

NATURE TRANSLATION

AN APPROACH TO DESIGN AN ARTIFACTUAL NATURE SPACE

Chen Shen

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Nature Translation
An Approach to Design an Artifactual Nature Space/ by Chen Shen

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includes bibliography reference

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ABSTRACT

As one of the most important elements in architectural design, natural environment always inspires architects. In the case of Fehn Pavilion of Nordic nations from Sverre Fehn, nature as an architectural identity was introduced in the space in the form of trees which grown between the beams. Several cases in the history show architects' attempt not only to create harmonious relationships between the buildings and the environment, but also to bring the natural feeling into interior space. However, how to understand and translate nature space in to artefact space is not that easy.

To translate nature space into architecture space is not merely only about to imitate the nature by planting vegetation and so on. Architects need to capture the most significant moment of the nature and abstract it into architecture language. The difficulty in the process of translating nature into architectural space is that architects should represent nature in an artefactual way. That is to say architects need to design an artefactual nature space.

This article would firstly discuss how to abstract and translate nature environment into architecture language by the works from elective course SECOND NATURE 01: LANDSCAPE conducted by guest critic Pezo von Ellrichshausen from Chile. Artefactual space would also be introduced by the research from elective course Architecture, Space and Structure conducted by Labics, an architectural and urban planning practice founded by Maria Claudia Clemente and Francesco Isidori. In the end, the project from the studio Material Matters, the 2018 fall optional studio conducted by Chilean architects Alejandro Beals and Loreto Lyon, would illustrate the whole process to design an artefactual nature space in architecture by abstracting nature environment, combining artefactual structure.

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BIBLIOGRAPHY

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1

1. Nature Environment

In elective course SECOND NATURE 01: LANDSCAPE, conducted by guest critic Pezo von Ellrichshausen from Chile, I was working on the John Constable's painting which is shown on the left. As this seminar was trying to explore the degrees of consciousness after a "mechanical reproduction" of hand-made pictures, we were trying to imitate the original painting. I started to paint from A5 size to A1 size for 15 paintings in total, and during this process, several interesting questions appeared. The painting exercise became a means to wonder not only about painting techniques but also about to understand and capture the moment that the painting conveys. Picturesque versus sublime was the one of the topics that we discussed the most during the seminar. Also, to abstract the original painting and how to represent it also effect the final result.



painting practices
by Chen Shen

Acrylic, A5

1.1 The Picturesque versus The Sublime

The picturesque and the sublime were the two aesthetic concepts established during the Romantic era. The picturesque represents Nature as a comforting source of physical and spiritual sustenance and it shows mankind's ability to control the natural world, while sublime is a humbling reminder that is not all-powerful. Sublime images show the Nature at its most fearsome.

The first painting on the left was the first one I tried to imitate every detail of the original painting from each difference in colors and the shapes of the objects. The whole painting could be described more as picturesque than as sublime for the reason that there were no strong contrasts in the painting both in the aspect of color and objects size.

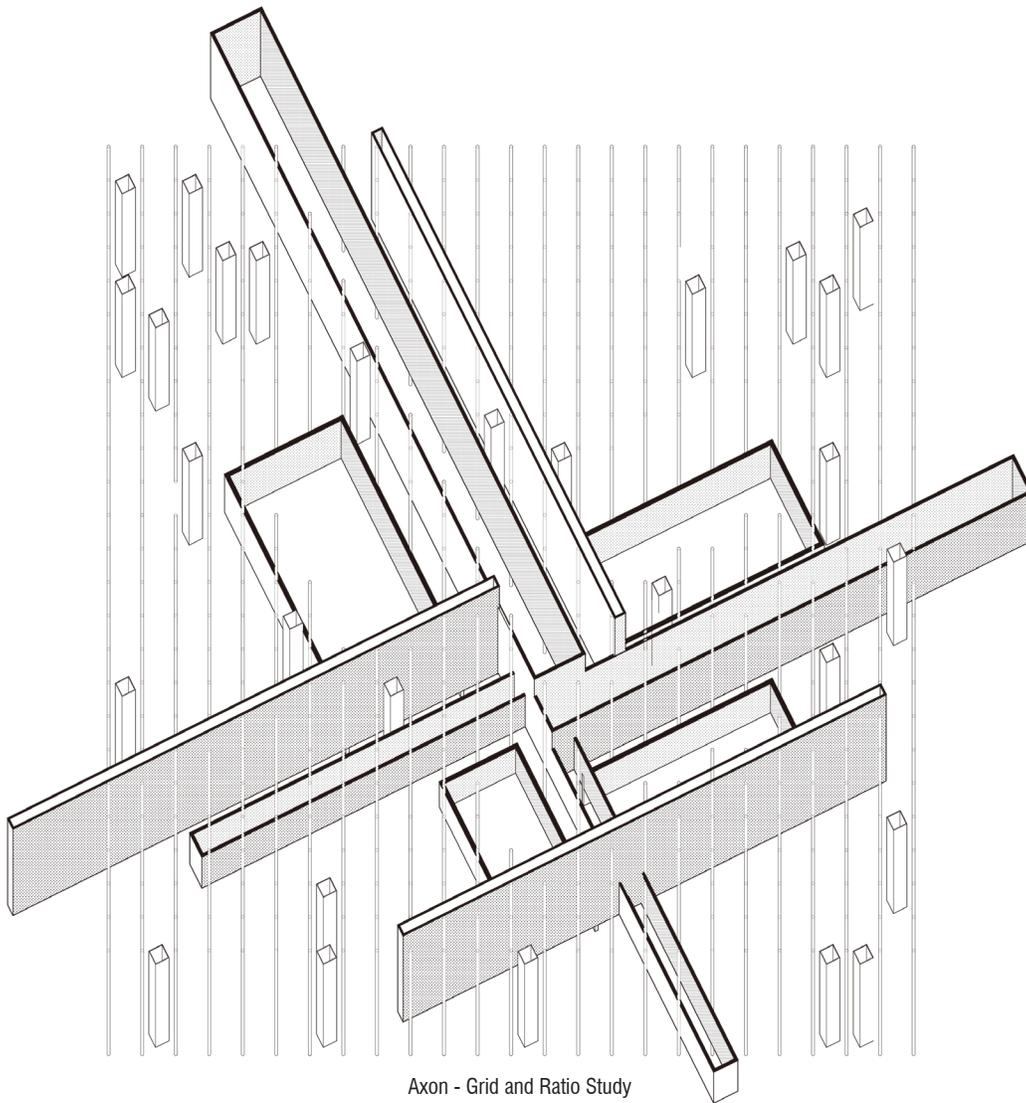
To understand the nature be picturesque or sublime provide a new idea to be taken in to consideration when architects translate the nature space into architecture, as it shows the architects' spatial intense. To imitating the same feeling that the nature gives to people need architects carefully consider about the size and portion of a space. A harmonious portion of a room could create the cozy feeling for the inside people; while if the ceiling is too high above the floor, the room would create an uncomfortable feeling like the fearsome that a sublime image could show.

1.2 Imitation and Abstraction

To imitate the nature is to capture the moment that attracts people the most. Architects use their eyes to observe the nature but what they see is regulated by need and prejudice.

It selects, rejects, organizes, discriminates, associates, classifies, analyzes, constructs.¹

This process is usually understood as abstraction. The second and last paintings on the left were my two attempts to abstract the original painting to show my own understanding. The lake and sky got merged together to emphasize the horizontal vegetation and the cows were painted as objects which only occupy the space but could hardly be figured out what they were.



Axon - Grid and Ratio Study

2. Artefact Space

Architectural design leads to the artistic works; however, the building construction results in the shelter that actually works.²

Trying to translate the nature environment shows architects' aesthetics and spatial intense. However, an architecture design is indeed a design that architects play not only with the space but also the artefacts objects – columns, walls, windows and etc.

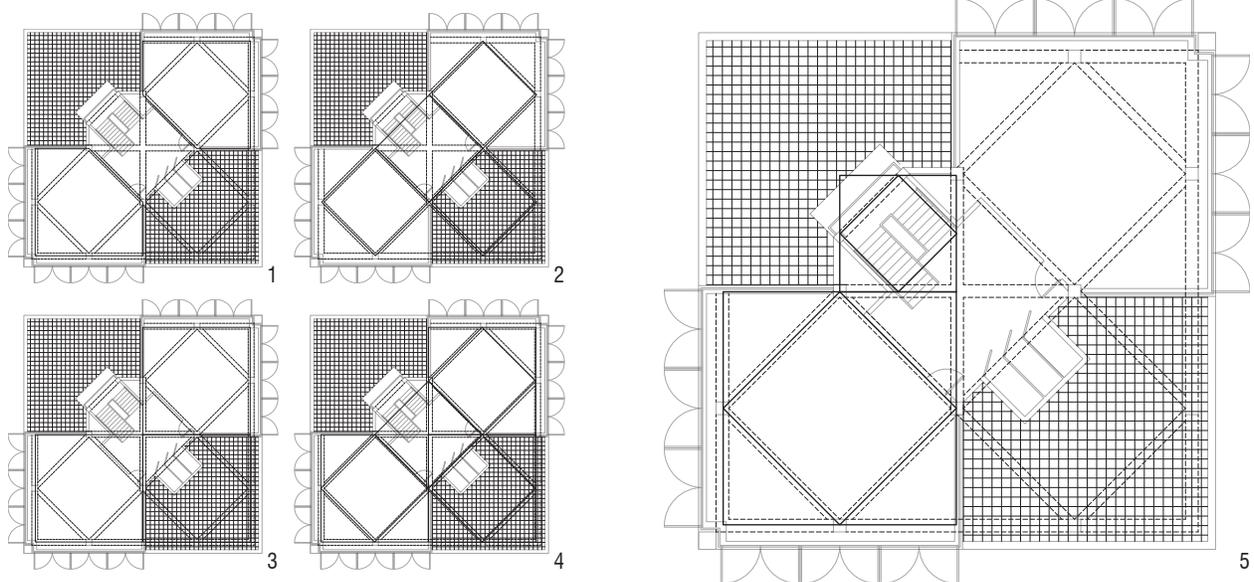
In the 2018 fall elective course Architecture, Space and Structure conducted by Labics – an architectural and urban planning practice founded by Maria Claudia Clemente and Francesco Isidori, we research on the elementary rules of an architecture by analyzing the case Crown Hall from Mies van der Rohe and Open Air School from Jan Duiker. We studied the relationships between ratio and space, grid and structure and came out with a small design (left) in the end.

2.1 Grid and Structure

Architects always play the game with geometry and grids. Geometry provides the boundary for a space, which people could clearly feel; the grid plays the role like a skeleton, which influences the arrangement of structure. As the result, structure in a building could hugely affect the space as it usually controls the boundary of a space.

In the case of Open Air School, architect Jan Duiker provided another idea to think about the relationship between space and grids. The direction of structure was designed to be rotated 45 degrees from the direction of the main space in this school. The columns stood in the middle of each side of the space, so that the corners were kept to be open to nature. This design made the space in the building have a feeling of extension and the structure of this building could grow.

1. Geometry Study - Geometry Defined by Program
2. Geometry Study - Geometry Defined by Structure
3. Geometry Study - Geometry Defined by Space Boundary
4. Geometry Study - Geometry Defined by Grid
5. Grid Study - Grid Rotating

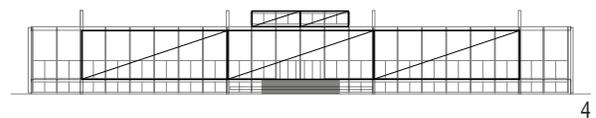
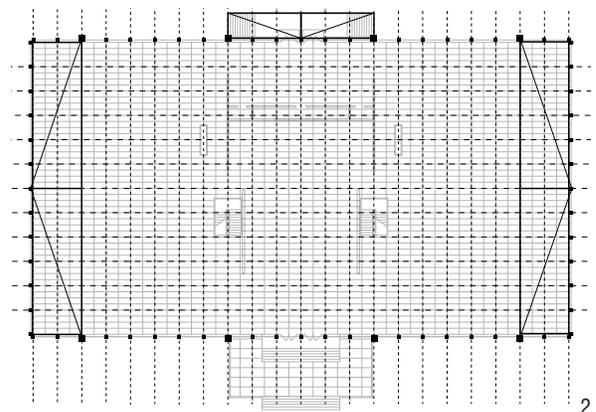
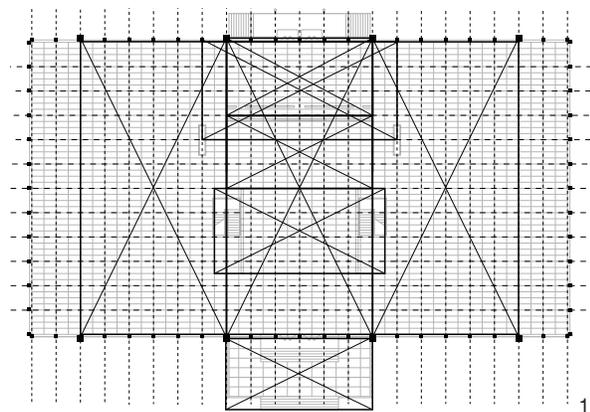


