

this is a  
collection of  
drawings,  
objects, and  
narratives  
by daniel noh.

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# Daniel Noh

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## Digital Skills

Adobe Photoshop  
Adobe Illustrator  
Adobe InDesign  
Adobe Premiere  
Adobe XD  
Figma  
Rhino 3D  
Grasshopper  
V-Ray for Rhino  
AutoCAD  
HTML5/CSS3  
JavaScript (p5)

## Other Skills

Woodworking  
Bent Lamination  
Steam Bending  
Laser Cutting  
Vacuum Forming  
3D Printing  
3-Axis CNC Mill  
4-Axis CNC Mill

## Languages

English  
Korean  
Japanese (Beginner)

## Achievements

GEE! Learning Games Award Finalist  
Epic Metal's Competition Finalist  
Louis F. Valentour A'49 Travel Scholarship

## Interests

Illustration  
Musical Theatre  
UX/UI Design  
Gaming

## Education

Harvard Graduate School of Education | Cambridge, MA  
Master of Education Candidate | 2021-2022

Carnegie Mellon University | Pittsburgh, PA  
Bachelor of Architecture, Honors | 2016-2021  
Minor in Design for Learning and Human-Computer Interaction

## Experience

Harvard Graduate School of Education | Cambridge, MA  
**Education Innovation Studio Assistant**

Beginning Sep 2021

- Will be assisting in the management of the EIS and monitoring students using digital fabrication systems including laser cutters and 3D printers.

Carnegie Mellon University HCII | Pittsburgh, PA  
**ClassInSight Extern Research Associate**

May 2021-Sep 2021

- Conducting user study and UX/UI interface design on scaffolding teacher noticing and reflection under PI Professor Amy Ogan, advised by Dr. Angela Stewart.

**ClassInSight Research Assistant**

Oct 2020-May 2021

- Prepared interface design work and user study protocols for the ClassInSight project under PI Professor Amy Ogan, advised by Dr. Angela Stewart.

Carnegie Museum of Natural History | Pittsburgh, PA  
**Center for Anthropocene Studies Intern**

May 2020-Aug 2020

- Researched about water in the Anthropocene and then produced, illustrated, and voiced two educational videos about my findings. The videos were submitted to ALCOSAN (Allegheny County Sanitary Authority) to present at the 2020 Virtual Open House.
- Drafted corresponding educational blog posts to be published in CMNH's monthly newsletters.

Carnegie Mellon University SoA | Pittsburgh, PA  
**dFab Monitor**

Aug 2018-Jan 2021

- Monitored and assisted other students with design fabrication systems such as laser cutting, CNC milling, and 3D printing.

**MFI Undergraduate Research Assistant**

Feb 2019-May 2020

- Designed and initiated the fabrication of swings for a park in Hazelwood using steam bent wood under PI Professor Joshua Bard through the Manufacturing Futures Initiative grant.

# Orientation Resource Guide Redesign

Pittsburgh, PA

In Collaboration with  
Angela Rubin & Jarrek Holmes  
Professor: Sara Moussawi

## Introduction

The Orientation Resource Guide a reference guide for members of the Carnegie Mellon community which can be used to access introductory information easily, and can be used by orientation staff to learn about the services that Carnegie Mellon offers. The website incorporated all the information within the resource guide, and provides an easily accessible location to learn about the various services Carnegie Mellon provides.

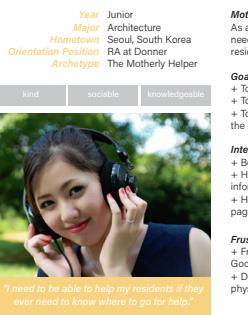
## Research

The Orientation Resource Guide was first created to reduce the amount of time spent during orientation training on teaching simple knowledge to the staff (Orientation Leaders/Orientation Counselors). This time spent would rather be spent on teaching the staff more people skills so they can more easily interact and help the Freshman. The resource guide was given to the staff to read over and learn before orientation training and then tested through games and icebreakers during the week. This however, was proven to be ineffective, as the games and icebreakers were done in large groups, so it was unclear if every staff truly understood the entirety of the resource guide--it was also not helpful that the current resource guide is a 29 page booklet with compact information.

In order to get further into what we were exactly looking for, we interviewed Julie Schultz, the Associate Dean of Parent and Family Engagement and First-Year Orientation. Initially, we thought that the website should be dedicated to helping the orientation staff easily access hours and locations of specific services. However, Julie mentioned that the resource guide should ideally be able to teach and test the students on the information. The website would be able to provide the knowledge, while the Head Orientation Counselors would teach the staff on the application of the knowledge. At the end of training, the staff should be able to point to which resources to go to for specific situations (which implied that the FAQ and Services were key points of the website).

## Persona Development

### SARAH PARK



Year: Junior  
Major: Architecture  
Hometown: Seoul, South Korea  
Orientation Position: RA at Donner  
Archetype: The Motherly Helper

kind | sociable | knowledgeable



**Motivations**  
As an RA for incoming Freshmen, the students always have many questions. Michelle needs a way to, not only inform her residents, but also provide a place where her residents can find information in the future.

**Goals and Tasks**  
+ To offer information to curious students  
+ To provide a resource to find information in the future  
+ To make sure her residents have a great time in college and take full advantage of all the resources offered at CMU

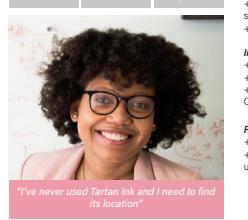
**Interest in the Website**  
+ Be able to show the available resources at CMU to Freshmen  
+ Have a useful and user-friendly website that is efficient at finding necessary information  
+ Have a better way of providing information on resources than a cumbersome 29 page PDF

**Frustrations with the PDF**  
+ Freshmen do not find the PDF useful and find it easier to look up information on Google  
+ Does not show location of resource via a map so resources are difficult to use for physical locations

### MICHELLE JAMISON

Year: Freshman  
Major: Computer Science  
Hometown: New York, New York  
Orientation Position: Freshman Participant  
Archetype: The Go-Getter

determined | efficient | inquisitive



"I've never used Tartan Ink and I need to find its location"

**Motivations**  
As a Freshman and someone who wants to know specific information quickly, Michelle is looking for a database that can provide specific information, such as a phone number or location of a specific resource at CMU.

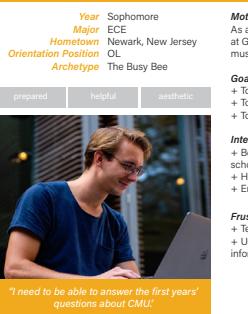
**Goals and Tasks**  
+ To find specific information fast  
+ To pull up information on the go on a mobile device in order to physically locate a service  
+ To have phone numbers and locations easily referenceable

**Interest in the Website**  
+ Find a place to easily look up information when needed on any device  
+ No downloads required!  
+ One online location to answer all (or at least most) specific questions regarding CMU's resources

**Frustrations with the PDF**  
+ It is faster to look up the information via the general CMU website or Google  
+ No visual indications  
+ One online location to answer all (or at least most) specific questions regarding CMU's resources

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### ROBERT JONES



Year: Sophomore  
Major: ECE  
Hometown: Newark, New Jersey  
Orientation Position: OL  
Archetype: The Busy Bee

prepared | helpful | aesthetic



**Motivations**  
As a busy ECE major and a first time OL, Robert spent his entire summer interning at Google in California. With only a few days until orientation training begins, Robert must learn the information in the Orientation Resource Guide quickly and efficiently.

**Goals and Tasks**  
+ To efficiently learn the information in the resource guide  
+ To retain all the information read  
+ To have a user-friendly experience while learning the necessary information

**Interest in the Website**  
+ Be able to learn information from multiple devices while at home or traveling to school  
+ Have one website to find all necessary information  
+ Enjoy learning information by having an easily navigable and aesthetic website

**Frustrations with the PDF**  
+ Text is too small for my poor vision  
+ User learning is required for each resource which makes it difficult to retain information

### ALEX SCOTT

Year: Senior  
Major: Harp Performance  
Hometown: Dover, Delaware  
Orientation Position: OC at Resnik  
Archetype: The Fast Finder

methodical | sociable | resourceful



"I need to quickly find information when students ask me questions."

**Motivations**  
As a Senior OC who went through training in the past, Alex is able to skip some training in order to practice the harp for his graduate school auditions. Although he remembers most of the general information, he forgot some specifics, such as hours, and must look up information quickly when asked questions.

**Goals and Tasks**  
+ To quickly access resource information when asked questions by first-years  
+ To access information on the go  
+ To inform students who have questions in a quick manner

**Interest in the Website**  
+ Find essentials information with minimal clicks  
+ Not required to carry around a packet of information for reference  
+ All information is found on a multi-device, accessible website so memorization is not required

**Frustrations with the PDF**  
+ Takes too long to find specific information  
+ Information is not organized neatly so it is difficult to find information in a timely-friendliest manner

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## Coded Prototype

**INDEX**

**RESOURCES**

**RESOURCES + HEALTH**

**SCHEDULE**

**SCHEDULE + SAT (OPEN)**

**SEARCH**

---

**LEARN**

**LEARN + HEALTH (Q)**

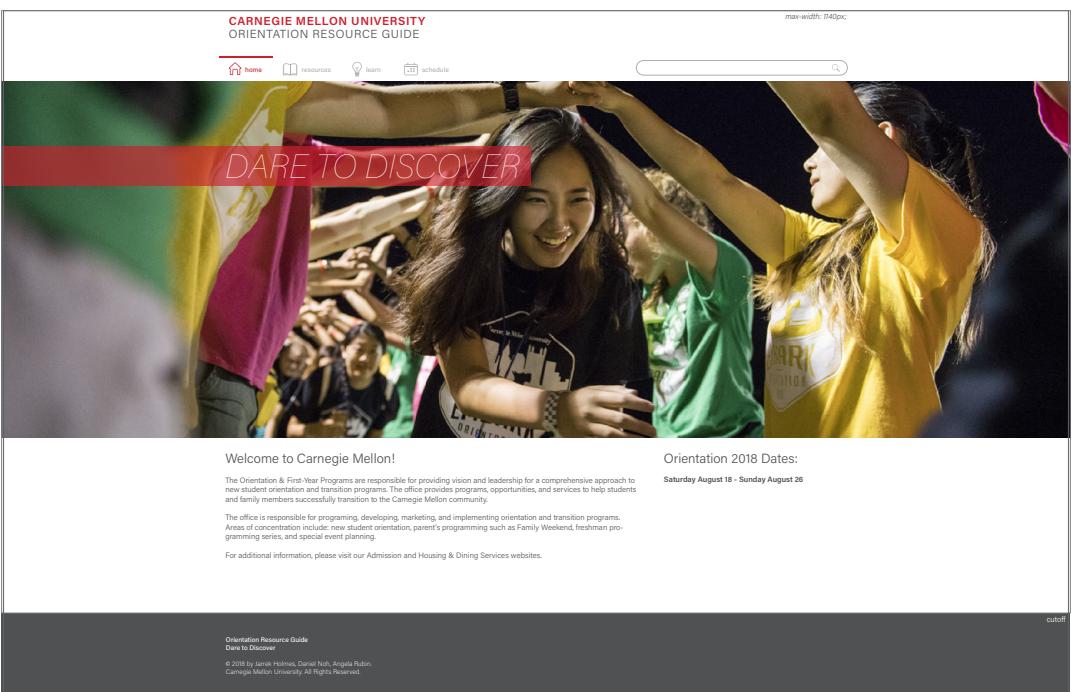
**SEARCH + TYPING**

Detailed description of the screens:

- INDEX:** Shows a welcome message for Carnegie Mellon's Orientation & First-Year Programs.
- RESOURCES:** Shows categories like Academic/Career, Computing and Printing, Health, Inclusion and Equality, Police and EMS, and Student Living.
- RESOURCES + HEALTH:** Shows a large 'Health' section with a map of Morewood Gardens.
- SCHEDULE:** Shows an 'Orientation Schedule' for August 18-26.
- SCHEDULE + SAT (OPEN):** Shows an 'Orientation Schedule' for August 18-26, with a note about residence hall move-in on Saturday.
- SEARCH:** Shows a search bar with placeholder text 'Search Here...'.
- LEARN:** Shows categories like Academic/Career, Computing and Printing, Health, Inclusion and Equality, Police and EMS, and Student Living.
- LEARN + HEALTH (Q):** Shows a 'Frequently Asked Questions' section with Q&A pairs.
- SEARCH + TYPING:** Shows a search results page for 'poli' with entries for CMU Police Department and CMU Emergency Medical Services.

## Desktop Compatible Wireframes

The project has some clear future goals and necessary adjustments. First, although we were focused on the mobile version of our website, its responsiveness leaves something to be desired. Sizing, spacing, and alignment can sometimes look incorrect on the tablet and desktop version of the website. As well, there are some general layout and design changes we'd like to make, as detailed by our desktop wireframes. So I came up with several large scale wireframes for a desktop compatible display.



This wireframe shows the "Resources / Health" page. It features a header with a search bar and navigation links for Home, Resources, Learn, and Schedule. The main content area is divided into three columns, each containing a "Carnegie Mellon University University Health Services" section with four tabs: Services, Hours, Location, and FAQ. At the bottom of the page, there's a footer with copyright and disclaimer information.

This wireframe shows the "Orientation Resource Guide SCHEDULE" page. It features a header with a search bar and navigation links for Home, Resources, Learn, and Schedule. The main content area is a grid of boxes representing the daily schedule for orientation week. Each box contains the day and date, a brief description of the event, and specific times. The schedule includes activities like residential hall move-in, campus tours, performances, and dinner. The footer at the bottom includes copyright and disclaimer information.

**ORIENTATION RESOURCE GUIDE**  
LEARN / HEALTH

max-width: 1140px;

Home Resources Learn Schedule

Frequently Asked Questions

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Orientation Resource Guide  
Date to Discover  
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Carnegie Mellon University. All Rights Reserved.

