

PENGYU PAN

PORTFOLIO

SELECTED WORKS

Columbia GSAPP · M.S.A.A.D · 2023 - 2024

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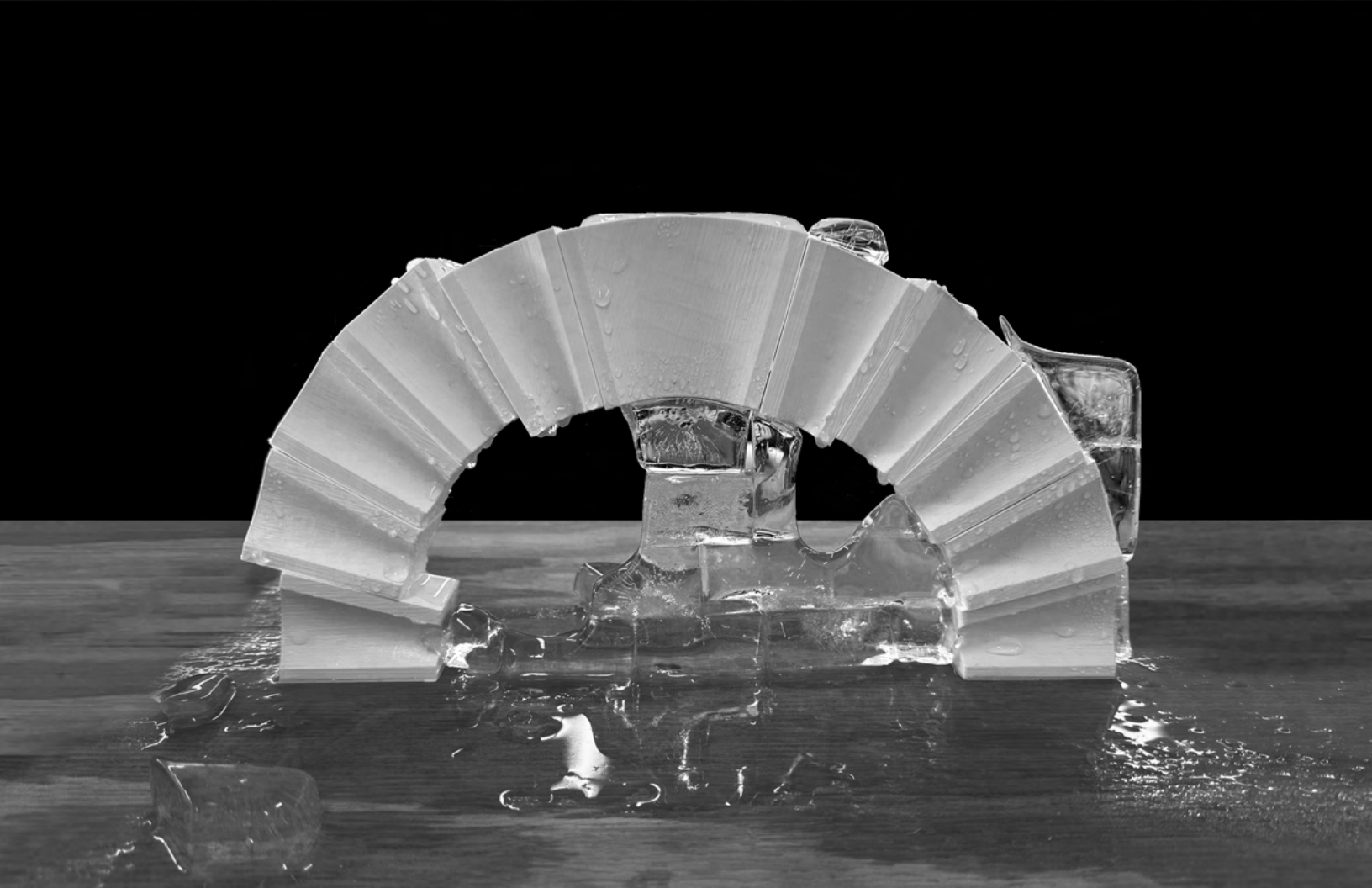
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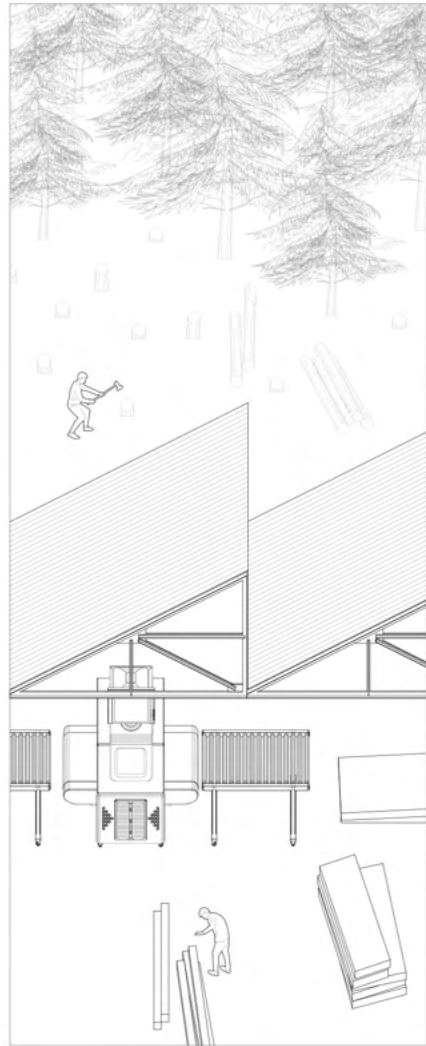


PROJECT 01

Stone matters

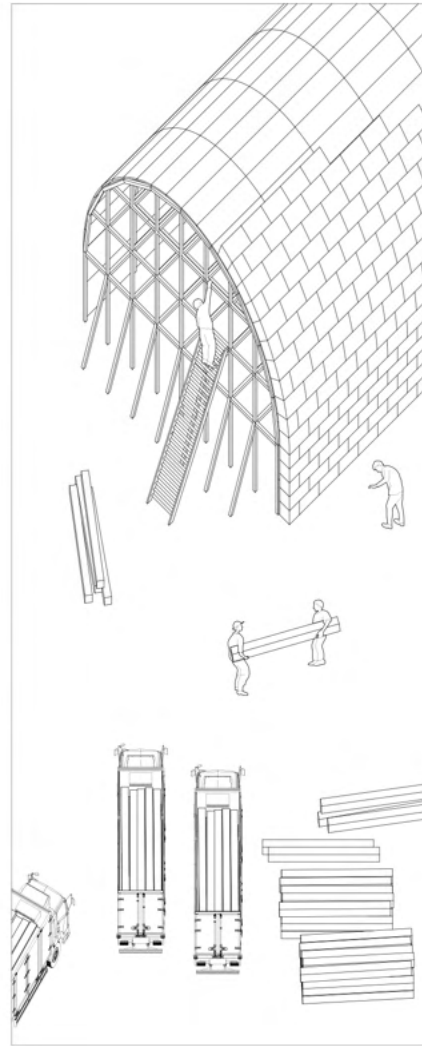
GSAPP Summer Design Studio
Group Work
Advisor: Yousef Anastas + Elias Anastas
2023. 08

We investigated using ice as an eco-friendly, recyclable formwork for large-span stone structures to reduce waste from traditional wooden forms. Ice is easily obtained, environmentally friendly, and melts away post-construction. Our research involved using uniformly shaped ice chunks as formwork, creating a novel masonry method. We developed basic building units by freezing stones in water, combining ice and stone. By mass-producing these units with designed interfaces and geometries, we efficiently constructed arches in a brick-like fashion. This innovative approach aims to revolutionize stone construction with minimal environmental impact, leveraging ice's natural properties for sustainable building practices.

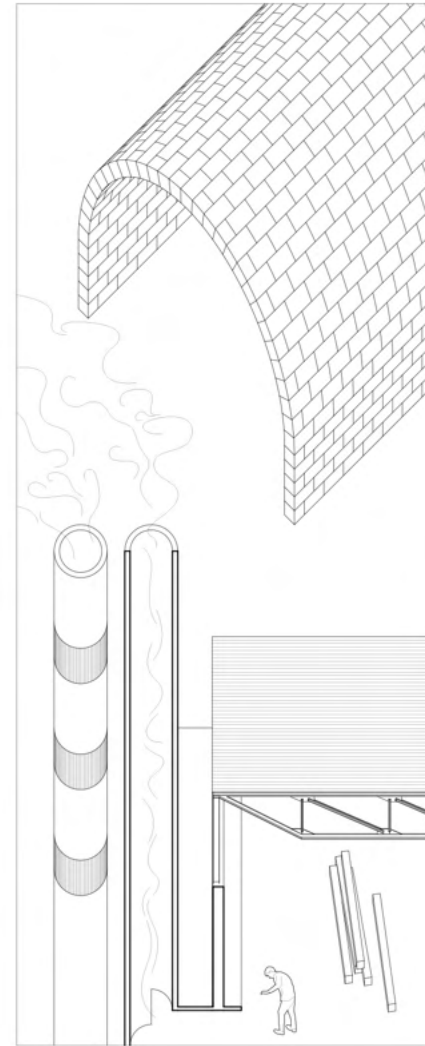


Tradition

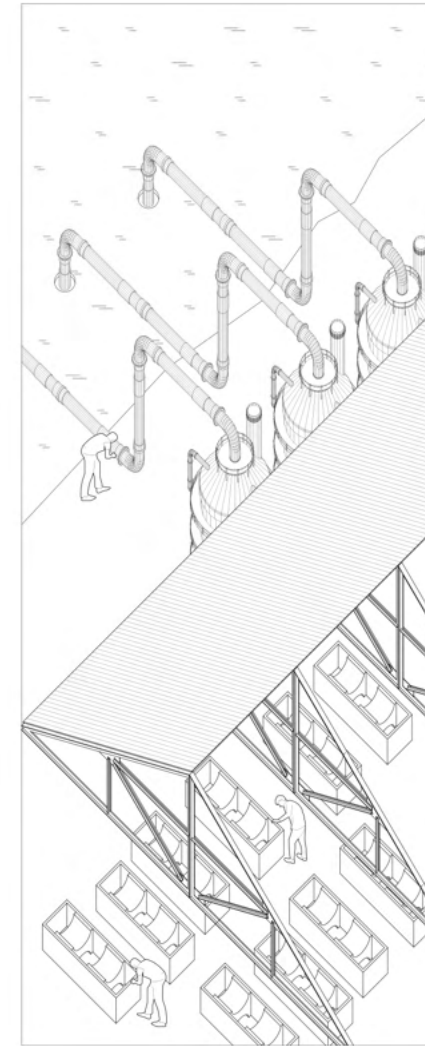
Workers cut down the trees and send the logs to the factory for processing, where they are cut into boards and columns. This causes irreversible damage to the forests.



The processed wooden columns as well as wooden boards were trucked by workers to the construction site and assembled into scaffolding and formwork. Workers follow the formwork to build the stone arch.

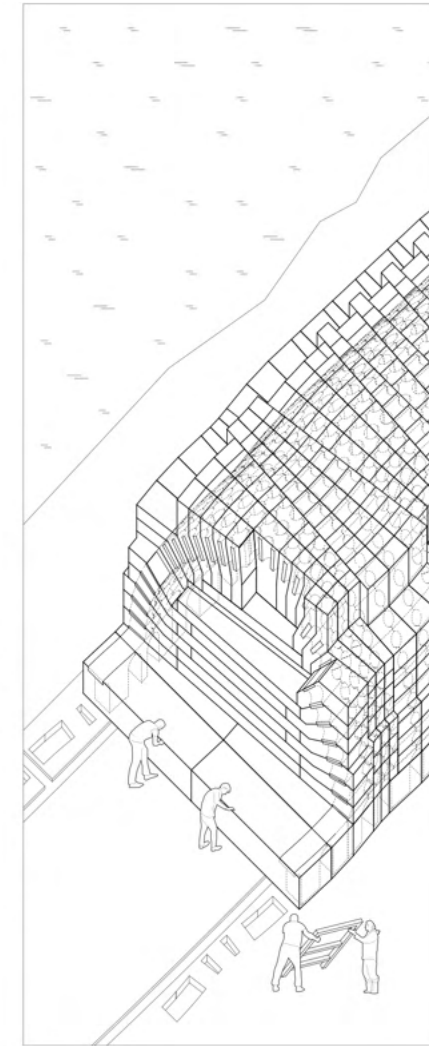


The timber, which had been used for scaffolding and formwork, could not be reused after its mission of building stone arches, so it was transported to a waste treatment plant to be burned.

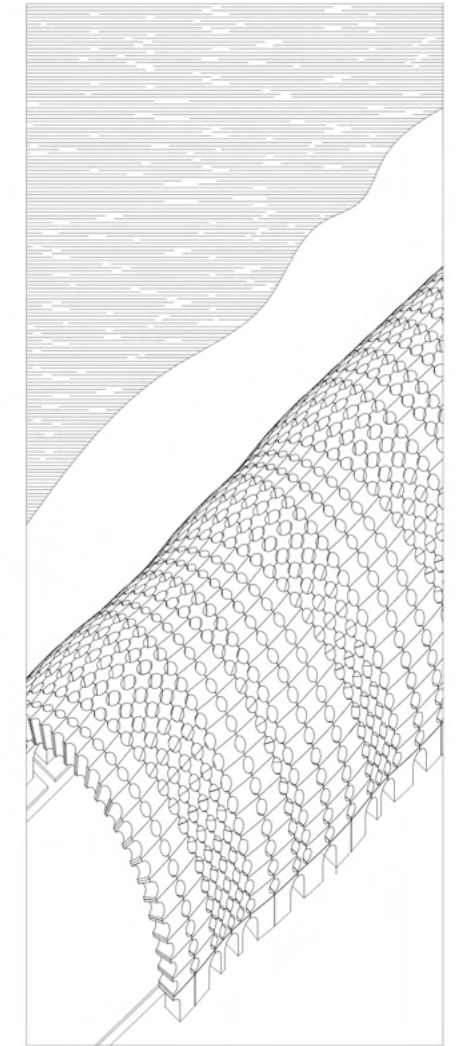


Proposal

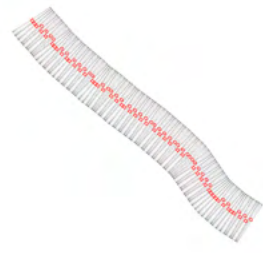
Workers use pumps to pump the lake water into storage tanks and purify it. And then, the water and stones are frozen in a freezer room to make ice bricks made of ice and stones.



In winter, bricks made of a combination of ice and stone are stacked by workers in designed positions following the construction logic of a brick wall. In the end, these bricks form a building in which ice and stone coexist at the same time.