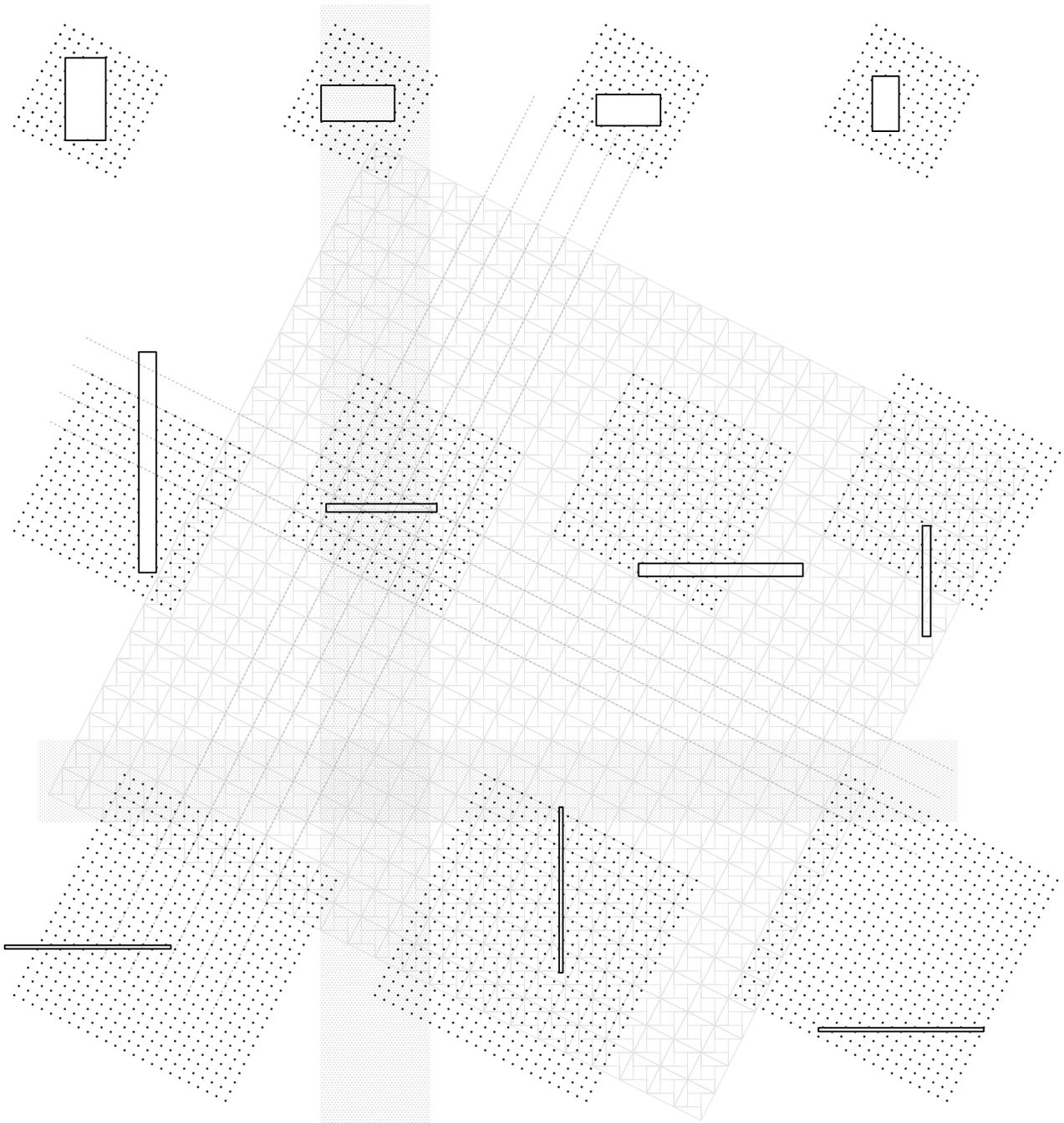
2.2 Ratio and Space

In the case Crown Hall, Mies van der Rohe controlled every architectural elements on the grid. And he divided the space follow the ratio 1:2 and 1:3. These two sets of ratios were also applied to the details like floor segmentation and structure sections. Not only in the plans could we found these ratios, the elevation was divided by such ratios as well. The following drawing shows these two sets of ratios that represented in the plan and elevation.

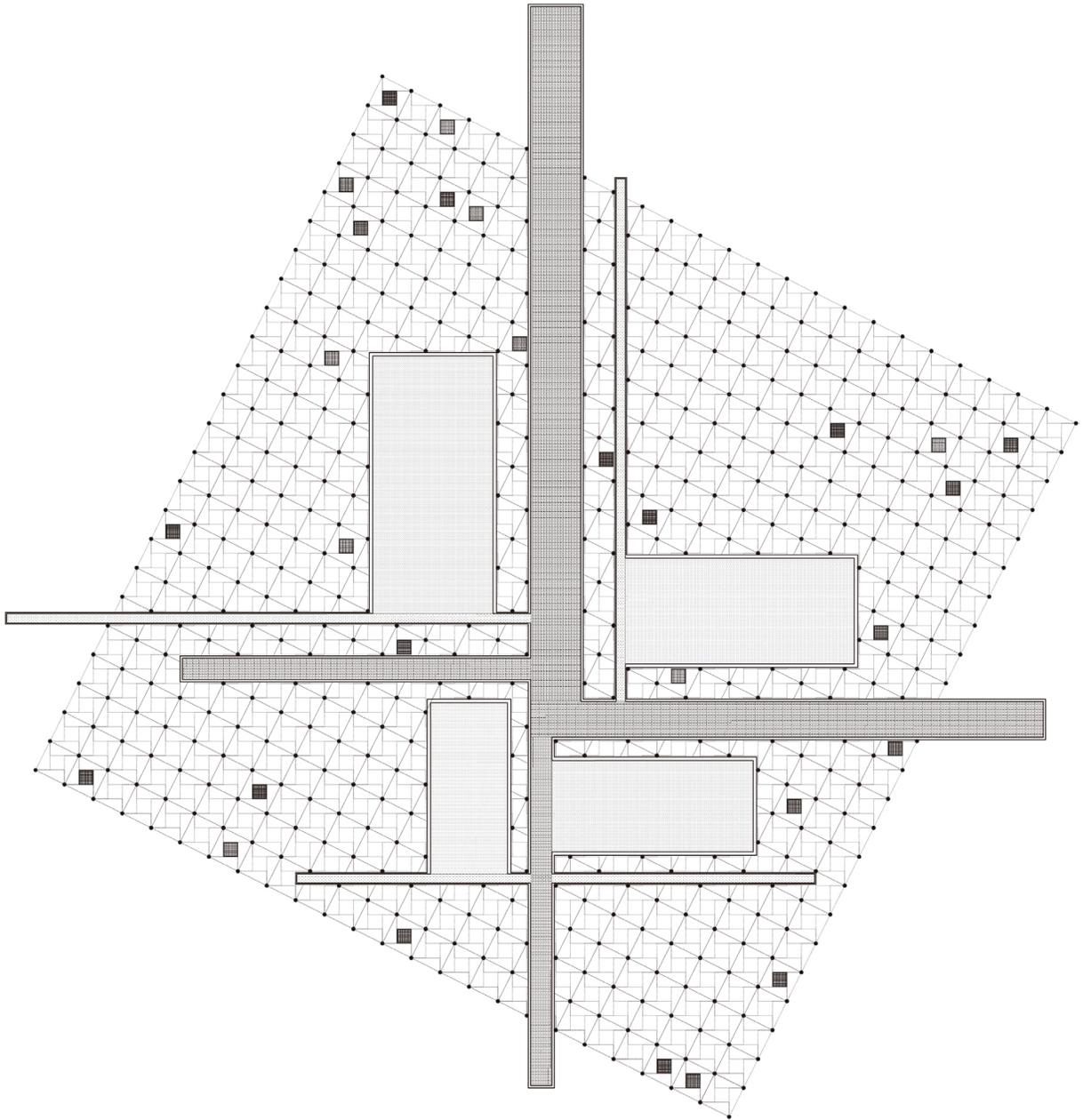
The control of the ratio made the whole project more logically. The 1:2 ratio represented the main space in the building; while 1:3 ratio were always used for other spaces. As a result people could feel the hierarchy of space easily, not only because every space were arranged symmetrically, but also because the similarity and differences of each space.

1. Ratio Study - 1:2 in Plan
2. Ratio Study - 1:3 in Plan
3. Ratio Study - 1:2 in Elevation
4. Ratio Study - 1:3 in Elevation

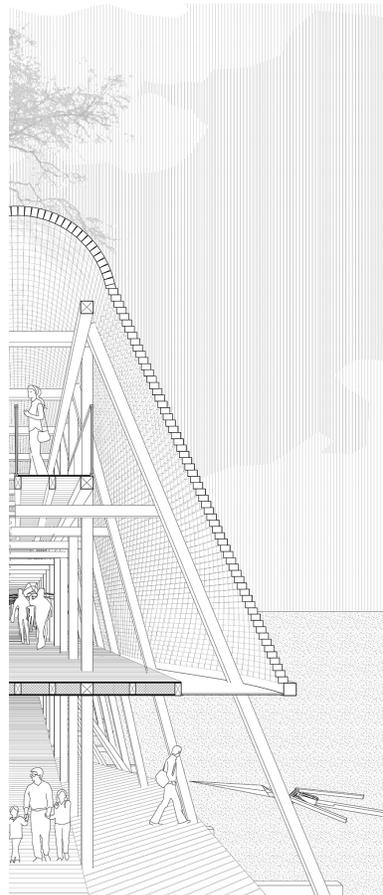




Grid and Ratio Practice



Plan



3. Artefactual Nature

The project explores how architecture may be inspired by everyday encounters with the natural and constructed environment. It is concerned with the atmospheric qualities of space and the role of architecture in producing a particular atmospheric condition - the artefactual nature .

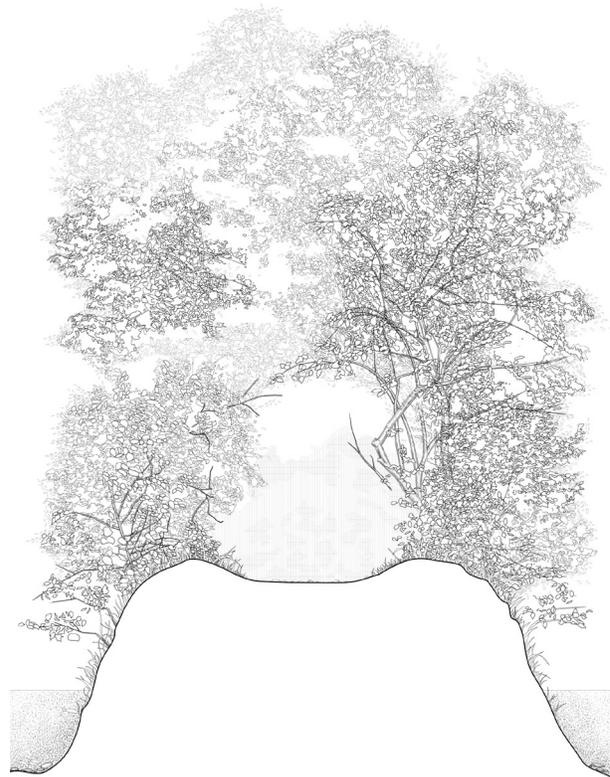
The project began by a research on a green tunnel in Stewart Park nearby Cayuga Lake. The green tunnel was studied and drawn in detail in order to capture its material and immaterial qualities. Then, the natural environment was analyzed through models which abstracted its conditions of light, enclosure, geometry and void. In the next phase of project, a similar investigation was also taken into the artifact environment, an old wooden pier in Farmers Market. This architectural artifact was studied for its material and structural conditions, its mode of assembly, its detail in construction and its atmospheric quality. The following page shows the process of translation from the original nature environment to the final project.



Original Nature Space

With the sight blocked by the green tunnel made by trees, people could experience different light qualities. At some places, people could also watch out to sky or the river with a sudden opening,

The trees not only provide the cover for people, but also play the role of the filter for the light to create different light qualities.



Imitation in Drawing

During the process of drawing the nature space into line work, the front bushes, the tree branches and the background trees were separated into different line weight to show the depth of the tunnel.

Additionally, the drawing tried to imitate every details of the site. Only with enough details could make the drawing more picturesque.



Abstraction in Model

With the intention to translate the natural condition of the green tunnel into architecture space, I tried to abstract the original spatial qualities with the wax model.

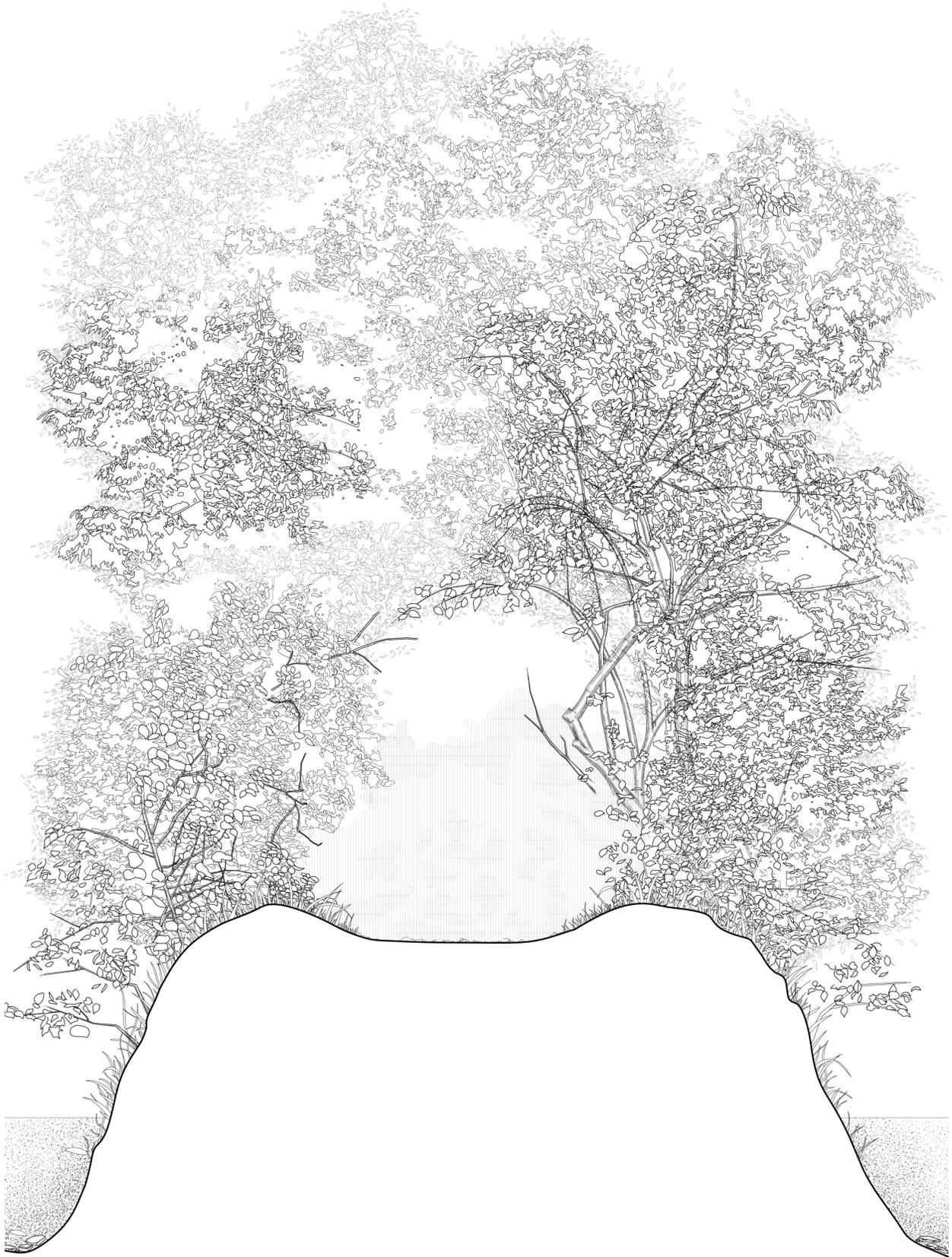
The wax could not only play the role to filter the light entering into the space, but also have the quality which was both solid and transparent like the green wall of the original tunnel.



