

Cody Jenny

architecture
transportation + energy

transportation + energy

archi + ecture

A Design Thesis Submitted

to

The Department of Architecture and Landscape Architecture
of
North Dakota State University

by

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



Primary Thesis Advisor



Thesis Committee Chairperson

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Abstract

typology

A hybrid building that has the potential to become an energy source for itself and surrounding buildings, a transportation hub for all of NDSU, and a central building for NDSU.

location

North Dakota State University, Fargo, North Dakota.

theoretical premise

Maximizing the purpose of architecture allows for a reduction in land use, materials, and energy, developing a better looking future of cities and campuses.

project justification

The future of North Dakota State University is important to the local, regional, and national communities. NDSU needs to look towards the future and design a solution to deal with land use, energy use, and the connection between NDSU main campus and NDSU downtown. A stronger connection between NDSU main campus and NDSU downtown will create a stronger community of students and faculty.

keywords

NDSU
sustainable
energy
transportation
renewal

Problem Statement

How can one piece of architecture be the connecting factor to a city or campus?

Statement of Intent

typology

A hybrid building that has the potential to become an energy source for itself and surrounding buildings, transportation hub for all of NDSU, and a central building for NDSU.

theory

Architecture becomes the means to the future of how a campus functions at its highest possibility creating a stronger community of students and faculty.

supporting premise

Architecture creates a sense of place for the people experiencing the different aspects of the design.

A place that has the capability of transforming for different purposes and events is a sustainable programmatic design.

A sustainable program has the ability to enhance human life.

Developing a multi functioning program that connects people with different reasons creates a center for greater human interaction.

theoretical premise

Maximizing the purpose of architecture allows for a reduction in land use, materials, and energy, developing a better looking future of cities.

project justification

The future of North Dakota State University is important to the local, regional, and national communities. NDSU needs to look towards the future and design a solution to deal with land use, energy use, and the connection between NDSU main campus and NDSU downtown. A stronger connection between NDSU main campus and NDSU downtown will create a stronger community of students and faculty.

Thesis Proposal

Narrative

North Dakota State University has become one of the top schools in the nation for research development. As the school continues to strive for greater achievements many aspects of the college also need to continue to grow in order for a level relationship between all the elements of the college. As the school continues to grow in size, land use becomes an issue. Following the trend of growth, as the downtown campus continues to develop further away from the main campus a source of connection would be beneficial for future growth. Looking into the future of how the campus of North Dakota State University will function and continue to grow is important to envision.

With growth, there is an increase in very important resources for energy systems and materials. The future of North Dakota State University needs to be responsive in the design and uses energy sources. North Dakota State University becoming one of the nations most important research colleges creates a precedence on the importance of how the college functions in terms of energy and efficiency.

The future of North Dakota State University needs to develop a connection from the main campus and the downtown campus. The development of an efficient transportation system that is convenient for students and faculty will allow for the growth of the downtown campus.

A design solution needs to be developed for future energy sources, transportation, and land use while creating a goal to be the most efficient campus that is creative and innovative in all of its fields, that becomes a learning tool for the importance of sustainability and design.

User/Client Description

The redevelopment of North Dakota State University is for the students and faculty. The vision of North Dakota State University would be funded by tax payers of North Dakota and students of North Dakota State University. The land envisioned for the redevelopment is land owned by North Dakota State University allowing for minimal effects to the local neighborhoods. The facilities would be maintained by the North Dakota State University maintenance faculty.

Major Project Elements

Transportation - Develop a transportation system that is time efficient and responsive to energy resources.

Energy Systems - Integrate an energy harvesting system into the architecture of future and existing structures.

Student Gathering Spaces - A center for students to gather in a central location on campus.

Offices - Faculty offices that will maintain and watch over the energy harvesters and transportation systems.

Circulation - An efficient design needs to focus on the way people move through campus and how architecture responds to the major nodes and paths.

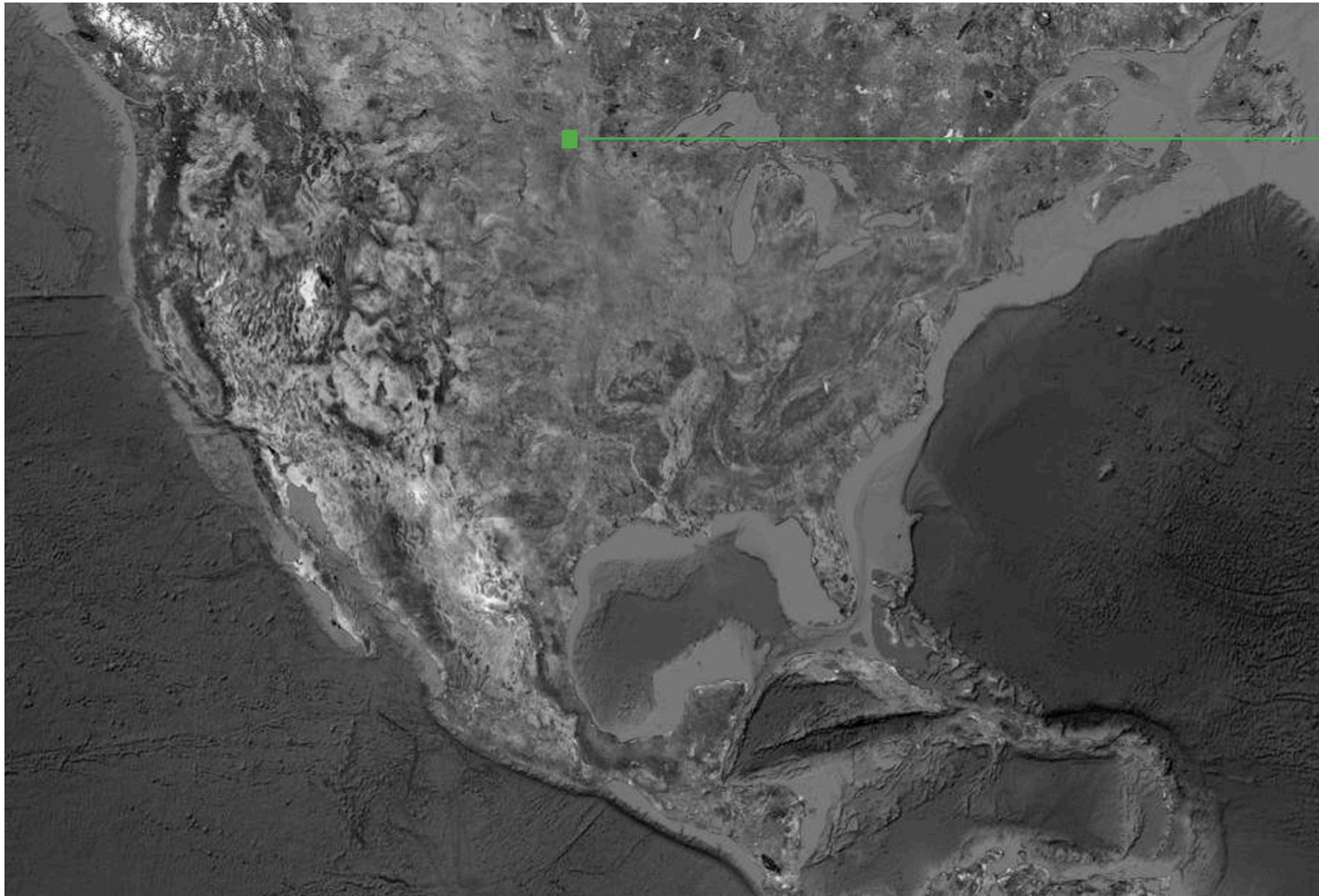
Factory - The harvested energy converted into usable power for the campus and transportation.

Flex Space - Space devoted to be continually changed as the program or event demands.

Site Information

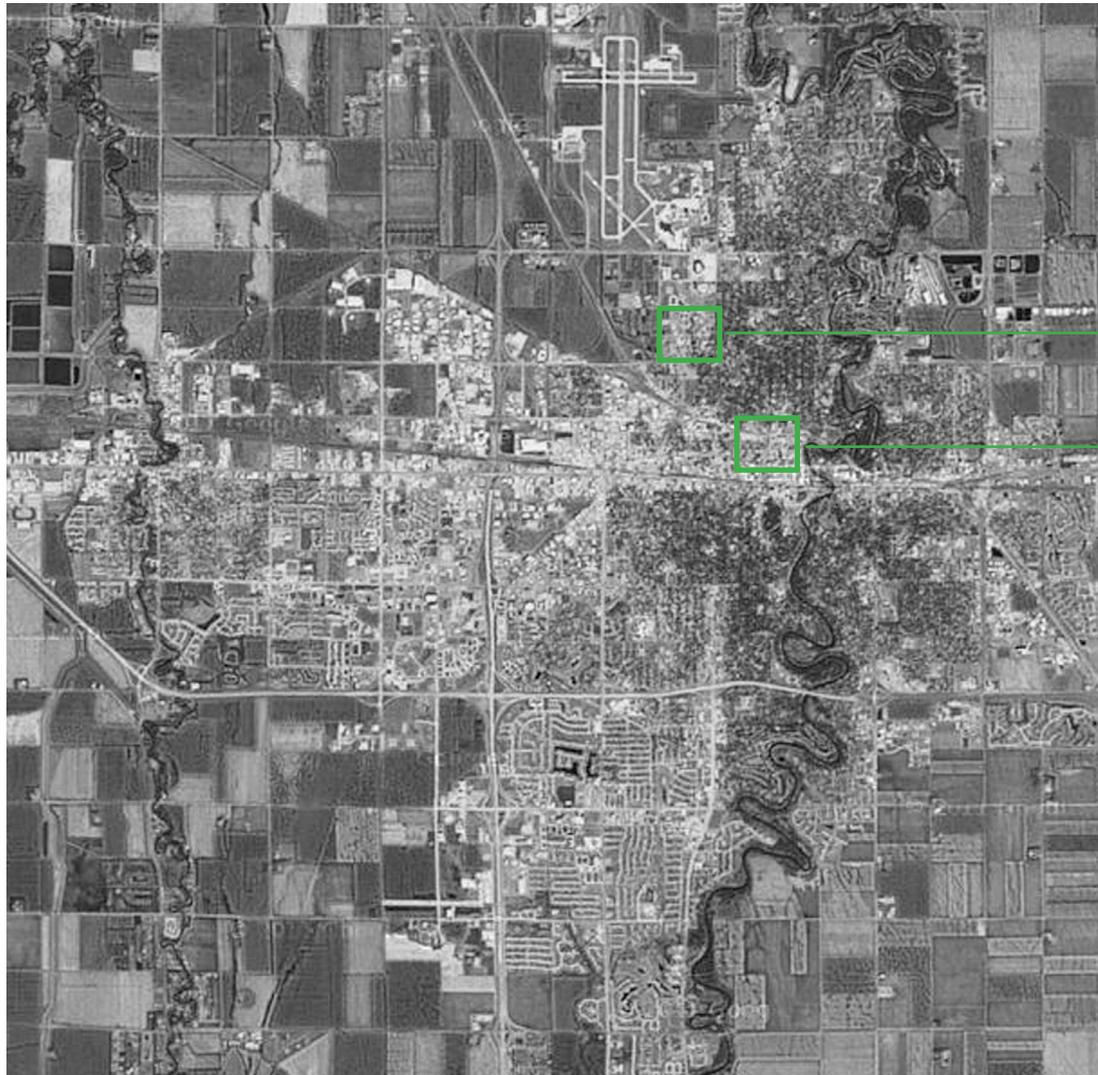
Site Information

United States



Fargo, ND

www.google.com



NDSU Main Campus

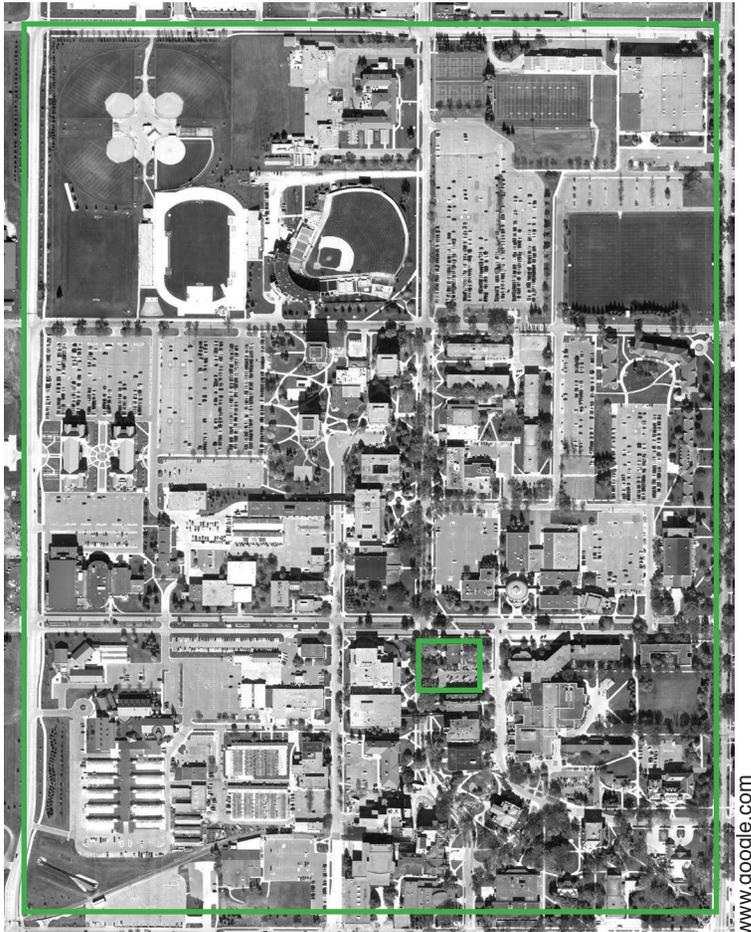
NDSU Downtown Campus

www.google.com

Site Information

NDSU is a place of opportunity for students, faculty, and new ideas. As NDSU continues to grow, a plan to deal with the growth is important. As NDSU continues to look into the future to provide a place of education and research, it also needs to think about becoming a leader in technology and design. NDSU has the potential to develop energy systems and architecture that can be an example or model to other higher education campuses. As NDSU looks into the future, more sustainable energy and transportation systems will need to be implemented into the campus.

NDSU Main Campus



NDSU Downtown Campus



Site Information

NDSU Main Campus



Project Emphasis

The primary focus of this thesis is to investigate the future of NDSU. What type of solution needs to develop in order to deal with the growth of the NDSU population?

Energy - A development in an energy source that will be able to replace the existing coal burning factory that is the primary energy source to the NDSU campus. Thinking beyond a simple solution and creating architecture that becomes an energy harvester.

Transportation - Connecting the two separate campuses in a sustainable way that will create efficient transition from the main campus and downtown campus. Understanding how students and faculty move through campus is a key feature to examine how the campus can become more efficient in layout and the movement throughout the campus becomes less of a thought process and more of an instinct.

Plan for Proceeding

Definition of Research Direction: In this thesis, research will begin to shape the direction of what the NDSU campus is in need of. The development of interviews, campus studies, and case studies will help with understanding where strengths and weaknesses throughout the site and campus, as well as developing an idea of a system that would be implemented into existing structures.

Defining the Possibilities: For the future of NDSU, it necessary to inform the campus about the importance of the future of campus design, building design, and the importance of sustainability.

Design Methodology: The development of the design solution will be based on interviews with campus officials, faculty, and students. The solution will be created by NDSU for NDSU. The involvement with the people of NDSU will express concerns and ideas that will allow for the design solution to be focused on the people that move throught NDSU campus on a day-to-day basis.

Design Process: The development of this thesis will be done in various methods of visual and physical documentation. The process of the redevelopment of NDSU will be examined by several types of mapping, physical modeling, and digital modeling software. Analysis of the movement through the campus will be documented through photography. In the end of all of the research and analysis, a final presentation of the design solution will be presented with different types of mapping, physical models, and digital modeling software. To conclude the thesis, all research, analysis, mapping, and modeling will be combined in this thesis document.

Previous Design Studio Experience

Fall 2008 - Assistant Professor Heather Fischer and Assistant Professor Meghan Duda

Tea House - Place of meditation located along the Red River in Fargo, North Dakota.

Boat House - Rowing house located along the Mississippi River in Minneapolis, Minnesota.

Spring 2009 - Professor Darryl Booker

Dance Studio - School of dance located on the North Dakota State University campus.

Dwelling - Three person dwelling located in Cripple Creek, Montana.

Fall 2009 - Professor Paul Gleye

Center for Excellence - Place of education located on the North Dakota State University campus.

Center for Intellectual and Social Life - Conservatory located in downtown Fargo, North Dakota.

Spring 2010 - Professor Milton Yergens

Multi-Use Lofts - Live/Work design studios located in Fargo, North Dakota.

The Field of Reflection - Agricultural Research Lab focusing on wild rice located in Crowley, Louisiana.

Fall 2010 - Professor David Crutchfield

Sync Tower - Multi-Use high rise in San Francisco, California.

The Motion of Time - KKE competition - The transformation of a platonic solid holding a precious object.

Spring 2011 - Professor Paul Gleye

Blois Urbanism - Urban development housing residential, retail, and education located in Blois, France.

Lille Urban Renewal - Outdoor urban public space located in Lille, France.

Fall 2011 - Professor Mark Barnhouse

Water Property Analysis - 3D modeling of rain water.

Water Analysis Laboratory - Water Resource Experiment Station located along the Missouri River near Linton, North Dakota.

Program

Research

A college campus is a place of education, careers, and the beginning of students' pursuits of their professional careers. The importance of a place of education is it needs to create a feeling of knowledge. Poor atmospheres and design of spaces inhibit the amount of energy in students' and professors' desire to learn.

"Designs thus created can define and celebrate a sense of place; communicate an institution's purpose, presence, and domain, and generate an image charged with symbolism, graced by history." (Dober, 1992, p.3).

As previously stated, the design is defining the college campus. The continuous appearance of buildings in close proximity within the college institution. As students approach and move throughout a campus, it should evoke a feeling of excitement. A desire to move through the spaces inside and outside the buildings.

"Whether new or old, each institution deserves to be shaped by a plan that is responsive to its own realities. Marked with its own destinations, and guided by concepts that are as workable as they are attractive." (Dober, 1992, p.3) With the idea of separating these spaces, whether adjacent to a city or in the middle of a dense location, the appearance needs to stand out in order to define the campus. The design needs to be solid and give off the feeling of a presence as it sits next to the surroundings.

The design needs to be able to stand up to time and give a feeling of location for many years. With the idea of growth in the future of the college campus and population. The scale of a campus is a major factor to the feeling of a college campus. Factors such as purposes, missions, funding, location, and research all go into the development of the campus. "These factors and related circumstances help determine the physical forms that shelter, serve, sanction, and signify higher education." The articulation and understanding of such determinants is thus essential in generating useful campus design. The "physical environment that combines the visionary and pragmatic, with ideas verifiable and pertinent, expressed in designs vigorous and persuasive. Designs thus conceived will resonate with reality, without compromising ingenuity or idealism, art or function," (Dober, 1992, p.3-4).

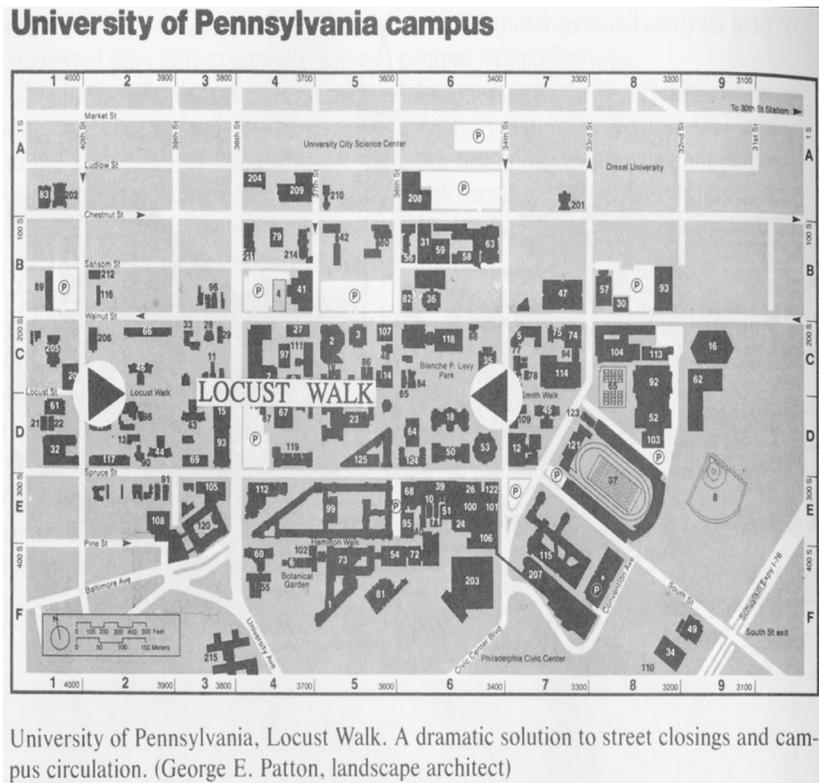
As Dober (1992) states, the importance of understanding the college's future goals and desires will generate what is needed to make the college appear and function as a higher education college should. The idea of taking a college campus with a strong identity of the colleges within NDSU and creating the future of what is existing develops the question of what the meaning of future really means for NDSU. As NDSU is in an upward incline in enrollment, it continues to push the boundaries of space.

Previously stated, multiple factors go into higher education campuses. NDSU needs to decide what it intends on foreseeing in the future of NDSU. As the campuses continue to separate from each other, a feeling of disconnection has been developed, even with transportation systems in place that connect the two campuses.

The idea of connection can become a major factor for redevelopment of NDSU as well as surrounding communities. The location of certain communities could benefit from their proximity to NDSU and its growth. A visual connection from NDSU Main Campus and NDSU Downtown Campus would create the connection that it lacks now.

A rail system could develop a connection between the two campuses, allowing for the possibility of creating a visual as well as a physical connection. As you look at a campus, paths and sidewalks dominate the landscape around buildings, roadways, and parking lots. They are what connect the person from one side of the campus to the next. They are designed to “carry large volumes of pedestrian traffic” (Dober, 1992, p.212), allowing for movement throughout campus without what Dober (1992) says are “interruptions and obstacles,” (Dober, 1992, pp.212).

Research



University of Pennsylvania, Locust Walk. A dramatic solution to street closings and campus circulation. (George E. Patton, landscape architect)

Photo from Campus Design.

Where the pedestrian and vehicle meet becomes a block in movement for both types of transit. A reduction of interaction of this possibility would help both pedestrians and vehicle users move quicker from destinations. The example of the Locust Walk in *Campus Design*, shows how separating pedestrians and vehicles can become a very successful design solution. Pushing the vehicles to the exterior of campus allows for fewer obstacles for pedestrians moving throughout the campus.

Taking the idea of the Locust Walk and developing something similar on NDSU would allow for a smoother transition through campus. With movement through campus being a major design feature, a system could be generated from the study of movement to create a connection from NDSU Main Campus to NDSU Downtown Campus. This system would transform present day NDSU into the future of a more successful connection between what has become the two separate campuses.

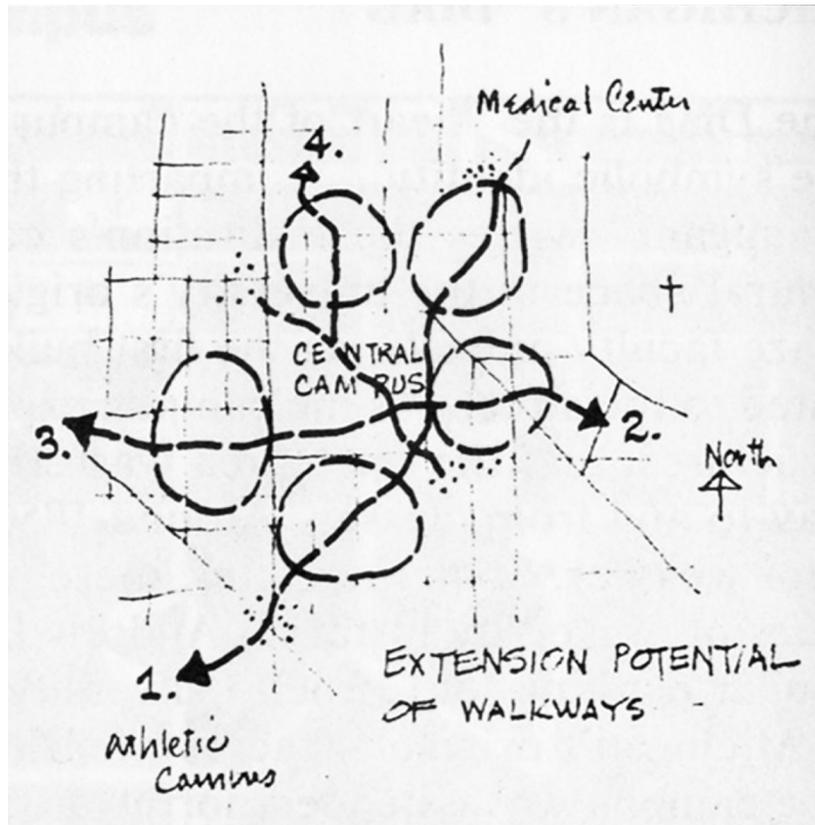


Photo from Campus Design.

The University of Michigan, for example, has what they call the “Diag,” marking the center of the campus. The “Diag” of the University of Michigan is in the same place as it was in the mid 1800s. As the University of Michigan grew, so did the movement throughout the campus. The architecture was created by the “dominate force” of the movement through the “Diag,” (Dober, 1992, p.211). The aesthetic of the campus developed with the growth of the architecture.

Dober (1992) discusses the importance of trees, paving, and lighting as a major design fixture for campuses. In a visual connection to campuses, these elements would be a simple design solution to the beginning of the connection between the two NDSU campuses.

Aesthetics of a campus are extremely important for creating the sense of place a campus desires. Especially when a campus has become separated and expanded across the city. The challenge is to figure out how this connection can be furthered on an existing campus that has a strong identity with building materials and orientation. As the campus desires a five-minute walk from the center to the farthest point, this connection changes when students and faculty have to be transported to a location a few miles away.

Research

“Campuses are movement systems, time-tabled during the school day, predictable, through informal, in other hours. Most campus buildings, and thus circulation can be located within a five-minute walking distance from the campus center,” (Dober, 1992, p.201).

This connection of spaces becomes the identity of the campus. The way people move shapes the way the campus functions. Movement is one of the most important aspects to the campus design and layout. As a campus grows over time, it is important to become even more aware and thoughtful of how the people will get to these places, whether it is by vehicle or foot. Vehicular traffic can disrupt the flow and movement of the campus, which ultimately kills the aesthetic of the campus. The importance of the separation of the two modes of transportation is important to understand. Dober states, “Vehicular traffic and parking should be limited to that which is necessary for safety, service, and courtesy within the precincts” (Dober, 1992, p.207).

The development of campuses is not something that happens at once, but over a period of many years. As a campus is being designed, the future is one of the major requirements. Growth, land use, and materials all have to be considered. The campus has to stand up to the time of development and withstand future growth. As the development of campuses and cities become more important due to sustainability and efficiency factors, the greater the opportunities are to focus on what is right.