**ORIENTATION RESOURCE GUIDE**  
RESOURCES

max-width: 1140px;

Home Resources Learn Schedule

Categories

Academic/Career icon

Computing and Printing icon

Health icon

Inclusion and Equality icon

Police and EMS icon

Student Living icon

Orientation Resource Guide  
Date to Discover  
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# Cabinet

Pittsburgh, PA

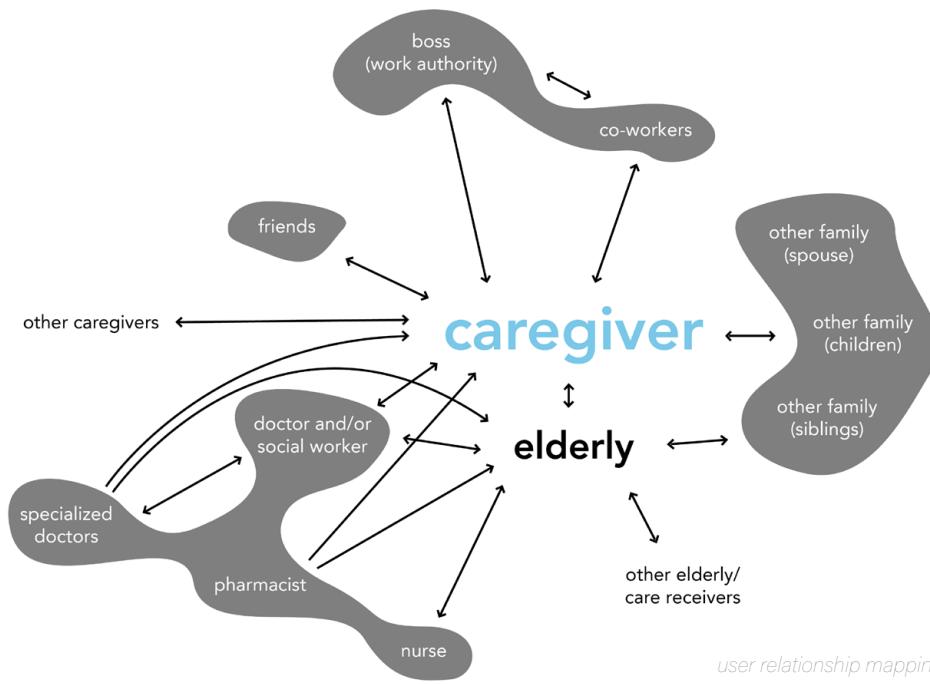
Professor: Victoria Crowley

## Introduction

Cabinet is a mobile interface that allows the user to easily track their or their loved one's medication stock and daily intake. It is directed to anyone who has to take several doses of medication throughout the day. The caregivers who use this application can connect their accounts to their loved ones, whether it be family or friend, to help the caregivers keep themselves updated.

## Research

The project first started from a given subject, in this case, a 60 year old taking care of an elderly relative. To be able to create accurate personas of our given age group, we conducted multiple live interviews. From the interviews, we were able to create journey maps for two personas in completely different situations. With the journey maps, I was able grasp several major pain points seen in this subject which include: organization, medication, emotional connection, and self-care.



## caretaker 1 : Sarah



Name: Sarah  
Age: 64  
Job Type: Full-time

Sarah is a currently single, middle-aged woman living on her own and working a full time job. She is the primary caregiver to her father who is in his 80s. He lives over an hour away from her and she goes to visit him every weekend.

**about Sarah**  
Sarah is a 64 year old woman who is currently working a full-time job. She also takes care of her father who lost his wife very recently. Due to her father's situation, Sarah recently quit her old job and is now working in an environment that is much warmer about her current situation. Her father lives far away from Sarah (approximately 2 hours away) and which makes taking care of her father a bit difficult at times. Her father refuses to move closer to Sarah because he desires to be independent. Due to all these circumstances, Sarah visits and stays over at her father's every weekend to clean up, pay his bills, do other chores, and keep her father company.

Sarah's father is currently healthy. He is able to drive and walk alone, but he requires assistance when hard labor comes into play. Although he resists moving closer to Sarah, he is very happy about the company he gets from Sarah. Her father tells her many stories when they are together. Even though Sarah lives so far, she wants to cherish all the time she has left with her father.

All in all, Sarah thinks her father's current situation is a temporary solution and her father will, sooner or later, move either closer to her or to an elderly's home. It could be rough at times, but she is glad that she is getting closer with her father.

### Sarah's Weekly Journey Map



## caretaker 2: Jen



Name: Jen  
Age: 62  
Job Type: Freelance

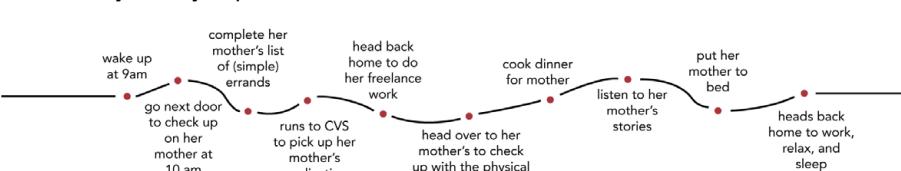
Jen is a middle-aged woman who takes care of her mother who lives next-door. She and her other siblings take turn taking care of her mother. She is a freelance designer with 4 children.

**about Jen**  
Jen is a 62 year old woman who is currently working as a freelance producer. She, like Sarah, takes care of her elderly, but still healthy, mother. Jen, however, lives just next door to her mother and has 5 other siblings who help her care for their mother on a weekly basis. Jen believes that her mother is happier now that she has constant company and help. She visits her mother every morning to check up, then for lunch, and sometimes for dinner, depending on the day of the week. On the nights she does not visit, her siblings take her place.

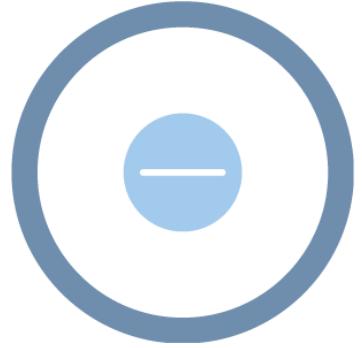
Jen's mother is very healthy, but she is not able to walk outside alone. Jen is very glad that her mother lives right next door, else she believes that life would have been a lot harder. She knows it was definitely worth it to give up her old full time job to be able to stay at home and work, to provide for her mother. From having to take care of her children, to now, taking care of her mother, she wonders the number of things she could have been doing otherwise, such as other hobbies.

Jen is glad she is able to help out her mother. And although it is tedious, having to have this "daily-job" like responsibility, it is definitely worth it and she believes she doesn't regret everything she has done for her mother so far.

### Jen's Daily Journey Map



two different personas of caretakers based on multiple interviews



### Logo and Colors

Initially, I was testing around with sketches of cabinets and pill bottles. However, after various iterations I decided to put off the logo and started designing the interface of the application. When working on the screens, I realized that the reoccurring icon/geometry in my design was the circle. The circle represents both the top view of a pill bottle as well as a sense of completeness which is essential in tracking medication. Inside the pill bottle I put in a circular pill rather than a capsule due to the lean towards a symmetrical and center-aligned design.

The colors seen in the application is fairly muted. I chose these colors because I wanted the interface to be very easy on the eyes and soothing to look at. Specifically, I chose two soft blue tones as the main colors because blue is a calming color. The soft salmon red/pink acts as a cautionary color, as it appears when certain things need attention (missed medication or need to restock). The yellow was a nice middle spot between calm and alarming which would act as a filler or transitioning color. The brown was simply used to replicate the look of a cabinet.

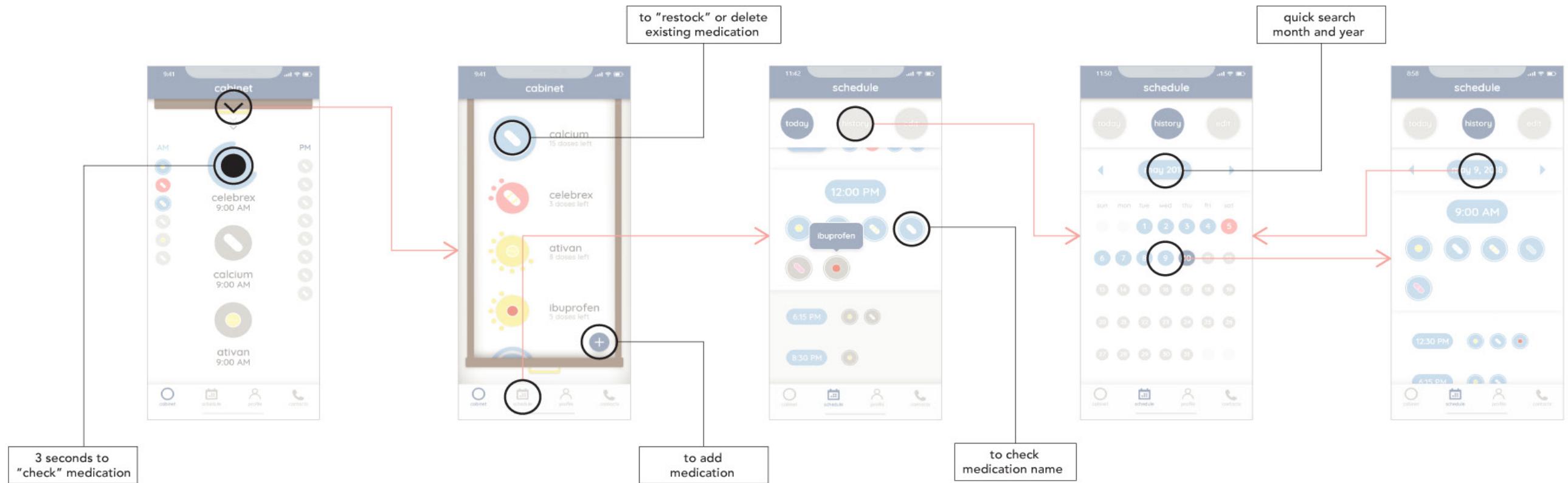
### Prototyping

With the topic of medication, I was able to both tackle the pain points of my given subject as well as cater the app to a broader audience. The initial sketches demonstrate the general scheme for the application I had in mind. This application would allow the user to keep track of their current "medicine

cabinet" and also be notified on when to take their medication on a digital interface. The sketches themselves attempt to visualize the application utilizing visual hierarchy and graphic qualities that would be incorporated into the design (i.e. cabinet).



- tap
- tap and hold
- ▽ swipe down
- screen changes



# Carrick ECS

Pittsburgh, PA

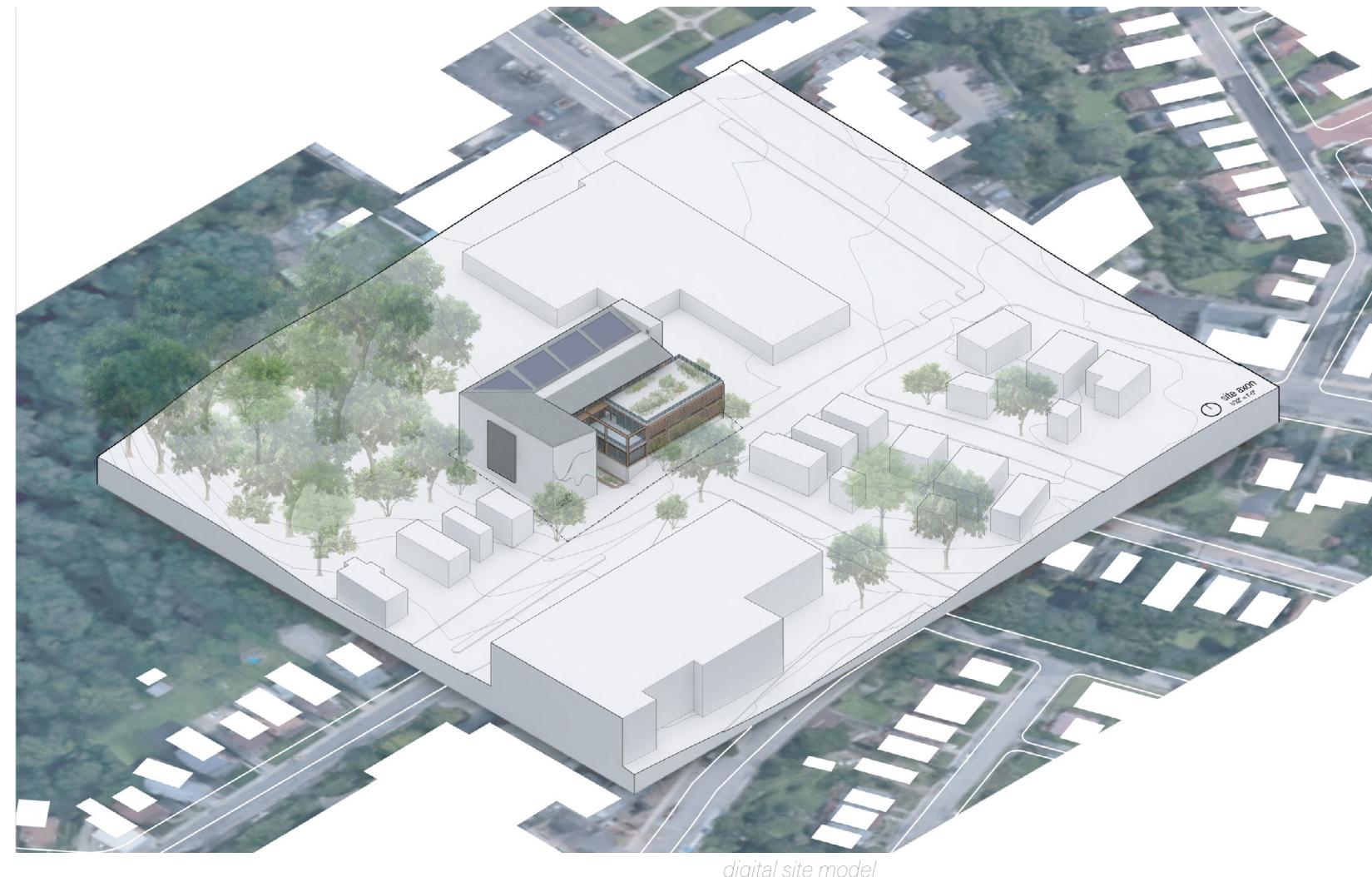
The focus for the design of this Environmental Charter School was to introduce new learning spaces that are uncommon in schools and **rethinking the idea of classrooms**. Rather than keeping education confined within four rectilinear walls, this design focused on the spaces outside the classrooms. The building itself also considered various environmental objectives such as solar shading, natural stack ventilation, and water retention to increase the efficacy of the architecture and help economically.