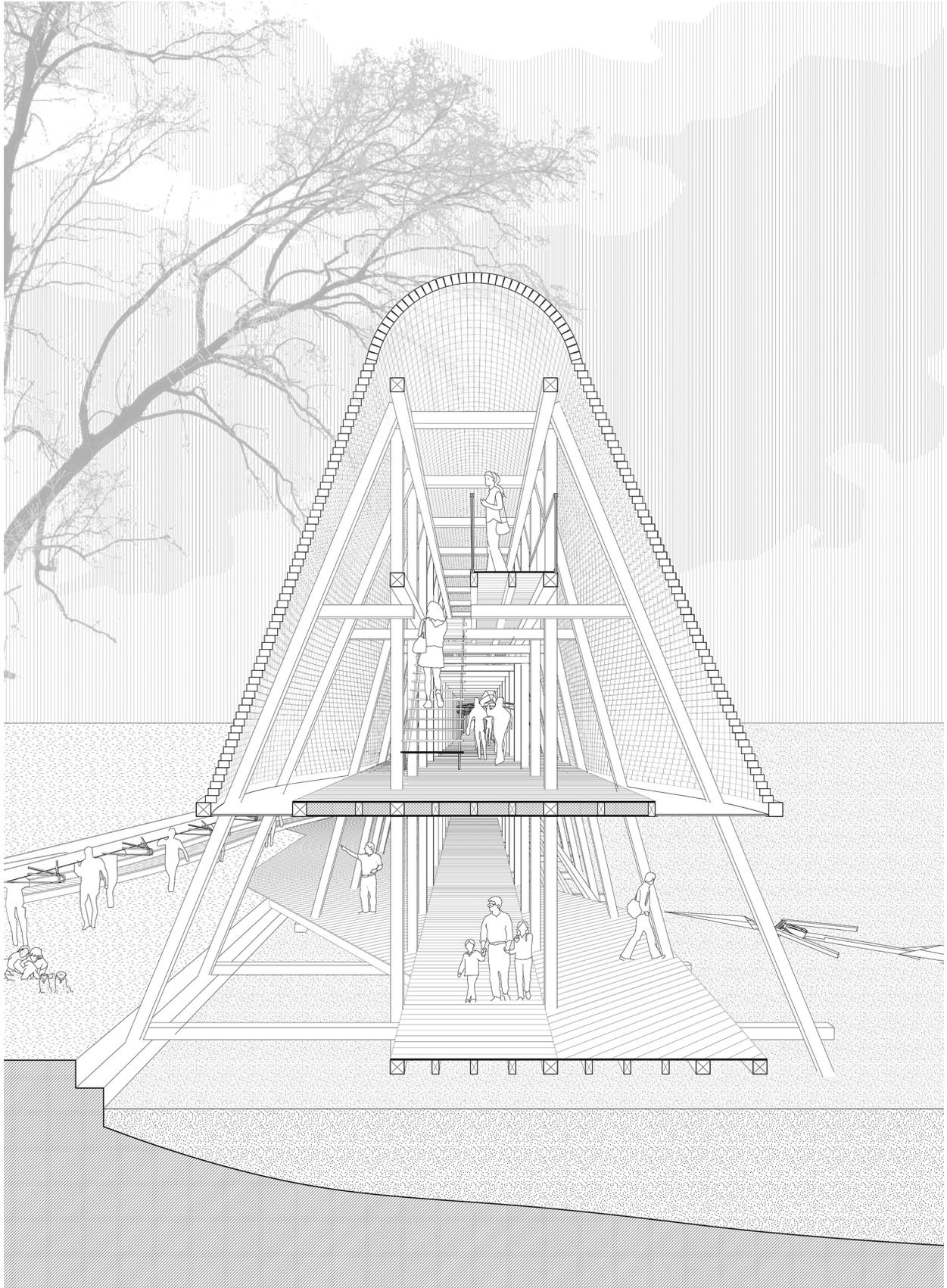
Final Representation

After studying the structure of the artefactual environment and abstracting the natural condition, I decided to use woods and glass bricks.

In the consideration of materiality, wood colomuns could create the mild interior atmosphere as the picturesque images could bring to us; and the glass bricks play the role as the filters to control the interior light qualities .



Nature Environment Section



Sectional Perspective

Moreover, after abstracting the atmospheres of natural environment and researching on the artefactual structure, both of them were then combined in the final architectural proposal. The site was located on the bank of Cayuga Lake, nearby the Stewart Park in Ithaca. The plan had the dimension of 150 meters by 5 meters, which was an abstraction of the liner space of the green tunnel. The project has three levels. The first level is floating above the river surface, providing both the wooden pier and open space for people get close to water; the second level is the place for rowing boats storage and boat repairing; the third floor provides the other service space for the rowing club, such as meeting room, gym and exhibition. The third floor is organized by several bridges in order not to block the light.

4. Conclusion

To design an artifactual nature space inside a building is a process of struggling with both the nature and the artifact. Differing from the natural environment, an artifactual nature space shows the most significant moment that is captured by the designers. In order to convey the most precise atmosphere that the nature brings to the people, architects should firstly catch the accurate emotion of the nature, whether it is picturesque or sublime; and after abstracting that moment, architects should carefully consider about the architectural elements - the grid of the structure, the ratio of the space and the representation of the materiality - and how to combine them with the natural atmosphere. In any case, the attempt to create the artifactual nature space is only one of the space designed methods. However, with such methods, the distinction between the nature environment and architecture space will be shrunked continuously and a cozy, natural space will finally be presented towards people.

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2. Leatherbarrow, David. *Architecture Oriented Otherwise*. New York: Princeton Architectural Press, 2009.

IMAGE CITATION

1. John Constable, *Wivenhoe Park, Essex*, oil on canvas, 56.1x101.2cm, 1816

PROJECT DOCUMENTATION

Chen Shen

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01 WALKING FACADE

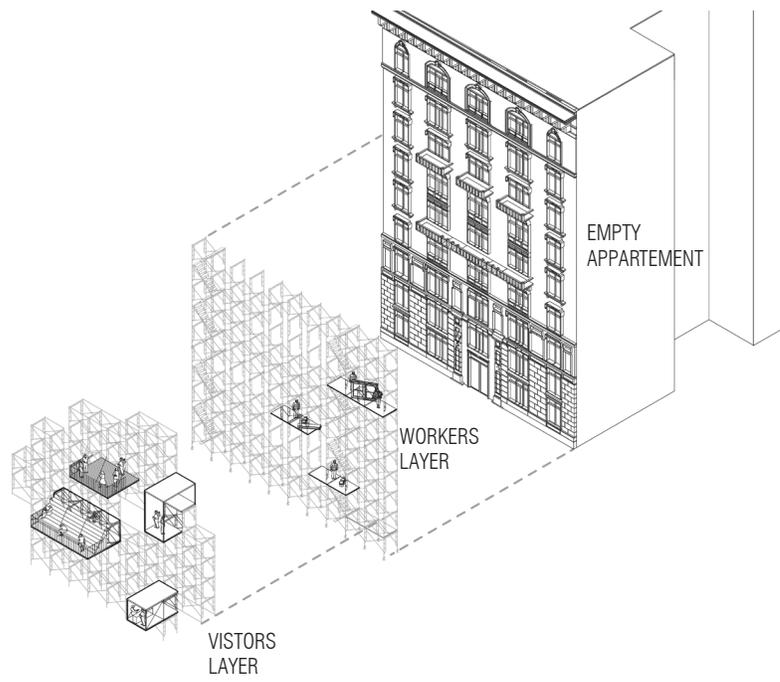
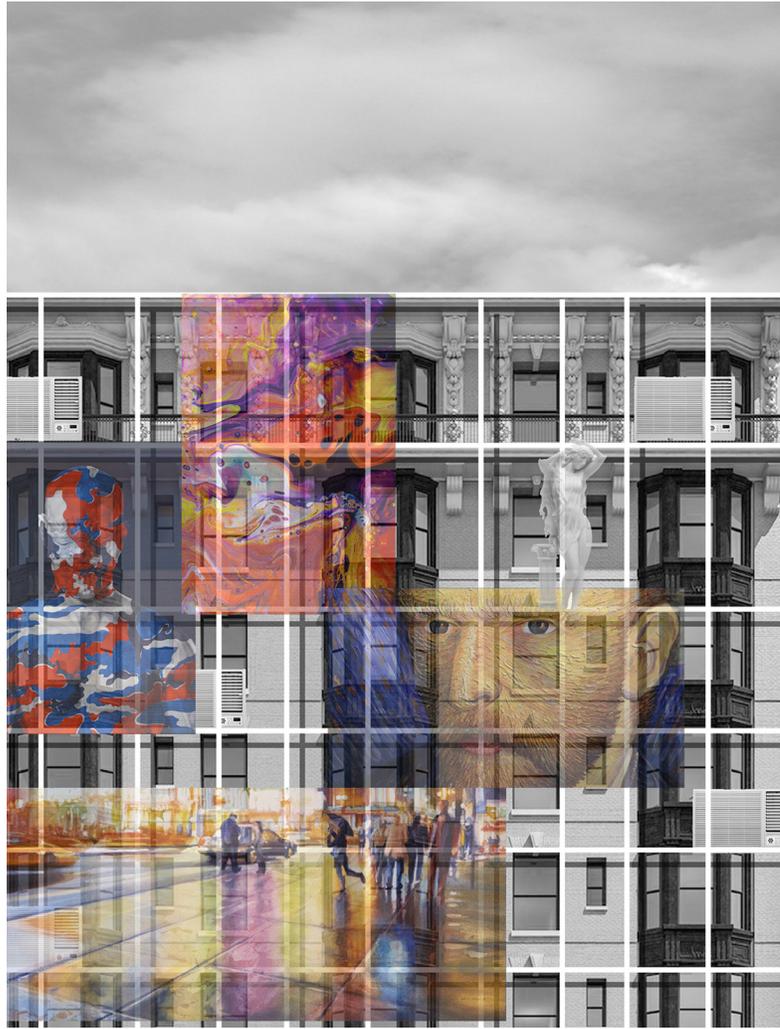
Urban Research and Design on Park Avenue

