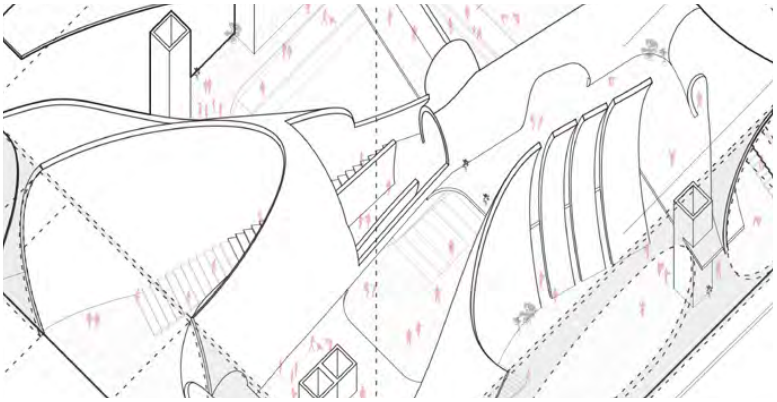


E L E N A Y U

P O R T F O L I O

S E L E C T E D W O R K S . 2 0 2 1 - 2 0 2 3

Xueyan Yu

Education

Sep. 2021-
May. 2023

Columbia University
Master of Architecture with Advanced placement
Annual scholarship of $24,000

Aug. 2017-
May. 2021

The Ohio State University - Columbus
Bachelor of Science in Architecture
Latin Honors
Research Distinction
GPA 3.6/4.0

Summer 2019

GSD, Harvard University
Design Discovery

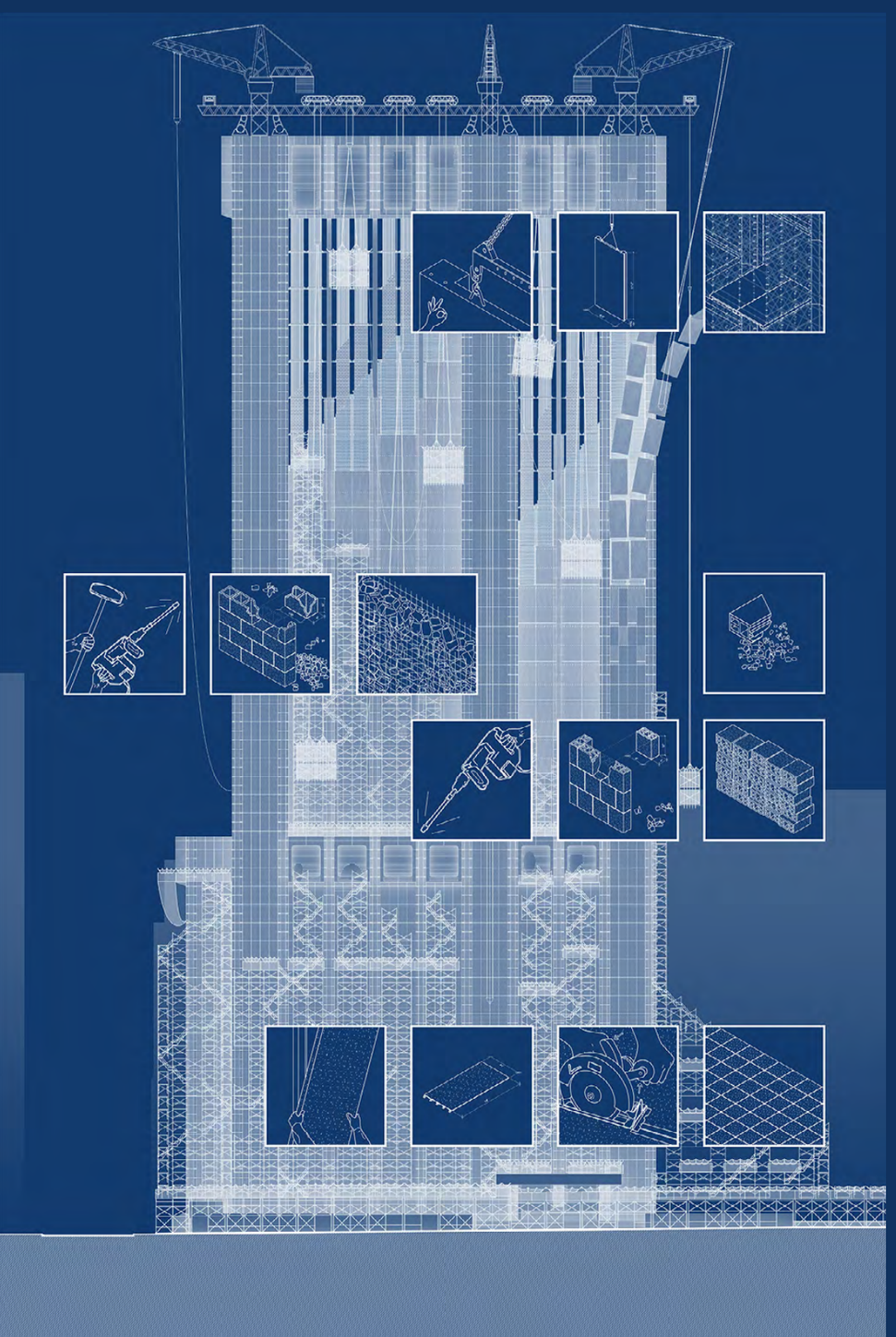
Dean's List
Spring 2020, Fall 2019, Spring 2019, Spring 2018

Table of contents

01. UNFINISHING THE FINISHED

GSAPP ADV STUDIO V, FALL 2022
Location: 33 Thomas Street, New York
Program: Adaptive Reuse
70% Affordable Housing 30% Social Infrastructure
Group Member: Ruisheng Yang
Instructor: Wonne Ickx

Covered by continuous granite panels cut in the same dimensions, the ATT long line building is totally opaque, geometric, and easily perceived as a finished solid object. Designed to protect precious communication devices deemed vital to a democracy under nuclear threat, the building's exterior is composed of extremely thick layers of granite cladding, precast concrete panels, terracotta and CMU bricks, in order to withstand the nuclear blast. As the longline technology became obsolete and the USSR collapsed, the windowless skyscraper lost its purpose it was initially designed for. What is left are a series of strangely layout floors concealed within opaque walls filled with an unnecessarily excessive amount of materials.



MATERIAL REUSE INSTRUCTION

CONCRETE PANEL

Reuse instruction:
Step 1. attach concrete panel anchor points to crane eye hooks
Step 2. transport concrete panels with crane
Step 3. repurpose panels as floating balconies

CMU BLOCK

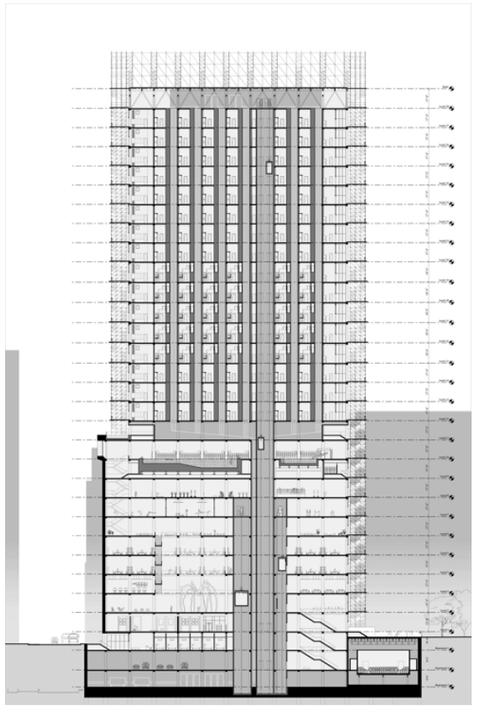
Reuse instruction
Step 1. knock out top course CMU blocks with sledgehammer
Step 2. use electric hammer to remove the mortar surrounding the lower course
Step 3. crush damaged CMU blocks into gravels as aggregates for concrete and gabion rainscreen wall

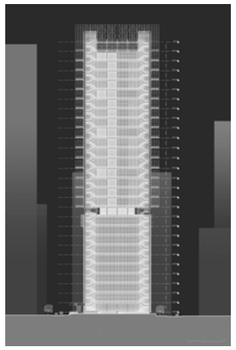
TERRACOTTA BLOCK

Reuse instruction
Step 1. use electric jack to drill holes on the mortar surrounding the terracotta bricks. Chisel out the remaining motor
Step 2. 70% of the bricks are kept intact and are stored for further construction
Step 3. crush damaged bricks into gravels as aggregates