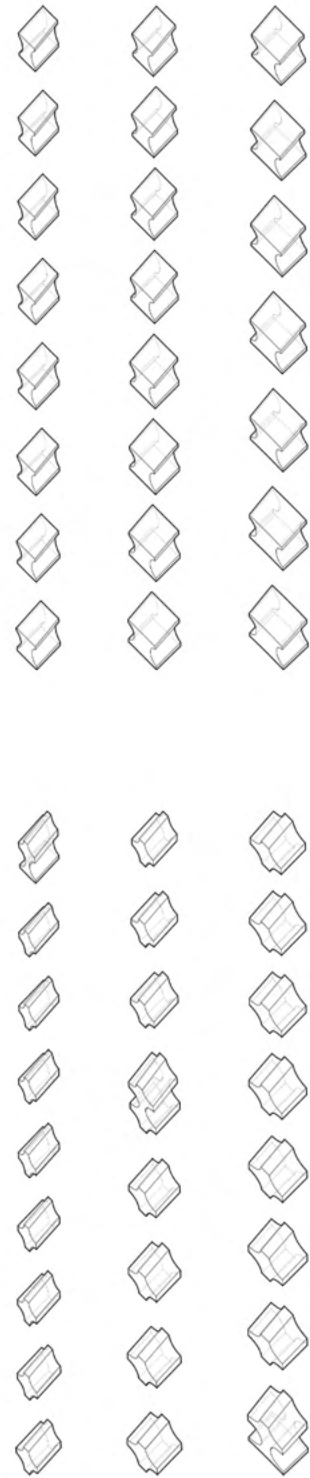
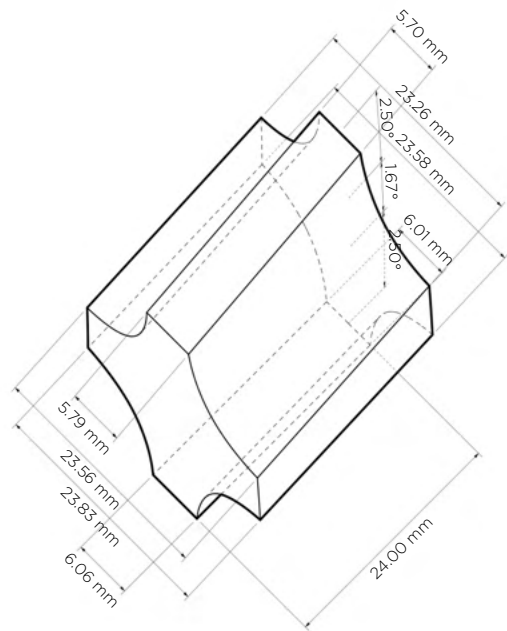
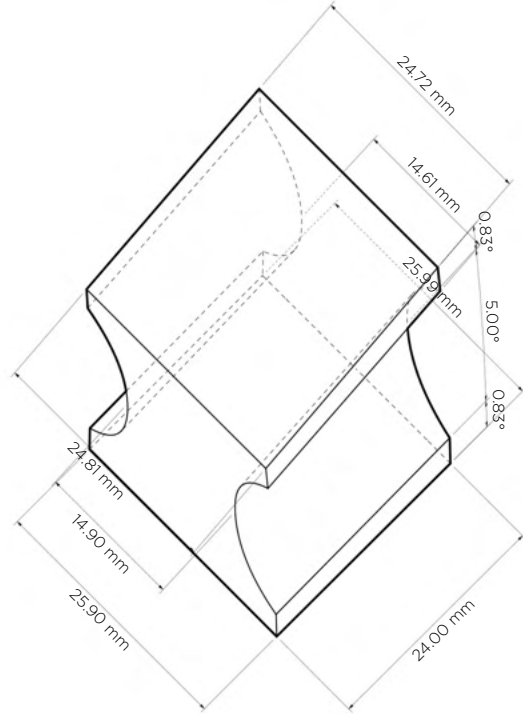


In summer, the ice formwork that originally supported the stone blocks gradually melted due to rising temperature, and eventually a stone arcade remained. On the day the ice ran out, the locals held a ceremony to celebrate the final manifestation of the arcade.



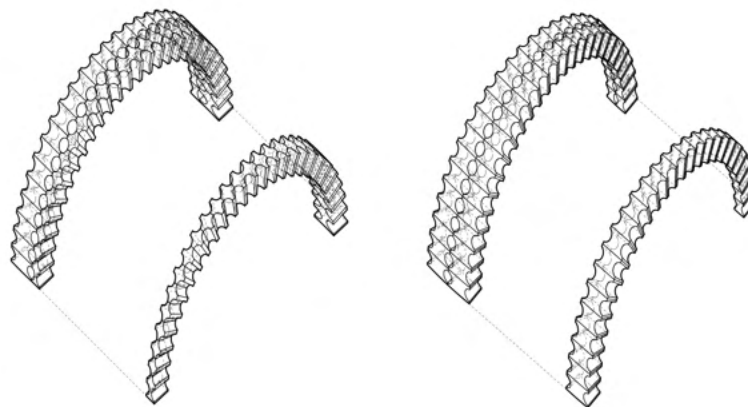
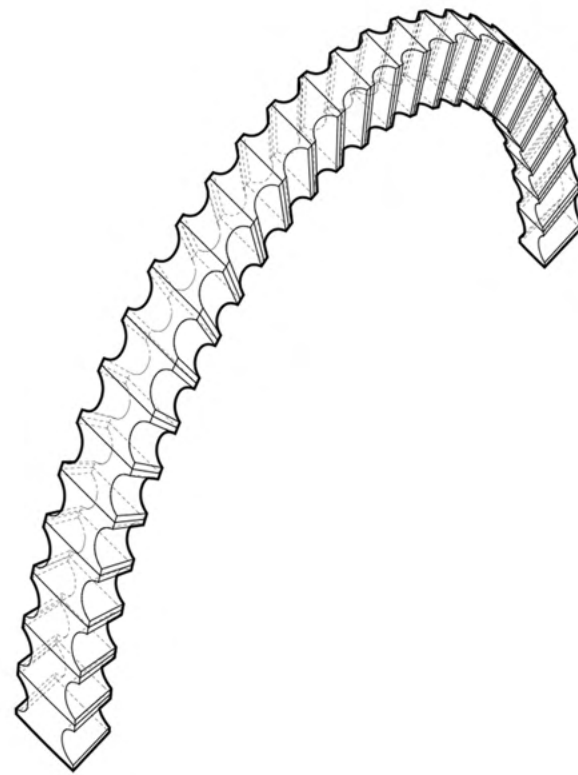
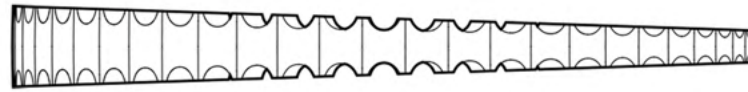
Units

Each arch unit consists of more than twenty stone block units. Each stone is logically identical in shape, and the concave portions of the stones are all designed so that the stones can interlock with the ice, allowing them to be blocked in. At the same time, there are slight variations in the size of each stone block, allowing the entire arch to form a wedge shape that is small at one end and large at the other.



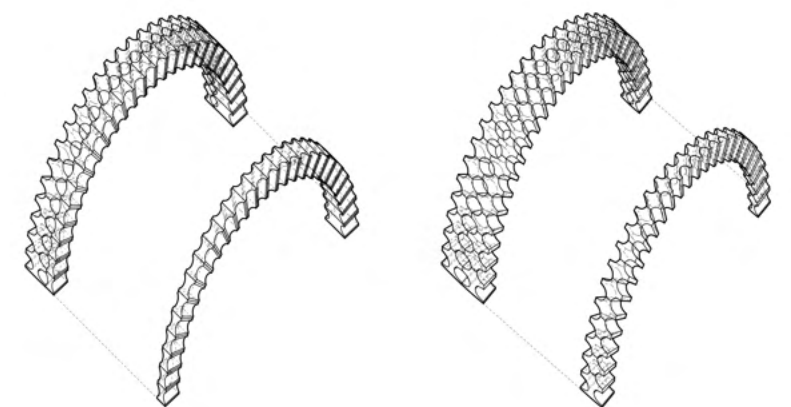
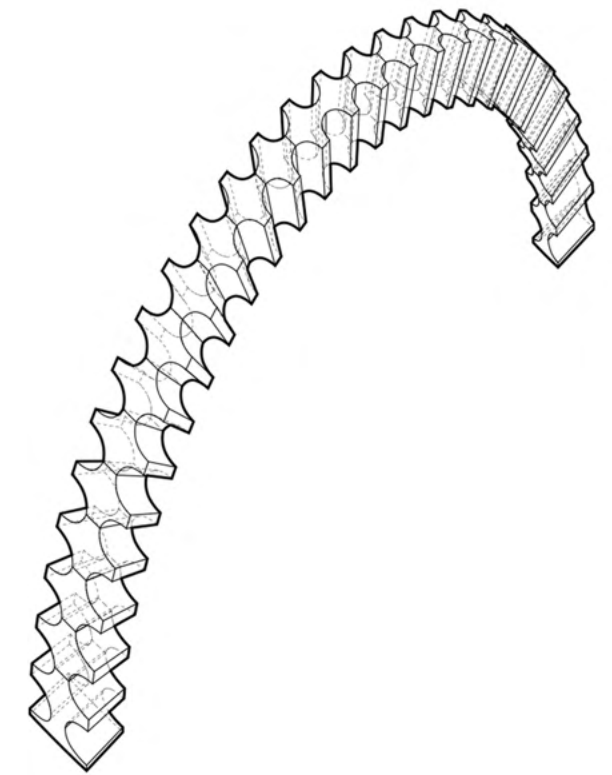
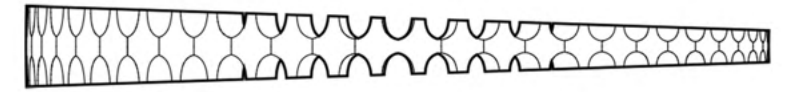
Arch A

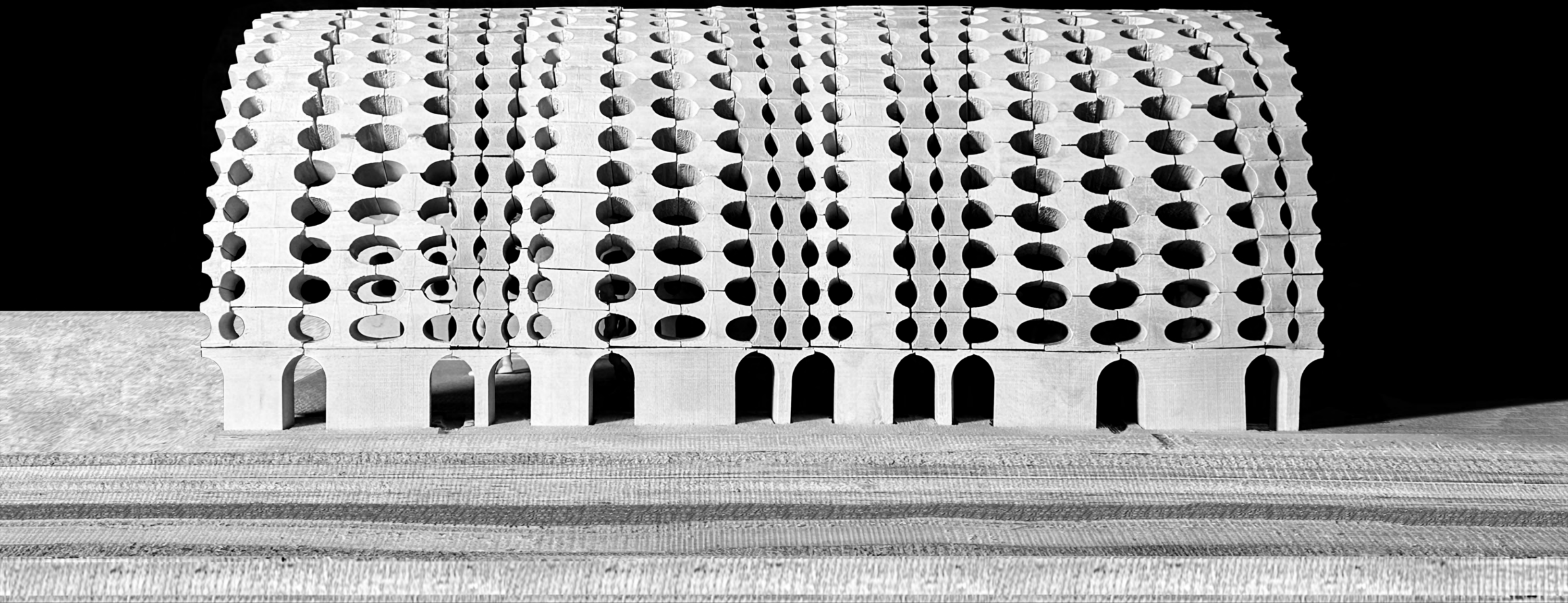
Arch A consists of "H" shaped stone units. Its connection with Arch A leads to a curved arcade, while its connection with Arch B leads to a straight extension of the arcade.



Arch B

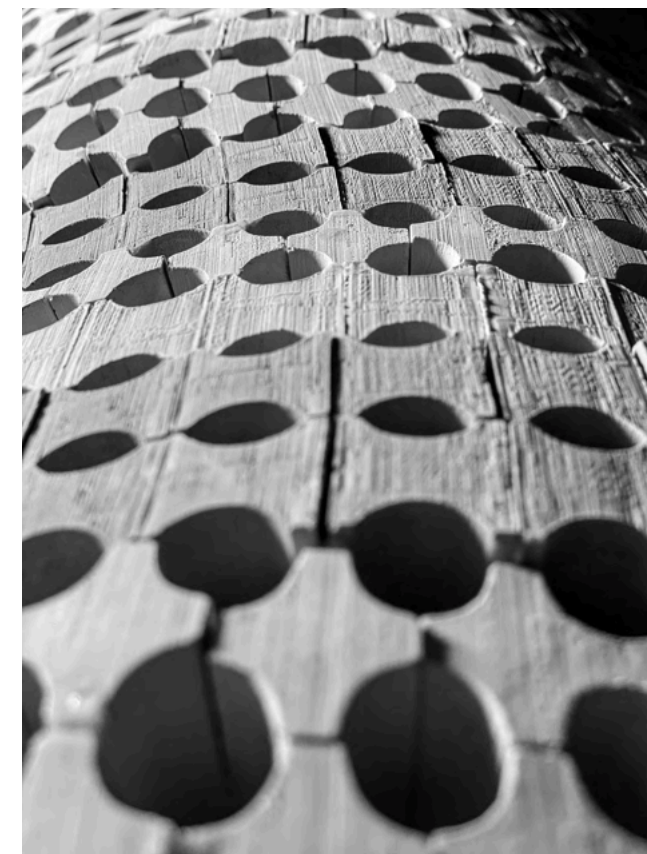
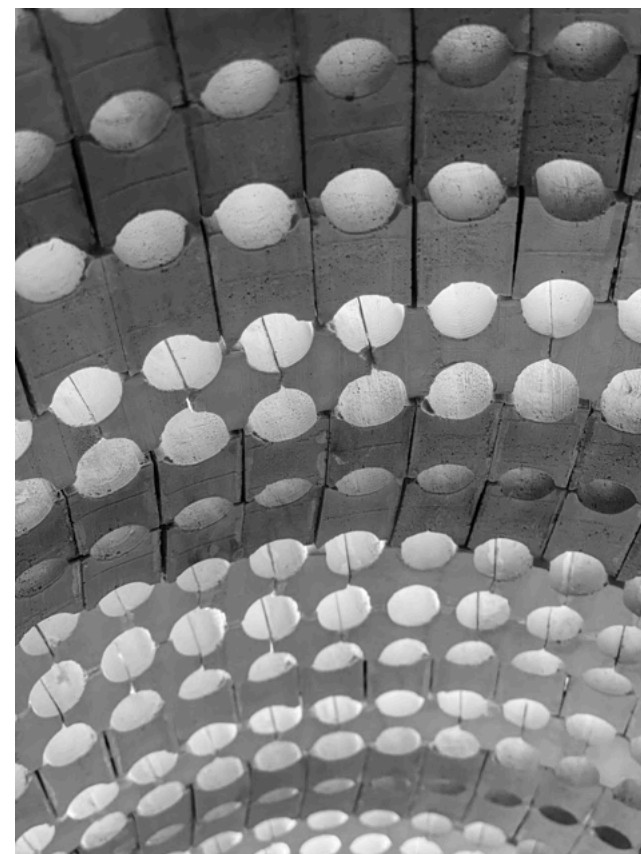
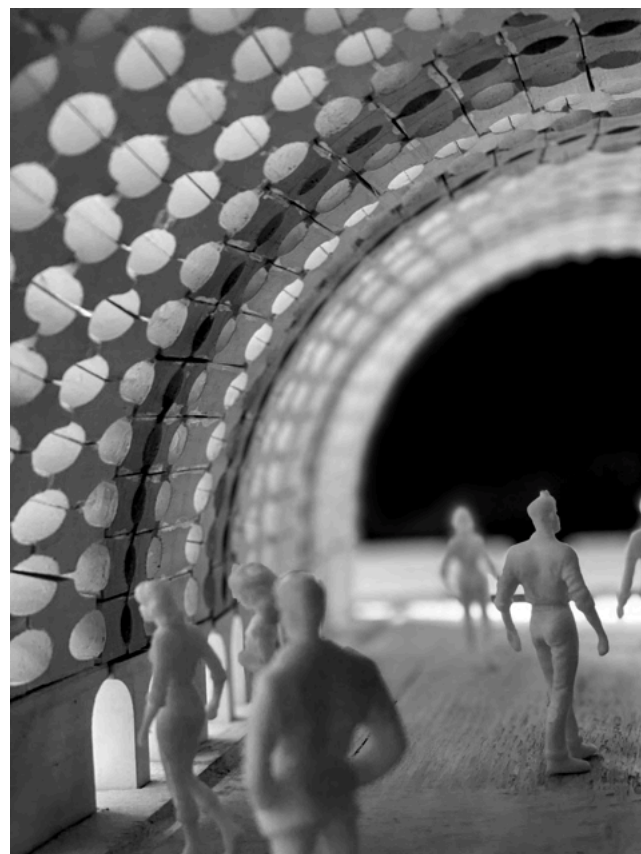
Arch B consists of "X" shaped stone units. It is connected to Arch B to guide the arcade in a curved direction and to Arch A to guide the arcade in a straight line. The simultaneous presence of these two different arches allows the contact surfaces of the stone blocks to be interlocked, thus increasing the structural strength of the entire stone arcade.