As you enter the middle school, you pass a patch of greenery that exemplifies the school's vision of environmental awareness and are greeted by receptionist. From this location, **the circulation bifurcates into two different paths; the left side with a lobby that leads to a staircase for students and faculty and the other side a hallway that leads to different functional spaces in the facility for staff**. The hallway also directs the public into the cafeteria for public gatherings and events outside of school hours. This bifurcation allows for **safety and security** which is achieved through the separation of potential public access from the private student learning environment.

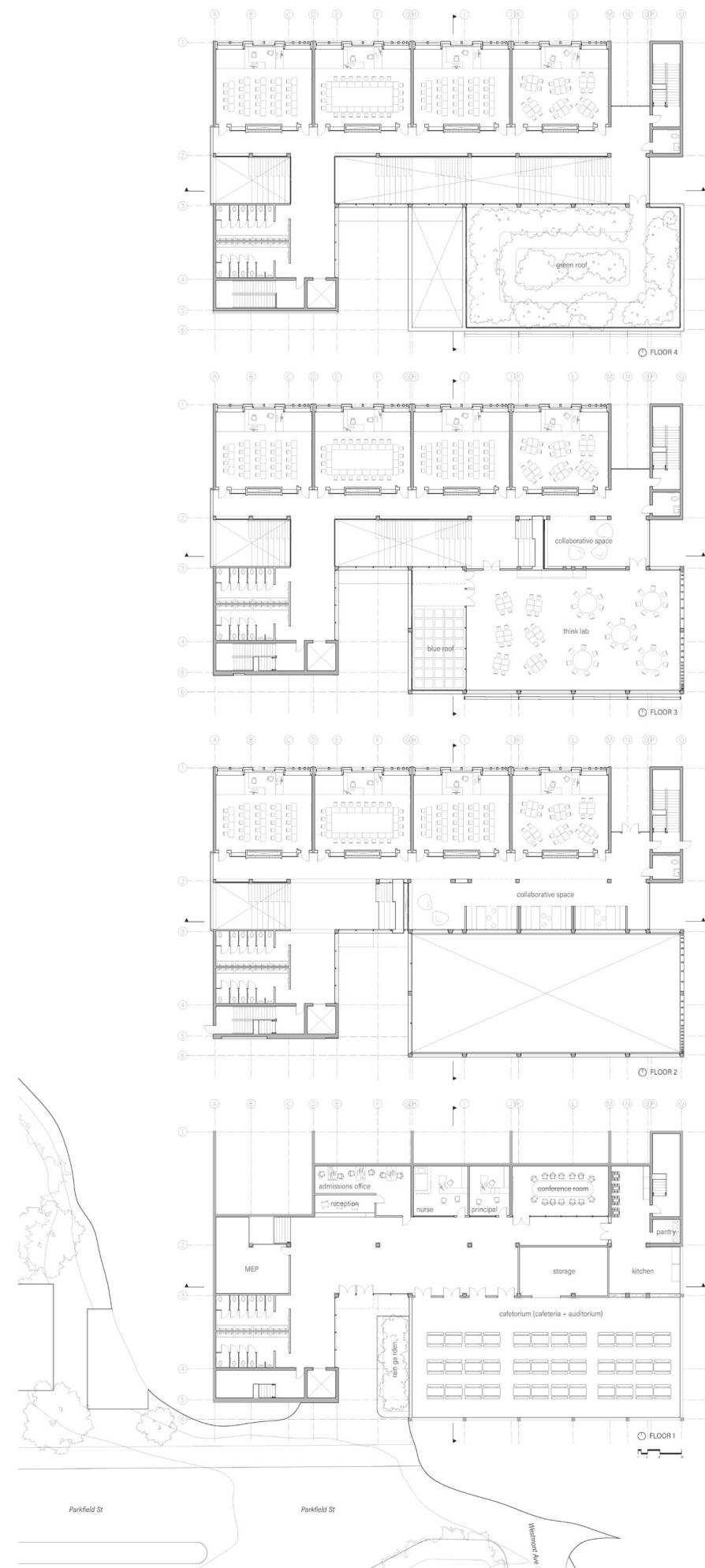
3rd Year Spring  
Professor: Steve Lee  
Adjunct Professor: Lori Fitzgerald

For the students, each programmatic element branches off of a **central, extensive social staircase that bisects the site**. The social staircase provides an open space where students can socialize and learn in a collaborative environment. **Under the staircase exists a branch-like framing system that houses collaboration spaces for smaller group activities or individual work**. On the exterior facade, following down the central staircase, is an exposed **water retention system** which directs rainwater from a green roof to a blue roof to a rain garden. This exposed system allows for visual learners to appreciate and learn about various environmental networks.

**Each floor landing of the staircase leads to major programmatic spaces:** the second floor landing allows access to the support tower, the third floor landing directs people into the thinklab, and the fourth floor landing opens out onto the green roof. This system allows each grade level to interact with each other through an **interweaving circulation**, which is important for social education. To engender inclusivity, the landings were extended to enable handicapped students to utilize the staircase as a social space along with fellow students.



digital site model



## STACK VENTILATION

PASSIVE VENTILATION SYSTEM THAT USES AIR PRESSURE TO PULL AIR OUT FROM CLASSROOMS THROUGH CHASES

## BIOPHILIC EDUCATION

CLASSROOM POSITIONING PROVIDES DIRECT VISUAL ACCESS TO THE FOREST BEHIND THE SCHOOL TO CONNECT THE STUDENTS WITH THE ENVIRONMENT

## NATURAL VENTILATION

REDUCES THE NEED FOR HVAC USE DURING THE HOT SUMMER SEASON

## RAINWATER COLLECTION

HELPS CONTROL THE COMBINED SEWER OVERFLOW THROUGH THE RETENTION AND COLLECTION OF WATER ALL THROUGHOUT THE BUILDING

## DAYLIGHTING AND HORIZONTAL SHADING

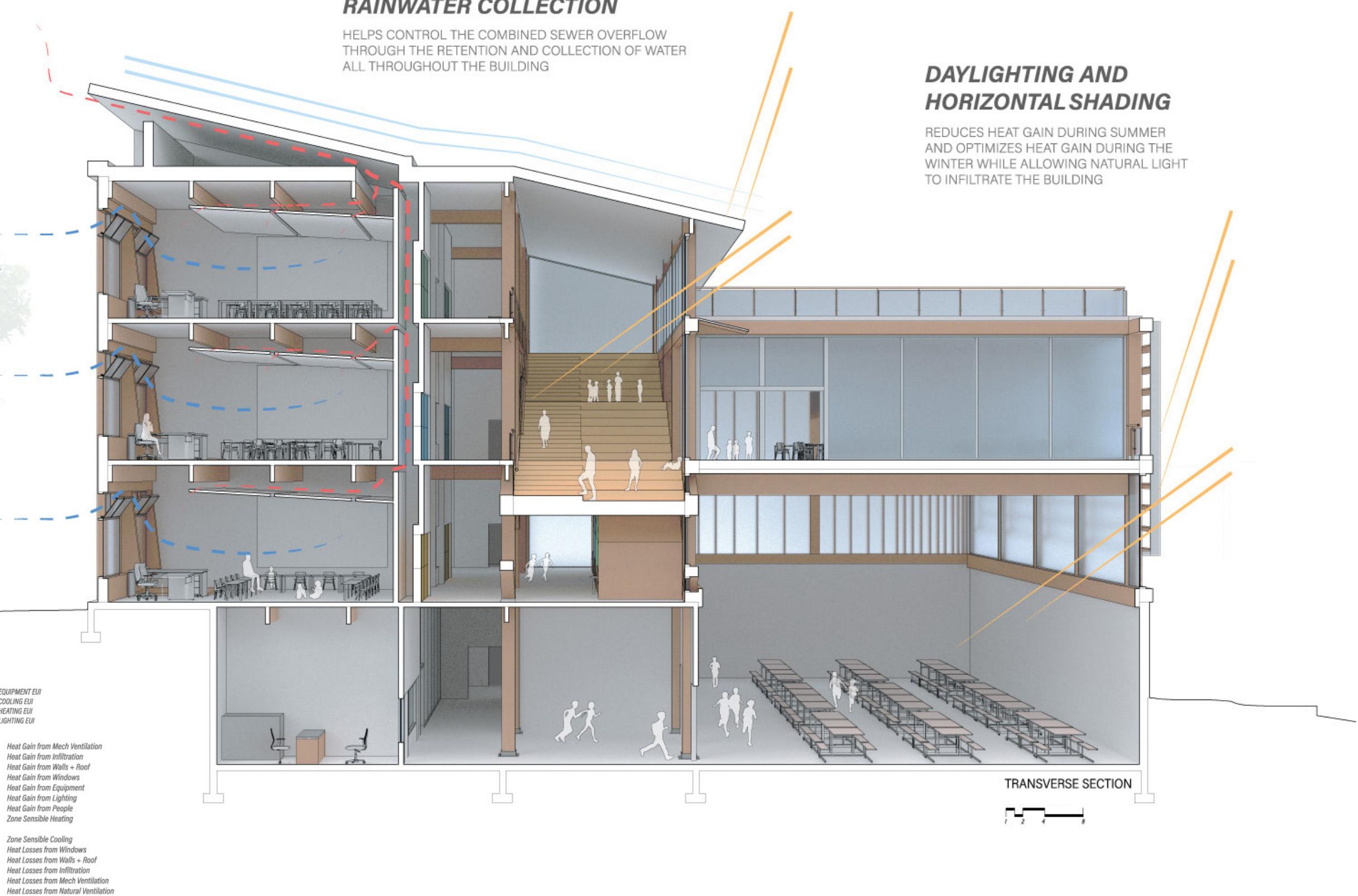
REDUCES HEAT GAIN DURING SUMMER AND OPTIMIZES HEAT GAIN DURING THE WINTER WHILE ALLOWING NATURAL LIGHT TO INFILTRATE THE BUILDING

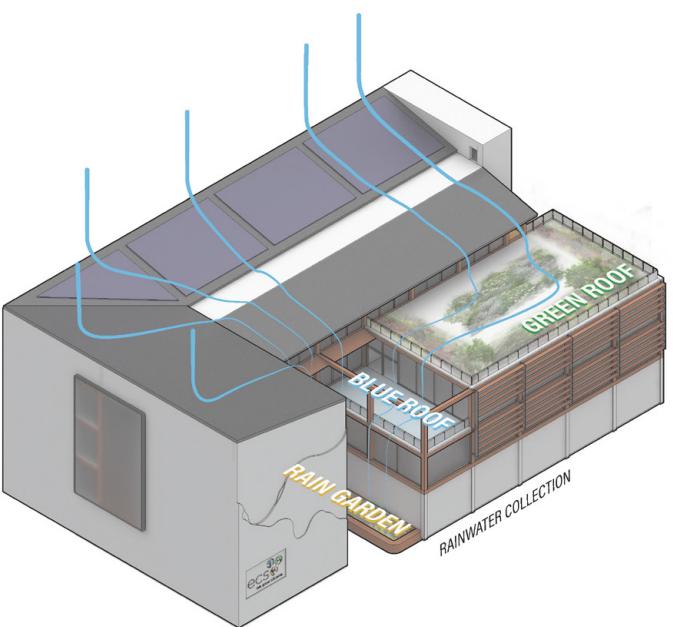
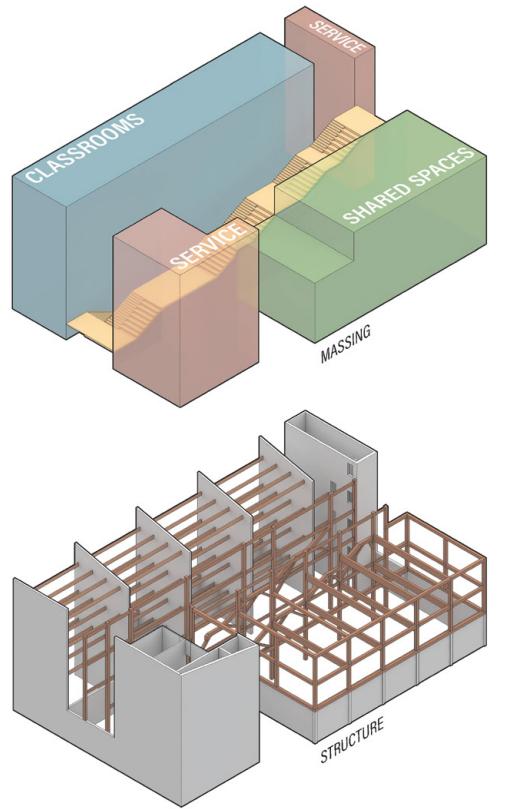
AVERAGE K-12  
SCHOOL EUI:  
**75**

50% REDUCTION  
TOTAL SITE EUI:  
**38**

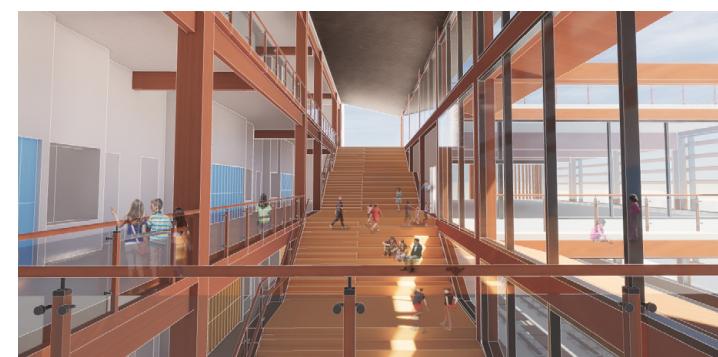
11 kBtu/ft<sup>2</sup> EQUIPMENT EUI  
4 kBtu/ft<sup>2</sup> COOLING EUI  
12 kBtu/ft<sup>2</sup> HEATING EUI  
11 kBtu/ft<sup>2</sup> LIGHTING EUI

