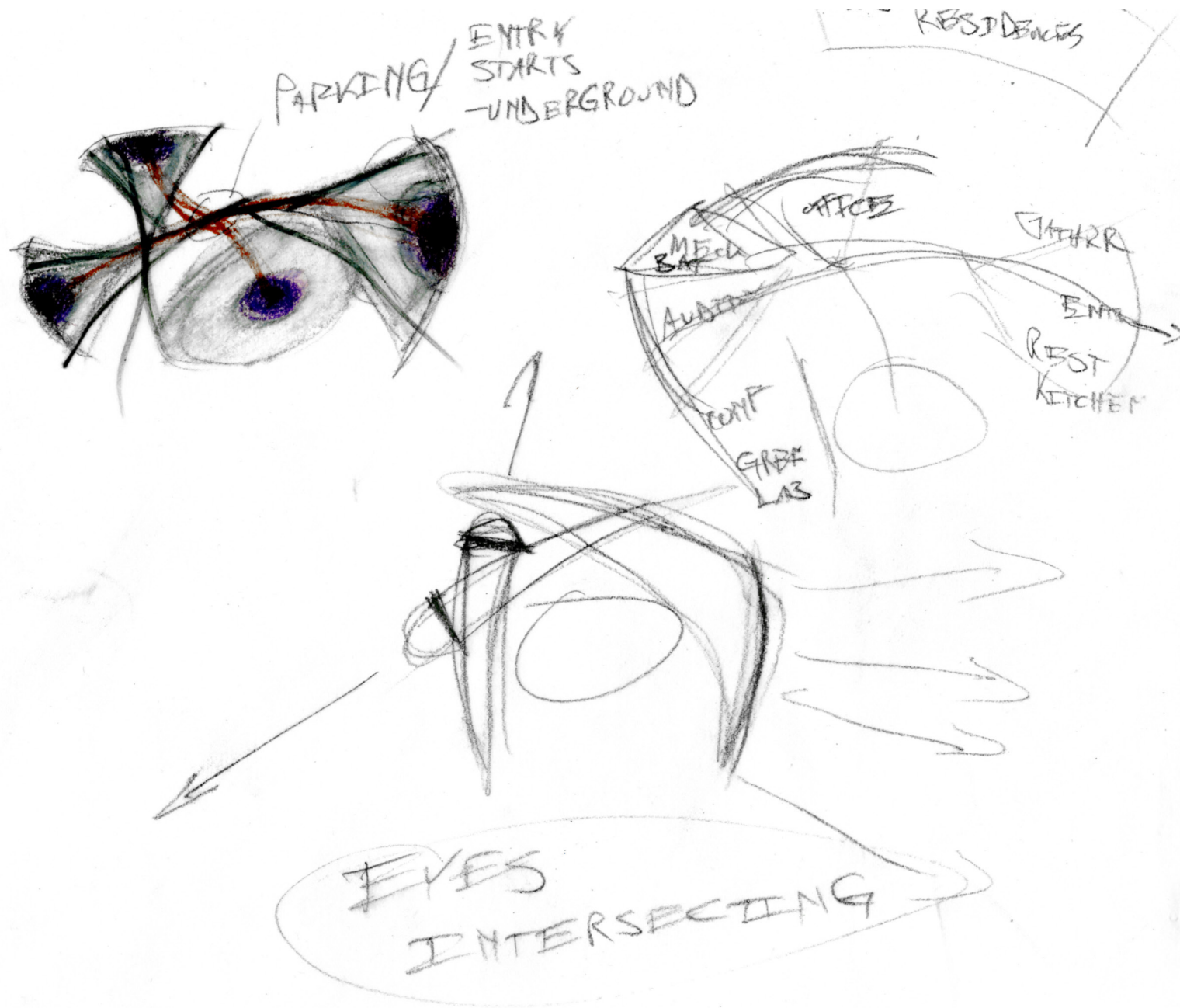


figure 66 process