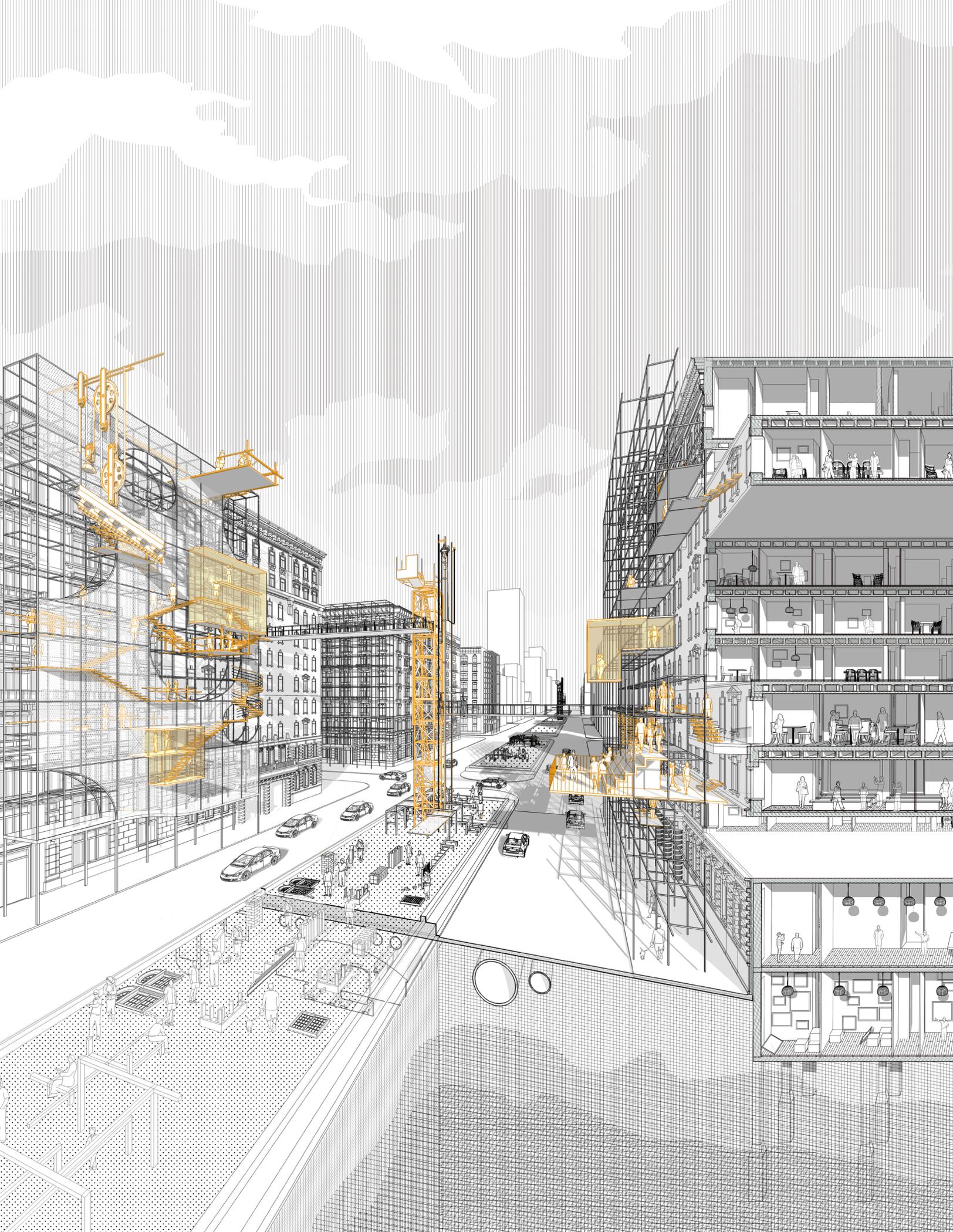
2018 "A+U" Cornell AAP Summer Studio

Collaborator: Maitai Kunawong, Shixuan Sun, Binhan Tang

Instructor: David Eugin Moon, Nahyun Huwang

Site: New York City





02 VERTICAL FARMING

Urban Research and Design on Roosevelt Island

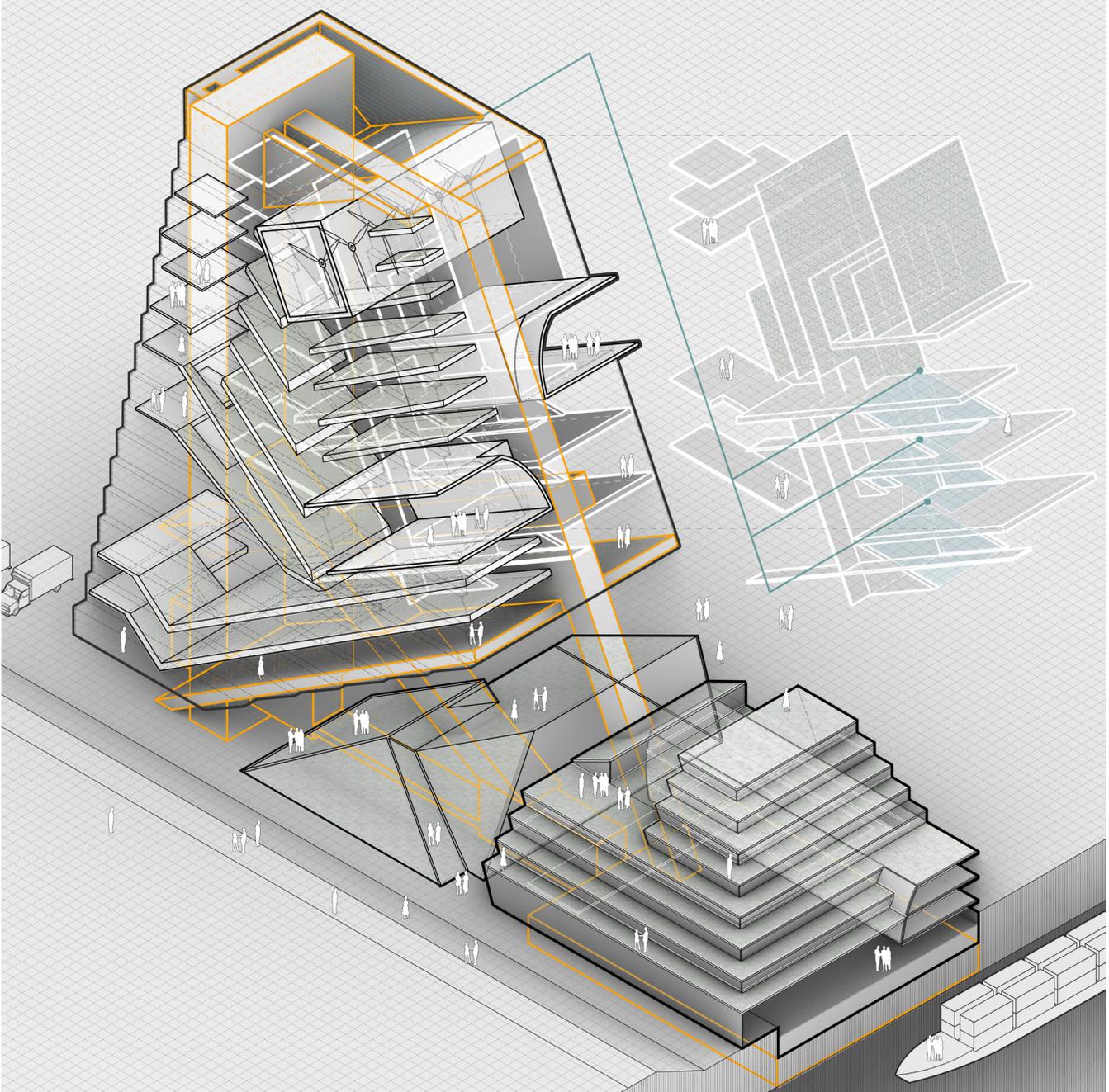
2018 "A+E" Cornell AAP Summer Studio

Collaborator: Yan Qingzhou, Yung Eun Yang, Ching-Lun Chen

Instructor: Tei Carpenter, Jesse LeCavalier

Site: New York City



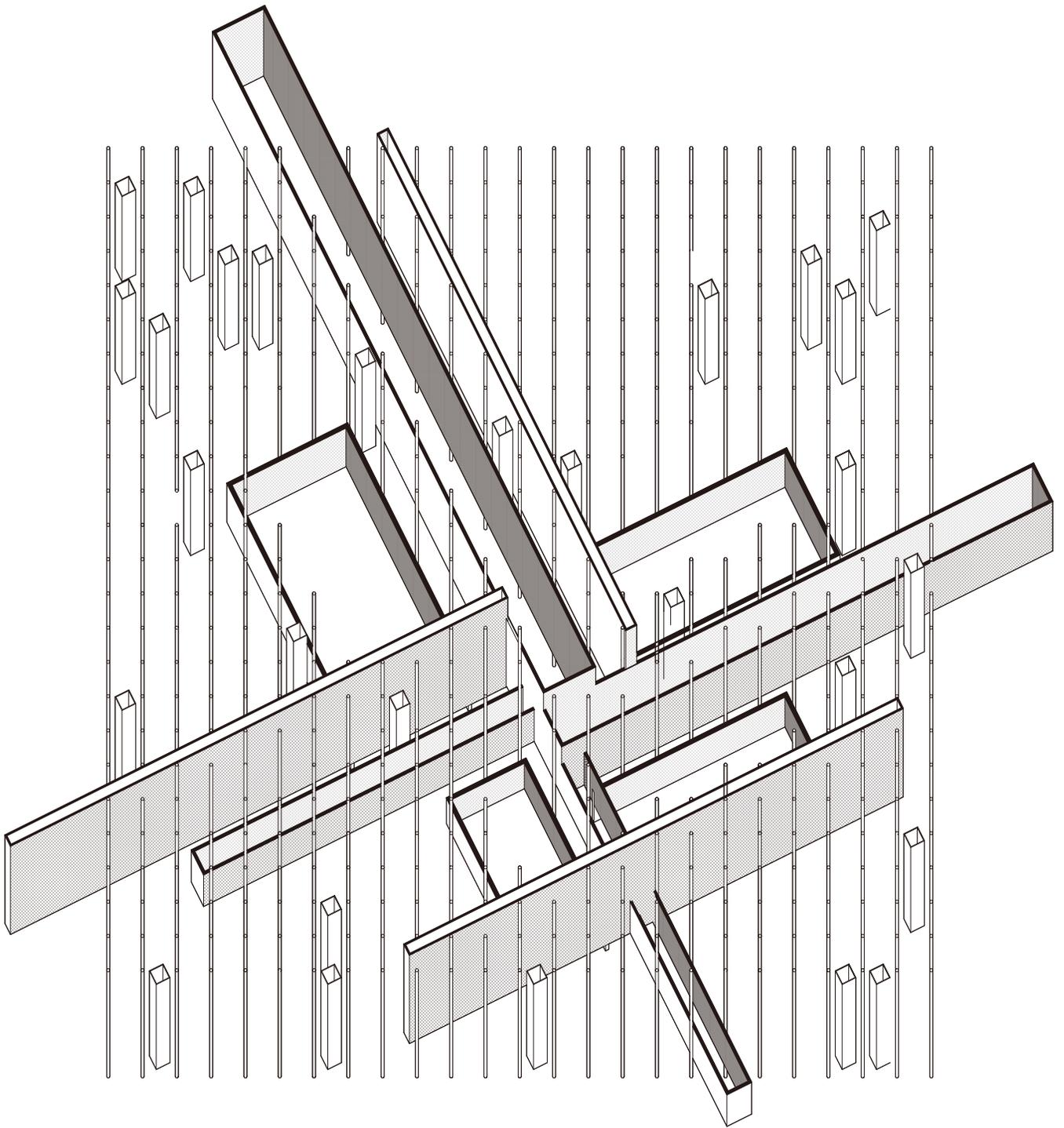


03 ARCHITECTURE, SPACE & STRUCTURE

2018 Fall Semester Electives

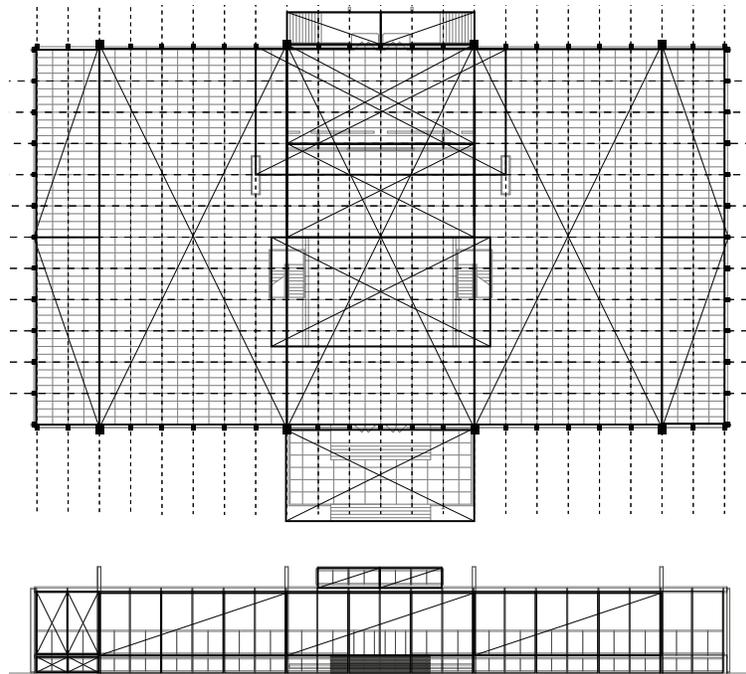
Collaborator: Qin Chen

Instructor: Maria Claudia Clemente and Francesco Isidori

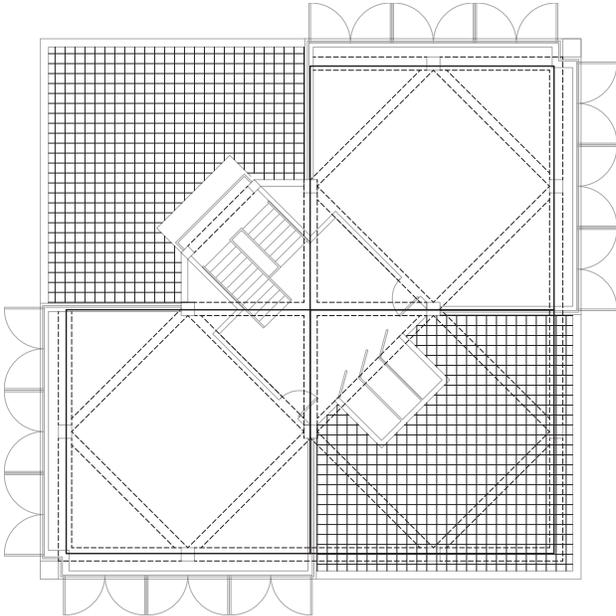
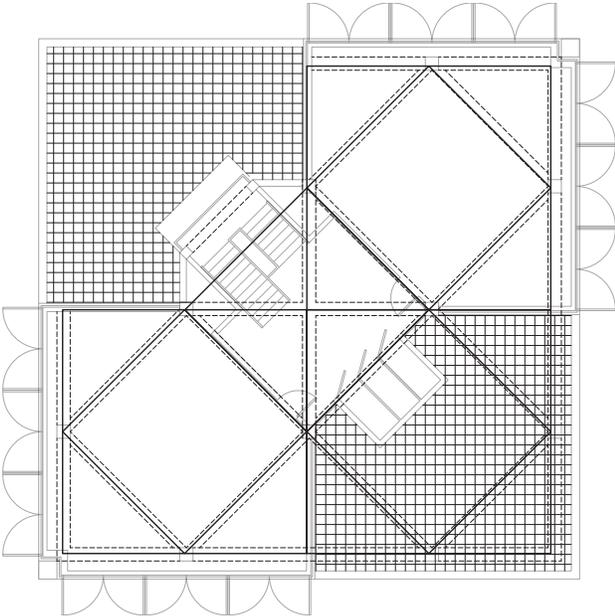
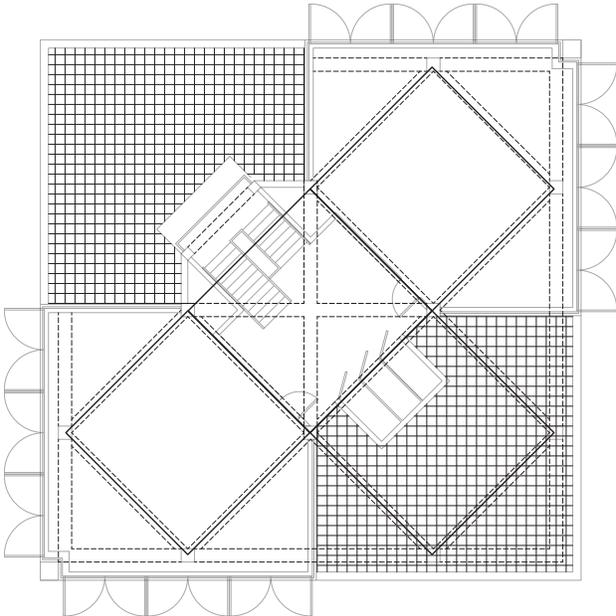
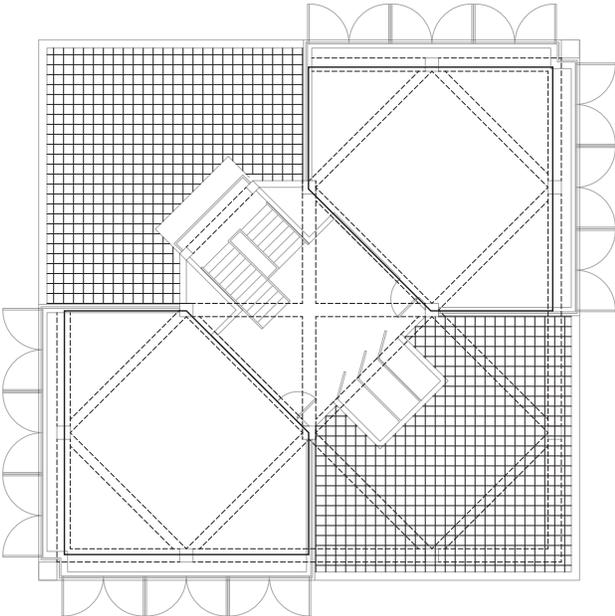