GRANITE PANEL

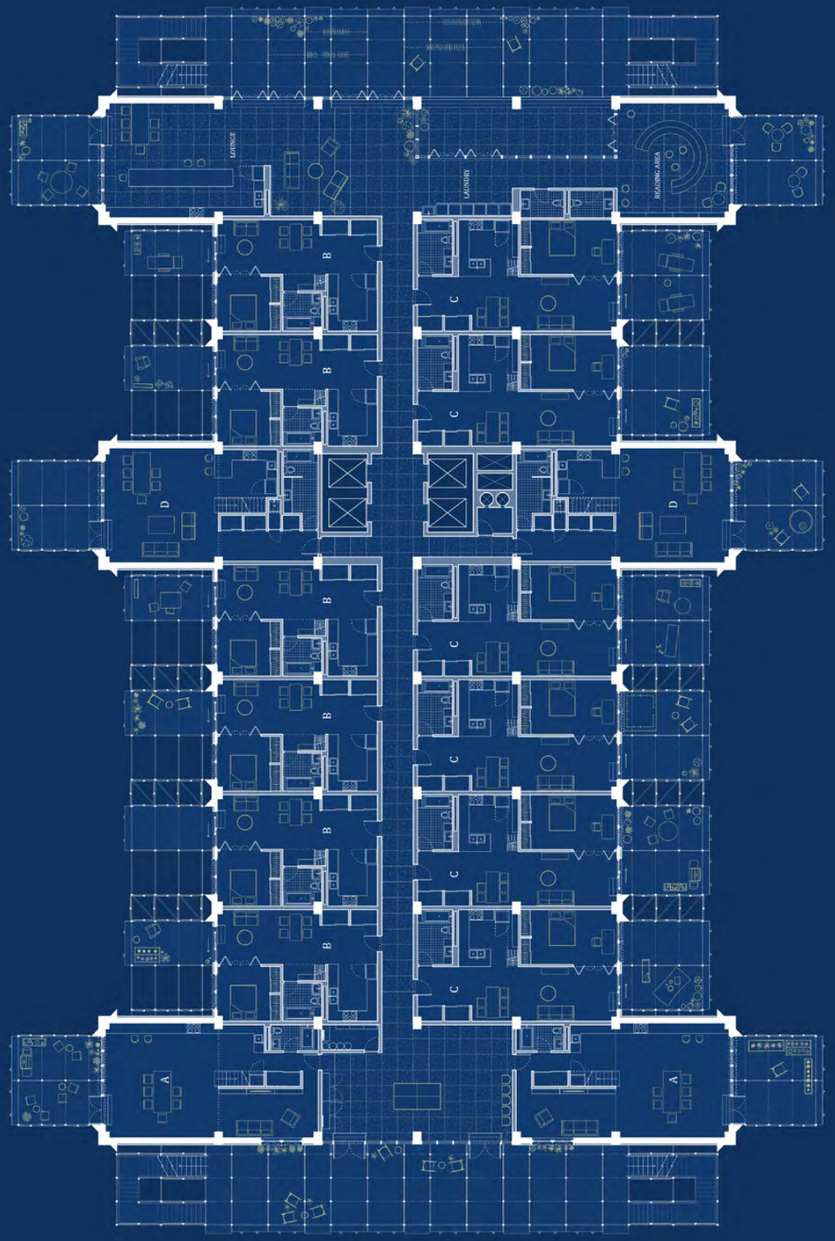
Reuse instruction
Step 1. remove granite cladding
Step 2. trim panels into differential sizes
Step 3. reuse new panels as floor and wall finishes



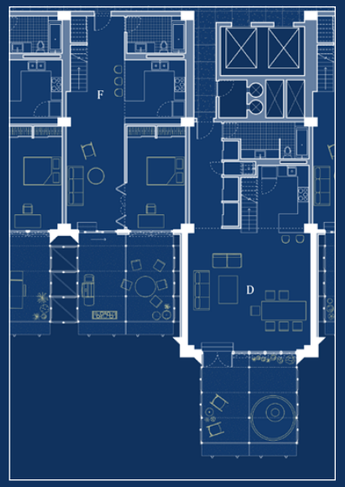


Our approach to adaptive reuse of the longline building is to keep as much of the original building as possible. This not only means that we are keeping most structures, but also leads us to redistribute the existing substances. The building's opaque thick walls, void of purpose, is seen as a quarry where most materials for the adaptive reuse are sourced. A careful deconstruction that disassembles the building into basic material units will happen to the building while dense layers of scaffolding provide space for interactions between labor and materials.

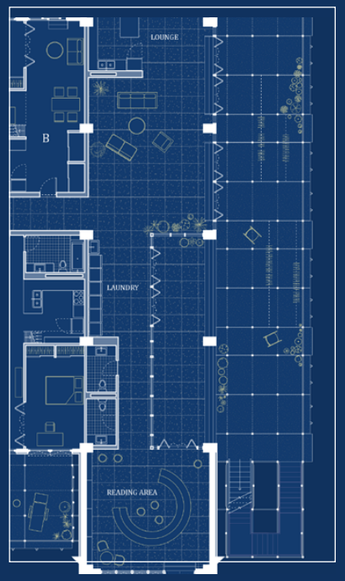
Materials that compose the facade, then, are collapsed into the interior of the building or expanded outward and held in place by scaffoldings that were initially used for deconstruction. For instance, the granite claddings are cut and used to clad the public swimming pool, floors of the public space, and cap the kitchen counters within social housings. The large precast concrete panels are hung outward, rotated 90 degrees and made into balconies for housing units, moved inside, elevated and transformed into loft sleeping platforms, or cut and reconfigured into art walls inside the gallery. Terra cotta bricks are cut out one by one. The complete ones are reused in dry walls and built-in furniture while the damaged ones are crushed together with CUM brick into gravels. Then these construction wastes are put into a thin layer of gabion that is used to clad the building's new exterior walls.



17.5' FLOOR HEIGHT_FIRST FLOOR PLAN



Considering different floor heights and NYC building codes, there are 6 housing unit types in total being embedded. Type A and D are artist studios with relatively larger open space, which provides flexibility of differential layouts.



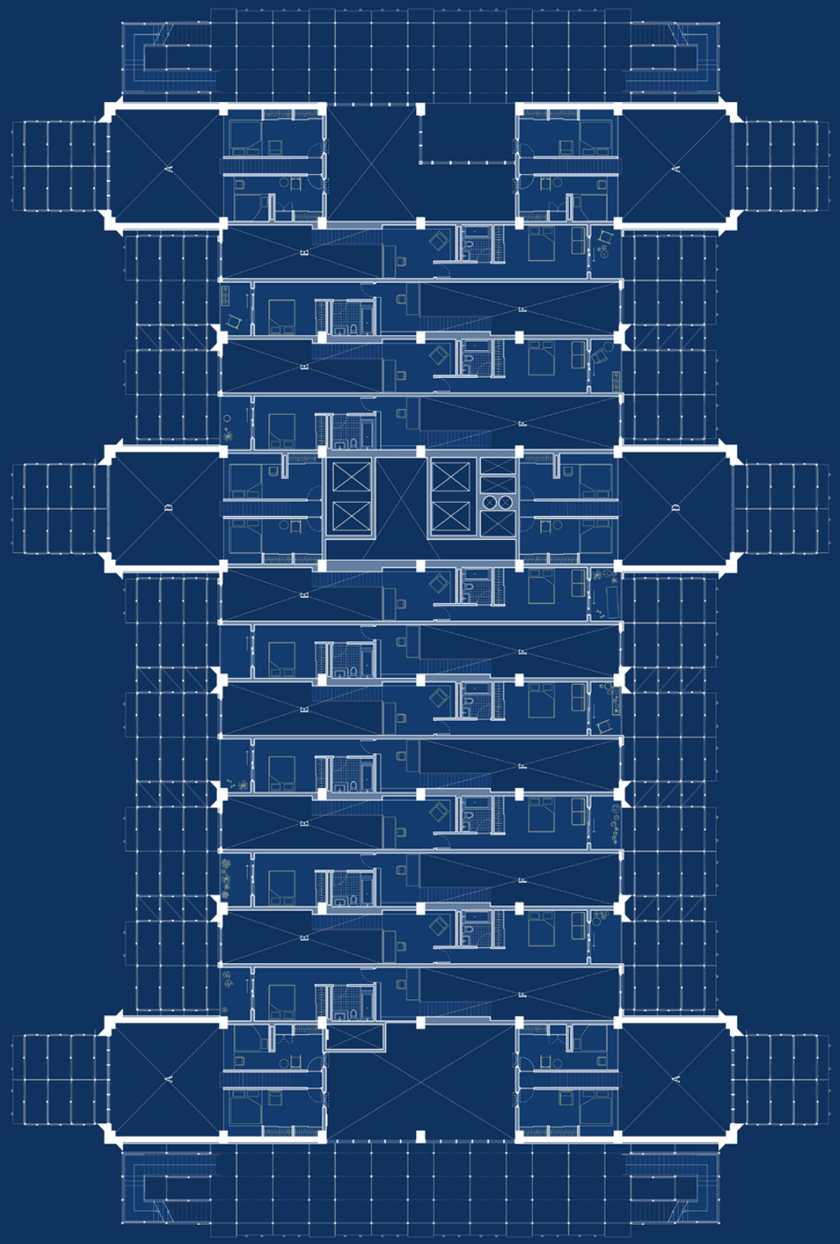
Public programs like laundry, and open terrace happens every level. Reading area and extended open terrace happen every four levels, acting as ties among residents, creating a supporting network within the building. It locates in the southeast area with sufficient sun light, connecting to the vertical circulation hanging outside of the envelope.

The leftover terracotta bricks are kept from deconstruction.