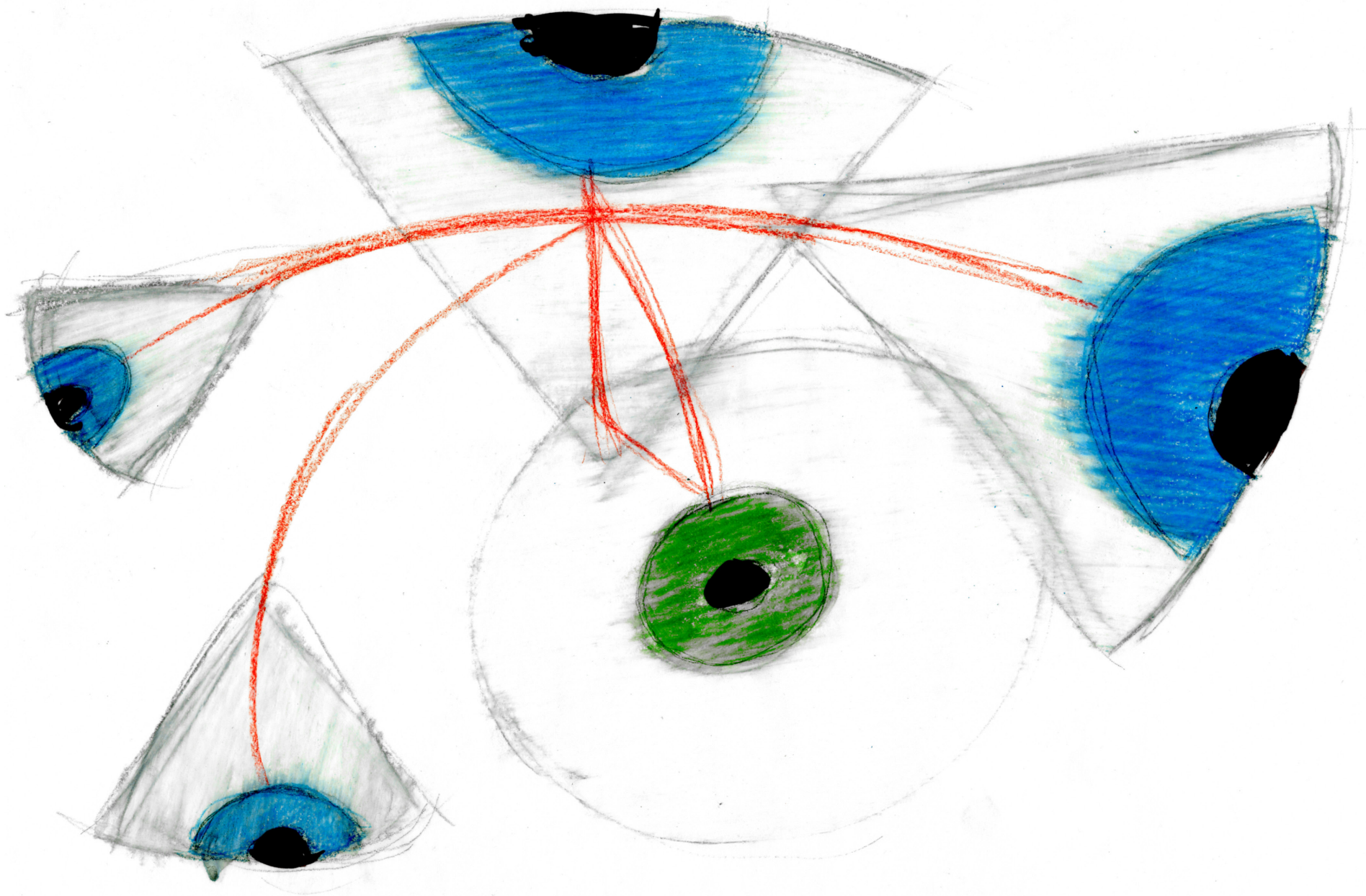
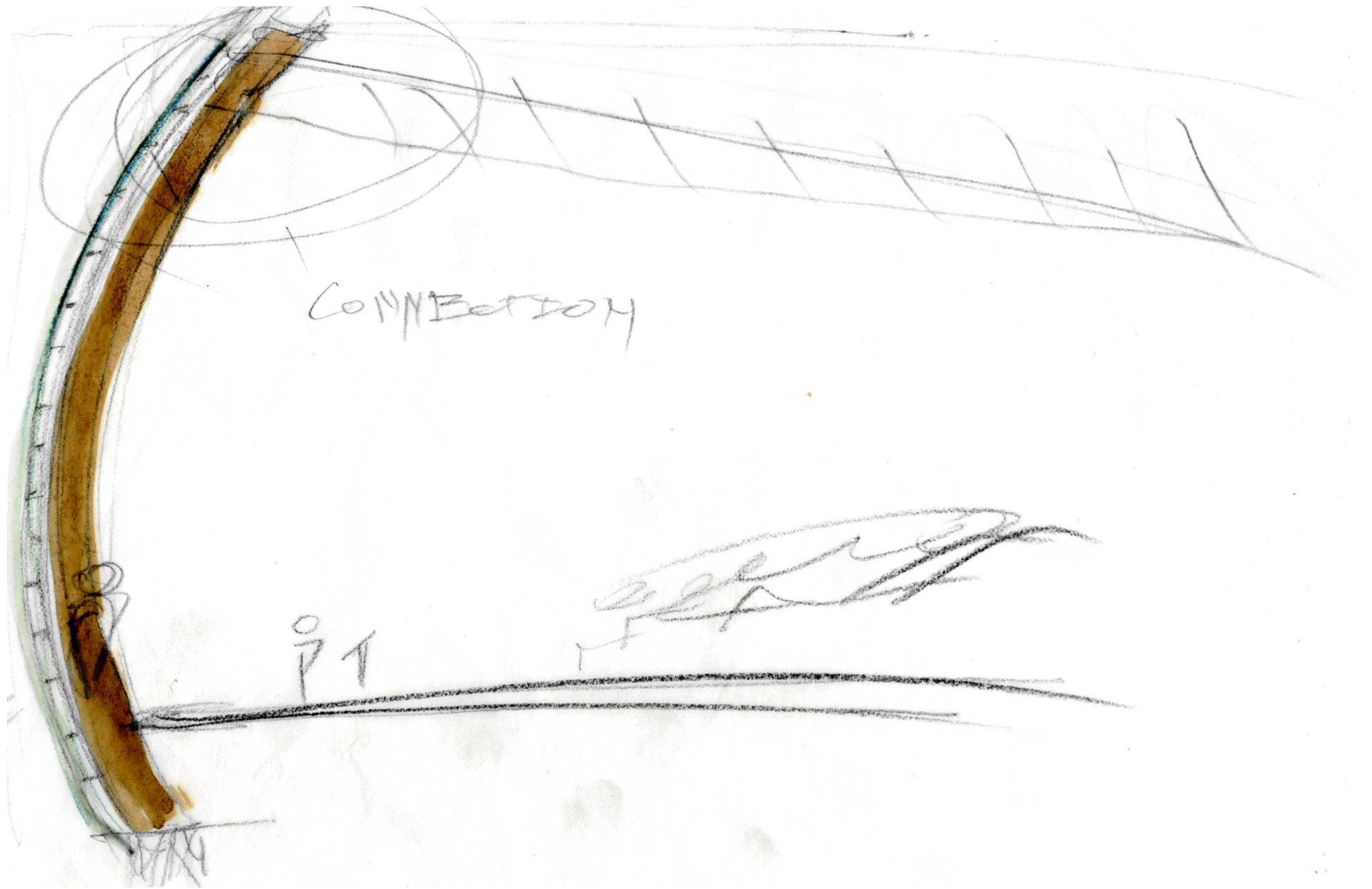




