ARCHITECTURAL PORTFOLIO

ANDREW FERRANTE

SECOND YEAR PORTFOLIO

FALL 2024 - FALL 2025

TABLE OF CONTENTS

DIGITAL CONSTRUCTS 1
FALL 2024

PRELIMINARY LINEWORK 4
COFFEE POT AND MACHINE 6

DIGITAL CONSTRUCTS 2
SPRING 2025

FOLSOM STAIRS PART 1 14
FOLSOM STAIRS PART 2 18

ARCHITECTURAL DESIGN STUDIO 1
FALL 2024

PAVILION 20
EARTHLY TECTONICS 22

ARCHITECTURAL DESIGN STUDIO 2
SPRING 2025

LOCK E-17 BOAT/BATHHOUSE 24

PRELIMINARY LINEWORK

DIGITAL CONSTRUCTS FALL 2024

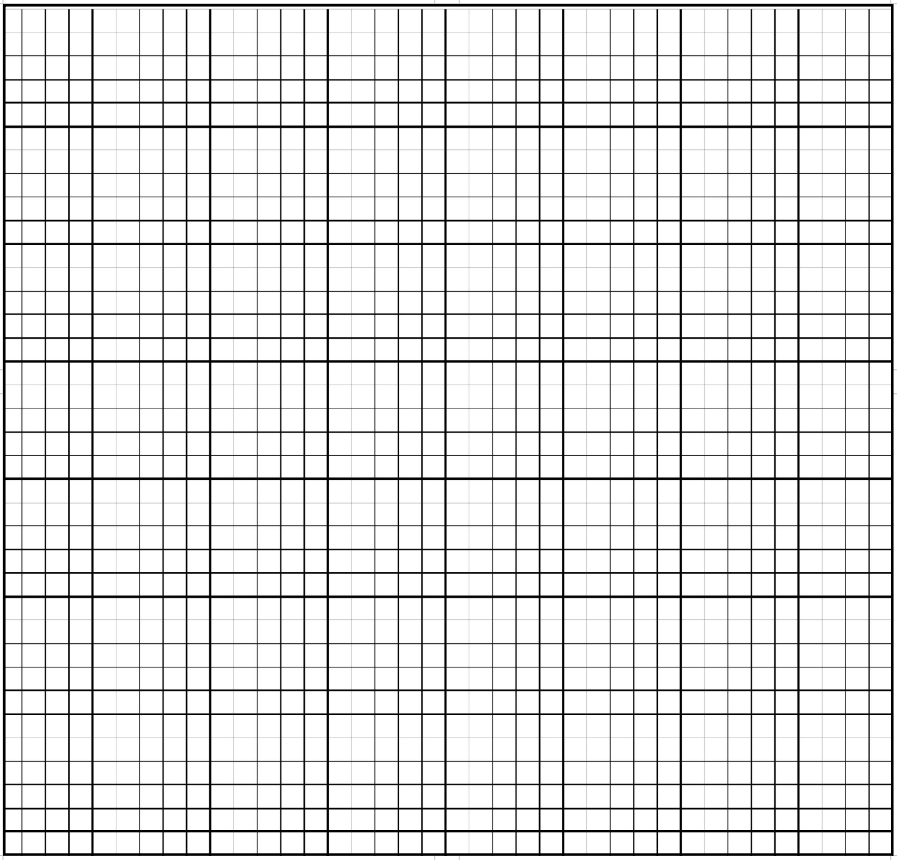
This assignment focused solely on two-dimensional, grayscale Rhino work. It was the very first project of Digital Constructs 1, and served as an introduction to Rhino as a whole. This assignment taught the concepts of layers, lineweights, offsets, movement, offset, and more. These skills were used to create two 24 x 24 images, a **Grid** made up of five smaller grids, and a series of offsets to make a **Gradient.**

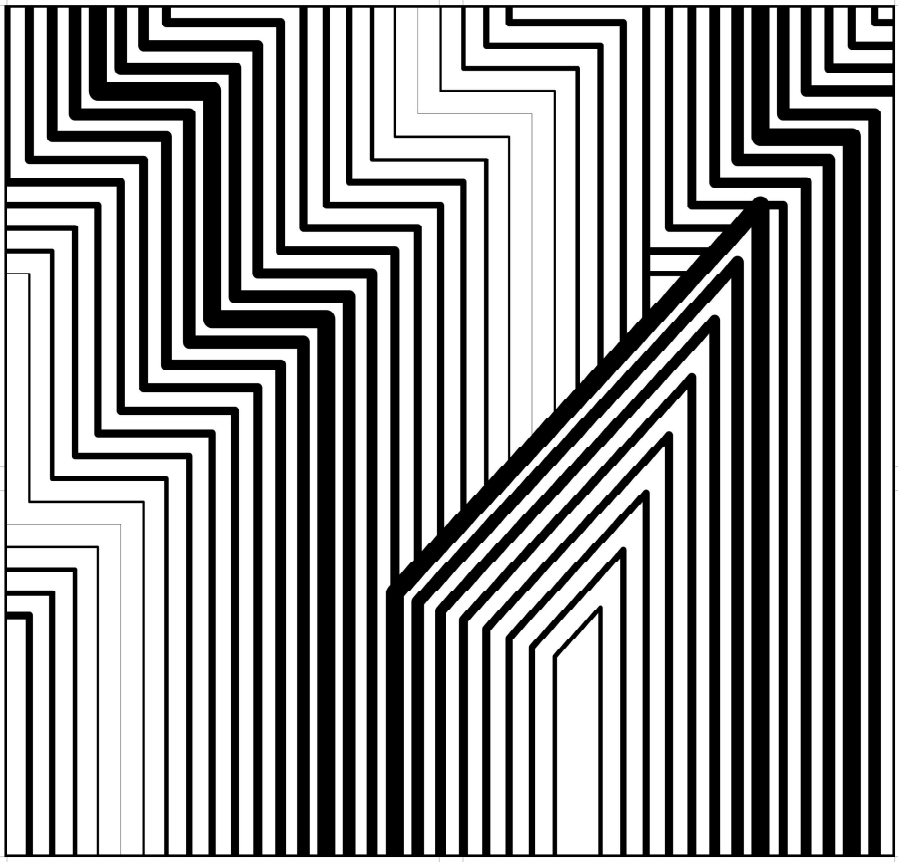
GRID

PRELIMINARY LINEWORK

DIGITAL CONSTRUCTS FALL 2024

For the first assignment we worked with grouping, duplicating, grid snapping, line thickness, and trimming. We used these techniques to create a grid of lines of various thicknesses. Mine in particular had these thicknesses in a **diagonal gradient**, which created an interesting effect, much like looking at glass blocks.





GRADIENT

PRELIMINARY LINEWORK

DIGITAL CONSTRUCTS FALL 2024

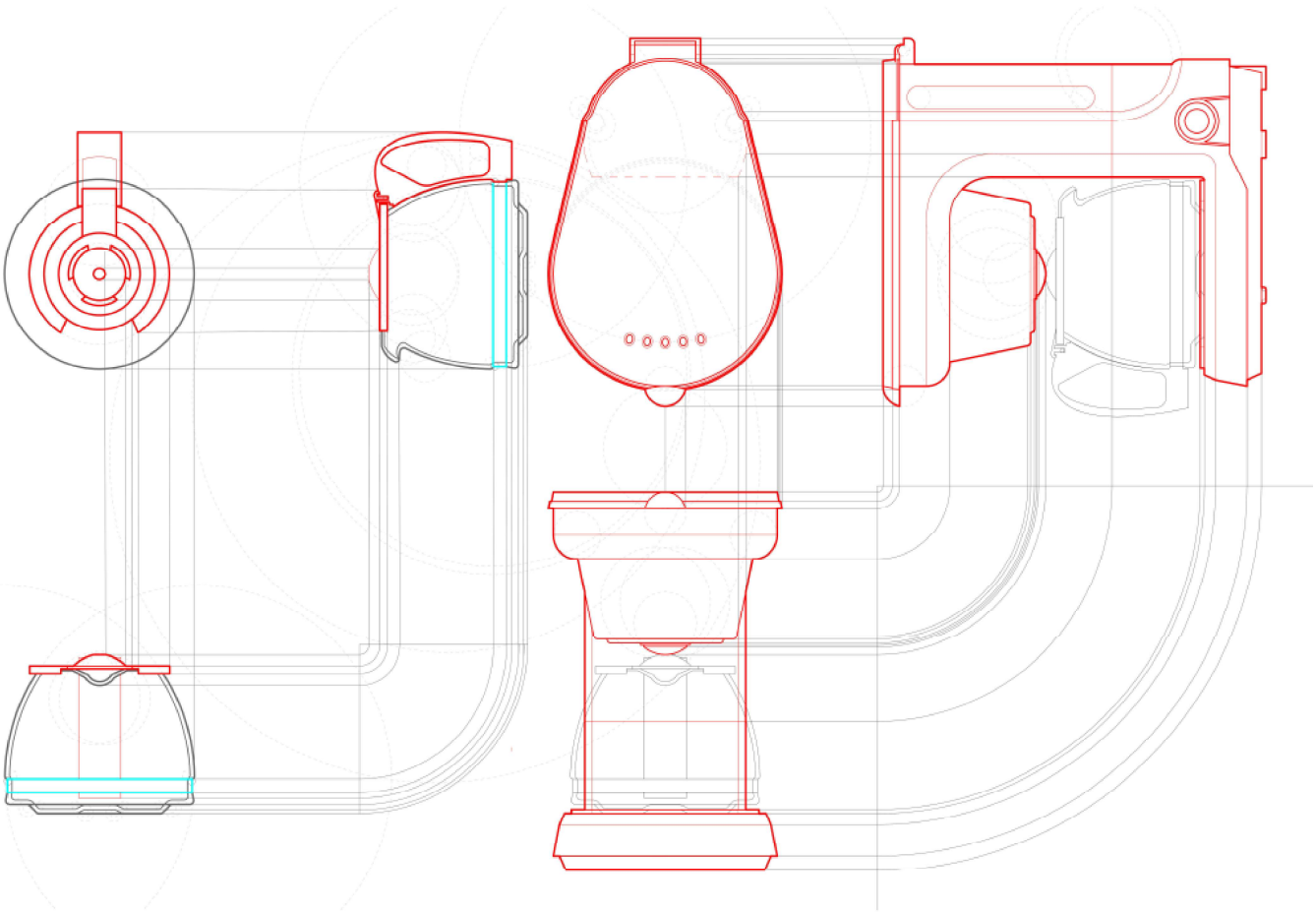
This assignment focused more on polylines, offsets, and using lineweights to make a gradient. We started by drawing three or four lines, then offset them in different lineweights to make a gradient coming off of them. I wanted to use this style to create a **depth effect**, like looking into a chasm.

COFFEE POT AND MACHINE

DIGITAL CONSTRUCTS FALL 2024

This assignment involved buying a **coffee machine** off the internet, which was used as the basis for the following steps. This overall project involved 2D and 3D, collaging, research, documentation, graphic design, and more.