Facade

This is the final partial model. The building faces the lake and its form follows the irregular contours of the lake. As can be seen from the model photos, the entire arcade consists of two different arch units that are continuously reproduced according to a certain pattern, which leaves holes on the surface of the building of different sizes, but also with a sense of order.



Interior

Inside, people can see the lake and the sky above through the holes on the arcade. The sunlight can also enter the house through these holes, creating countless beautiful spots of light. People can sit down for a rest and chat, and at this time they can see the wider view of the lake through the low arches.

Detail

The holes on the arcade are naturally occurring due to the use of the new formwork material -- ice. At the same time, the holes vary in size, and the variation in their dimensions is due to the compliance of the arcade with the lake contour.

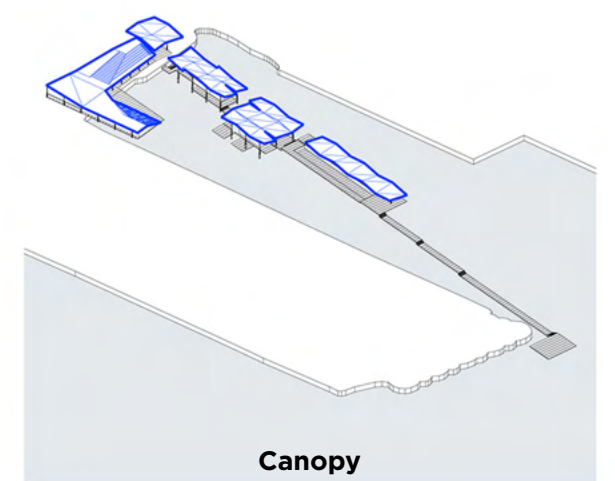
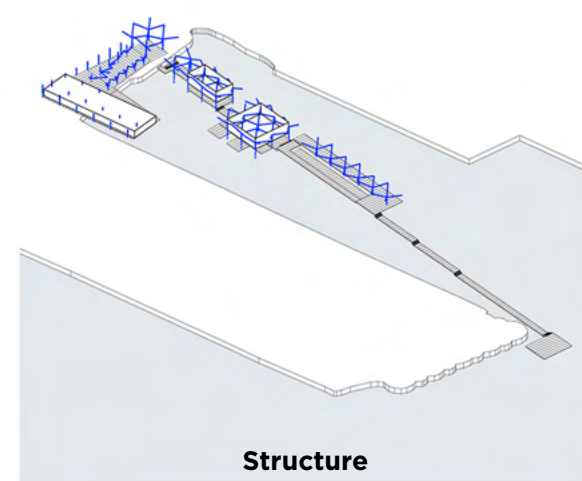
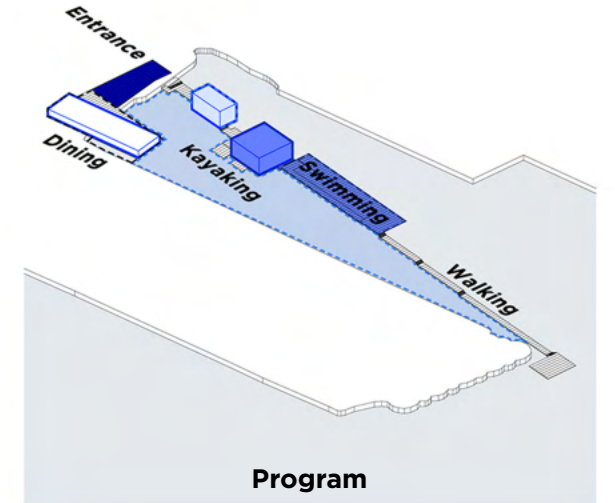
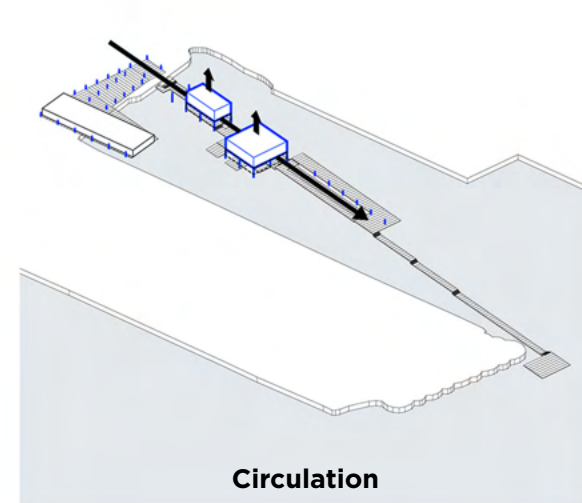
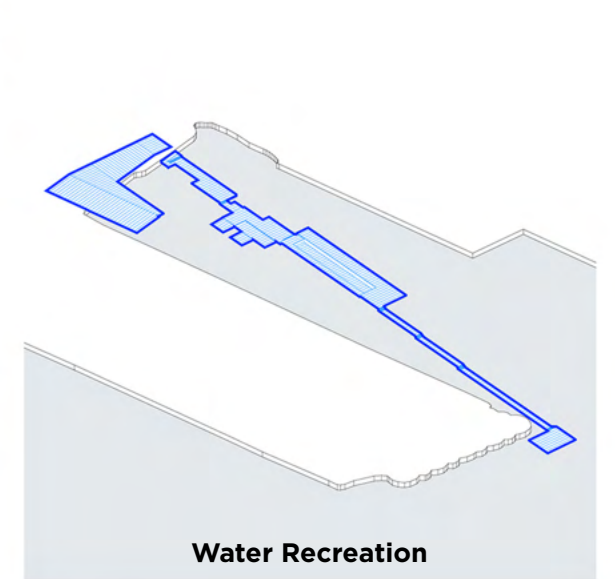
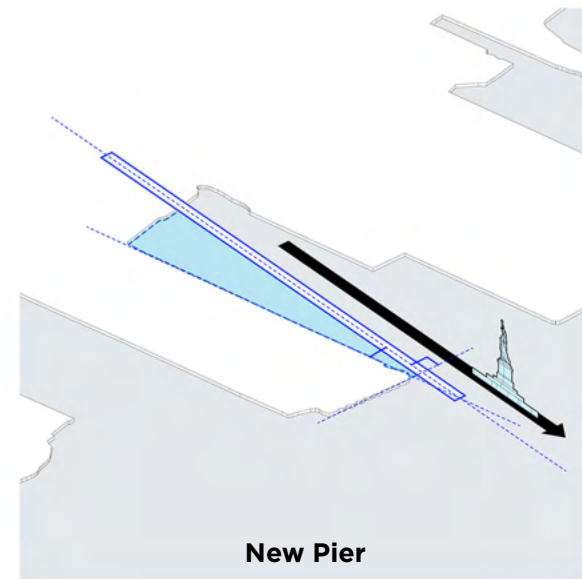


PROJECT 02

Amplification

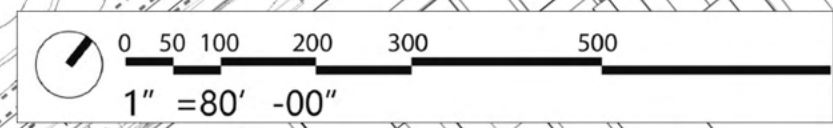
GSAPP Spring Design Studio
Group Work
Advisor: Laurie Hawkinson
2024. 05

As global temperatures rise, many waterfront areas, like the South Brooklyn Marine Terminal, are at risk of being submerged by seawater. However, this process is slow and often imperceptible on a daily basis, leading people to overlook a problem that is actually quite severe. There is a huge gap between public awareness and the cruel reality. Therefore, our goal is to draw people to the waterfront to experience this process, which will be amplified through our design. We created a new linear pier pointing directly to the Statue of Liberty, creating an enclosed triangular kayaking area with the existing pier and a linear water recreation area on the first floor where both people and water can come inside and have many different kinds of interactions at different times.