figure 68 process



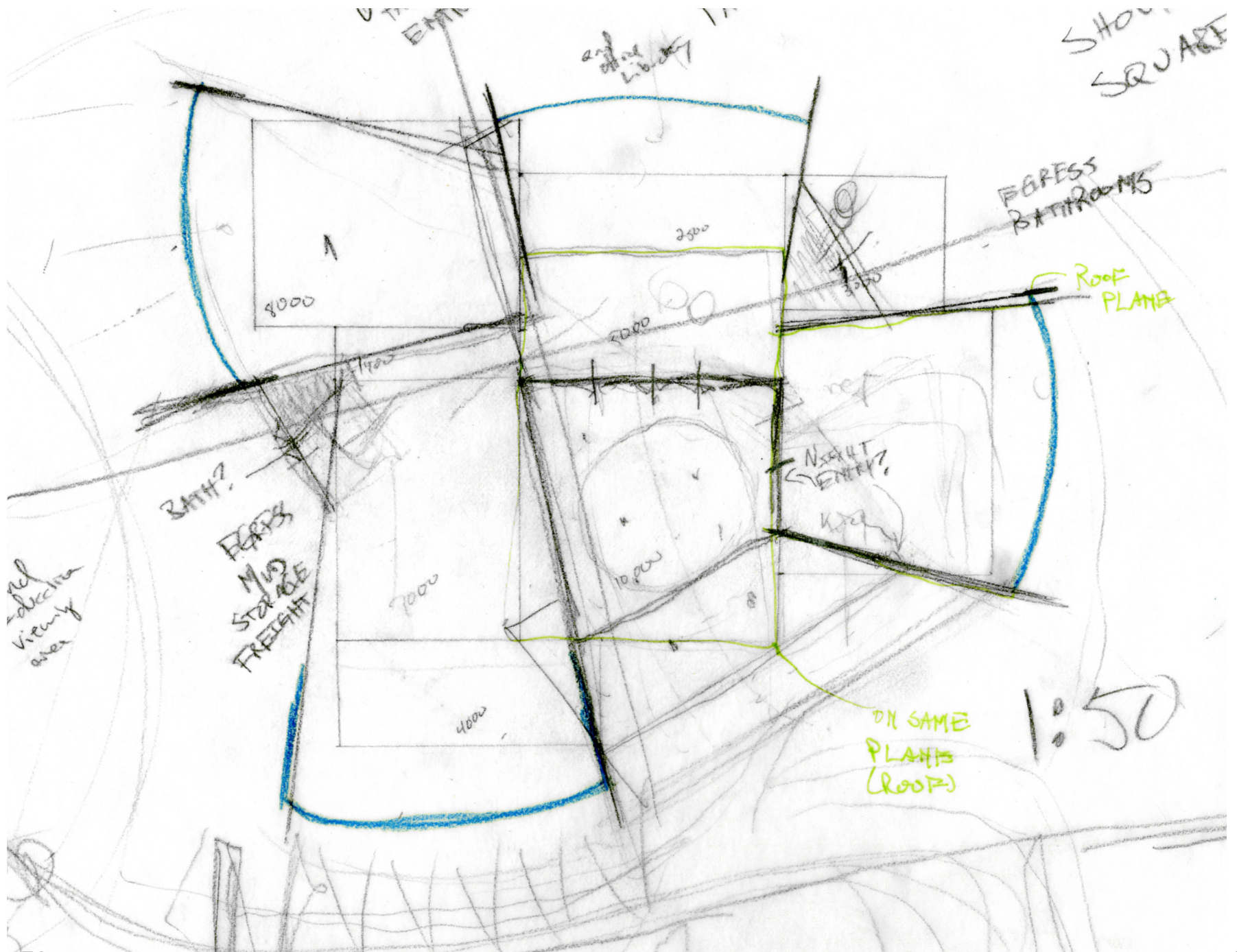


figure 70 process

Design



figure 71 site plan

Level One

West-Auditorium Wing

- Storage
- 160 Permanent Chairs

North-Office Wing

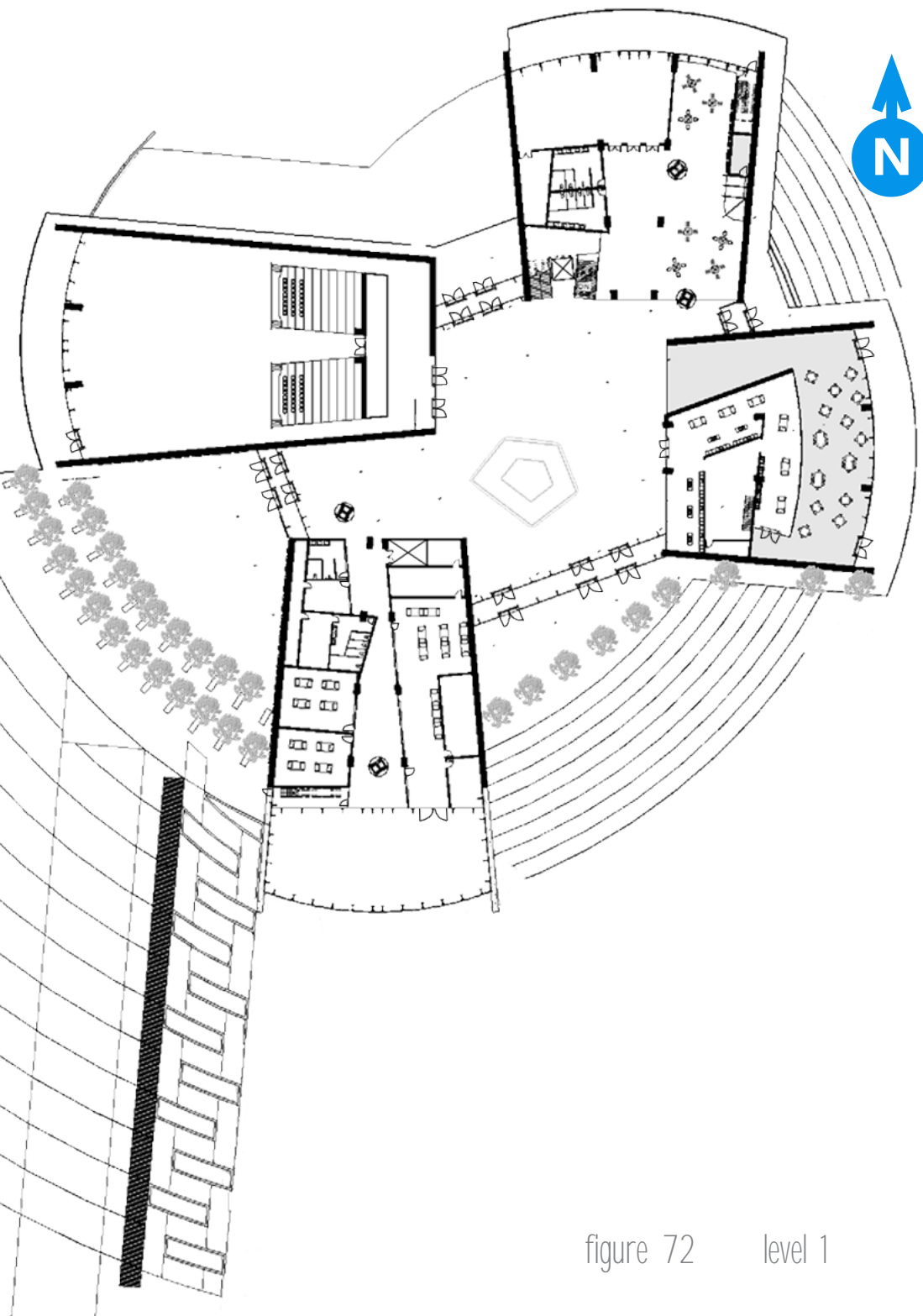
- Cafe
- Bathrooms
- Conference Room

East-Restaurant Wing

- Incubator Kitchen
- Restaurant Kitchen
- Restaurant Seating

South-Research Wing

- Greenhouse
- Lab Space
- Compost Area
- Shop
- Storage
- Mud Room/Lockers
- Bathrooms