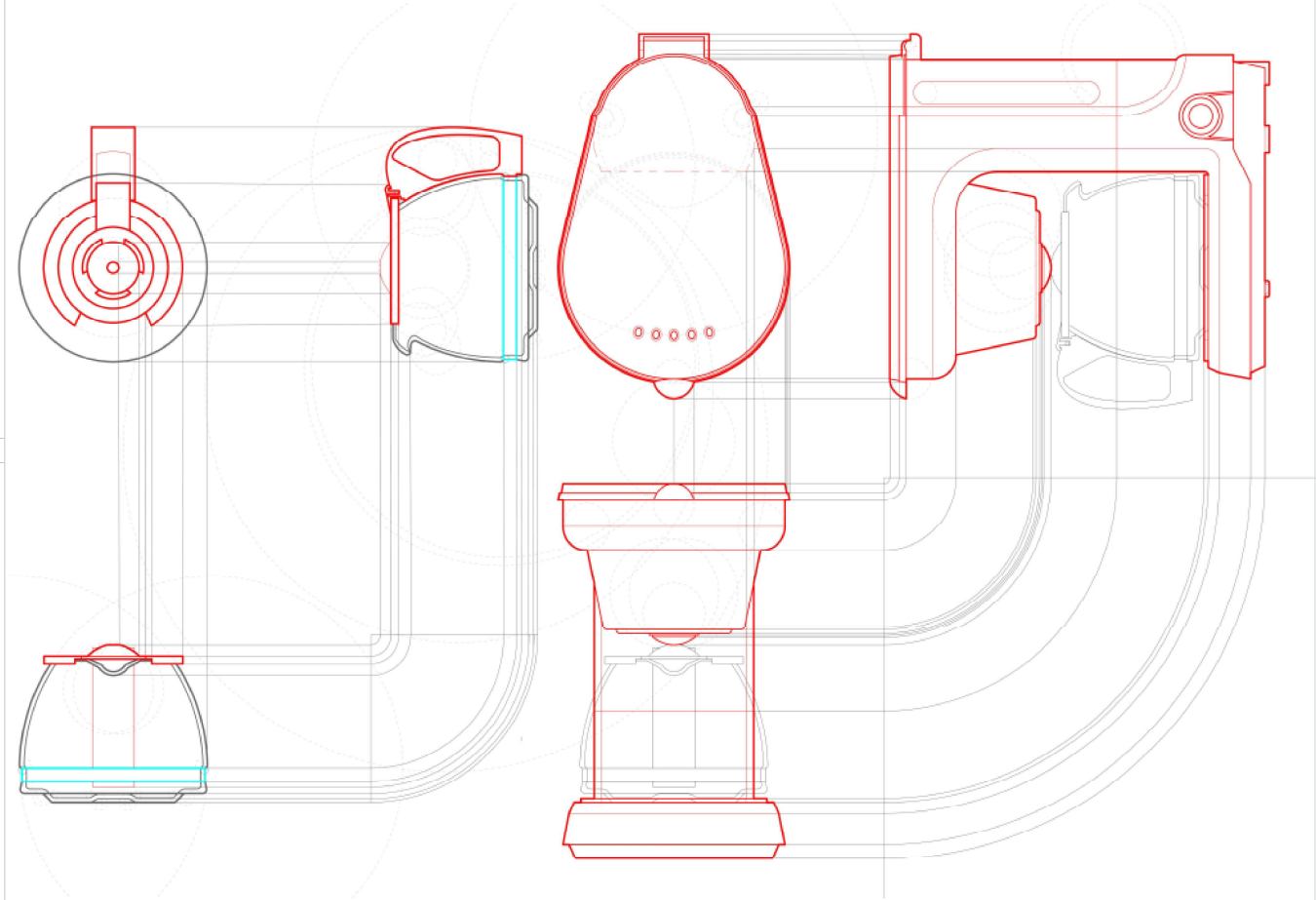
The project began by drawing the **coffee pot**, then subsequently the **machine**, in Rhino 2D. Then, this same coffee pot would be transformed into a **3D object**, then exploded to demonstrate the makeup. The actual coffee pot/machine would then be **dissasembled** and analysed, sorted, then photographed. Following that, the coffee machine would be reassembled, **sawed in half,** then drawn in 2D, arranged to demonstrate how certain parts come together. Using this drawing, the inputs and outputs of the machine would be researched and displayed as a **graphic.** Using specifically the graphic with the section cut, the coffee machine would be transformed into a 3D shape, then cut to **defamiliarize** it. Lastly, all of these elements would be combined in one large **collage**, demonstrating graphic design capabilities.

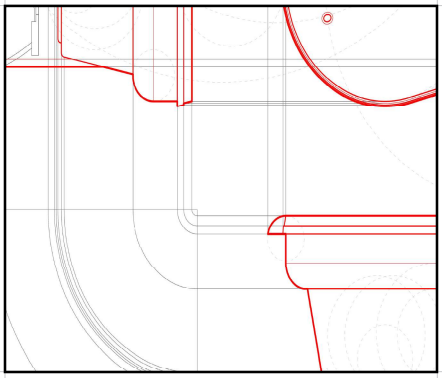


ORTHOGRAPHIC COFFEE MACHINE

COFFEE POT

DIGITAL CONSTRUCTS FALL 2024



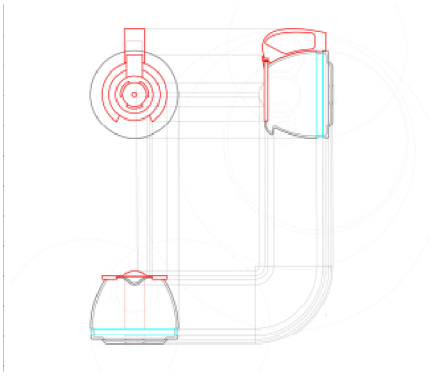


This assignment involved documenting real-world objects and transforming them into Rhino. Every student purchased a coffee pot from various brands, and measured the dimensions from a top-down, front, and side view to create othographic projections. Afterward, these same techniques were used to document the coffee machine in the same way. These were laid out in the grid above, along with projection lines, and varying **thicknesses** to make the object more legible. My project in particular involved the addition of **color**, which corresponded to the different materials of the coffee pot and machine.

ISOMETRIC COFFEE POT VIEWS

COFFEE POT

DIGITAL CONSTRUCTS FALL 2024

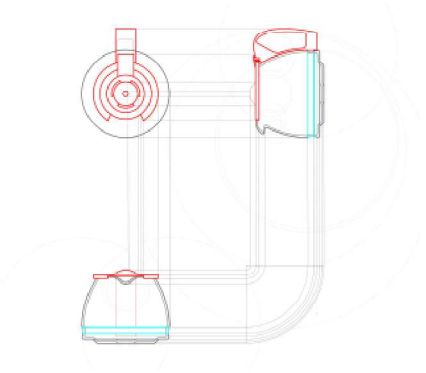


This assignment focused on tranforming the 2D documentations into **3D forms**, using techniques like revolve, extrude, offset surface, and cut. These were used to make the coffee pot as shown above, along with exploded aspects that attach to the coffee pot, like the lid and the handle. Shown below are the same techniques used on a more **abstracted** version of the coffee maker, designed so that it is unrecognizable from the original machine. I used the top part of the coffee machine, in addition to the diagrams shown later, cut through in an effort ot create a visually confusing effect.

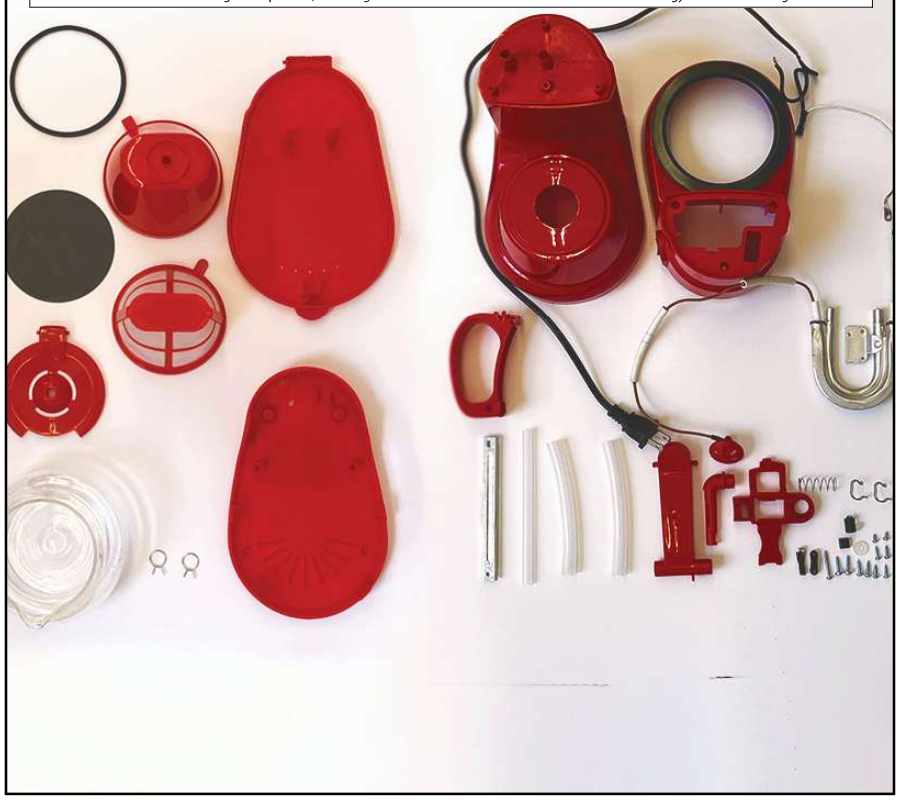
ANALYSIS

COFFEE POT

DIGITAL CONSTRUCTS FALL 2024



Holstein 5 Cup Coffee Maker Purchased for $19.47 on Amazon.com 550 wattage, made from virgin aluminum, polypropeline, and glass.	Virgin Aluminum - 134g in model. Made by mining bauxite, refining it, then smelting it into aluminum. 230 MJ (manufacturing) and 2 kg per kilogram. 30.82 MJ to manufacture, 0.268 kg carbon embodied. Polypropeline - 618g in model. Made by polymerizing propylene gas using a catalyst system. 69 MJ (manufacturing) and 1.58 kg per kilogram. 42.642 MJ to manufacture, 0.97644 kg carbon embodied. Glass - 181g in model. Made by heating ordinary sand then shaping it. 6.9 MJ (manufacturing) and 1.437 kg per kilogram. 1.2489 MJ to manufacture, 0.26 kg carbon embodied.
74.7109 MJ for the manufacturing of the product, 1.5044 kg CO2 embodied. That is almost four times as much energy as it takes to charge an EV.	

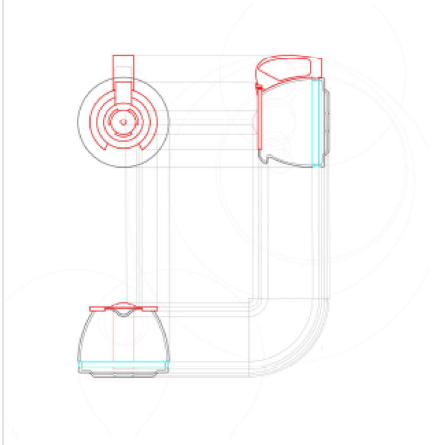


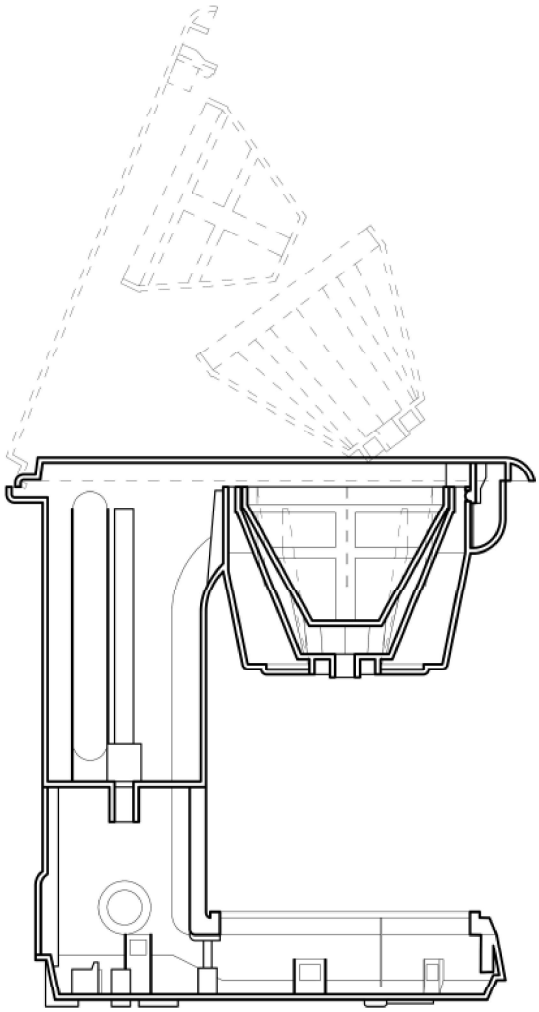
This section of the assignment involved **breaking apart** the coffee pot and machine in order to understand the parts inside and what they do. These parts were also weighed, in order to understand their makeup and **environmental impact**. Then, the elements of the two parts were laid out in various ways, like mine, where they are laid out so that like-shapes were together. Once a layout was achieved, their pictures were taken, then combined and touched up using Photoshop.