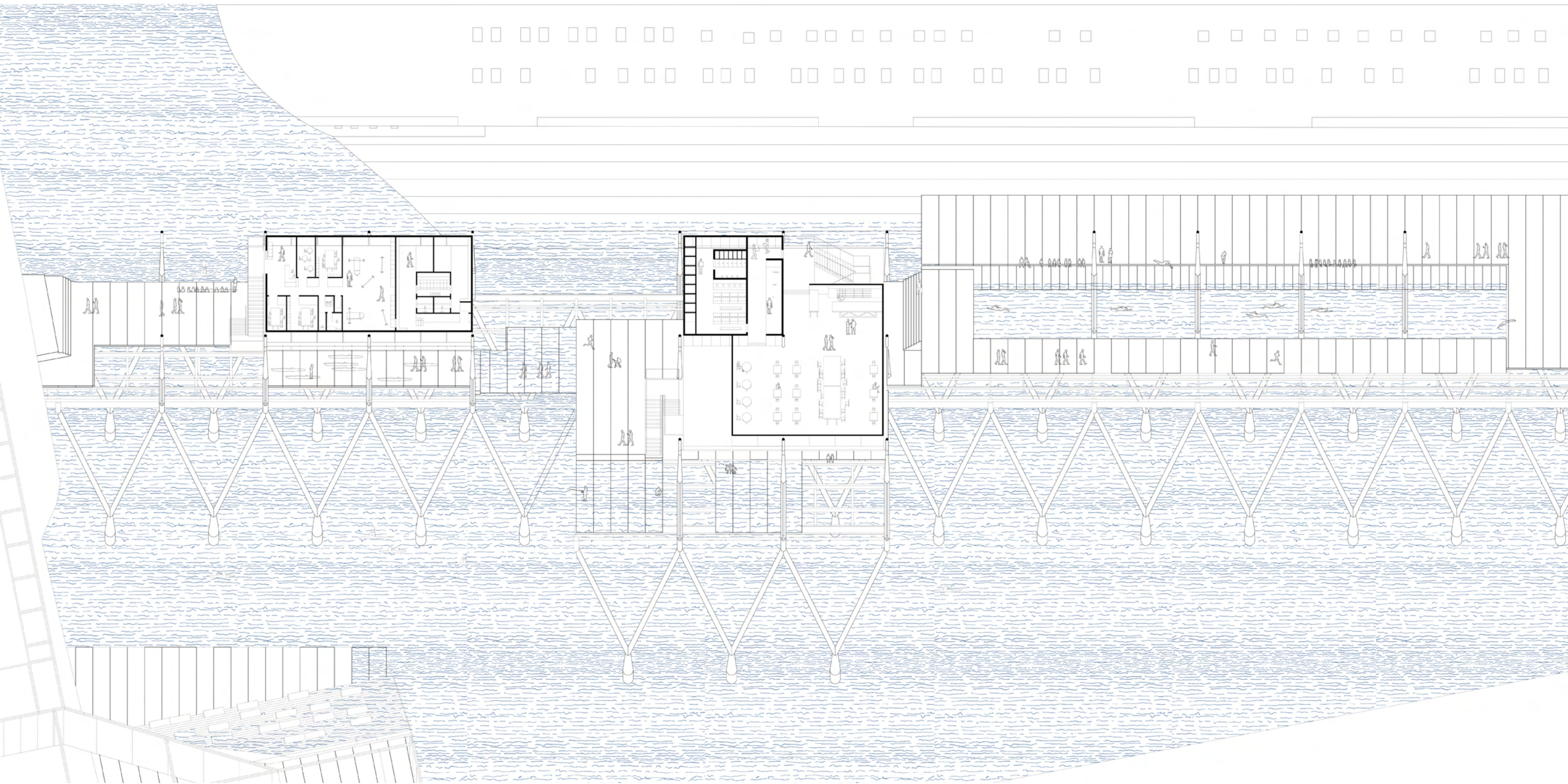
Collective Master Plan





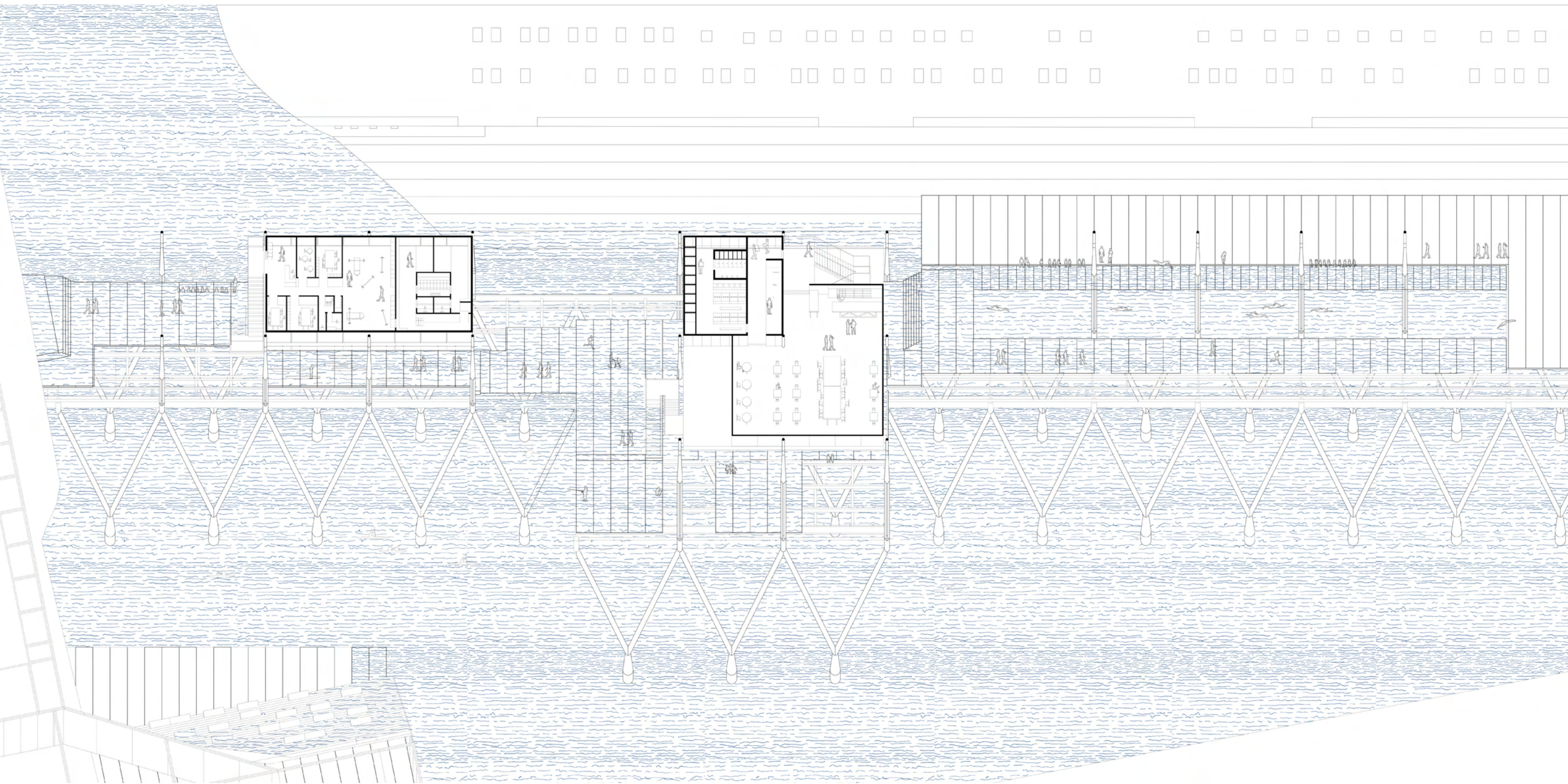
Now

present - 2050



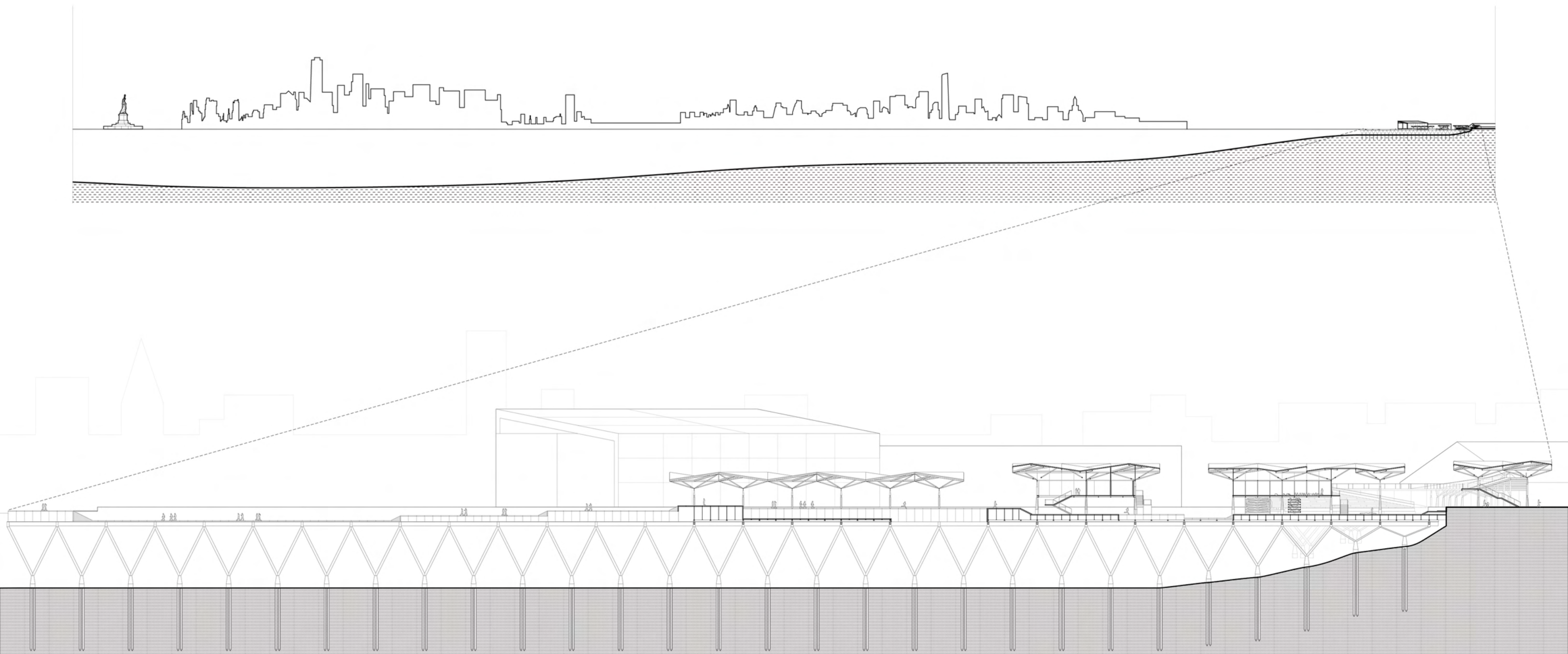
Soon

2050 - 2010

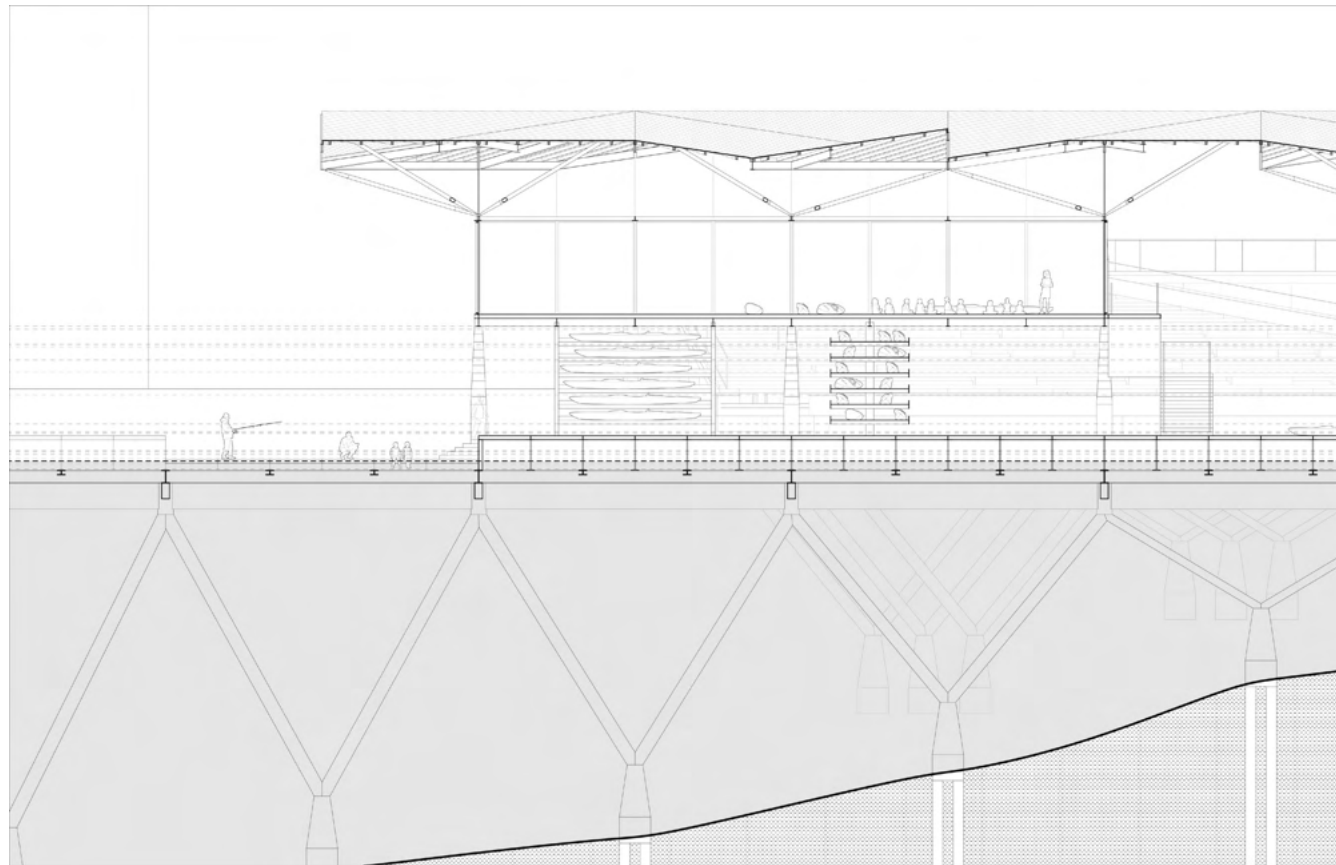
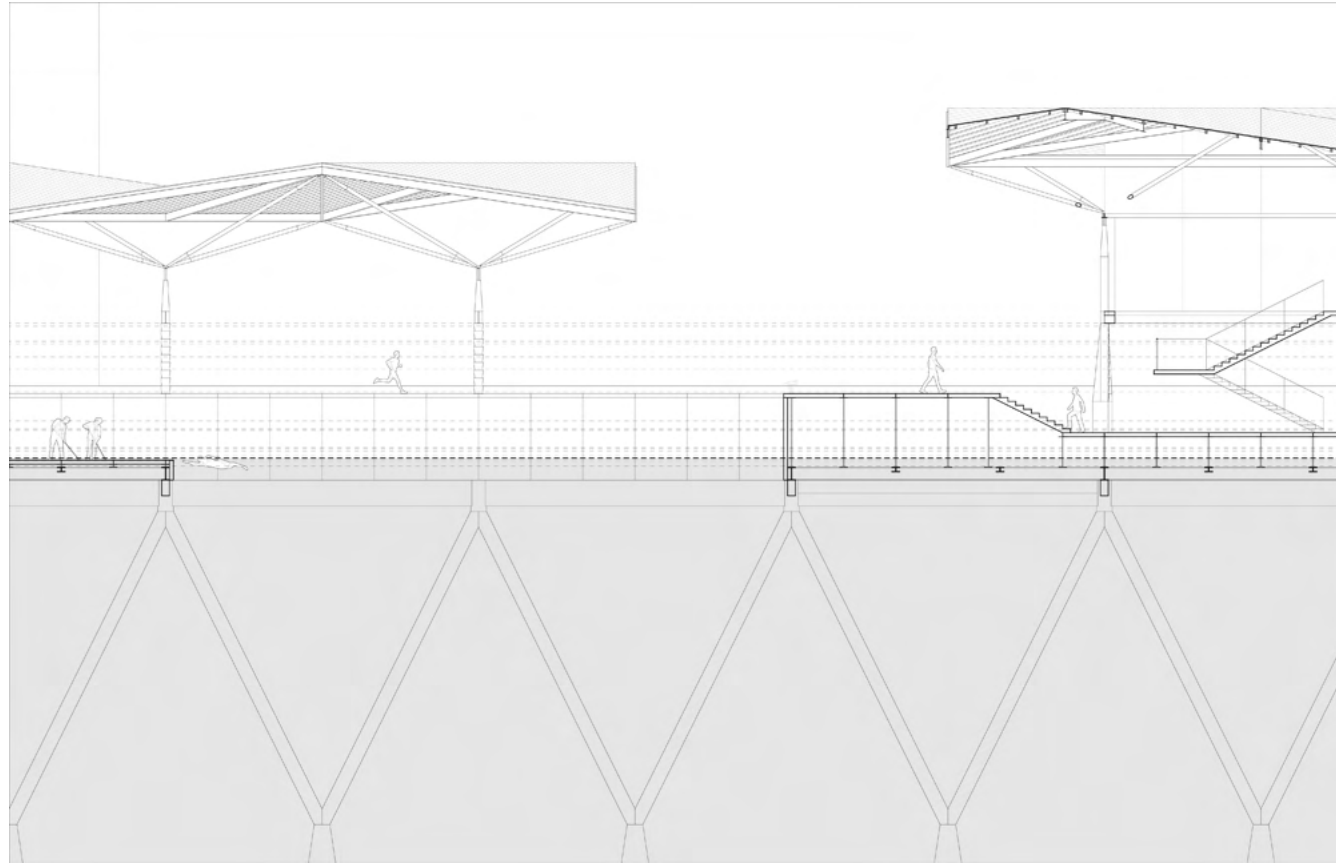


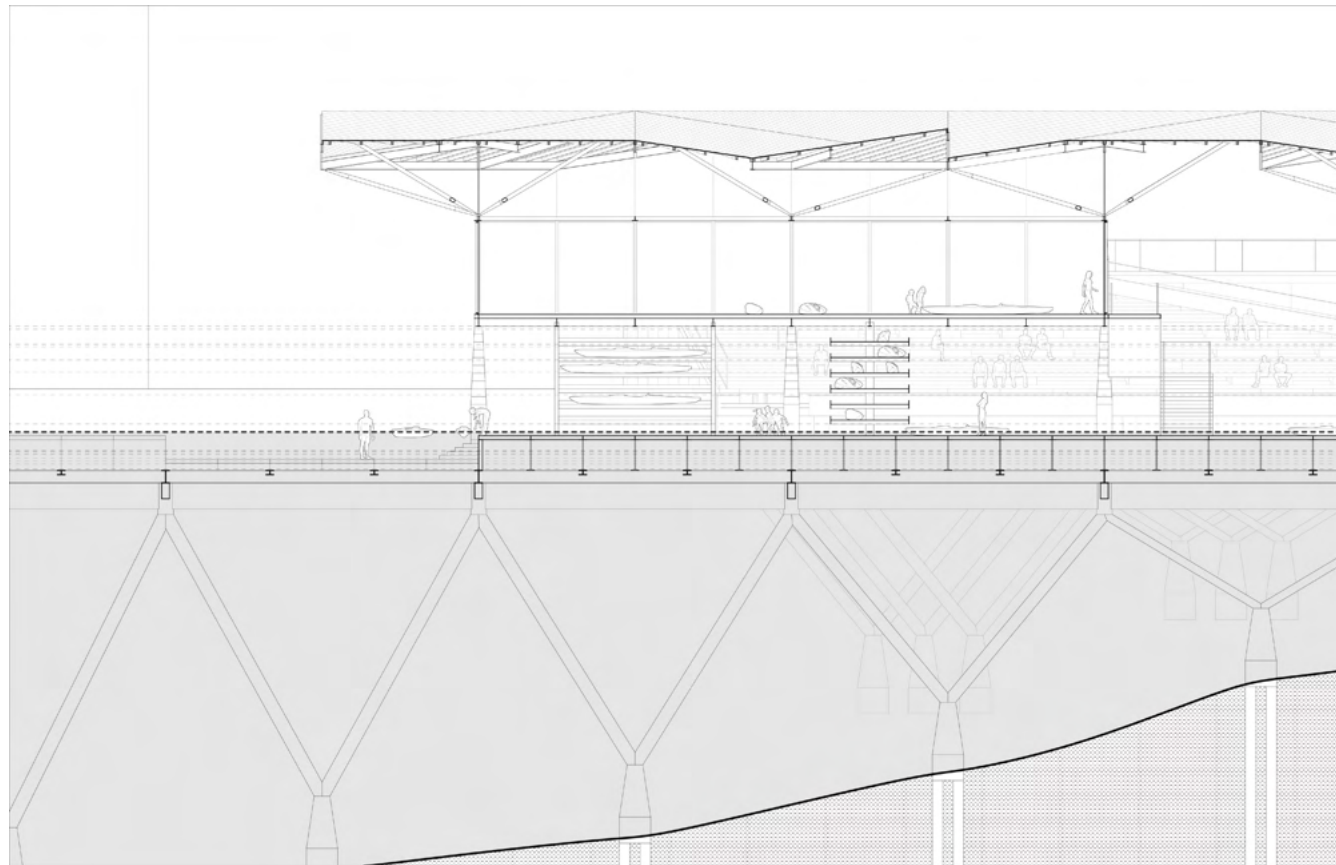
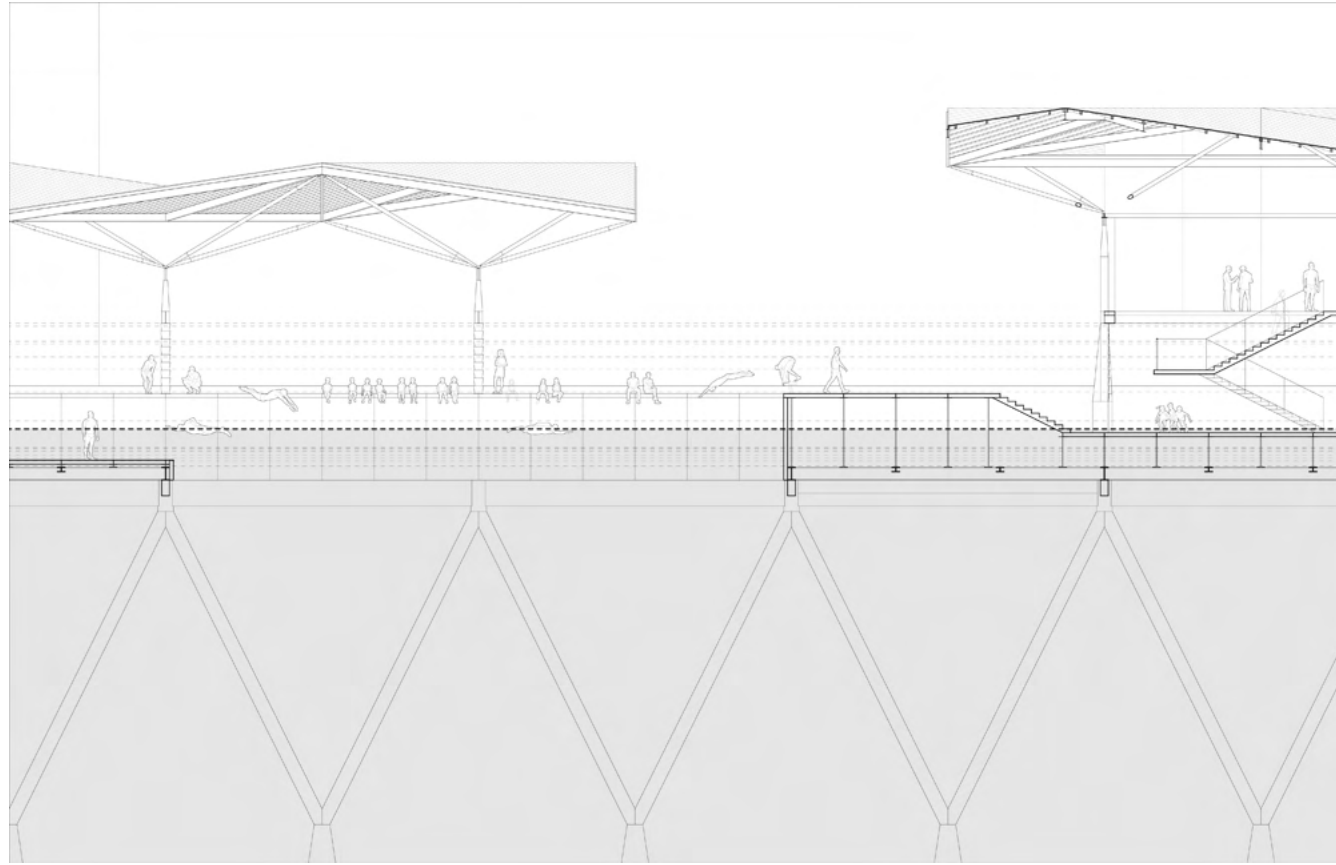
Eventually