This thesis will deal with the opportunities that the future will hold with greater technologies and an understanding of the original methods of sustainability practices. The importance of education dealing with sustainable design and energy efficiency has a great opportunity in higher education. If our buildings have a stronger connection to the earth through material decisions, orientation, and a greater thought process on the use of fossil fuels to power our buildings, then we have a greater opportunity to educate the public on the importance of possibilities the future of architecture holds.

Energy is also a major factor in the process of campuses functioning with a large amount of people in a fairly small area that campuses utilize. In an interview with North Dakota State University President Dr. Dean Bresciani, a discussion on energy power plants for the campus was discussed dealing with proximity and location of the energy generators. North Dakota State University has been constantly growing taking up more and more space around the campus. Dr. Dean Bresciani said that with the population of North Dakota State University continuing to grow, the thought of space becomes an issue.

The energy plant in particular once was distant from the campus, but as North Dakota State University grew it became surrounded by campus structures. Location of the future energy plant would again be pushed out farther, but available space is an issue. The discussion of the future North Dakota State University power plant becoming a part of the campus buildings is an interesting idea, which would allow for transportation of energy to no longer be necessary. The amount of energy lost in transportation only strengthens the idea of architecture becoming an energy source for itself.

Energy harvesting techniques are in place today in architectural design, but the possibilities have not all been utilized in many campuses around the nation. North Dakota State University could become an example to the Midwest and other schools around the nation. The design of buildings that integrate energy-harvesting sources into themselves in a different way that is stronger in efficiency and design would possibly change the future of campus design and architecture in general.

Campus design depends majorly on layout and how the person moves through the land. The research depended heavily on creating an understanding of the importance of just that. If the research didn't explain the findings on the importance, an addition to a campus would potentially not function to the standards a campus must hold. Especially with a proposed structure that would be a connecting factor to the two separate campuses.

The research develops an idea of what is necessary for the future of North Dakota State University. Several resources explain the importance of movement and how ease has to be a major factor for the placement of everything. This thought process needs to be implemented in our spaces to make movement become mindless. With the spaces interlocking with each other, roadways, walkways and paths need to flow together as if they were one.

The theoretical premise of this thesis is to develop architecture that is not obtrusive or dominating, but that creates integration with the previously built campus. Maximizing the program in order to have a piece of architecture that connects everything to make it feel as if every building were to become one even if they are miles apart like North Dakota State University Main Campus and North Dakota State University Downtown Campus.

Research Summary

The typology of this thesis focuses on exactly what the research has explained is necessary: linkage that would be developed in order to connect North Dakota State University Main Campus with North Dakota State University Downtown Campus. This connection would be visually and physically connecting the two campuses with a light rail system that would transport students and faculty in a timely fashion.

A light rail would also have the potential to create a campus wide understanding of the importance of sustainable living. Public commuting to and from the two campuses begins to create a new sense of thinking of efficiency. Research has shown that vehicular traffic on campuses creates problems with movement for both the vehicle and pedestrian. If the vehicle were pushed off, campus the pedestrian would have an easier time getting through the campus. The same goes for the vehicle with no pedestrians blocking the traffic movement.

Research has also verified the importance of campuses and how they are powered. Energy has become a major issue in the past ten years, and now it is even more than ever. As regulations get stronger and the population continues to grow, energy can really be important for the future of architecture. The interview with North Dakota State University's President, Dr. Dean Bresciani, verified that the energy plant is always going to end up where it wasn't intended. With the idea of creating our architecture as its own energy plant, we can develop a greater understanding of what we use as the consumers of the planet.

Movement and energy both are becoming interrelated, as the future becomes present. The research of the two typologies are now one and the same as the idea is to connect the two into a space that is the unifying element on a campus like North Dakota State University that will hopefully shape the future of architecture.

CaseStudies

McCormick Tribune Campus Center, IIT

Chicago, Illinois

Design 1997

Construction Completed 2003

Project Type

Campus Center

Client

Illinois Institute of Technology

Location

Chicago, Illinois

Size

115,067 Square Feet

Program

Bookstore

Food Court

Café

Auditorium

Computer Center

Meeting Space

Materials

Steel Structure

Concrete

Glazing

Steel

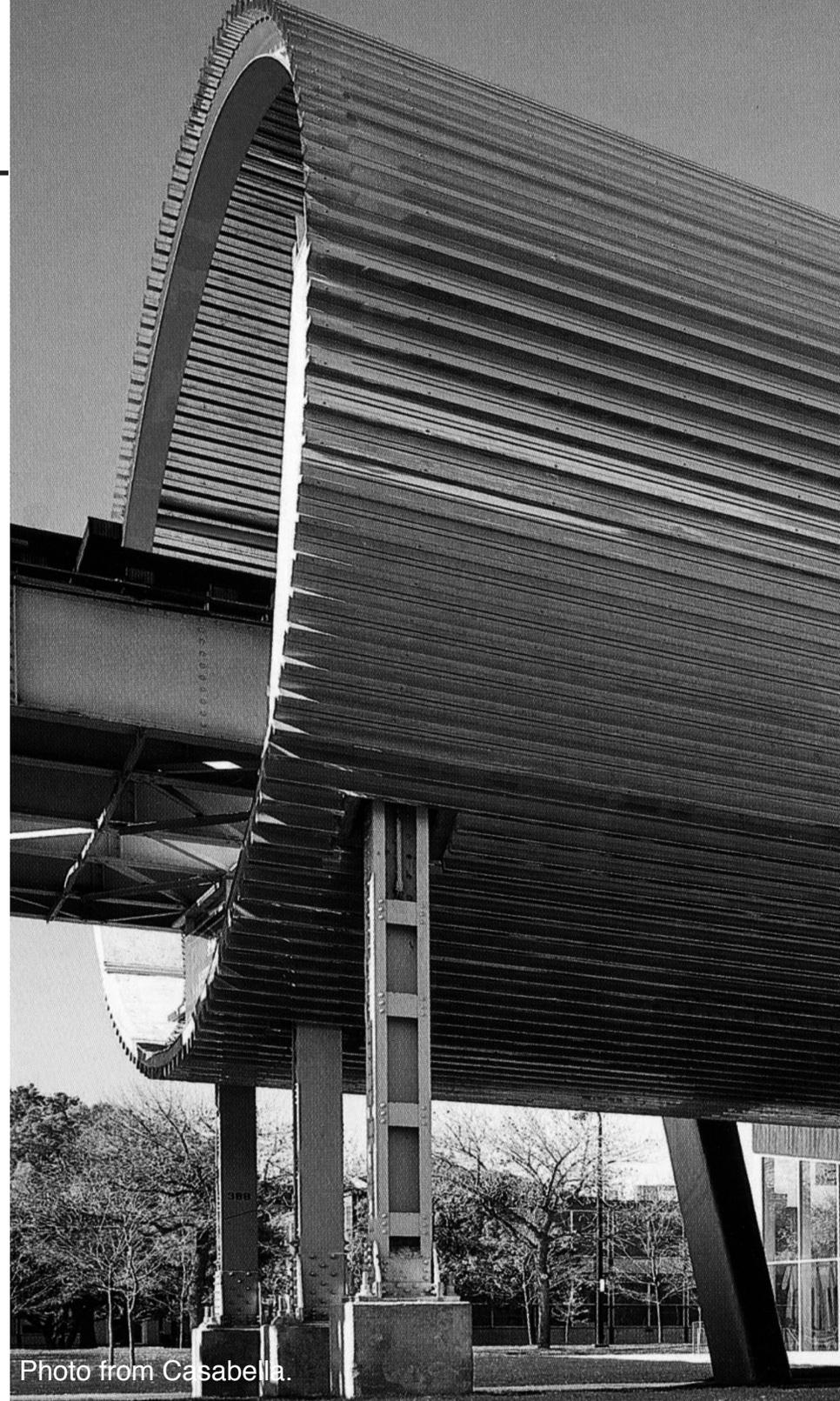


Photo from Casabella.



McCORMICK TRIBUNE CAMPUS CE

Case Study Research



Illinois Institute of Technology had become underpopulated and in need of a larger enrollment number. The campus became neglected and needed to rebuild its past population and reputation. The McCormick Tribune Campus Center sought out to do just that. Once the building was completed, the population of the school doubled for the incoming freshman class.

Close attention was paid to the location of the site. The “L”, which connects all of Chicago by a train that allows for quick commutes around the city of Chicago, created the potential for the student body to easily move throughout the city. “Rather than stacking activities in a multi-story building, we opted to arrange each programmatic element of the campus center in a dense single plane that would foster an urban condition,” (OMA.com). This connection allows for all the programs of the space to be interconnected. The proximity to the ground allows for an easy transition through the campus as you pass through the McCormick Tribune Campus Center.

The design of the campus center focuses on how the student moves through the campus and location of what is now the McCormick Tribune Campus Center. A study of the paths were documented and examined to develop the programmatic spaces around the axis that was created. With the movements studied, the building was then pushed under the “L,” which runs through the middle of the campus. The “Tube” was created in order to muffle the sound of the trains moving through the space.

Case Study Research

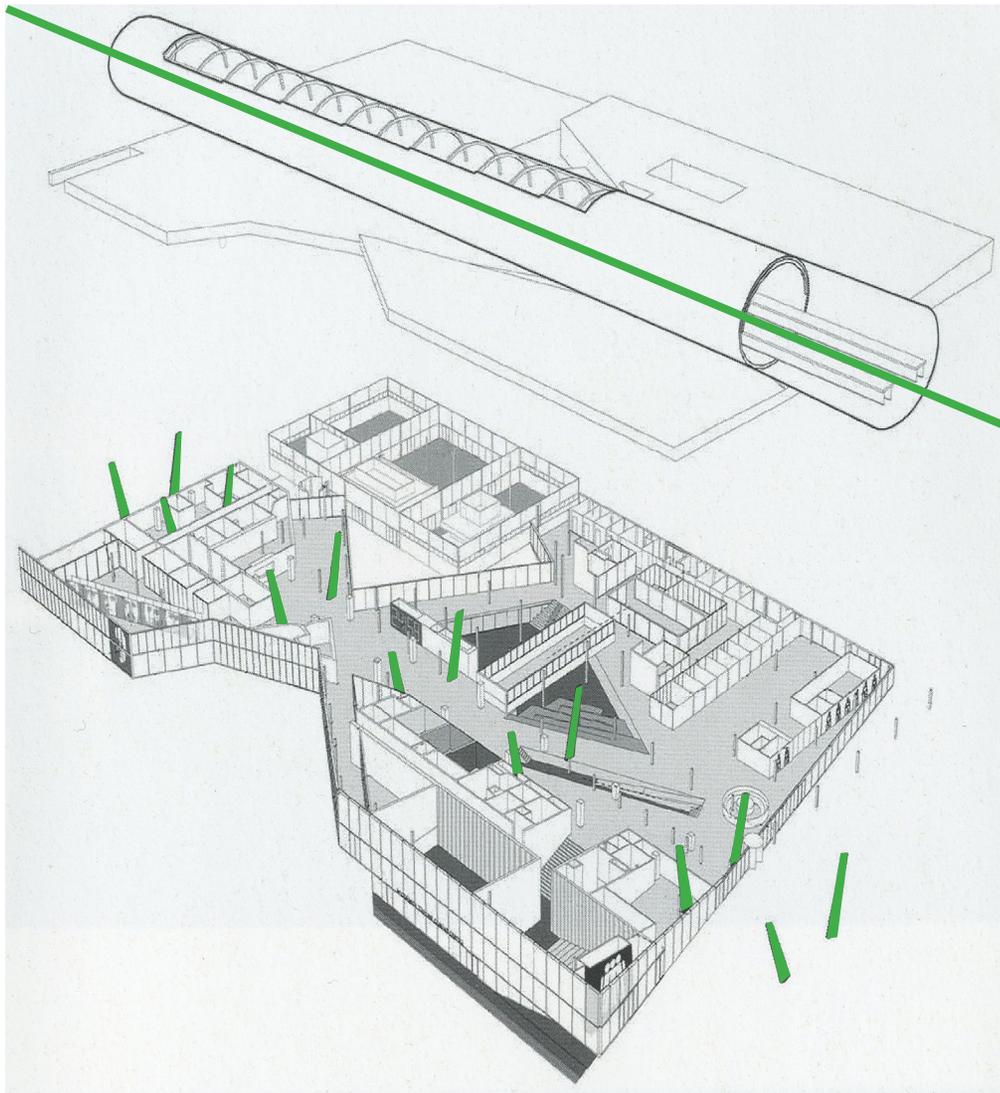


Image from Casabella.

The physical, visual, and sensual connection develops a sense of place for the students and faculty of the Illinois Institute of Technology.

This project was developed to put the Illinois Institute of Technology back to what it used to be when Mies van der Rohe was the designer. The shape of the building doesn't necessarily represent Mies van der Rohe's design style, but Rem Koolhaas looked up to Mies van der Rohe as he was designing the building. A rectangle was placed under the "Tube" as a salute to Mies van der Rohe's style of designing. Then the rest of the building was developed around the paths created by the Illinois Institute of Technology population.

The McCormick Tribune Campus Center had a larger program of spaces that had to connect Illinois Institute of Technology students and faculty together in one space as well as to the rest of Chicago. The idea of one piece of architecture becoming the unifying factor to a city or campus is represented here. A campus that was slowly losing its population and identity was revived as the McCormick Tribune Campus Center was completed. The building created a connection to the rest of the architecture and campus around the center, providing the spaces desired that the campus was lacking previously.

Elevation



Figure 1

Section

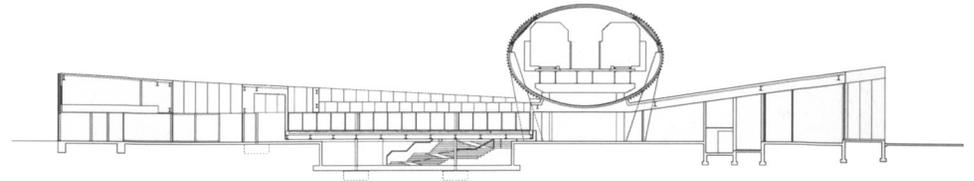


Figure 2

Plan

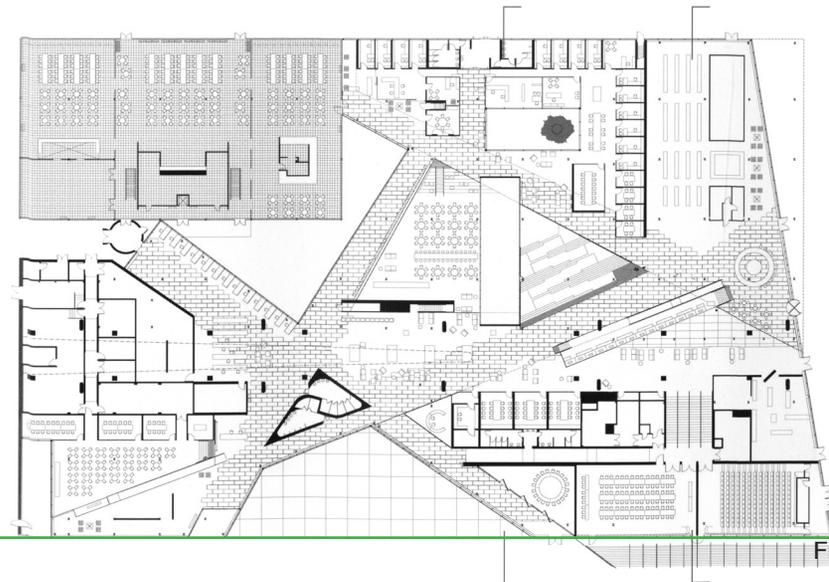
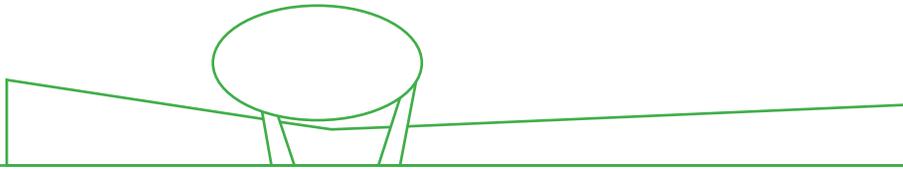


Figure 3



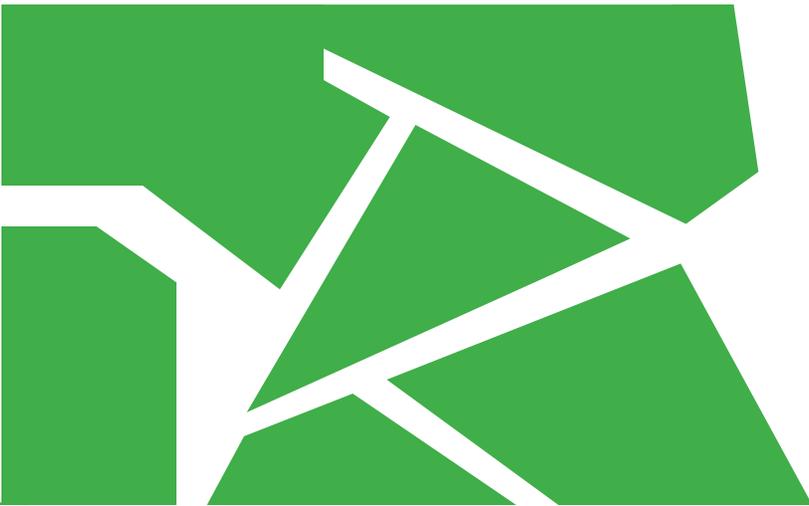
Massing

The form explains how the architecture had to work with existing structures.



Structure

The building and “Tube” explain the difference between the necessities in structure.



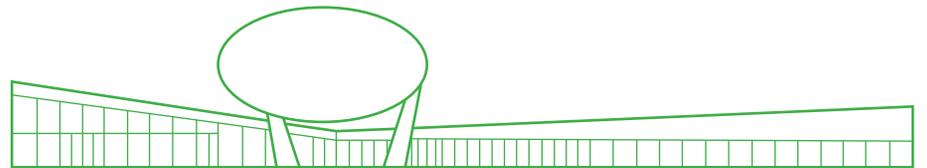
Geometry

Circulation creates the useable spaces within the architecture.

Hierarchy



The elevated “L” in Chicago was a major force in the development of the rest of the architecture.



Plan to Elevation



The “Tube” cuts through the building from plan to elevation, creating a visual and physical presence.



Natural Light

Public spaces suggest the necessity of natural lighting.



Circulation

Circulation was developed from major paths developed by the users of IIT Campus.

Liège-Guillemins TGV Station

Liège, Belgium

Design 1996

Construction Completed 2009

Project Type

Transportation Station

Client

SNCB Holding - Infrabel
Euro Liège TGV

Location

Liège, Belgium

Size

527,000 Square Feet
(Including Tracks)

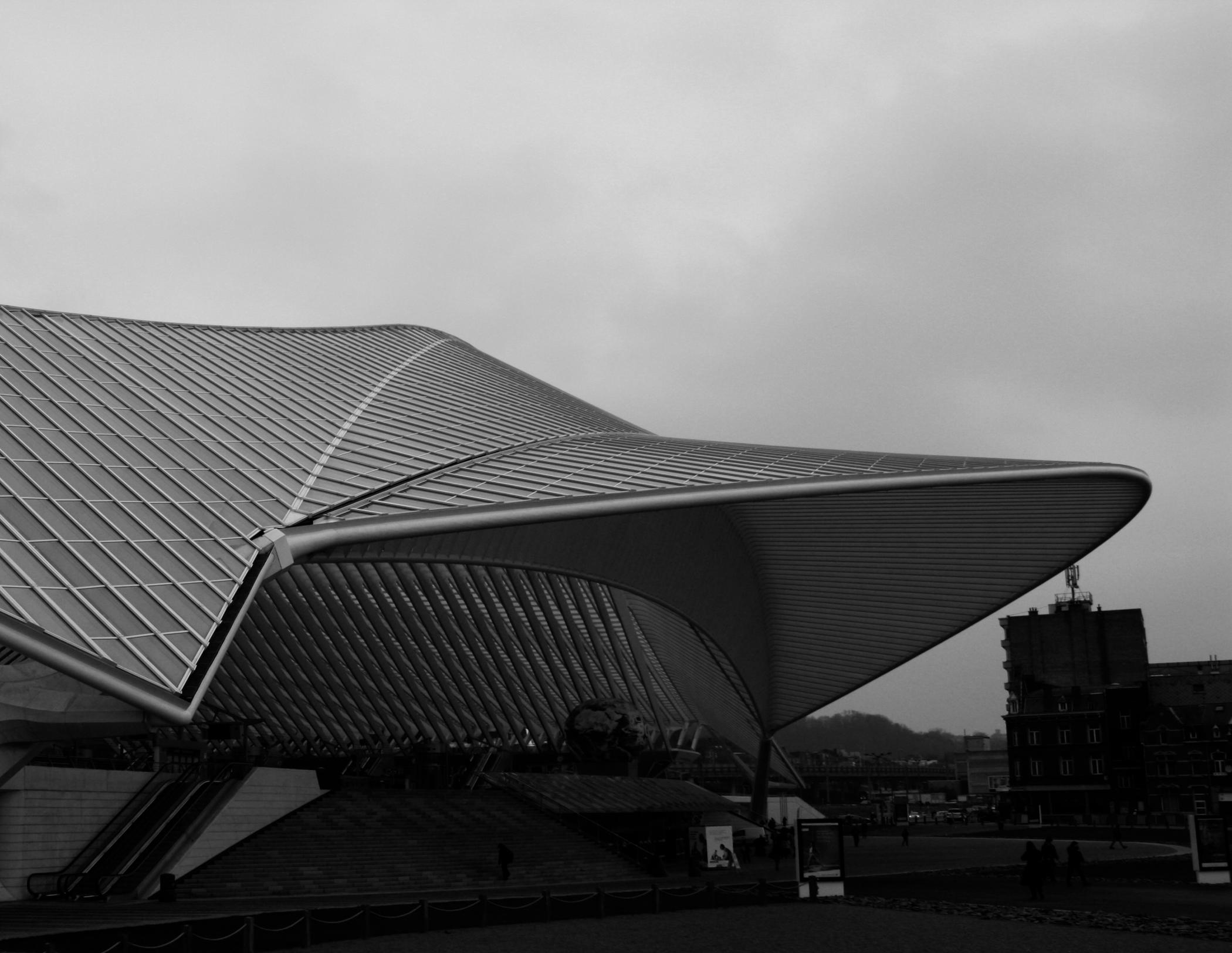
Program

Train
Access Footbridge
Commercial Units
Ticketing Area
Bar/Restaurant

Materials

Steel Structure
Concrete Structure
Glazing
Glass Block
Stone





Case Study Research



Photo from GA Document.

The Liège-Guillemins TGV Station became a popular connection to England, France, Belgium, and Germany. The original station was no longer sufficient to hold the demands of the users. The previous station split the city into two separate pieces, creating a disconnection between the urban area and the major residential area. The new station was conceived by connecting the two parts of the city to allow for greater ease of movement between the two sides. By bridging the two spaces, a visual connection through the station was created. The tracks and platforms of the station are elevated off the ground, allowing for pedestrian movement above and below the platform space connecting the two separate parts of the city.

The station boldly stands strong in the old Belgium city, but the development of the bridging of the station is what has created the success for the station. The glass and steel roof allows a visual connection through the station from on top of the hill where the residential part of the city is located. The structure was conceived to have no facades in order to allow the station to become part of the city and not a dominating force splitting the city into two parts like the previous station did.

Case Study Research



Like other transportation stations, this project creates spaces that allow for shopping, eating, and relaxing. These spaces are closest to the ground for ease of movement from within the station and out onto the city streets. The space creates a communication between the spaces in and around the station. The structure opens itself up to the public creating a warm welcome up the grand stair in the front of the building facing the urban area of Liège.

The amount of people utilizing the Liège-Guillemins TGV Station everyday is nearly 33,000. The projected growth was to be above 30 percent after completion, bringing demand for other businesses.

Hotels and commercial space have become a demand in the city of Liège now that the larger scaled station can move people quicker around the European Union. Residential space also has become in demand since the redevelopment of the station. Space has since been allocated for different types of development close enough to walk to the station, allowing for a continuing popularity.

The Liège-Guillemins TGV Station has redeveloped and changed the future of Liège. The city of Liège has seen a growth in population, which has created the demand for the different construction projects near the station. The attention to the site allowed for this piece of architecture to be a connecting factor to the city that was separated by the tracks for the train. The success of this project is an excellent example of how one piece of architecture can change the future of a city.

Elevation



Figure 4

Section

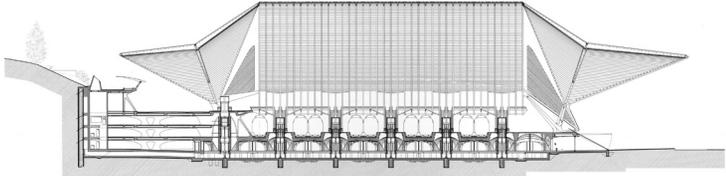


Figure 5

Plan

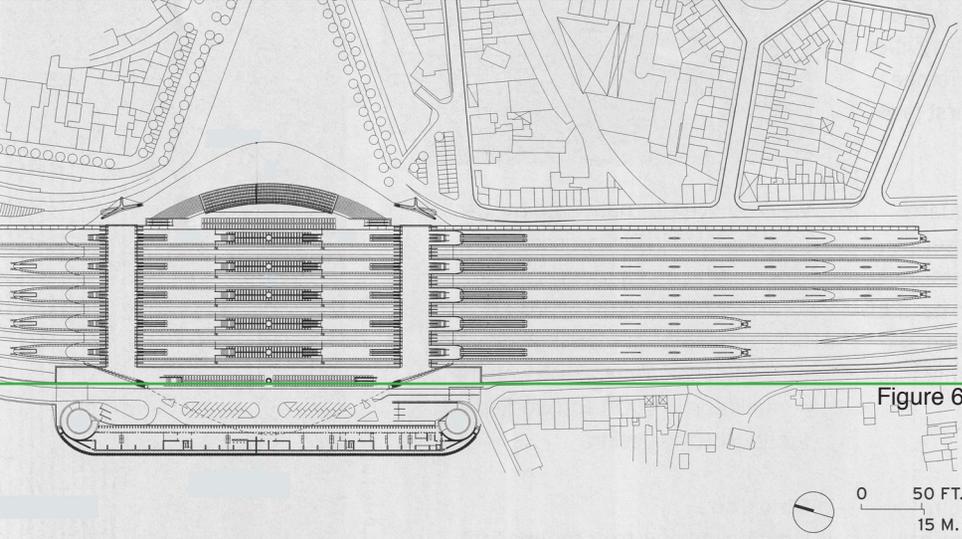


Figure 6

0 50 FT.
15 M.