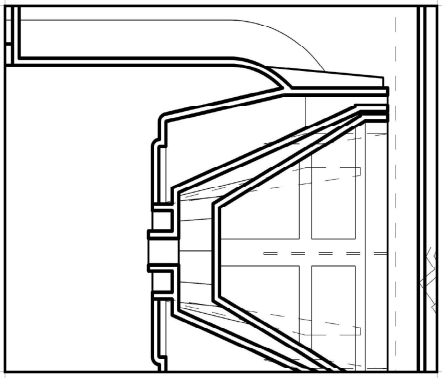
SECTION CUT

COFFEE POT

DIGITAL CONSTRUCTS FALL 2024





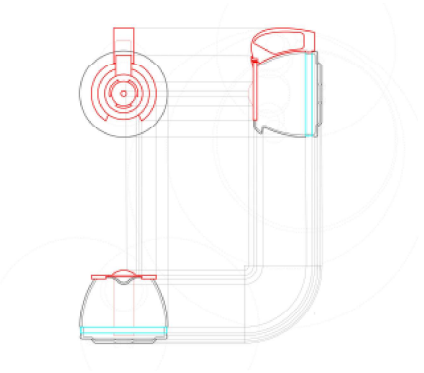


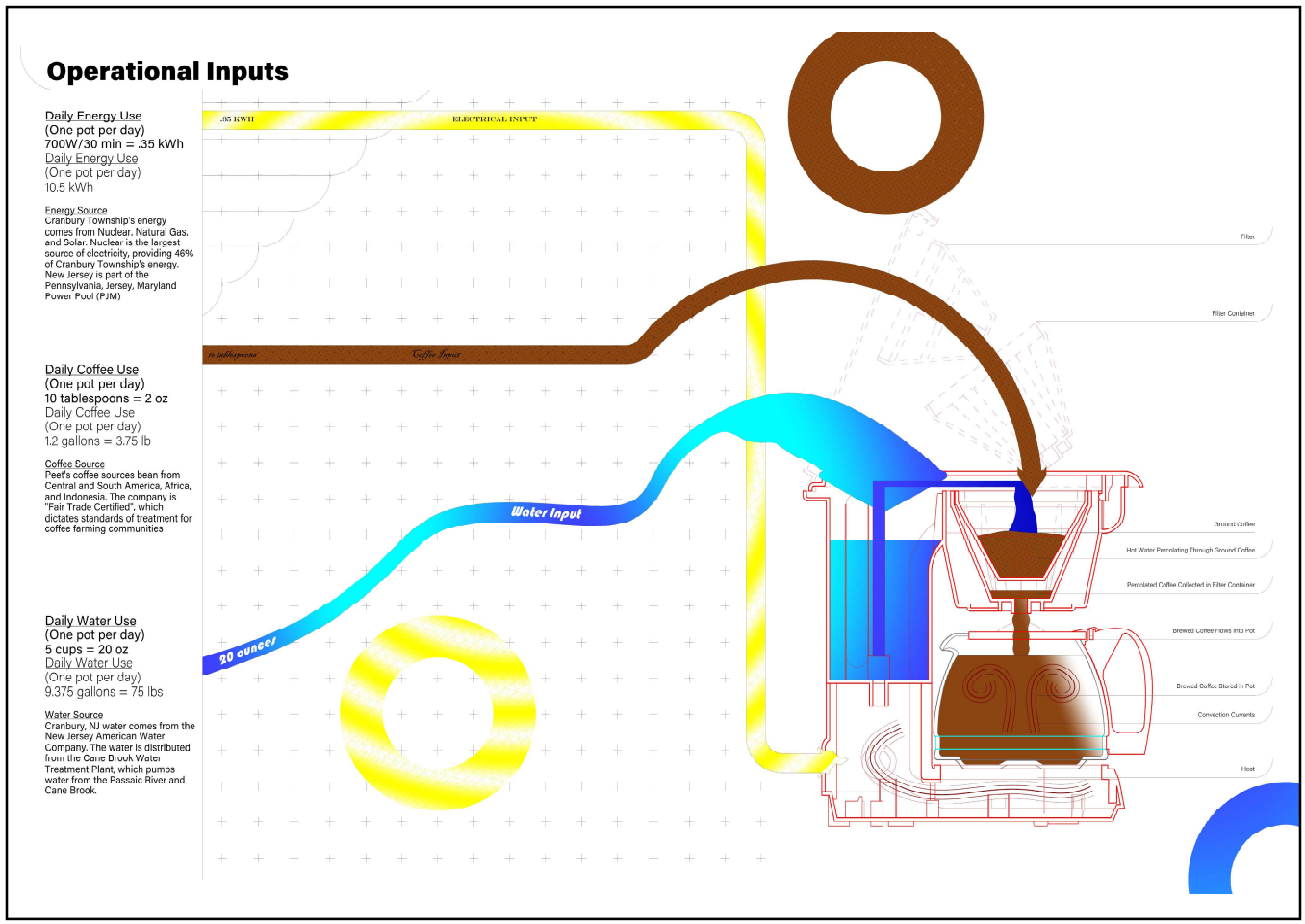
Once these aspects were all laid out and documented, they were reassembled, then cut in half using power tools, in order to mimic a **section cut** of the object. Again, using similar techniques to the documentation of the coffee pot, the interior of the machine was drawn. Additionally, there were **projections** of possible ways this machine would be used, like how the lid would open as well as the parts inside. I decided to show how it would open and how all the parts would move along this same axis.

OPERATIONAL INPUTS

COFFEE POT

DIGITAL CONSTRUCTS FALL 2024



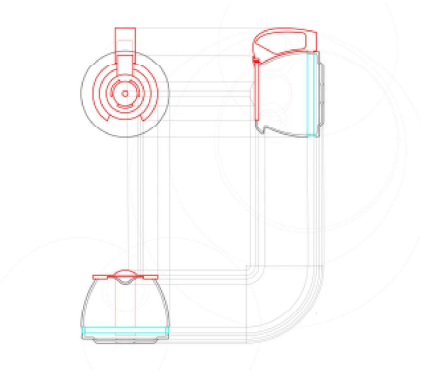


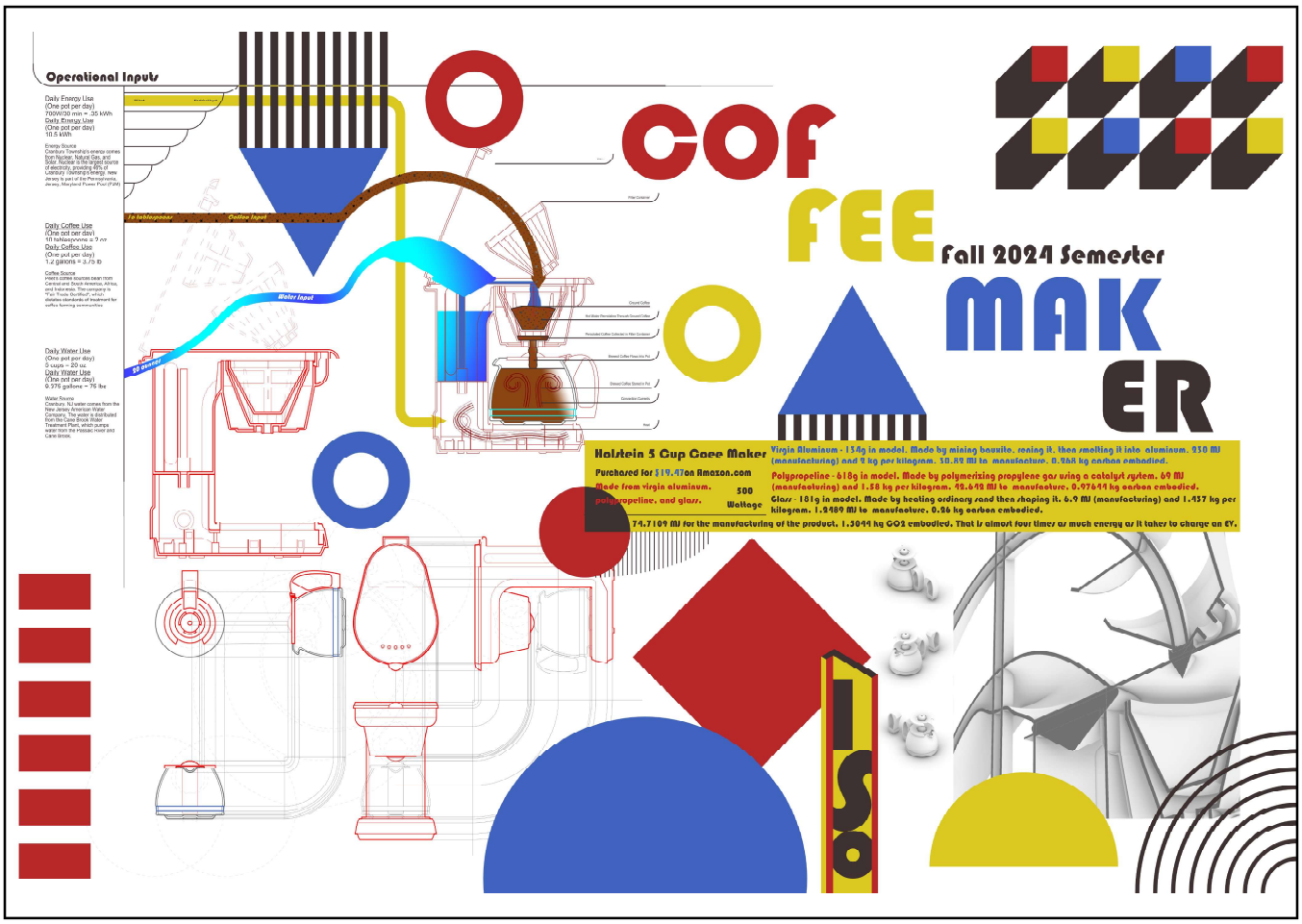
This assignment continued some of the ideas in the analysis of the coffee pot, this time focusing more on the use of aspects like inputs of water, energy, and coffee grounds. These were then combined in a **diagram** showing the use of these resources per day and the source of these elements. These elements were **shown graphically** in addition to through text, demonstrating how these aspects flow throughout the machine. I wanted to **highlight the differentces** between the types of inputs, and have that reflected through the use of color, patterns, and fonts.

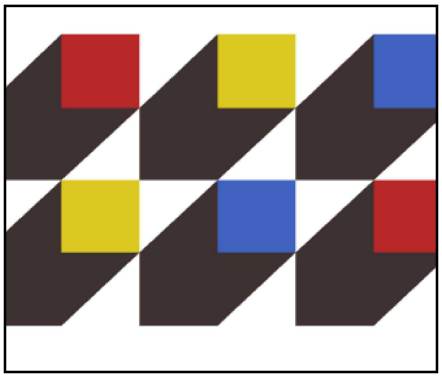
FINAL COLLAGE

COFFEE POT

DIGITAL CONSTRUCTS FALL 2024







This assignment, the final part of the coffee machine project, involved laying out all the previous assignments into a collage. This collage not only incorporated the designs, but also **overlaid** them atop each other, moved aspects to different areas, created a **visual flow** across the different steps of the process, and made the whole layout graphically interesting. This was done using specific color palettes, font choices, visual balance, and more. I used a **Bauhaus style** because the color scheme was present althroughout the previous projects, as well as the font.

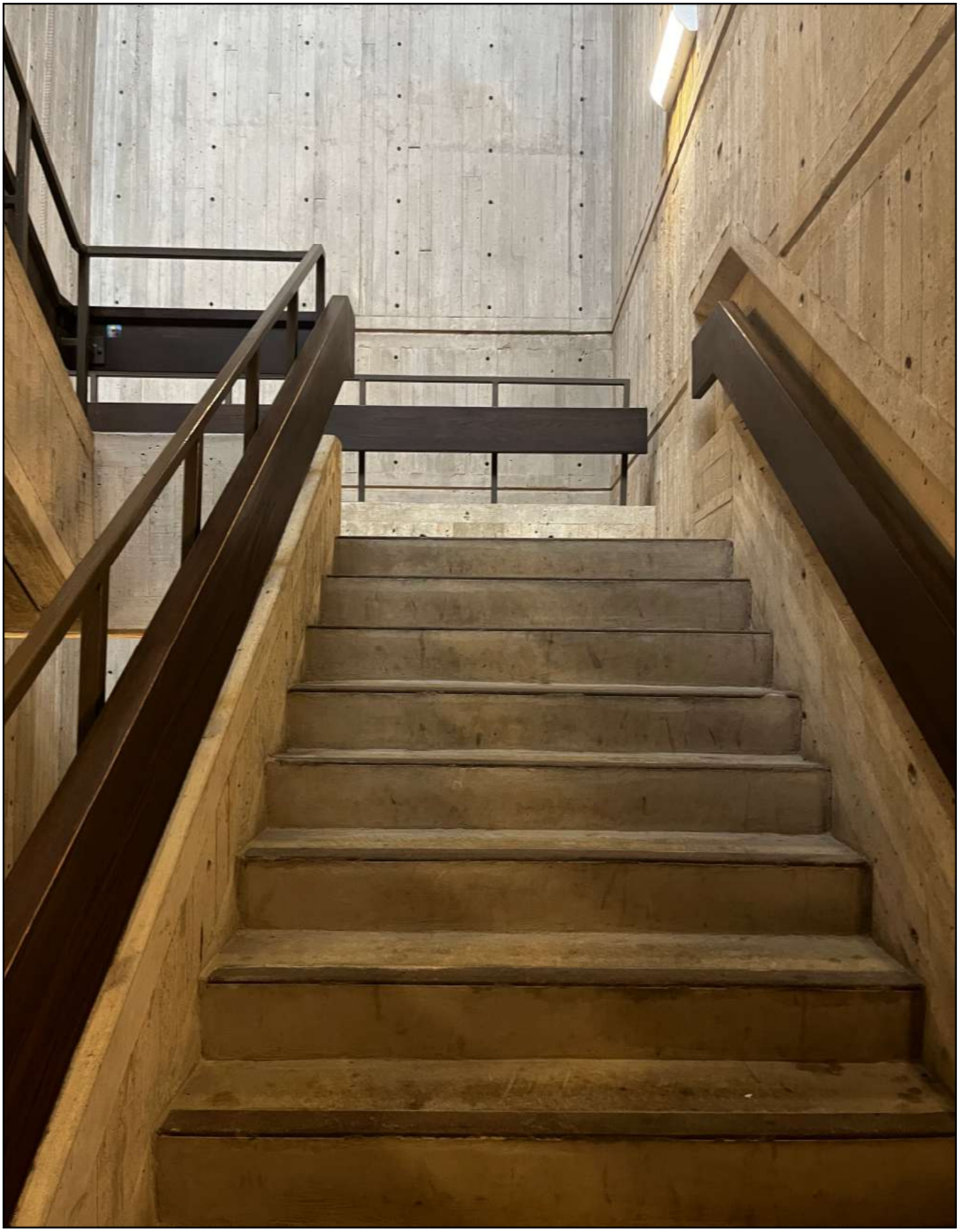
FOLSOM LIBRARY STAIRS

DIGITAL CONSTRUCTS 2 SPRING 2025

The **Folsom Library Stairs** were the central part of this assignent, being documented, modeled, and abstracted in several different ways.