2010 -



Long Section







Looking West from Entry

Elevation DFE +17'

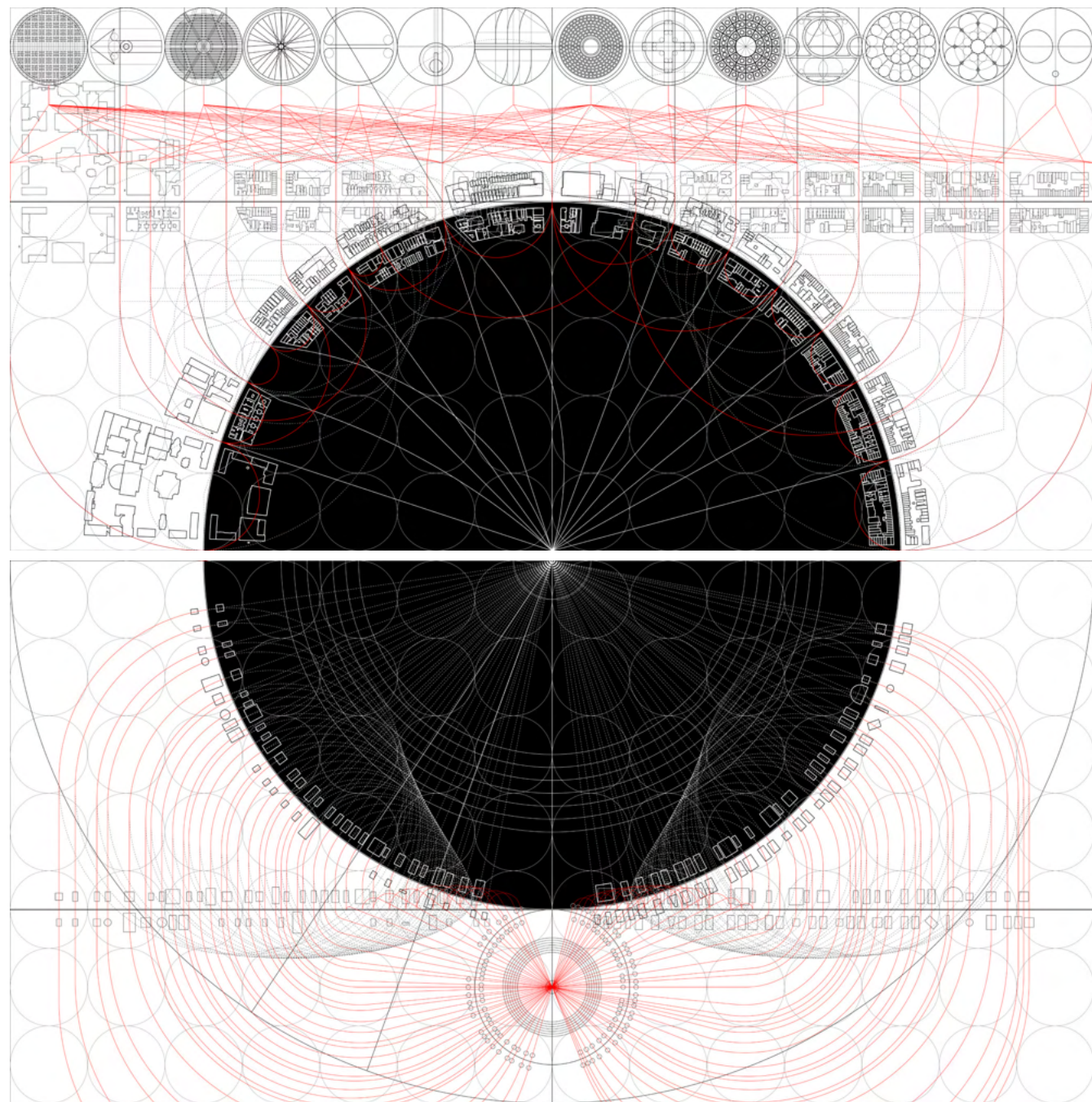


PROJECT 03

Life Circles

GSAPP Fall Design Studio
Individual Work
Advisor: Rozana Montiel + Thomas De Monchaux
2023.12

This research project of Little Mexico reminds me of the movie coco since it discussed the unique and poetic way Mexicans view life and death. The cemetery is an important scene for people to see their families in this movie. So, I found a real place in Mexico City, which is rotonda de las personas ilustres, to be the portal to connect NYC and Mexico City.



Mapping

I made these two mappings, one is for 116th street in NYC and another one is for Mexico City, to both show the process of my thought, how I transfer my topic from circle to circle of life, and show the portal between NYC and Mexico City.



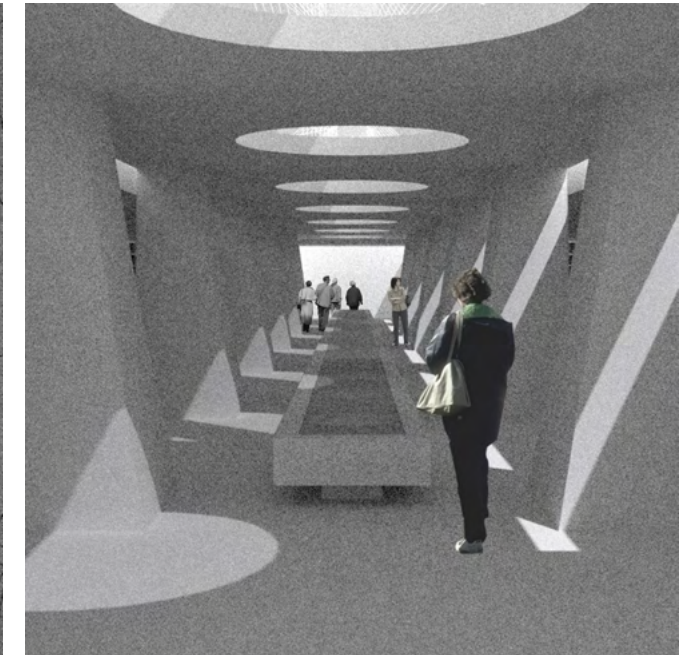
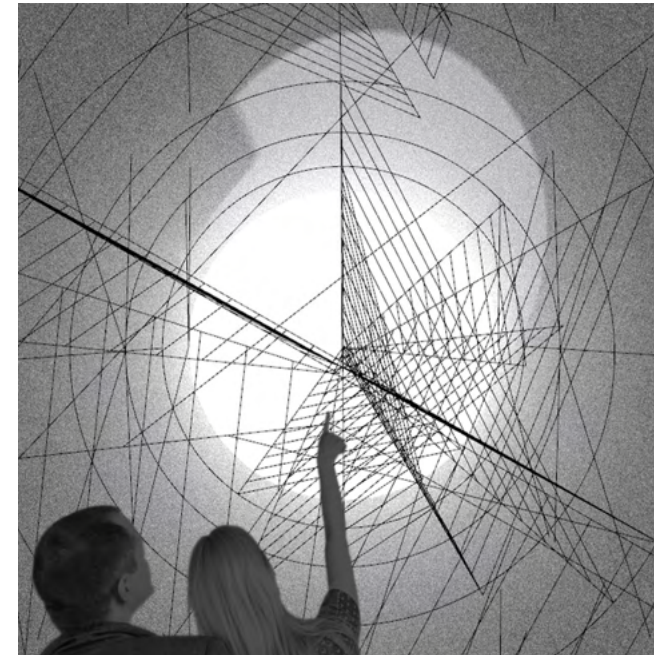
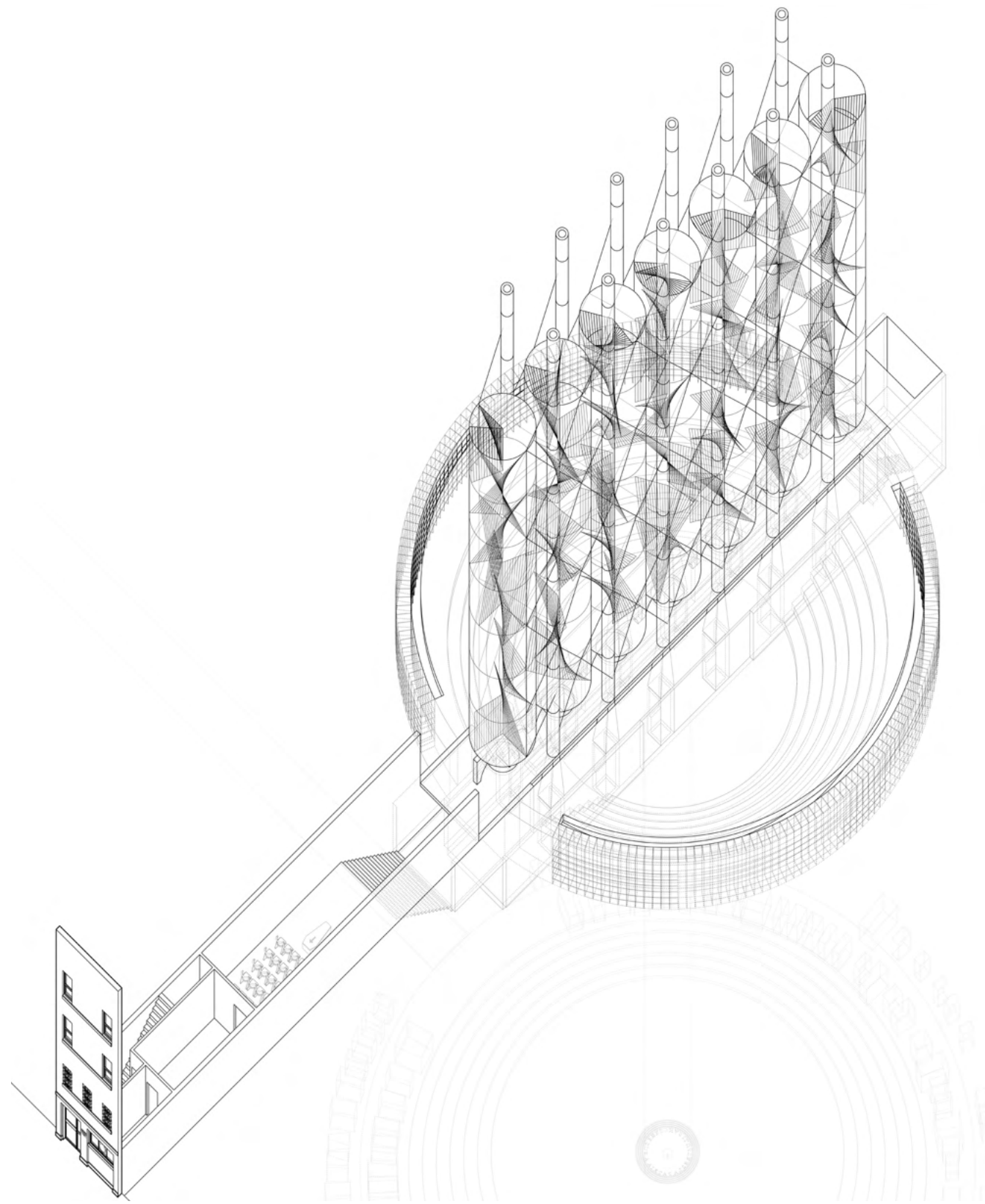
Circles

at the beginning, I just recorded all the circular objects I discovered on the street. Basically, there are well lids, wheels, some kind of signs, ...



Life Circles

I made a collection of the "cycles" I discovered on the street. There are leaves turning yellow, metal getting rusty, the color of beer bottle caps fading away, the receipts in one store showing the passage of time.

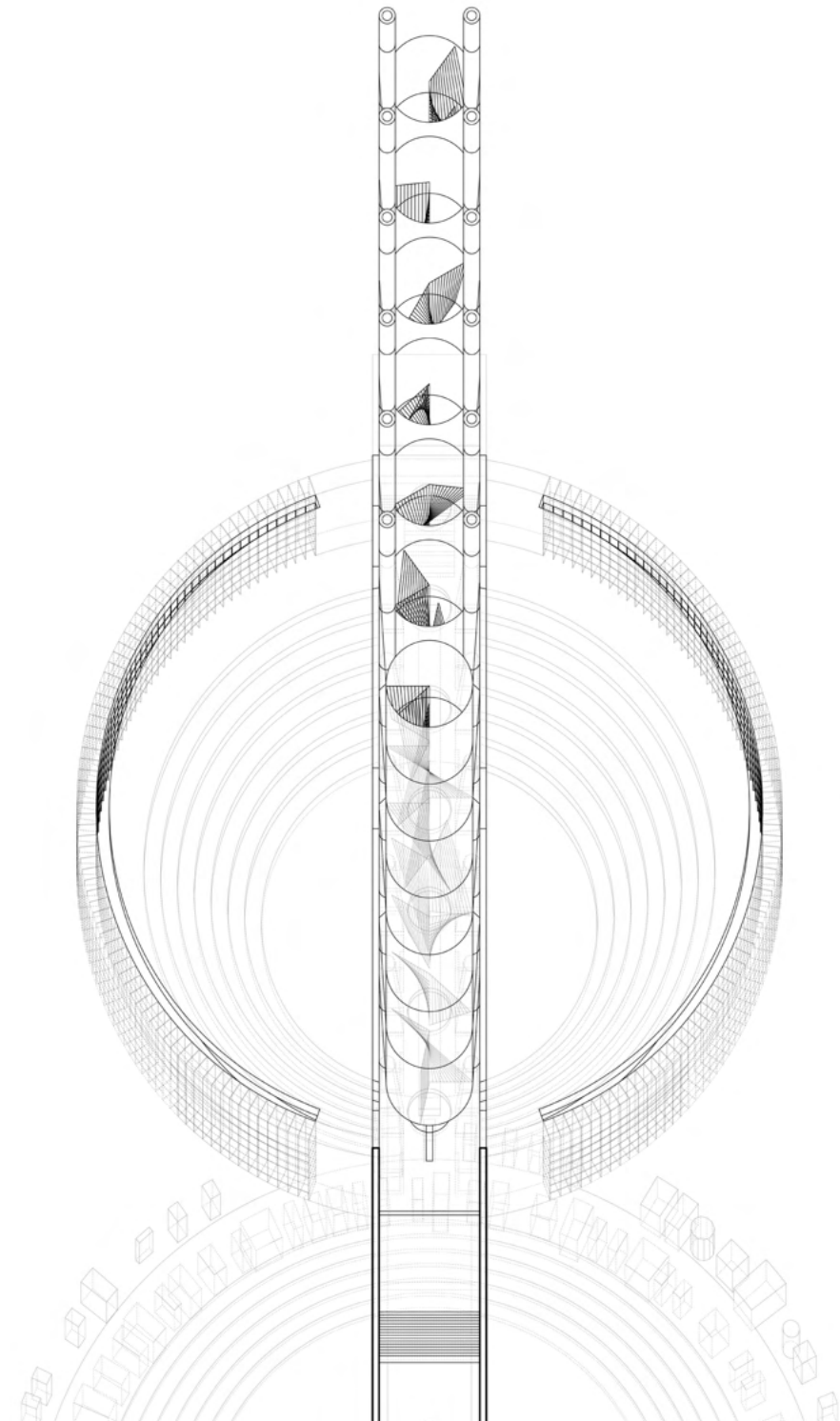


Impossible Building | Timeless Monument

I chose one of the funeral homes as my storefront because it's a place where life and death are going on and there happens to be a clock on the storefront of it. So, for the design of impossible building, I followed my idea of clocks. I transferred the spiral and circular shape of mechanic spring into a memorial collective space.