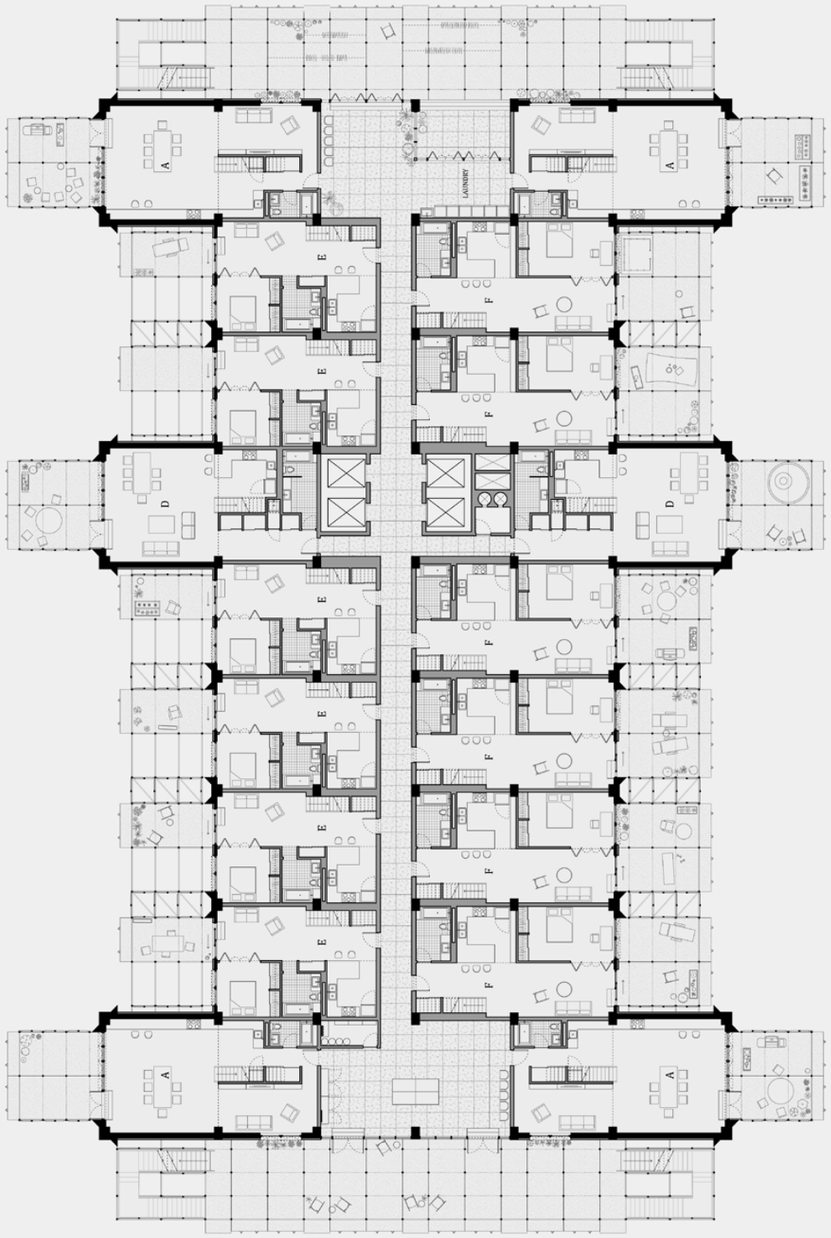
Granite claddings are resized to cap kitchen counters.

Loft units are served for levels with 17.5 floor height. Southern units provides larger outdoor terrace of two concrete panels. Northern ones provides smaller terrace.

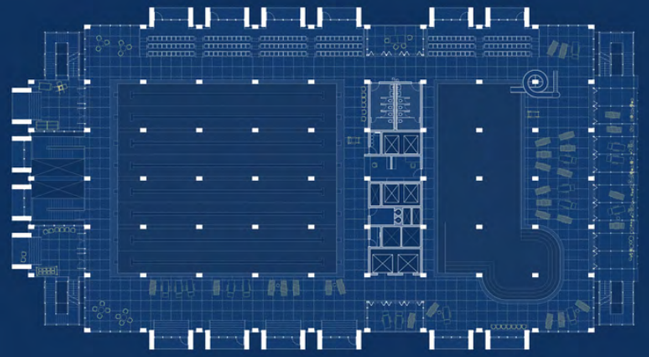
Facade materials are repurposed inside. Concrete panels are rotated 90degrees, elevated and transformed into loft sleeping platforms. The intact terra cotta bricks are reused in dry walls and built-in furniture.



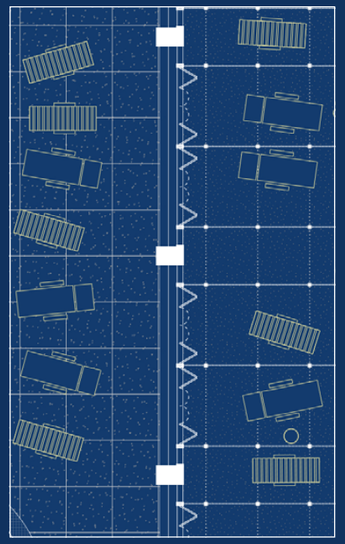
18.5' FLOOR HEIGHT_SECOND FLOOR PLAN



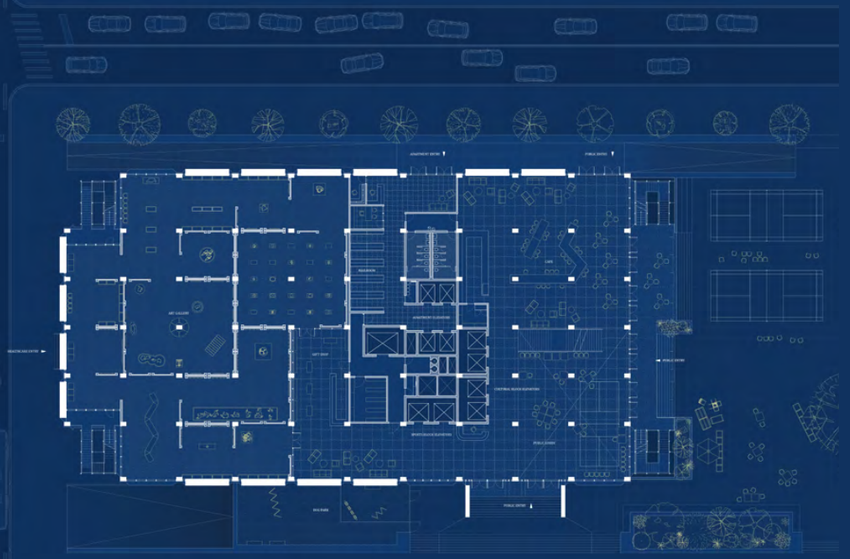
18.5' FLOOR HEIGHT_FIRST FLOOR PLAN



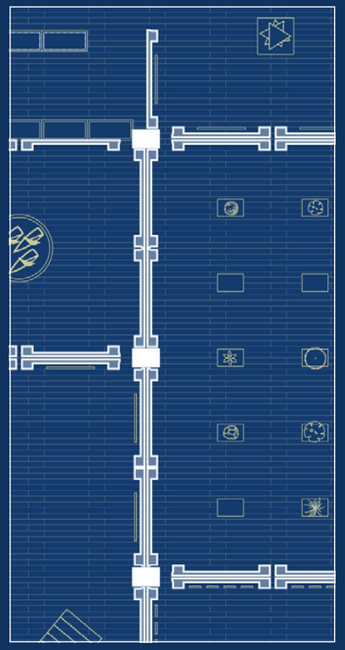
SWIMMING POOL FLOOR PLAN



Visitors can enjoy the exterior terrace for sunbathing.



GROUND FLOOR PLAN



Concrete panels on the facade are repurposed as space divider in the art gallery.

Housing and social infrastructure are gapped by mechanical trans floor. Redirect plumbing from housing to lower space.

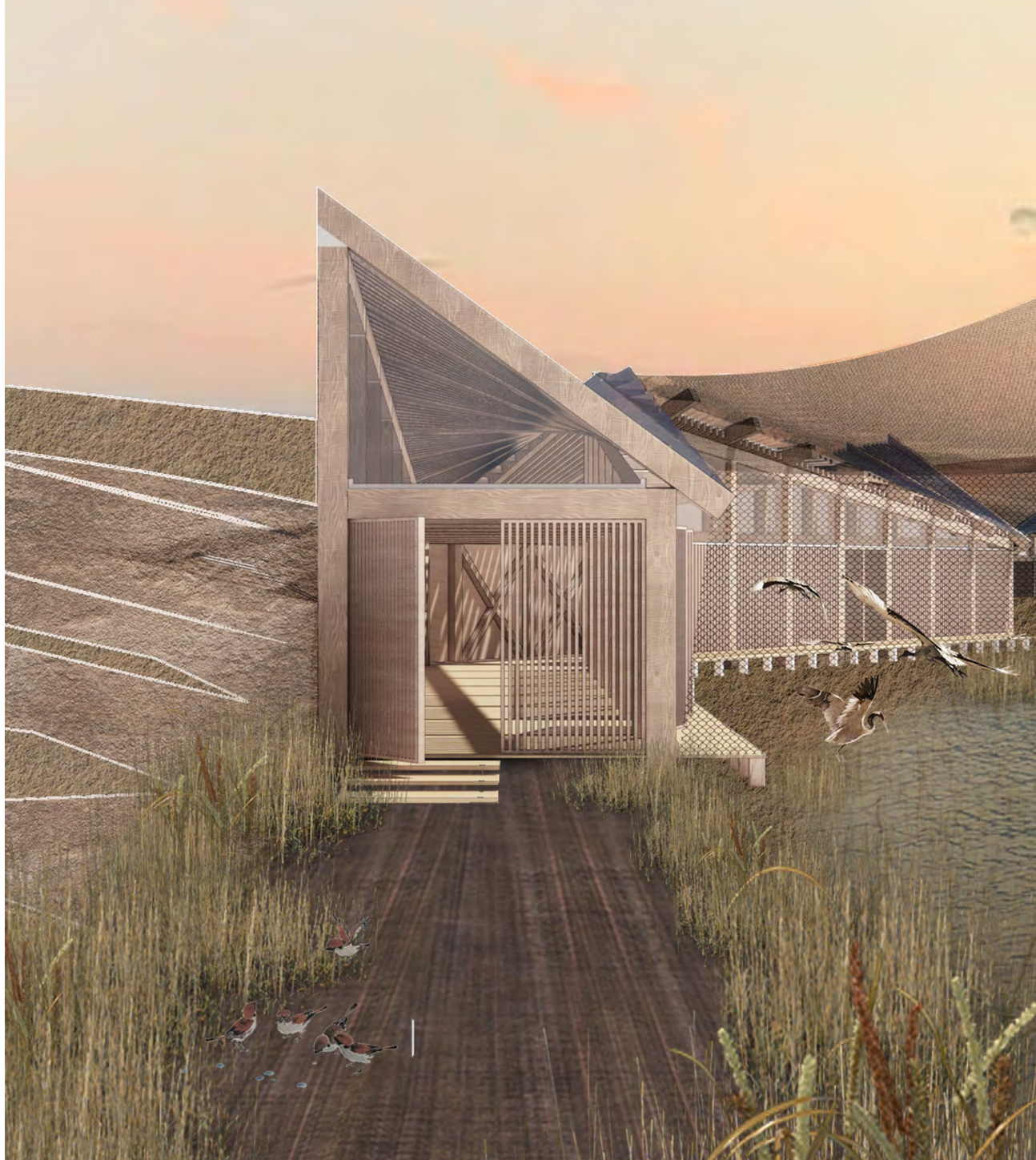
Granite cladding on the facade are trimmed int differential sizes and repurposed as floor and wall finishes.