The first part of this project centered around documenting this staircase, and drawing it in **plan and elevation views**, based on real-world measurements. Using these same measurements, a **cut view** of these stairs was made. From there, using those three drawings, a 3D model of this particular section of the staircase was made, then turned into an **axonometric view.** From there, the model of the staircase was **exploded** into all of its many parts.

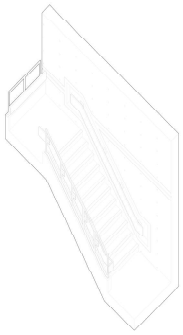
The second half of this project centered around **abstracting** these models into different forms. First, using abstracted elements of the exploded model, a design for a **physical model** was made. This file was then fabricated. Using the same model in different ways, along with the physical model, a **collage** was made, abstracting the staircase, its elements, and the model into a pattern of sorts.

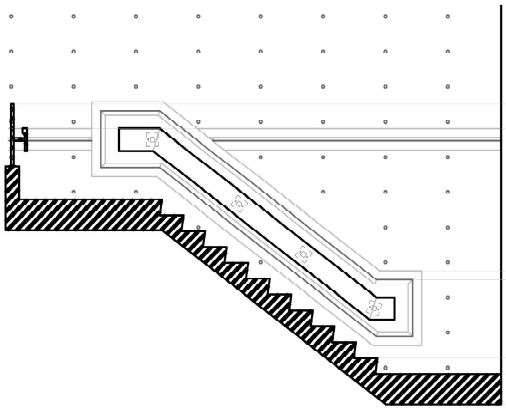


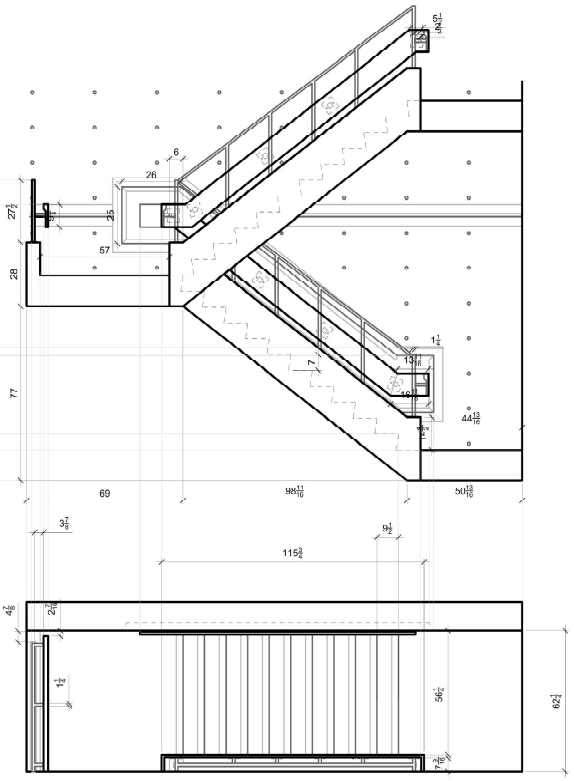
CUT, PLAN, AND ELEVATION

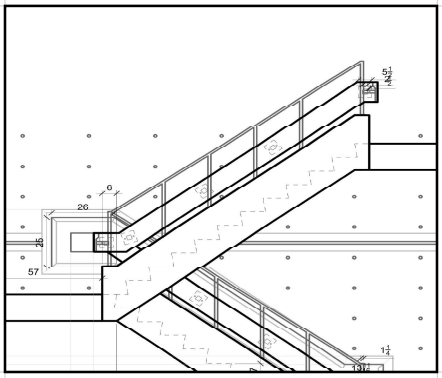
FOLSOM STAIRS PART 1

DIGITAL CONSTRUCTS 2 SPRING 2025







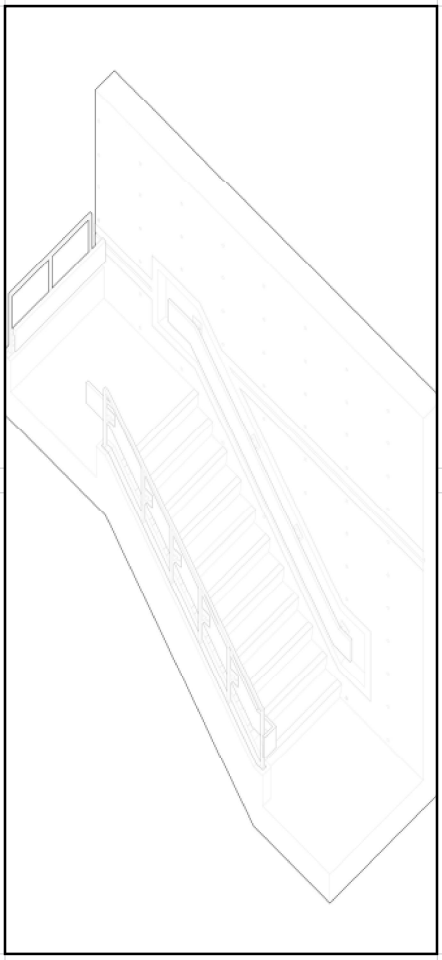


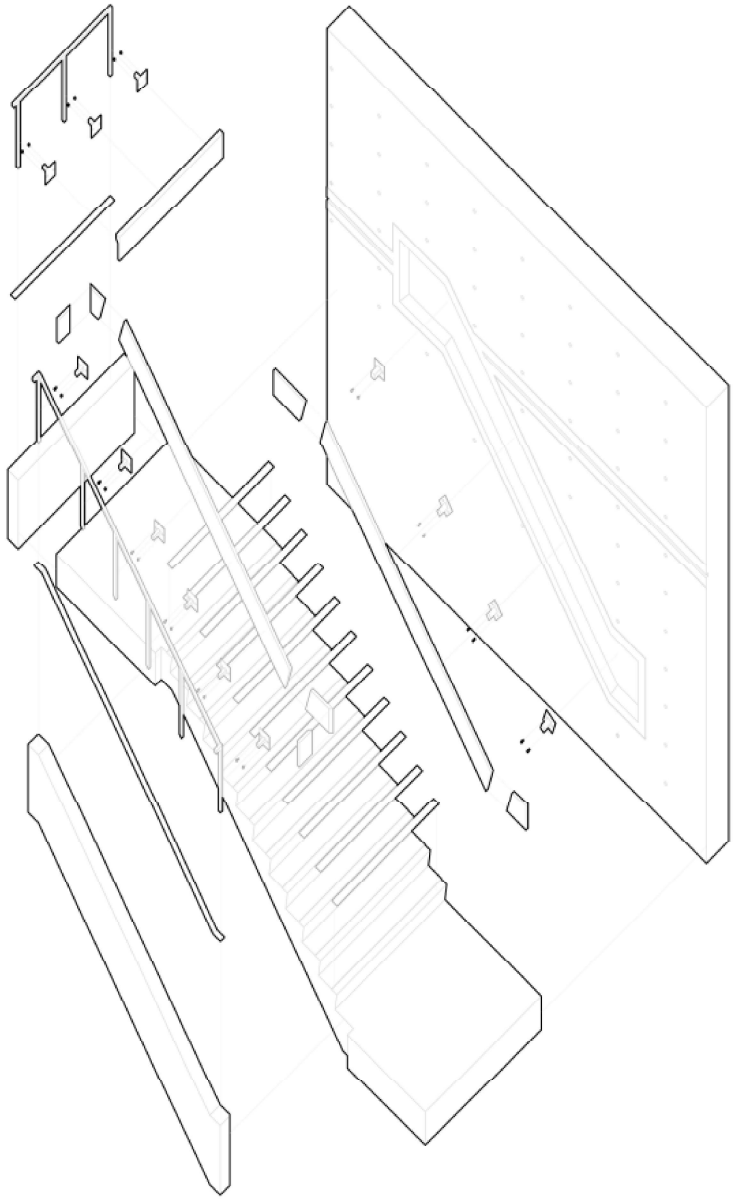
This overall project used similar techniques from the last overall project, however at a **much larger scale**. Instead of the small scale of a coffee pot, this project centered around an entire staircase on RPI's campus. This particular staircase is in the Folsom Libary, travelling from the third to fourth floor. For this assignment, the stairs were documented in **plan, elevtion, and cut**. The bounds of this project were much less concrete, ironically, and there were creative liberties as to how much of the staircase should be shown.

