ARCHITECTURE

PORT-FOLIO

WEI WANG

2014-2020

CONTENTS

01 SPATIAL TRANSFORMATION OF GLISSANDO
A Concert Hall Design Inspired from Glissando Music

02 REVIVING ALLEYS OF PARK AVENUE
An Urban Practice in New York City

03 AS IN THE PAINTING
A Theater Design of Chinese Traditional Culture

04 2050 COW JOURNEY
A Future Mode of Beef Production

05 LIFE WITH(OUT) WINDOW
A House Design to Protect Privacy

06 BETWEEN MOUNTAINS AND WATERS
A Hotel Complex Conforming to Environment

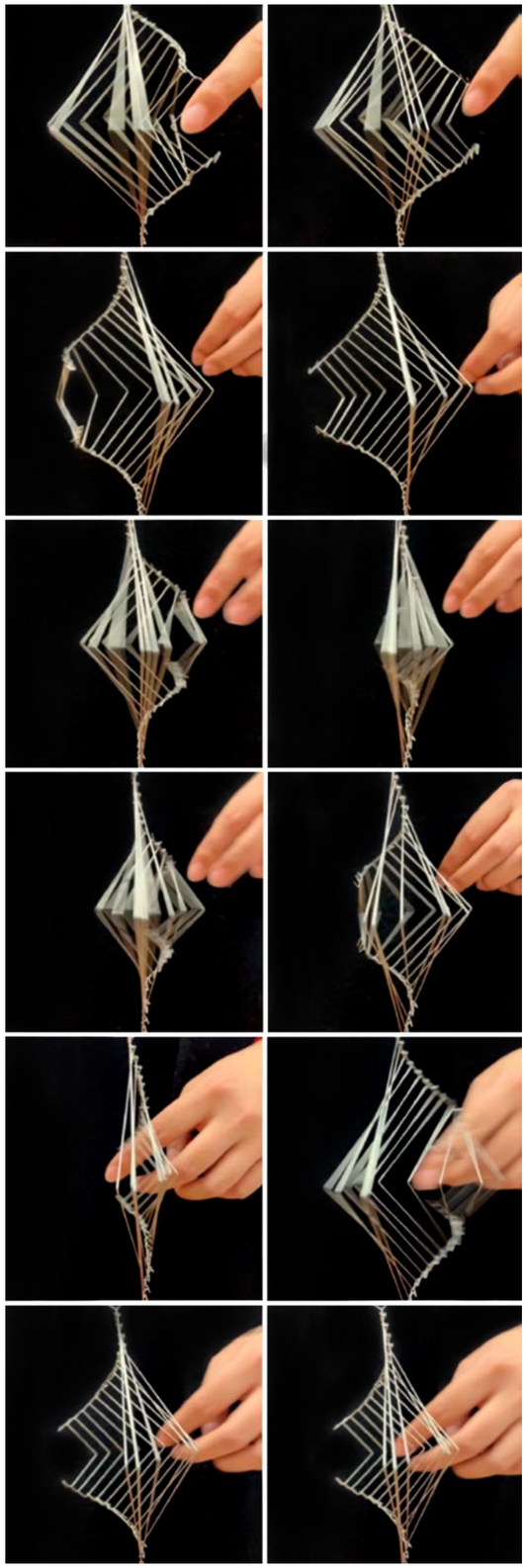
07 FOREST-LIKE ROOM
A Prototype Testing out the Potential of New Building System

08 SHRINKAGE SKY
A Deployable Tensile Struts

01

SPATIAL TRANSFORMATION OF GLISSANDO

A Concert Hall Inspired from Glissando Music



Teamwork with Peizhe Fang

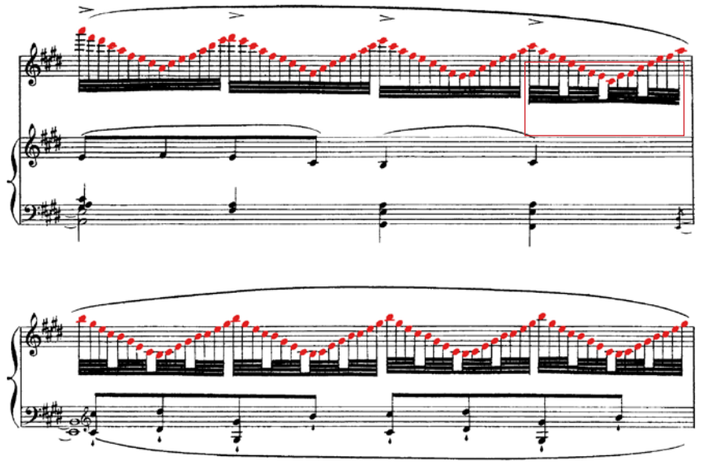
Type | Academic, 2020 Spring
Advisor | Steven Holl,
Dimitra Tsachrelia(dt2236@columbia.edu)
Location | Tesnov, Prague, Czech
Role in Team |Site research/Model making/
Rendering / Thesis drawing

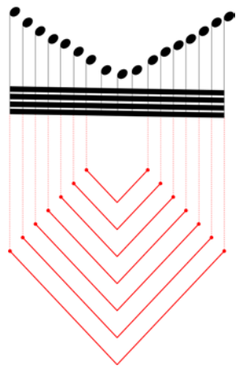
In music, a glissando is a glide from one pitch to another.Does the rythmic linear language also has potential in architecture?

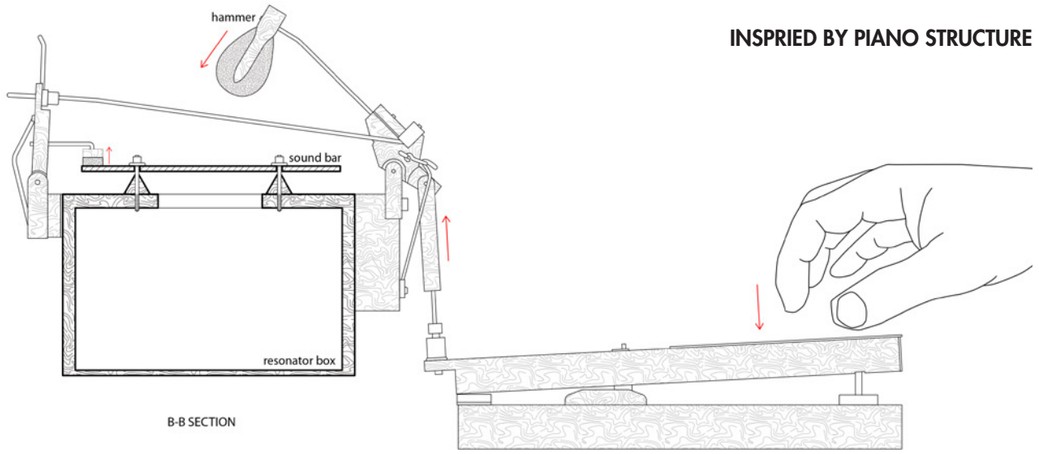
The design comes from the movement of linear glissando model and develops its potential of translation to structure, space, light and material, building a link between rhythmic glissando music and concert hall.

With the hall open and suspended, the open-air concert hall becomes a sculptural attraction and provides for public spaces in the central Prague. The fluid balconies inherit the glissando element and combined into a four-layer interpenetrating auditorium.