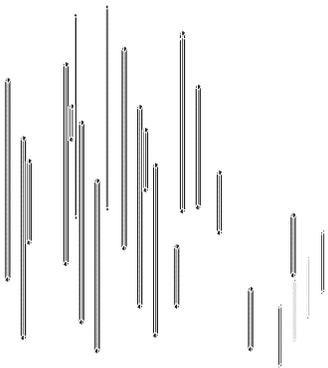
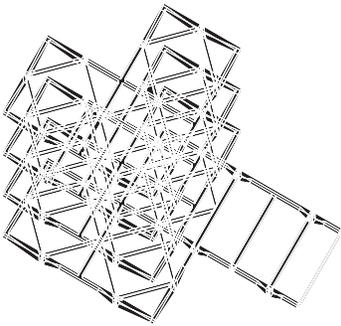
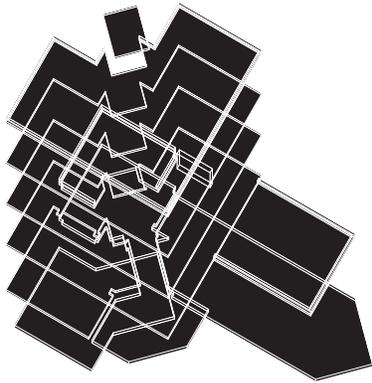
Case Study - Ratio