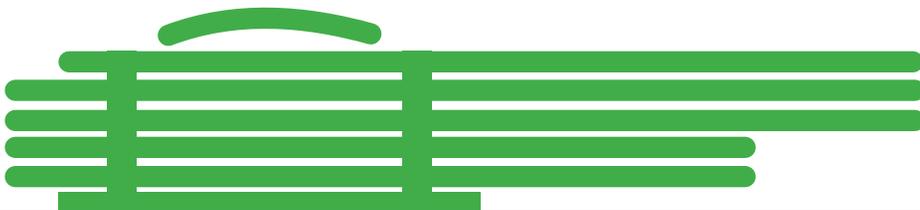
Structure

The structure shows the long spans that are necessary for this type of architecture.



Massing

The massing explains how important the structure becomes within the rest of the architecture.



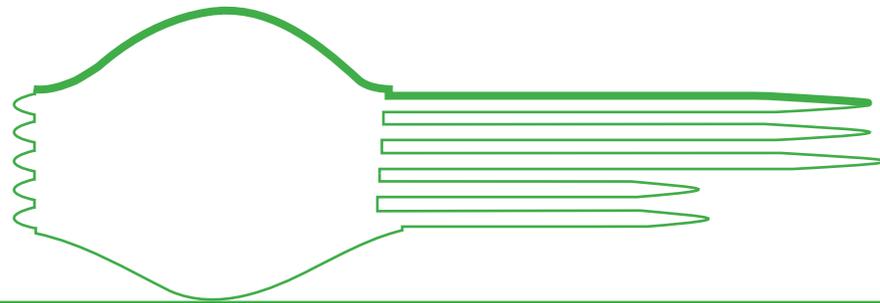
Geometry

The length that is necessary in the architecture is a major driving force in the building form.

Hierarchy

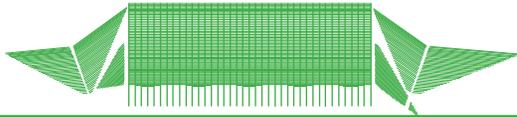


The heirarchy explains how the entire form is continuous and flows from the ground to the roofline.



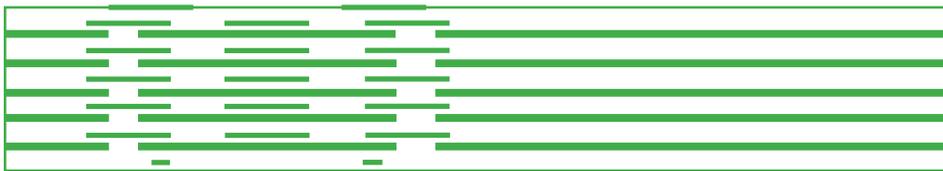
Plan to Elevation

Overall, the diagram connects the length and height of the architecture, explaining programmatic areas.



Natural Light

The amount of light that is being let in through the roof line explains the importance of light.



Circulation

The length of this building and typology give an understanding of the horizontal motion within the architecture.

New Waste Treatment Plant

Copenhagen, Denmark

Project Type

Incineration Plant
Ski Slope

Client

Amagerforbraending

Location

Copenhagen, Denmark

Size

1,020,000 Square Feet

Materials

Concrete
Green Facade
Snowflex®

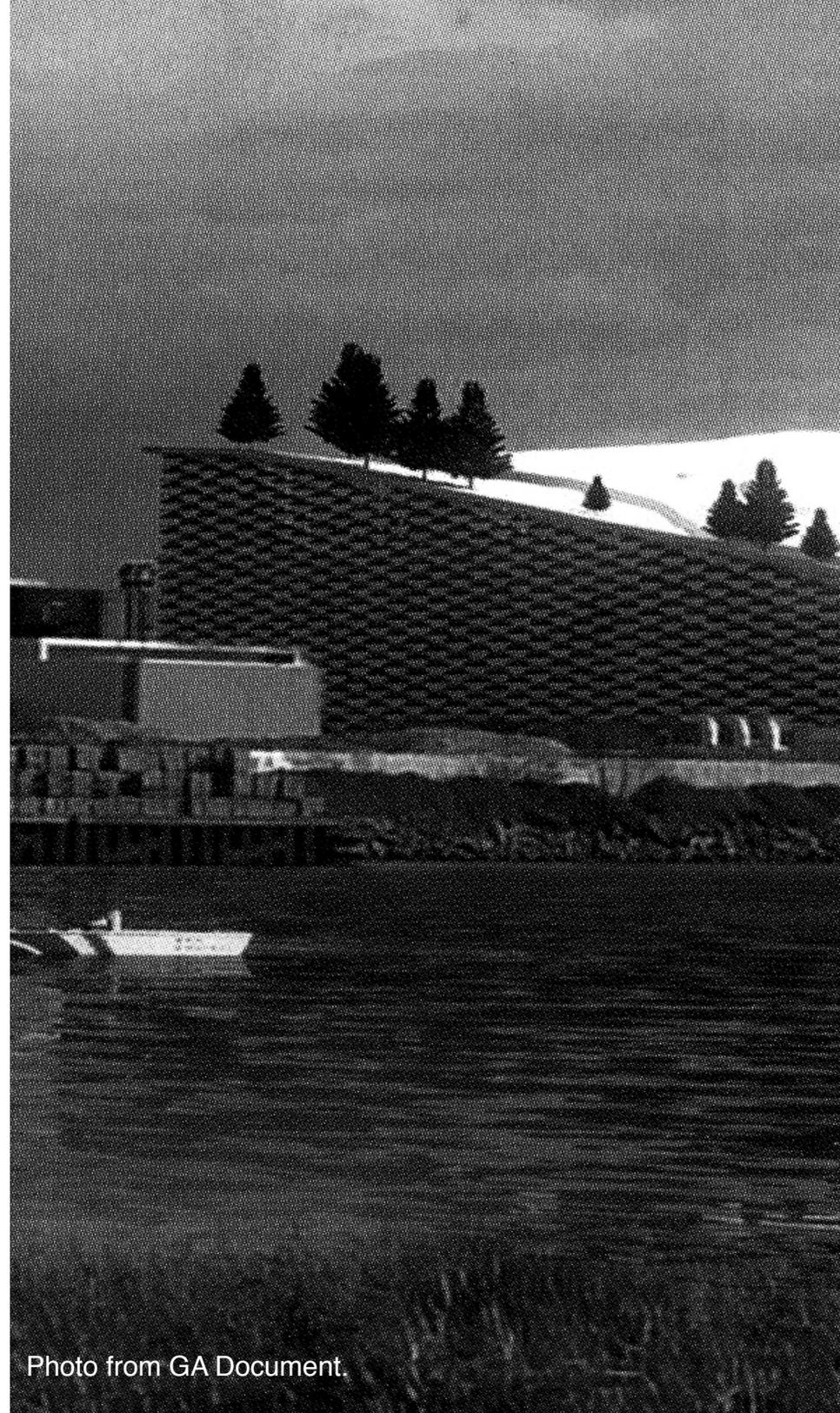
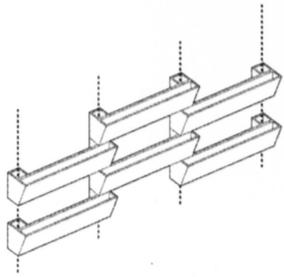


Photo from GA Document.

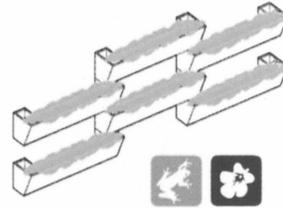


Case Study Research



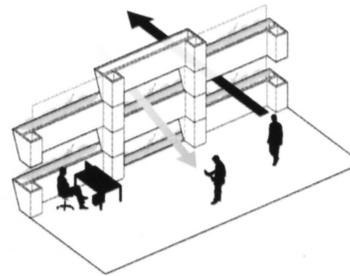
Cladding Module

“The vertical facades are formed by planter modules stacked like bricks. They can be flexibly configured and supported required services distribution and maintenance routes behind the facade.”



Ecology

“Green facades support an increase in habitats and biodiversity and are a potential stormwater management solution. Studies show an improvement in air quality from reductions in levels of CO, NO₂, O₃, PM₁₀, and SO₂.”



Work Environment

“The facade system allows for generous daylighting in staff areas as well as views back to Copenhagen.”

Vertical Facade Module Concept

The city of Copenhagen, Denmark was looking to replace their existing power plant. The industrial site was a place that no one ever went to where the power plant is located. Near by is the residential area of Copenhagen. The two areas were in close proximity to one another, but the places really never belonged together. The architecture that BIG then proposed a new place to generate power that is on the corner of both areas that would create a new destination for both the people of the residential area and the rest of Copenhagen.

Case Study Research

The New Waste Treatment Plant is “located in an industrial area near the city center. The new waste-to-energy plant will be an exemplary model in the field of waste management and energy production. As well as an architectural landmark in the cityscape of Copenhagen.” (archdaily.com) This connection of spaces brings life to both the industrial area and residential area.

The architects saw an opportunity to create something new for the power plant. Creating a ski slope on the top of the plant where usually there would be a standard roof. Taking the two typologies and combining them is now creating a new space for Copenhagen. This area that was once a deserted area to humans will now become a recreation zone that will unite the people of Copenhagen.

This idea was developed because the city of Copenhagen was going to create an incineration plant that would power the city. “The aim of the project is to tie all these opposing forces together, forming an identity for a new place in Copenhagen” (archdaily.com). This “new place” looks beyond the typical plant and creates functions for every part of the building. The project wanted to create something more for itself and the exterior, when on the interior the spaces are limited or in need for a large open space to hold all of the equipment for the incineration plant.

The exterior had many possibilities for allowing “a new breed of waste-to energy plant. One that is economically, environmentally, and socially profitable.” (archdaily.com) The building and the city expands the possibilities for everything.

This function of two typologies develops a mindset for the future of buildings and architecture. Combining these typologies allows for many new typologies to be born. Spaces that combine not only save space but develop a stronger use of technologies. This combination of energy and recreation will be an example for the future.

Elevation

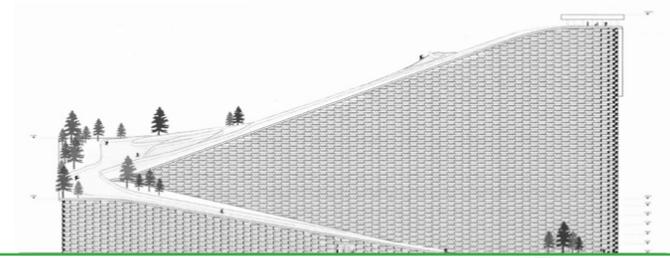


Figure 7

Section

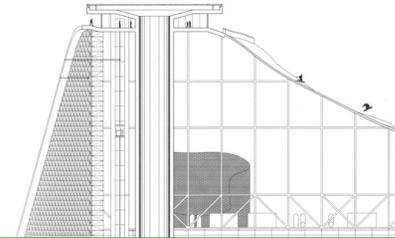


Figure 8

Plan

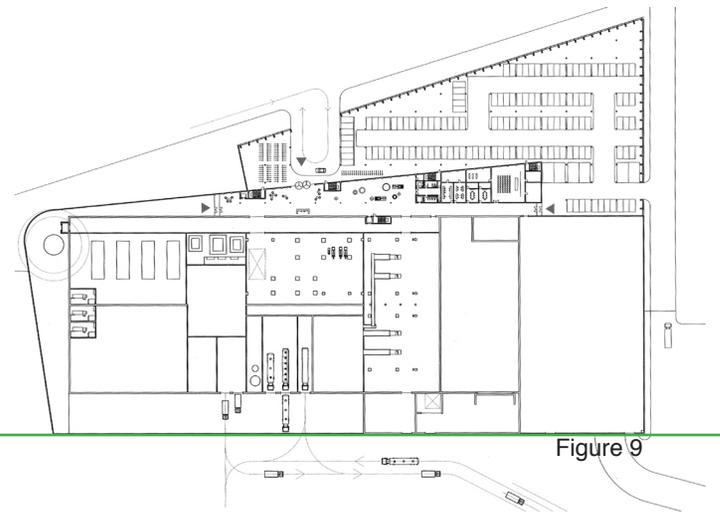
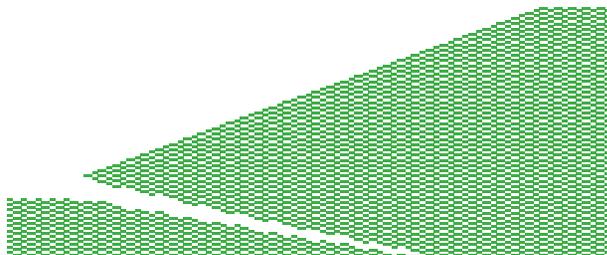


Figure 9



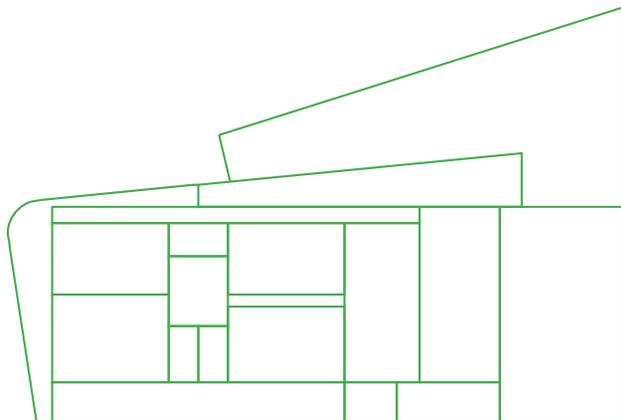
Massing

The diagram explains the massive space needed for such a program.



Natural Light

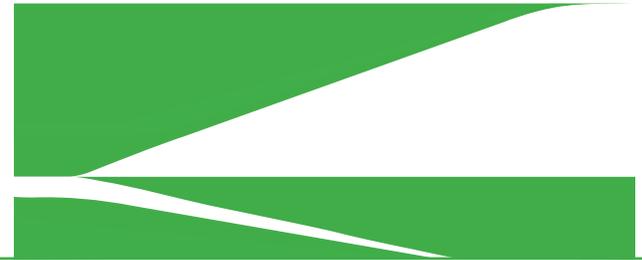
Natural light is important for the daily users of the building, which also creates views of the surroundings.



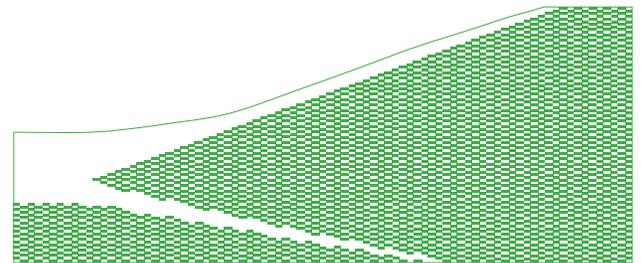
Geometry

In this building type, simple forms are important to allow for efficient circulation and storage.

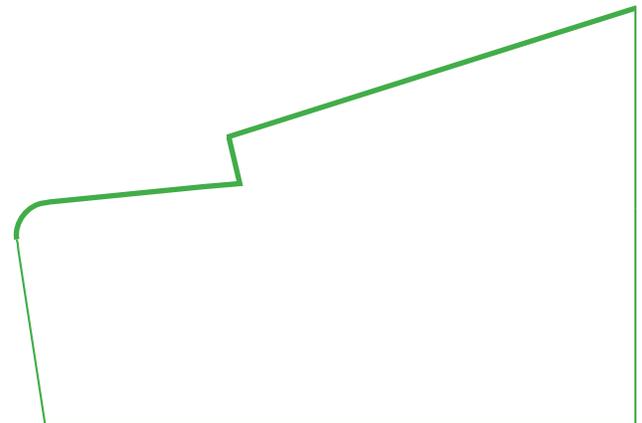
Hierarchy



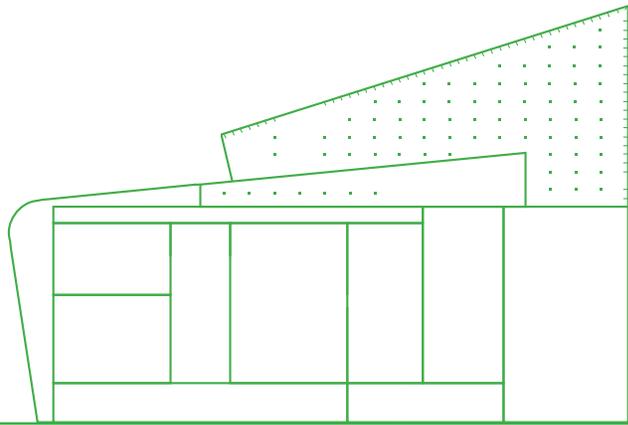
The heirarchy creates the possibility for the ski slope.



Plan to Elevation

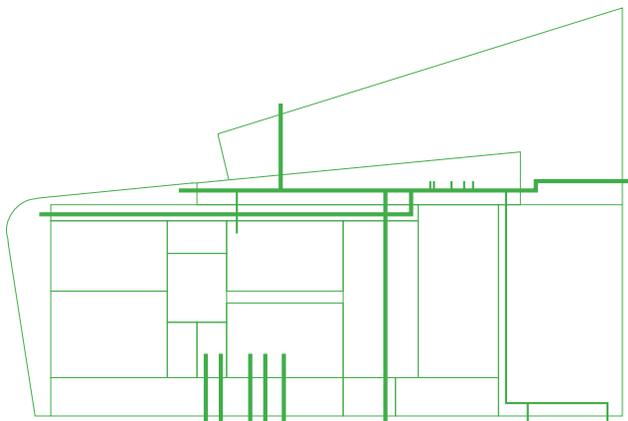


The plan to elevation explains the movement from the top of the building to the bottom.



Structure

The structure diagram explains the importance to the open spaces within the building to allow for the equipment.



Circulation

Movement throughout the building is developed more for the machinery rather than the human.

Case Study Summary

A summary of the typological research done for this thesis will combine the three case studies and explain the connection between the three. The unifying idea relates to all three of the case studies, because each case study does exactly what architecture should do. Architecture has the ability to revitalize cities, campuses, and areas of distress.

The case studies all were their own typology but focused on one thing. A combination of typologies that worked together to create something new. Architecture that opened itself up to a new experience that unites the who that came for different purposes.

The case studies all have or are expected to revitalize the areas where the projects are located. The Liège-Guillemins TGV Station and the McCormick Tribune Campus Center both were developed in hopes that populations would grow due to what the projects did for their area. The New Waste Treatment Plant, once completed, expects for a new population to develop because of the architecture. The importance of architecture and what it does for communities changes the future of how everything functions.

Each case study has its apparent typology, but as examined it was obvious they all unite people that are using the space, just passing through, or who are there for other reasons. The theoretical premise questions the ability to combine typologies that create an efficient lifestyle. These case studies relate to the idea of creating hybrid buildings that function in many ways no matter where they are located.

These case studies all have their own major spatial developments. The spaces that relate are the places that unite people in architecture. Activities and transportation both unite the people into a population due to the typology of the project. These projects all can become one to create spaces that unite, transport, and power our future.

Historical Context

Historical Context

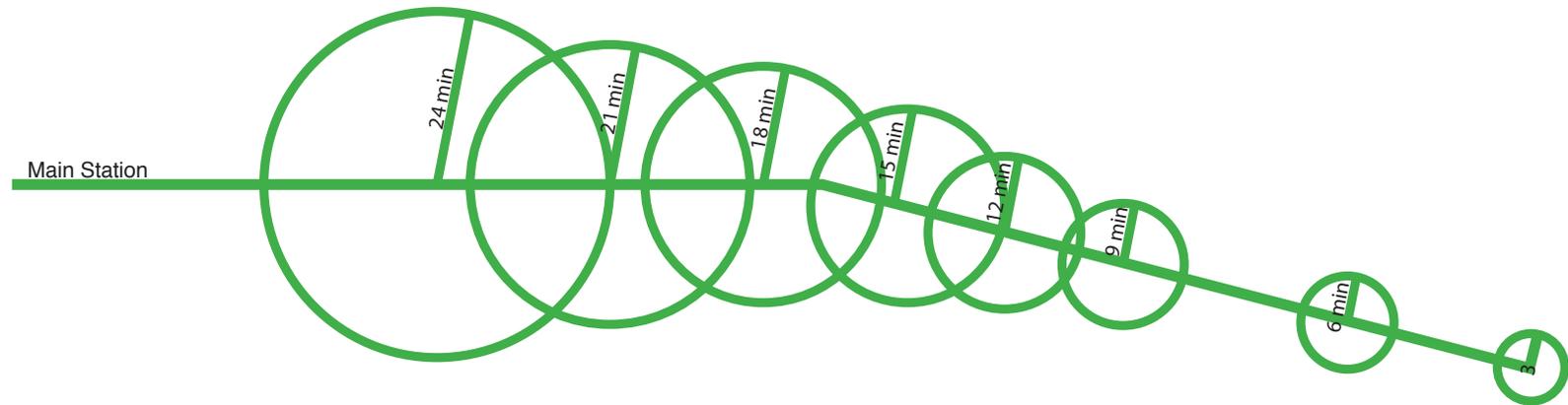
Transportation has been around for centuries. Public transportation didn't start until the 19th century for several reasons. Before the Civil War, cities didn't exist as they do today. Populations were very small and cities were made up from a very small amount of wooden houses. The landowners also were very protective of their land and were not interested in letting a railway be developed through their property. After the Civil War, the population of the United States grew. With the population spike, people needed places to live, which started the growth in infrastructure. The first transit industry began in 1830.

With the "horse car transit systems" slowly began to spread over every city after the Civil War. Both in Europe and the United States, rail transit began in the 19th century. The rail system mainly moved goods and products across the countries. With development and success with transporting the goods and products, rail systems were starting to create transportation for the public. "The railway was the single greatest and most far-reaching innovation of the 19th century, reshaping both town and country and transforming society" (Toy, 1994, p.17). The railway was becoming more and more popular, creating a means of transportation for all social classes.

Railway stations began to be respected pieces of architecture around cities. People began to see the stations as the same way people saw the cathedrals in the 13th century. The stations were known to be immaculate and decorative, creating a look into the future. The freight stations were the true forms of architecture that were simple and functional. They began to be the "honest function tradition of the 19th century design" (Toy, 1994, p. 17).

In the late 19th century the railways was the future of transportation. The cities around Europe, Canada, and the United States were equipped with both cargo and human transportation railways. The railway was successful and prosperous due to the location of the main station. The station was found in the city center making walking a possibility around the city. Businesses would start around the stations because of the high population the rail would bring in.

Historical Context



The locations of the stations allowed for a demand in new businesses. “Around the stations grew inns, warehouses, and workshops which attracted additional traffic” (Leibbrand, 1970, p.64). As the populations around the city centers began to grow, so did the suburbs. Suburbs size depended on the distance from the rail station. The further they got from the station, the less populated they were. “Suburbs of a ‘rail city’ are strung like pearls of decreasing diameter along the railway.” (Transportation and Town Planning, 1970, pp.68) People were willing to walk further to get to the train if the time on the train was shorter. Once the train ride began to take more time the distance from the station, the suburb grew smaller due to people not willing to walk a long distance and then ride for a long period of time.

Historical Context

The railway continued to have success during the world wars because the government regulated the amount of cars that were produced. This forced people to use the rail because they had no other way of transportation to get into the city for their goods. During those times the electric trolley was introduced. The trolley systems provided a mode of transportation to and from the suburbs. They were not the fastest piece of transportation, but it got the people to and from their destinations. As soon as World War II was over, the United States saw a major change with the rail system.

Ford motor company came out with the Model T car. There was an increase in sales but not until the vehicle companies dropped the prices by almost fifty percent. The people that started buying personal vehicles and neglecting the public transit systems. The people with vehicles saw that the trolleys were too slow and caused congestion in downtown areas. Complaints lead to the trolleys being removed from the streets. As the popularity diminished, many rail stations were demolished to make room for other businesses. Around the 1960's "design quality evaporated along with the pride in the look of things" Toy, 1994, p.17). Room was being made for vehicles on the streets, which eliminated all of the trams as well. In Europe and Canada, the popularity continued as well as the development in the types of systems used.

Many stations and examples of the 19th century stations are gone, so there is an inability show the history of the rail stations, especially the freight stations that were completely taken out of the landscape. The freight stations were built to be functional and were not decorated like the public transportation system stations were. These buildings were great examples of clean designs from the 19th century.

Today in America, public rail systems are slowly developing around the nation. Many examples in Europe have begun to update stations to meet today's needs. Today, the "contemporary 'urban gateway' has increased in vitality as we move into the 21st century" (Toy, 1994, p.7). Cities are seeing similar responses to new stations. "The need for increasing more efficient transport interchanges has created a demand for public buildings which not only provide the required ease of movement but also celebrate the sense of arrival and departure" (Toy, 1994, p. 7). "Throughout the developed world, new rail systems are being used as the adjuncts of major redevelopment and urban design projects. This phenomenon indicates a movement towards greener, more humanly responsive cities where easy movement is a priority" (Toy, 1994, p. 18).

Historical Context

The development of trams, metros, and other types of public transportation systems are mainly in larger cities and help move the people within the city. Small examples in smaller cities haven't been seen as a demand for the market. With gas prices not being as expensive as other parts of the world, people in the United States still find it easier to use their personal vehicle. As technologies and transportation systems become more efficient and easier to use, we might see an increase in the development of public rail systems around the United States being developed.

Goals

Academic

This thesis has been in development for many years as I have always had an interest in transportation. Mainly, I had been interested in personal vehicles, but once I began to experience public transportation I started to get a good understand the importance of both. Traveling and studying abroad in France gave me the experience to be only able to rely on public transportation. The public transportation systems connected me to twelve countries and several more cities around Europe. I didn't know exactly what my thesis was going to be about, but I had been building a repertoire of several modes of public transportation. As I began to realize what transportation does for the public, I started to gain interest in the idea of implementing transportation somewhere that wasn't connected like I had experienced.

With architecture and design becoming more important than ever, I find that architecture will change the future of how we experience life on Earth. Politically, publically, culturally, and socially, architecture is extremely important. I believe that it will become one of the best tools and examples to inform the world about important topics like sustainability and efficiency. My goal academically is to develop this thesis that will begin to inform the public on the importance of design and our personal impact on the Earth.

Professional

My goals professionally are to develop a thesis that will be the beginning of an exciting career. Transportation and energy are a part of everyone's lives in some way. If I am able to take what I learn from research and the development of this project to become aware of how it will shape architecture in the future, I believe I will have a good understanding of the major qualities of architecture.

Personal

My dream was to go to North Dakota State University for architecture. Once I began to research the school, I knew it would be a perfect match. Now that I am through four-and-a-half years and developing my thesis for my master degree, I couldn't be happier about what I am about to propose for the college of North Dakota State University. My personal goal for the outcome of this project is to blow myself away. I am the hardest critic for myself. If I am able to please myself, I know that I have succeeded.

SiteAnalysis

Site Analysis Narrative

As A North Dakota State University student for currently the fifth year I am very familiar with the campus and area of my thesis site. Half of my career at North Dakota State University was spent on North Dakota State University Main Campus and the other half was spent on North Dakota State University Downtown Campus. I was a resident of North Dakota State University Main Campus for two years until I moved downtown Fargo to live closer to Renaissance Hall, which is the architecture building. The four-and-a-half years spent here have allowed me to become very familiar with the needs of North Dakota State University.