0 kBtu/ft<sup>2</sup> Heat Gain from Mech Ventilation  
0 kBtu/ft<sup>2</sup> Heat Gain from Infiltration  
2.6 kBtu/ft<sup>2</sup> Heat Gain from Walls + Roof  
4.1 kBtu/ft<sup>2</sup> Heat Gain from Windows  
3.6 kBtu/ft<sup>2</sup> Heat Gain from Equipment  
3.6 kBtu/ft<sup>2</sup> Heat Gain from Lighting  
3.4 kBtu/ft<sup>2</sup> Heat Gain from People  
20.1 kBtu/ft<sup>2</sup> Zone Sensible Heating  
  
-3.8 kBtu/ft<sup>2</sup> Zone Sensible Cooling  
-4.7 kBtu/ft<sup>2</sup> Heat Losses from Windows  
-10.2 kBtu/ft<sup>2</sup> Heat Losses from Walls + Roof  
-5.8 kBtu/ft<sup>2</sup> Heat Losses from Infiltration  
-8.8 kBtu/ft<sup>2</sup> Heat Losses from Mech Ventilation  
-0.3 kBtu/ft<sup>2</sup> Heat Losses from Natural Ventilation





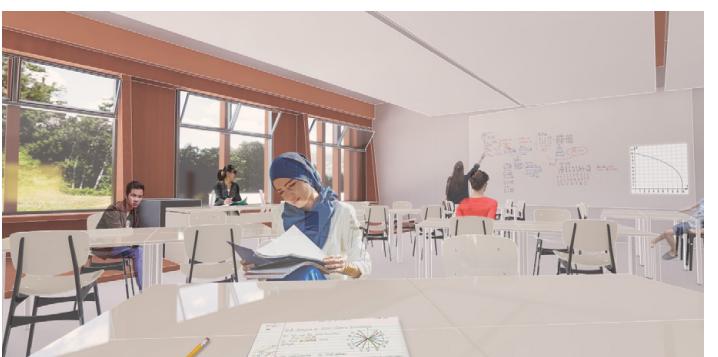
*entry sequence*



*central staircase and classrooms*



*study nooks under central stairs*



*classroom interior*

# Future Fictions

Pittsburgh, PA

Future Fictions is a studio heavily focusing on narratives and aesthetics. How can a fictional scenario be portrayed as non-fiction? Much like how all architecture starts as a fictional thought and becomes embodied into a real and physical form, Future Fictions is about taking a fictional concept and embodying it into a physical instance through imagery and narrative.

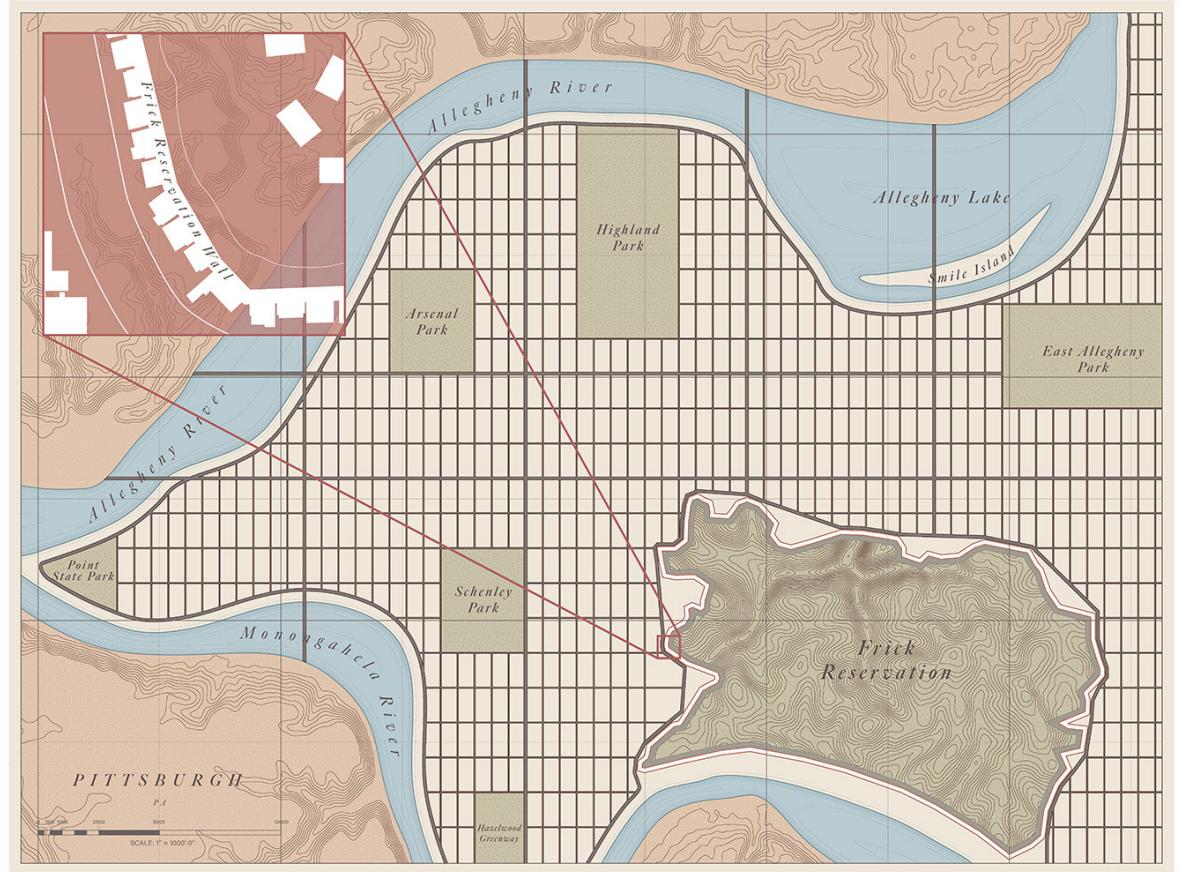
This project is very much a story as much as it is a spatial exercise. It is about setting up a scenario and letting it play out. Analyzing how various underlying systems shift and adapt to a progression of events happening above ground. Seeing what a community, or two communities, sees through a limited frame and understanding the results of the loss of the full narrative:

This is a historical documentation of the rise and fall of the Frick Wall, focusing on the themes of control, propaganda, and frailty. The exploration investigates how a society reacts to the growth of a foreign phenomenon.

4th Year Fall  
Professor: Heather Bizon

The overflowing growth of the flora around Frick Park startled the city of Pittsburgh, starting the construction of the Frick Wall. To reduce the austere view of the wall, faux house facades were built onto it, feigning the existence of a new neighborhood. In response, the 'infected inhabitants' of the Frick Reservation rediscovered and repurposed the coal mines of olden Pittsburgh as a new Underground Railroad to escape the confines of the barrier. On one side of the wall exists an extremely systematized Pittsburgh and the other, a chaotic outburst of greenery. The elevation-section drawing displays the timeline of how the wall was risen over time, where the axonometric drawings illustrate the eventual fall of the wall.

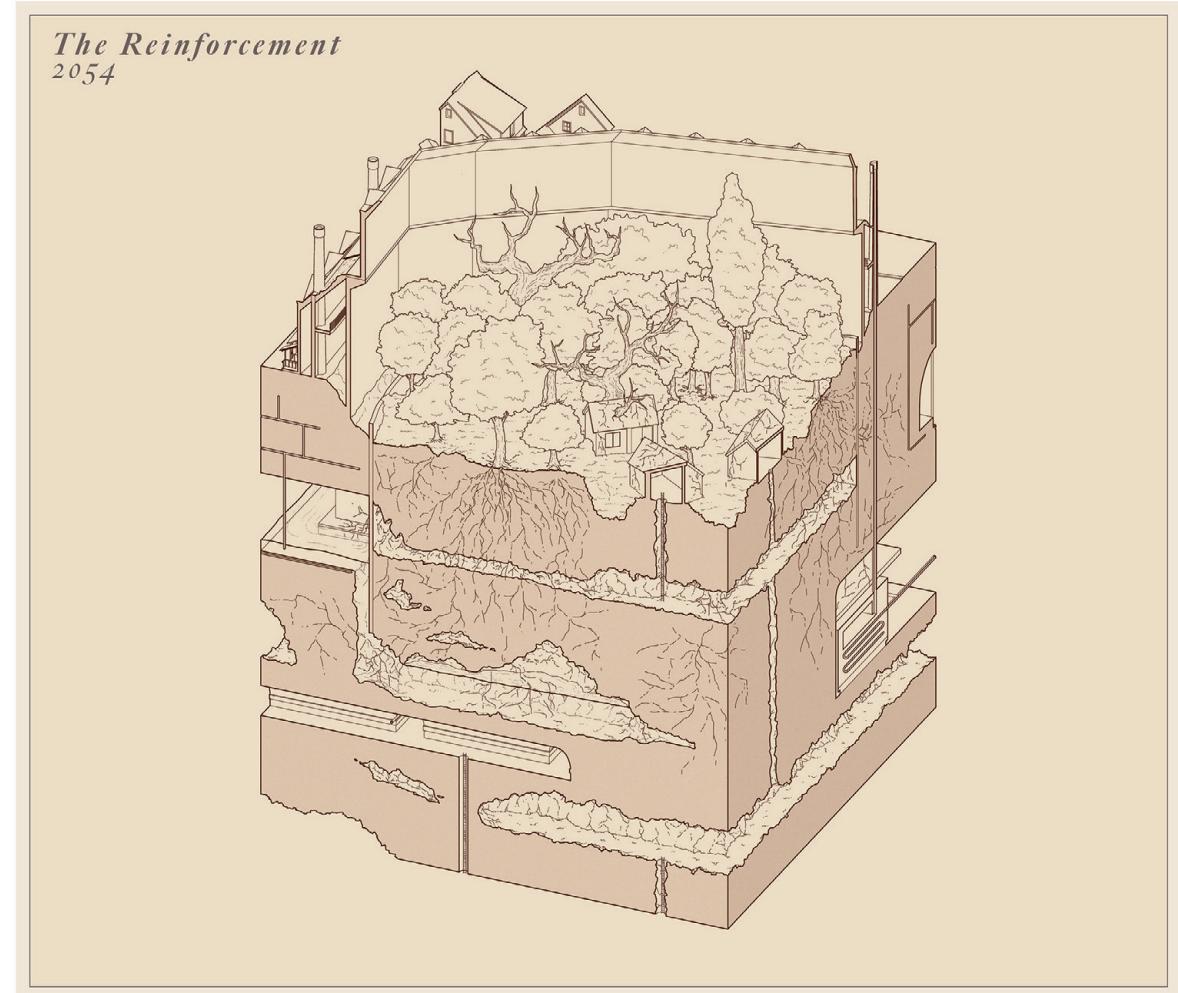
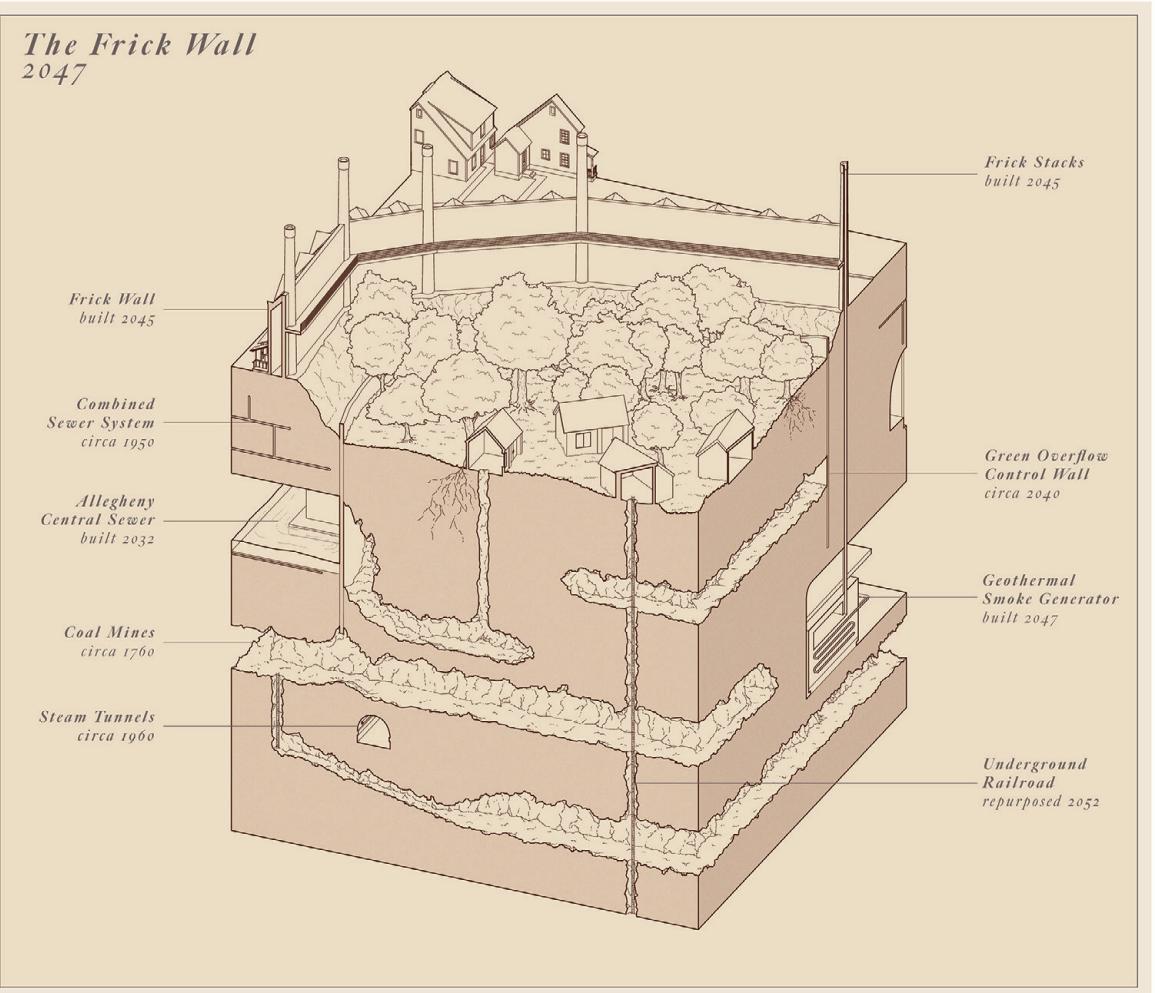
The narrative focuses on the communication of two opposing sides, through the changes both in the visible realm and the unseen infrastructure. The axonometric drawings, as well as the renders, highlights a certain society's opposition to a foreign phenomenon and the fragility of a physical wall.