Level Two

West-Auditorium Wing

- Operation Room

North-Office Wing

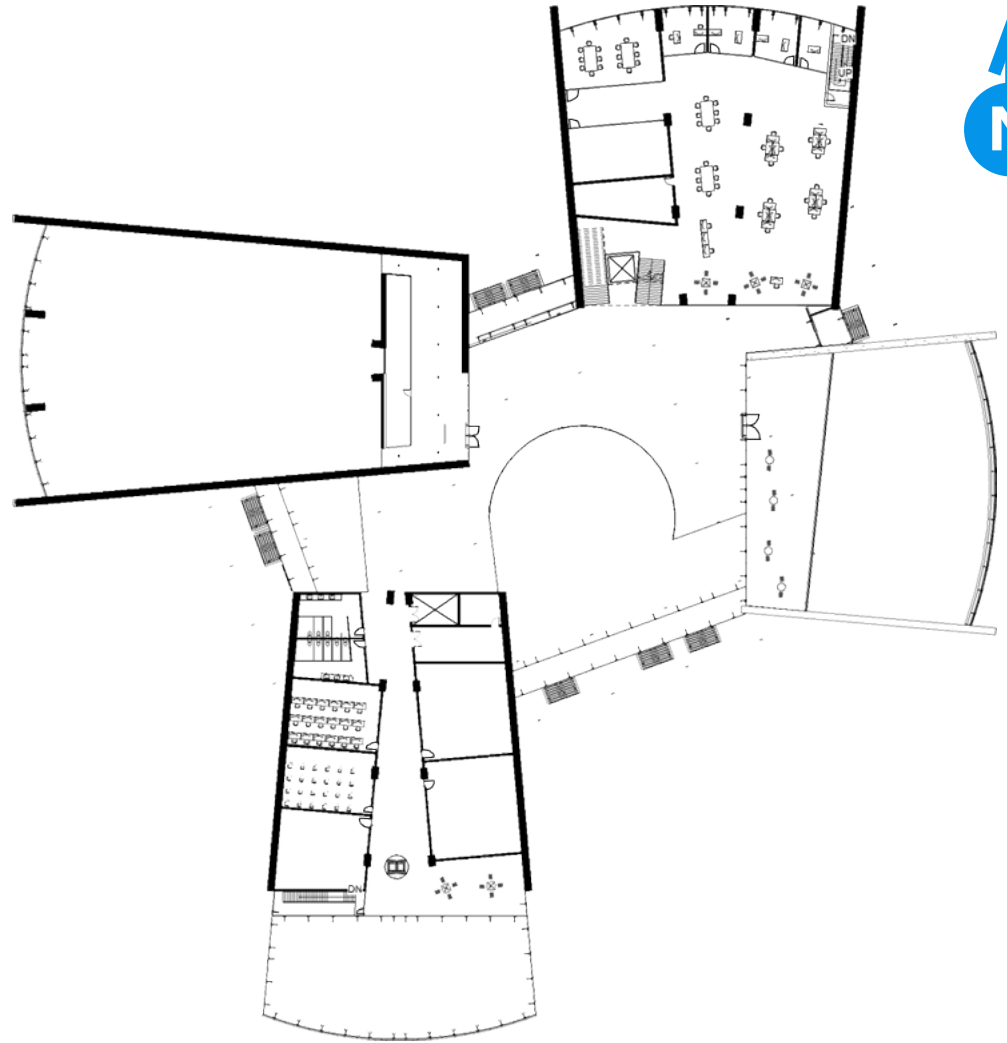
- Office
- Conference Room
- Library

East-Restaurant Wing

- Outdoor Patio

South-Research Wing

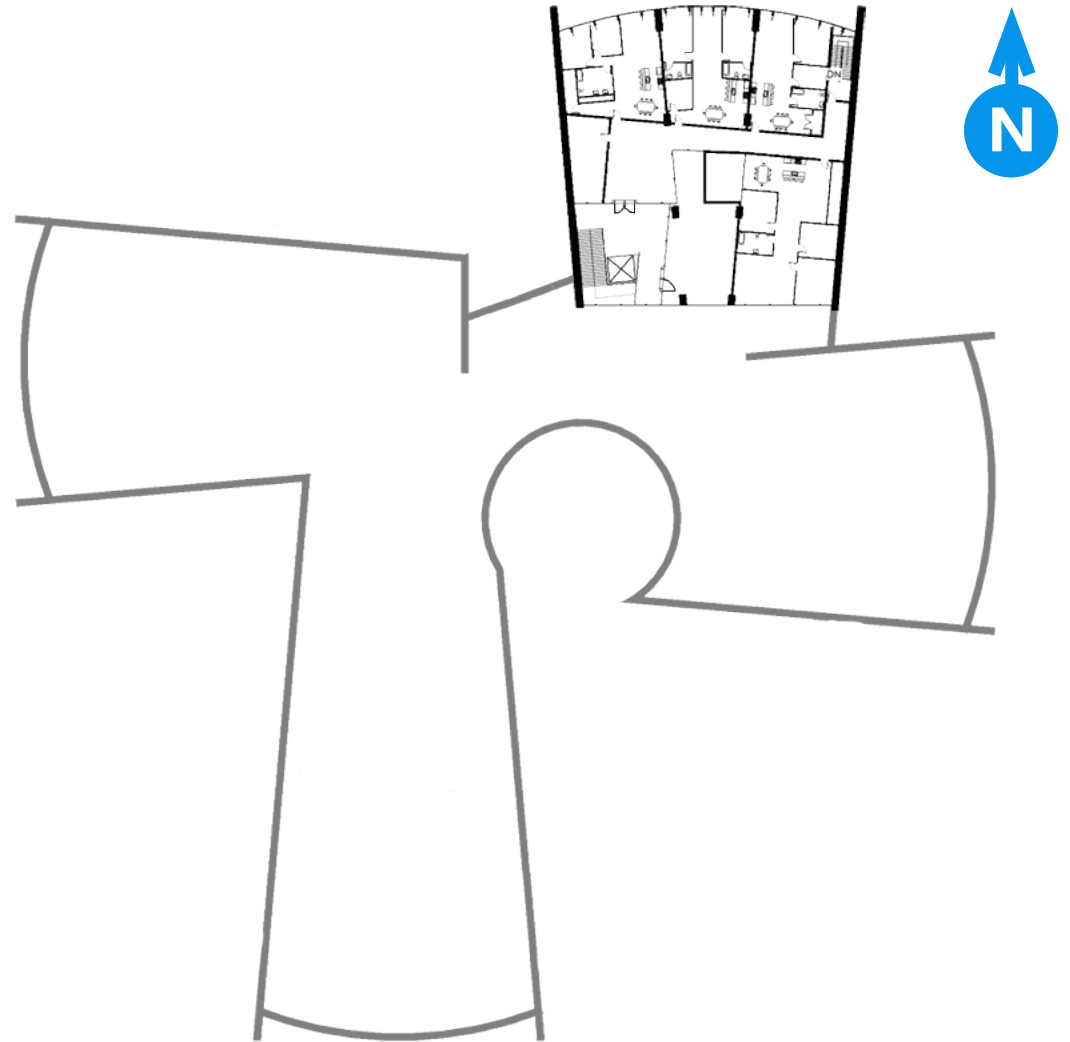
- Greenhouse Viewing Area
- Classrooms
- Storage
- Bathrooms



Level Three

North-Office Wing

- Shared Patio
- Shared Laundry
- 4 Different Residential Units



- Undergournd Parking
- West-Auditorium Wing
 - Parking
- North-Office Wing
 - Entry
 - Parking
- East-Restaurant Wing
 - Mechanical
 - Storage
 - Loading
- South-Research Wing
 - Mechanical
 - Freight
 - Loading