The site on North Dakota State University Main Campus is located on the corner of the crossroads of the center of campus. At the center of the campus, you are able to see that it becomes one of the busiest parts of campus. People are coming from dormitories, apartments, classes, off campus, and the main dining center on the north side of the campus. To the south, people are coming from North Dakota State University student union, the main bus stop, and classes. The center of campus, where the site for this thesis is located, experiences a lot of foot traffic.

North Dakota State University student union is southeast of the site and which is the busiest place on campus for people to hang out, study, eat, and socialize. The IACC is the campus's main computer center which students regularly use several times a day. The library is on Albrecht Boulevard, but is not directly adjacent to the site like the Union and IACC. In the future, North Dakota State University will be moving the library to the proposed site, which is across Centennial Boulevard.

North Dakota State University has all of its major public buildings surrounding the site. Currently a small building is there, but I see it as a valuable location to not use for such a building that I am proposing. The site is located at the crossroads of campus, which would allow for convenient boarding and departing for the passengers of North Dakota State University. This location has the opportunity to create architecture that becomes one of the most interacted in spaces on campus. The architecture has an opportunity to connect all major aspects of North Dakota State University into a unified network of buildings.

Site Analysis Narrative

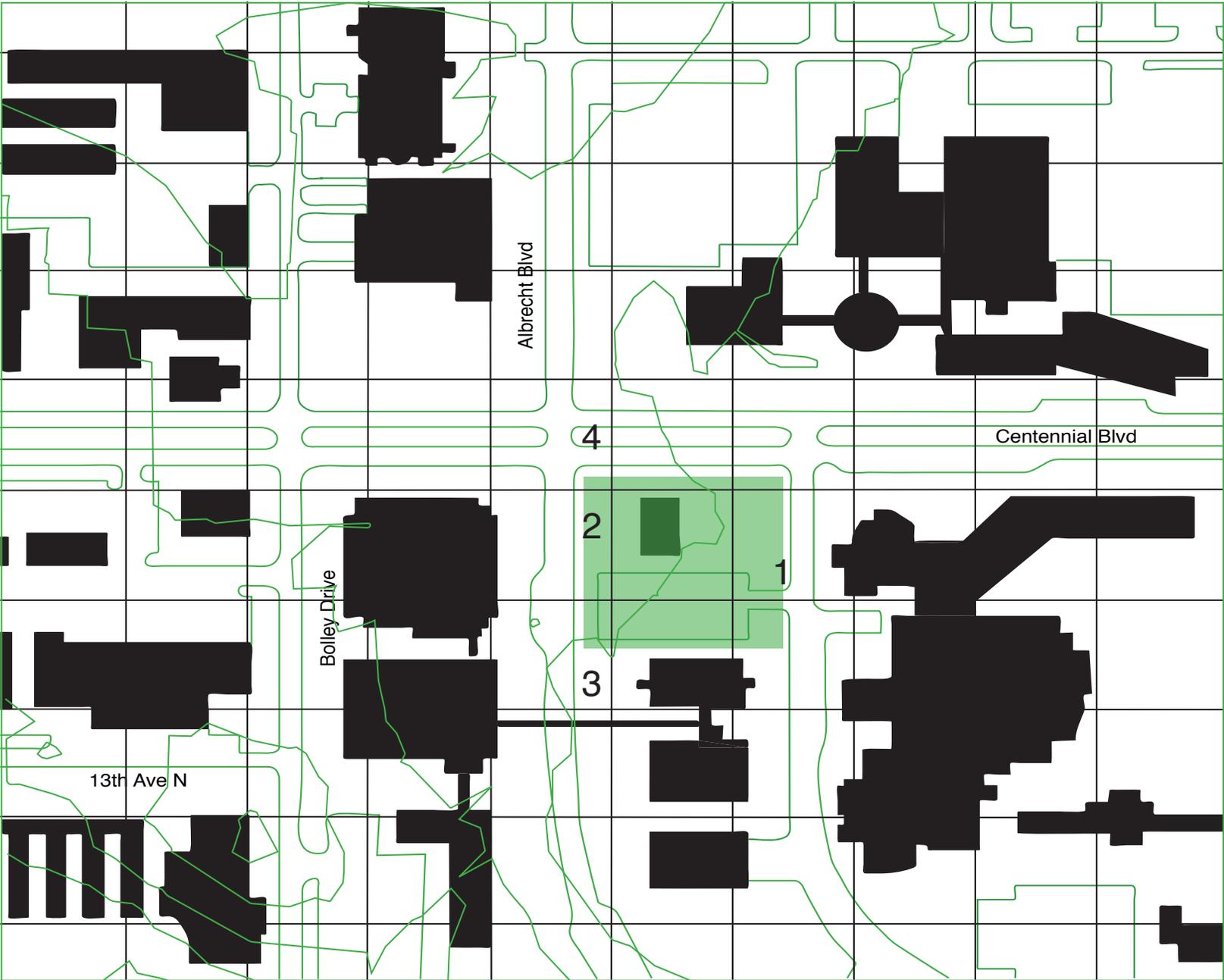
The site also is adequate to become a tool to inform the campus on the importance of where energy is coming from. The building will integrate strategies that power the building. With the amount of foot traffic passing through, I have the advantage of designing the building to reach out to the students and make it impossible not to experience interaction. An understanding of techniques and strategies that can be integrated into our architecture rather than energy harvesters becoming an after thought and solar panels just being placed onto the roof of the building.

Utilizing one of the most valuable pieces of land on the North Dakota State University Main Campus will allow for a convenient and efficient system. That will connect the two campuses that North Dakota State University utilizes visually and physically to create a sense of place as a North Dakota State University student or faculty member.

Site Analysis



Site Analysis



Site Analysis



Pedestrian Traffic

NDSU Main Campus - Pedestrian traffic is constant throughout the day. The site is located on the two main roads that split NDSU Main Campus. Two major buildings are directly behind and in front of the site. The student union and the IACC are two buildings that are utilized by the most people constantly throughout the day and night.

NDSU Downtown Campus - Pedestrian traffic is constant throughout the day but is never a heavy flow of traffic. The location is mainly utilized by vehicular traffic. Pedestrian traffic is constant throughout the day in and out of the downtown NDSU buildings but is rather low.

Site Character

NDSU has a strong visual appearance that creates the character of the site. NDSU buildings are mainly finished in red brick. The site is well maintained throughout all seasons, keeping a clean and welcoming atmosphere. Pedestrian traffic fills the space throughout the day, keeping the site lively.

Site Distress

The site shows no major distress on the corner of Albrecht Street and Centennial Avenue. The site is well maintained both in the summer and winter by the NDSU Facilities Maintenance crews.

Vehicular Traffic

NDSU Main Campus - Vehicle traffic is fairly minimal on the two major roads that go through NDSU Main Campus directly north and west of the site. Bus routes go through the campus on a regular basis throughout the day.

NDSU Downtown Campus - Vehicle traffic downtown Fargo is constant and heavy. The NDSU Downtown buildings are surrounded by several businesses and apartments that keep constant traffic heavy throughout the day and into the night.

Air Movement

NDSU Main Campus - Wind can become an issue from the lack of trees northwest of campus. There are no natural land forms that create protection from the wind. The site on the corner of Albrecht and Centennial does get some protection from the IACC building west of the site.

NDSU Downtown Campus - Wind can become an issue along NP Avenue and downtown. Wind tunnels are created from the various heights of buildings ranging from 1 to 5 stories near Renaissance Hall, Klai Hall, and Barry Hall. There are no natural land forms that create protection from the wind.

Light Quality

NDSU Main Campus - The common materials found on the campus are red brick on the buildings and concrete roads and sidewalks. Groomed grass and mature trees are located throughout the campus.

NDSU Downtown Campus - There are several materials that are used in downtown Fargo, but the majority are buildings from the early 20th century meaning they are made from brick. Stone, stucco, and steel are common as well. There is little to no grass in the dense areas of downtown Fargo. Grass is found near or around all the NDSU buildings downtown. Trees are sparse downtown but, again, around the NDSU buildings you are able to find new and mature trees.

Human Characteristics

NDSU Main Campus - The site is located in the middle of a North Dakota State University. The site has human intervention all times of the year. Personal vehicles, maintenance vehicles, buses, and pedestrians are passing through at all times of the day, moving from student housing and classrooms.

NDSU Downtown Campus - NDSU Downtown buildings are located throughout downtown Fargo. Human traffic is constant at all times of the day and year. Several businesses, residential apartments and condos, restaurants, and civic buildings are located near the NDSU buildings.

Utilities

NDSU Main Campus - All main utilities are connected to Fargo's utilities, except heat that comes from the coal plant located on campus.

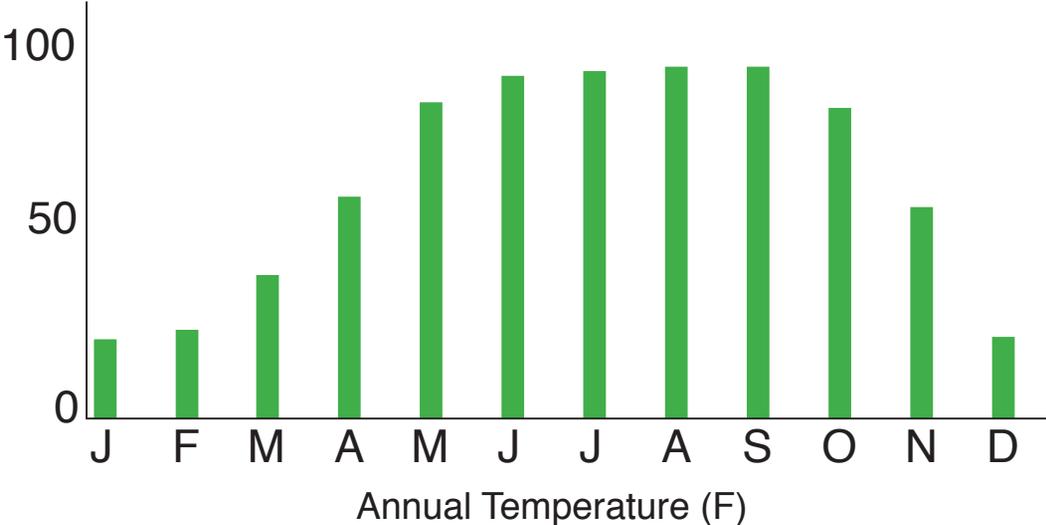
NDSU Downtown Campus - All main utilities are connected to the Fargo utilities.

Soils

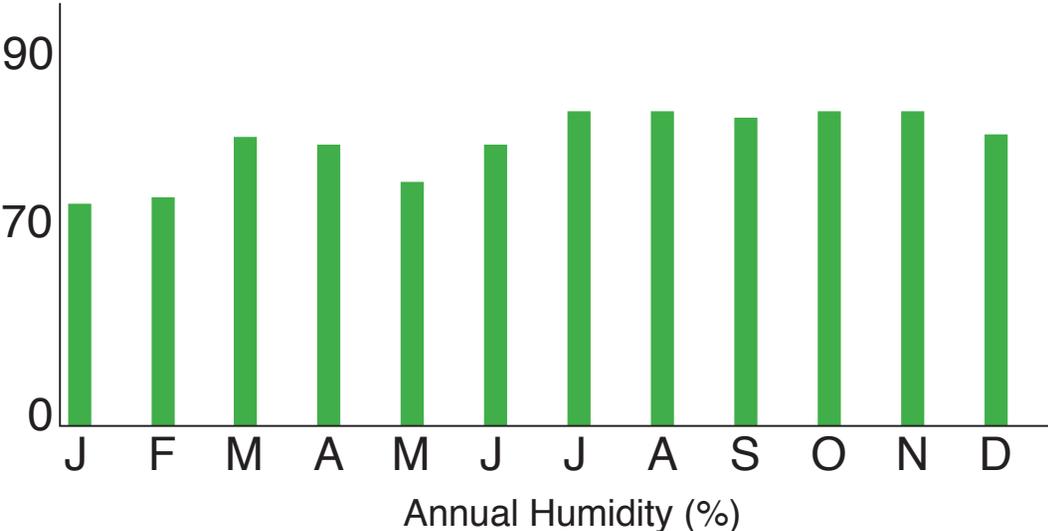
0 to 8 inches: Silty Clay
8 to 21 inches: Silty Clay
21 to 32 inches: Silty Clay
32 to 60 inches: Silty Clay

Climate Data

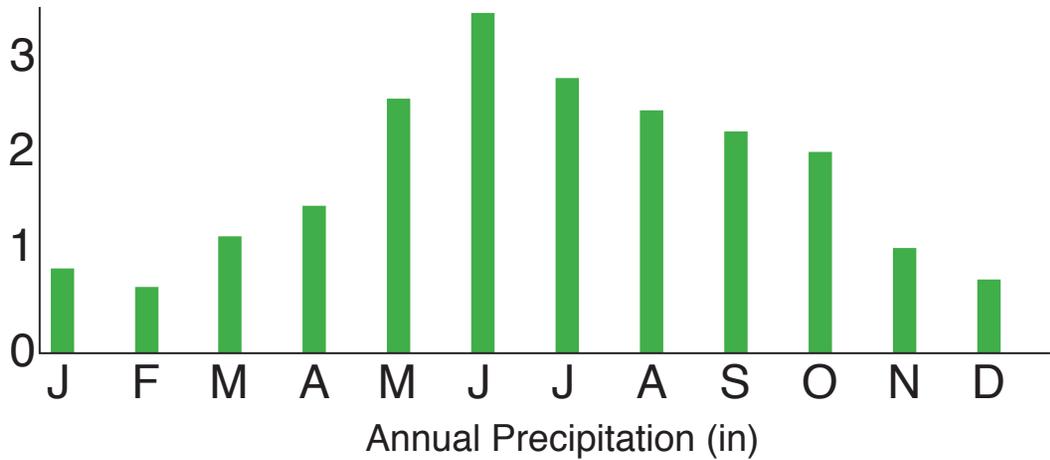
Fargo experiences both extremes for temperature. During the summer months, it can be very hot and the winter months can be very cold.



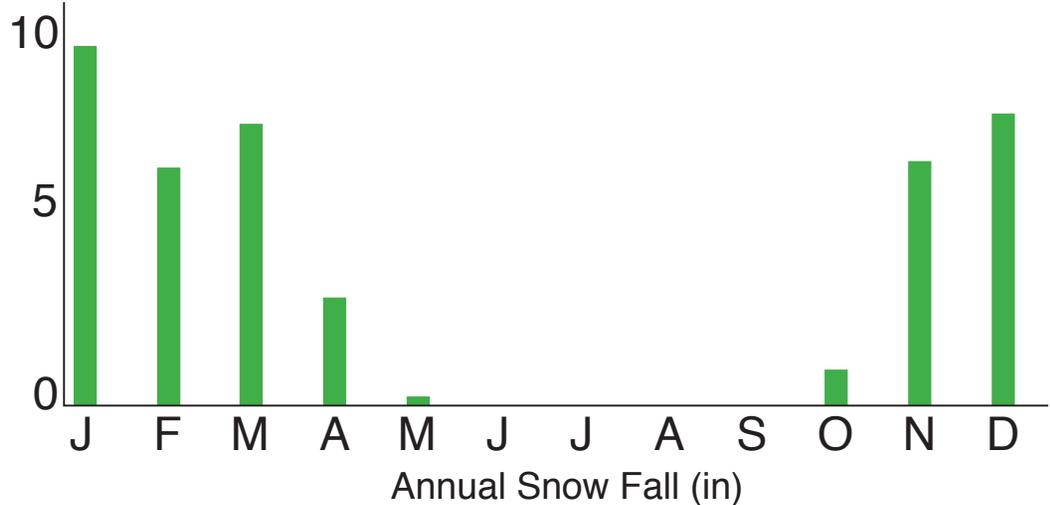
The humidity during the summer months can create extreme discomfort uncomfortability and the winter air can become dry.



Climate Data

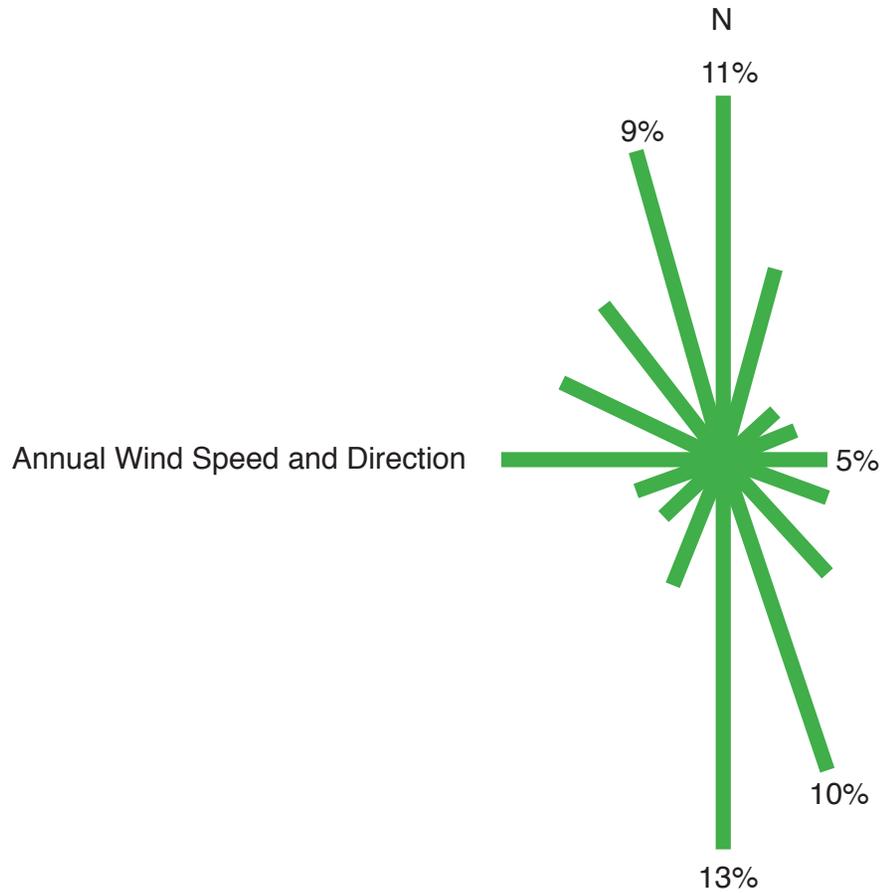


Rain can create an issue for agriculture but does not create a concern for architectural purposes.

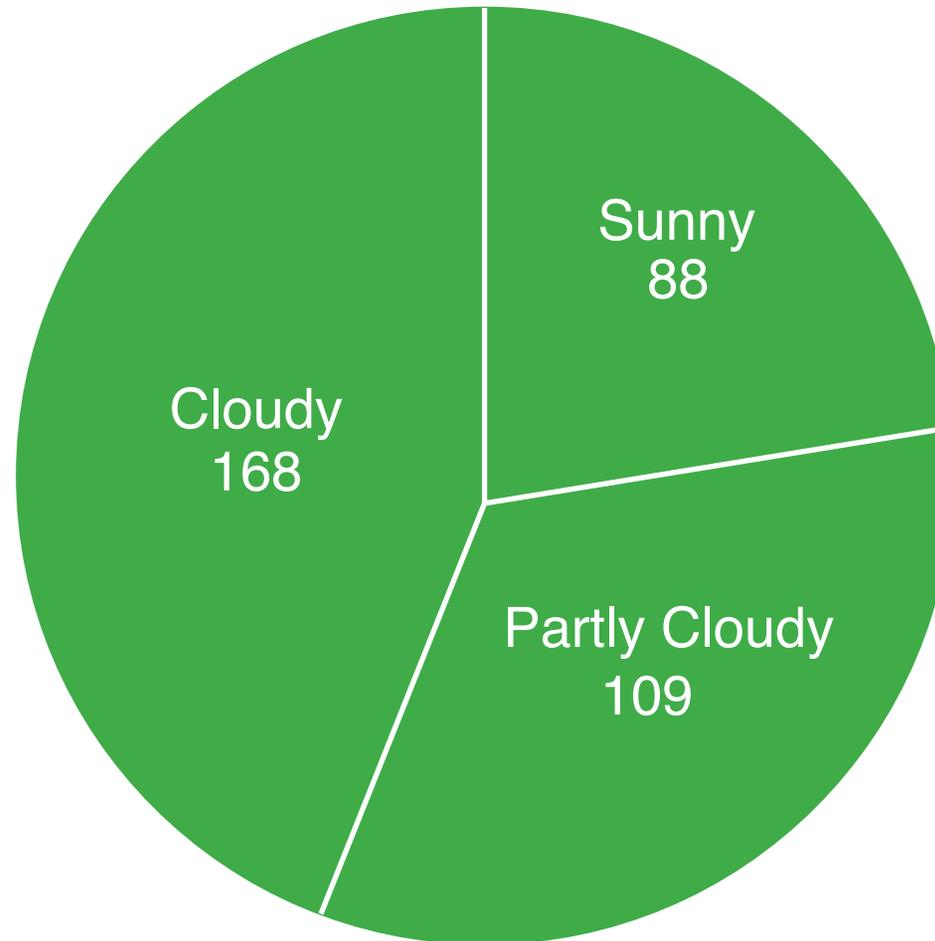


Snow fall has to be considered for the architectural designs in Fargo. The snow accumulates during the winter months and is very abundant.

Climate Data



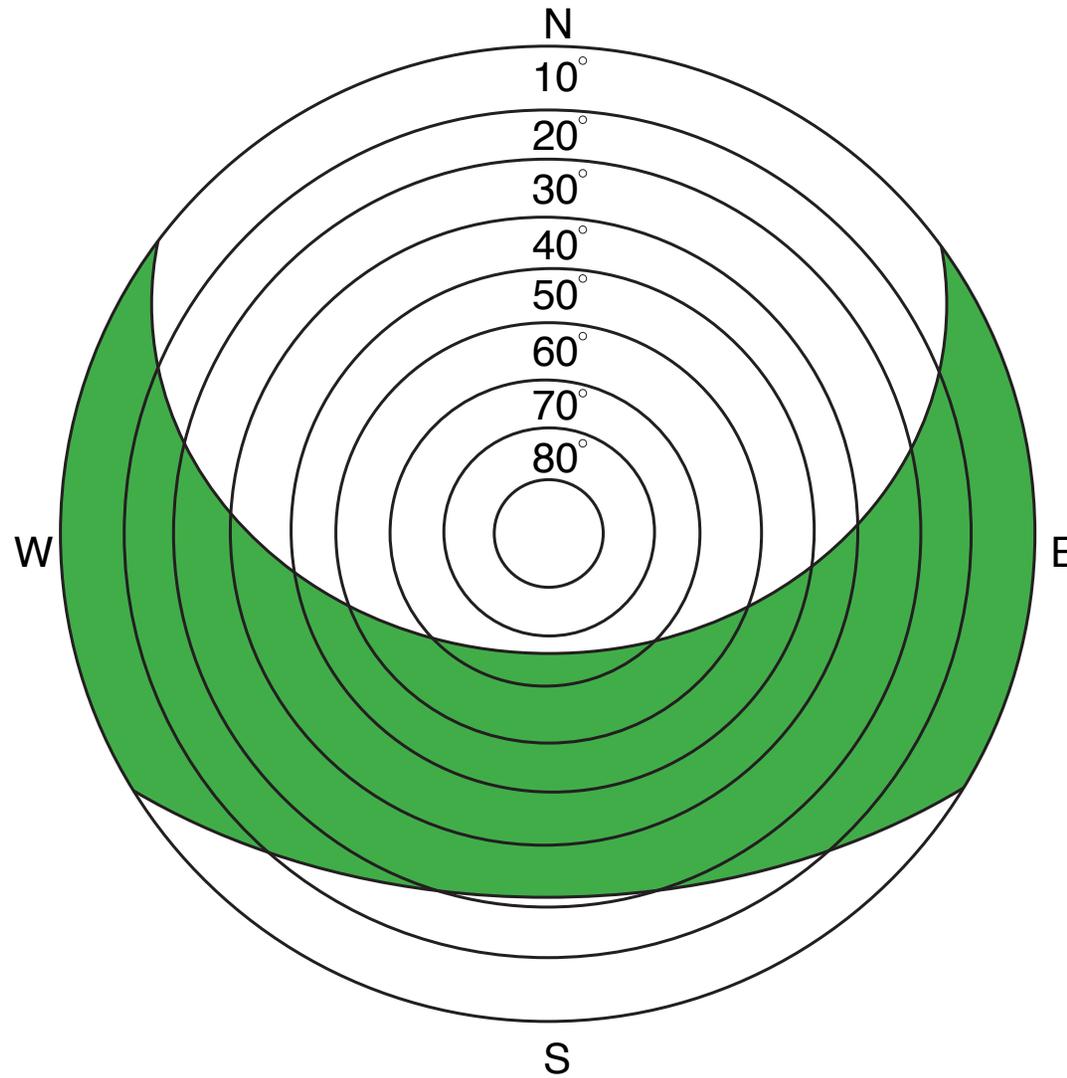
Wind can become very strong due to the lack of wind breaks around the area, causing the temperatures to feel much colder in the winter months.



Shade is important during the summer months for protection during the partly clear and clear days. The sun can create harsh light if not considered.

Average Amount of Cloudy Days. Fargo, ND

Climate Data



The sun angles during the summer are very high with long days. The sun angles during the winter are low with short days.

Sun Path. Fargo, ND

Noise

NDSU Main Campus - Site noise is fairly minimal. During the day, vehicular traffic is limited. Pedestrian traffic is constant throughout the day as students, faculty, and staff move throughout NDSU campus. Air traffic is constant throughout the day from the Hector International Airport. The proximity of the airport does cause noise throughout the day but is not a major concern.

NDSU Downtown Campus - Site noise is constant throughout the day. NP Avenue has continuous traffic, causing a fair amount of noise. The railroad is directly behind Renaissance Hall with 55 trains traveling through daily. Pedestrian traffic is minimal compared to vehicular traffic.

Air Movement

NDSU Main Campus - Wind can become an issue from the lack of trees northwest of campus. There are no natural land forms that create protection from the wind. The site on the corner of Albrecht and Centennial does get some protection from the IACC building west of the site.

NDSU Downtown Campus - Wind can become an issue along NP Avenue and downtown. Wind tunnels are created from the various heights of buildings ranging from 1 to 5 stories near Renaissance Hall, Klai Hall, and Barry Hall. There are no natural land forms that create protection from the wind.

Shading

NDSU Main Campus - Shaded areas are scattered throughout the campus. The site on the corner of Albrecht and Centennial does get shade during the summer from mature trees in the street boulevard. Surrounding buildings create shade as well at different times through the day.

NDSU Downtown Campus - Shade downtown Fargo is created from the buildings ranging from 1 to 5 stories. The main entrance of Renaissance Hall is nearly always in shade due to it facing north. Klai Hall's and Barry Hall's main entrances are nearly always in sun due to them facing south.

Slope

NDSU Main Campus - There is no major elevation change throughout the main campus.

NDSU Downtown Campus - There is no major elevation change throughout the downtown campus.

Programmatic Requirements

Total Square Feet - 21,750 square feet

Platform - 1,000 square feet

Location where students and faculty board the tram. Size is important in order to keep efficient transitions quick and easy while riders get in and out of the tram. Located on the exterior of the building, but necessary to be included.