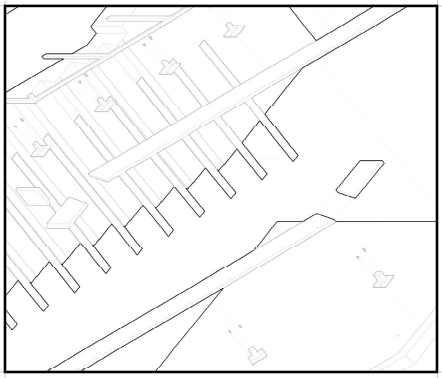
EXPLODED AXONOMETRIC VIEW

FOLSOM STAIRS PART 1

DIGITAL CONSTRUCTS 2 SPRING 2025





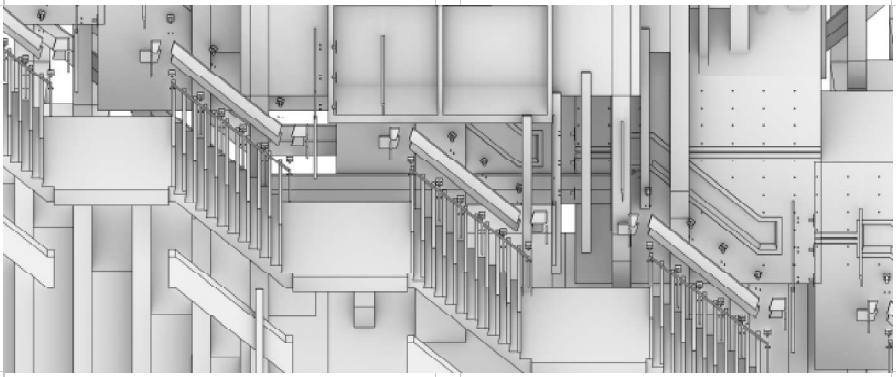


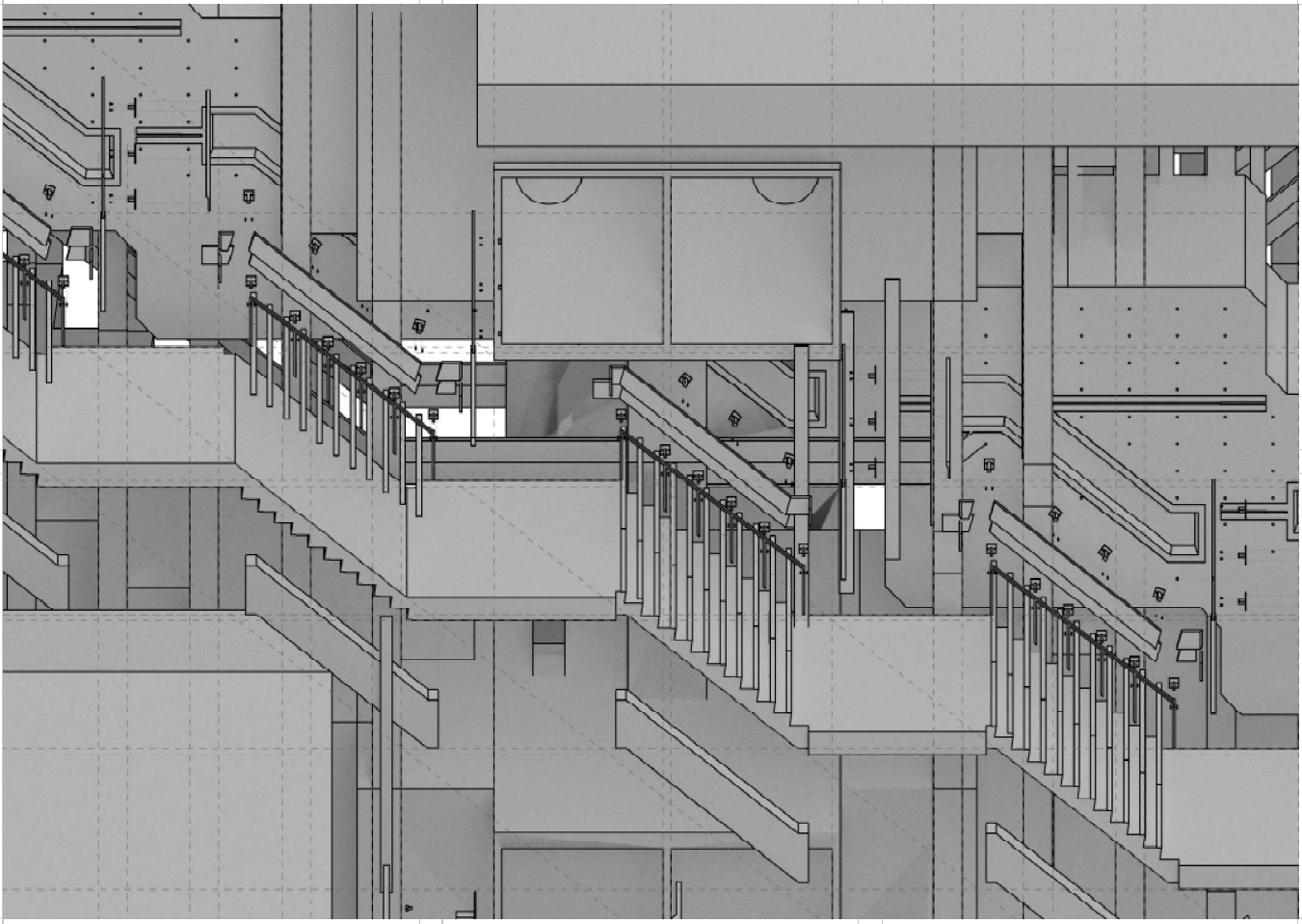
Once the staircase was documented, these cut, plans, and elevations were combined in 3D to make an **axonometric view**. Unlike the previous project, in which the 3D element did not need to be fully resolved, this assignment did, meaning every dimension had to line up. Once this 3D shape was made, it was then **exploded** into individual aspects, taking the bolts out of their holes, and the walls from their floors, showing a more **intricate representation** of its makeup.

BACKGROUND

FOLSOM STAIRS PART 2

DIGITAL CONSTRUCTS 2 SPRING 2025



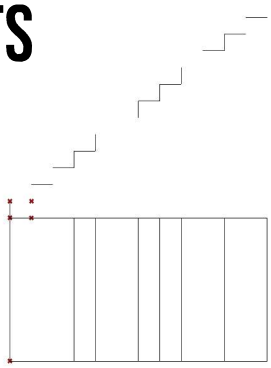


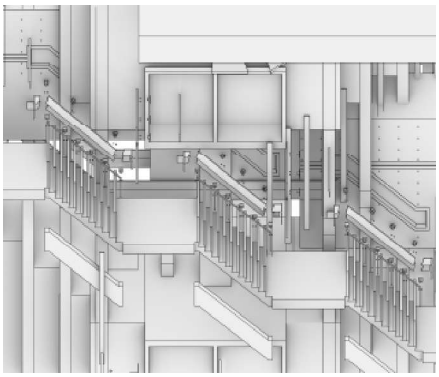
Using the elements of the axonometric and exploded axonometric models, combined with aspects of the physical model, an **abstracted background was made.** I wanted to focus on the **ascending** of the stairs, and highlighted the **orthogonal nature** of the building, juxtaposed to the angles of the stairs, to create something both **incredibly detailed** while also **very legible.** I also made the lineweights very thick in order to highlight the **bluntness and scale** of Folsom.

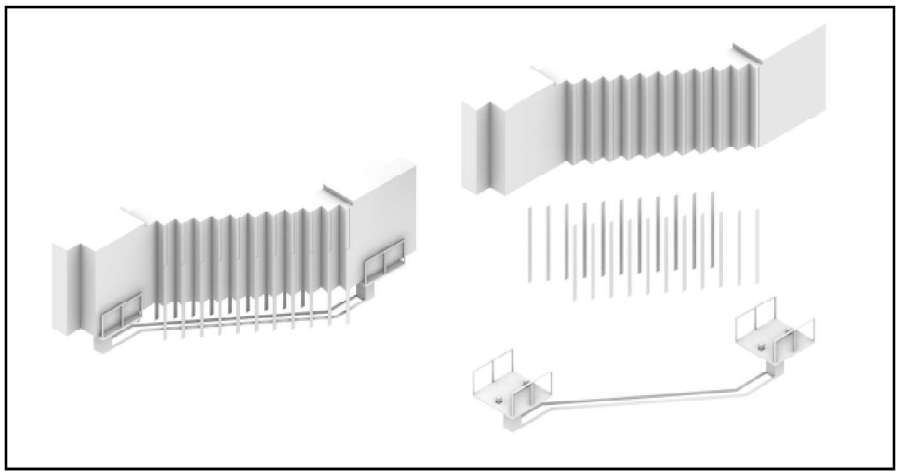
PHYSICAL COMPONENTS

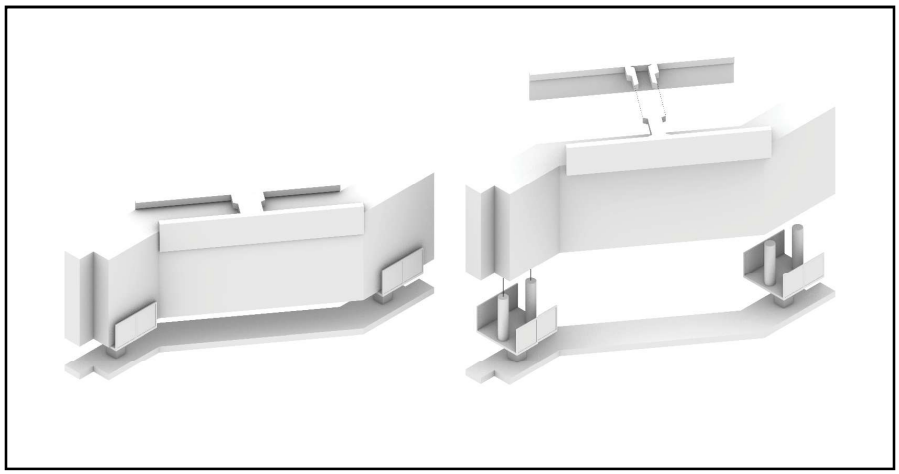
FOLSOM STAIRS PART 2

DIGITAL CONSTRUCTS 2 SPRING 2025









As mentioned in the previous project, certain elements of these stairs were abstracted in a different way to create a **physical model.** In this case, the walls were changed into a concrete block, the handrail as well as the supports were combined to make a base, and these two elements were combined so that they **interlocked** together. These were then fabricated using 3D printing and casting. I employed **highly-fabricated** aspects, like the base, in combination with entirely **hadmade** aspects, like the block to create a visually interesting effect where gravity seems to be **reversed.**

JOSEF ALBERS PAVILION

ARCHITECTURAL DESIGN STUDIO 1

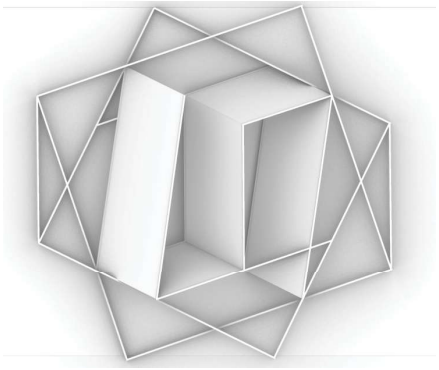
This assignment focused around abstraction of an art piece by Josef Albers into a **pavilion** that can be inhabitated by **one inhabitant.**

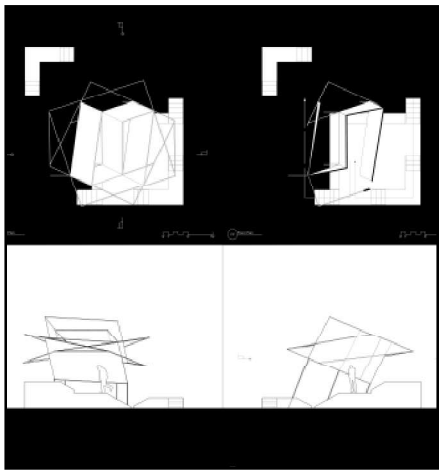
This assignment focused around abstraction of an art piece by Josef Albers into a pavilion. One of three images from *Transformations of a Scheme* was used to make three 3D sculptures. This sculpture was then changed into a pavilion, with a site and a circulation added afterward. This pavilion was then modelled in 3D. My project focused on the idea of orders and breaking orders as discussed by Robert Venturi, and it incorporates this idea with the use of two orders, the one of the pavilion, and the one on the site, in juxtaposition, which creates interesting geometry and relations between the inhabitant and the project.

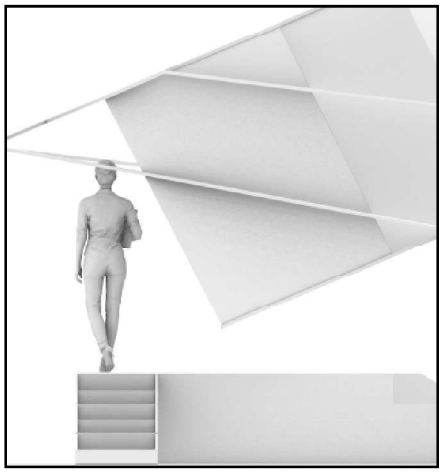
PAVILION

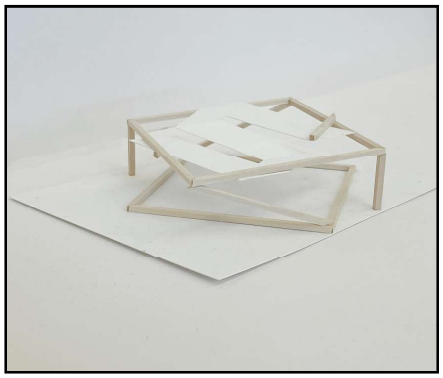
PROJECT 1

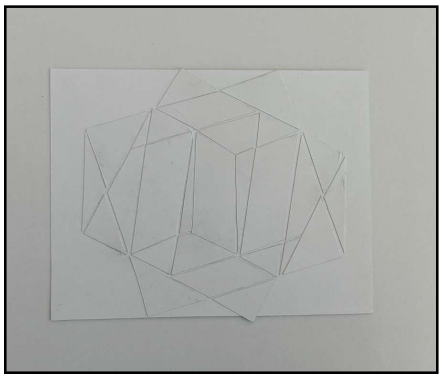
STUDIO 1 FALL 2024

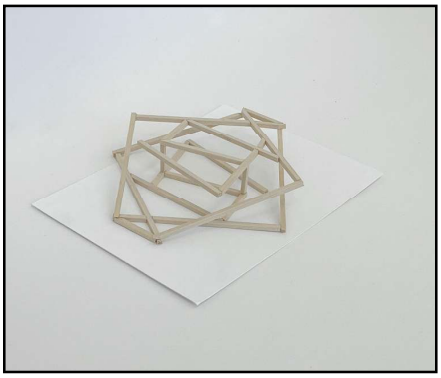












EARTHLY TECTONICS

ARCHITECTURAL DESIGN STUDIO 1

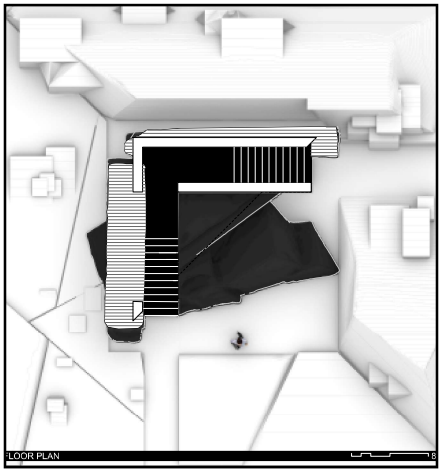
The second half of the semester for this studio moved onto a completely different project, centered around **rock formations** and making them into spaces inhabitable by **two inhabitants.**

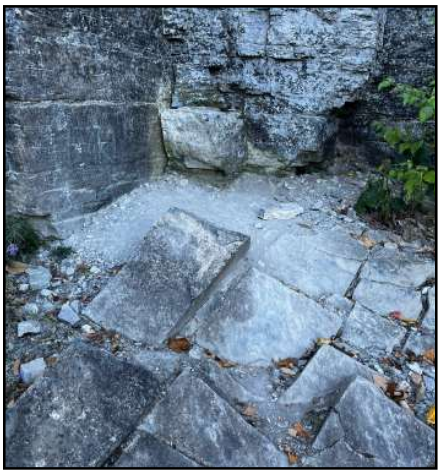
This project centered around the idea of balance. Midway through the semester, the studio went to **Indian Ladder Trail** to photograph rocks of different **typologies**, which they then modeled physically, then scanned to tranfer it digitally. Then, **interventions** using euclidean geometry were added to the rock to create a pavilion of sorts. I decided to use the rock type of **fallen rocks,** which created a unique effect where some areas were incredibly **dense** and others areas were incredibly sparse, which I reflected in the model, then the interventions had circulations that reflected these two effects, with one path being very claustrophobic and another being very open.