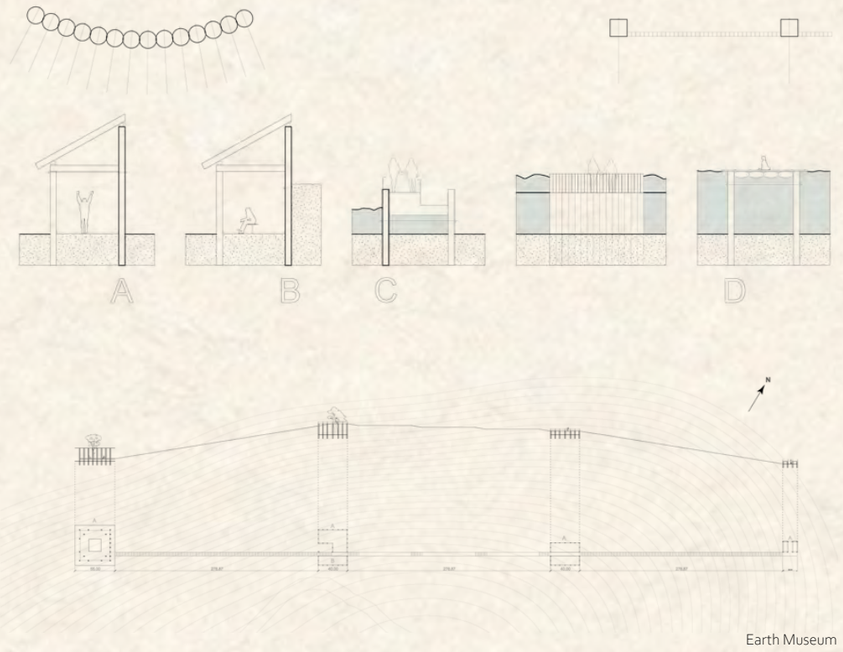
02. New Means of The Acropolis of Athens in Nature

GSAPP ADV STUDIO IV, SPRING 2022
Location: South Bay Tidal Wetland, Annandale-on-Hudson, New York
Program: Museum of Nature
Instructor: Robert Marino

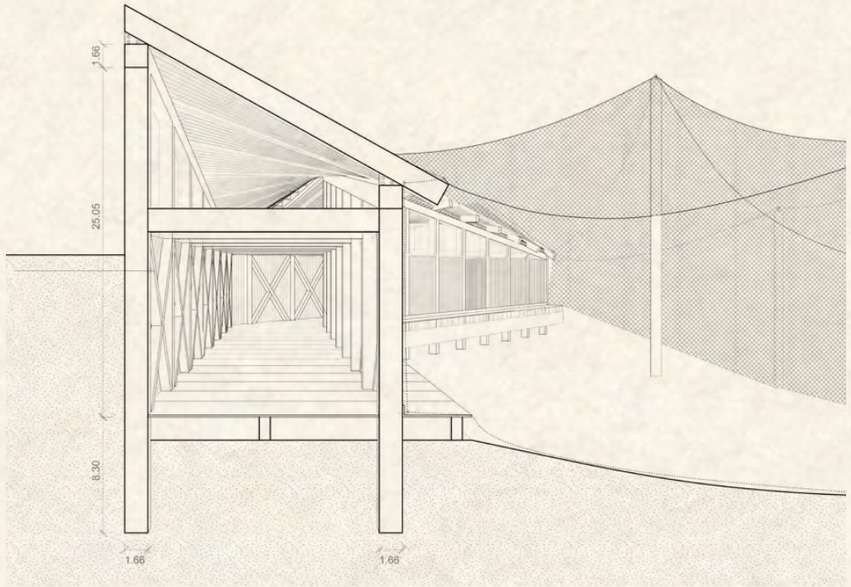
This project studies from the Acropolis of Athens and gets situated in the south bay tidal wetland in the upstate. Acropolis is primarily dedicated to the goddess Athena in Greek mythology. The means is to keep what is sacred inside. Original acropolis was not designed for pure aesthetics, but for good defense and to manipulate perspectives by precise proportion alignment and part to whole relationship. In this project of the museum of nature, natural phenomena provide the higher importance. Museums are oriented according to the landscape to demonstrate respect to nature.

The experience starts with a ramp and is derived into three axes, air, water, and earth. The floating island celebrates the tension between human and nature. Visitors are forced to look at it at the end of all three axes, but only able to take a boat there at certain seasons. Architecture itself is like a petri dish. It is artificial, but neutral. It says nothing, but carefully curates fauna and flora in different scales, even water. With rising water levels, different exhibits become active. Bulkhead is the construction method used in structural elements, learning from piers in the Hudson river.





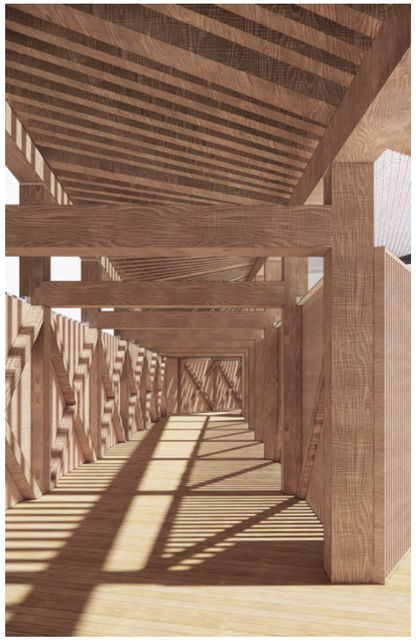
Earth Museum



Air Museum

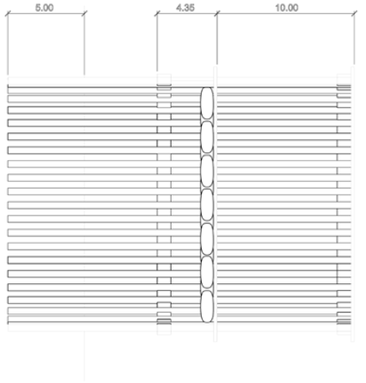
In the earth museum, stairs reinforces the axis. Visitors are forced to look at the floating island at their last stop. These four structures scale up depends on the size of fauna and flora. It starts with animals like frog, turtle, marbled salamander and etc. Then the structure gets lifted up, keeping visitors a safe distance away from larger size animals like deer and cayote. The third one is at a very steep slope. It curates plants. Visitors can reach to the branches and leaves on the northwest side. and easily touch bushes and rocks on the southeast side. Plants that required very low sunlight are curated under the platform. The last one curates one oak tree. White oak is the main source of wood structures for this project. Visitors are brought here to appreciate this natural material.

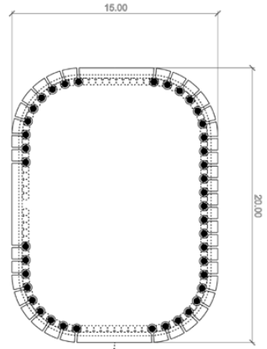
This project is orientated according to the landscape bc nature is what is celebrated here. The experience starts with a ramp and derived to 3 directions (air, water, earth). The island in the end is to celebrate the tension between human and nature. Visitors are only able to get there at certain seasons. The animal analysis showcases what animals are curated in the museum. They all live in this area, including endangered ones, and some disappeared but returned ones. They are listed on the order of scale, from small to large. The grid is a guideline measuring time you walk from place to place Wood is the main material with two shapes that can apply to different building forms. The circular one is used for curvy form, and the rectangular one for the others. This idea comes from piers in the Hudson river. Some special treatment can be applied to the pier. Use a bulkhead to pin it into the retaining wall and it can last for decades. All buildings in this project are structured by these wall types based on different environment conditions. A is to insert vertical piles into soil and strengthen them by horizontal elements. B is to pin the bulkhead into retaining wall. C is a half- underwater structure, having a metal bar connect the underwater structure to the one in soil. Floor Plates can be placed on top of the metal bar. D allows water to go through the space between vertical piles and it's used mainly in the bridge and floating island in this project.



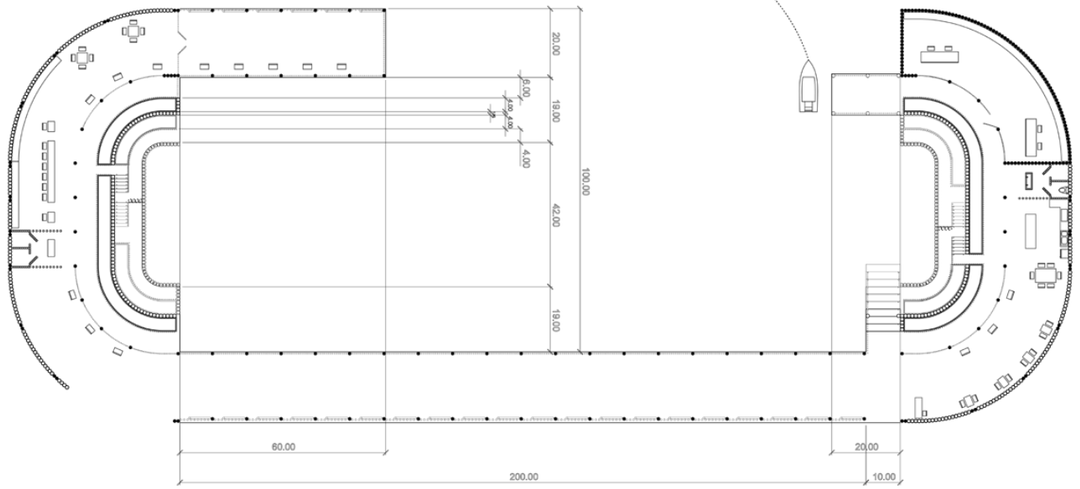
Air museum is oriented north-south, responding to wind direction. It's built along existing path to save construction cost. It has two scales for different bird sizes. Bird cage acts like a tent with wiremesh sitting on top of the four columns and anchored to the roof structure. It uses wall type B retaining wall, which is to have the metal bar inserted into the soil behind.