Lobby - 6,250 square feet

The entrance into the building. Space designated for students and faculty to wait indoors while waiting for their next tram.

Circulation - 750 square feet

Corridors in the building that connect all of the office and energy storage/mechanical spaces together.

Offices - 750 square feet

Directors and assistants spaces that manage the tram and flex space.

Energy Storage/Mechanical - 1,000 square feet

The location where the buildings power sources and mechanical equipment are stored and managed.

Flex Space - 12,000 square feet

Space meant to change for a desired event such as an art gallery, event space, and presentation/lecture space.

Interaction Matrix

Essential



Desirable

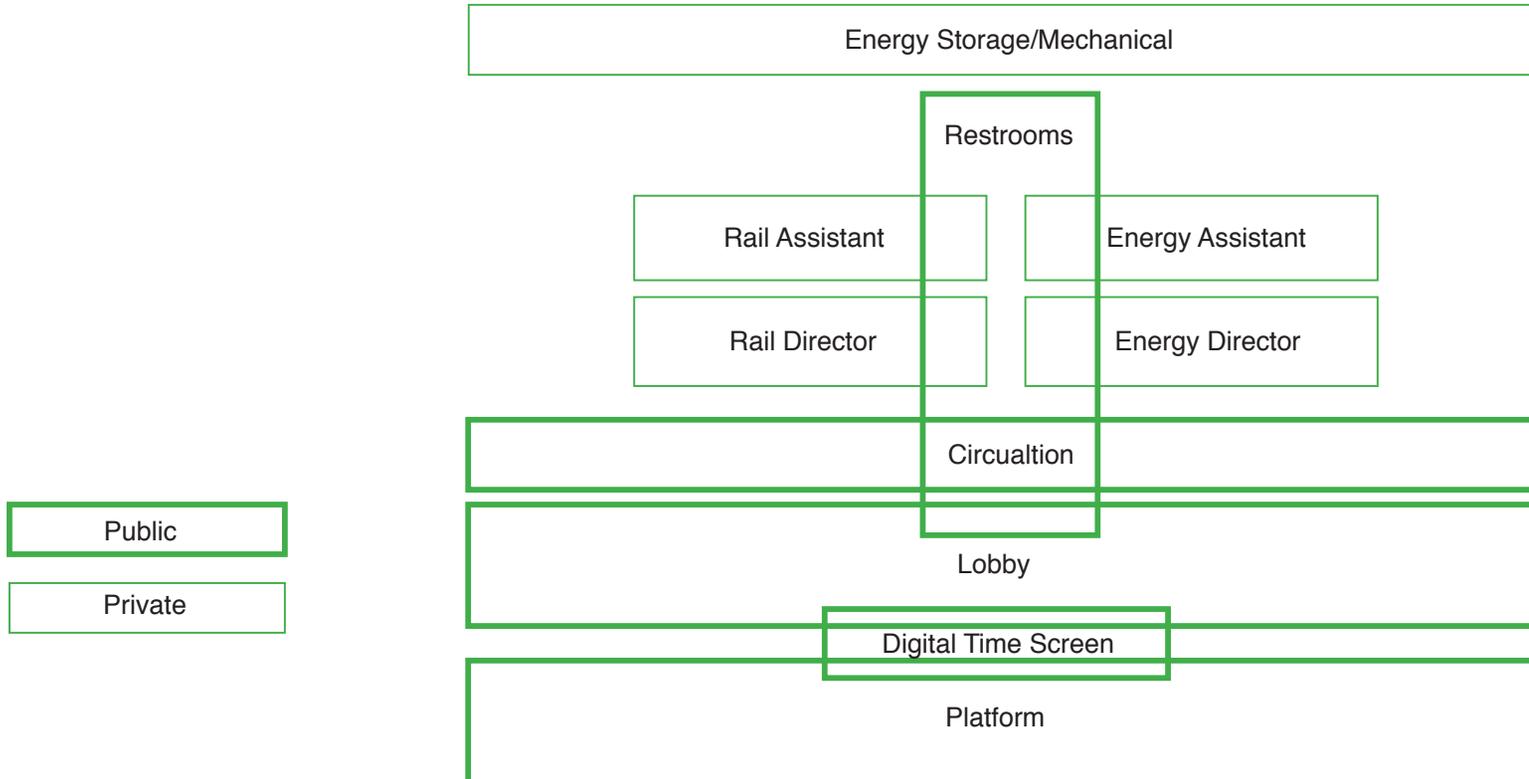


Not Needed

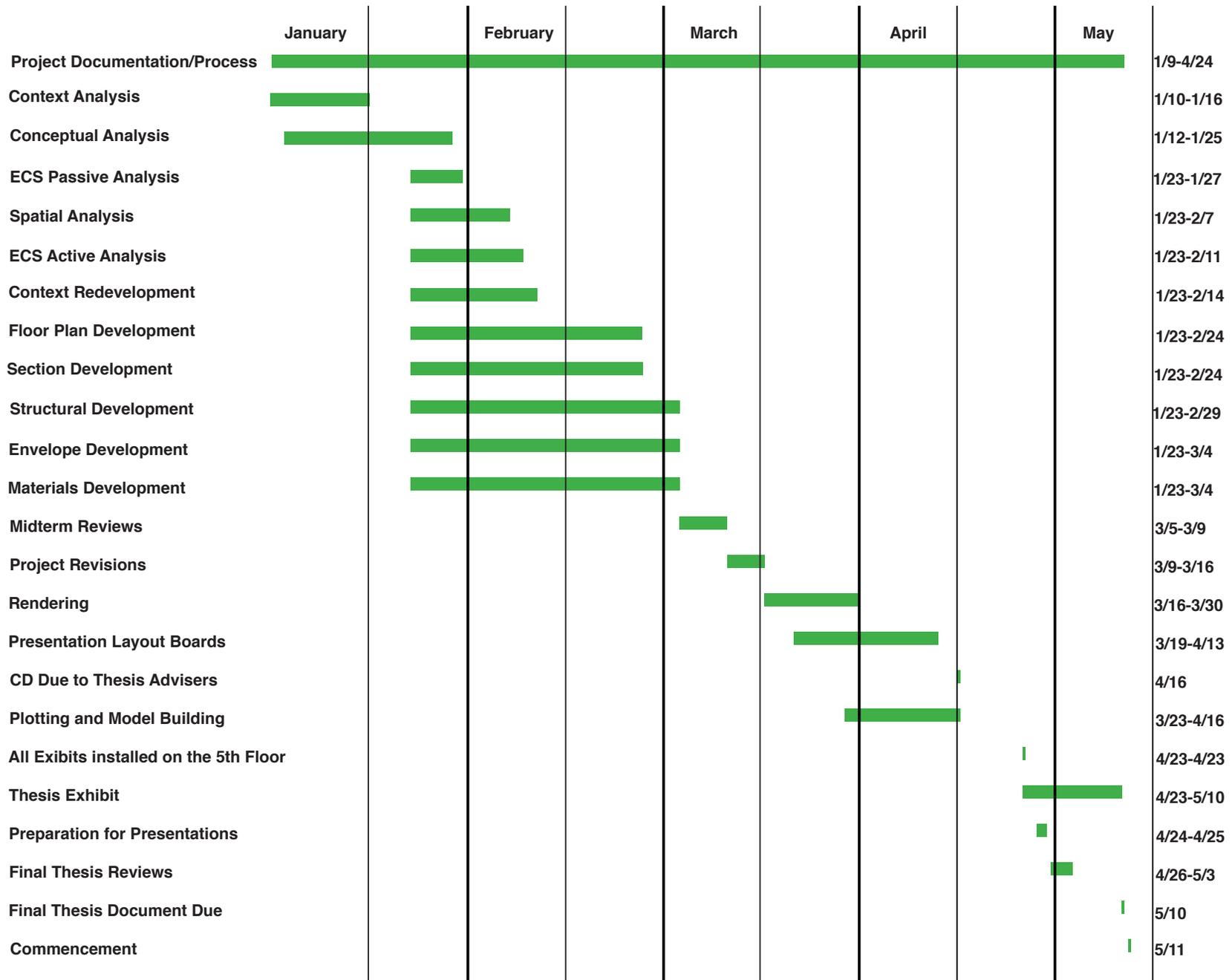


	Lobby	Platform	Digital Time Screen	Rail Director	Rail Assistant	Energy Director	Energy Assistant	Energy Mechanical/Storage	Restroom	Circulation	Skyway
Lobby	Not Needed	Essential	Essential	Desirable	Desirable	Not Needed	Not Needed	Not Needed	Not Needed	Essential	Essential
Platform	Essential	Not Needed	Essential	Desirable	Desirable	Not Needed	Not Needed	Not Needed	Not Needed	Desirable	Essential
Digital Time Screen	Essential	Essential	Not Needed	Desirable	Desirable	Not Needed	Not Needed	Not Needed	Not Needed	Desirable	Essential
Rail Director	Desirable	Desirable	Desirable	Not Needed	Essential	Desirable	Desirable	Not Needed	Essential	Essential	Not Needed
Rail Assistant	Desirable	Desirable	Desirable	Essential	Not Needed	Desirable	Desirable	Not Needed	Essential	Essential	Not Needed
Energy Director	Not Needed	Not Needed	Not Needed	Desirable	Desirable	Not Needed	Essential	Essential	Essential	Essential	Not Needed
Energy Assistant	Not Needed	Not Needed	Not Needed	Desirable	Desirable	Essential	Not Needed	Essential	Essential	Essential	Not Needed
Energy Mechanical/Storage	Not Needed	Not Needed	Not Needed	Desirable	Desirable	Essential	Essential	Not Needed	Not Needed	Essential	Not Needed
Restroom	Not Needed	Not Needed	Not Needed	Essential	Essential	Essential	Essential	Not Needed	Not Needed	Essential	Not Needed
Circulation	Essential	Desirable	Desirable	Essential	Essential	Essential	Essential	Essential	Essential	Not Needed	Desirable
Skyway	Essential	Essential	Essential	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed	Not Needed	Desirable	Not Needed

Interaction Net



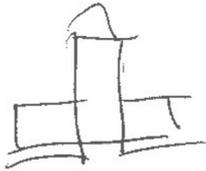
Work Schedule



Process

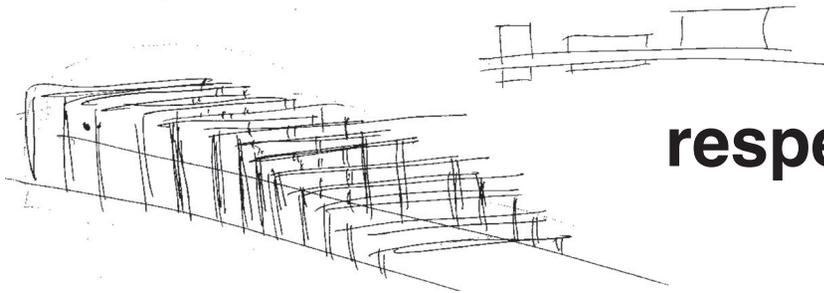
harvest

POSSIBLE PARTI
HARVEST / AGRICULTURE
FARM - VERTICAL + HORIZONTAL

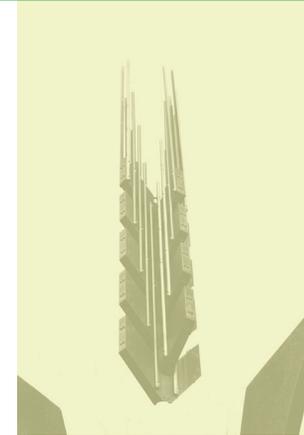


vertical + horizontal

TUNNEL
VISCONARY FUTURE GROWTH



agriculture



respect past

CURIOSITY
FUNCTIONAL ASPECTS
RESPECTFUL TO PAST
RESPECTFUL TO YOURSELF

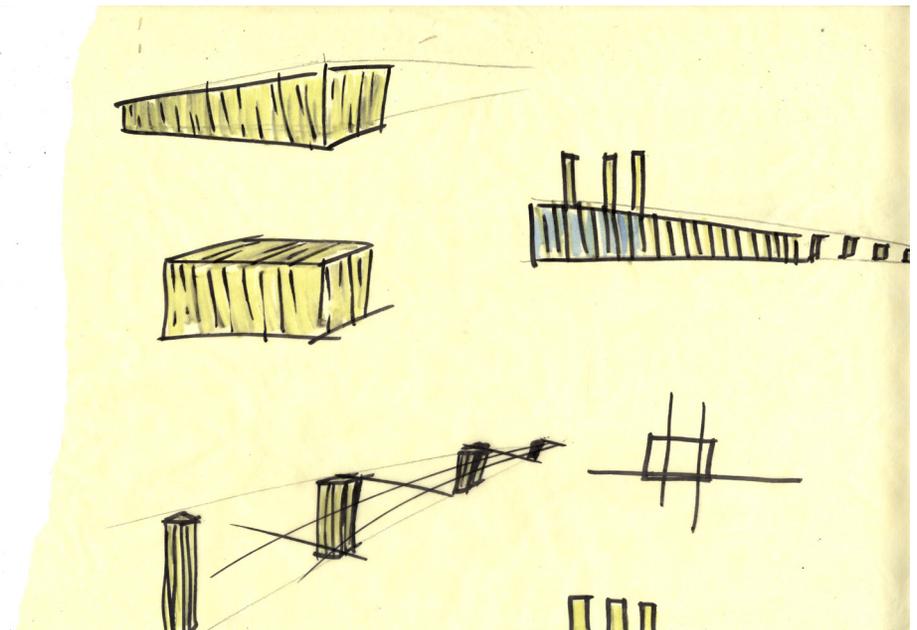
SATURDAY JAN 21

BUILDING OUTLINES
START SOME SKETCHES

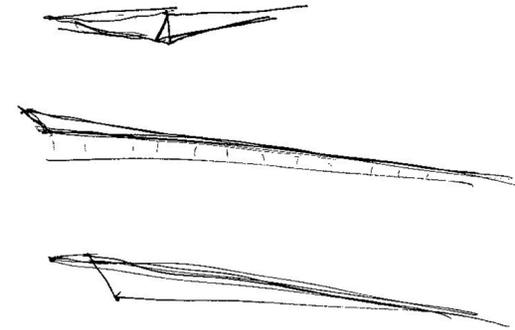
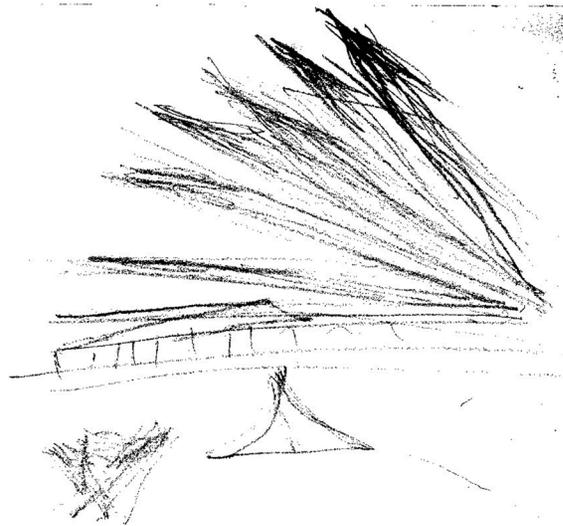
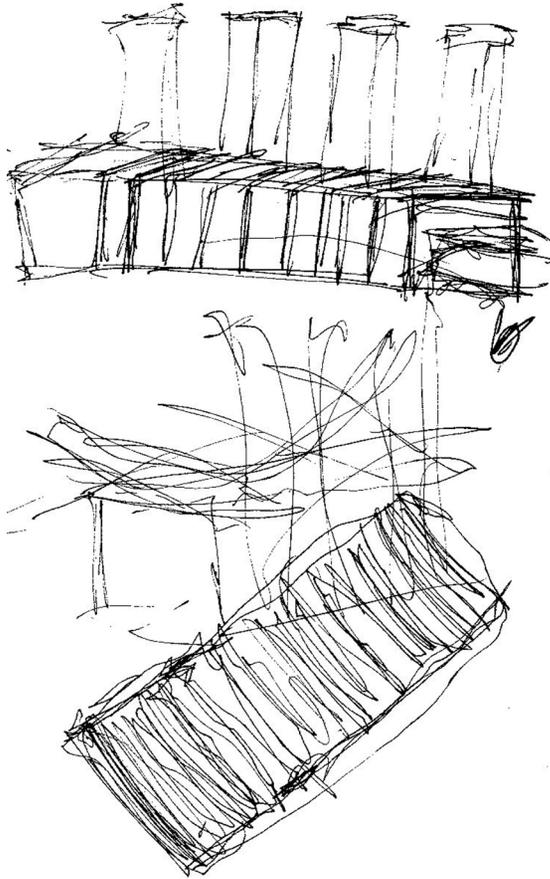
respect myself



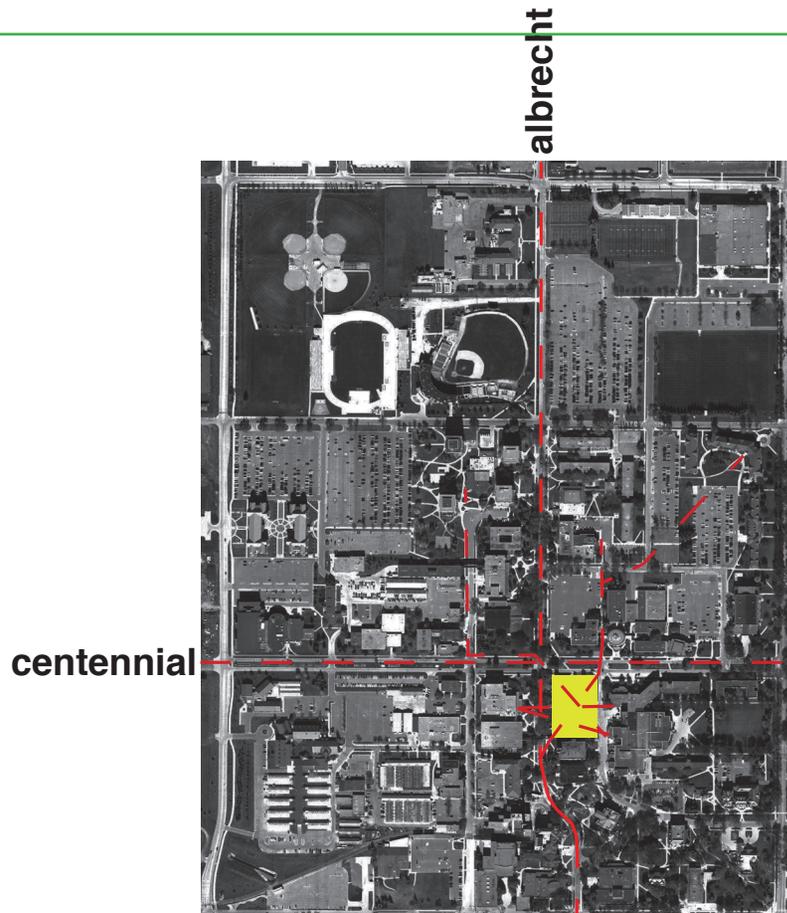
COMPOSITE
HYBRID



Process



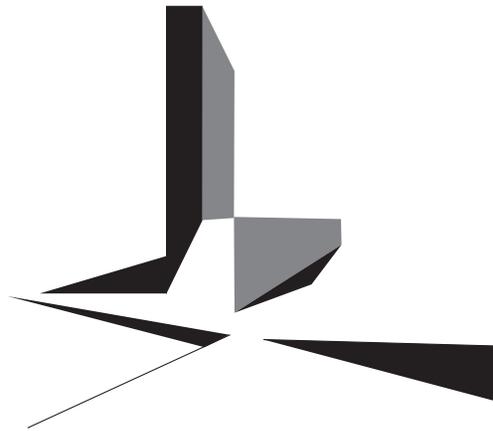
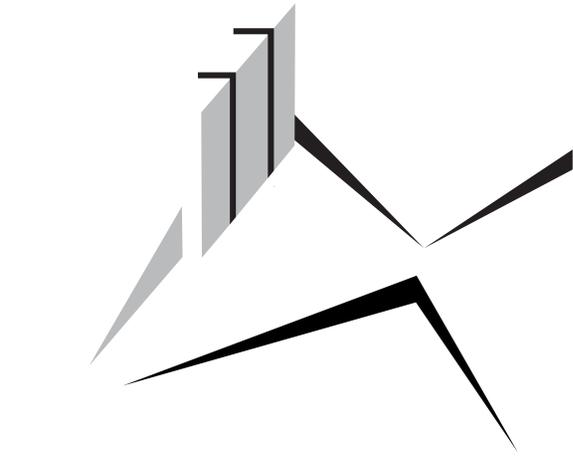
initial sketches

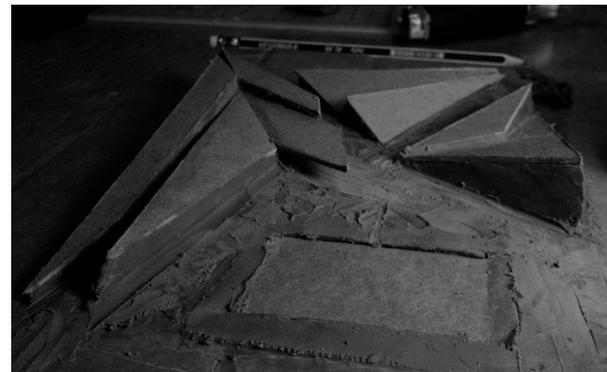
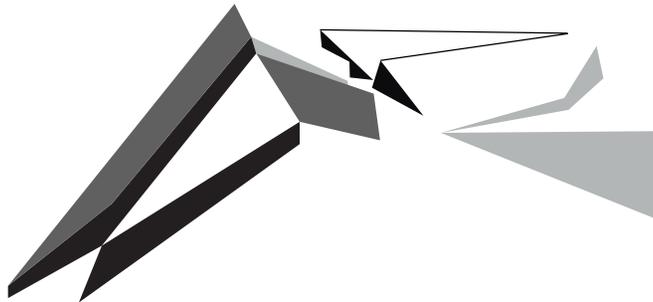
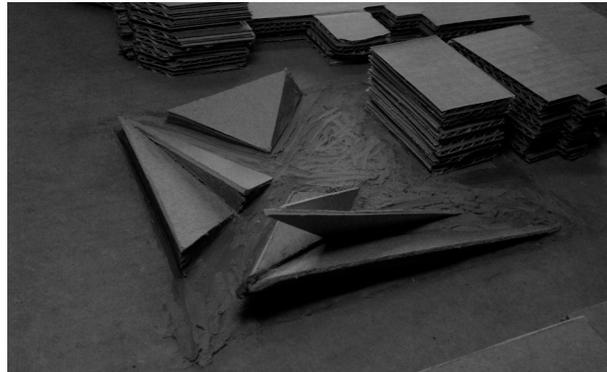
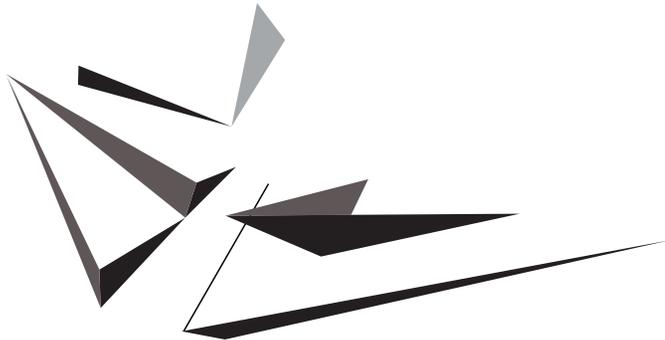