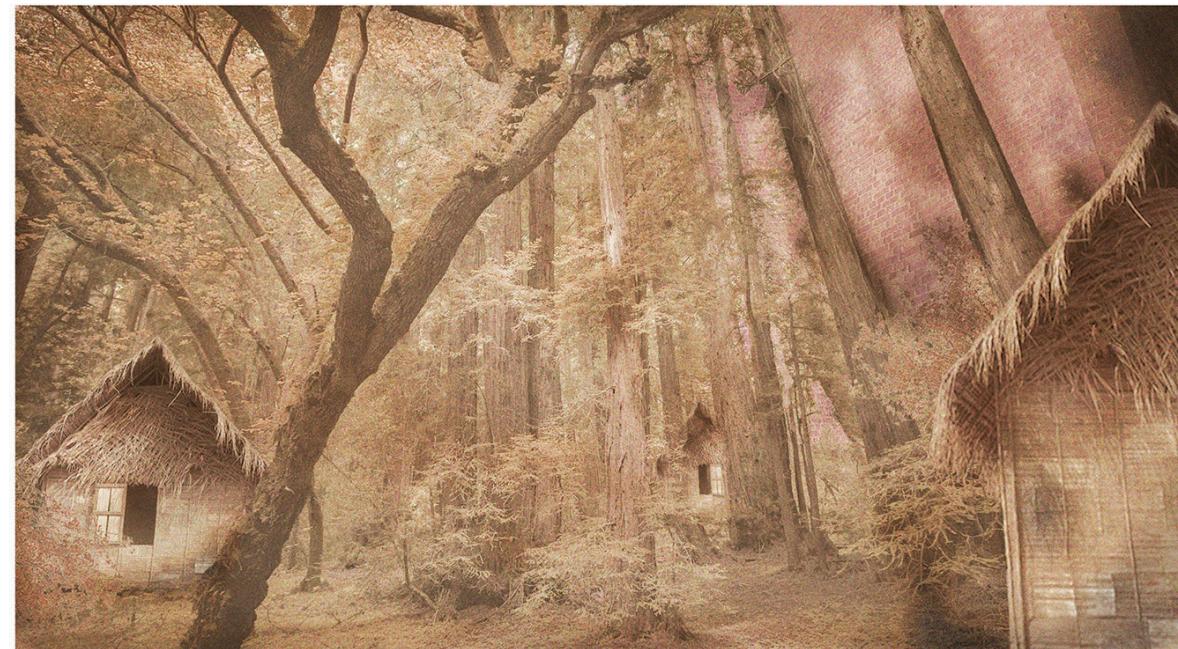
site plan of pittsburgh in 2047



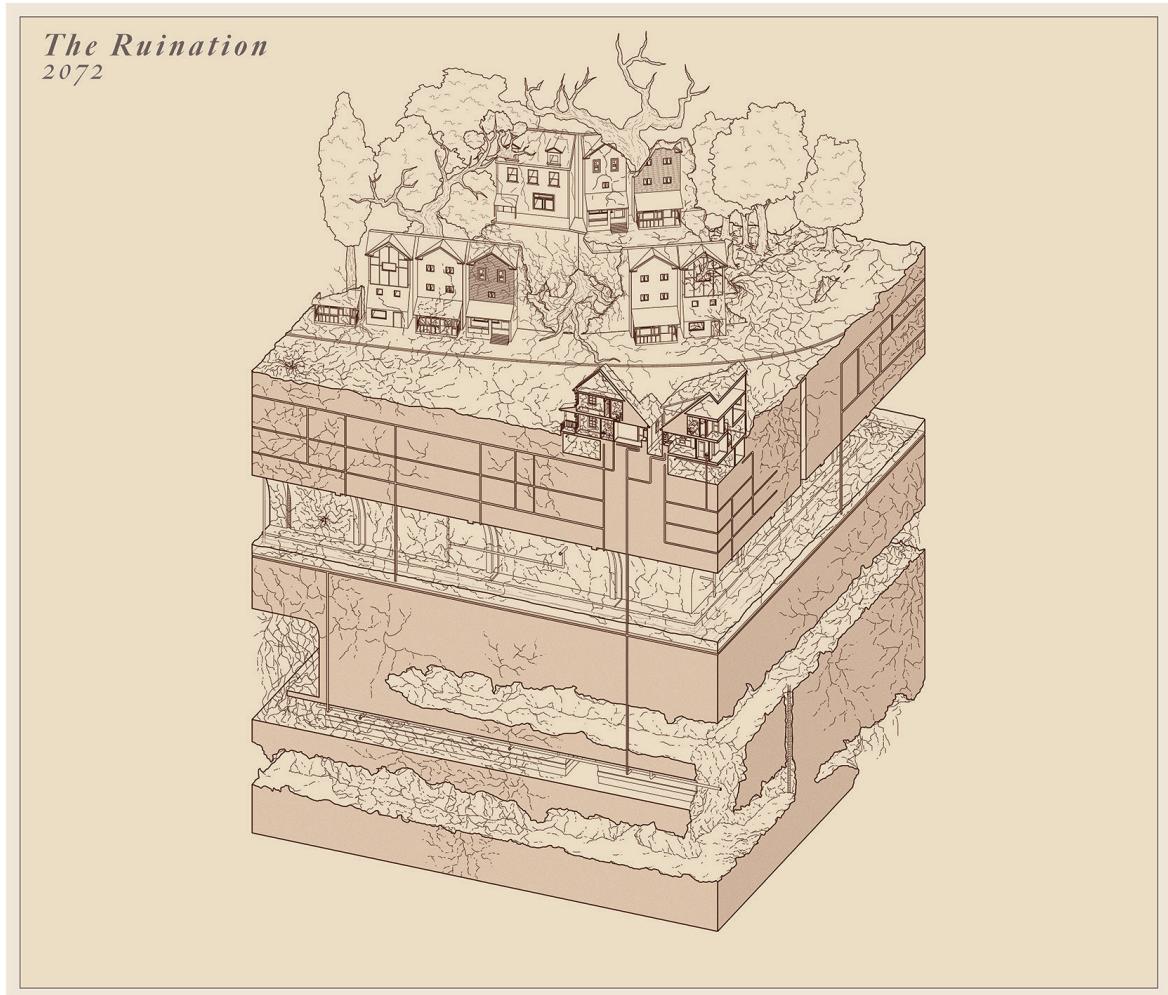
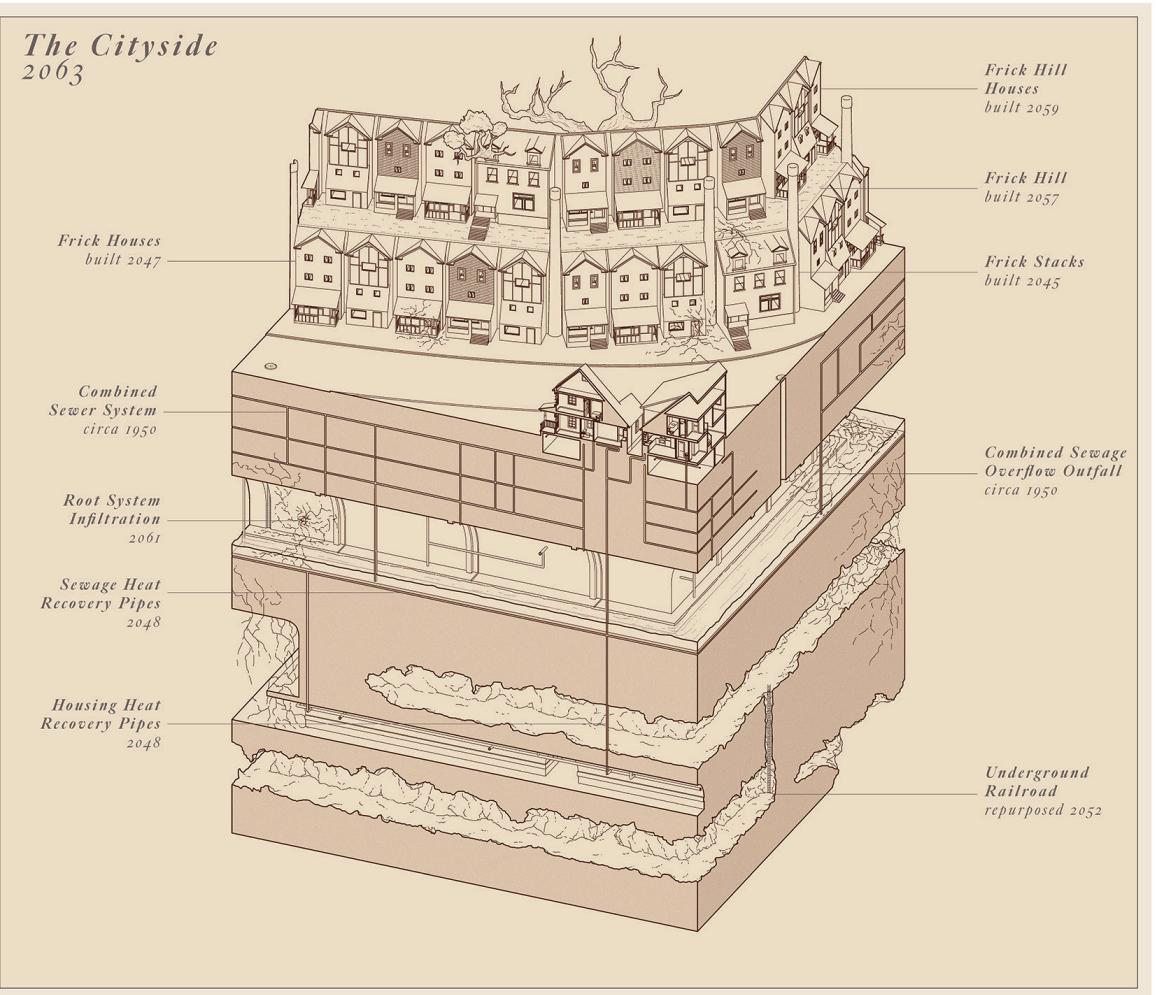
elevation and section of the frick wall in 2054



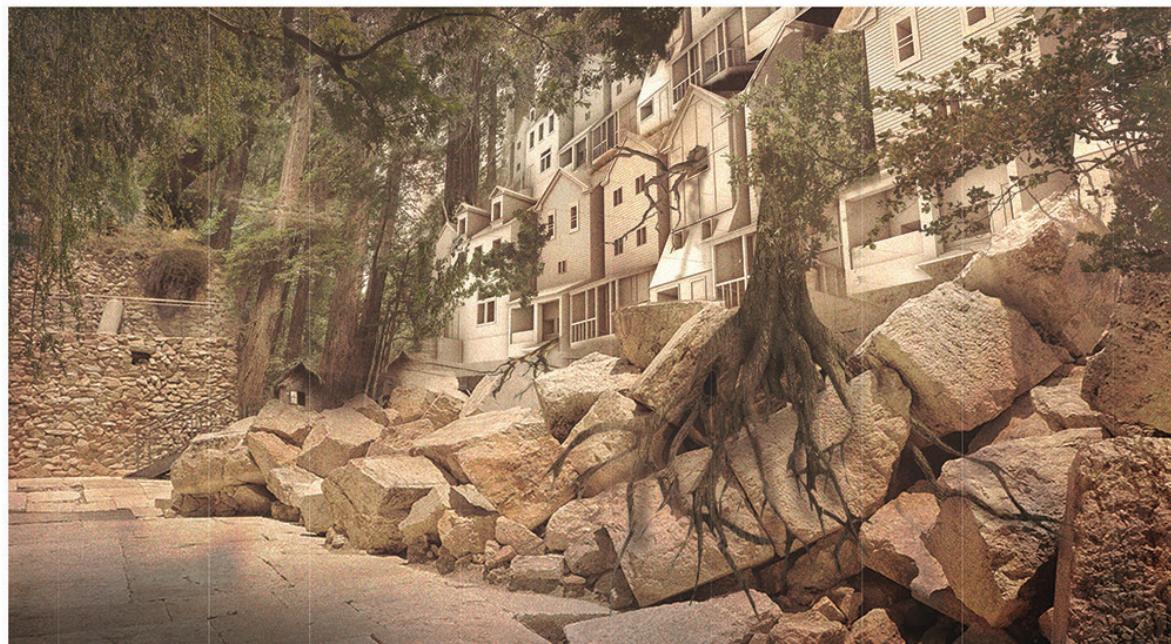
inside the coal mines



above ground view of the wall and dwellings



the "frick houses" and "frick hill houses"



the ruination of the wall

# East Liberty Office Building

Pittsburgh, PA

2nd Year Spring  
Professor: Jeremy Ficca  
Adjunct Professor: Eddy Man Kim

East Liberty is a culturally diverse neighborhood located along eastern Pittsburgh, Pennsylvania. The site is situated just *in-between the gentrification line*, amidst older commercial buildings, a Target, the East Liberty Presbyterian Church, Bakery Square (home of Pittsburgh's Google office), and a bus-way that links directly to Downtown Pittsburgh. In this rich environment, of both cultural vibrancy and cultural sensitivity, students were prompted to design an office building for a widget company.