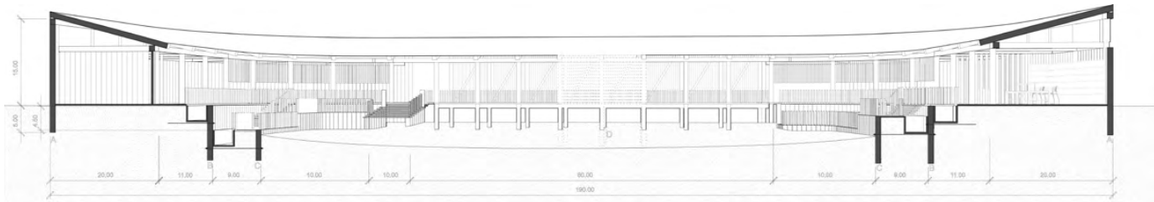
"A turtle coming up for air, its reptile's head in almost blind swaying. No matter.
Take off your sandals, lie on your back, breathe deeply, but with no purpose in mind.
Beside the still waters, you will be restored."
---Dick Allen "Still Waters"

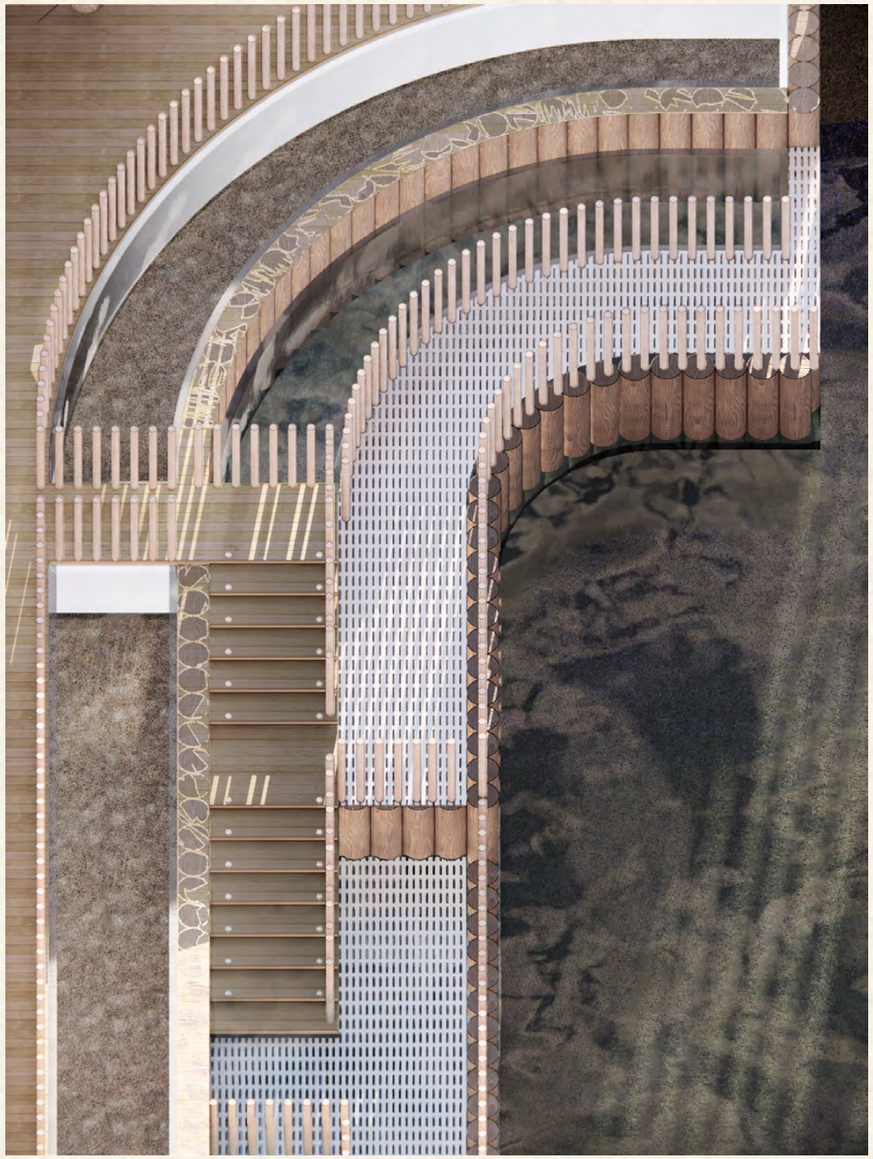




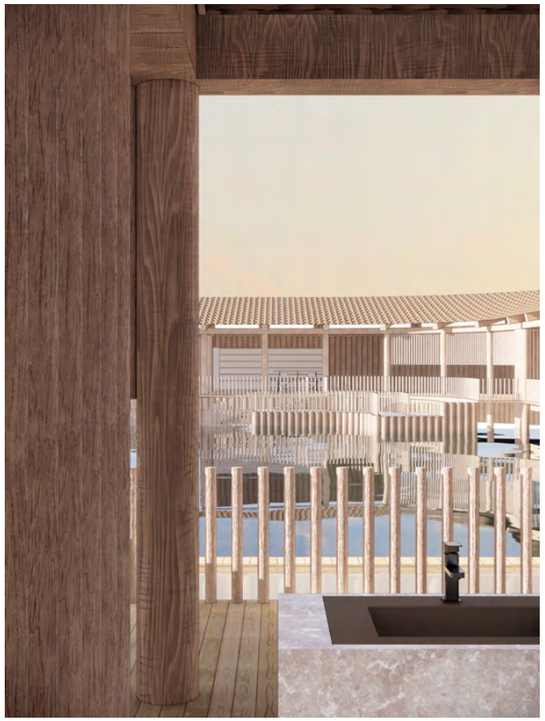
Water museum is the main building. In the upper level, the program includes reception, cafe, kitchen, bathroom, lab, permanent exhibit, and library. In the lower levels, exhibits are seasonal. Two wings are pulled apart, and sit on two sides of the stream, allowing water to go under the bridge. Visitors can take a boat to reach to the furthest point, the floating island. To create the semi-floating island result, airbags are tied on the bottom of the floorplate, allowing it to go up and down as water flows. This view is taken from island looking back at the museum.







"Upward or downward, motion, thy rest. Full of a nature, nothing can tame. Changed every moment, ever the same."
---James Russell Lowell "The Fountain"



Water museum - view from bathroom

Water museum - view from research lab

The water museum is located in a tidal zone. Water level changes in the range of four feet. When water rises, it will hit the upper exhibit space and leave water in it. Different faunas are curated based on their living levels. Each level becomes active in different seasons. Metal deck with special treatment is used for levels that would interact with water. The hole allows water to flow in and out. After years, a thin layer of dirt would leave on the metal deck, symbolizing nature taking over man made structure. The stairs in front of the entrance go directly into the water, providing easy access for visitors. Special community events can happen in the mudflat area Natural light get introduced into the room. Room divider also serve as sun shading mullions.

03. From Sacrifice Zones to Equitopia: a pathway to justice

GSAPP ADV STUDIO VI, SPRING 2023
Program: Board Game
Instructor: Paulo Tavares

a letter from the broken world, 28th April, 2023

Dear Environmental Citizens,

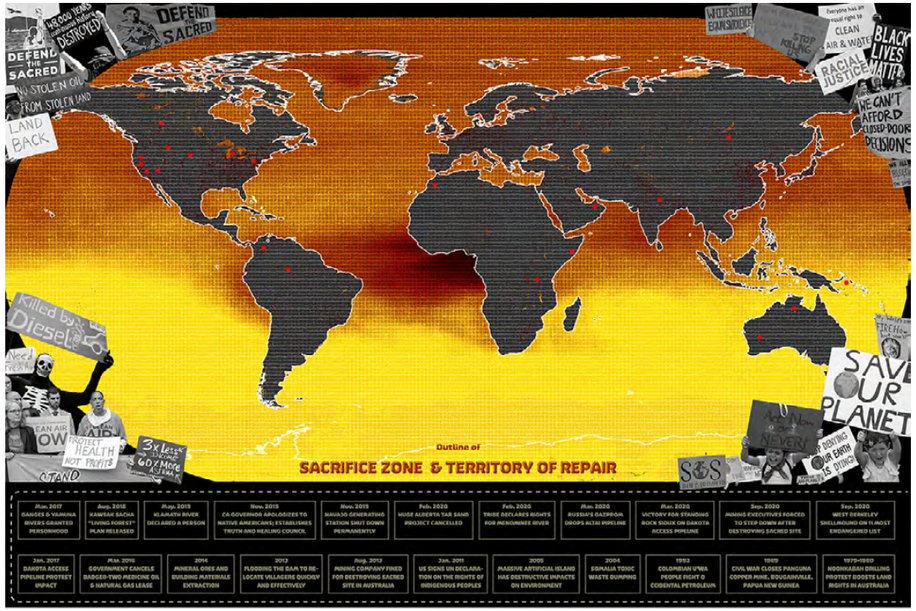
Here begins the journey, where players become defenders of the environment and allies to those impacted by sacrifice zones. Let's roll the dice, draw the cards, and uncover the hidden forces that shape our world, the intricate ecological web of causes and effects that surrounds us. Together, we can discover new insights, spark meaningful conversations, and lay the groundwork for a more just, equitable and sustainable world.