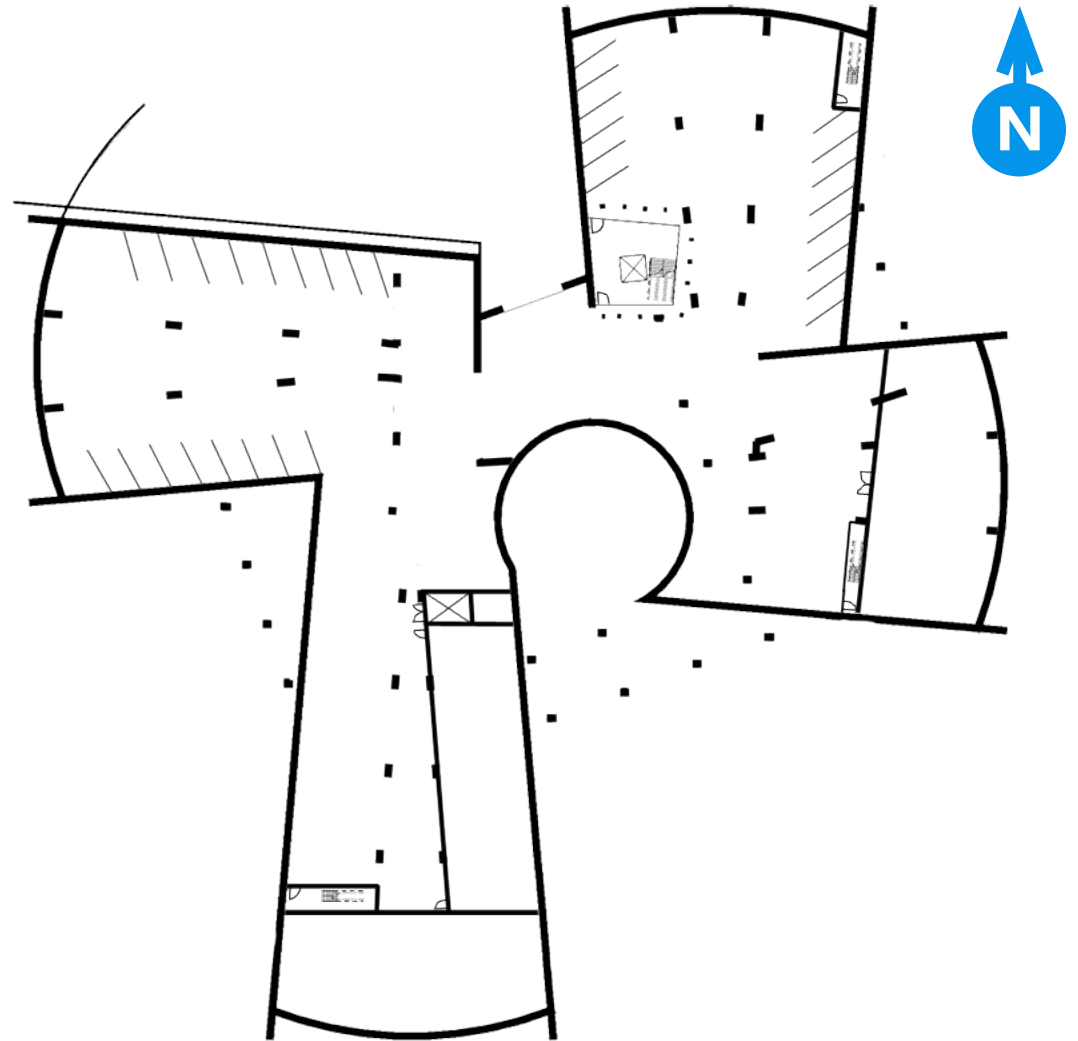


figure 75 underground parking

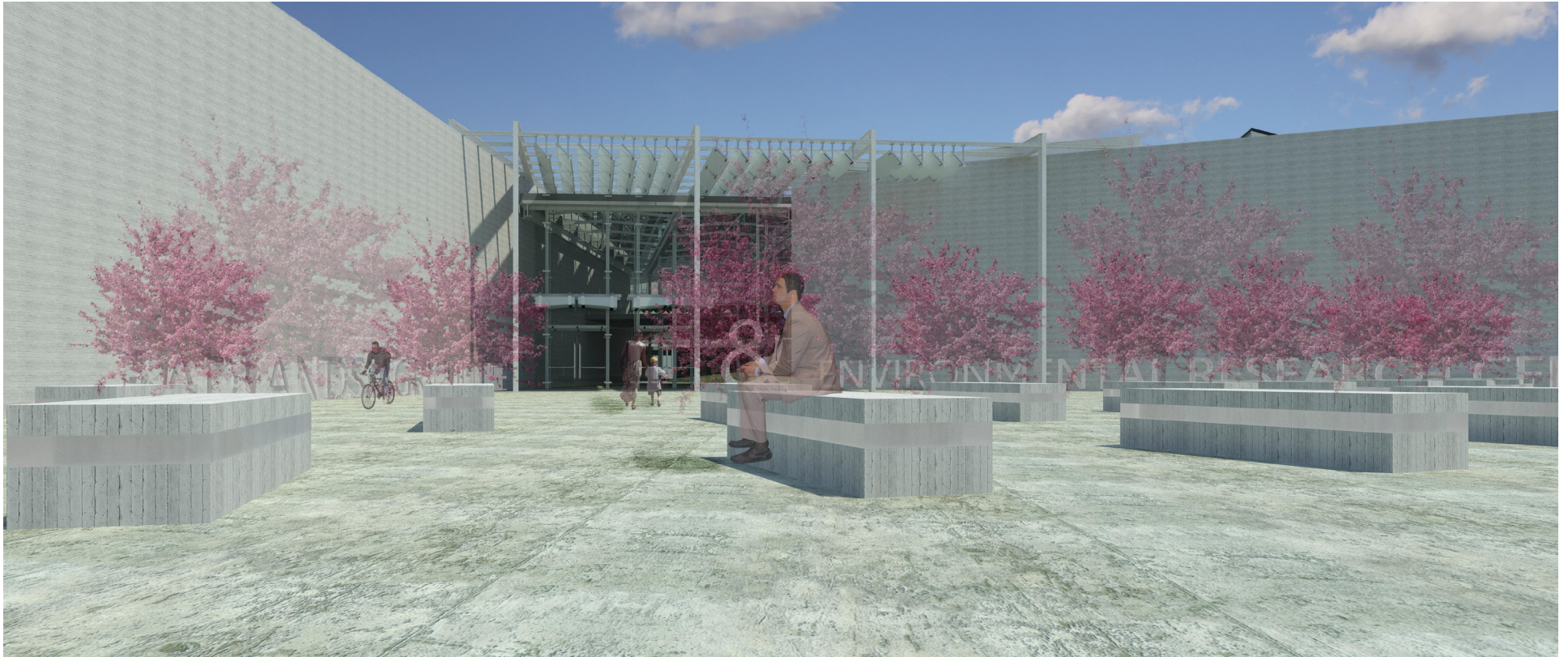




figure 77 research hallway