FROM MUSIC LANGUAGE TO GRAPHIC LANGUAGE

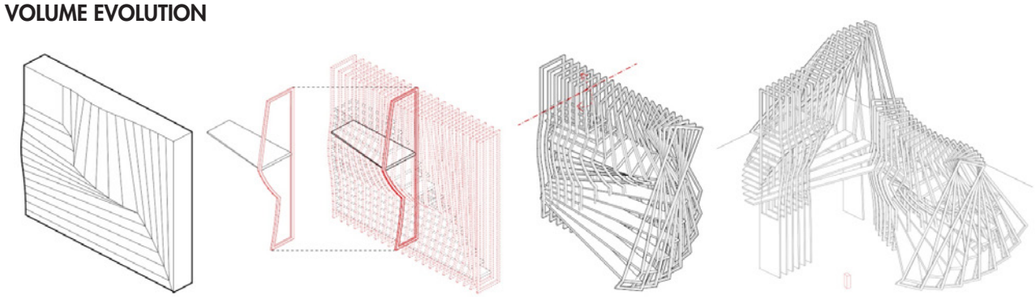


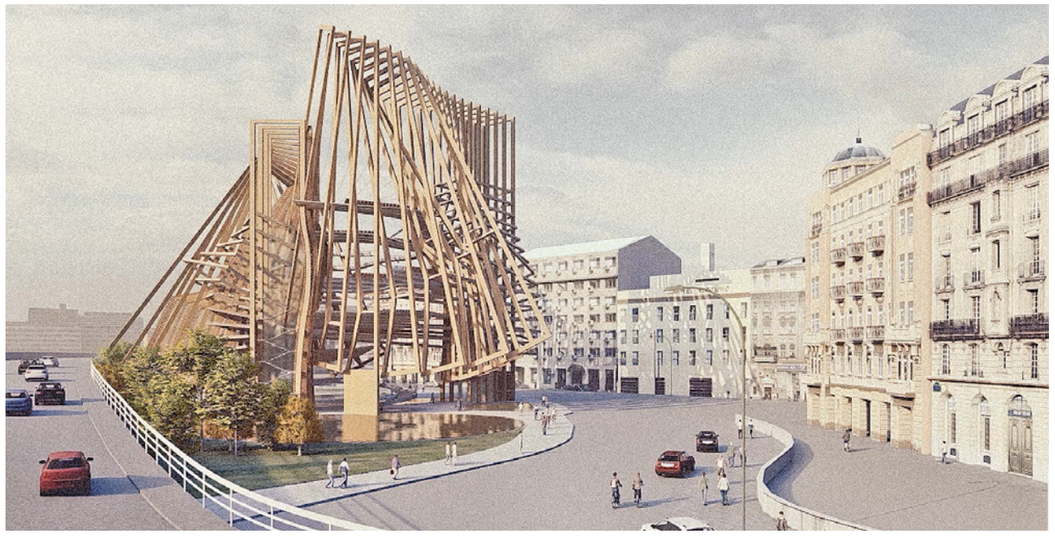


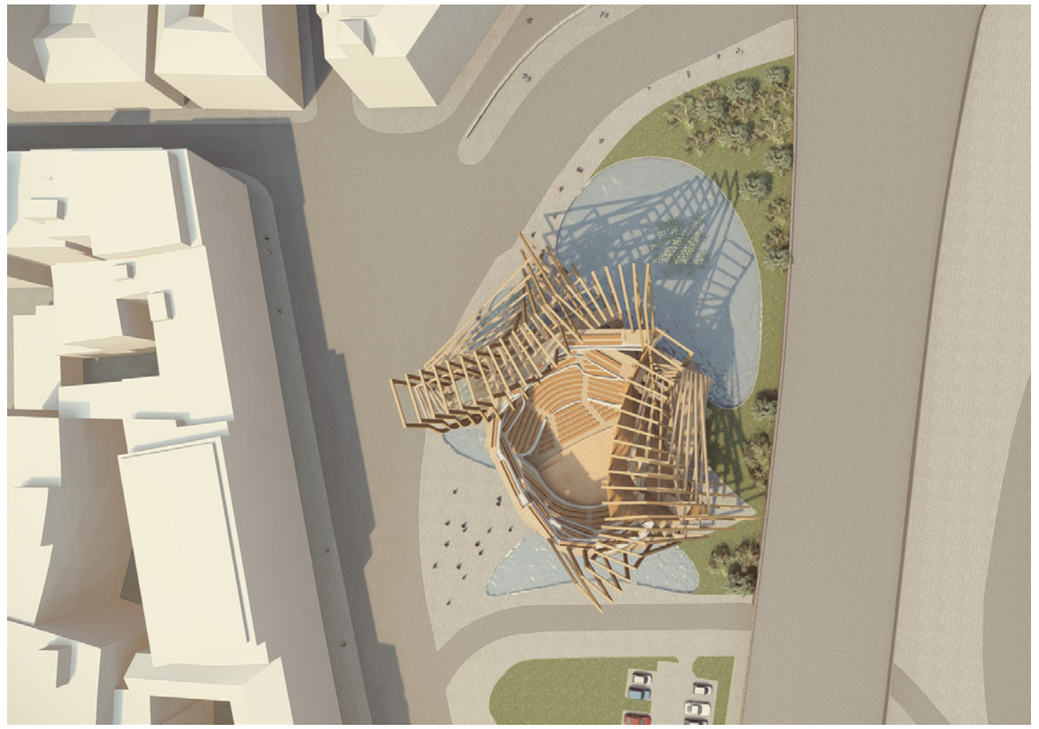


INSPRIED BY PIANO STRUCTURE

VOLUME EVOLUTION

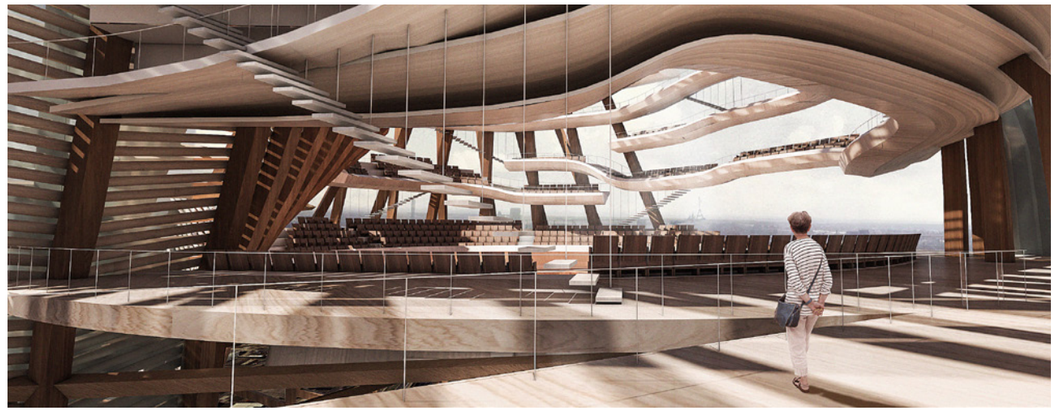


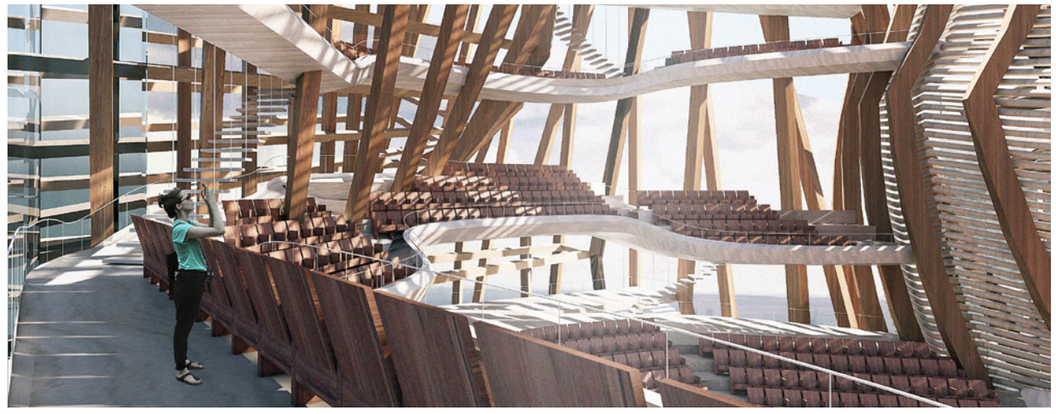


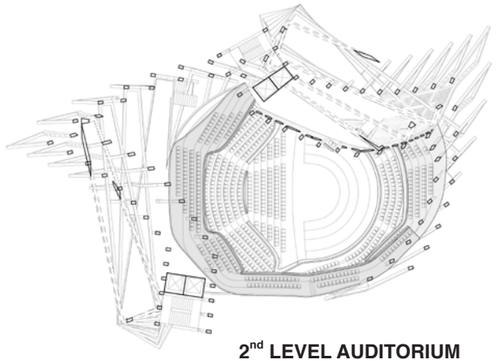


GENERAL LAYOUT

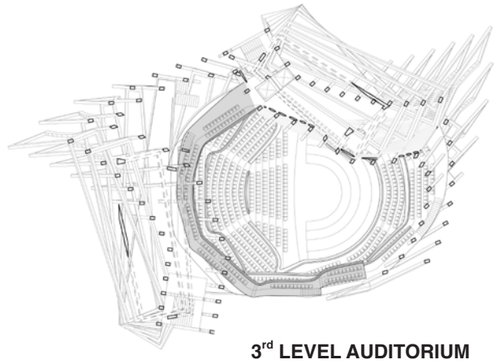
PARK PLAN



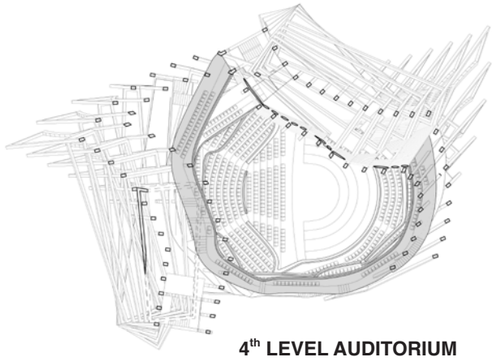




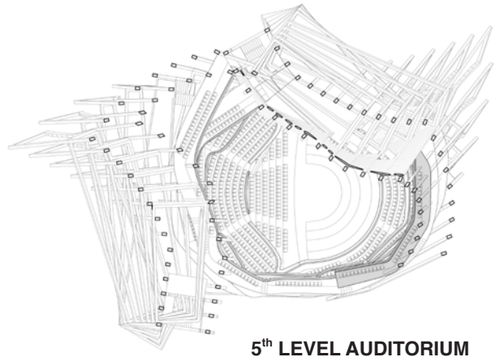