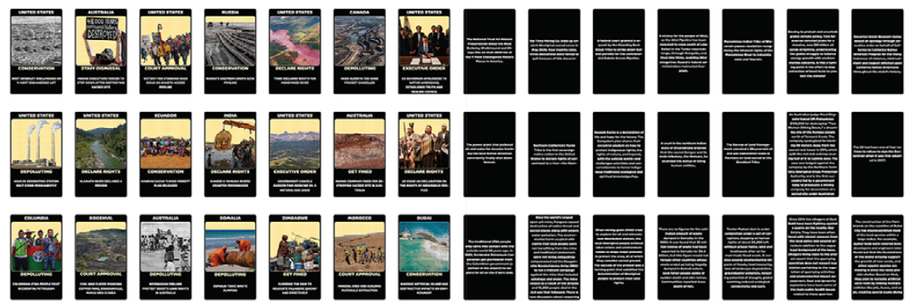
Lots of love,

From the Game Creator

This project seeks to explore methods for transitioning sacrifice zones into territories of repair, known as Equitopia. Initially, "sacrifice zone" referred to areas that suffered extensive environmental damage or economic disinvestment, causing chemical pollution and health hazards for adjacent residents. Today, the term encompasses a range of case studies from across the globe, describing situations where particular groups are deemed expendable and thus subjected to harm or sacrifice without their consent. The victims can include humans, animals, nature, or even cultural and religious beliefs. The project aims to identify and implement strategies to address these harms and shift towards more just and sustainable outcomes.

A key tool in this endeavor is a board game designed to foster critical thinking and discussion among citizens, empowering them to advocate for their rights and claim the services they need. By playing the game, individuals can become more engaged in civic events and better equipped to navigate complex power dynamics within the system. In the future, the potential applications for this tool are diverse. As a pedagogical tool, it could prove invaluable for teachers seeking to enhance their lessons with interactive and engaging content. Its interactive nature provided the potential to be a conversation starter at international conferences. As I continue to develop and refine its capabilities, we may discover even more innovative and exciting ways to leverage its power.



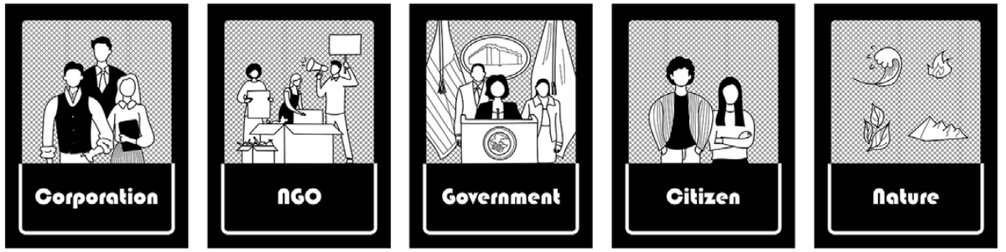


Each player takes on the role of one of five stakeholders.II Government use an 8 faced dice, Corporation use 6 faced dice, other player use 4 faced dice, hinting the power structure. II And everyone picks a case card. Then each player should determine their own mission, stating how they want to win the game - whether through cooperation with other players, going solo and completing the mission alone, or doing whatever it takes to win the game. The relationships between different stakeholders is fluid which may change and evolve over time. Everytime they change their side, they need to write it down. When the game ends, players can use the mission card as a tool for further reflection.

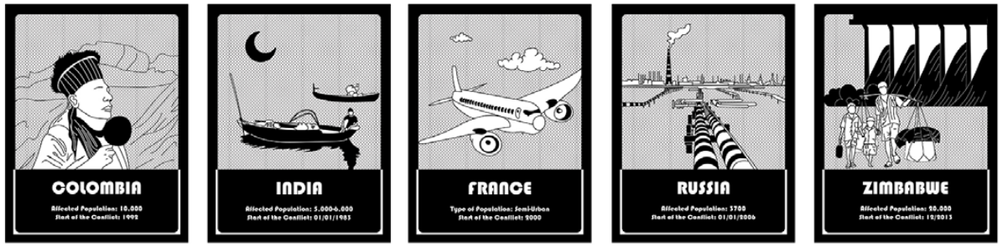
Relationship Station is where players can switch their side. Event Station is where multiple stakeholders may be affected. In Question Station, players need to share their answers or thoughts to other people. If they can't come up with anything, they will be sent back to where they started. Lexicon Station is to assist players fill in the missing ending from different aspects, Inherent right, cultural preservation, environmental justice, racial equity, nature rights. They can look up the definition of each word on the card.

Game Stand

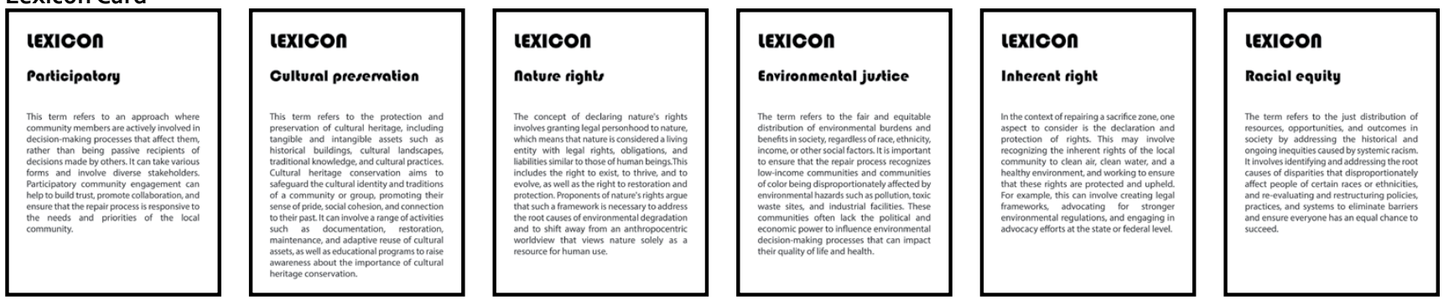
Actor Card



Case Card



Lexicon Card



BOARD INSTRUCTION

The goal of this game is to repair the situation of the damaging world. The way is to fill in the missing endings of the given case with reparation methods through play and conversation. The first player arriving at Equitopia with questions answered wins the game.

STAKEHOLDER

Each player takes on the role of one of five stakeholders: Government, NGO, Corporation, Nature and Citizen. Additional players can choose an Actor card from Citizen, NGO or Nature.

FLUID RELATIONSHIP

To begin the game, each player should determine your own mission. Write it down on your mission card and don't share it with anyone. State how you want to win the game - whether through cooperation with other players, going solo and completing the mission alone, or doing whatever it takes to win the game. The relationships between different stakeholders may change and evolve over time. When the game ends, use the mission card as a tool for further reflection. 1. Once the partnership is formed, the player who's further away from Equitopia gets transferred to the other player's station. 2. Partners can assist each other by answering questions and providing guidance.

STATION INSTRUCTION

To learn about the specific actions and rules for each repair station, refer to the instructions provided below.

1. Write down your own mission. Each of you select one Case card from the top of the stack. Roll the dice and determine how many stations to move forward.

2. Use Lexicon to reflect on your own story. Share your thoughts. For all the Lexicon Station, if you can't come up with anything, go back to where you started.

3. As citizens become increasingly concerned for their health and well-being, they begin to file hundreds of reports to the Department of Air Quality Management. As a result of their efforts, the extraction operation responsible for much of the pollution was eventually shut down. Skip Corporation's next round. Nature take one additional round

4. *Q: How can individuals stay motivated to maintain a sustainable lifestyle over the long term?*

5. *Q: How can social media and technology be used to promote awareness and mobilize communities around social justice issues?*

6. **Let's take a moment to have an open discussion about who you want to cooperate with in the game, or not. Consider which stakeholder is most important to work with in order to achieve your mission. Once a partnership is formed, it cannot be broken until the next relationship station is triggered.**

7. Use Lexicon to reflect on your own story. Share your thoughts.

8. The corporation illegally dumped toxic waste into a nearby river. Skip Corporation and Nature's next round

9. NGO starts a protest to raise awareness about an important social or environmental issue. NGO and Citizen take one additional round

10. Use Lexicon to reflect on your own story. Share your thoughts.

11. Corporation is fined for violating environmental regulations. Skip Corporation's next round.

12. *Q: What are the challenges indigenous people are facing today?*

13. Use Lexicon to reflect on your own story. Share your thoughts.

14. *Q: Imagine you are part of a political organization or advocacy group that aims to address a particular issue. What steps would you take to create meaningful change and achieve your organization's goals?*

15. Under the effects of global warming, the frequency of extreme weather increases. The devastating impact of wildfires results in the displacement of thousands of people from their homes. Skip Nature and Citizen's next round

16. Use Lexicon to reflect on your own story. Share your thoughts.

17. Use Lexicon to reflect on your own story. Share your thoughts.

18. Kids in the community begin to suffer from nosebleeds. The severity of the situation prompted the community to launch an investigation to identify the cause. Skip Citizen's next round

19. **Take a moment to review your cooperation with your partner. Either one of you has the option to terminate the partnership at this stage.**

20. *Q: What are some examples of innovative technologies that are being developed and used to promote sustainable living and address environmental challenges, and how effective are these solutions in achieving their intended goals? E.g. Sustainable agriculture, hydro power*

21. The construction of the oceanic facility has led to the displacement of numerous local species within a significant radius. Skip Nature's next round

22. Use Lexicon to reflect on your own story. Share your thoughts.

23. *Q: What role does education play in addressing social injustice, and how can it be used to promote greater understanding and empathy?*

24. *Q: How can non-Indigenous people and communities be better allies to Indigenous peoples and support their efforts towards greater equality and self-determination?*

25. Use Lexicon to reflect on your own story. Share your thoughts.

26. Government decides to displace affected individuals or communities from their homes or land without providing sufficient compensation or alternative housing, leading to further economic and social disruption. Skip Government's next round

27. **Any of the three - citizens, NGOs, or corporations - can establish a partnership with the government through a process of compromise by trading off rounds. Corporations may attempt to gain advantages through bribery. NGOs or citizens can utilize media outreach to exert pressure on the government for prompt action. The process of successful partnership with the government involves mutual negotiation and compromise.**