pedestrian movement

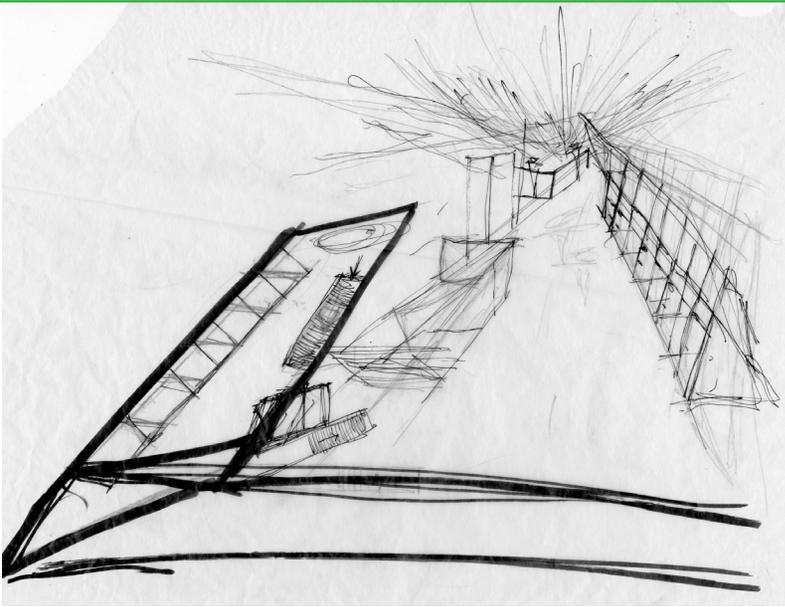
NDSU Main Campus

Process

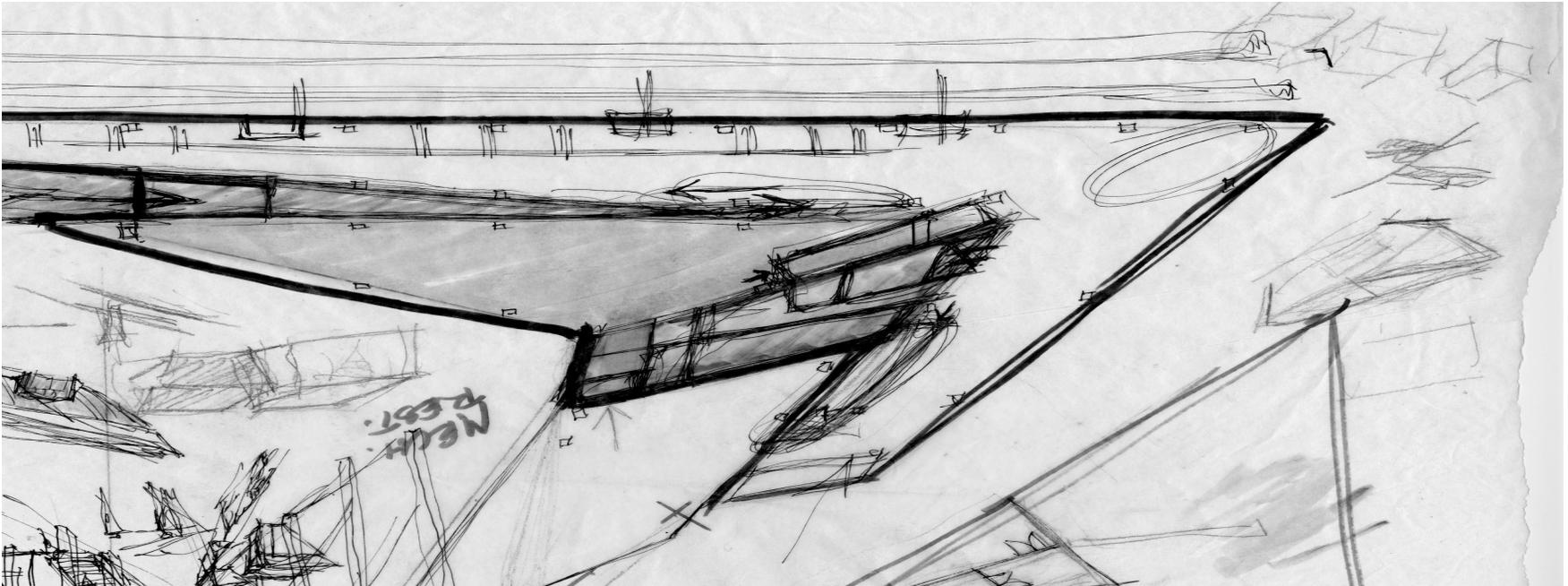




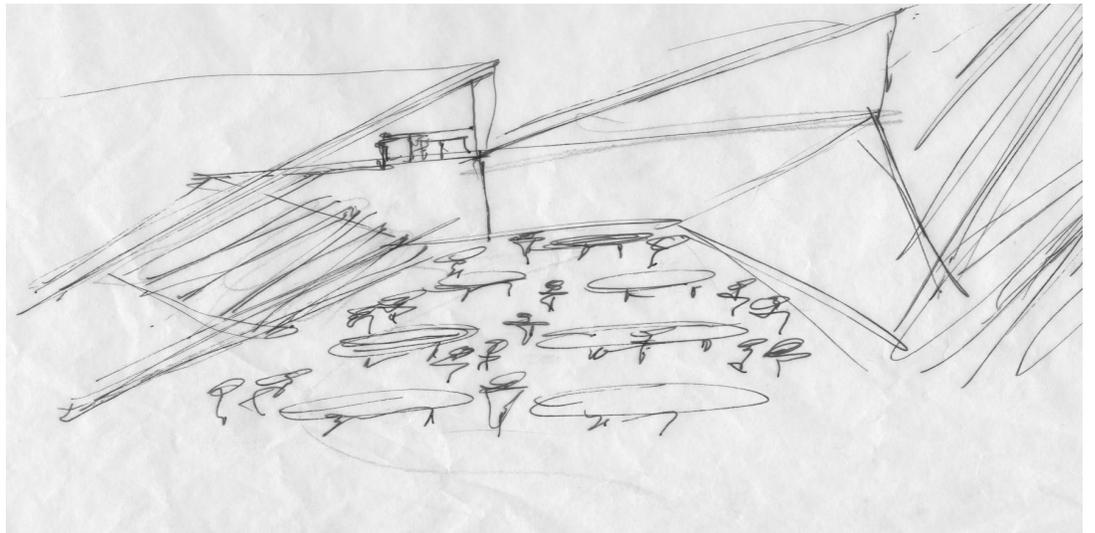
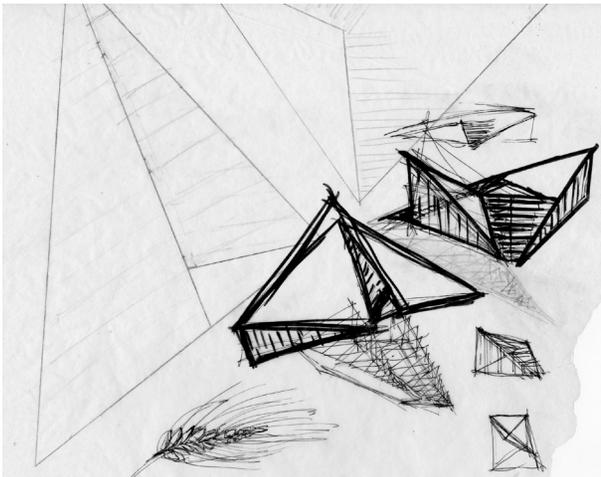
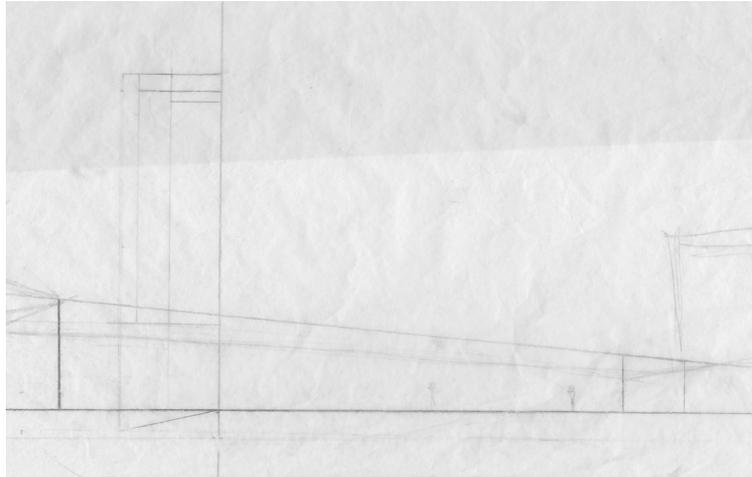
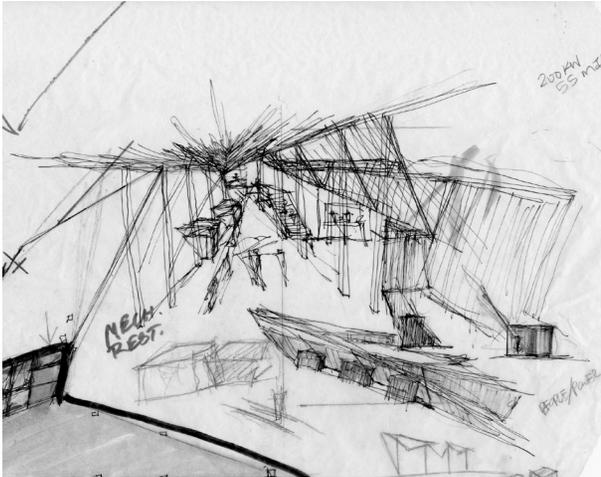
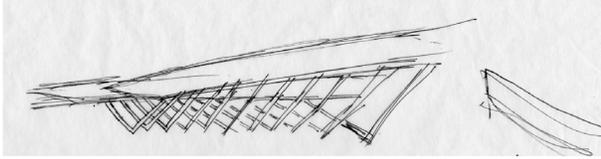
Process

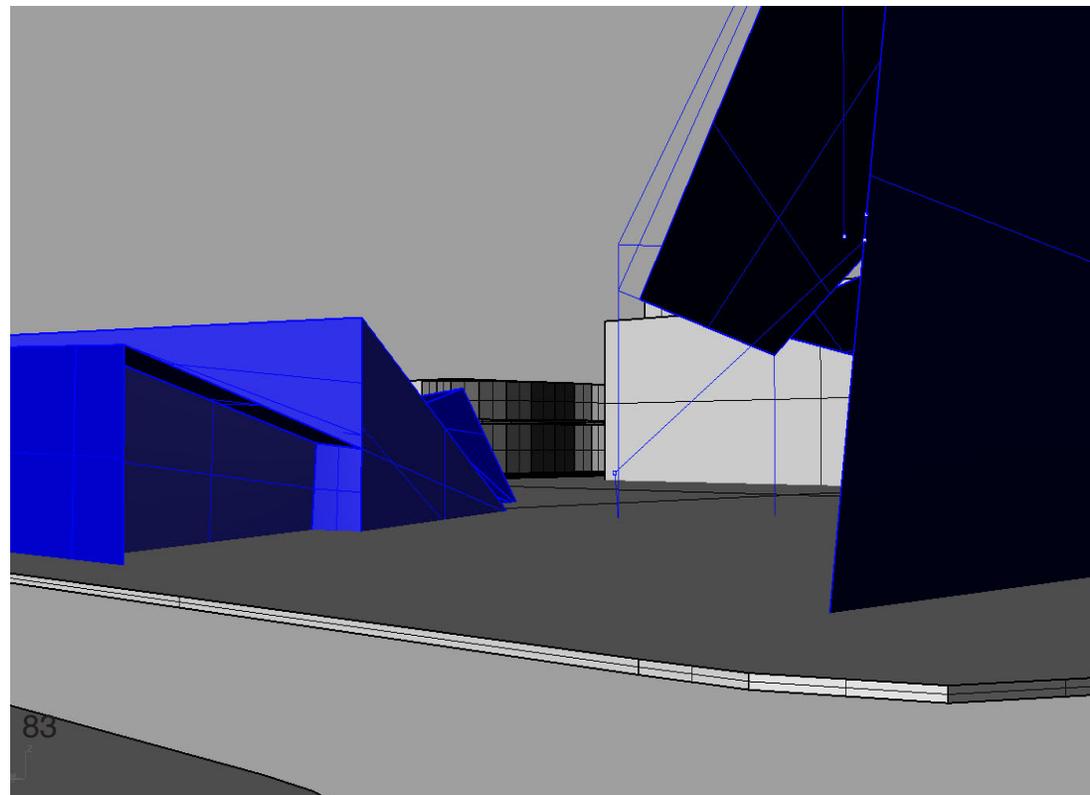
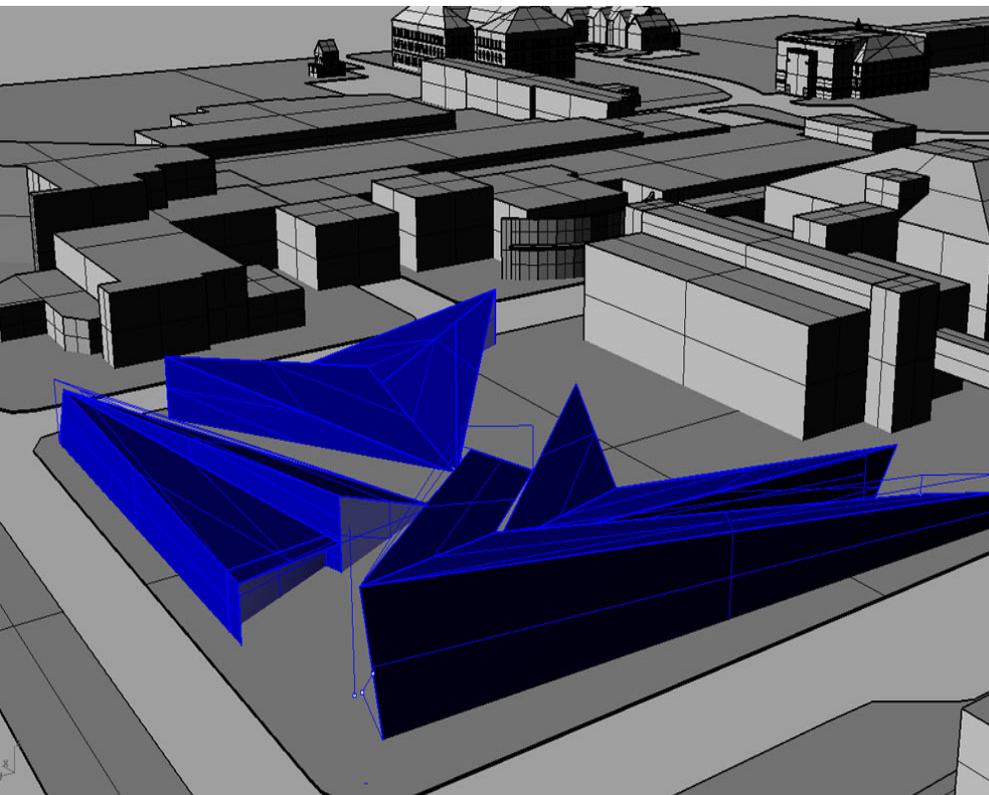
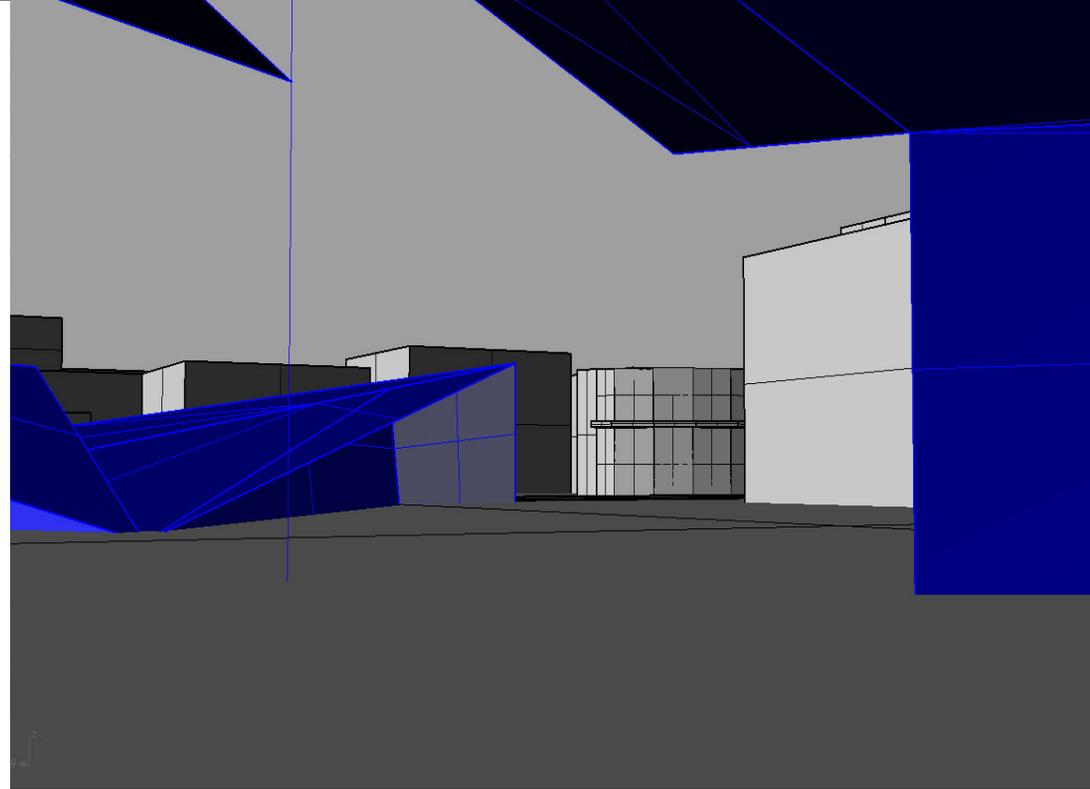
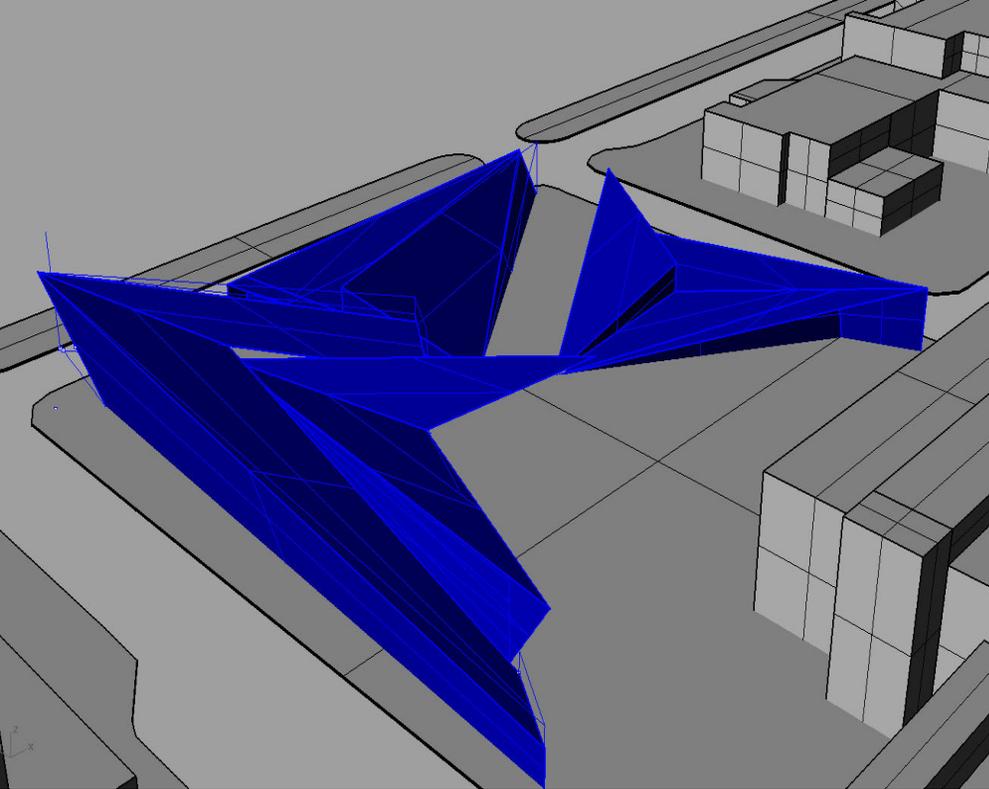


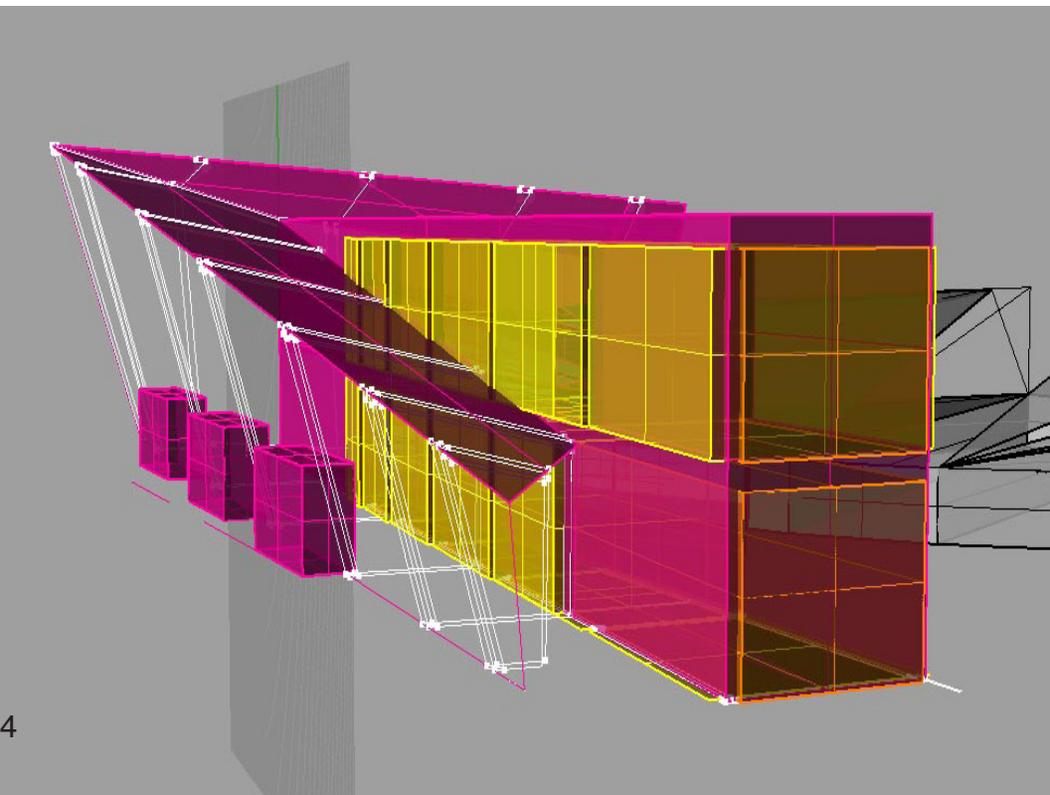
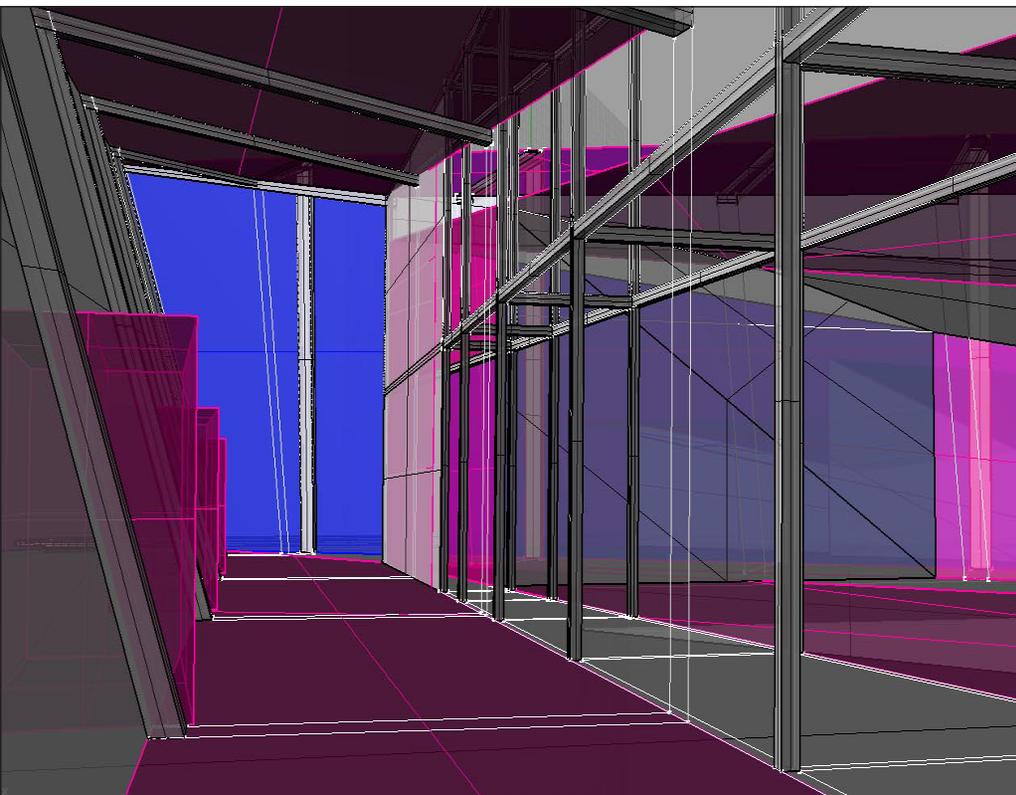
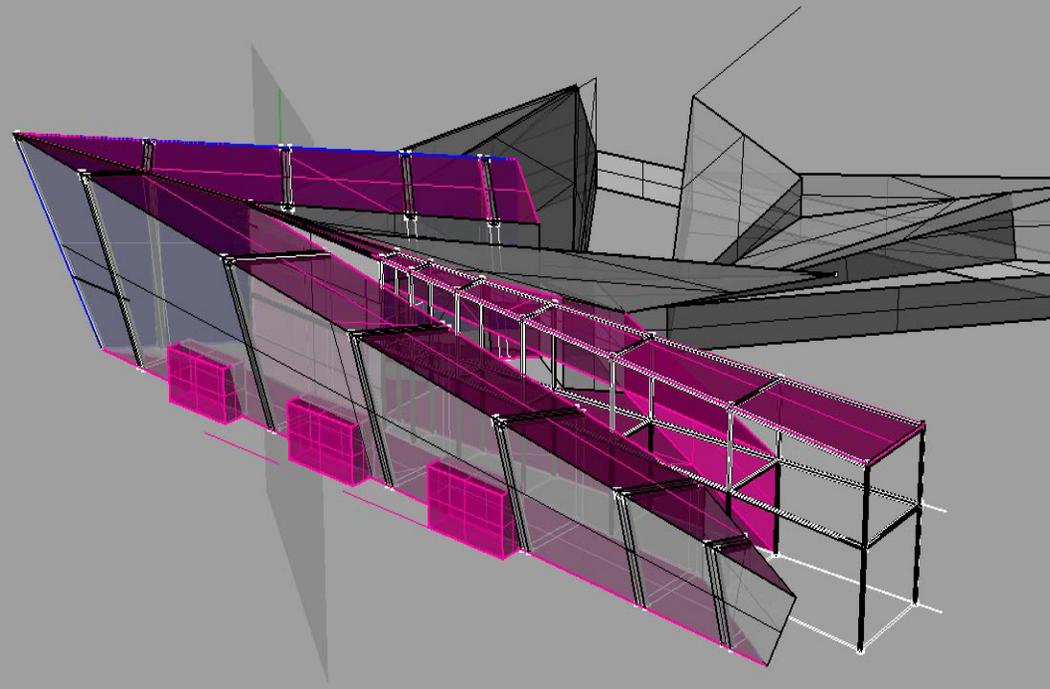
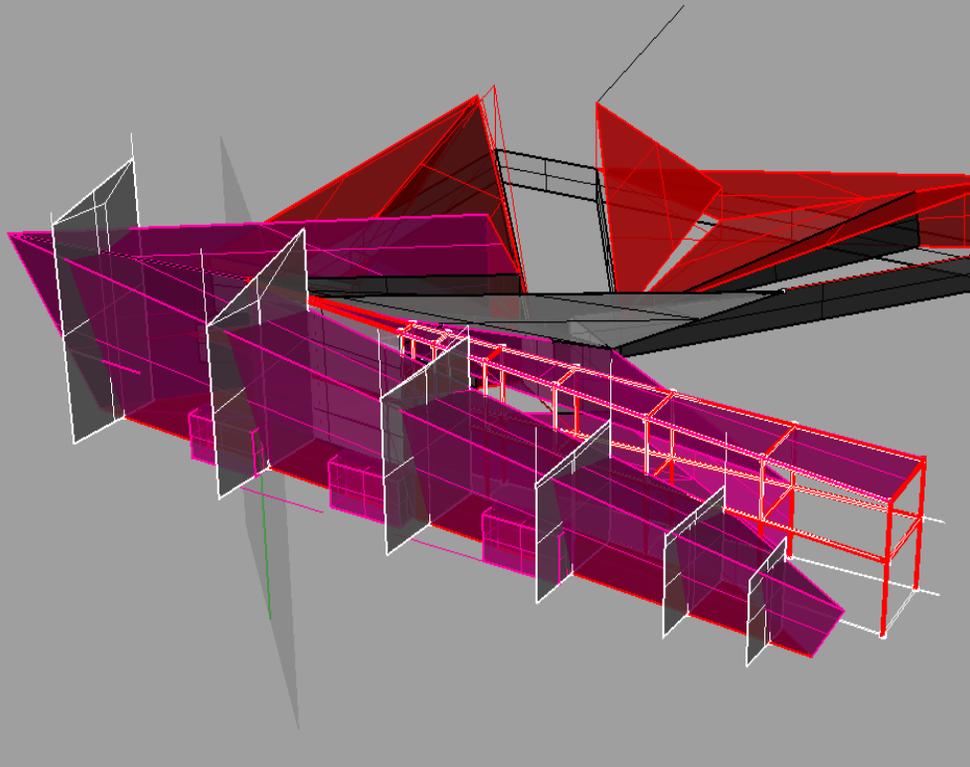
floor plan sketches