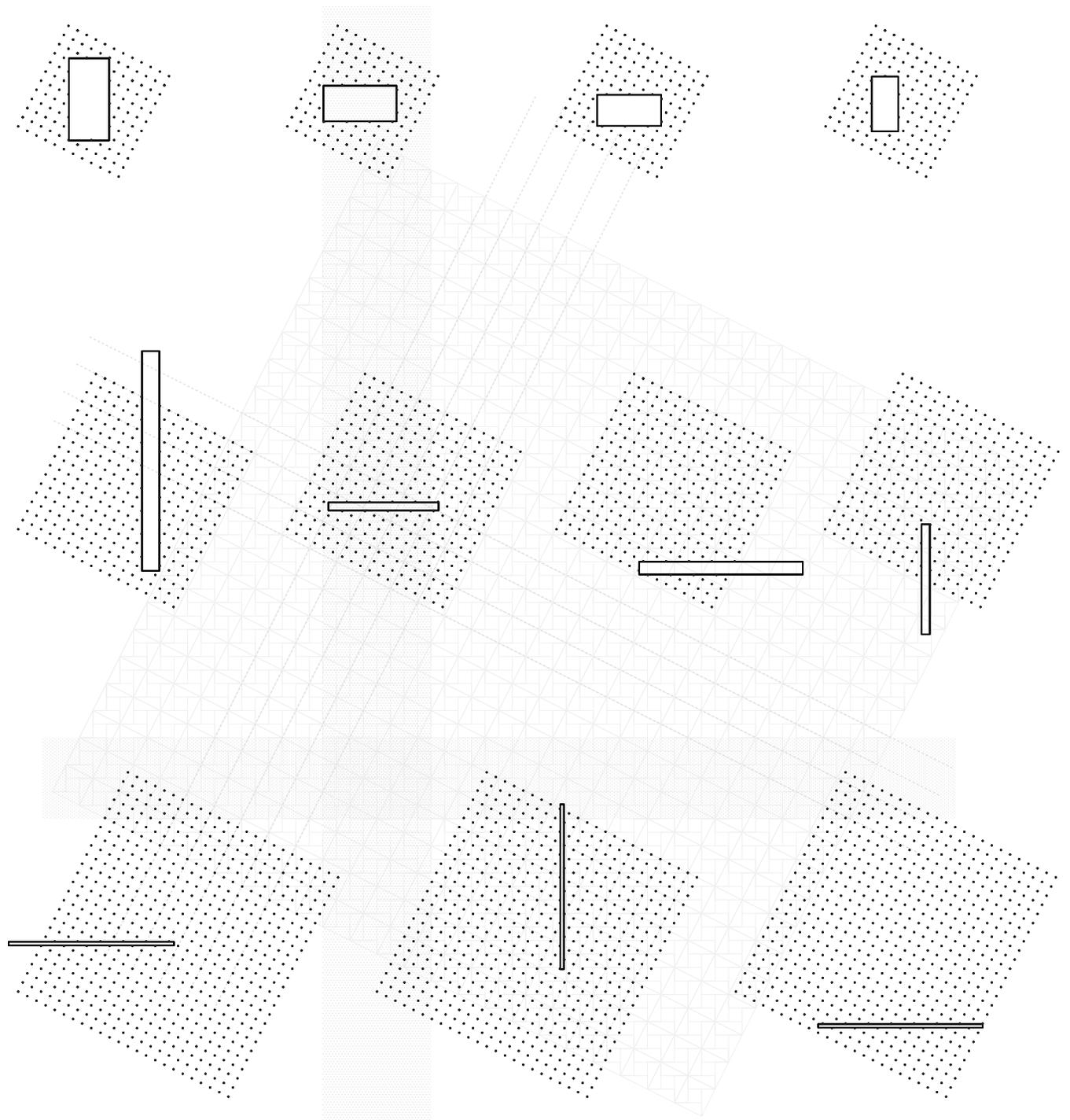


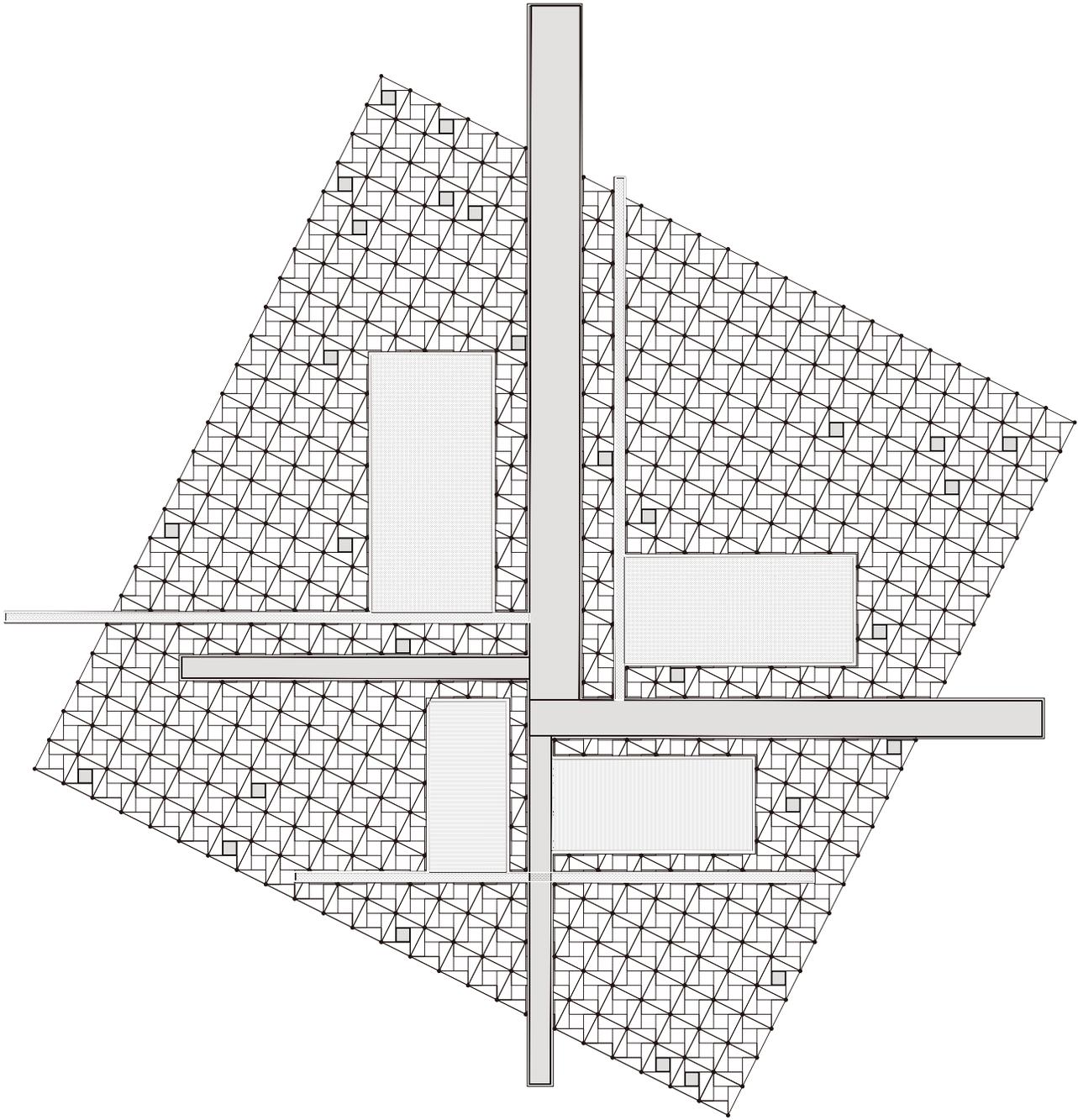
Case Study - Grid



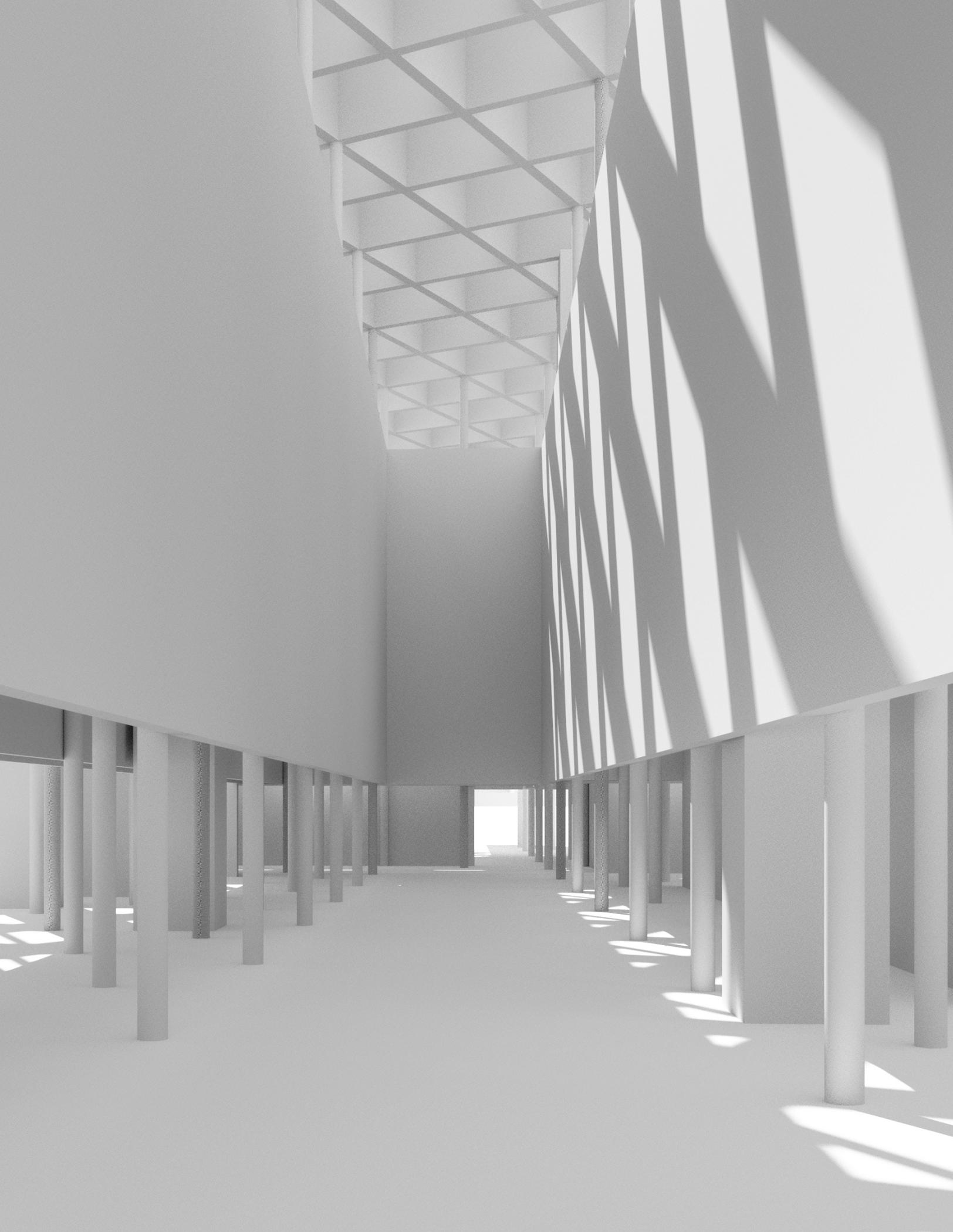


Ratio and Grid Practice









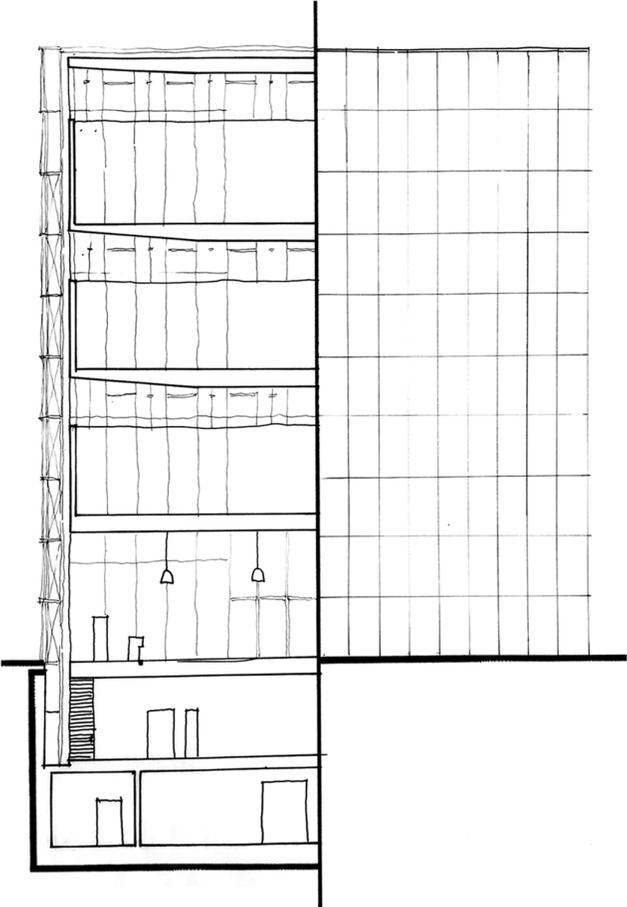
04 DETAIL

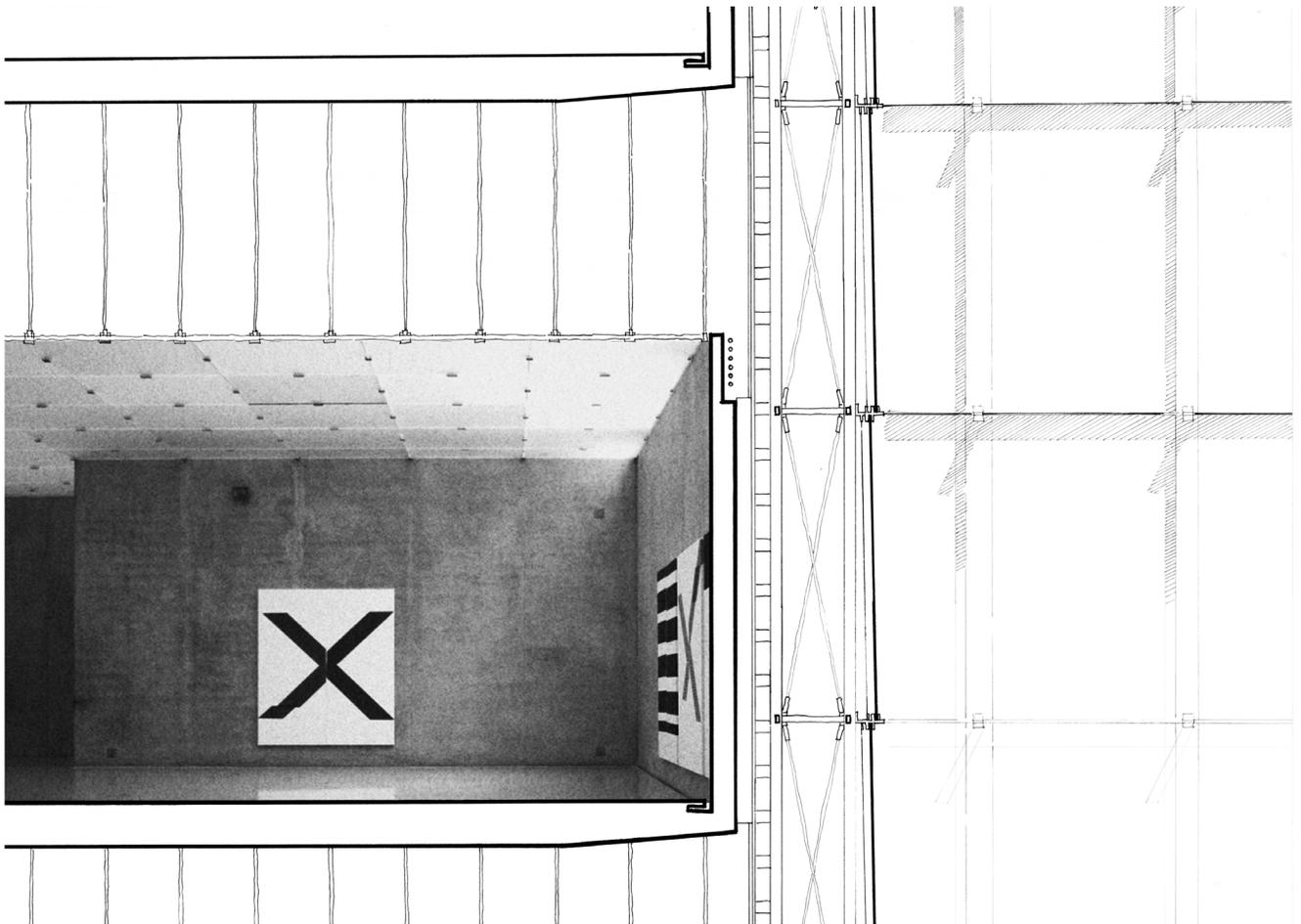
ARCHITECTURE, SPACE & STRUCTURE

2018 Fall Semester Electives

Instructor: Rodolfo R. Dias

Case Study







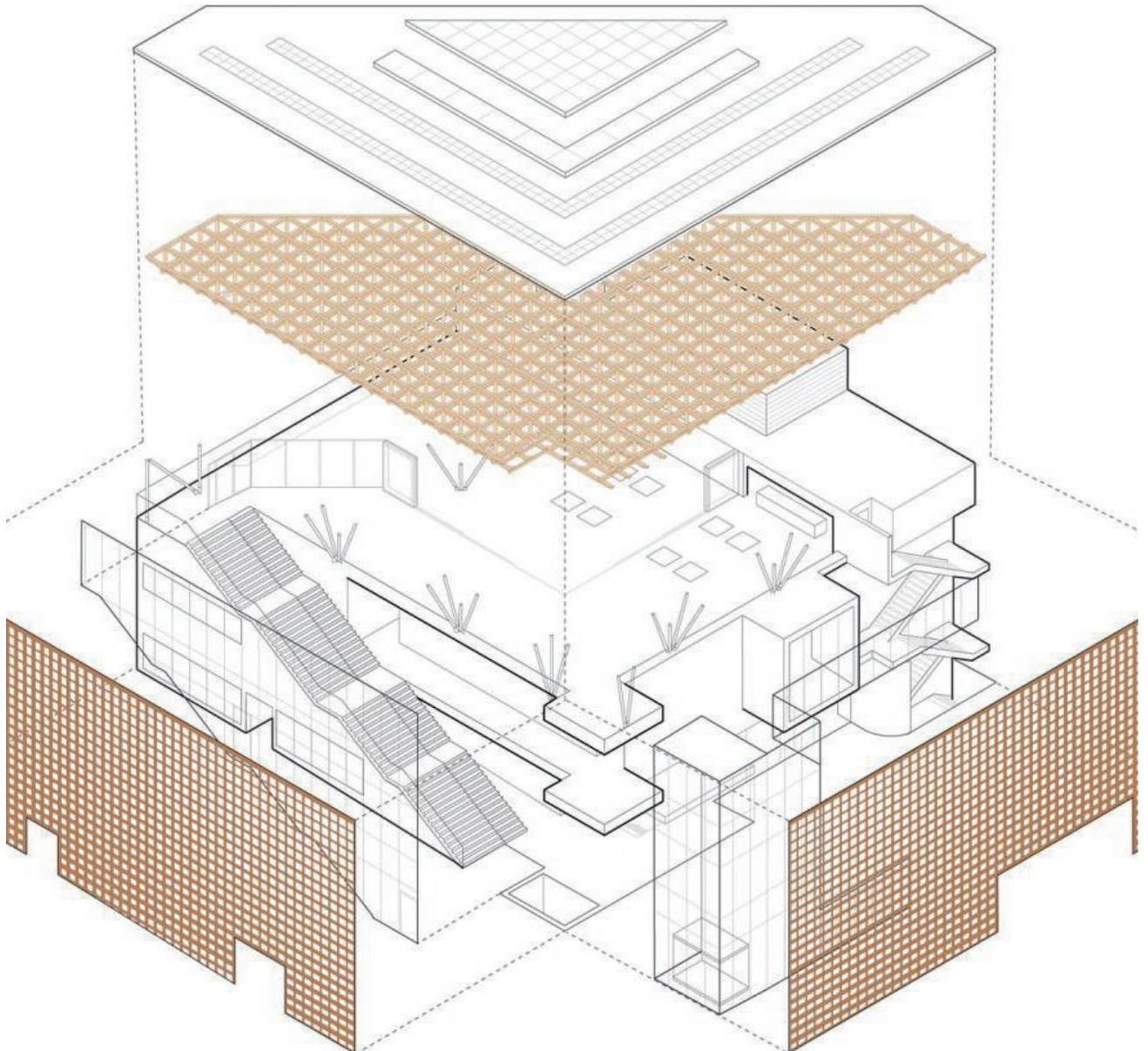


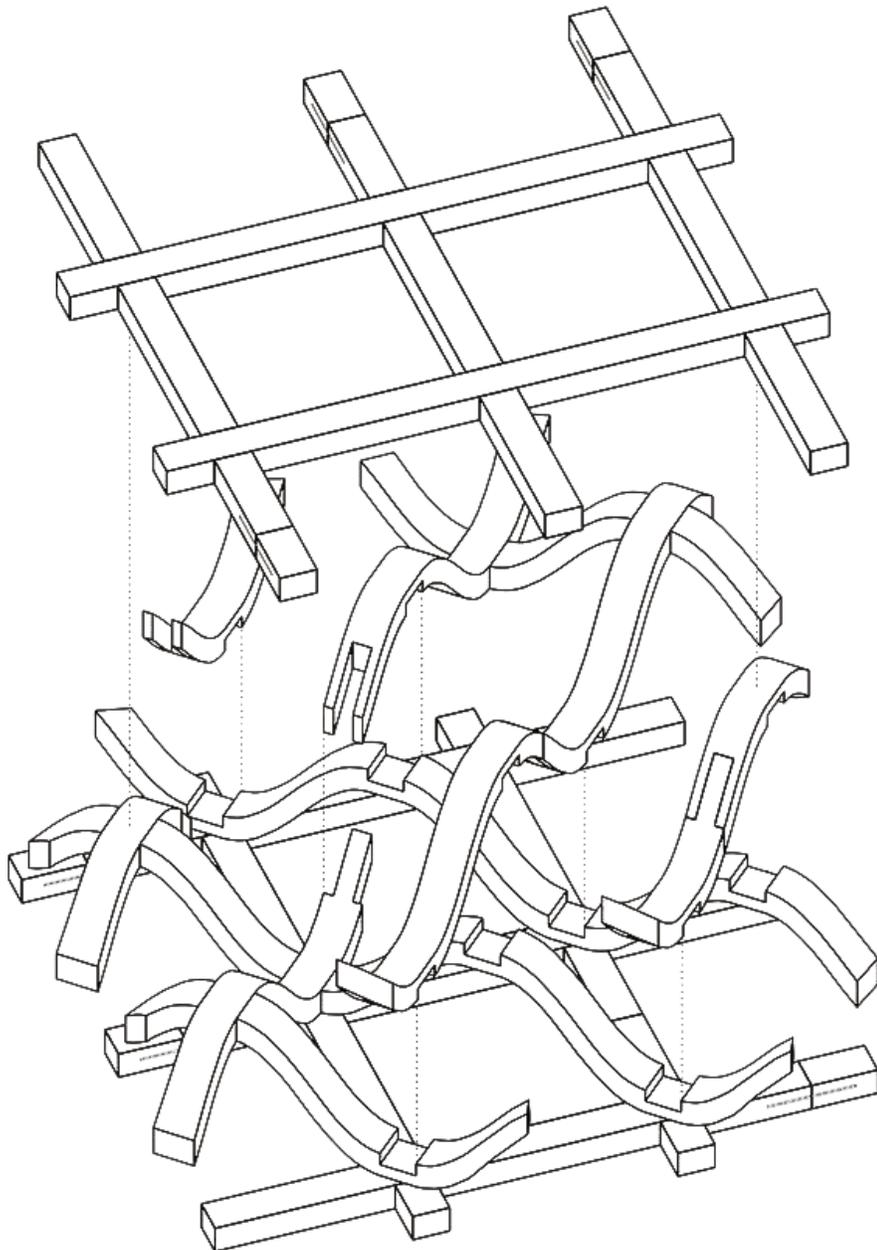
05 RETHINKING TIMBER SYSTEM

2018 Fall Semester Electives

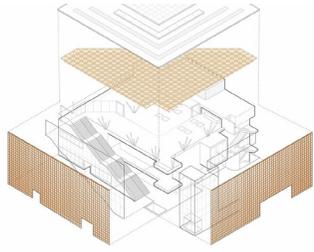
Collaborator: Yan Qingzhou

Instructor: Katharina Kral





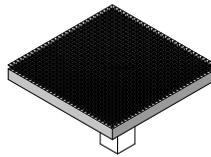
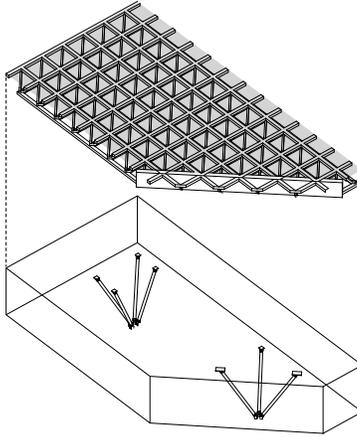
Precedence: Aspen Art Museum



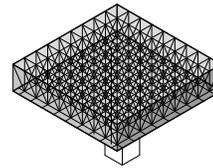
Description:

Located on the corner of South Spring Street and East Hyman Avenue in Aspen's downtown core, the new AAM is Shigeru Ban's first permanent U.S. museum to be constructed. Ban's vision for the new AAM is based on transparency and open view planes—inviting those outside to engage with the building's interior, and providing those inside the opportunity to see their exterior surroundings.