2nd LEVEL AUDITORIUM



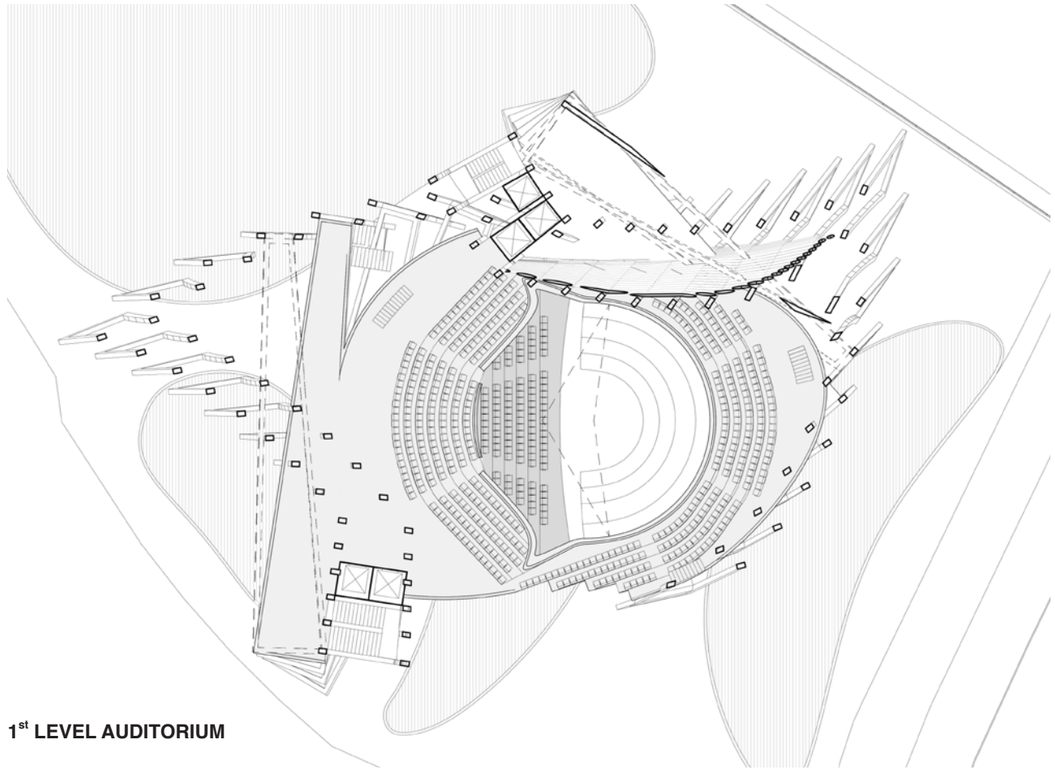
3rd LEVEL AUDITORIUM



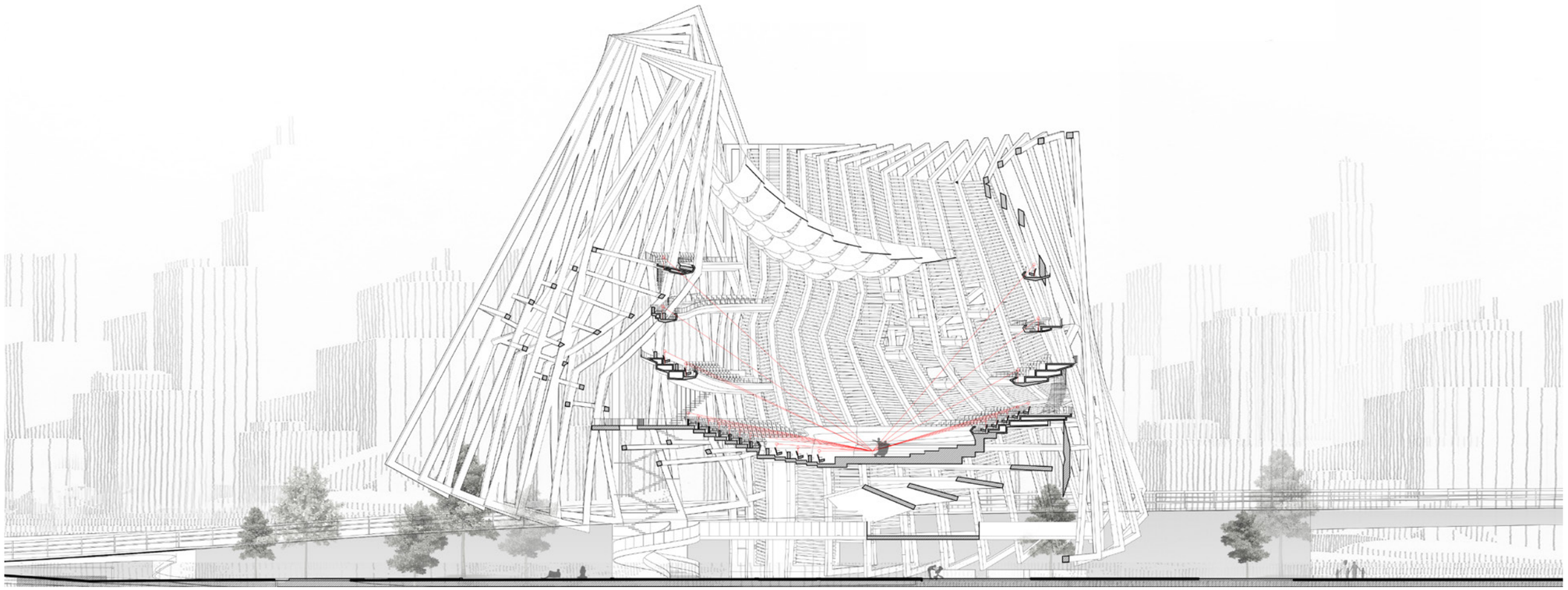
4th LEVEL AUDITORIUM



5th LEVEL AUDITORIUM



1st LEVEL AUDITORIUM



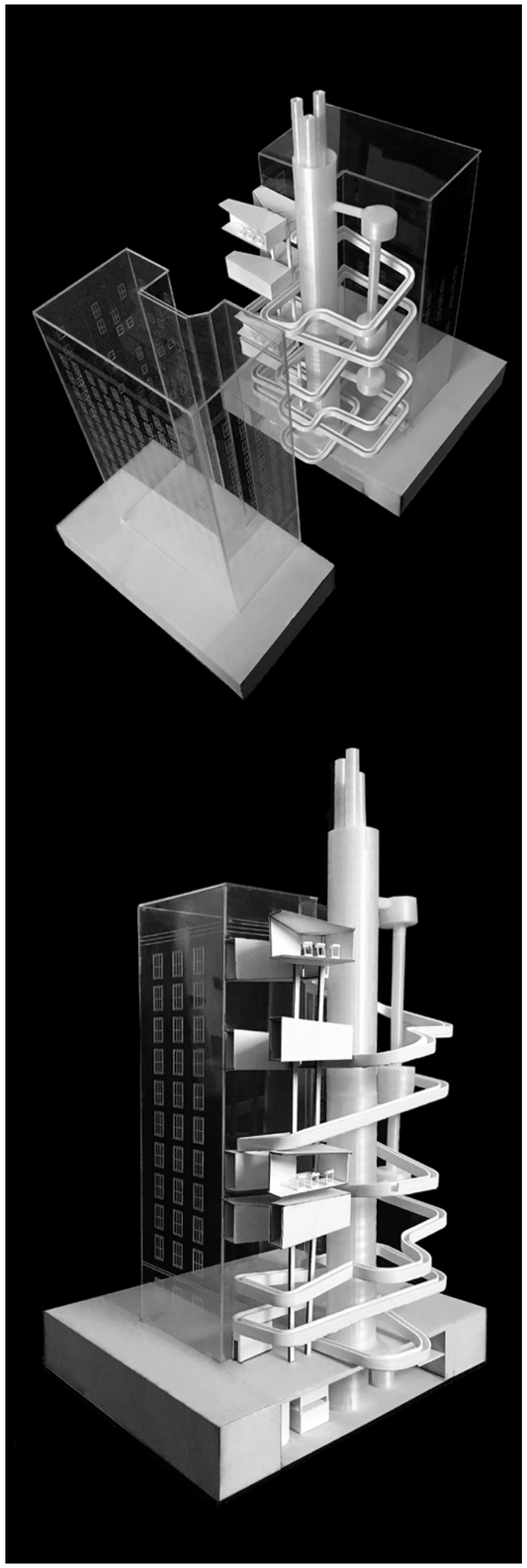
With the hall open and suspended, the open-air concert hall becomes a sculptural attraction and provides for public spaces in the central Prague. The fluid balconies inherit the glissando element and combined into a four-layer interpenetrating auditorium.