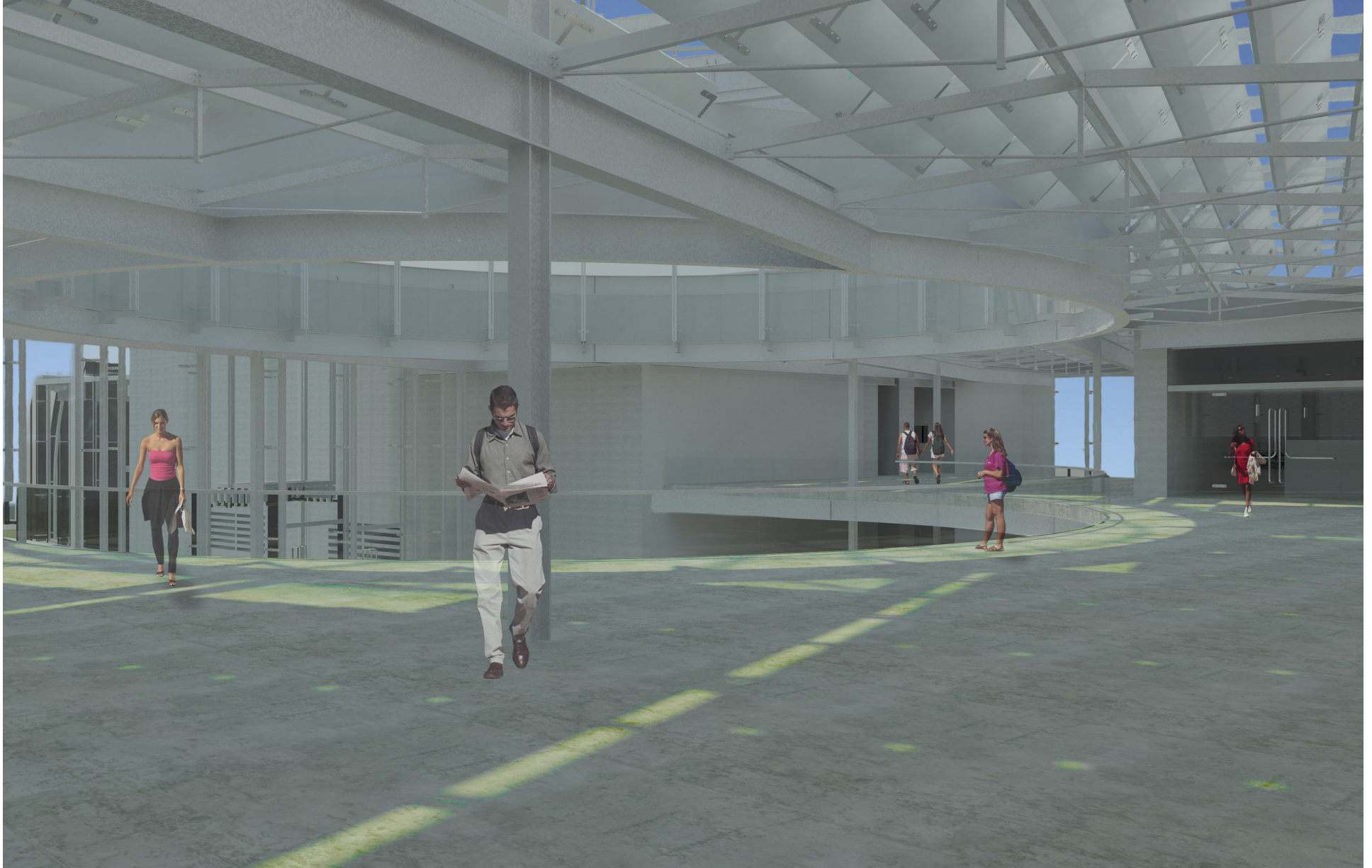


figure 79 restaurant





figure 81 auditorium



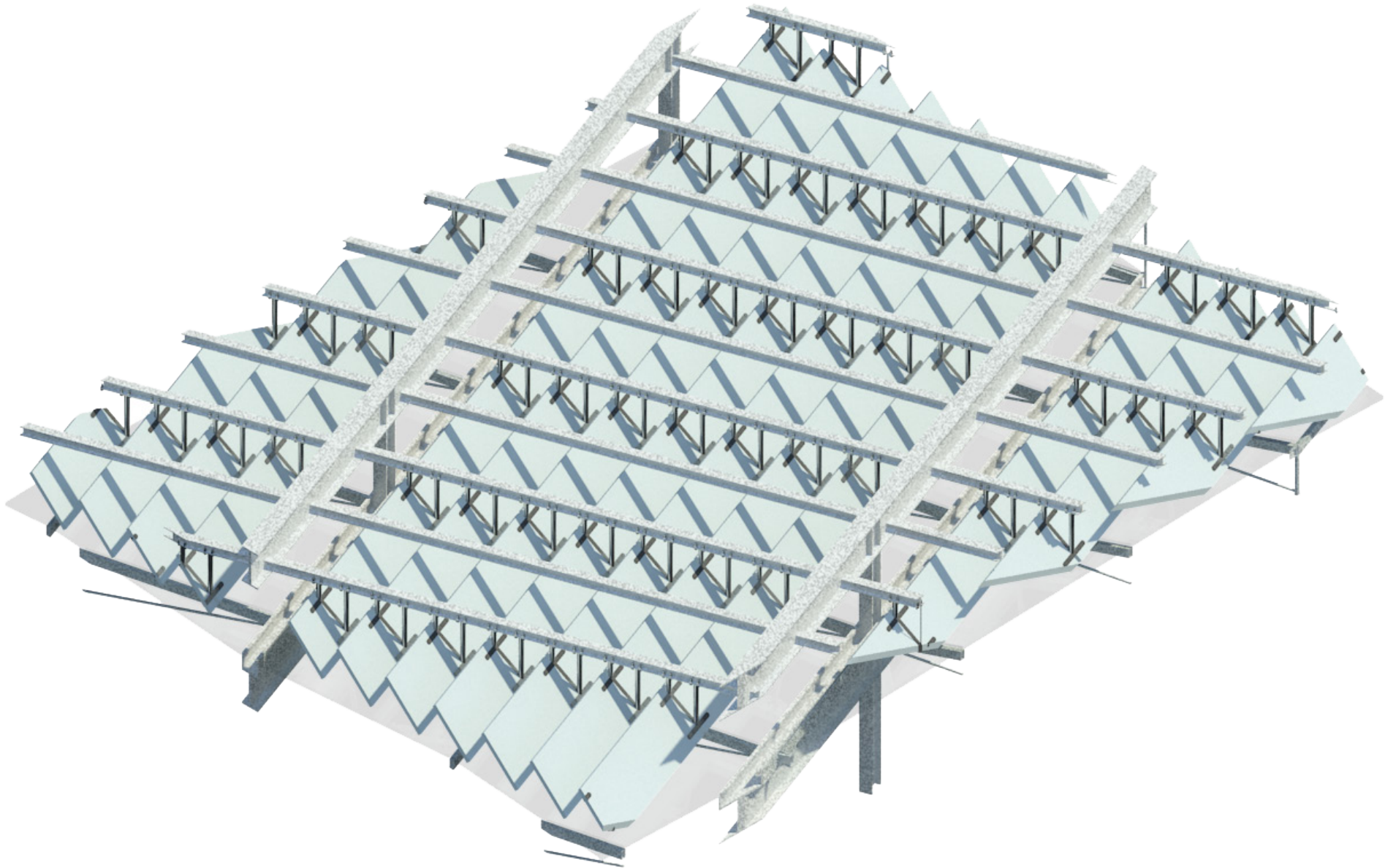
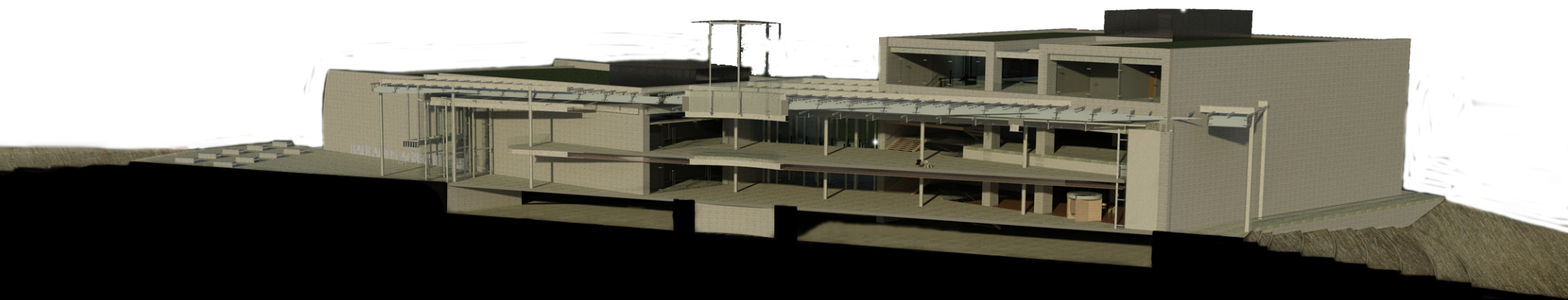