AN UNBALANCED BALANCE

EARTHLY TECTONICS

STUDIO 1 FALL 2024





LOCK E-17 BOAT/BATHHOUSE

ARCHITECTURAL DESIGN STUDIO 2

This studio's overall project centered around **stickers**, **vector/containment spaces**, and using that to create a building on the Erie Canal's Lock E-17 in Little Falls, NY, combining the interior programs of a **bathhouse**, a **boathouse**, and **lodging** with an exterior of **castle/bunker goemetry.**

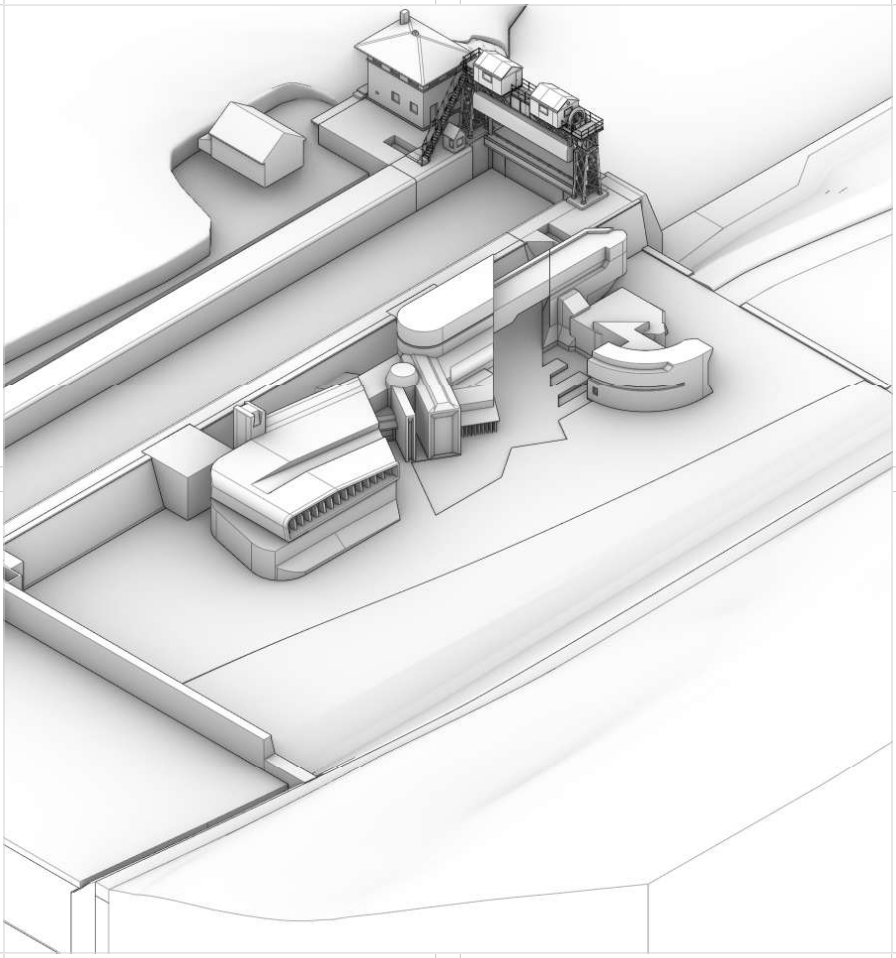
The project began by modelling images with bunker/castle geometries and combining them in various ways. Eventually, the studio made their own **stickers**, which were then combined with each other to form an **overall massing.** This massing was then extruded and shaped to the bunker/castle geometry. The same principal of stickers was then applied to the **floor plan** and the **section cut,** which created plans similar to those of castles. This project is intended to be used as a **bathouse**, **boathouse**, and **lodging** for people along the **Erie Canal**, in an attempt to revitalise it.