28. Use Lexicon to reflect on your own story. Share your thoughts.

29. *Q: What role can advocacy and activism play in pushing for greater environmental protections and regulations?*

30. *The CEO and two top lieutenants were sent to jail due to their violation of laws. Skip Corporation's next round*

31. *Q: What are some of the most pressing social justice issues facing your community today, and what steps can be taken to address them?*

32. Use Lexicon to reflect on your own story. Share your thoughts.

33. *Q: How can those of us who do not live in sacrifice zones support the communities that do?*

34. A declaration of life and hope for the future is proposed. Indigenous people share their ancestral wisdom on how to safeguard their rights and the rights of nature. NGO take one additional round

35. *Q: How should governments and organizations ensure equal access to technology and information?*

36. **Take a moment to review your cooperation with your partner. Either one of you has the option to terminate the partnership at this stage.**

37. Use Lexicon to reflect on your own story. Share your thoughts.

38. Despite being ordered to halt extraction, the company has failed to adequately maintain their equipment, posing a risk of leaks, explosions, or fires. Skip Corporation's next round

39. Use Lexicon to reflect on your own story. Share your thoughts.

40. Government doesn't provide adequate information or transparency about the situation, which leads to mistrust and confusion among affected individuals and communities. Skip Government's next round

41. NGO's action can sometimes be viewed as confrontational by other stakeholders. It can exacerbate tensions. Skip NGO's next round

42. *Q: How can non-governmental organizations (NGOs) work with businesses and corporations to promote diversity, equity, and inclusion in the workplace, and what are some strategies for building effective partnerships between these two sectors?*

43. Use Lexicon to reflect on your own story. Share your thoughts.

44. Government did not take any immediate action to address reported issues in the area until they dispatched staff to conduct a site visit and assess the situation. Skip Government's next round

45. **This is the final opportunity to reconsider your relationship with other stakeholders. While open discussions and persuasion are encouraged, the final decision does not require mutual negotiation.**

46. *Q: How can we ensure that marginalized and underrepresented communities have equal access to resources, education, etc.?*

47. Use Lexicon to reflect on your own story. Share your thoughts.

48. The community members decided to organize their own group meetings. Through these meetings, they hoped to work together to address the challenges facing their community. Citizen take one additional round

49. *Q: Give an example on how communities can be transformed from sacrifice zones to sustainable communities.*

50. Use Lexicon to reflect on your own story. Share your thoughts.

51. *Q: Welcome to Equitopia! As you look back on your journey through this game and the intricate relationships among its stakeholders, what visions do you hold for a just ending of your own story? In the wake of sacrifice zones and their impacts, what role can you play in shaping an "equitopian" future?*

04. Avery Hall Basement Rearrangement

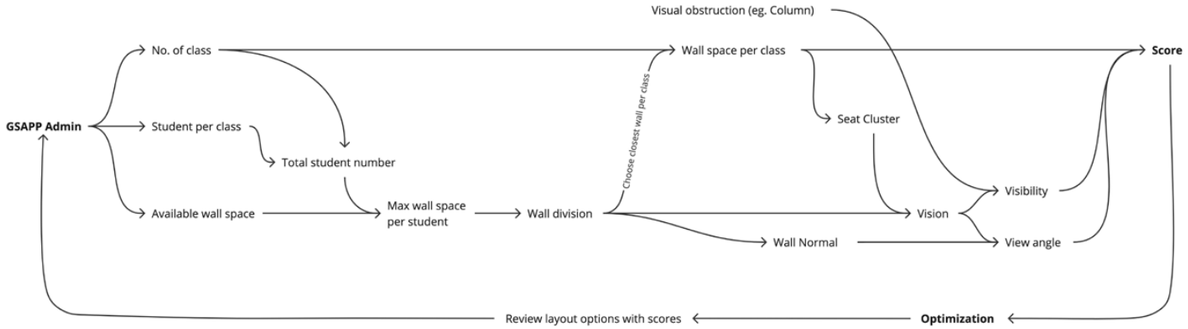
A study of optimizing possible layouts for review/exhibitions in Avery 100.

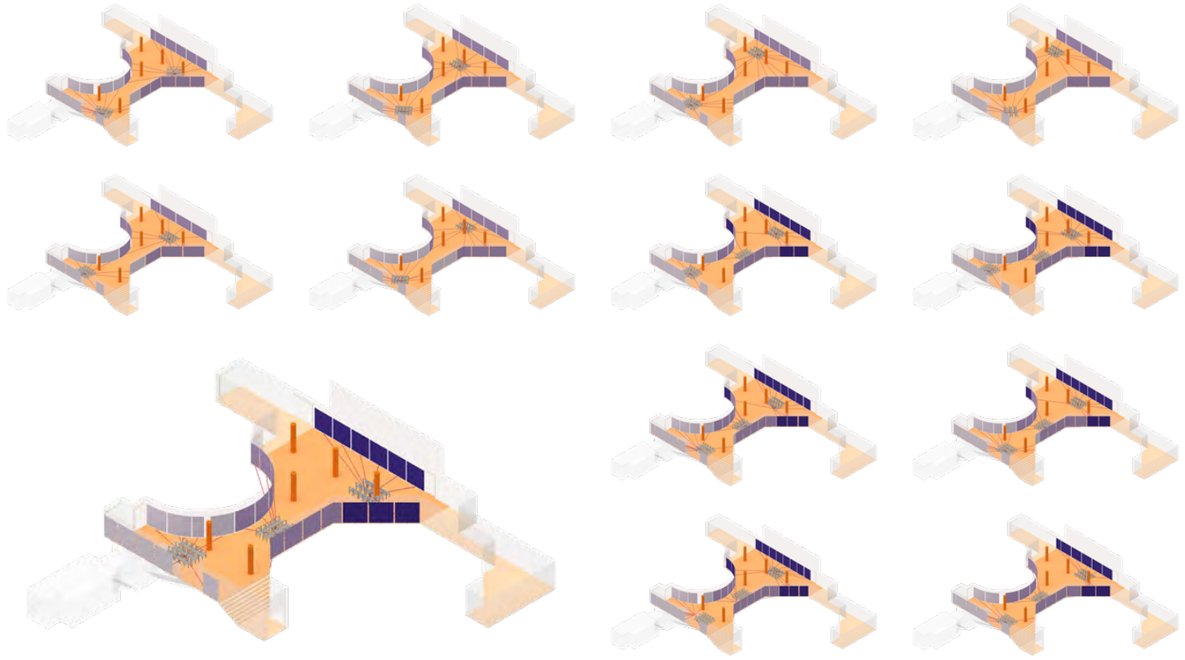
GSAPP TECH Generative Design, Spring 2023
Group Member: Cohaul Chen, Walter Wang, Wenjing Tu, Zixiao Zhu
Instructor: Danil Nagy

Avery Hall was built in 1912 as part of the original campus plan. As the architecture department has expanded, the available space for conducting studio reviews has become increasingly cramped. This lack of space has forced students and faculty members to share classrooms and other inadequate spaces, which can negatively impact the quality of reviews and limit the department's ability to foster collaboration and innovation. This is a pressing issue that needs to be addressed to ensure that the department can continue to provide a high-quality education for its students and maintain its reputation for excellence in the field of architecture. This project aims to highlight the underutilization of the Avery basement and propose potential solutions to optimize its use for studio review or exhibition. Therefore, the project uses generative design as a method to generate optimal layouts for reviews.

Methodology

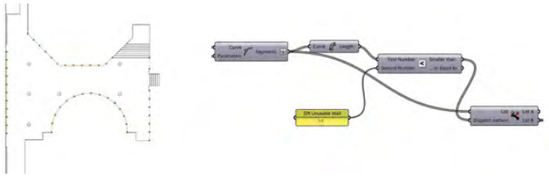
Based on the idea, we propose a four-step process:
1. Collect input information and calculating maximum wall space for each student
2. Determine class boundary based on proximity to the walls.
3. Apply view angle and visibility as metrics to measure the performance.
4. Generate the optimal options and provide users with options.





Input Parameters

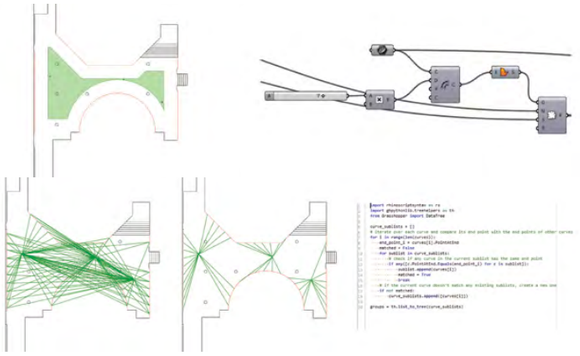
To determine the maximum wall space available per student, we first calculated the total number of students by multiplying the Number of Classes and Student Number per Class inputs. Then we divide this value by the total length of the wall. With the maximum wall width per student determined, we divided the wall into segments.



Poster Clustering and Class Boundary

To create a comfortable distance between the jury and the wall during reviews, we created a boundary by offsetting the wall by 7 feet. Within this narrowed down boundary, seeds were randomly populated, from which a given number of seeds were selected as the center point of a cluster of chairs for the juries and students. The number of points is determined by the Number of Class input. This approach ensures a fair and equal distribution of seating for each class during reviews.

With walls divided and cluster points selected, we measured the distance between the middle point of each wall segment and each of the cluster points, and connected the middle points to their closest cluster points.