figure 83 shading detail



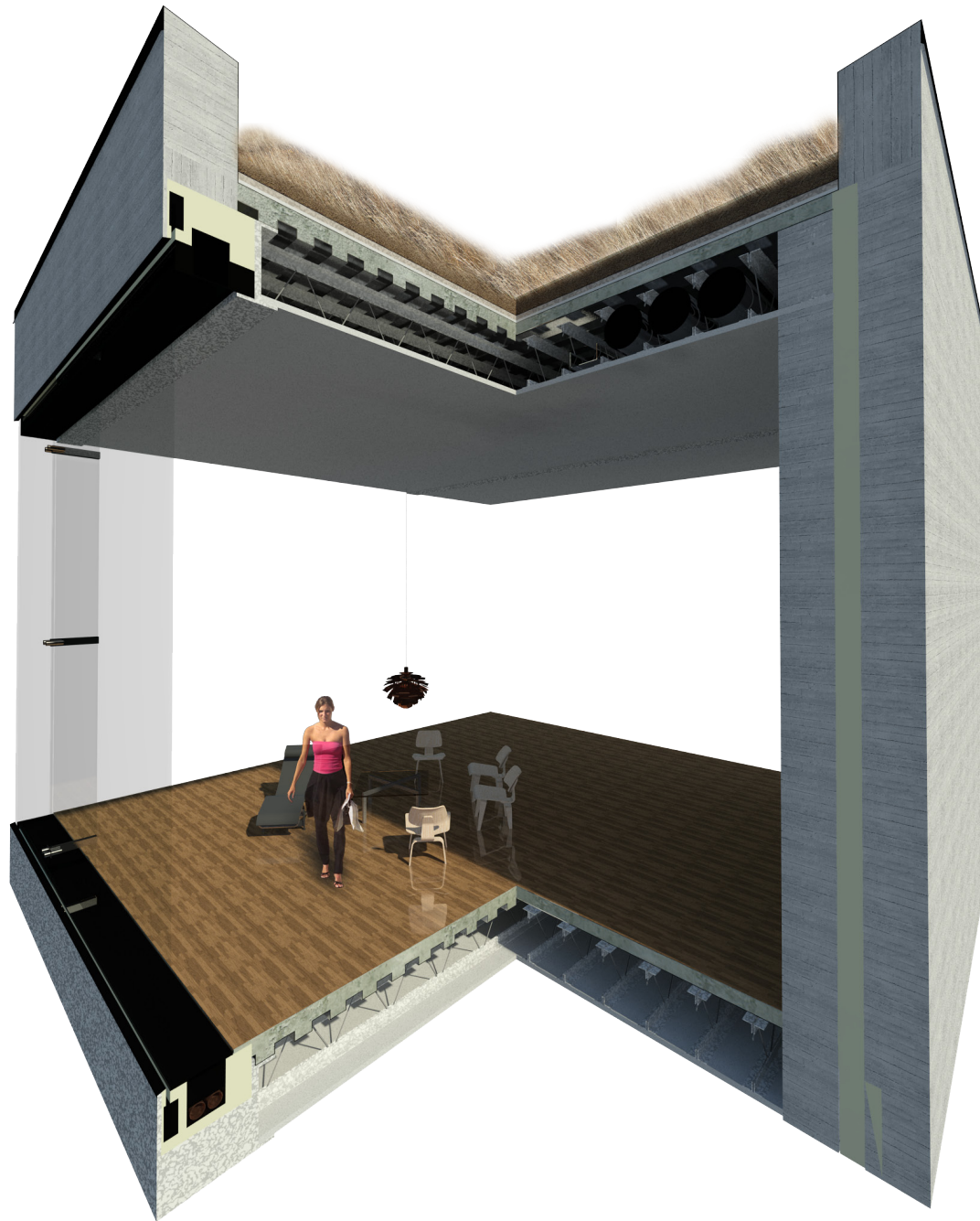


figure 85 wall detail

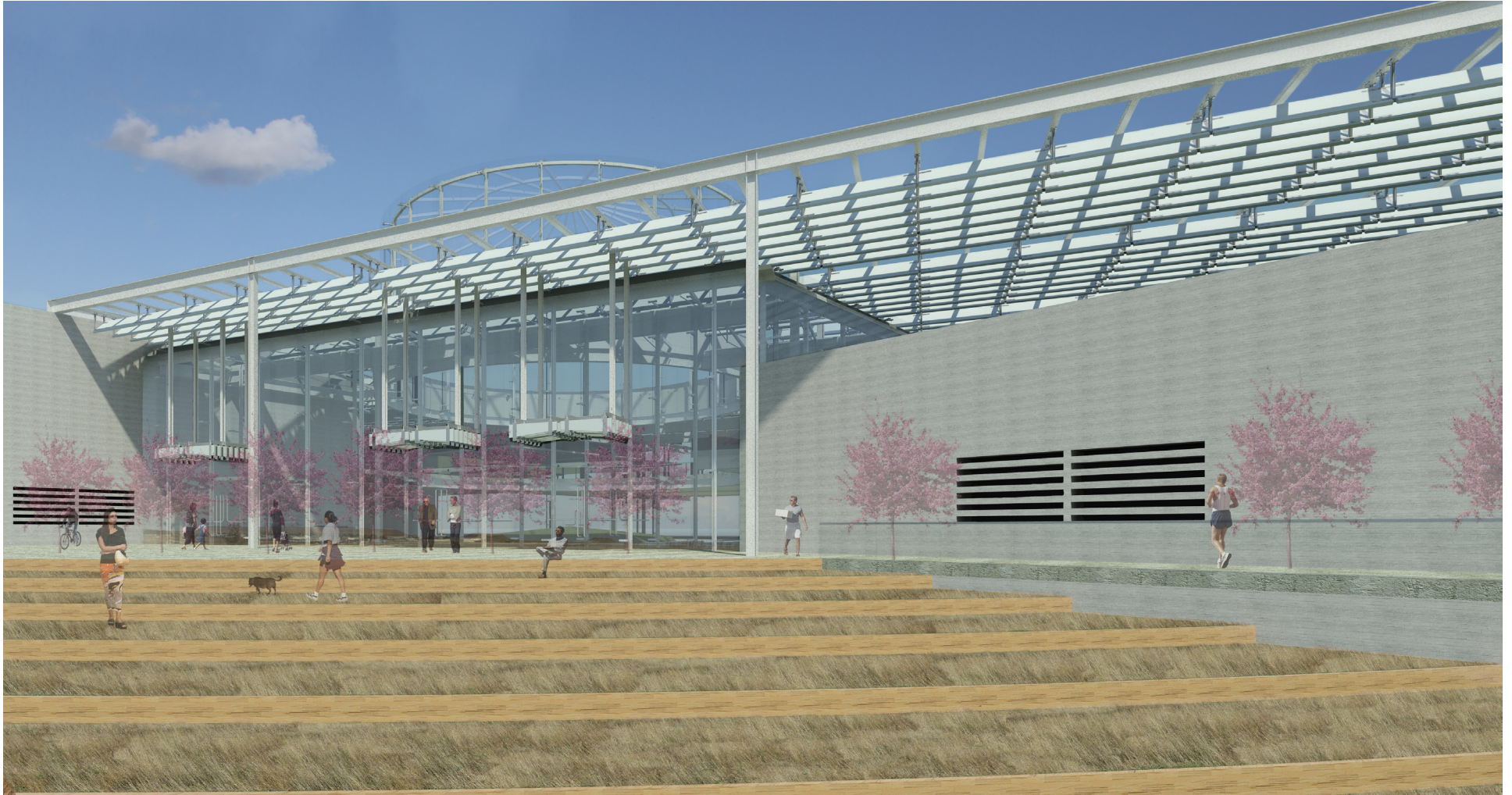
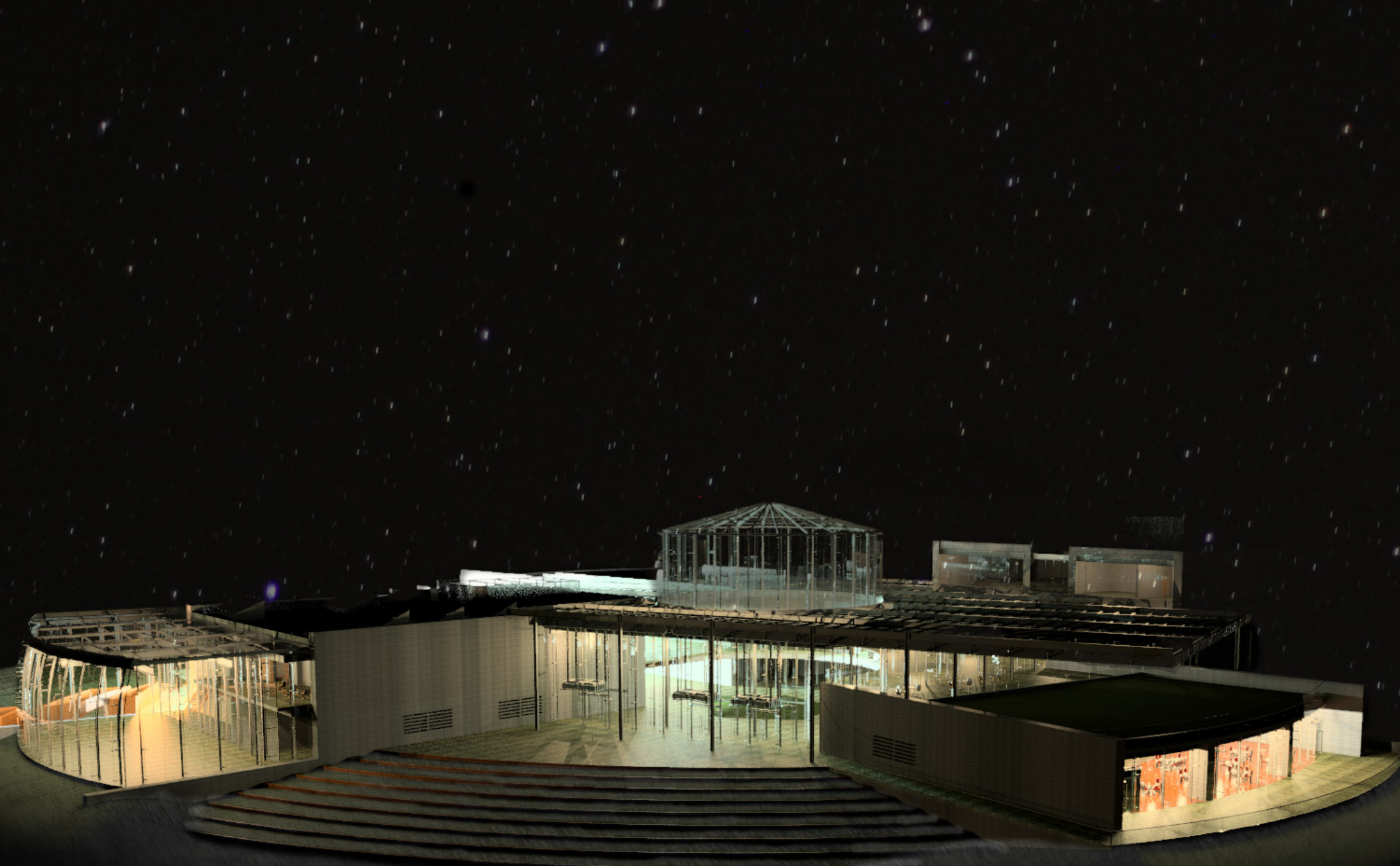
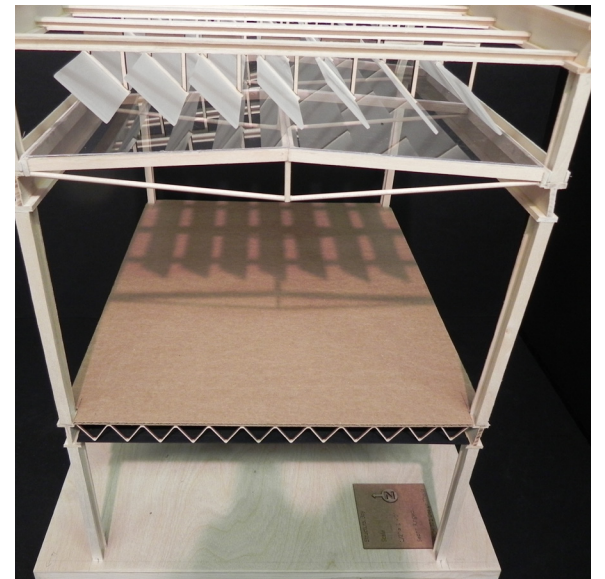
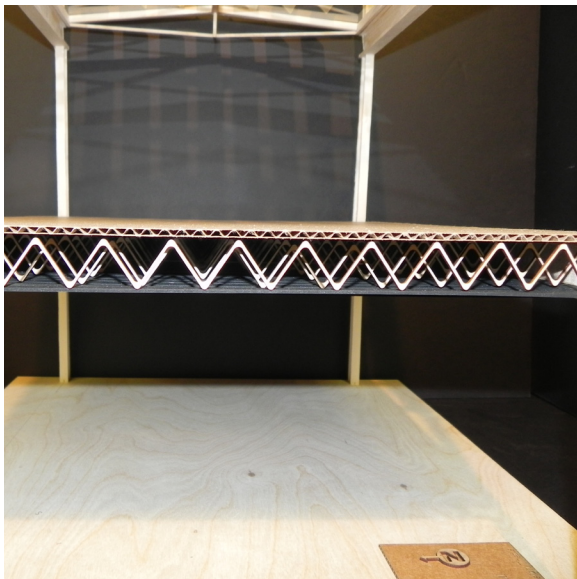
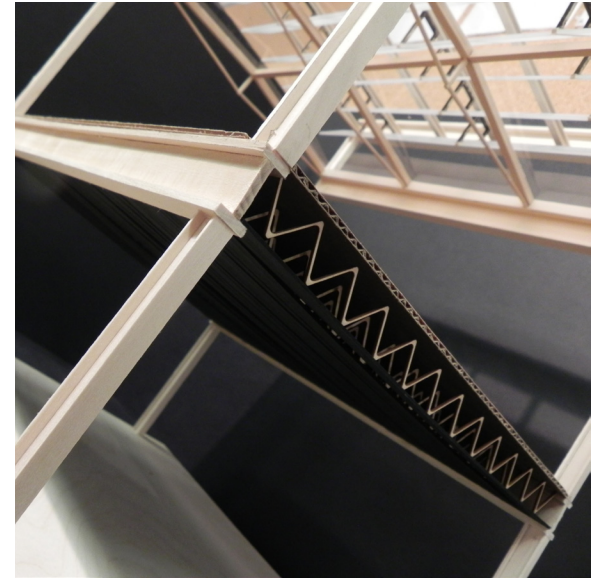
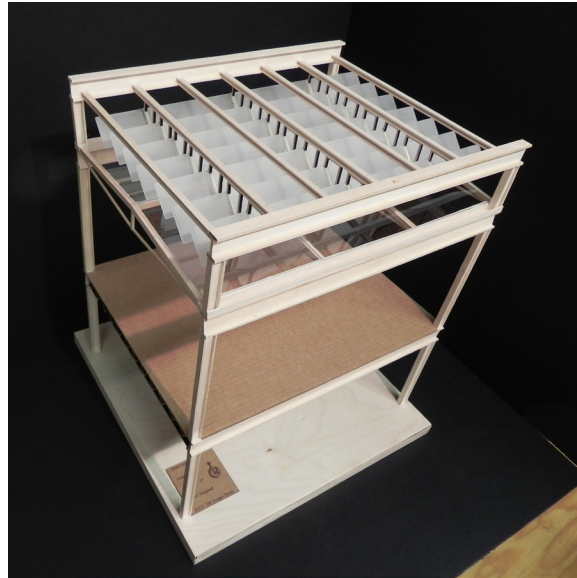




figure 87 terrace detail



Model



143

model

figure 89

model

PROGRAM APPENDIX

figure 90 site



figure 91 westbound



figure 92 eastbound



Intent

- Revitalize connections with agriculture and the environment
- Aid human healthfulness through education
- Connect community
- Versatile functions and spaces
- Design an influential environment

Design + Health + Lifestyle

Seven Aspects of Wellness

Influence + Nurture

Visibility + Community

Center for Food + Goods + Environment + People

Typology

Mixed Use

-Education

-Community

-Research

-Living

-Office

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-Mohandas Gandhi

ABOUT



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