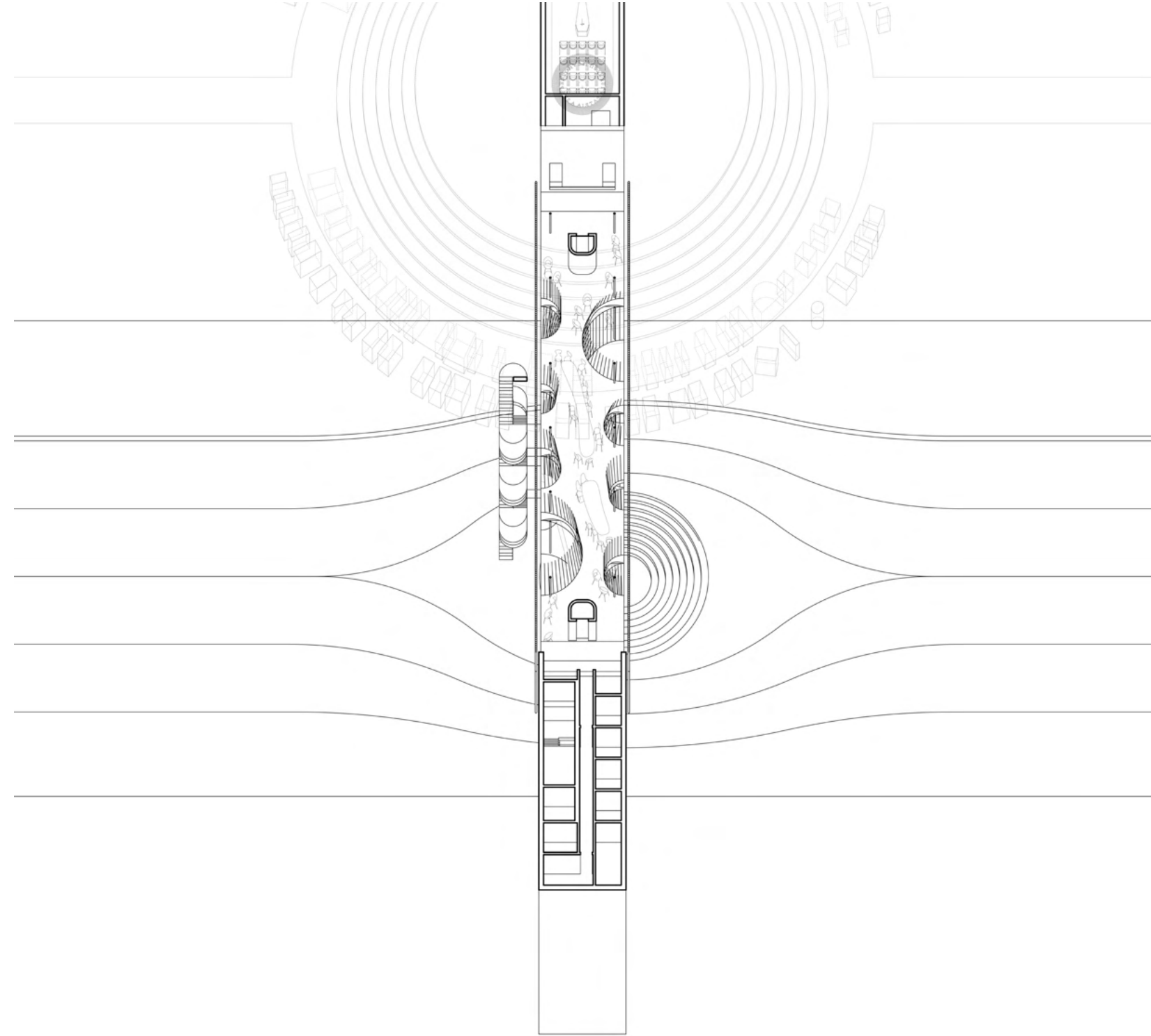
Impossible Building | Frontal Axon

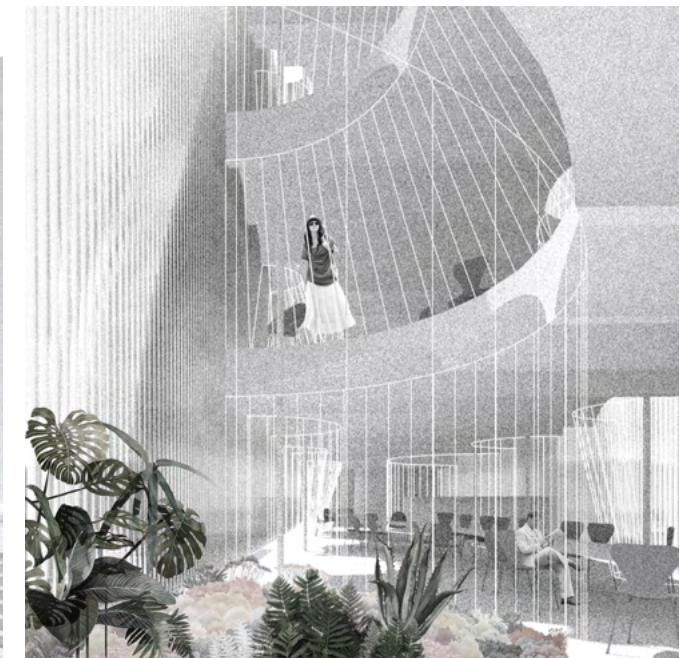
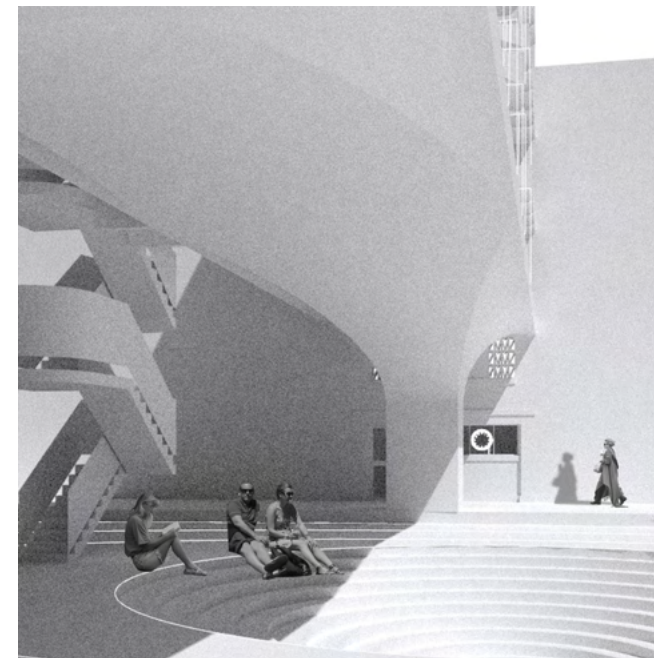
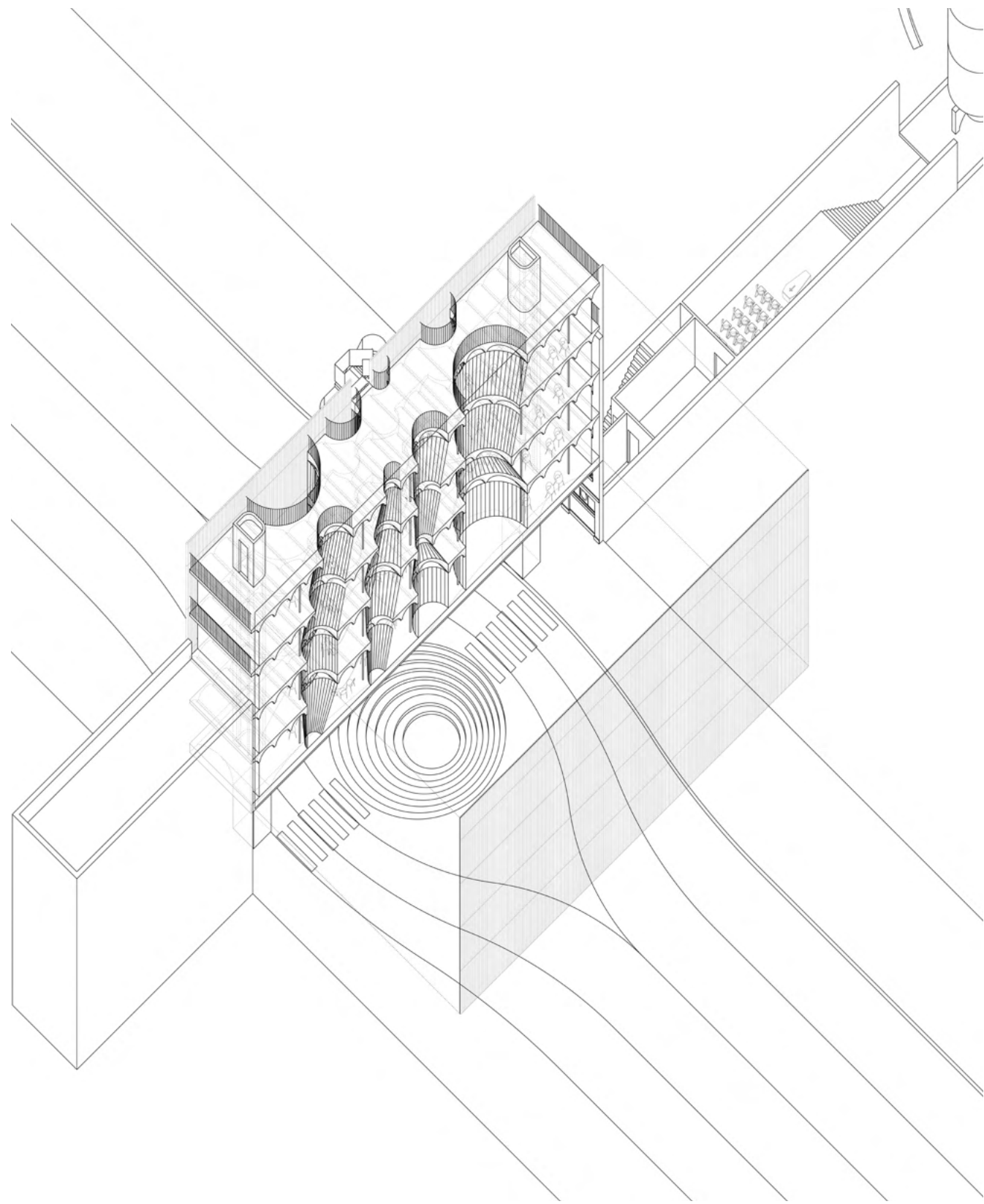
I abstracted the measure of time into several columns. These 12 structural columns represent 12 years and have the function as chimneys. And the 7 towers represent 7 days a week and will bring light into the chapel space underground.



Possible Building | Frontal Axon

I projected the impossible building forward on the street, it connected to the opposite building naturally. And what is super interesting is that the opposite building happens to be a medical clinic.



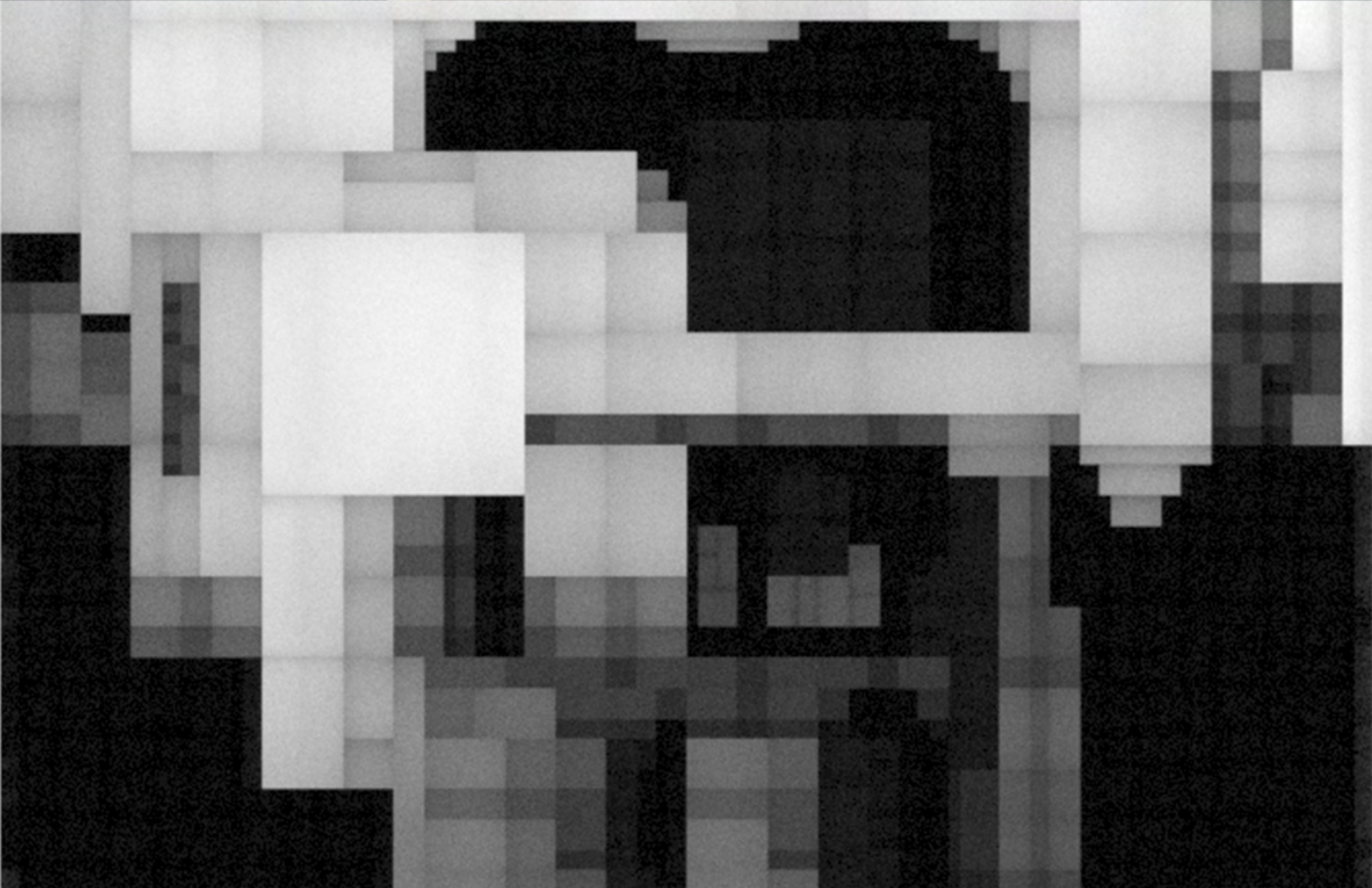


Possible Building | Waiting Corridor

The possible building could be a waiting building, a waiting space to have people waiting here because waiting is what both people going to funeral home and clinic will do and has something to do with time.