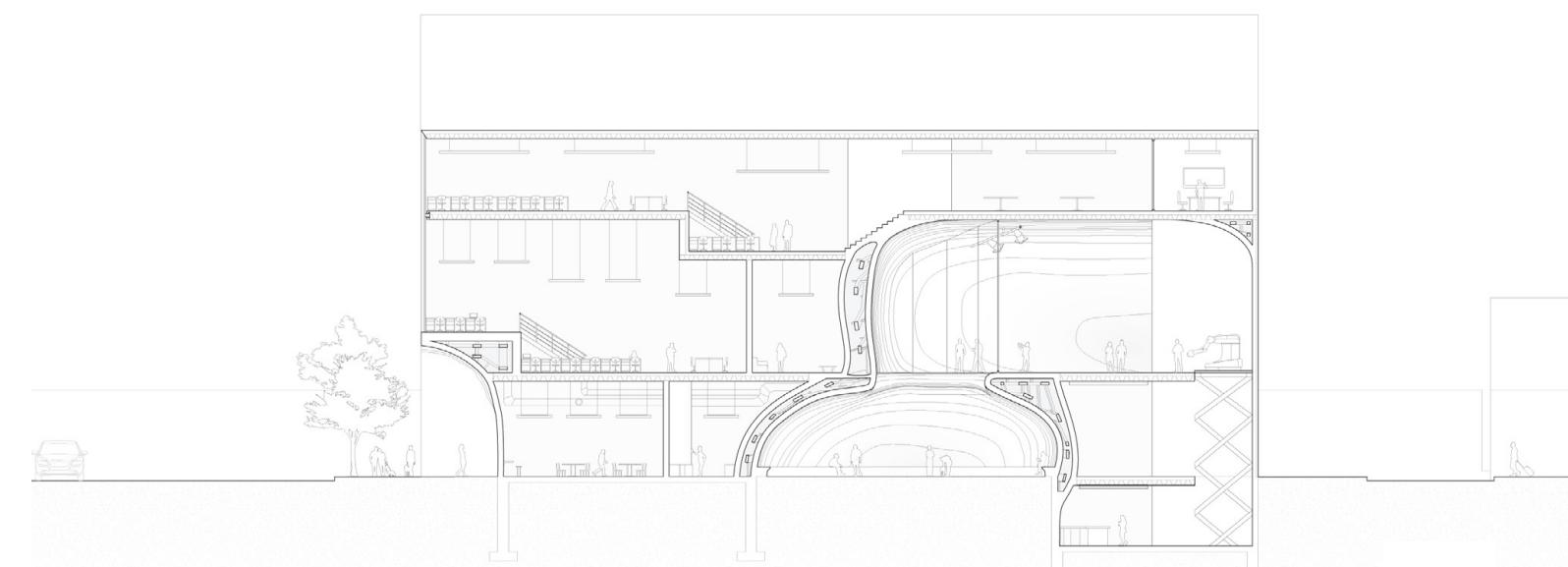
The form of the building was *designed through several sectional cross-sections* to allow for a much more spatially oriented analysis of the architecture. The negative space formed from the stacked slices provided the most open spaces, while the volume housed the primary office space.

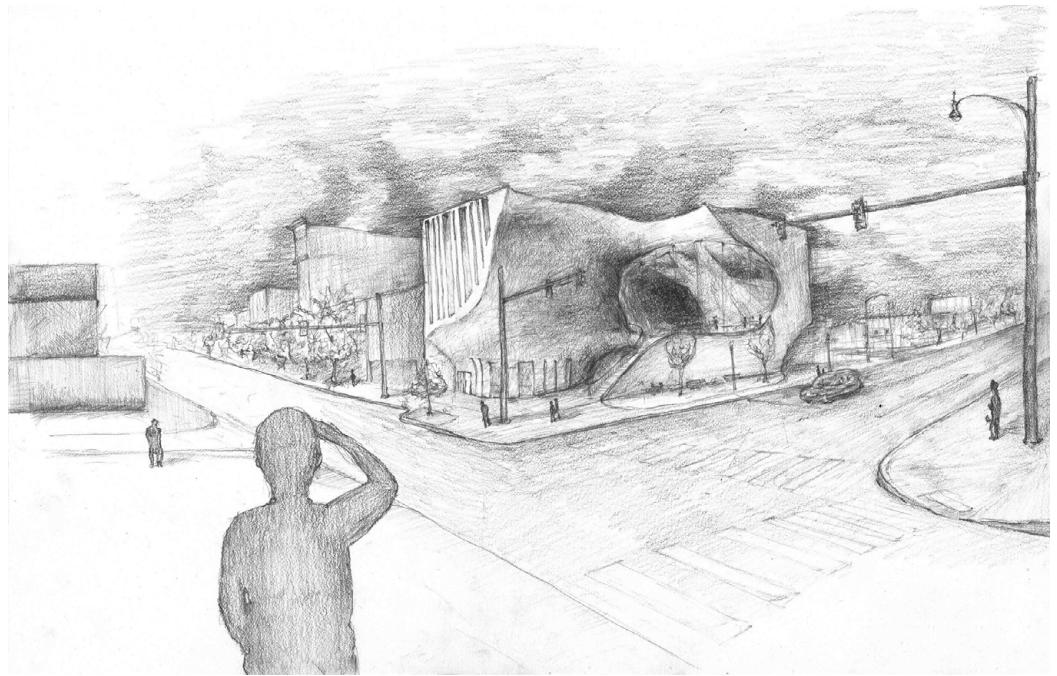
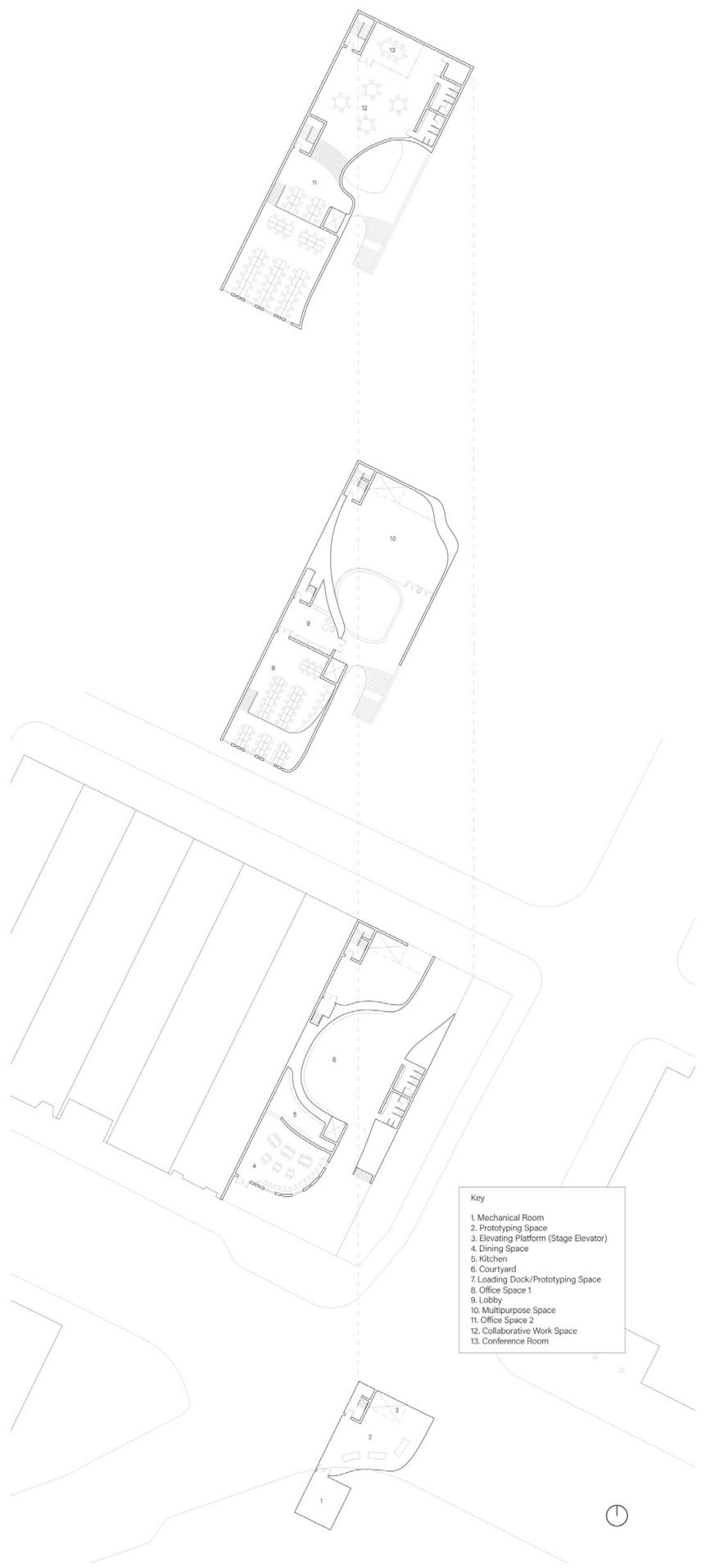
In the upper floors of the building exists more private programmatic spaces such as the offices and multipurpose space. The central multipurpose space is celebrated as the central void which was *formed from the erosion of the rectangular datum of the site*. This monumental space can be used

flexibly due to the large space the cave-like form provides, and even more so thanks to the elevating platform which rises from the basement storage, to the prototyping space, and finally to the stage of the versatile room. Moreover, curtains can be moved to either flood the space with natural light for more public events or closed and the room filled with artificial light for private events. The prototyping space is located on the first floor to provide easy access to a docking space from the service road, however, this space is only accessible from the second floor.

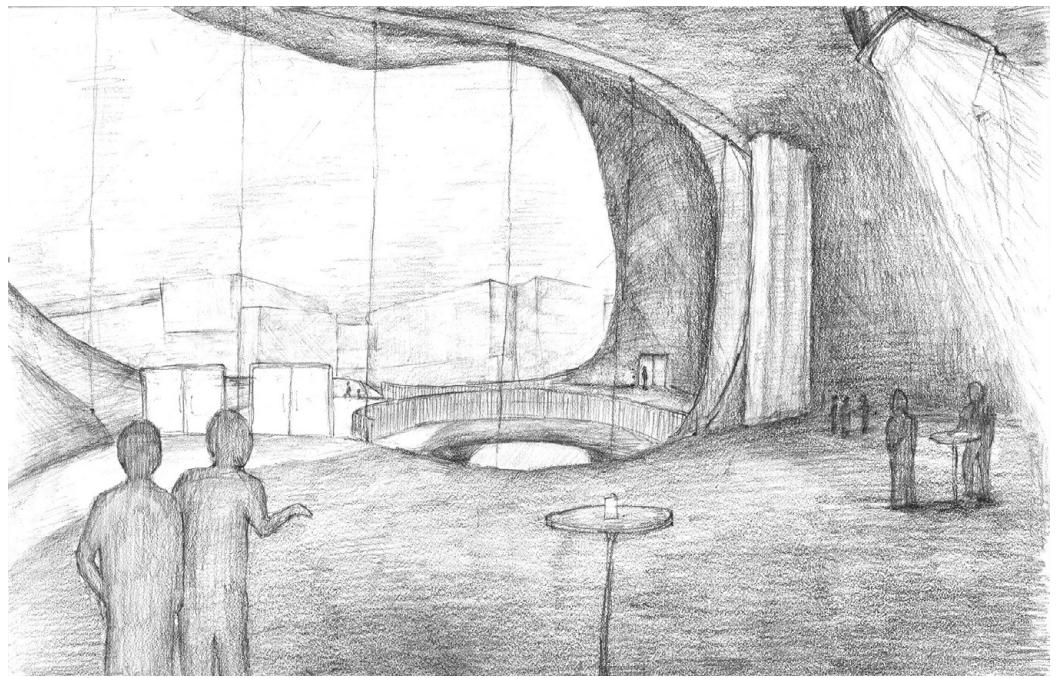
Sensitive to the flow of this area, this design keeps the lower levels of the office open to the public. The office building is open to both ends of the site, allowing entry from both ends of the area, the front catering to the bus-way and the back opening up to both residences and a public parking lot. In the center is an open courtyard to help connect the hyper-organic architecture back to the community.

This project is about heeding to the *ebb and flow of a population while also acknowledging the accelerating development of the community*.