A removable roof made of cable and fabric is also added to keep the rain and the sun off people.

02

REVIVING ALLEYS OF PARK AVENUE

An Urban Practice in New York City



Teamwork with Aayushi Joshi

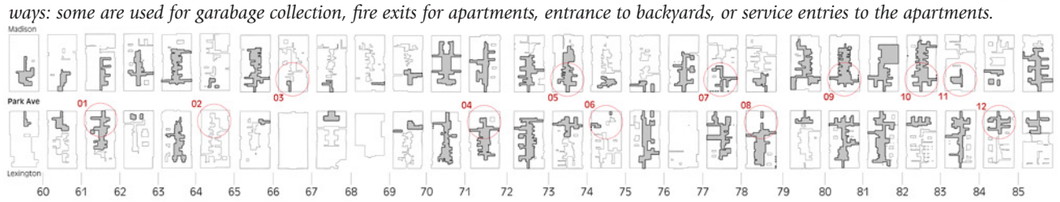
Type | Academic, 2019 Summer
Advisor | Nahyun Hwang(n.hwang@nhdm.net),
David Eugin Moon(d.moon@nhdm.net)
Location | Manhattan, New York City, USA
Role in Team | Research of Park Avenue/ Analysis drawing/Rendering/ Thesis drawing

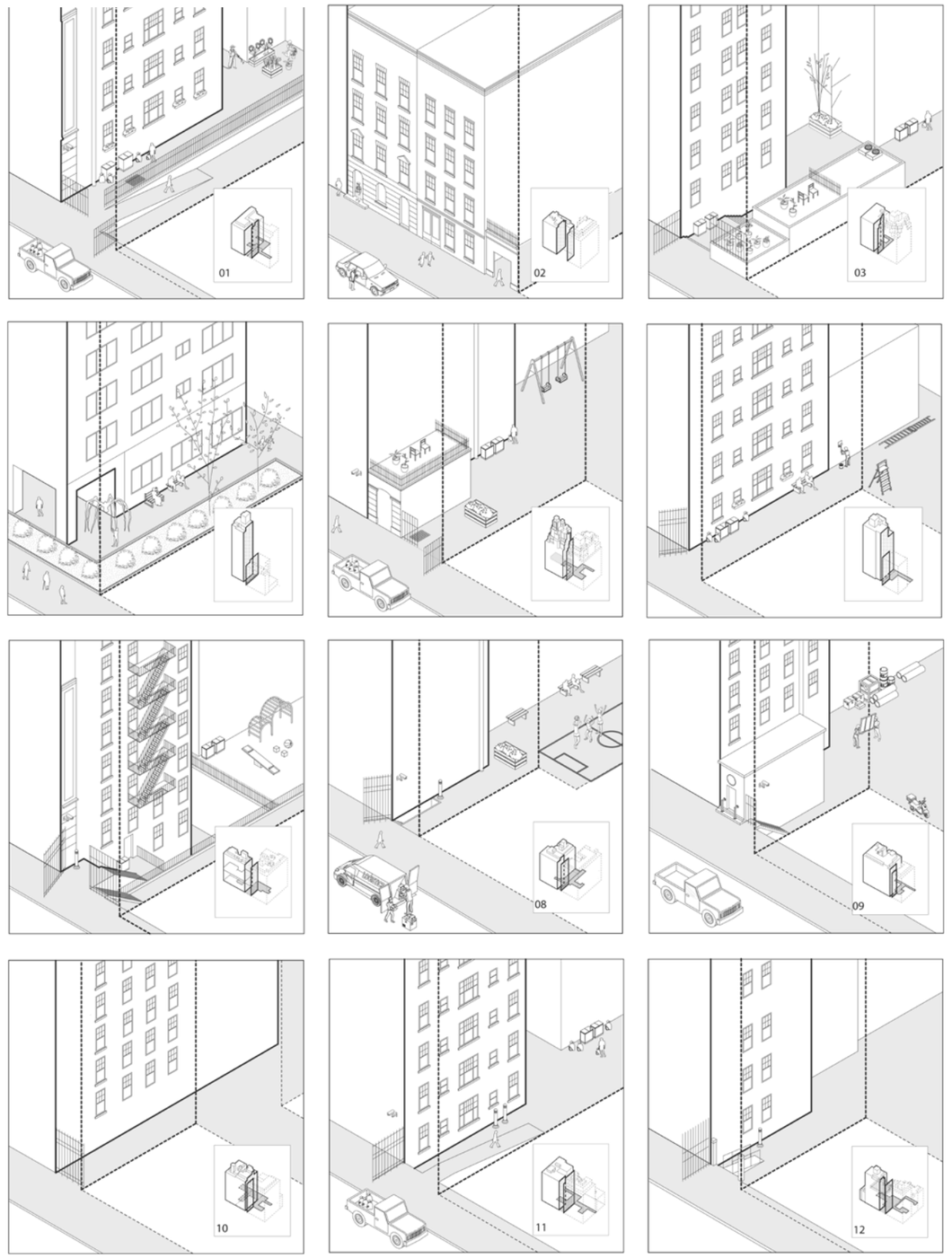
In New York City, where every square foot area is of high value, why are alleys of Manhattan not appreciated and utilized enough? The alleys of Lenox Hill at Park Avenue are one such example of residual under-utilized spaces between elite buildings of Upper East Side.

This design investigates into these alleys and provides for different functional spaces that are given back to the community, making use of them to their full potential.

RESEARCH ON ALLEYS OF LENOX HILL, PARK AVENUE

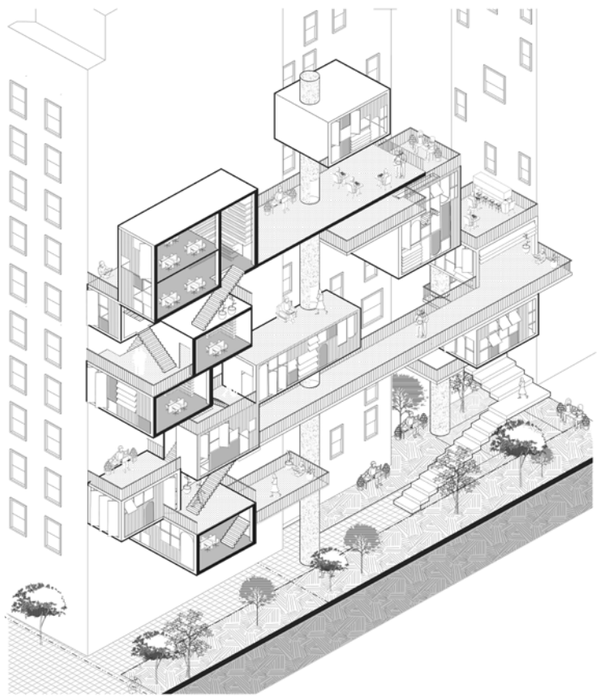
The residual alleys between buildings are one peculiar feature in the upper east side. 80% of the alleys are under-utilized in different ways: some are used for garabage collection, fire exits for apartments, entrance to backyards, or service entries to the apartments.