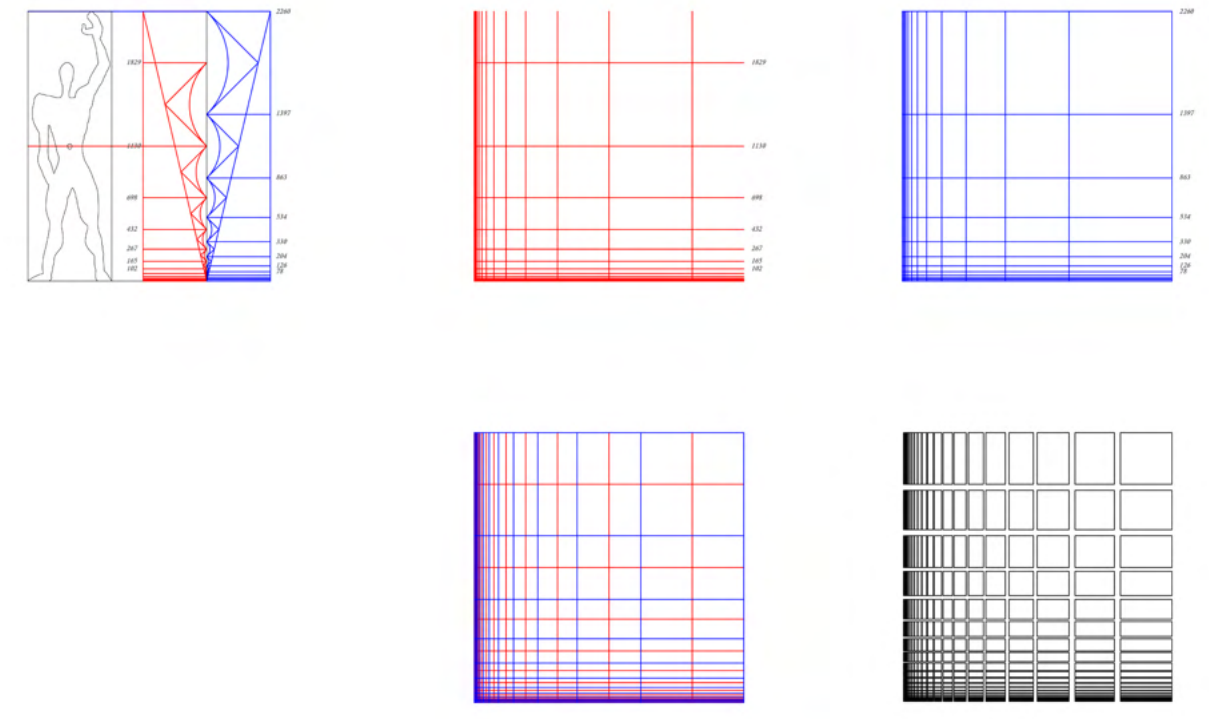
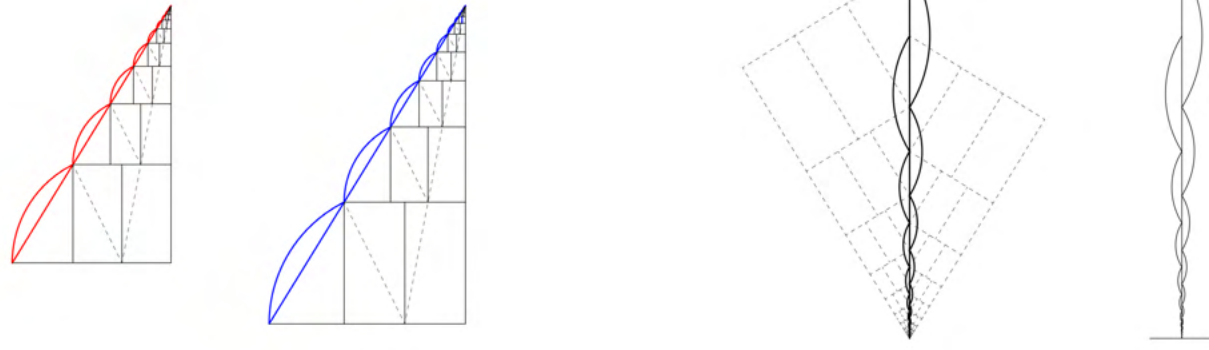
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OTHER WORKS
Elective Projects · Art works

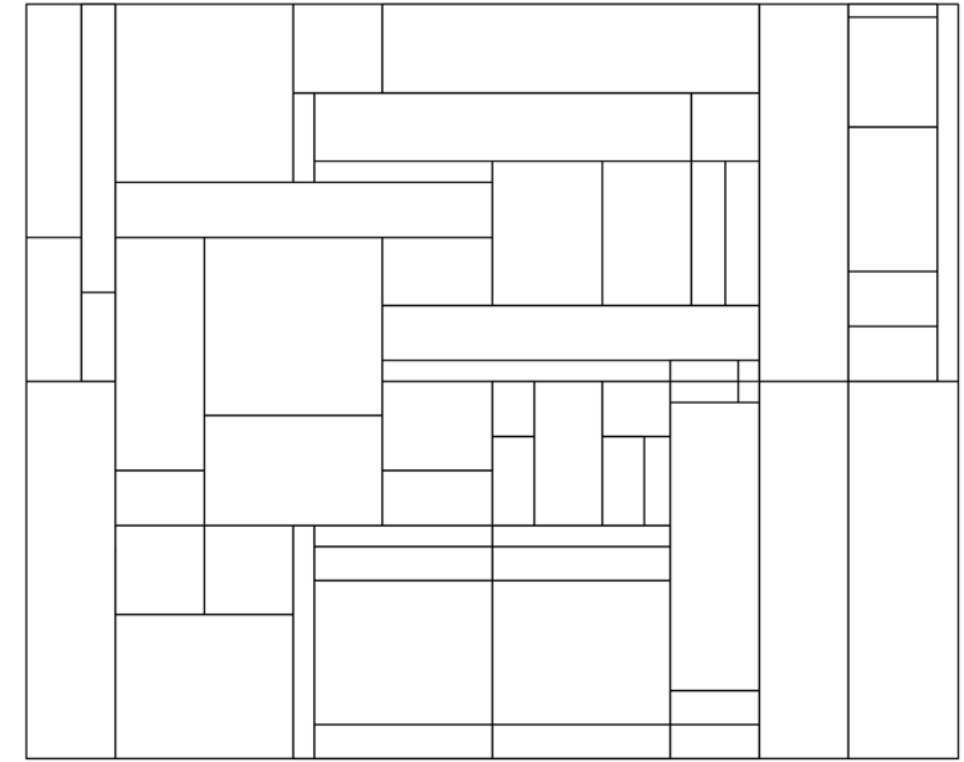


PROJECT 04
MODULOR

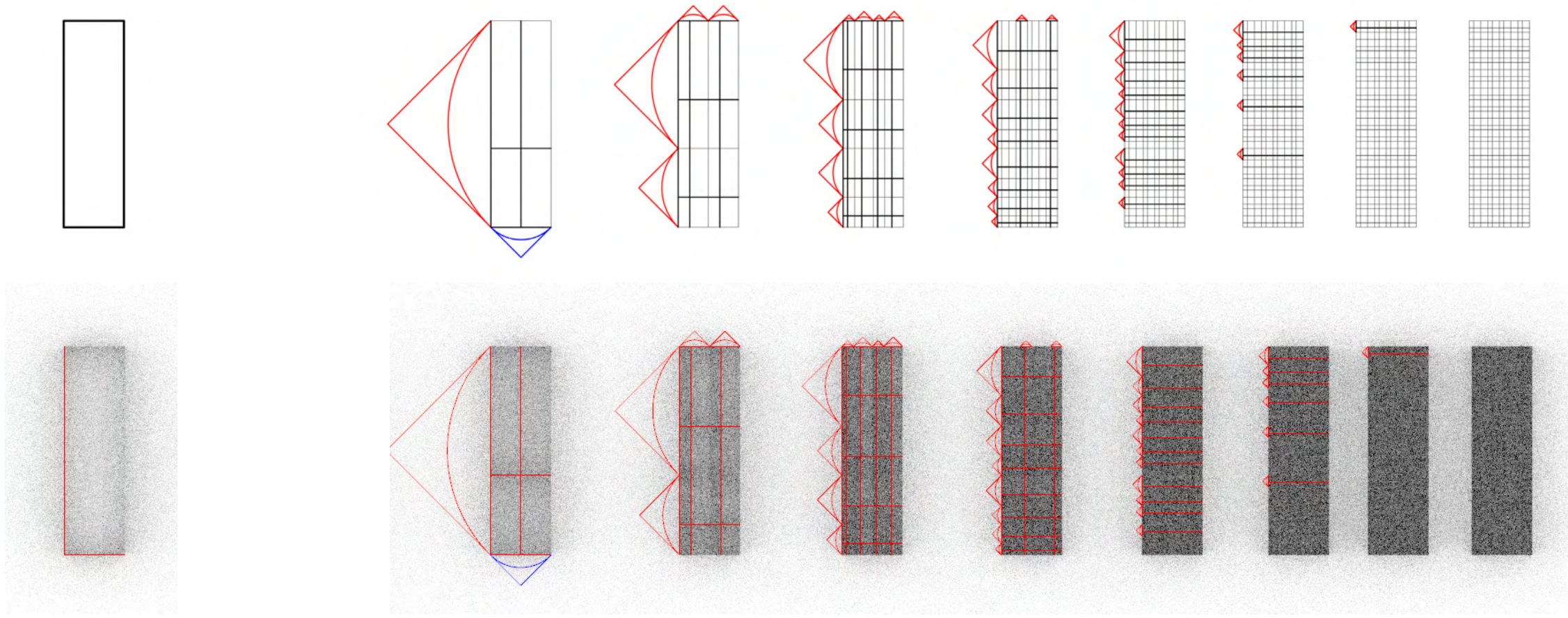
GSAPP Fall Elective Design Studio
Individual Work
Advisor: Steven Holl + Dimitra Tsachrelia
2023.12



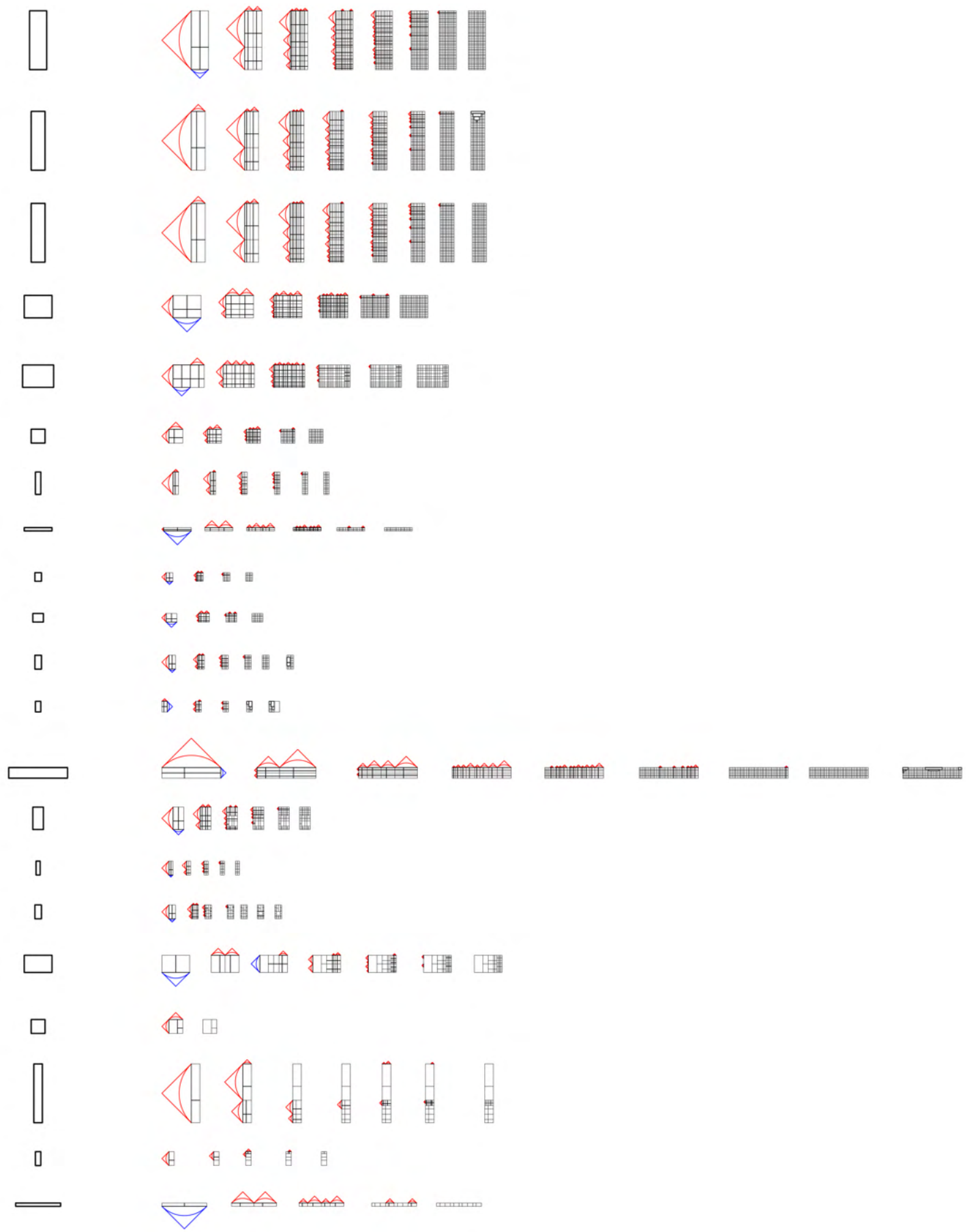
Modulor

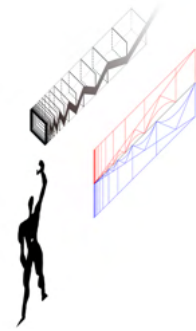
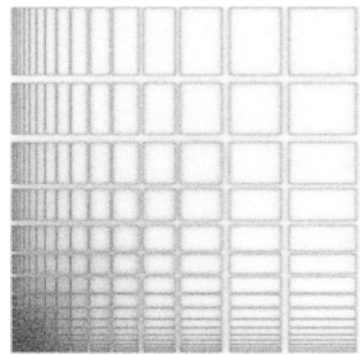
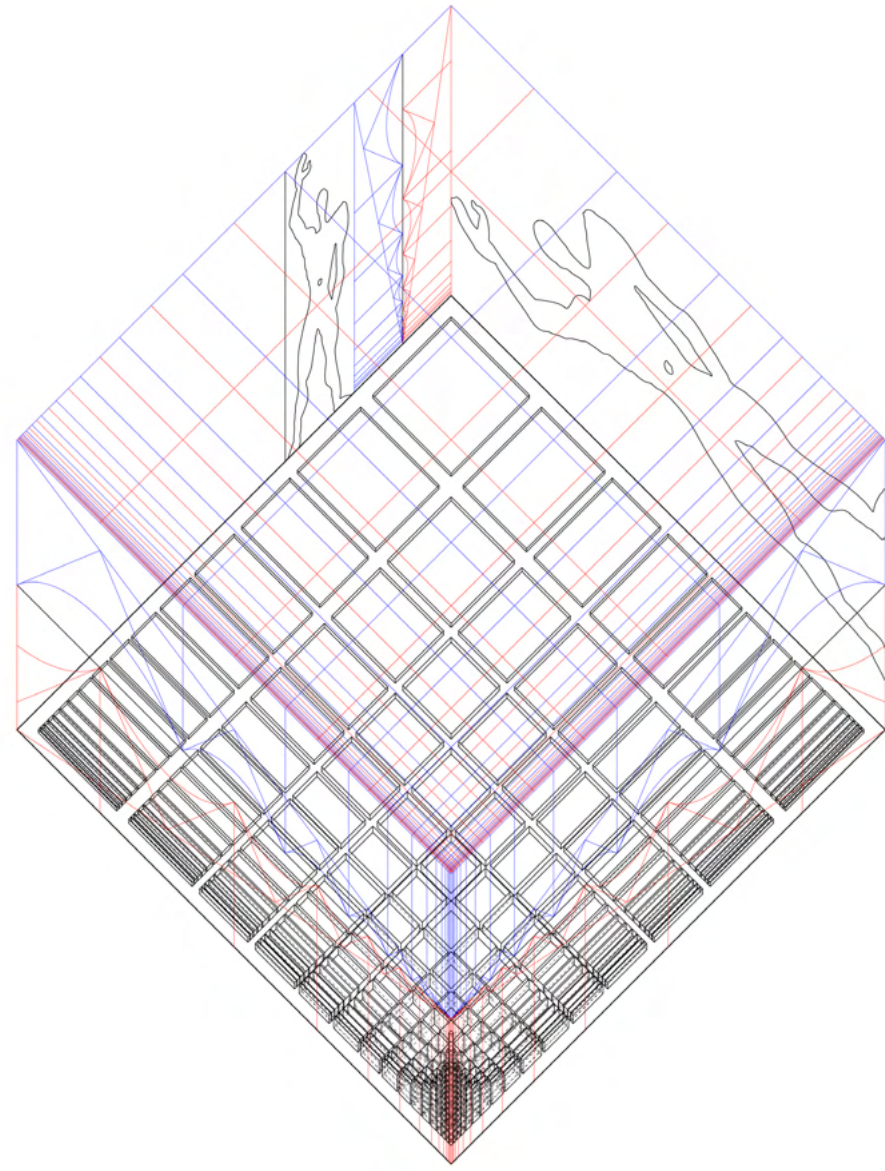