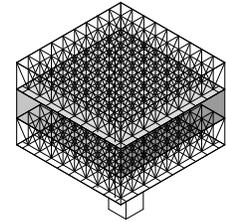
Conceptual Sketch



Truss as a roof supporter



Truss as a spacial system

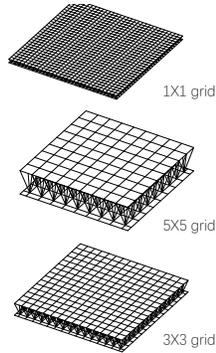


Stack generating in between pure large space

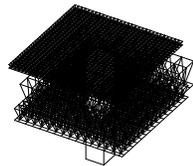
Concept Description:

The original design use the truss system to support the roof, allowing the space below basically a large free space, with very few columns. We developed the truss system into a spacial structural system, the truss only support the slabs, but also defines the space. The loads are then transmitted to the central core, which allows the space between two unit a totally pure large space without any columns. The stack generate a vertical hiearchy of space.

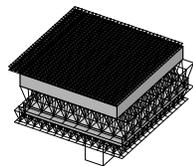
Generative Design Process



3 Types of Truss

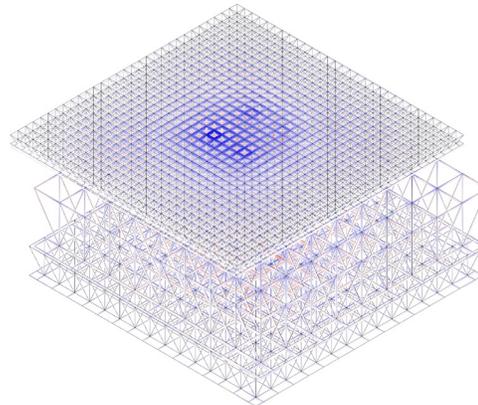


Link with Central Core



Stack the in between Space

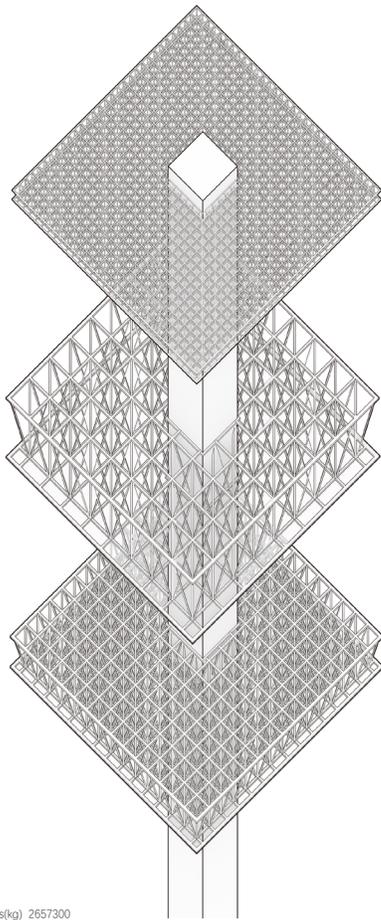
Beam and Shell Analysis



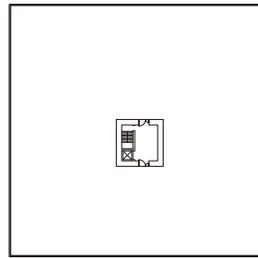
utilization	res.disp.(cm)
75.3%	1.29e+00
66.0%	1.86e+00
-56.6%	2.42e+00
-47.2%	2.99e+00
-37.7%	3.55e+00
-28.3%	4.12e+00
-18.9%	4.68e+00
-9.4%	5.25e+00
0.0%	5.82e+00
6.1%	6.38e+00
12.3%	6.95e+00
18.4%	7.51e+00
24.6%	8.08e+00
30.7%	8.64e+00
36.9%	9.21e+00
43.0%	9.78e+00
49.2%	1.03e+01

utilization	res.disp.(cm)
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54.0%	1.32e+00

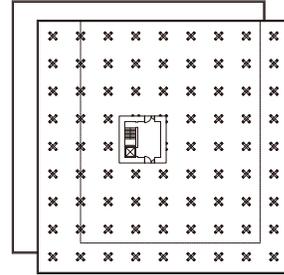




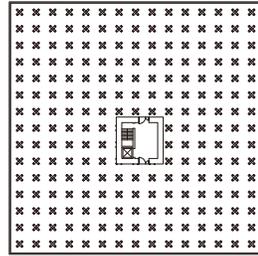
Building mass(kg) 2657300



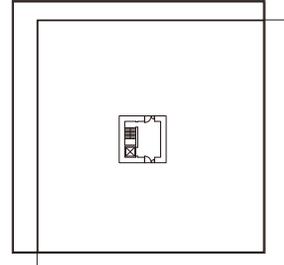
1st Plan



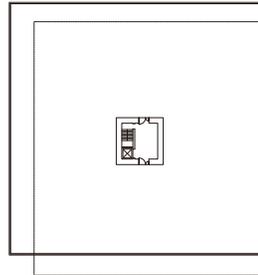
4th Plan



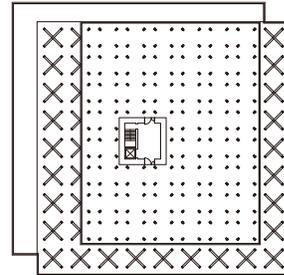
2nd Plan



5th Plan



3rd Plan

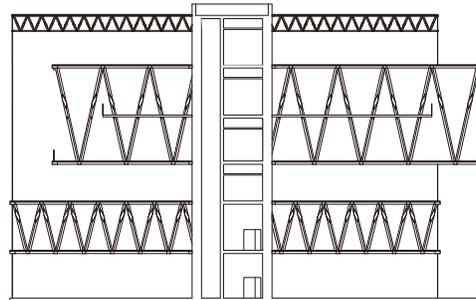


6th Plan

Axo

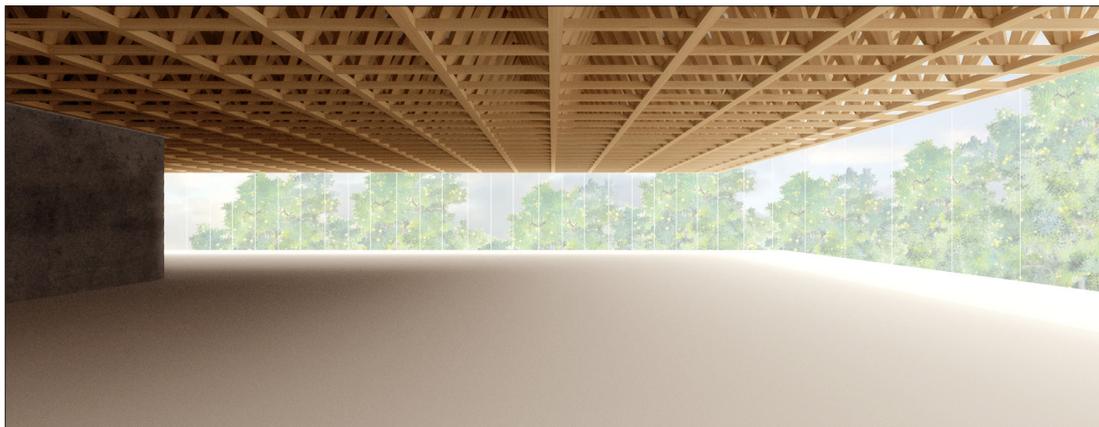
	Embodied Energy(MJ/kg)	Embodied Carbon(kg CO2e/kg)	Embodied Carbon
Glue Laminated Timber	12	0.42fos+0.45bio	1116066os+1195785bio
Concrete	0.75	0.107	284331
Steel	25.3	1.95	5181735

Sequestered Carbon	Density(kg/m3)	Volume required	Sequestered Carbon(/m3)
Cedar	450	5905	5905*816.5=4821432



Section

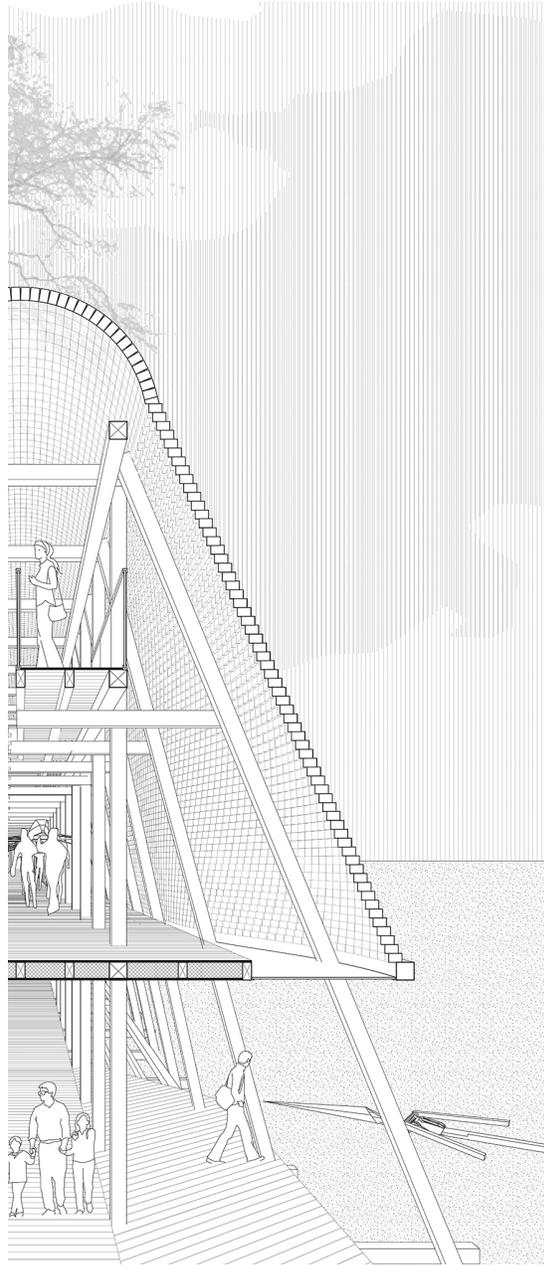
Embodied Carbon Comparison



06 BUILD FROM NATURAL MEMORY

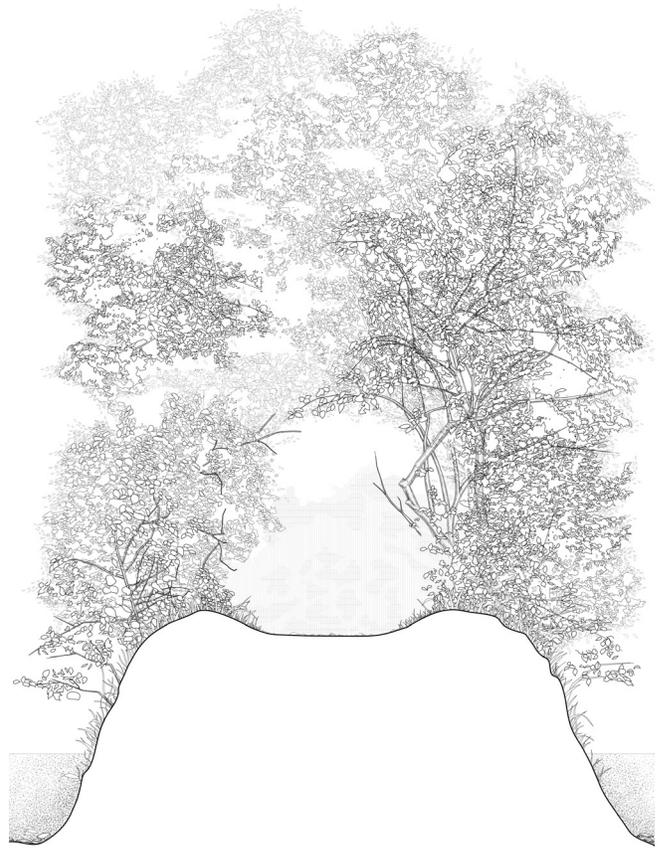
Rowing Club Design by The Waterfront of Cayuga Lake
2018 "MATERIAL MATTERS" Cornell AAP Optional Studio

Instructor: Alejandro Beals, Loreto Lyon - BEALS+LYON ARCHITECTS
Site: Ithaca, New York