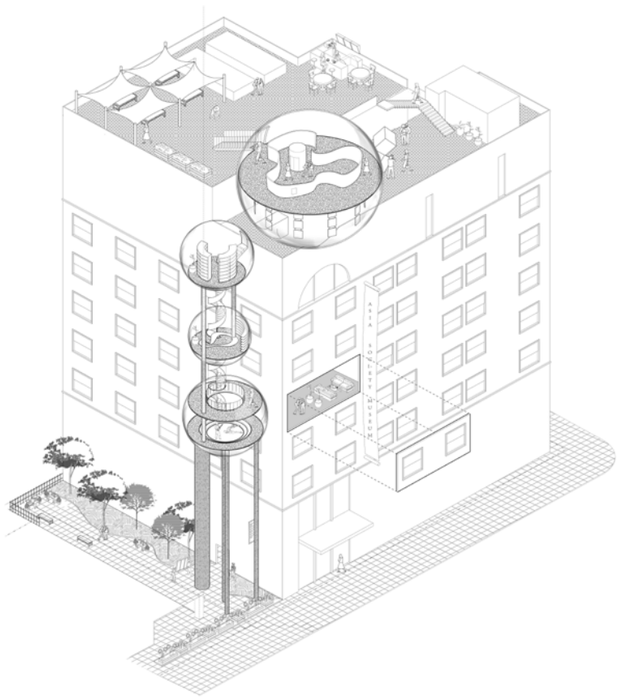


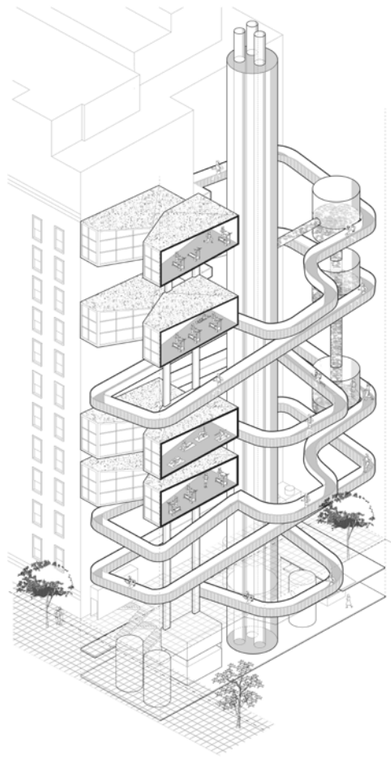


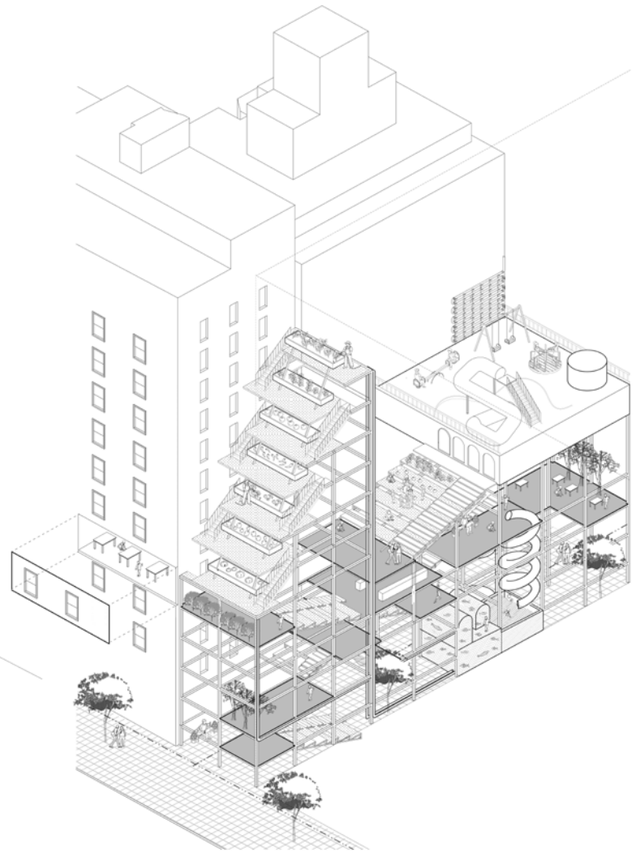
RESEARCH ON ALLEYS OF LENOX HILL, PARK AVENUE

We intervened four sites that had distinctive characteristics as an experiment. The idea was to introduce the design to benebit the upper east side community as well as invite volutantry visitors from the surroundings based on the typology of the alley.







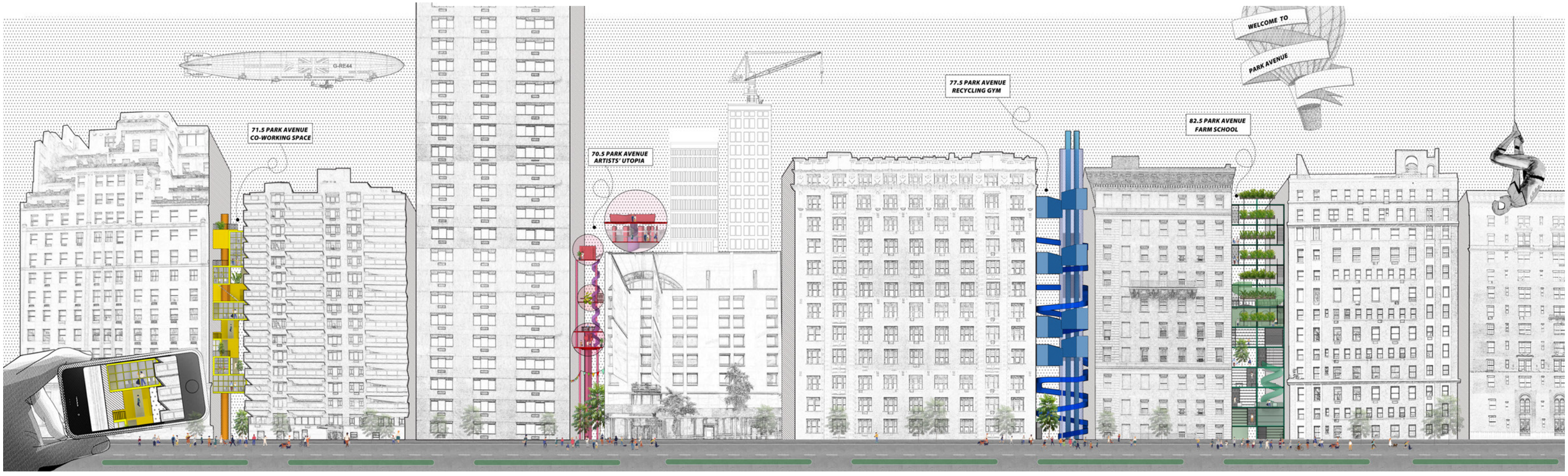


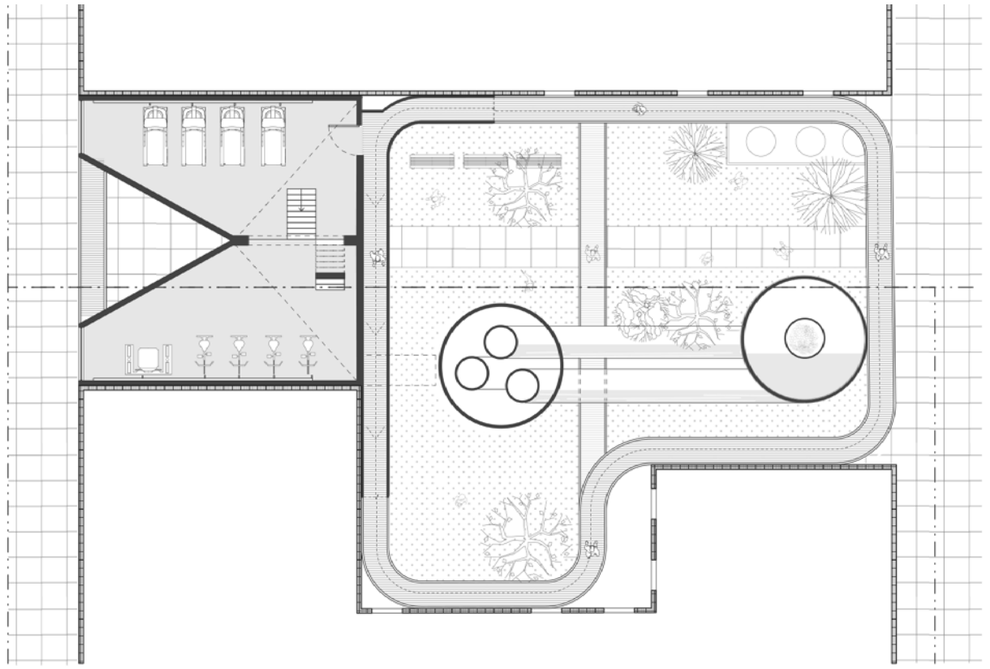
Design 01- Co-working Space
71.5 St, Park Ave

Design 02- Artists' Utopia
70.5 St, Park Ave

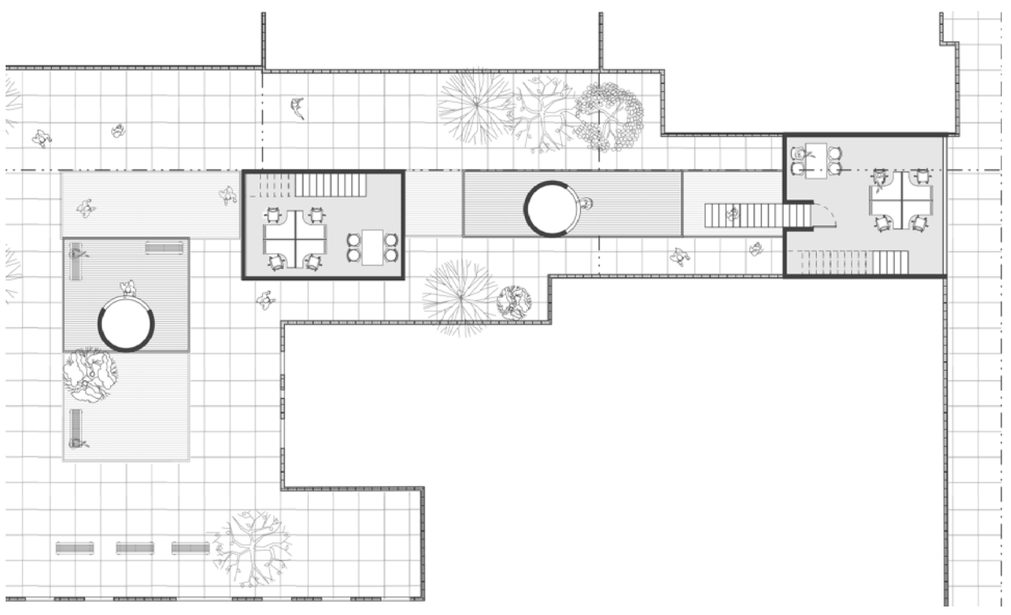
Design 03- Recycling Gym
77.5 St, Park Ave