Division

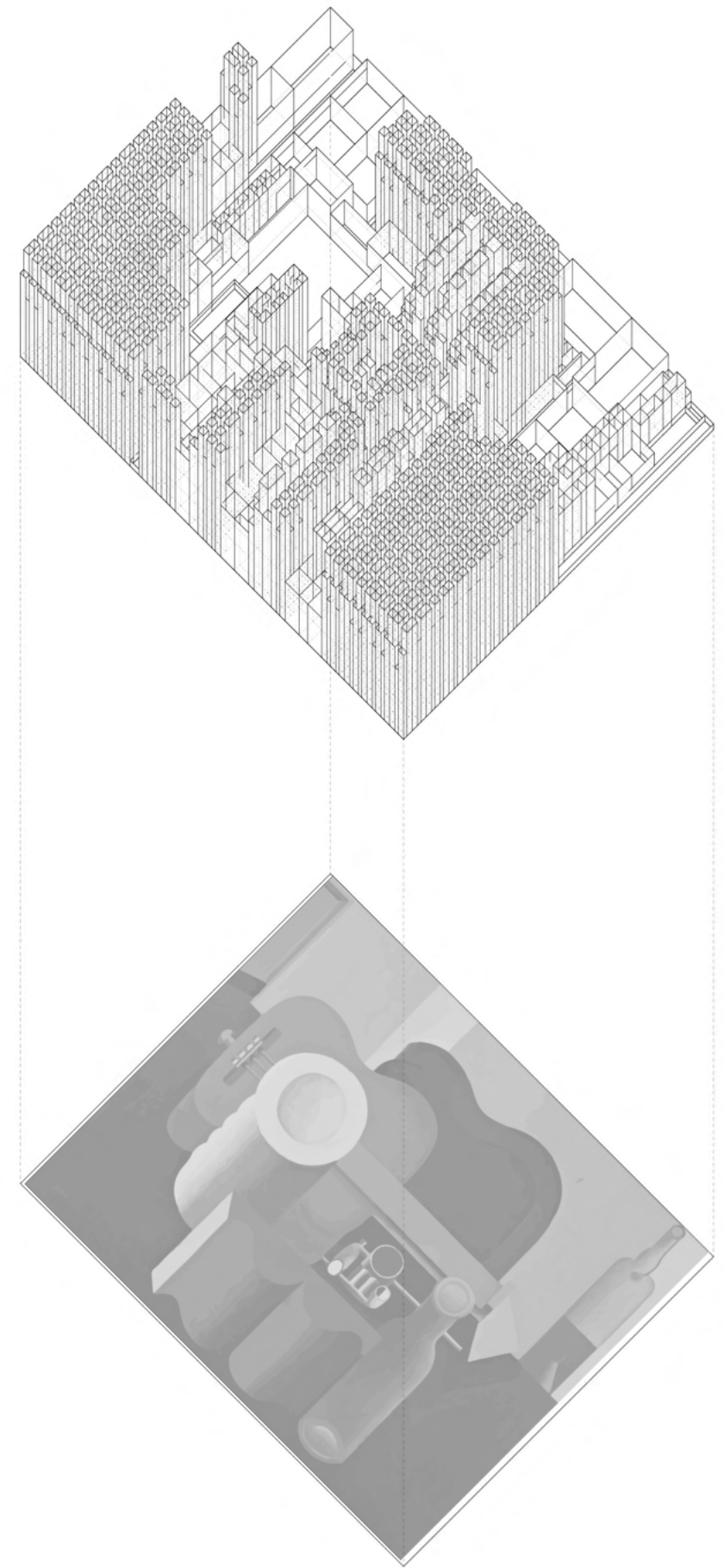


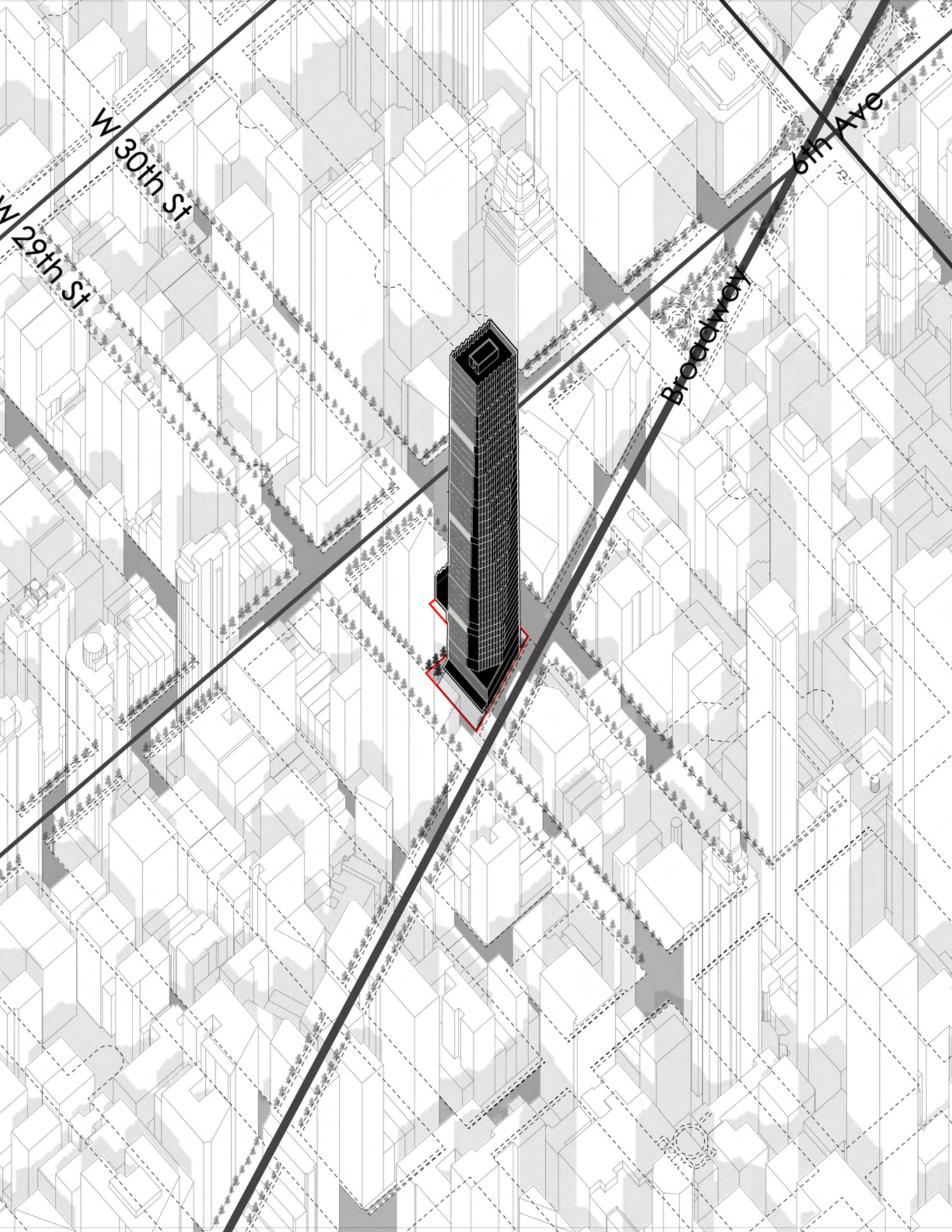
Depth & Darkness





Extrusion & Depth





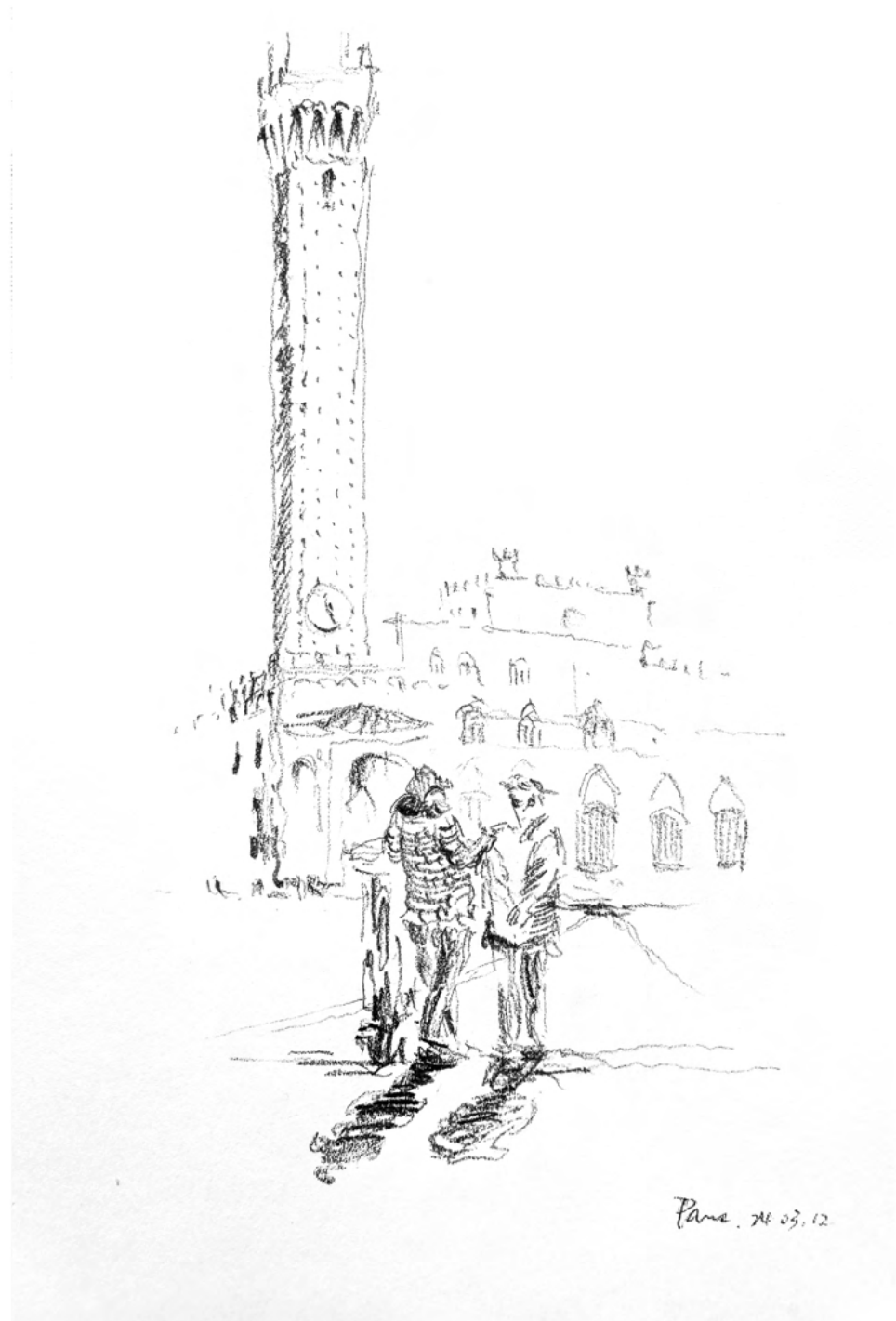
TECH PROJECT
Rethinking BIM

GSAPP Fall Elective
Group Work
Advisor: Joseph Brennan
2023.12

ART WORKS

Paintings

Charcoal Sketch · Watercolor
Individual Work



Pane. 74 03, 12

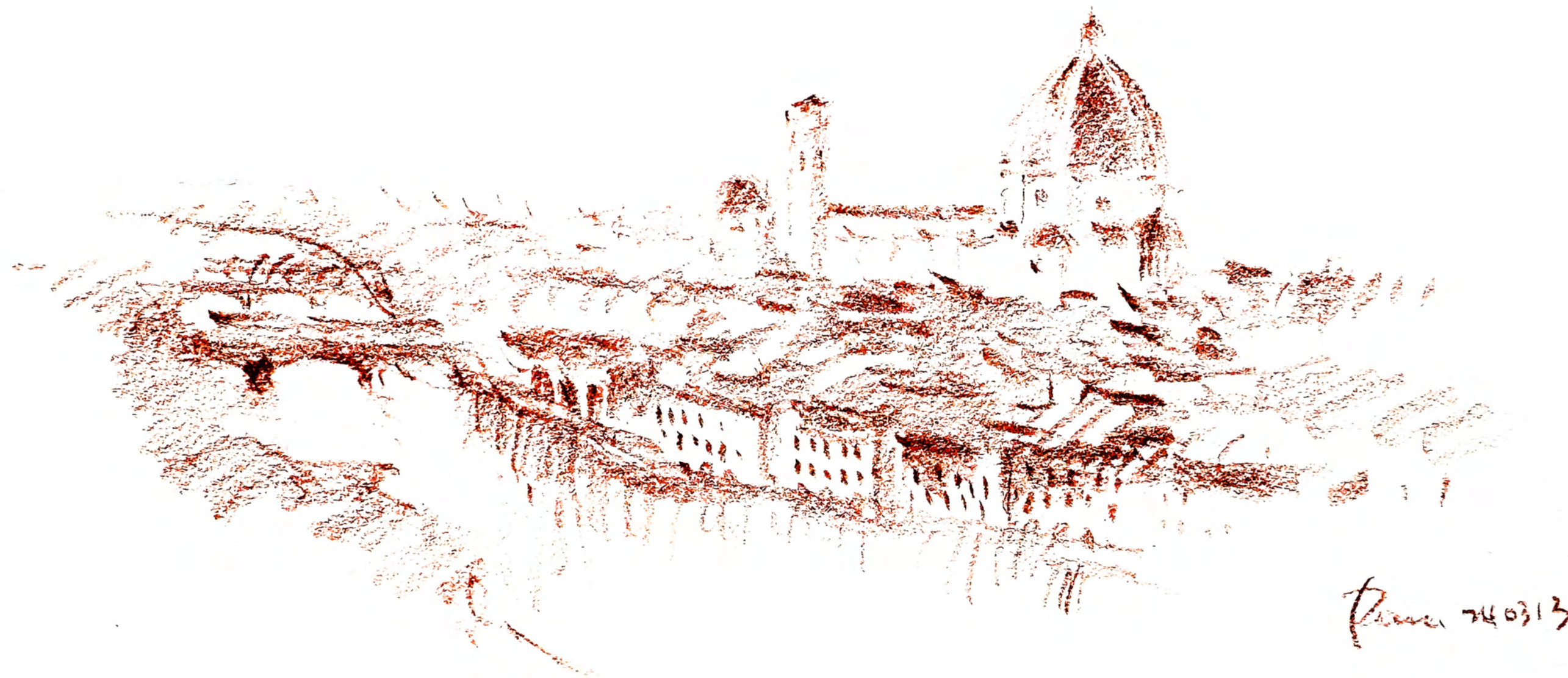
Piazza del Campo

Pencil
Siena, Italy
2024.03.12



Palazzetto Posso

Charcoal on paper
Siena, Italy
2024.03.13



Florence Panorama from Piazzale Michelangelo

Pencil
Florence, Italy
2024.03.13



Historic Streetscape

Watercolor
Florence, Italy
2024.01.27

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