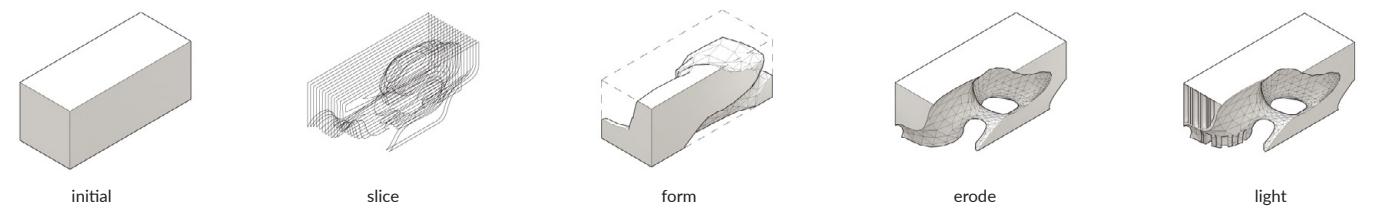




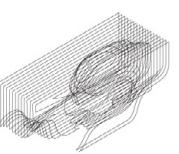
exterior view



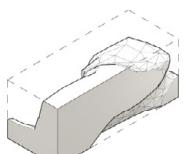
view from inside the multipurpose space



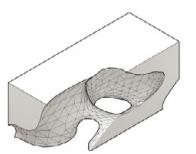
initial



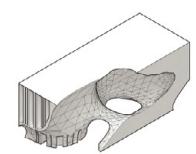
slice



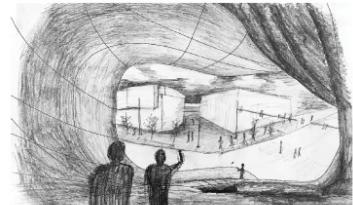
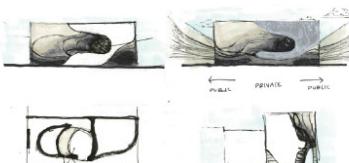
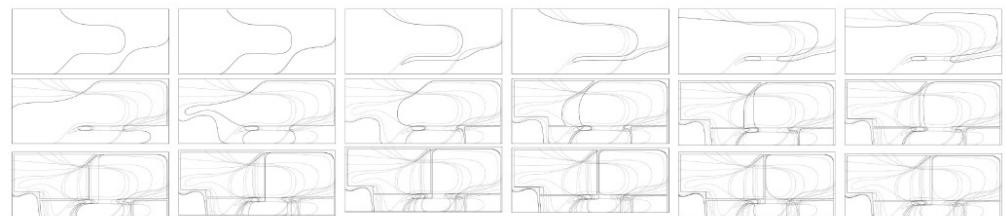
form



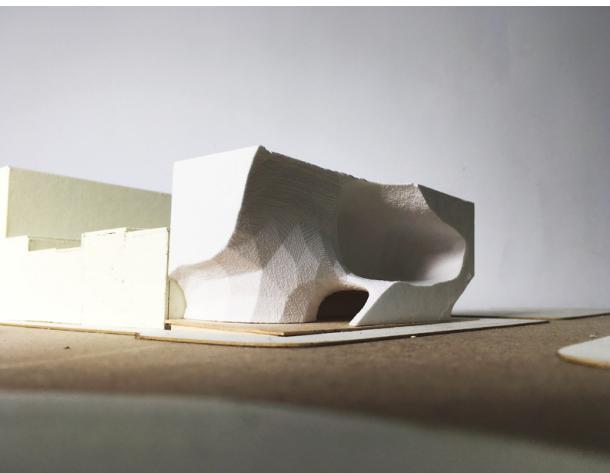
erode



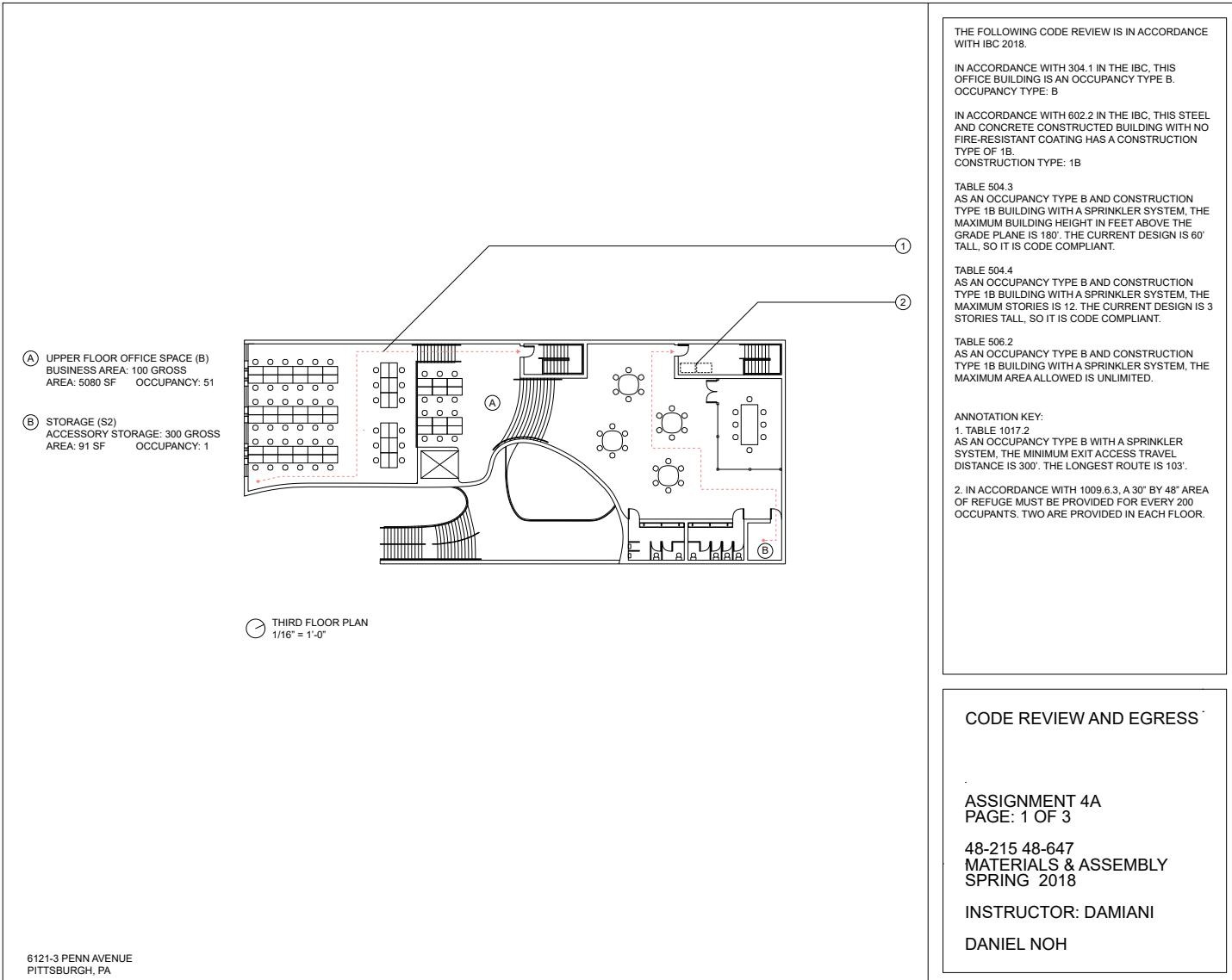
light



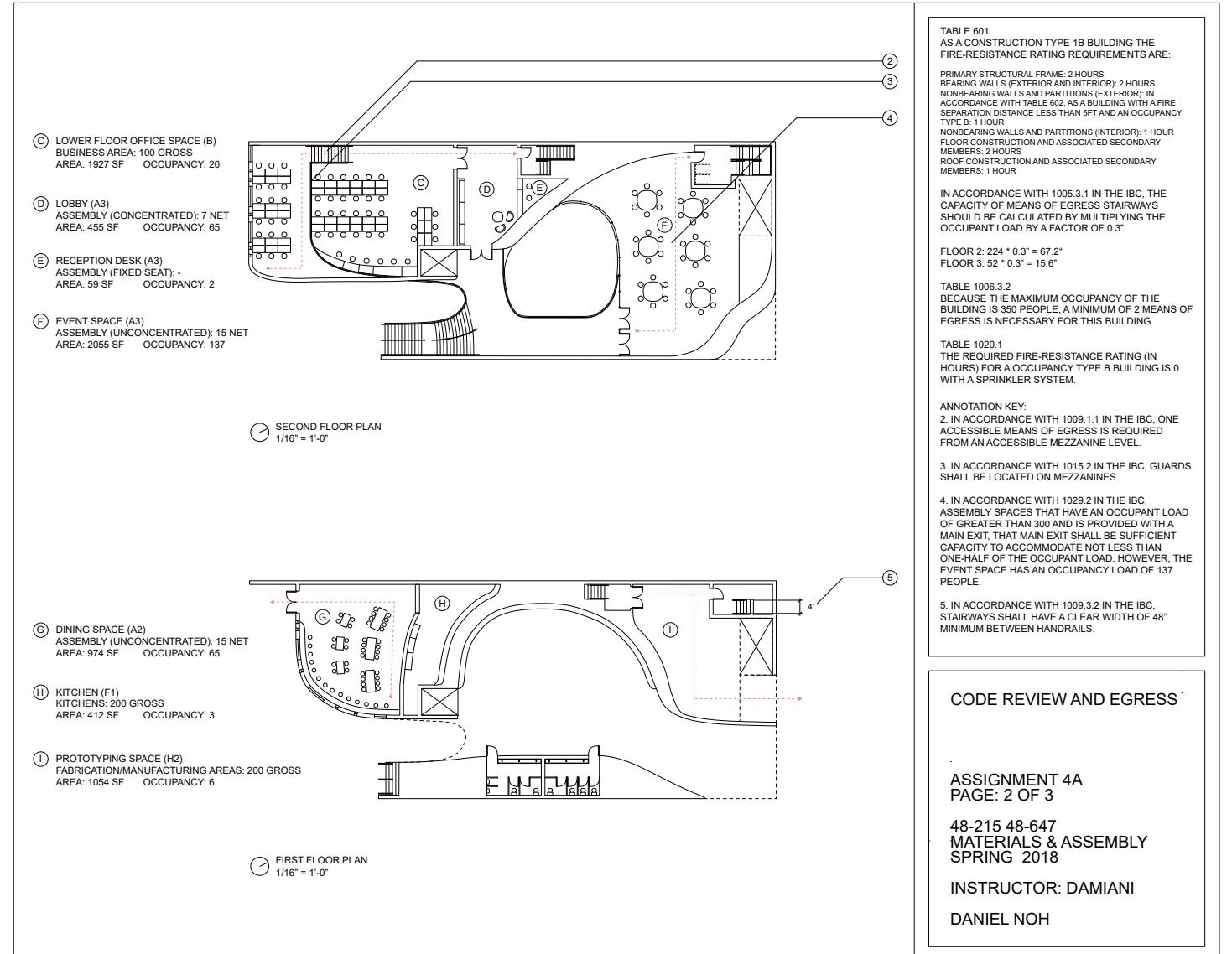
parti, sketch renders, and initial sectional sequence drawings

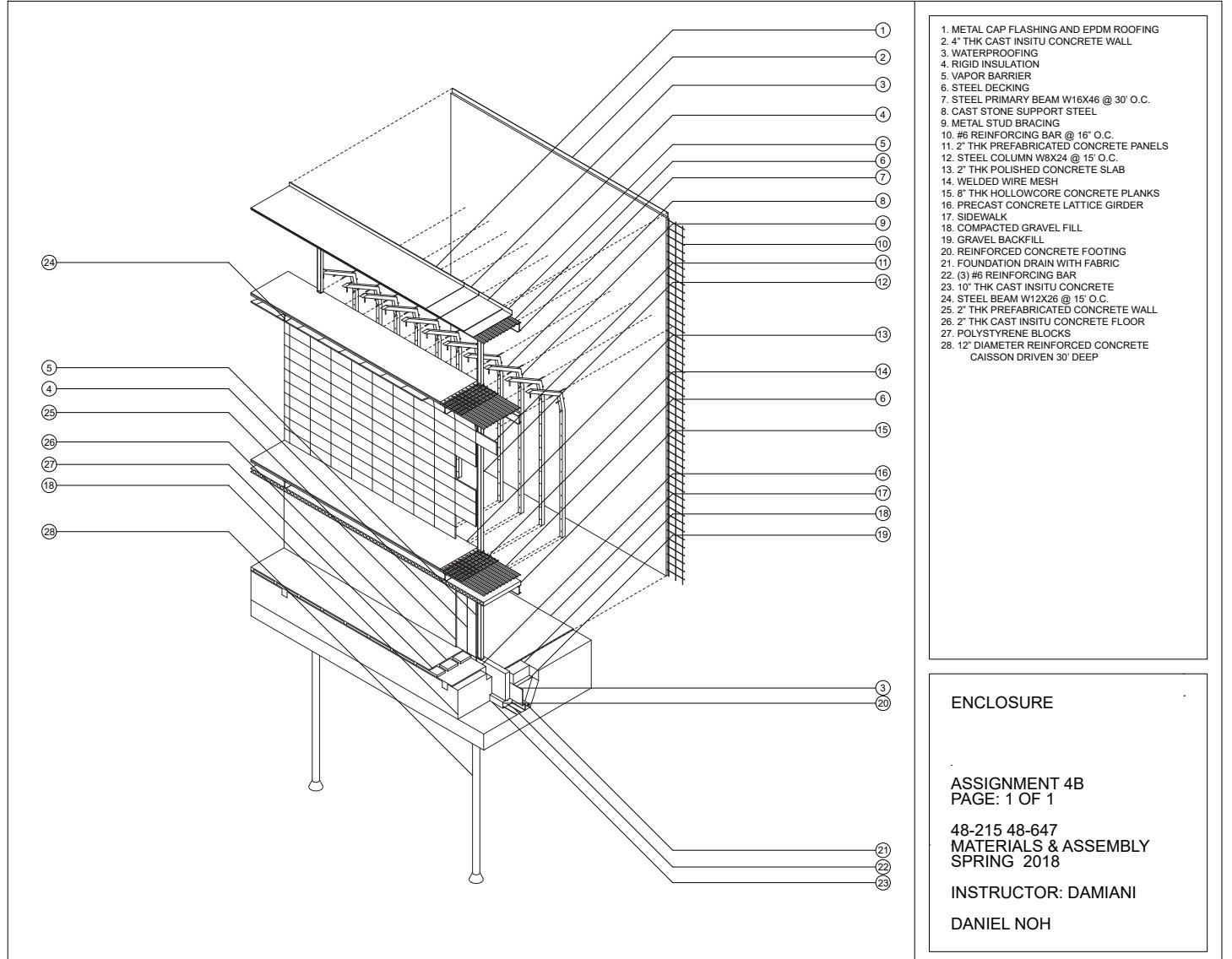
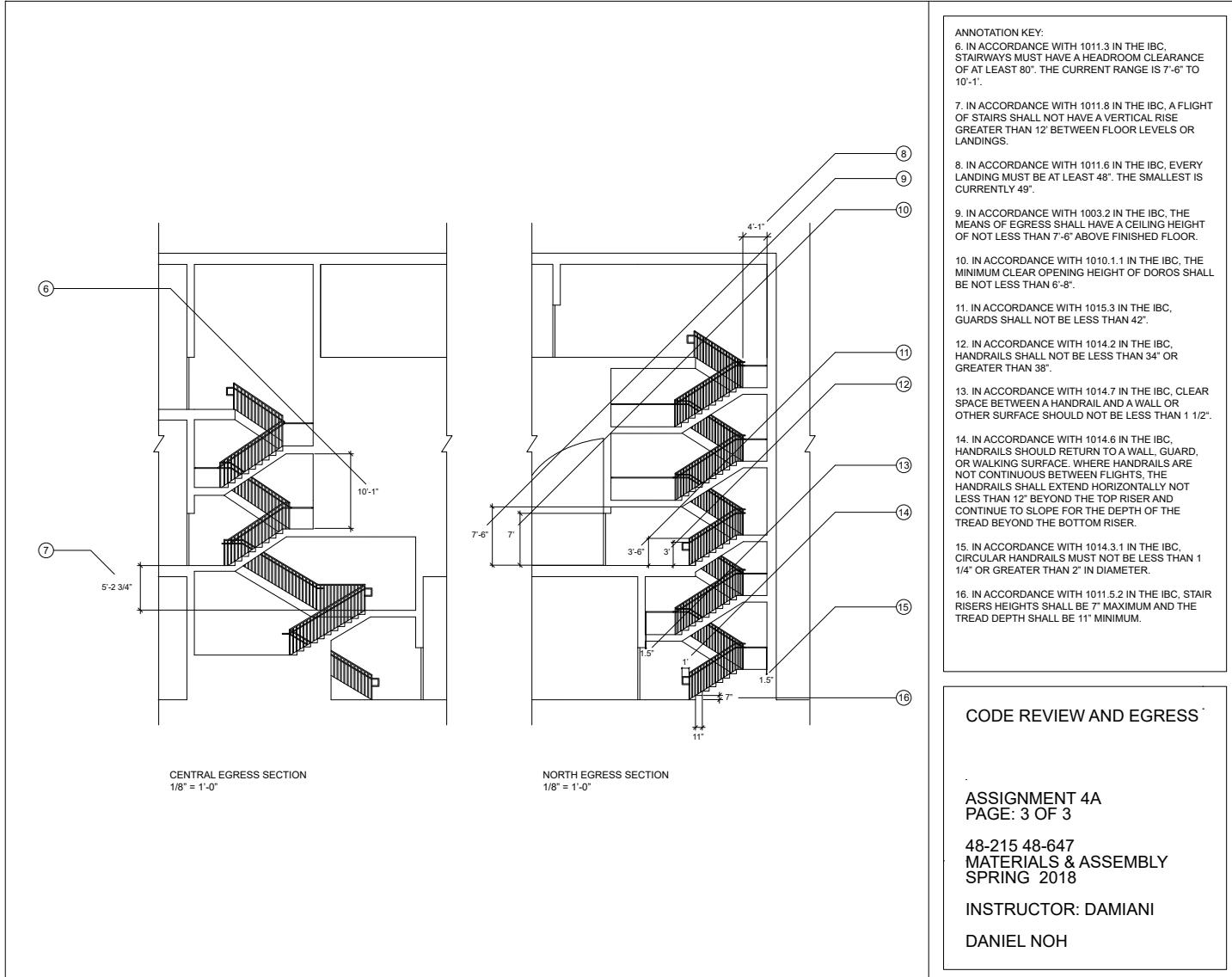