Design 4- Farm School
82.5 St, Park Ave

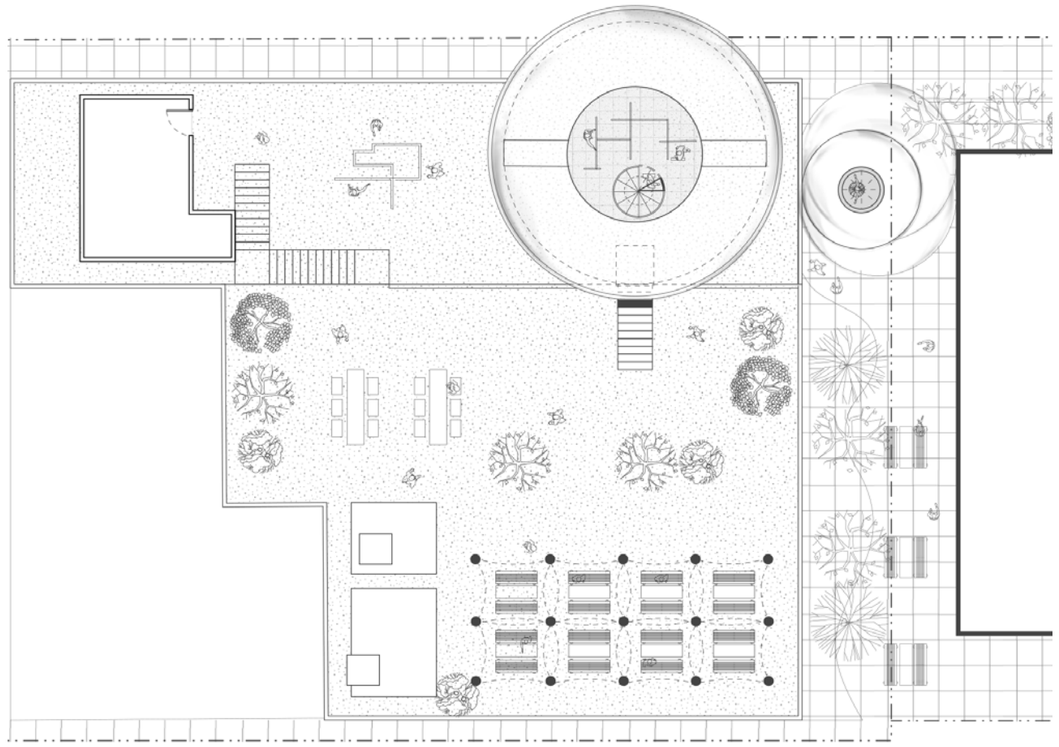




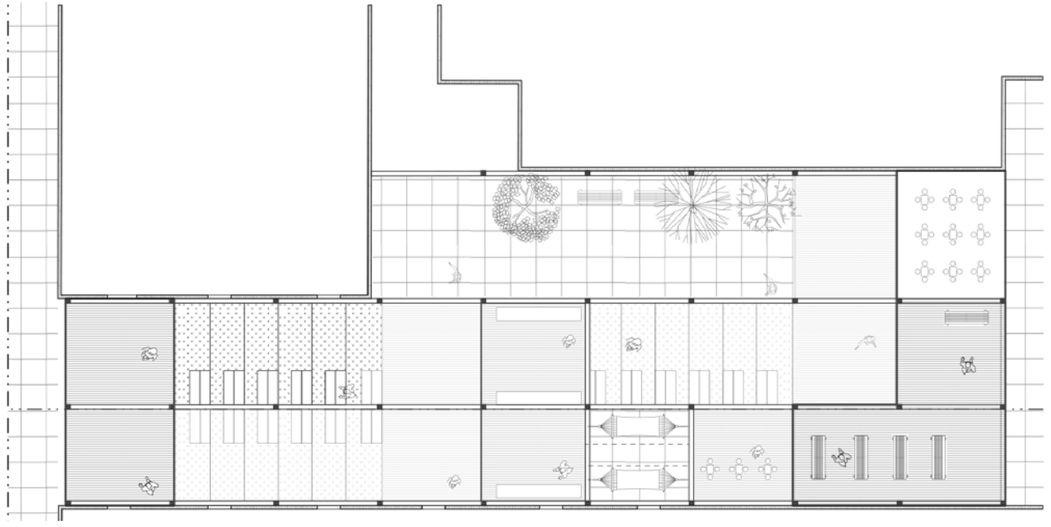
ALLEY OF RECYCLING GYM



ALLEY OF FARM SCHOOL



ALLEY OF ARTISTS' UTOPIA



ALLEY OF CO-WORKING SPACE

03

AS IN THE PAINTING

A Theater Design of Chinese Traditional Culture

Individual work

Type | Academic, 2017 Winter

Advisor | Jingsong Shi(sw.sjs@163.com),
Tao Xu(xt2012@home.swjtu.edu.cn)

Location | Maotai, Guizhou, China

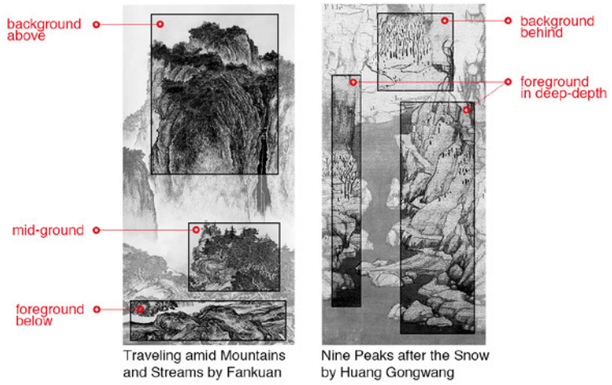
Guizhou is famous for its landscape and is also known for its traditional residences. Therefore, a theater built here should not only response to the natural environment, but also response to the traditional Chinese landscape paintings. Combined with the profound Chinese landscape painting culture, we can not help but try to design a theater as in the paiting.

Based on the view strategy of ancient Chinese landscape paintings, this theater is designed to not only fit into the landscape but also evoke memories of traditional architectural culture.

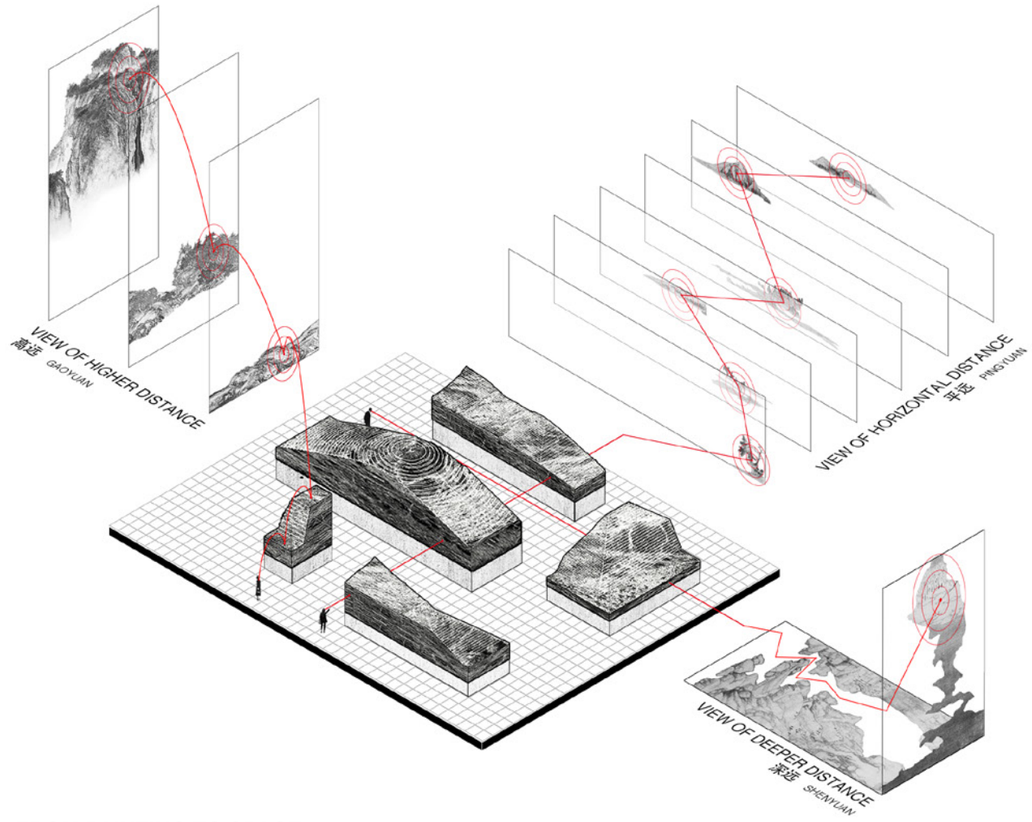
VIEW STRATEGY——"SANYUAN"

Unlike the western landscape painting, which is a direct reproduction of real nature, the Chinsese landscape painting emphasizes the feelings while enjoying nature sceneries. When ancient Chinese painters observed mountains, they found that the spacial experience had a close relationship with viewpoint, so they started to differentiate scenes from different viewpoints by arranging the elements' positions in paintings, which creates different artistic conceptions in Chinese paintings.