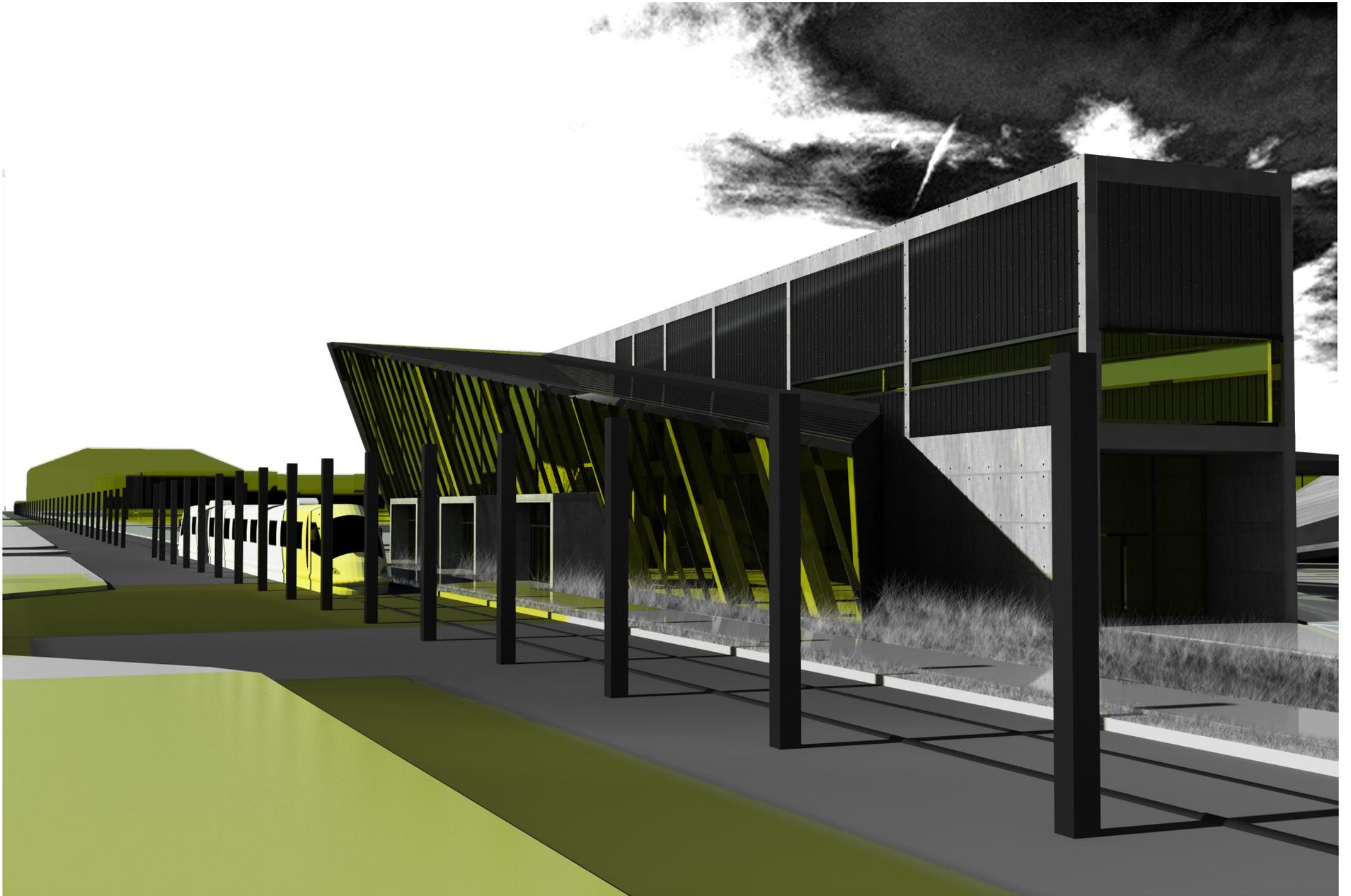
building development

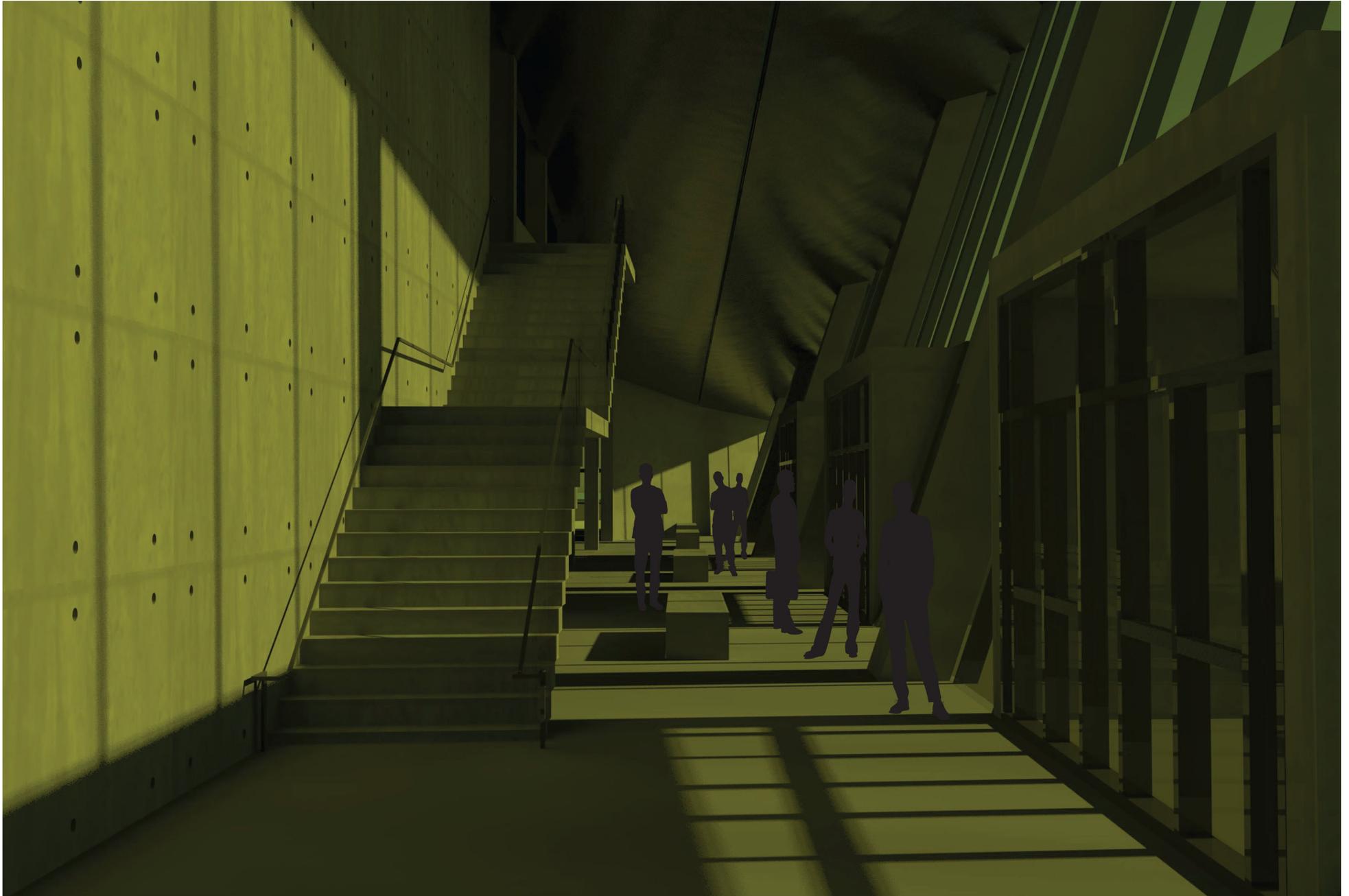


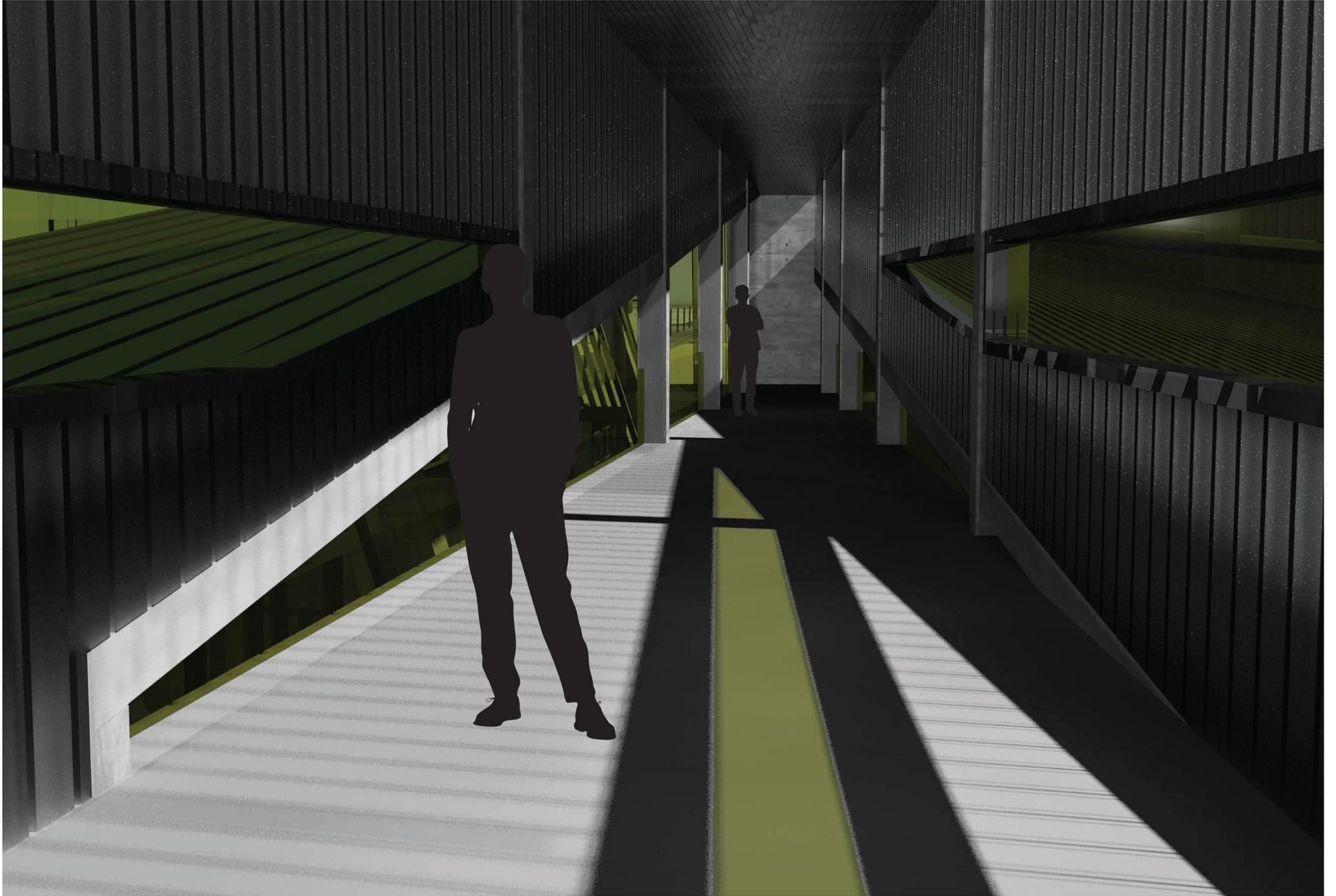




Renderers

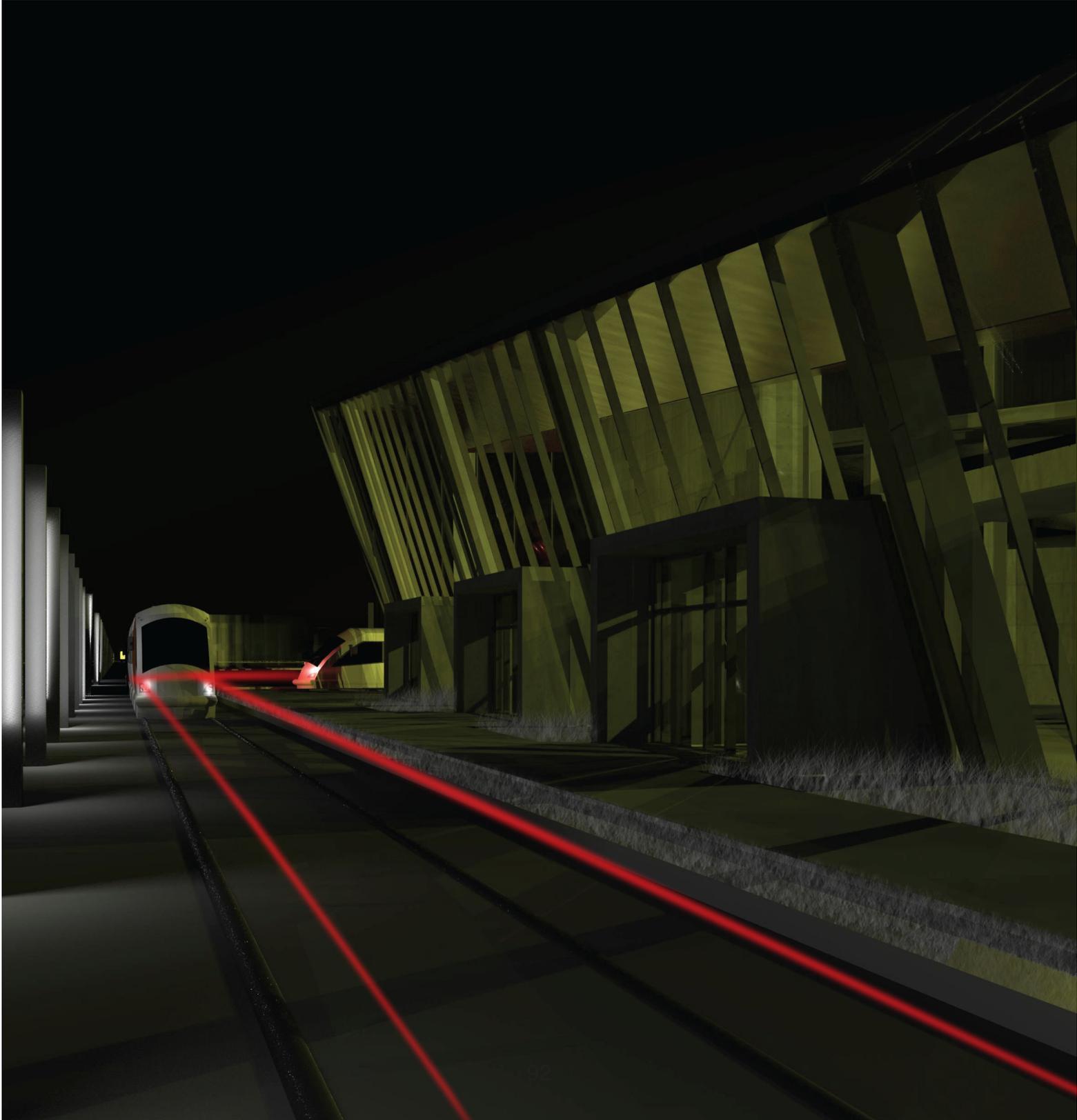


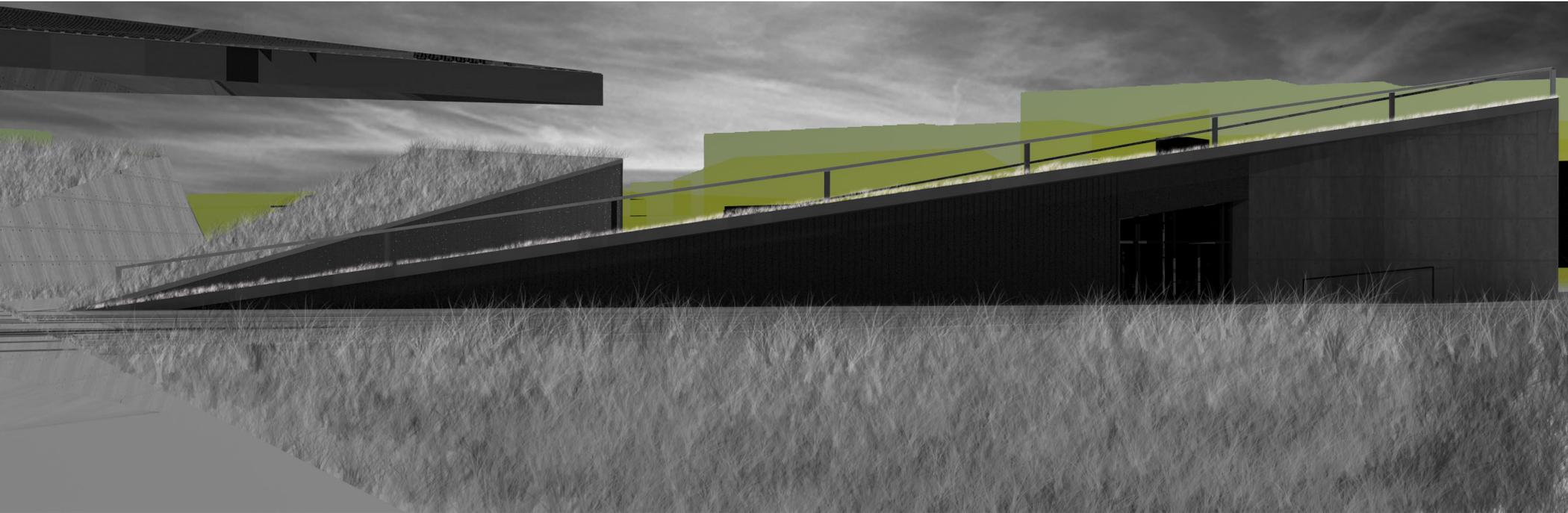


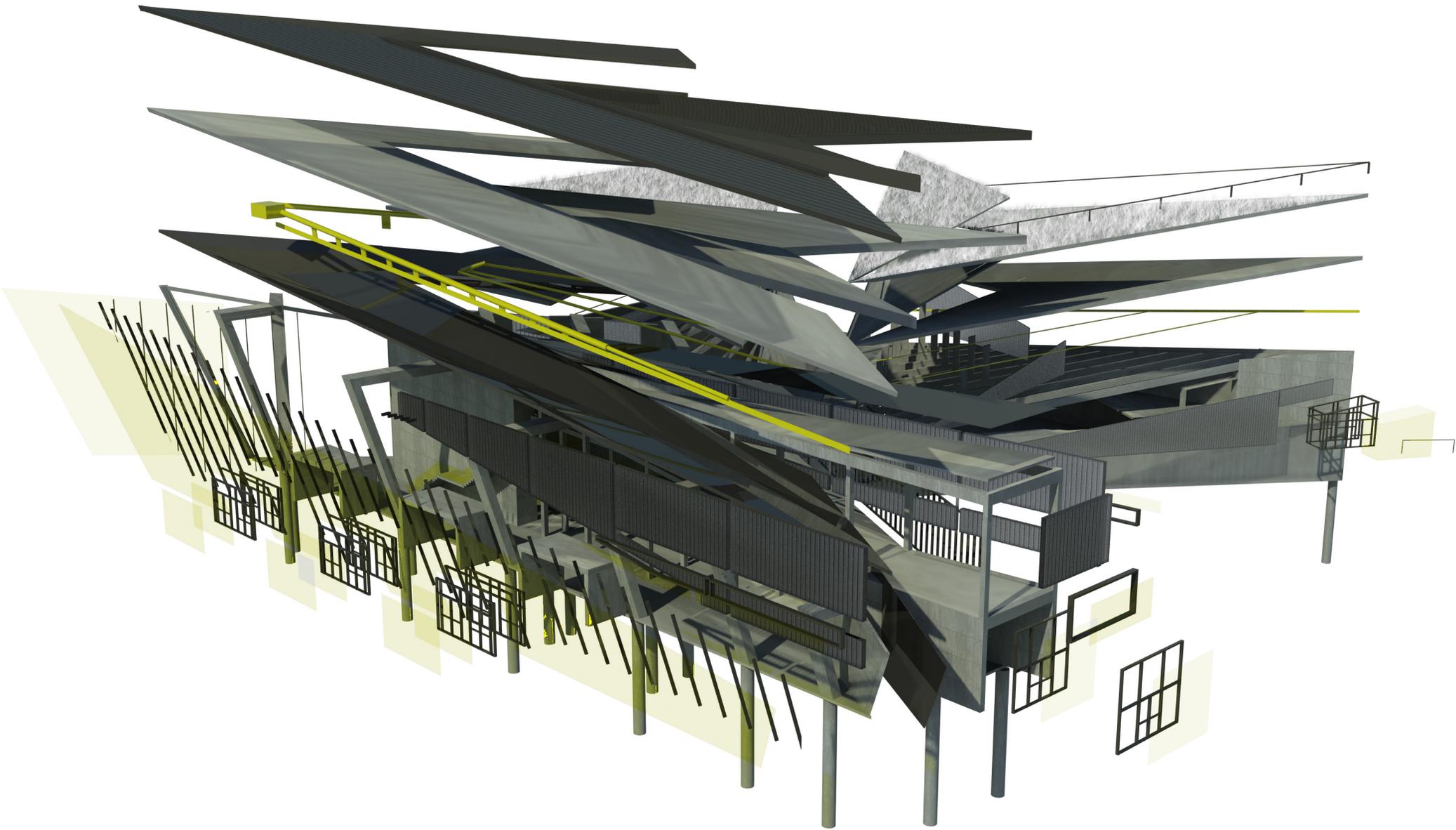


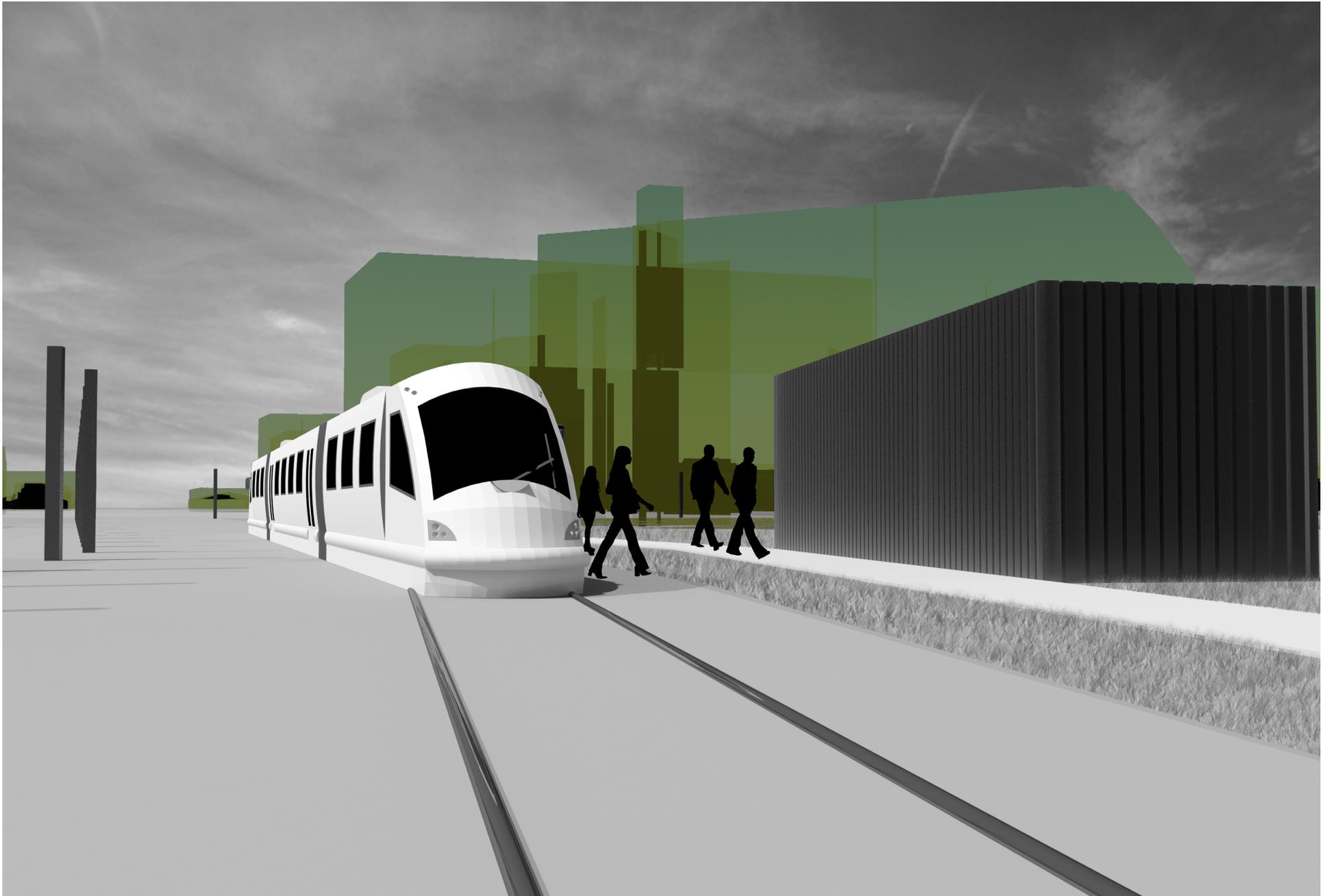


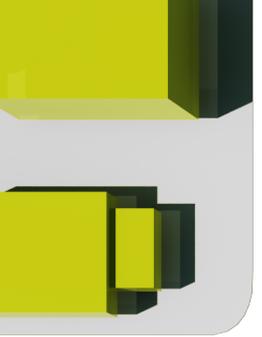




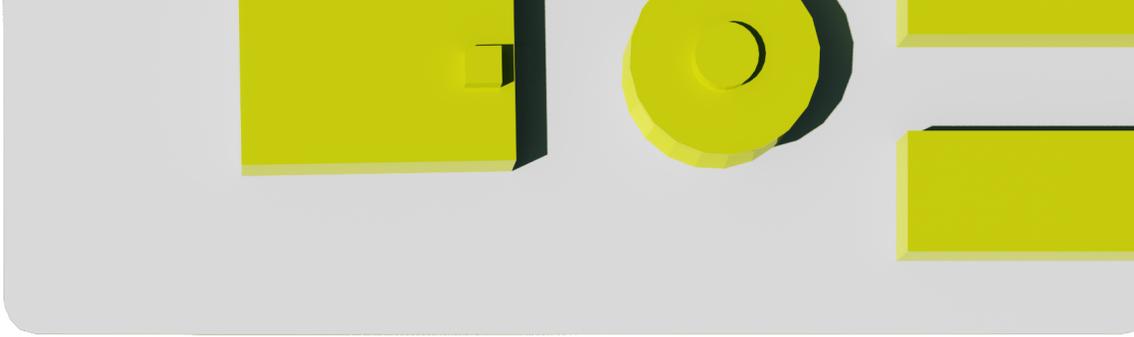




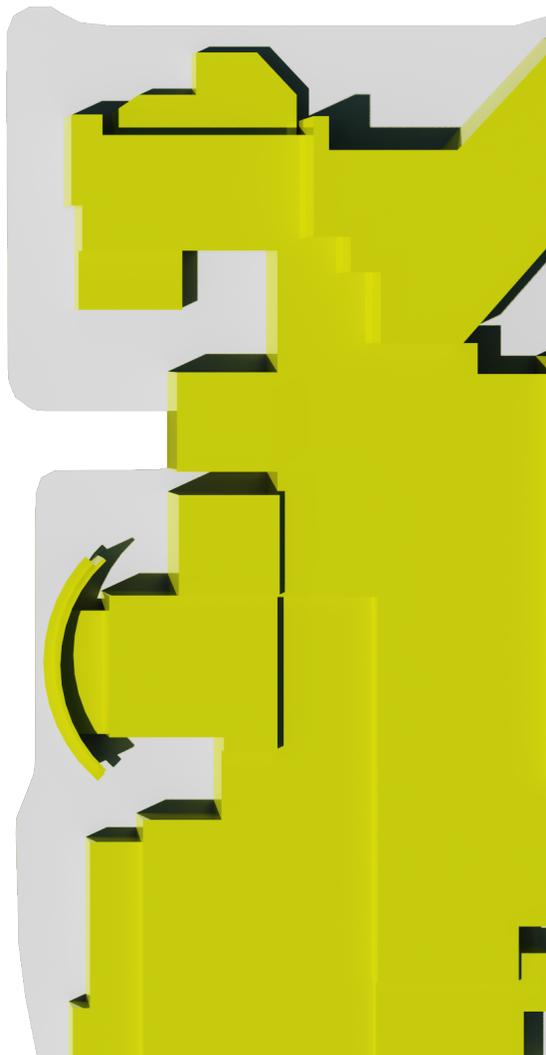
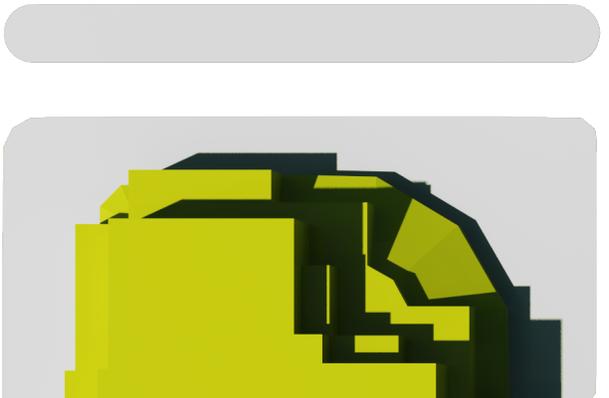