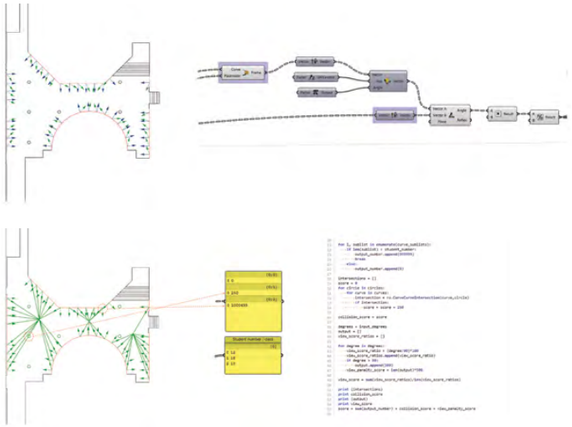


Minimum number, View angle and visibility

First, We calculated the angle between the visual line and normal line as θ. A smaller value of θ indicates better visibility for the jury. We added all the θ values. The optimal option was then identified as the configuration with the smallest sum of θ, ensuring that all juries have the best possible visibility during review/exhibition. For each iteration, the sum of θ is calculated towards the score for optimization.

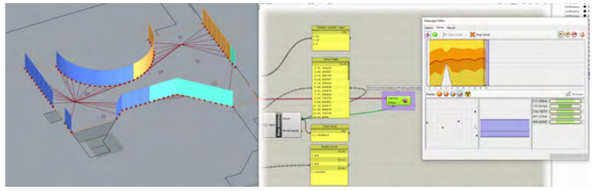
Second, the total number of lines in each cluster is compared to the desired number of students in each class. When a cluster with lines fewer than that number, a penalty number will be calculated towards the score for optimization in this iteration.

Third, when the lines in a cluster intersect with columns, the intersections are documented and counted. The counts of intersections are weighted and calculated towards the score for optimization.



Optimization

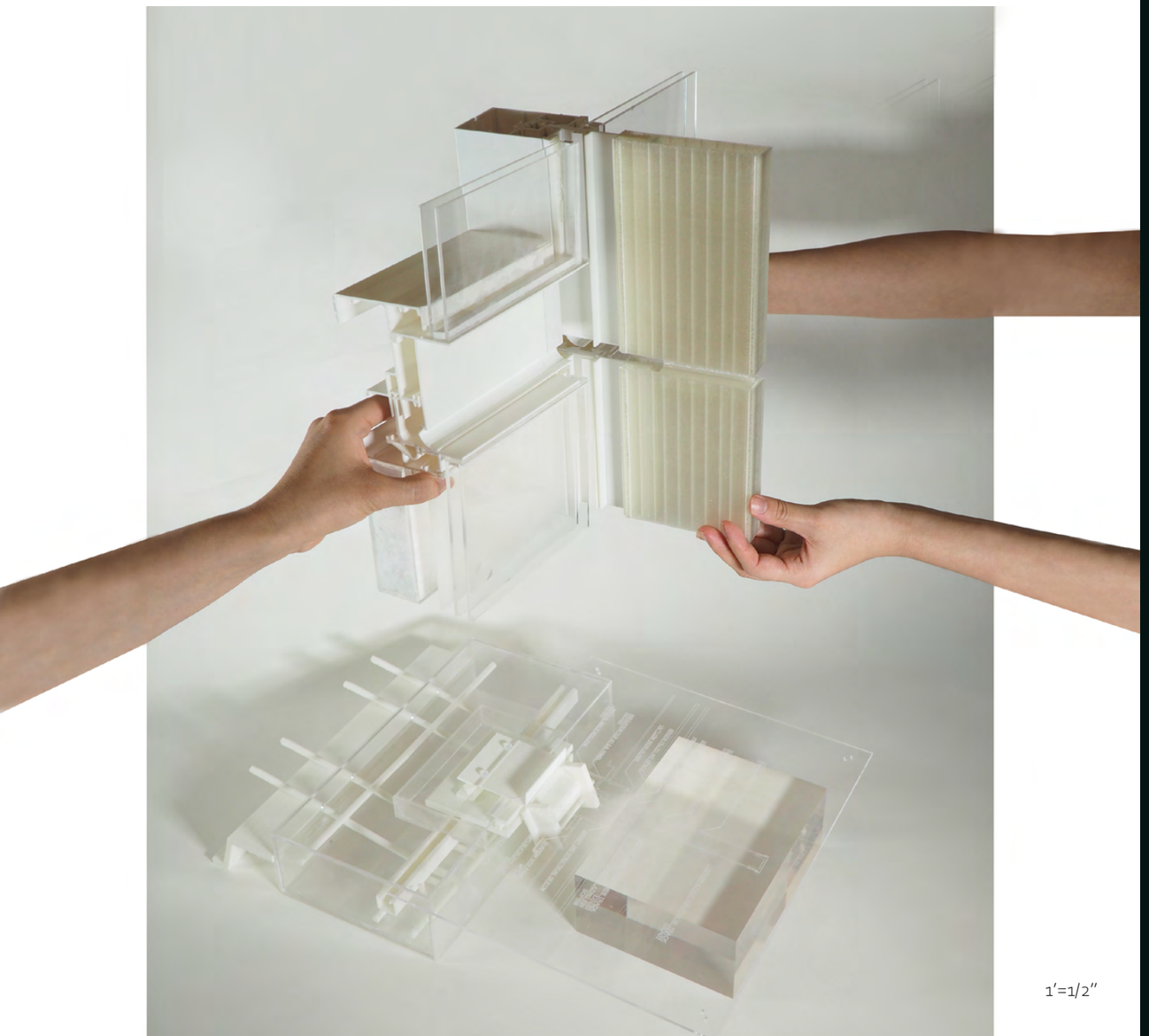
As mentioned earlier, view angles, minimum number, and visibility are factored in when calculating a final score for each iteration. In this project, the minimum number of lines has the heaviest weight as meeting the number of students per class takes priority. In the end, a higher score indicated higher penalty, which means a less optimal layout for reviews.



05. COMMERCIAL CURTAIN WALL

GSAPP AT V, Spring 2022
Group Member: Lucas Pereira, Linru Wang, Mingyue Zhang
Instructor: Nicole Dosso
TA: Gustavo Lopez

Following the same concept from our MRI-inpired drawings, we want to showcase in our model as many elements as possible at a first glance. We use 3D printing for the extrusions, and more intricate elements of the model. After having all of them properly printed, we construct the base and the slab with cotton and acrylic. Finally, we assemble the model with the IGU part.



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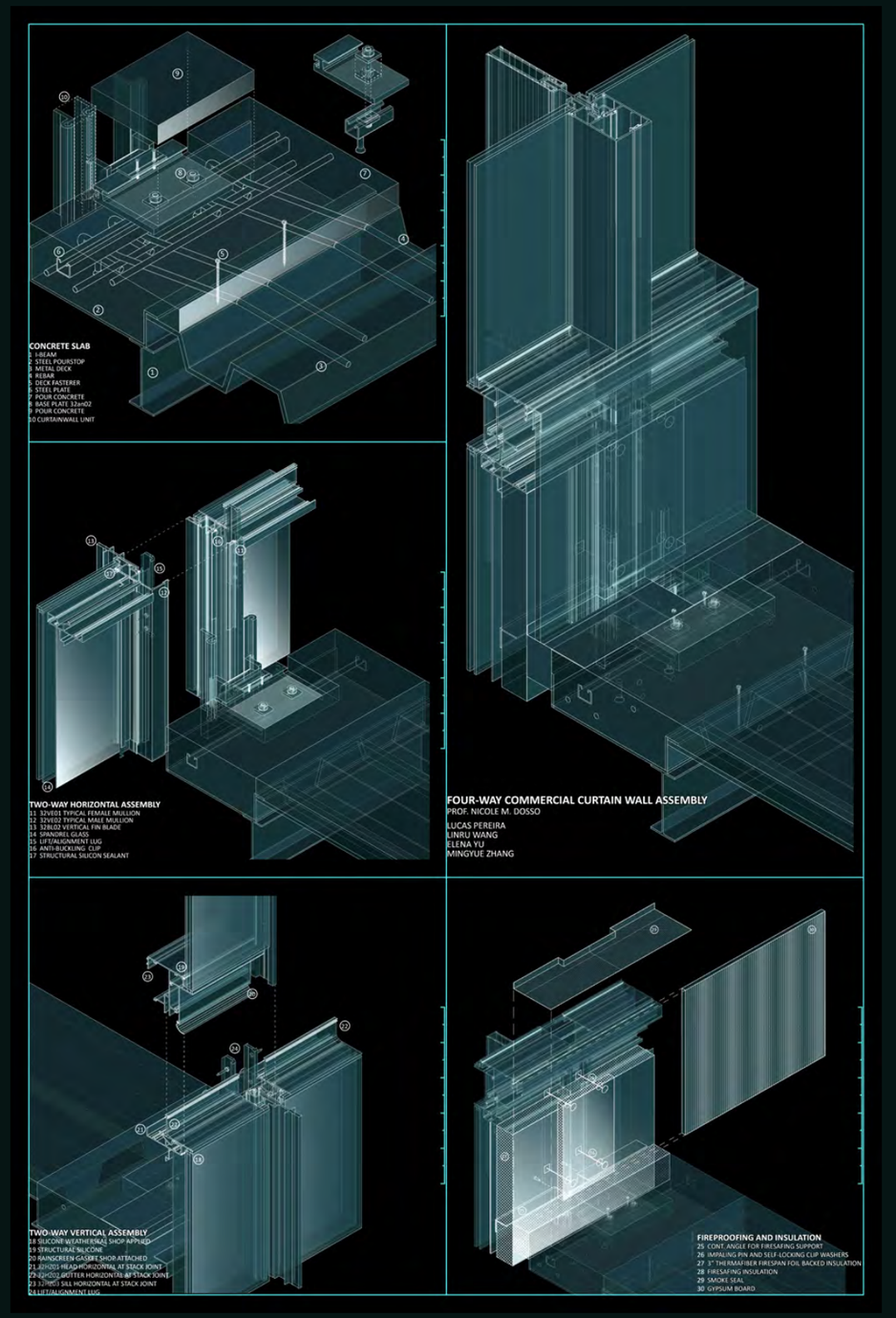

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