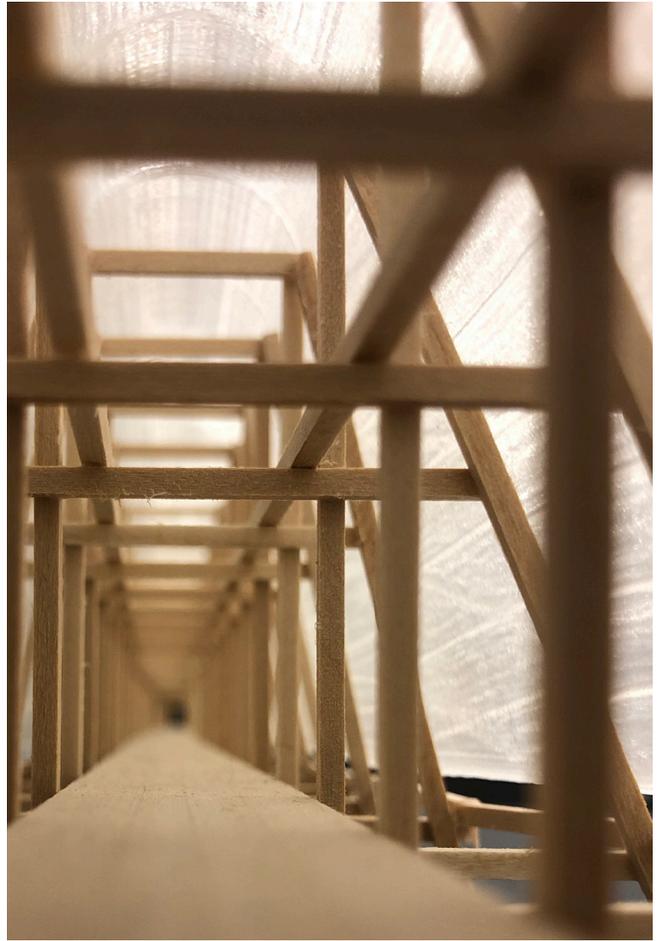
Original Nature Space



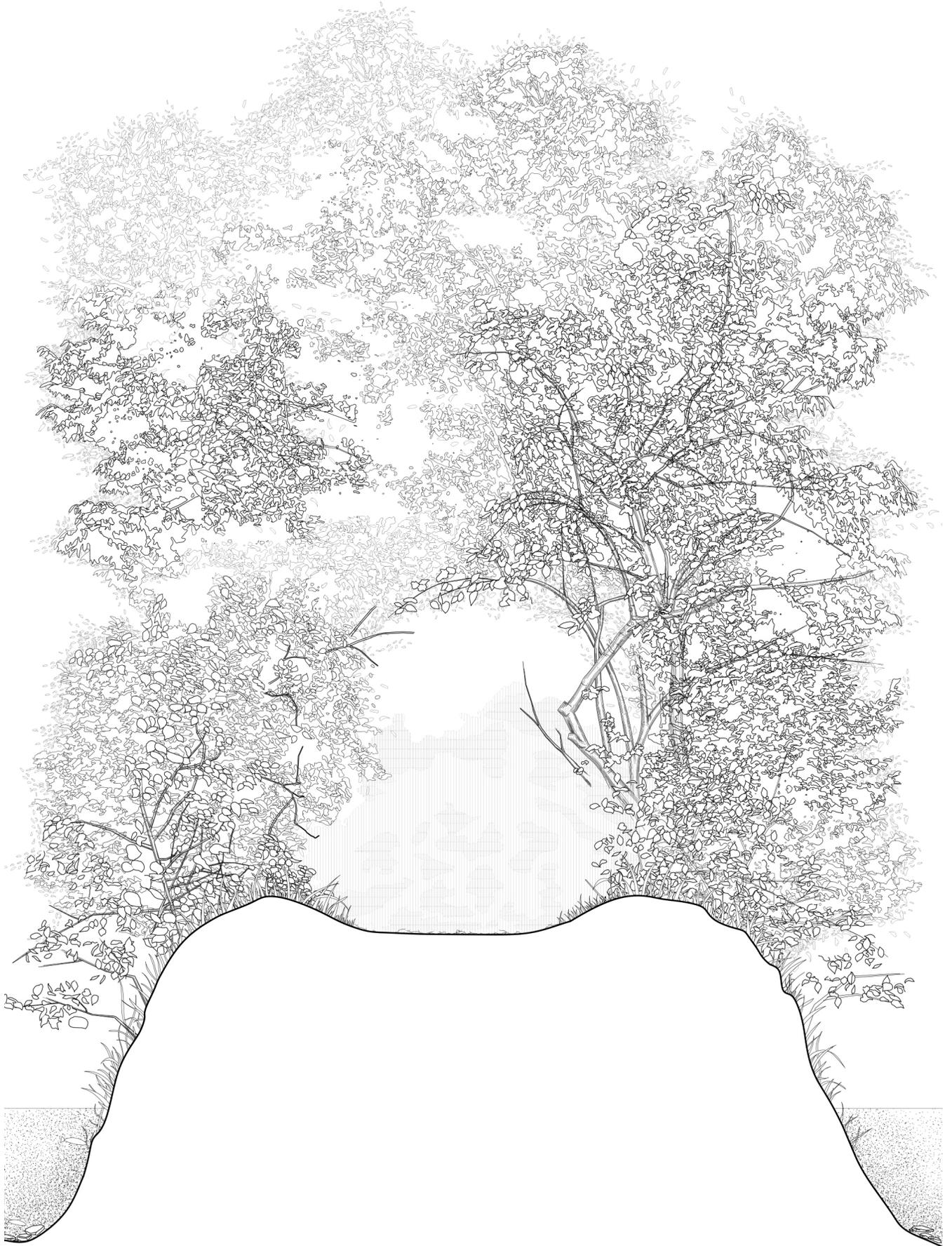
Imitaion in Drawing

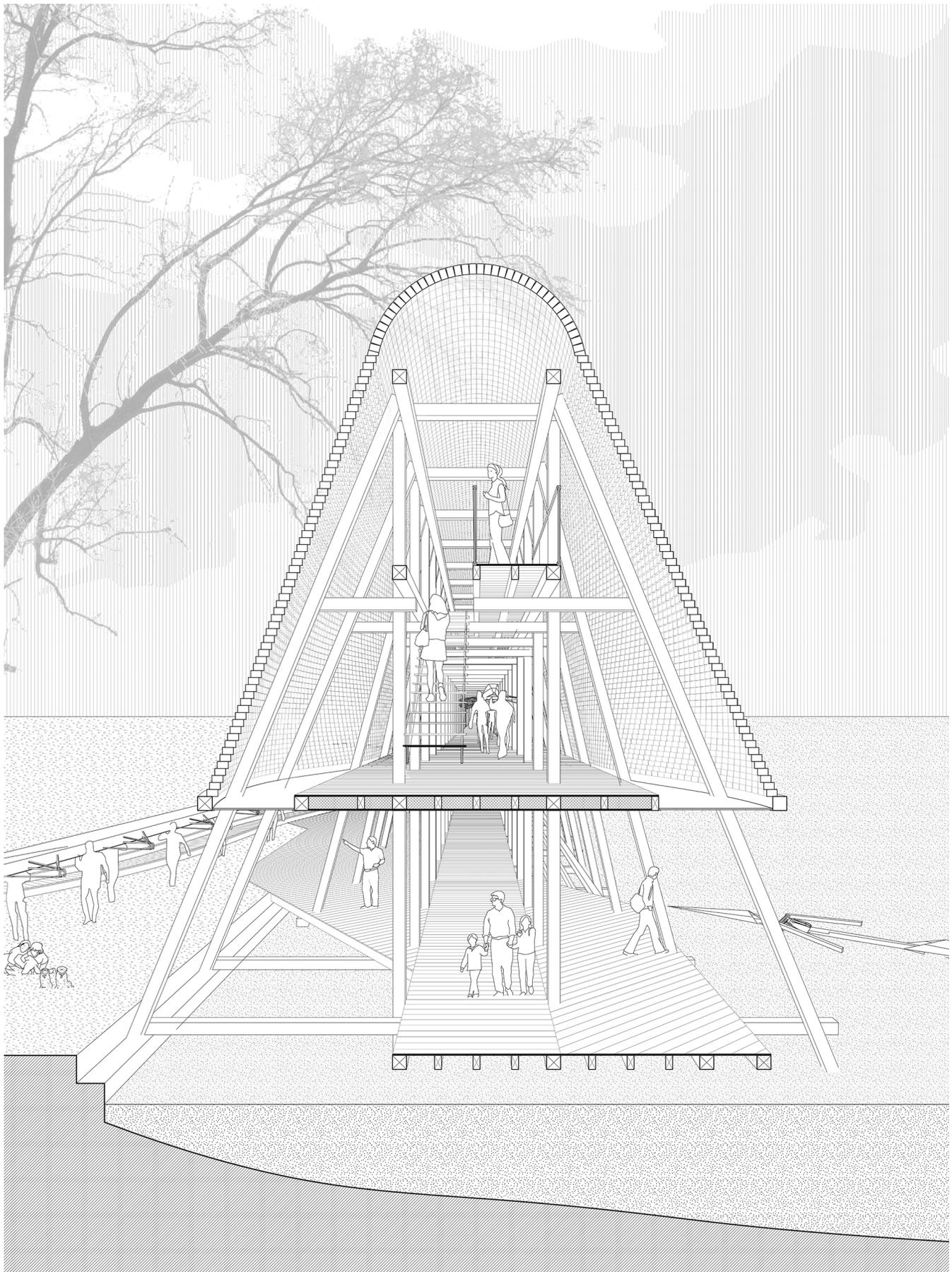


Abstraction in Model



Final Representation





Sectional Perspective

07 SECOND NATURE 01: LANDSCAPE

2019 Spring Semester Electives

Instructor: Pezo von Ellrichshausen



Notes and Observations

At the very beginning of the course, I simply tried to imitating the original given painting. With the former learnt techniques, I tried to make the color and detail as same as possible. However, for the reason of different size between the given painting and the A5 size painting, it actually was very hard to mimic everything. It took almost two and a half hours for each painting.

The change of the paper size was supposed to provide more space for more details. However, with the attempt to painting fast without losing the original manner of the painting, I tried to capture the whole feeling of the painting and did not pay more attention on the tiny details. The painting was finally presented in the way between abstraction and mimic. For the painting of A3 size, it took still two and a half hours. When it came to the size of A2 and A1, it cost more time.

After finishing all the 15 paintings, I found that the landscape in the painting gave the more feeling of picturesque than sublime, due to the fact that the paintings contain certain elements, such as geese, boats and cows, and the paintings also convey the balance between dark and light. From my personal understanding, the sublime painting could evoke the intense emotions and inspire awe.

Originality:

The originality is always the topic that I struggled a lot during the painting process. I used to consider originality as a singular way to copy. As the result, every detail of color and composition was every important when I drew. However, I still find that it is hard to define what is original when I compare my painting with the given one. I feel like the composition of my painting is from the original one but the color and brush stroke are based on my understanding of the original one. The more I draw, the more I tried to present my personal way on the painting. When drawing the A2 and A1 size, I could finish the painting without putting the original one in front of me.

Translation:

I think the process of mimicking the original painting is much more like paraphrasing than translating. Translation is to change the way of presentation, which is like the process of conveying the same meaning from English to Chinese. When thinking the translation as an architecture student, the process of translation is much more like to draw a sketch from a real building in a personal way. The reason I think my painting process is more like paraphrasing is because that I convey the whole feeling of the original painting but I didn't present every single detail.



08 What is a House? The Living Space in Movies

2019 Spring Semester Electives

Instructor: Rubén Alcolea

Appendix IV. Color analysis



The Gate (Beginning Scene)



The Court



The Woods



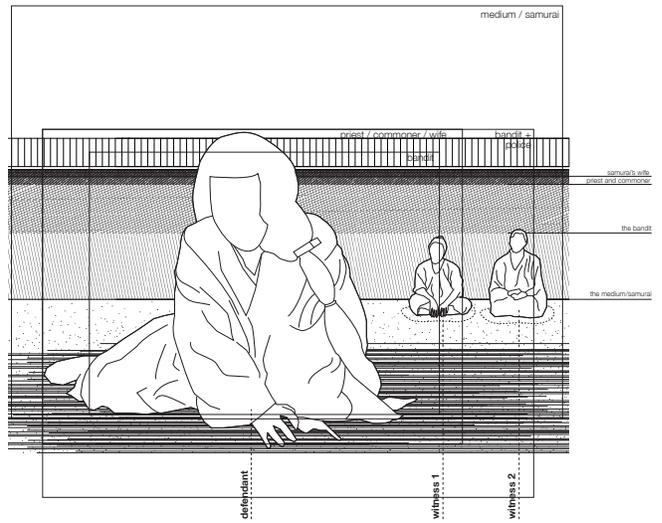
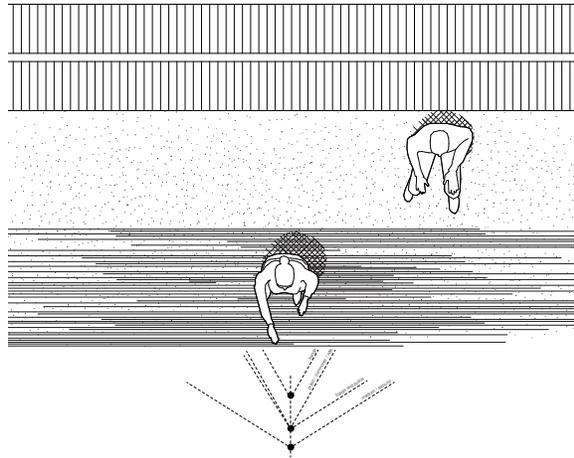
The Gate (End Scene)



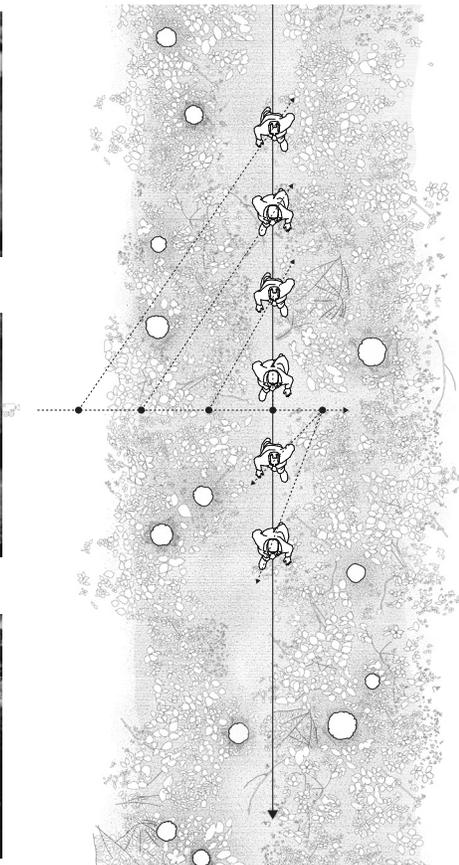
Camera Analysis



Temple of Minerva Medica
(1720-1778), Piranesi



Camera Analysis



09 SPILIT 3.0

2019 Spring Semester

Optional Studio

Instructor: Gesa Büttner Dias & Saša Begović