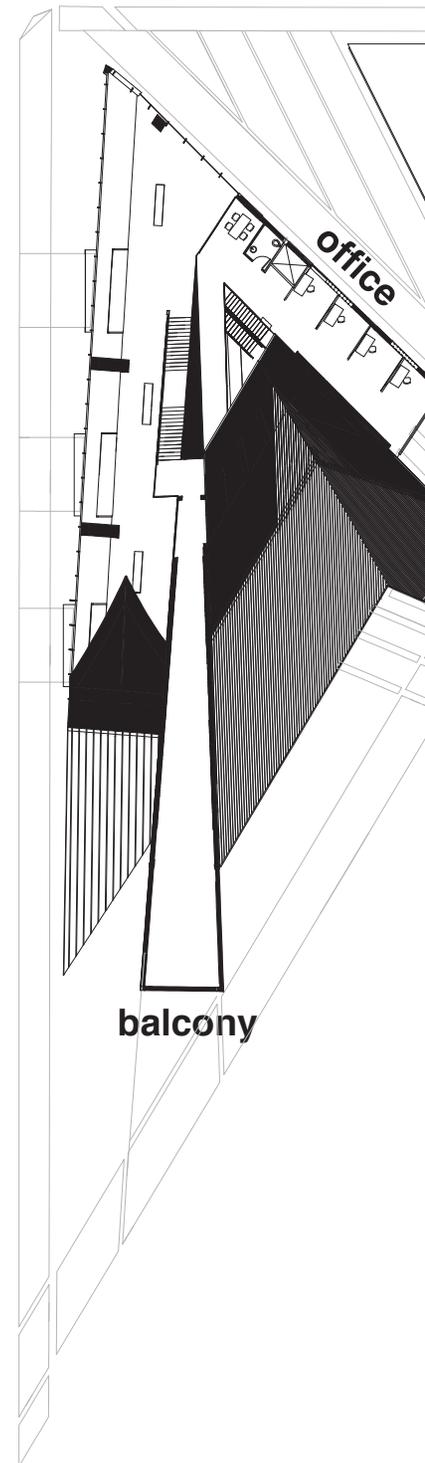
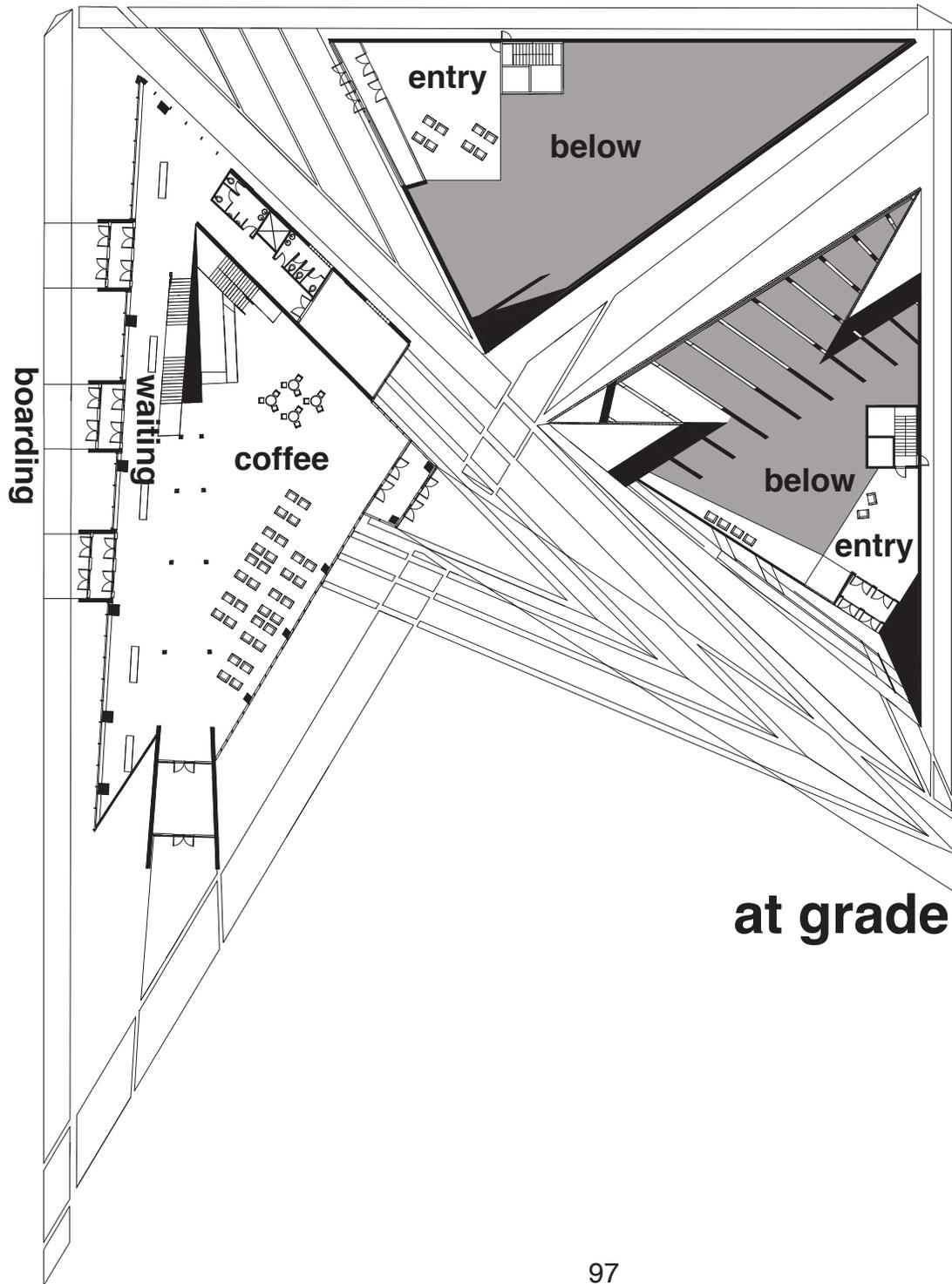


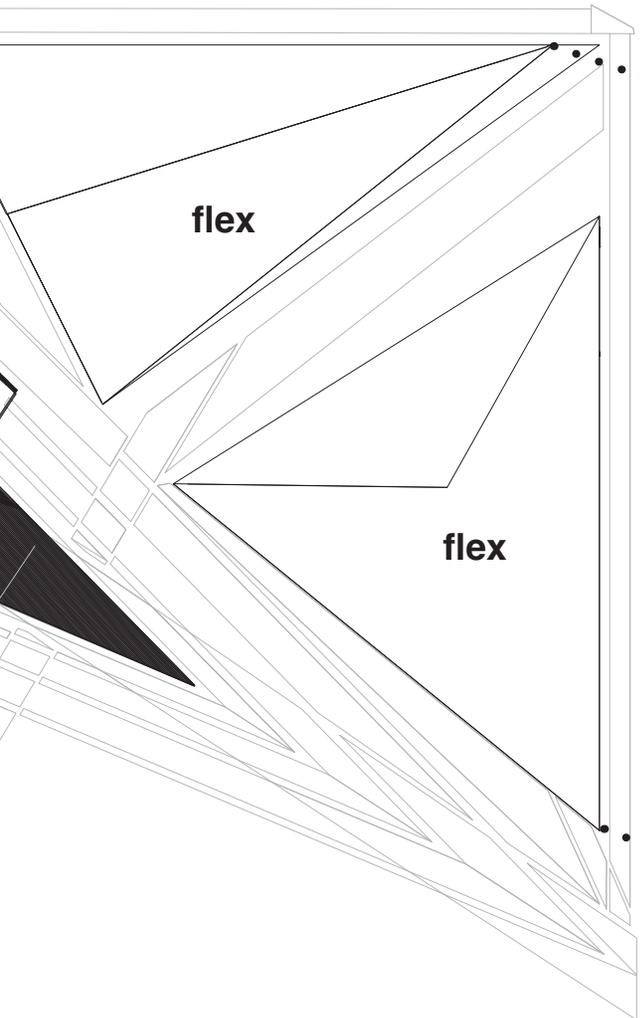
albrecht



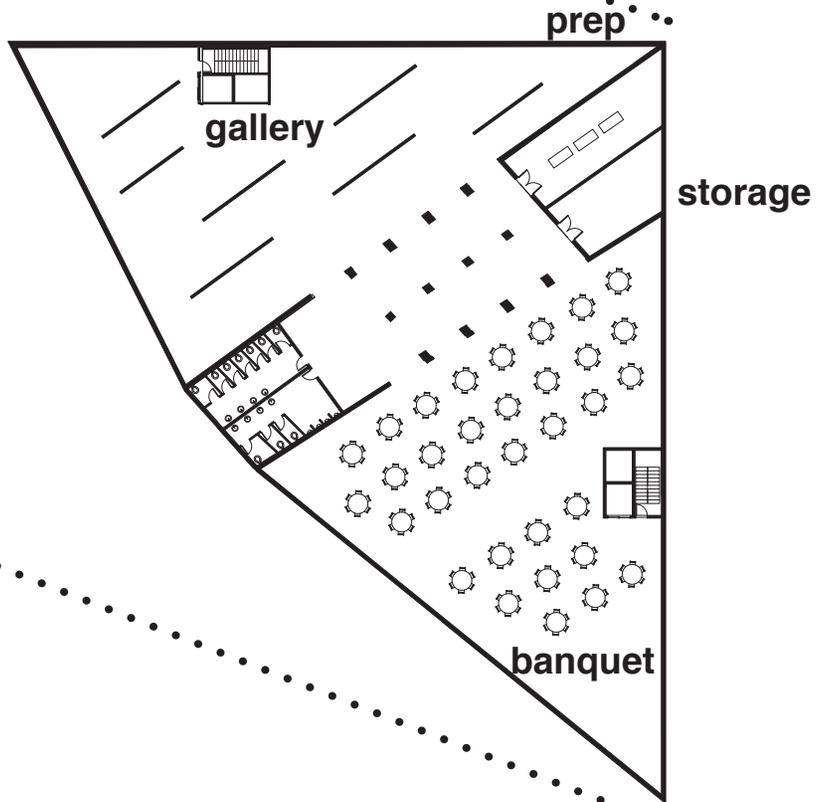
centennial





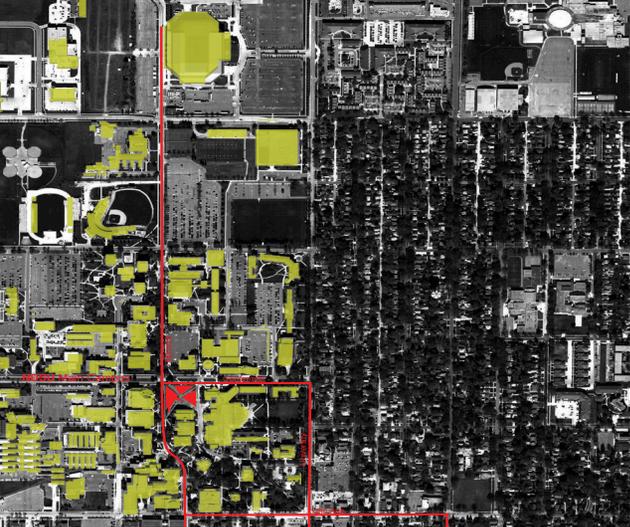


above grade



below grade



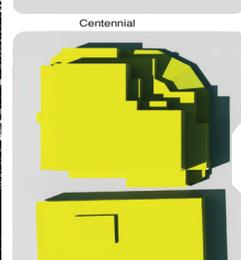


The future of NDSU is important to the local, regional, and national communities. The separation of the two campuses creates a break in the NDSU community. The development of a physical and visual connection through a light rail train would reunite the growing campus.

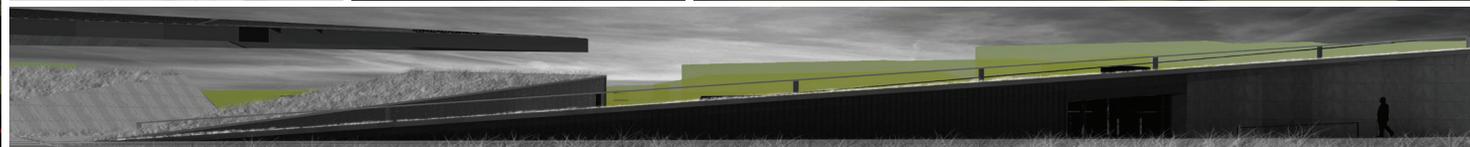
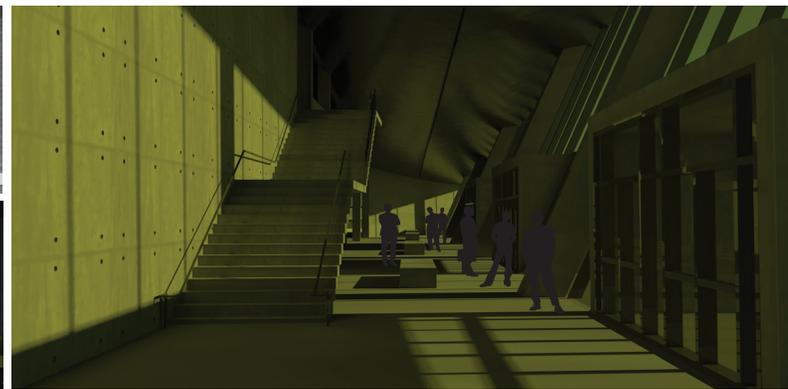
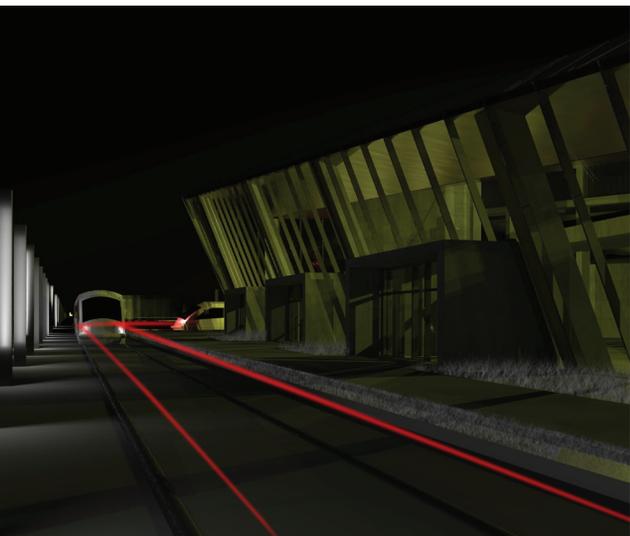
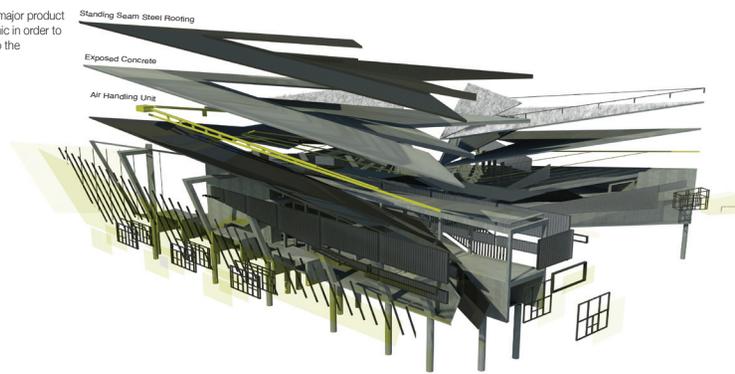
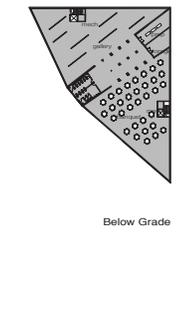
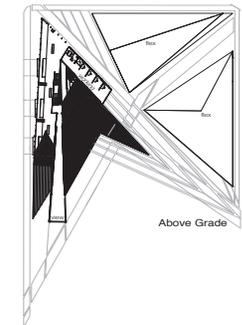
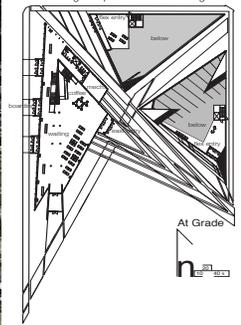
CAMPUS CONNECTIONS

NDSU TRANSIT STATION
fargo, nd

How can one piece of architecture be the connecting factor to a city or campus?



The architecture was developed around the movement of the people on NDSU. Creating an "x" through the site. The design was derived from a major product of the Midwest. The wheat plant, which represents NDSU's largest college and pays tribute to the land grant institution. The architecture is dynamic in order to create curiosity by the public drawing them in and asking for more. It is important for the architecture to speak a different language, but respond to the surrounding campus aesthetic looking forward into the future as the students of NDSU do.





The future of NDSU is important to the local, regional, and national communities. The separation of the two campuses creates a break in the NDSU community. The development of a physical and visual connection through a light rail train would reunite the growing campus.

How can one piece of architecture be the connecting factor to a city or campus?

CAMPUS CONNECTIONS

NDSU TRANSIT STATION
Fargo, ND

Contextual

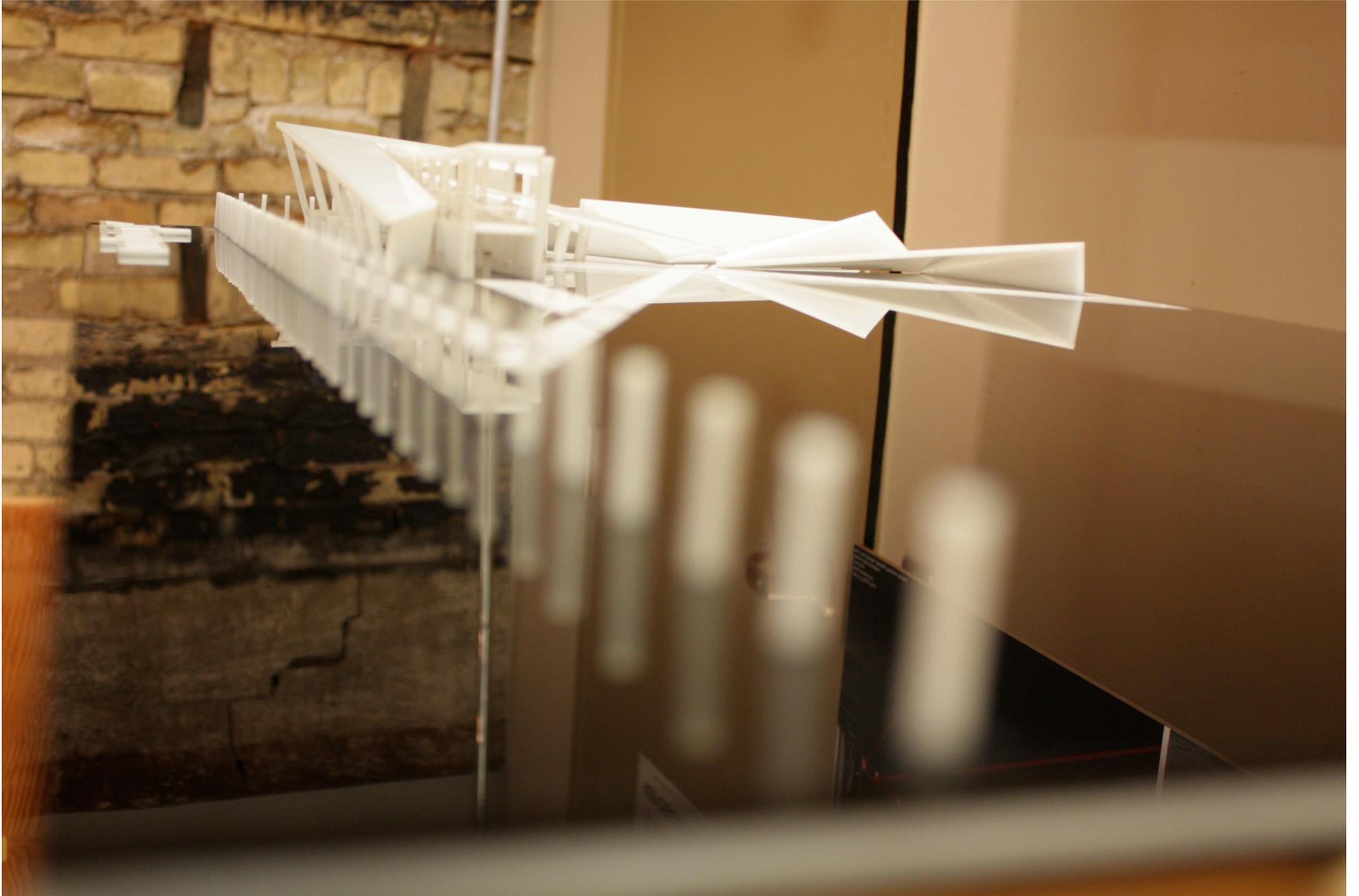
Process

The architecture was developed around the movement of the people on NDSU. Creating an "X" through the site. The design was derived from a major product of the Midwest. The wheat stalk, which represents NDSU's largest college and pays tribute to the local grain tradition. The architecture is dynamic in order to create curiosity by the public, drawing them in and asking for more. It is important for the architecture to speak a different language, but respond to the surrounding campus aesthetic, looking forward into the future as the students of NDSU do.

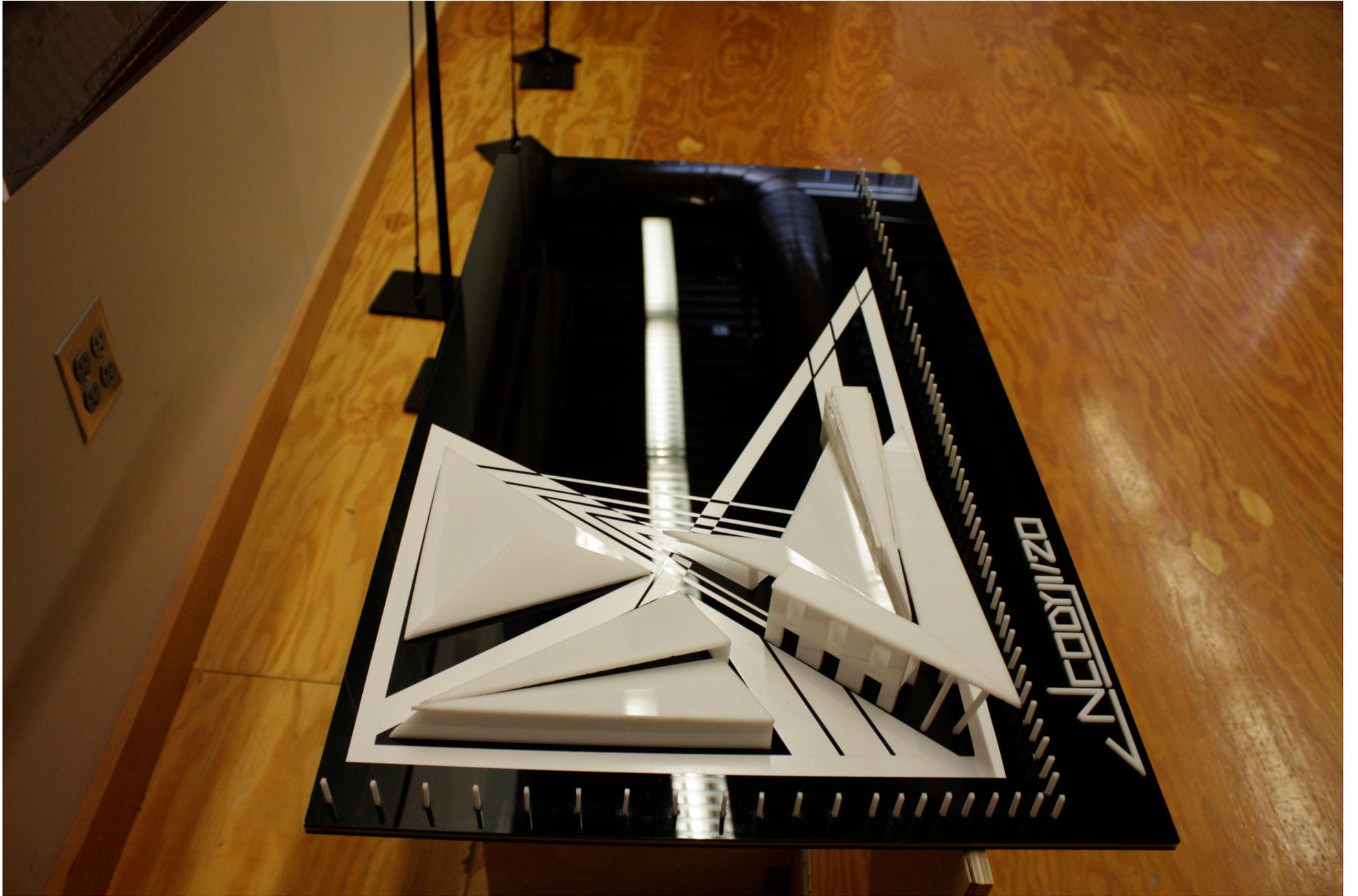
At Grade Above Grade Below Grade

Reuniting Green River Crossing









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Figure 1,2,3.
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“All architecture is shelter, all great architecture is the design of space that contains, cuddles, exalts, or stimulates the persons in that space.”
-Philip Johnson



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