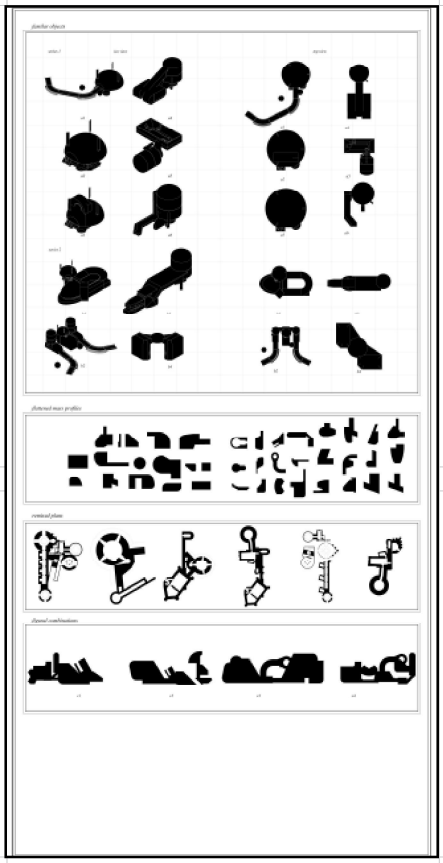

NO PARKING
ANY
TIME
ROAD
CLOSED

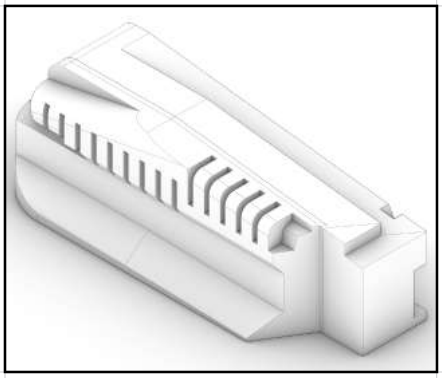
MASSING AND PARTI

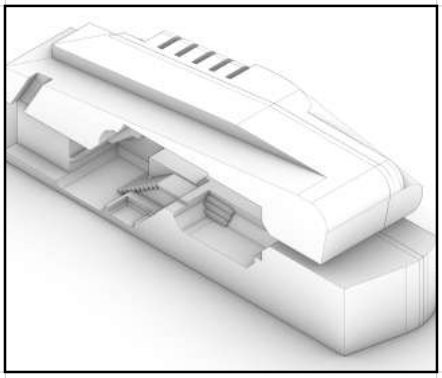
LOCK E-17 BOAT/BATHHOUSE

STUDIO 2 SPRING 2025





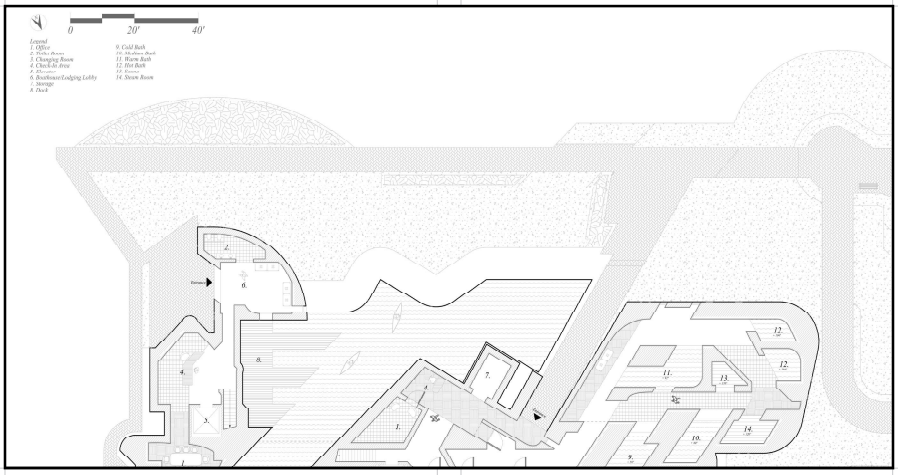


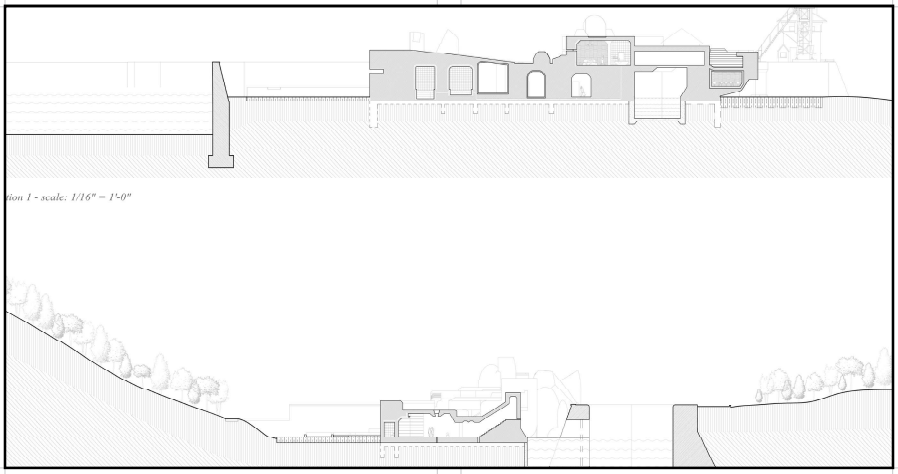


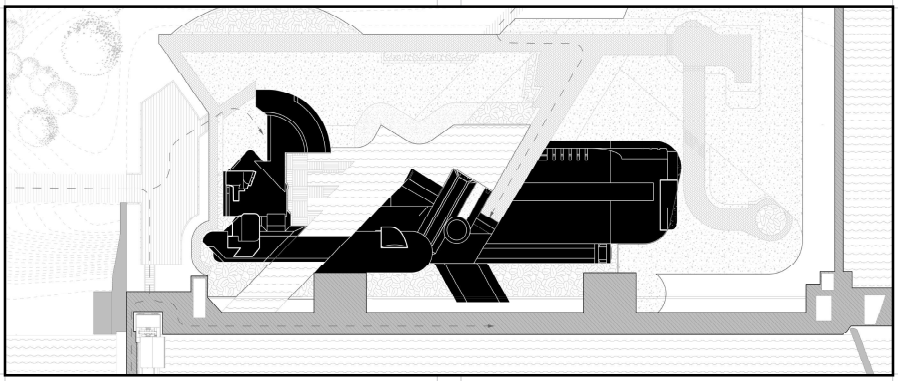
PLANS AND SECTIONS

LOCK E-17 BOAT/BATHHOUSE

STUDIO 2 SPRING 2025



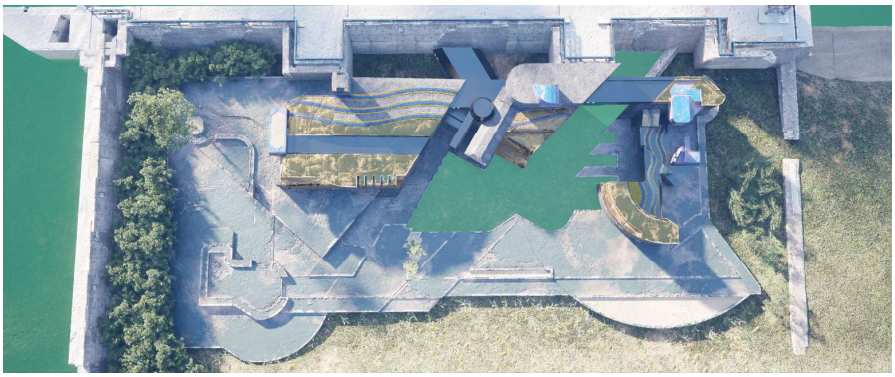


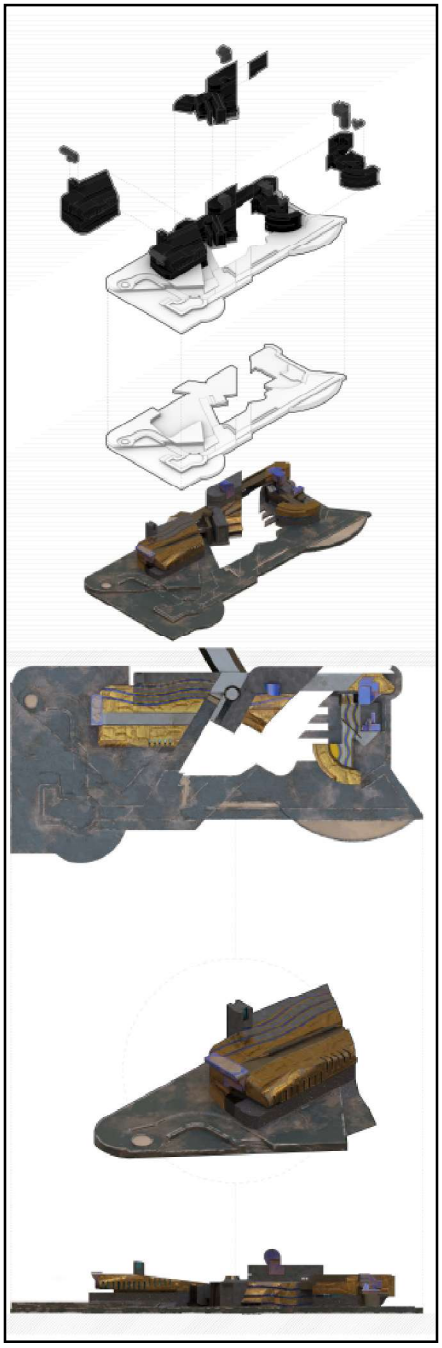


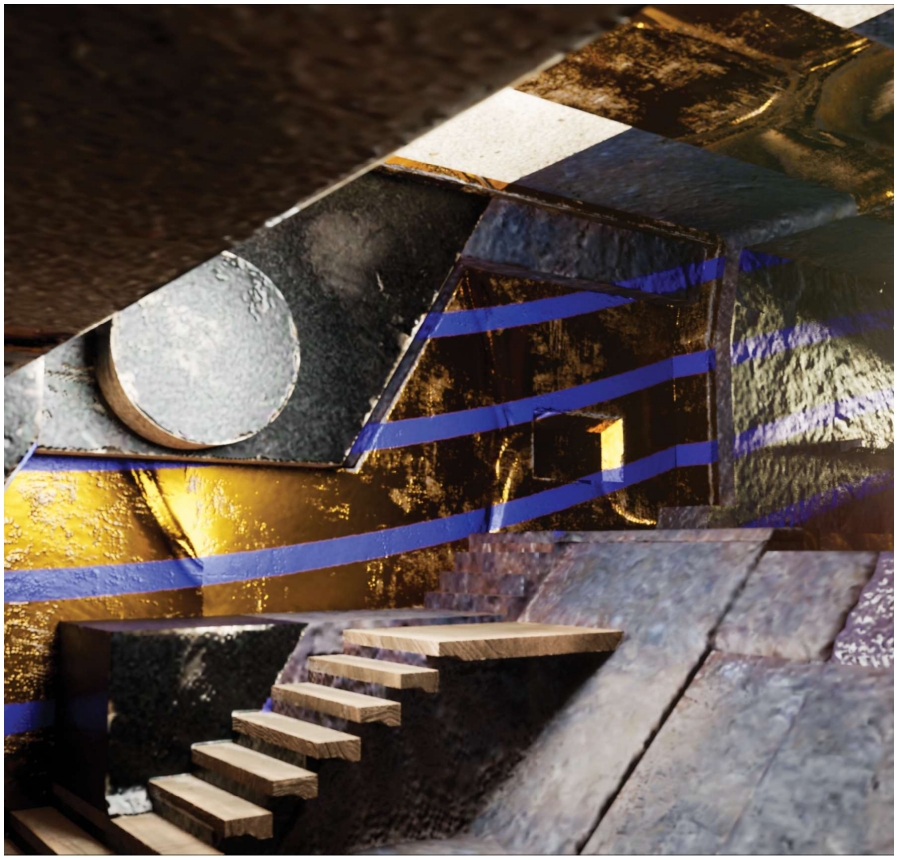
RENDERINGS

LOCK E-17 BOAT/BATHHOUSE

STUDIO 2 - SPRING 2025



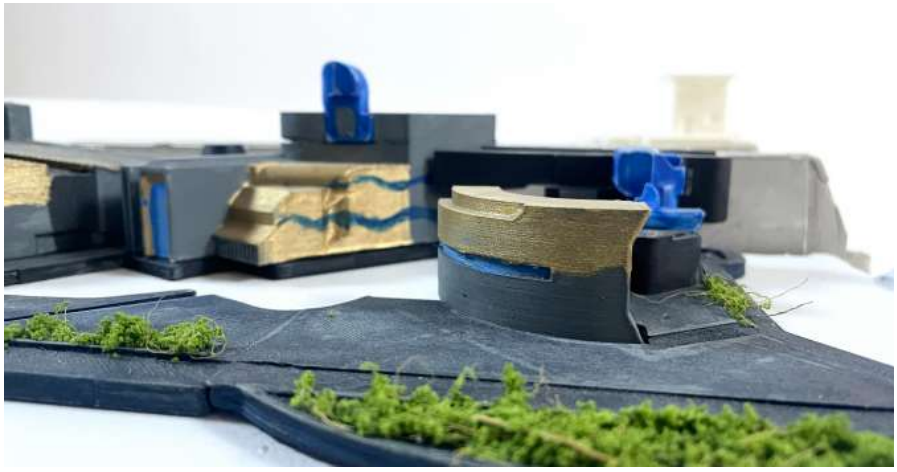


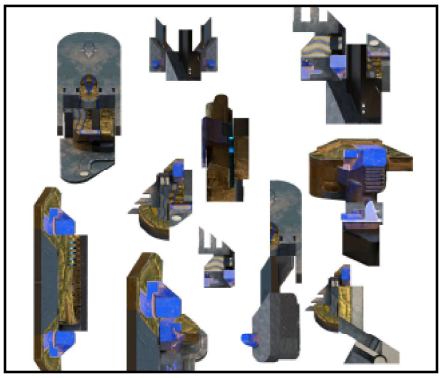


PHYSICAL ELEMENTS

LOCK E-17 BOAT/BATHHOUSE

STUDIO 2 - SPRING 2025





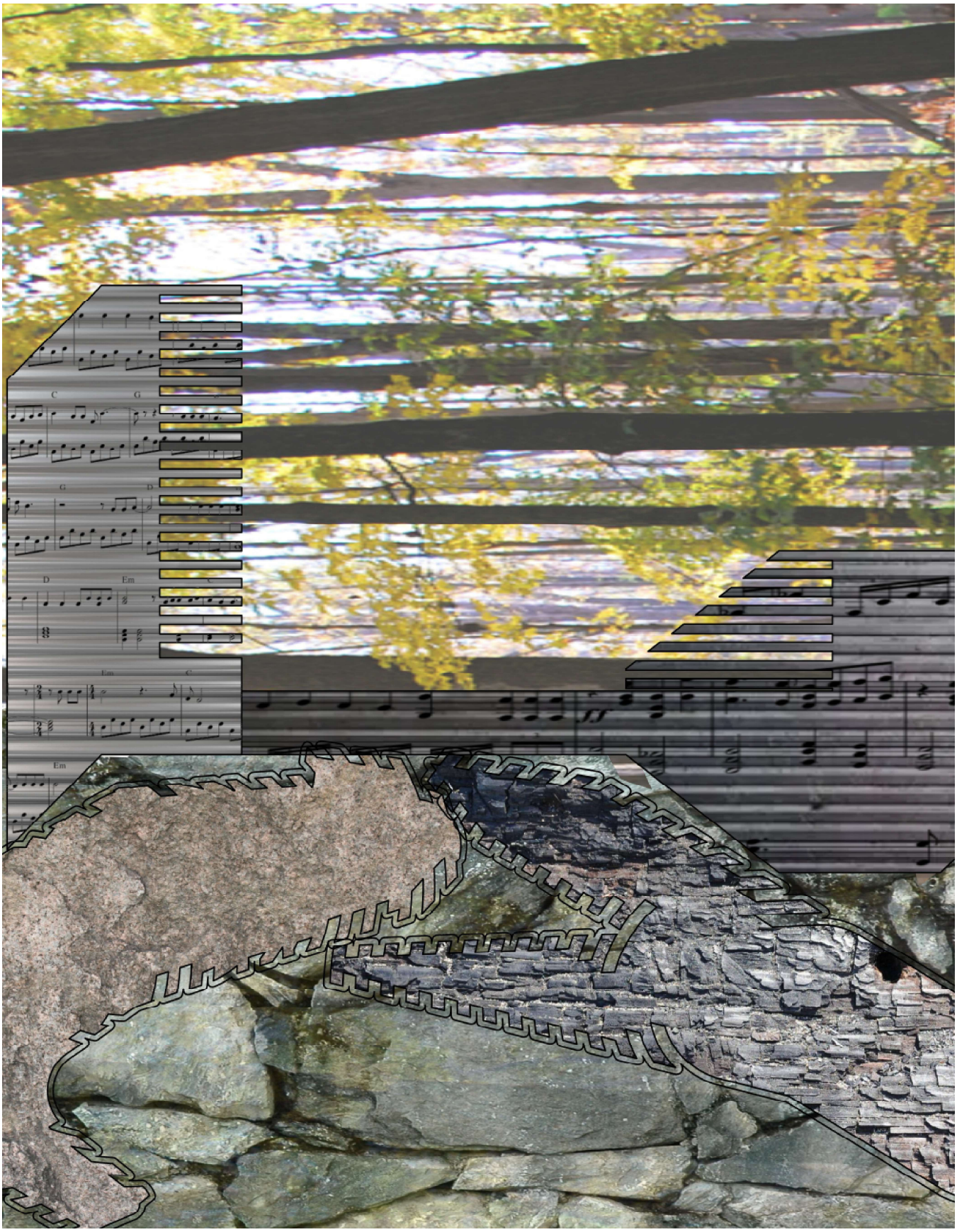
A **visual aesthetic** was applied to the previous model, in this case one of **Hokusai / Hiroshige block paintings,** and this aesthetic evolved when we were adding textures onto our model, where I employed a color palette and aesthetic very similar to those patterns. In regards to the textures, I also incorporated another idea from earlier on, being the use of vector and containment spaces. Ironically enough, this reminded me of fashion, and how these ideas are employed less directly in color choices, with items like **shirts or shoes** being the **containment** spaces, and the in-between items like **pants** being **vector** spaces. With my bathhouse being a much more spread-out building, these spaces are both employed, and were represented with a similar philosophy in regards to texture; the more distinctive pieces were highlighted with gold and cobalt, whilst the "pants" of the building were subjected to a darker, less noticeable texture.