rockite sketch model and 3d printed final parti model



6121-3 PENN AVENUE  
PITTSBURGH, PA





# Wooden Handrail And Balustrade

4th Year Fall  
Professor: Jeremy Ficca

The movement of a person up and down a staircase is relative to each person, some skip steps, some walk at the steady pace, some bounce up and down. So how do you make a handrail that is purposefully designed around the entire movement of the body, rather than just the grasp of the hand? Moreover, how can this be done through contemporary fabrication techniques?

Taking the qualities of Alvar Aalto's furniture and detailing, various forms were prototyped digitally and physically. There was special consideration for how a hand wrapped around the railing, much like many of Aalto's handrails. Through the full utilization of the CNC-Machine at Carnegie Mellon University School of Architecture's Design Fabrication Lab, as well as bent lamination techniques, this prototype of a handrail and baluster was created.

The initial prototyping involved analog processes of molding clay to fit a hand. The first clay prototype failed due to the density and crackling nature of paper clay. The second clay prototype used proper molding clay that was far easier to manipulate. However, it was apparent that the clay was too variant through its profile. The final physical prototype involved hand-carving floral

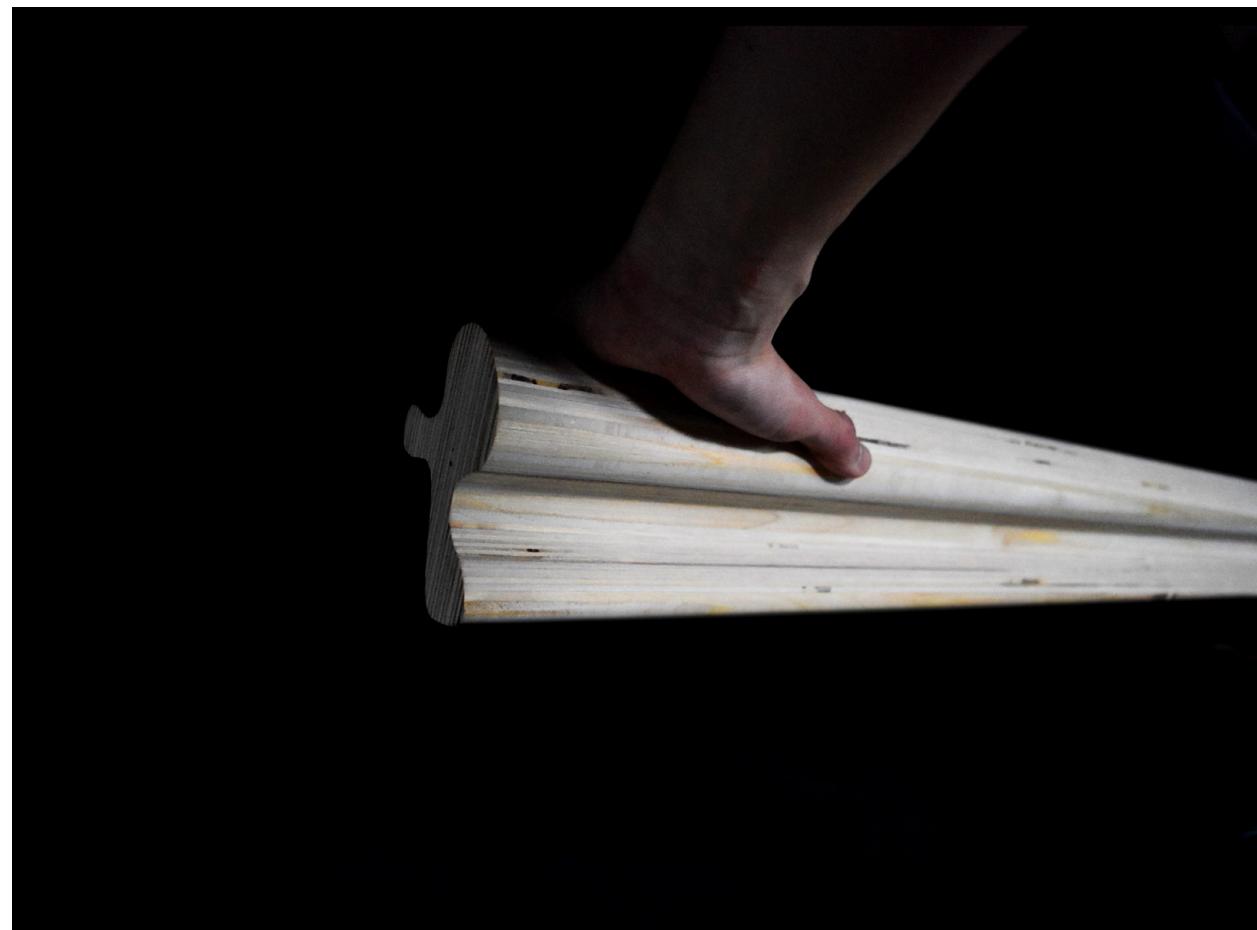
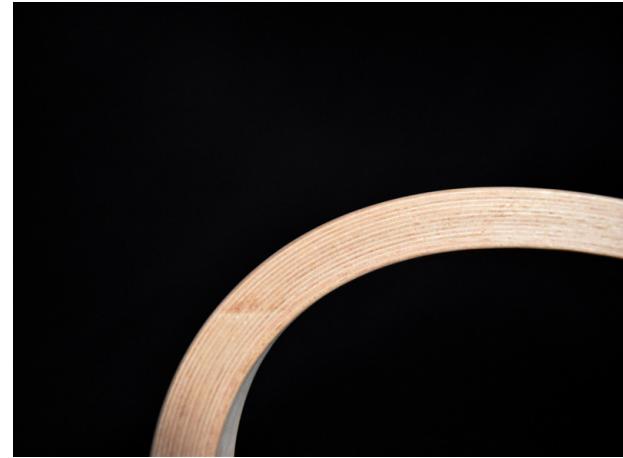
foam over several days, fine-tuning it to various hand sizes and shapes. Using this profile with slight modifications throughout each process, various forms were created through digital means (laser cutter, CNC). The chipboard was unsuccessful in the y-axis scaling, and the HD foam shifted during the CNC, resulting in scalloping.

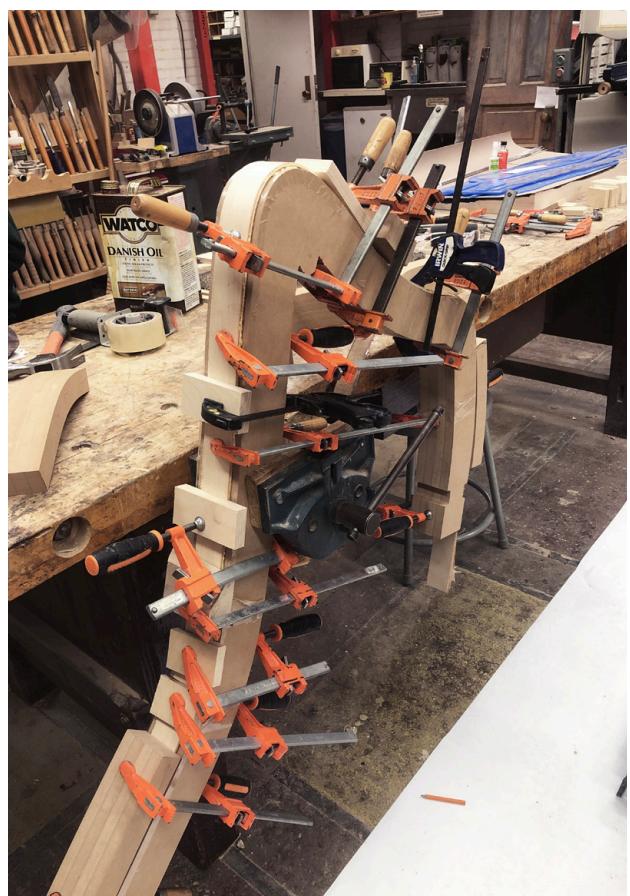
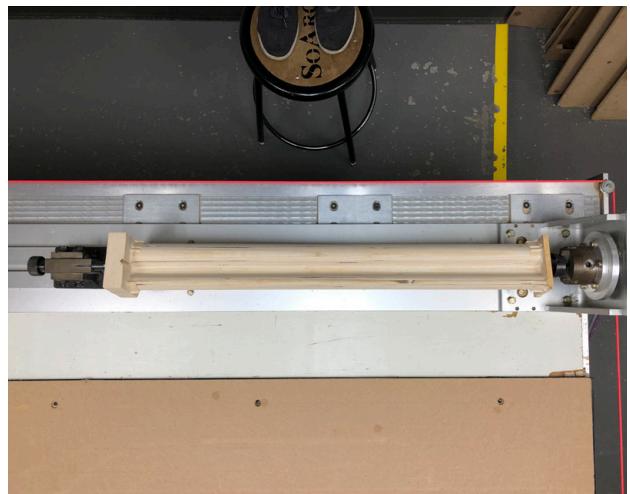
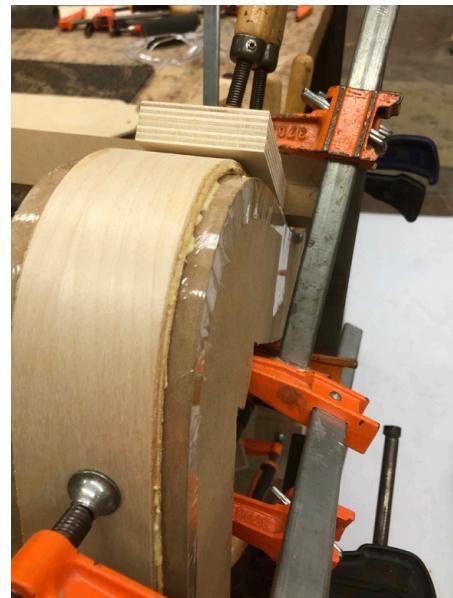
Prototyping the baluster involved a far more digital to physical conversation. The form was first digitally iterated in Rhino until a satisfactory form was generated. This form was then profiled out on the CNC mill (2.5 axis) as a mold. For the first bent lamination tests, chipboard strips and standard multipurpose glue was used in a stagger method. Through this mold, it was apparent that the extreme curve at the top would not be structurally sound; moreover, it would be difficult to wrap the layers of veneer around the curve. The curvature was modified to a lesser degree and another mold form was milled out, this time with an outer mold to spread out the pressure of the clamps. After a couple of small layer tests, the final baluster was produced.

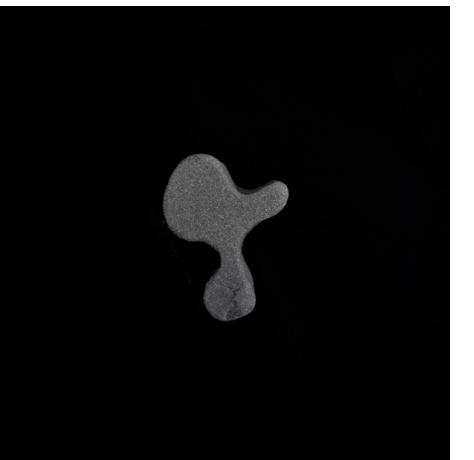
The Aalto inspired handrail ended up taking the form of an object you want to hold on to, but also a form that invites you to let go.



render of final design







*handrail form process work: paper clay, clay, gardening foam, stacked chipboard, 4-axis CNC on laminated high density foam, and 4-axis CNC on birch plywood*

# Illustrations And Digital Drawings

*Personal Projects*