ART GALLERY

ARCHITECTURAL DESIGN STUDIO 3

This year focused on studying existing **art galleries** across the world to use as a **precedent** to design a new building, featuring **educational** space, **community** space, and a **gallery** space**.** This building would be placed on the site of **Manitoga**, home of the **Russel Wright Design Center** in Garrison, NY**.**

The first step of the project involved picking a art gallery as precedent, making graphs and models analysing the structure, lighting, program, circulation, and more. Then, tectonic nuggets would be made out of abstracted ideas and geometries from the precedent. These nuggets would then be abstracted into 3 schemes for a potential building on this site. One of these schemes would be chosen to continue as the final product.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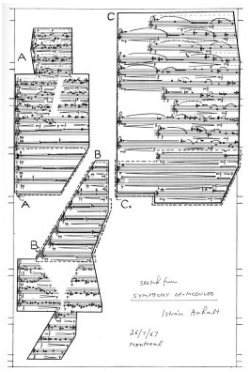
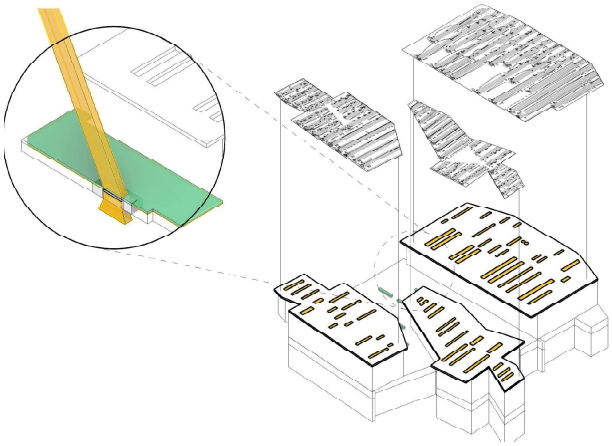
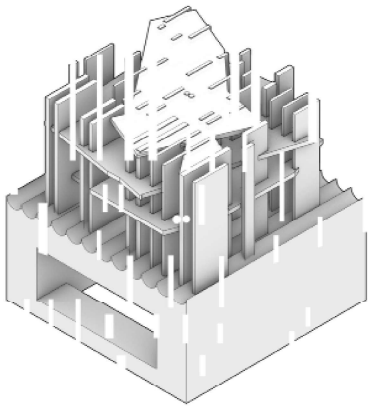
GENERATIVE ANALYSIS

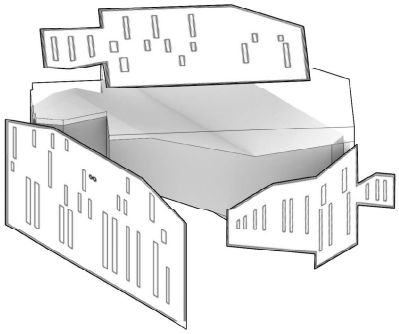
ART GALLERY

STUDIO 3 FALL 2025









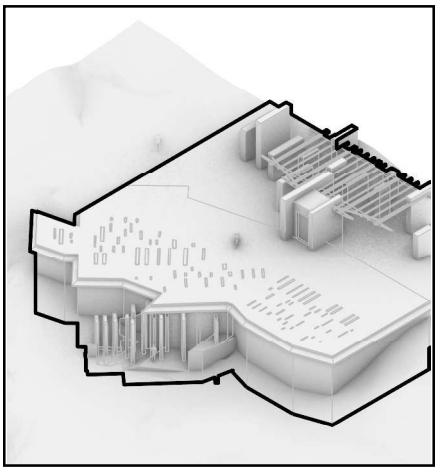
The precedent I chose was the **Daeyang Gallery and House** in Seoul, Korea by Steve Holl. The entire building was a metaphor for **'Symphony of Modules'.** In that case, the three modules represent different types of music, being pre-recorded, live, and improvised pieces. The artist believed the "art" is the **combination** of them all, so the three modules rise aboveground and the art gallery is underneath, the space between them. In my nuggets, I chose to abstract this metaphor by having a form created from the three module **profiles**, with a cap to serve as the "horizon". The second abstracted how the the "**notes**" on the roof protrude in the context of music but "cut" in the building.

ANDREW FERRANTE

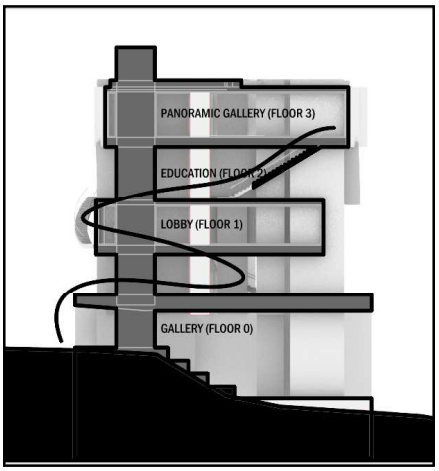
INITIAL SCHEMES

ART GALLERY

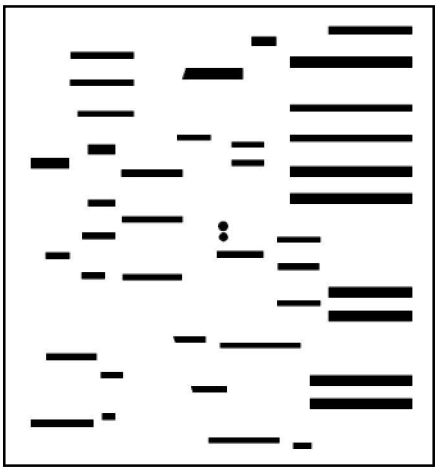
STUDIO 3 FALL 2025



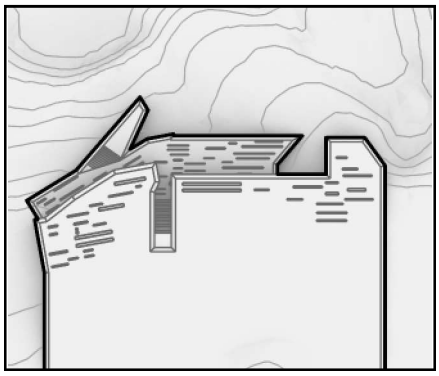
The first scheme was meant to be a venn diagram of the designs of the Russel Wright Design Center and my precedent, taking these three modules and embedding them in the hillside, with skylights cutting through the terrain of the roof, in which you would be able to walk upon. It also uses the notes and both a hole and a protrusion.

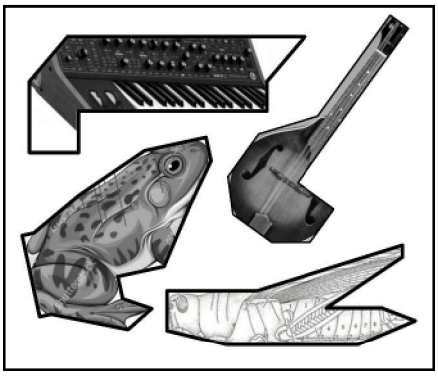


The second scheme took the design of one of the nuggets and turned it into an architectural forest, where the notes appear like the trees across Manitoga. Using the trees as support, three floors would be suspended through this forest. The guests of this museum would weave in and out of doors to arrive at a panoramic art gallery looking above the entire site.

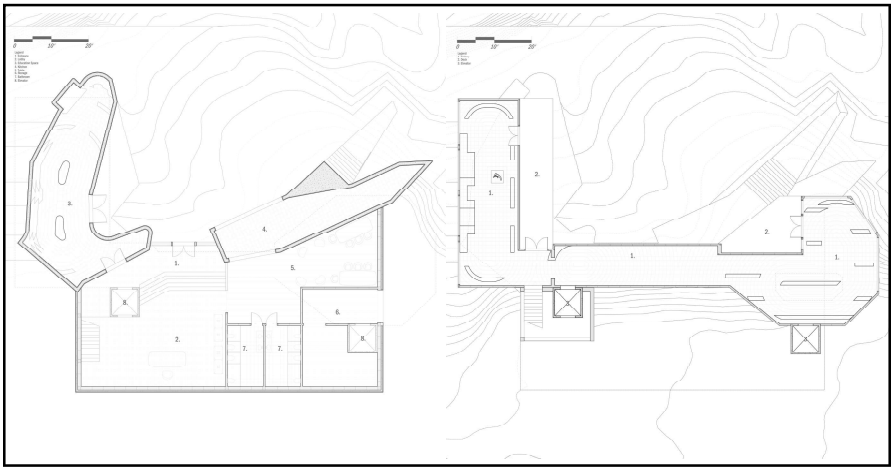


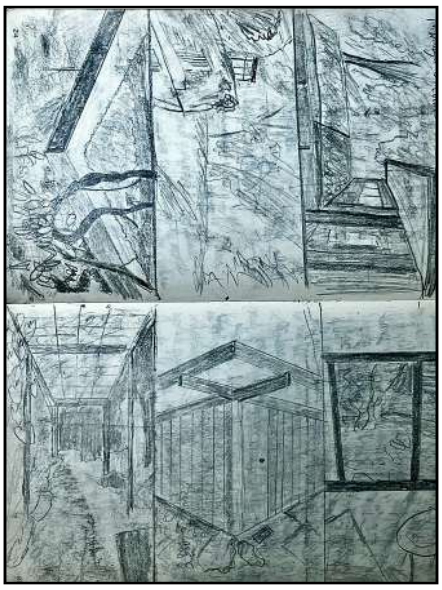
I researched art that had been displayed/performed at Manitoga and I found a piece entitled "Secret Sounds of Lost Ponds", in which artists with mandolins and keyboards played alongside frogs and crickets. I tried to abstract this idea into a building similar to my precedents.

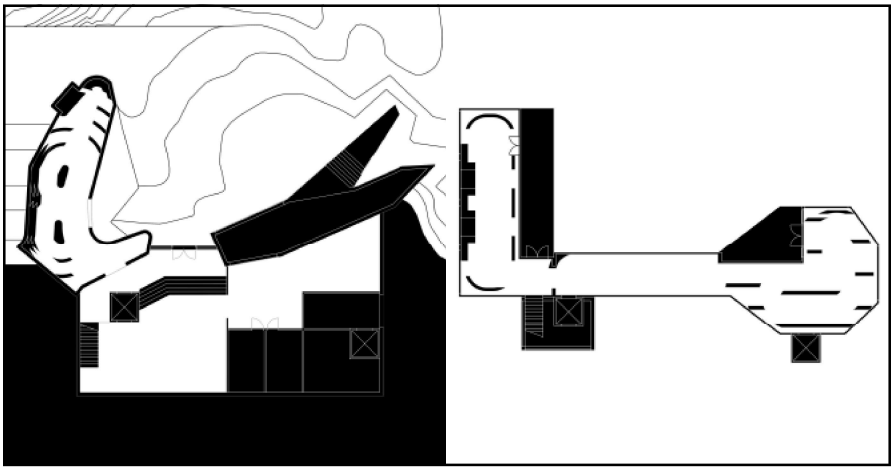


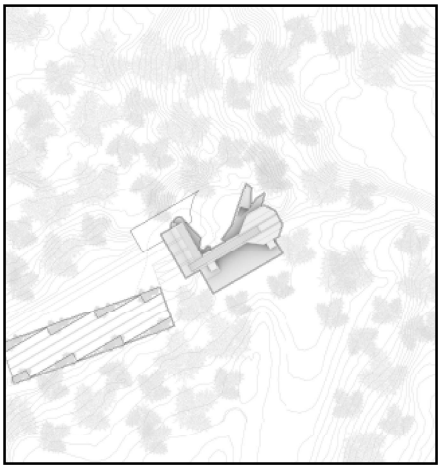


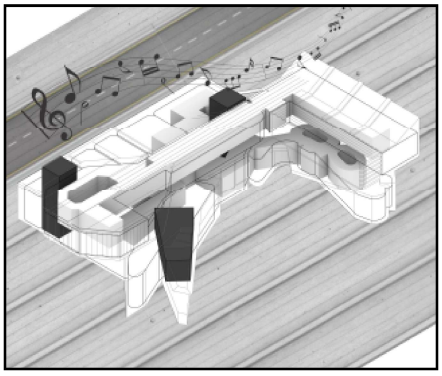
DRAWINGS
ART GALLERY
STUDIO 3 FALL 2025

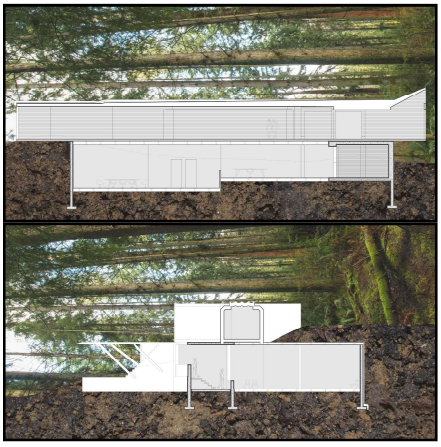








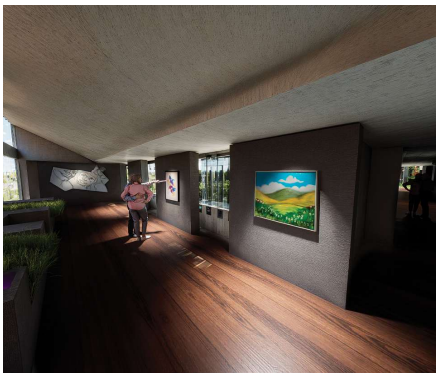




DELIVERABLES

ART GALLERY

STUDIO 3 FALL 2025



I moved forward with scheme 3, because I like the idea that the natural **fauna** serve as the **foundation**, and the '**art**' is what is **built upon** this natural base. So the community spaces and education on the bottom serve as the **foundation** for the art galleries on top. In addition, the profiles and plans on the bottom resemble the fauna of frogs and crickets, and the galleries above them are abstractions of a mandolin and a keyboard. The bottom space has a materiality of heavy, ruin-esque stone supporting the sharp, processed steel above. The interior spaces are organized with the bottom having a combination of inward and outward offsets to create natural-seeming patterns, whereas the top is the combination of outward emanating (to represent sound) and perpendicular lines (to represent sheet music). The building overall represents a **balance** between **natural** and **manmade**, and how each of them is strengthened by their context to the other. Without nature, we would have no art, and without art, we would be unable to realize the importance of nature.