The Chinese landscape painter Guo Xi（郭熙）made a further interpretation of the relationship between viewpoint and spacial experience of mountains. In his book "LIN QUAN GAO ZHI"(林 泉 高 致), he summed them up as three patterns: higher distances(高远), deeper distances（深远）, and horizontal distances（平远）. Higher distances, which means admiring mountains from below to top, offers an imposing spacial experience; horizontal distances, which means admiring mountains from near to far, offers a peaceful and misty spacial experience; and the deeper distances, which means admiring mountains from front to back, offers a deep and mysterious space experience.

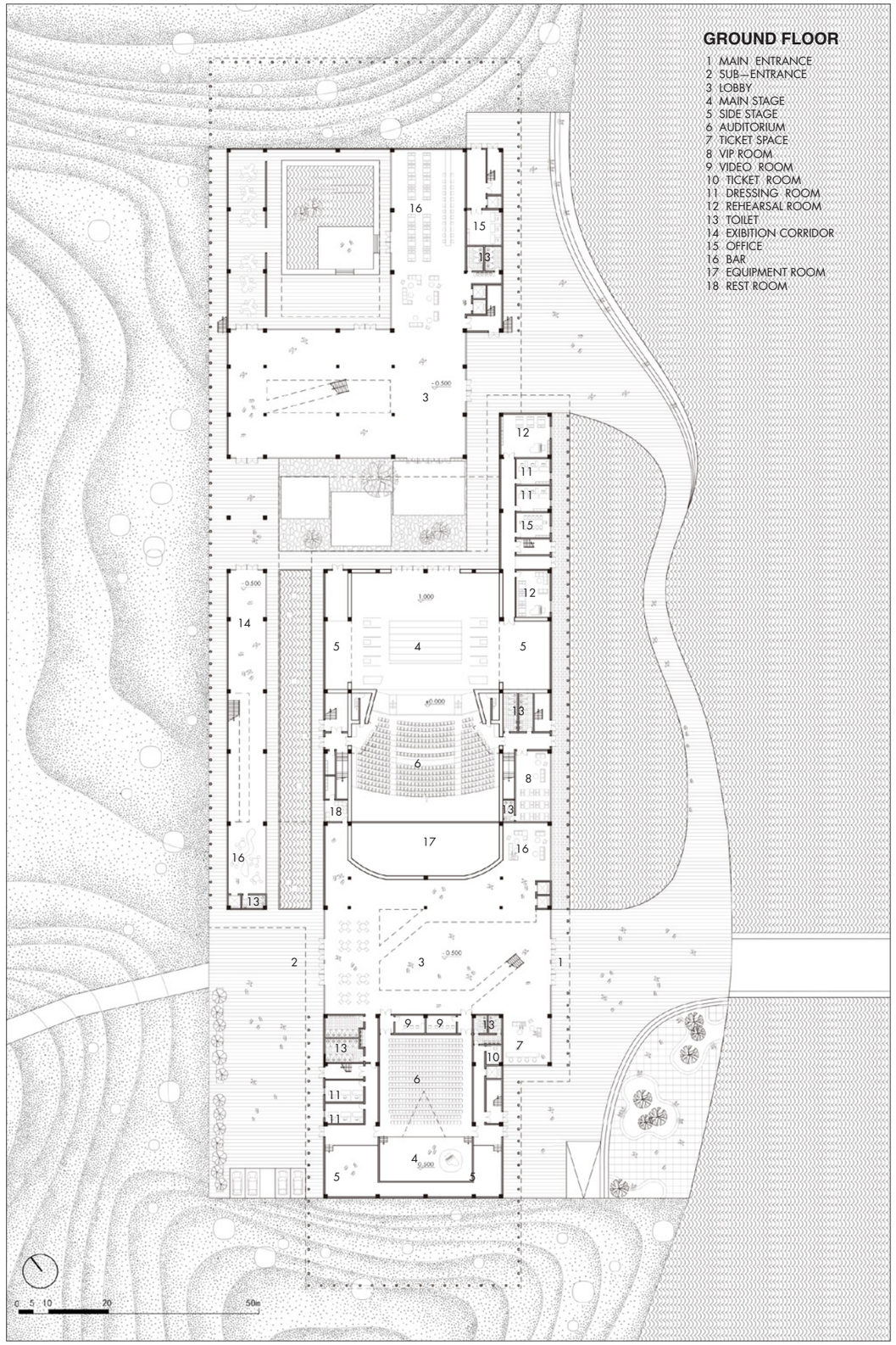


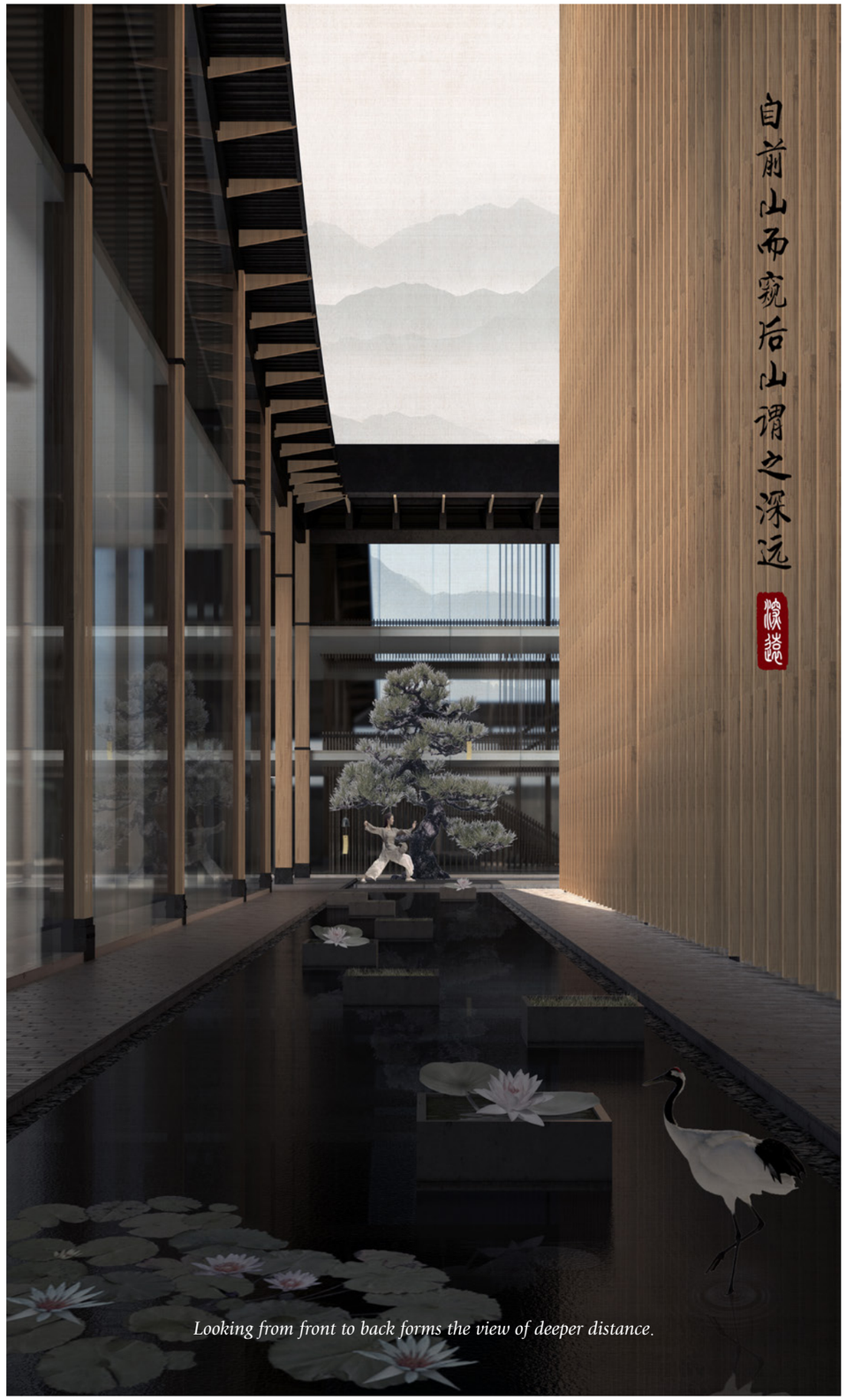
DECONSTRUCTION OF THE ARTISTIC CONCEPTION IN CHINESE PAINTINGS



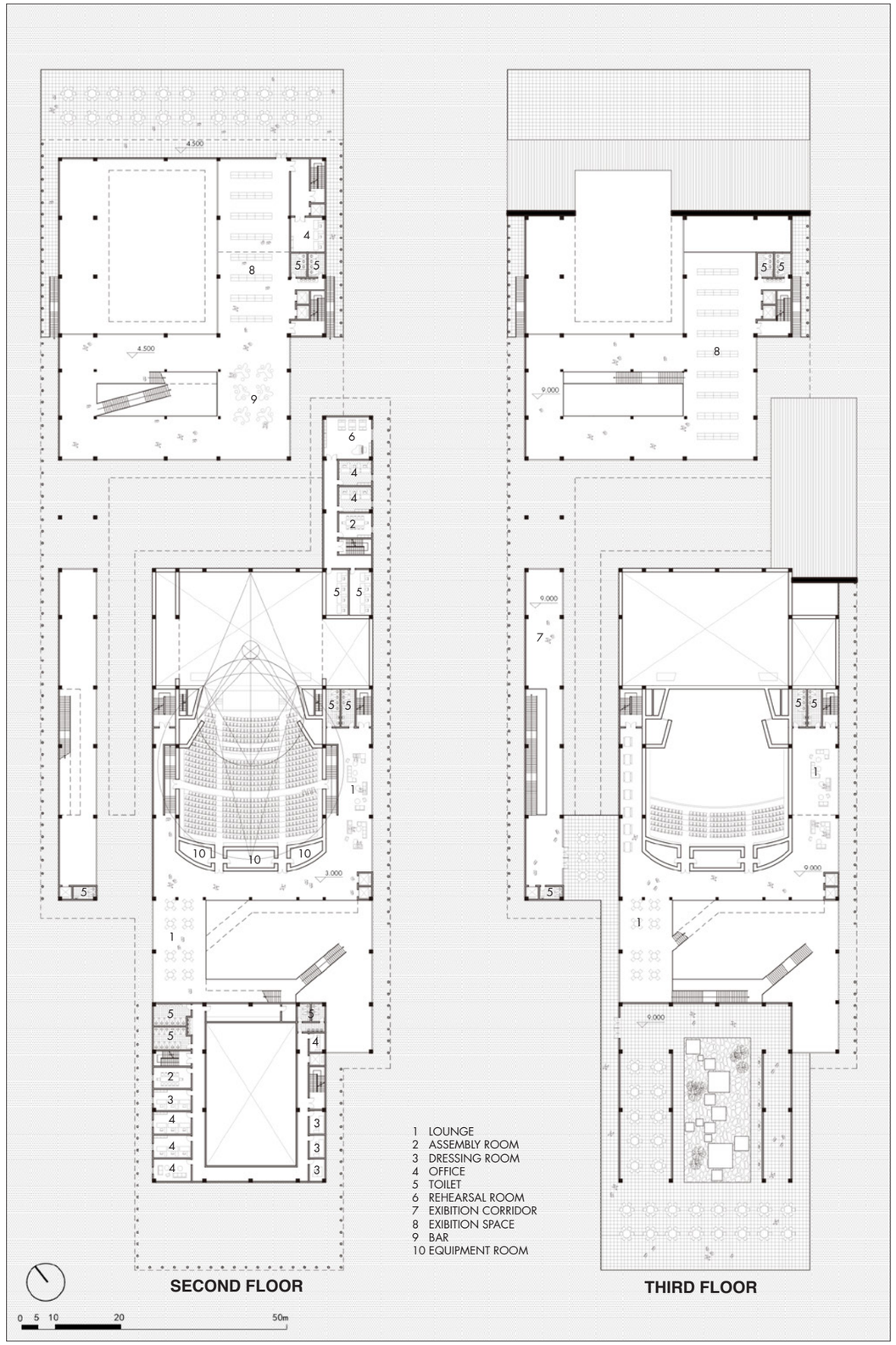
FROM PAINTING TO SPACE

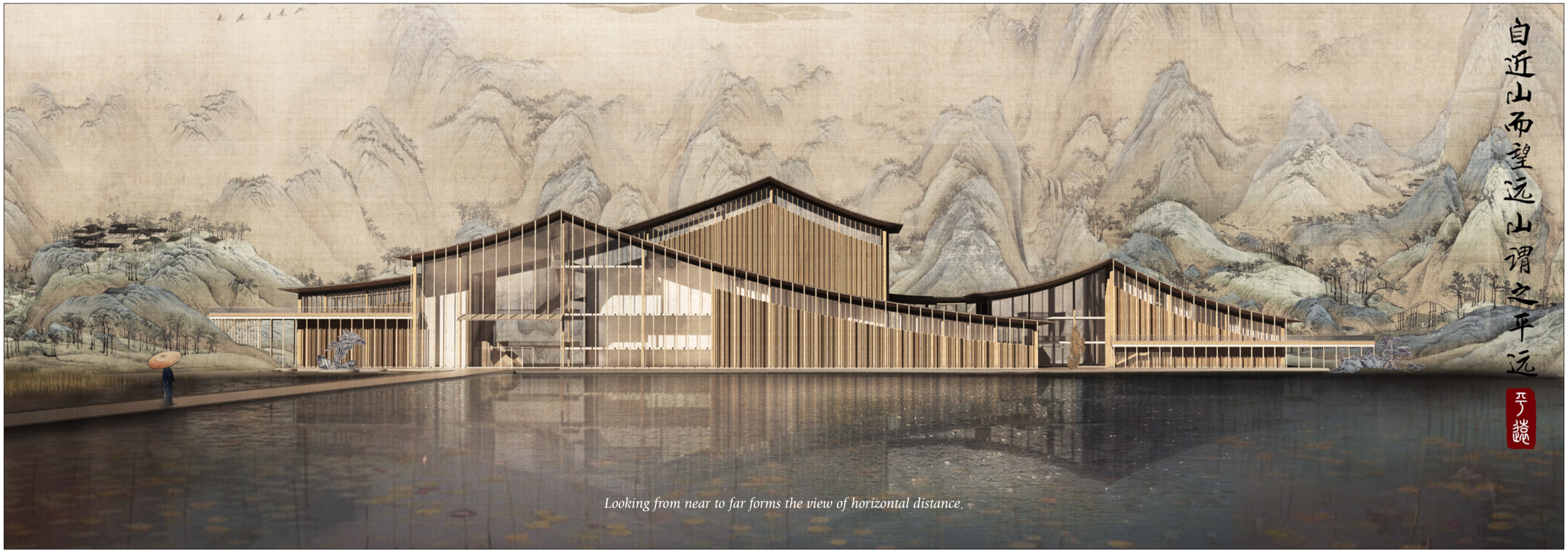
Looking from bottom to top forms the view of higher distance.



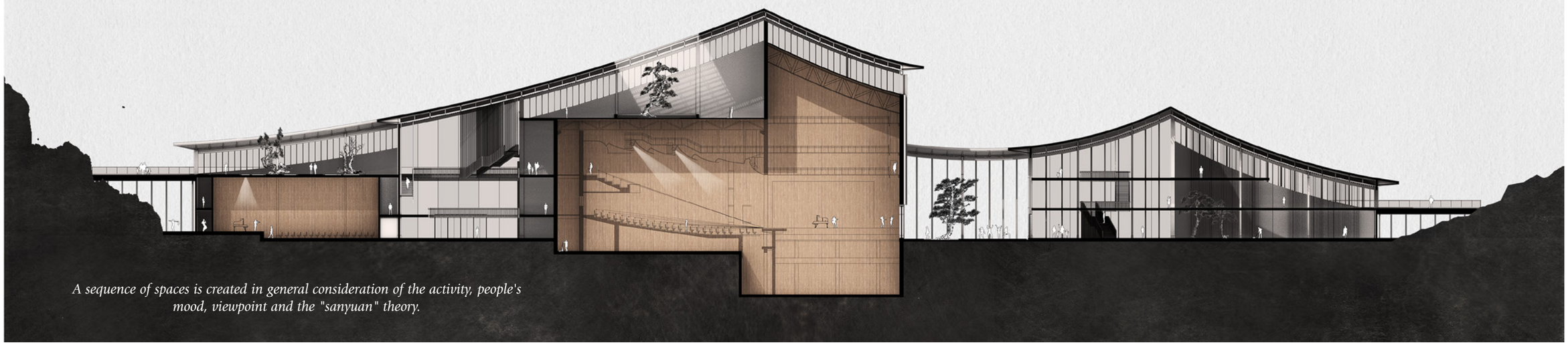


Looking from front to back forms the view of deeper distance.

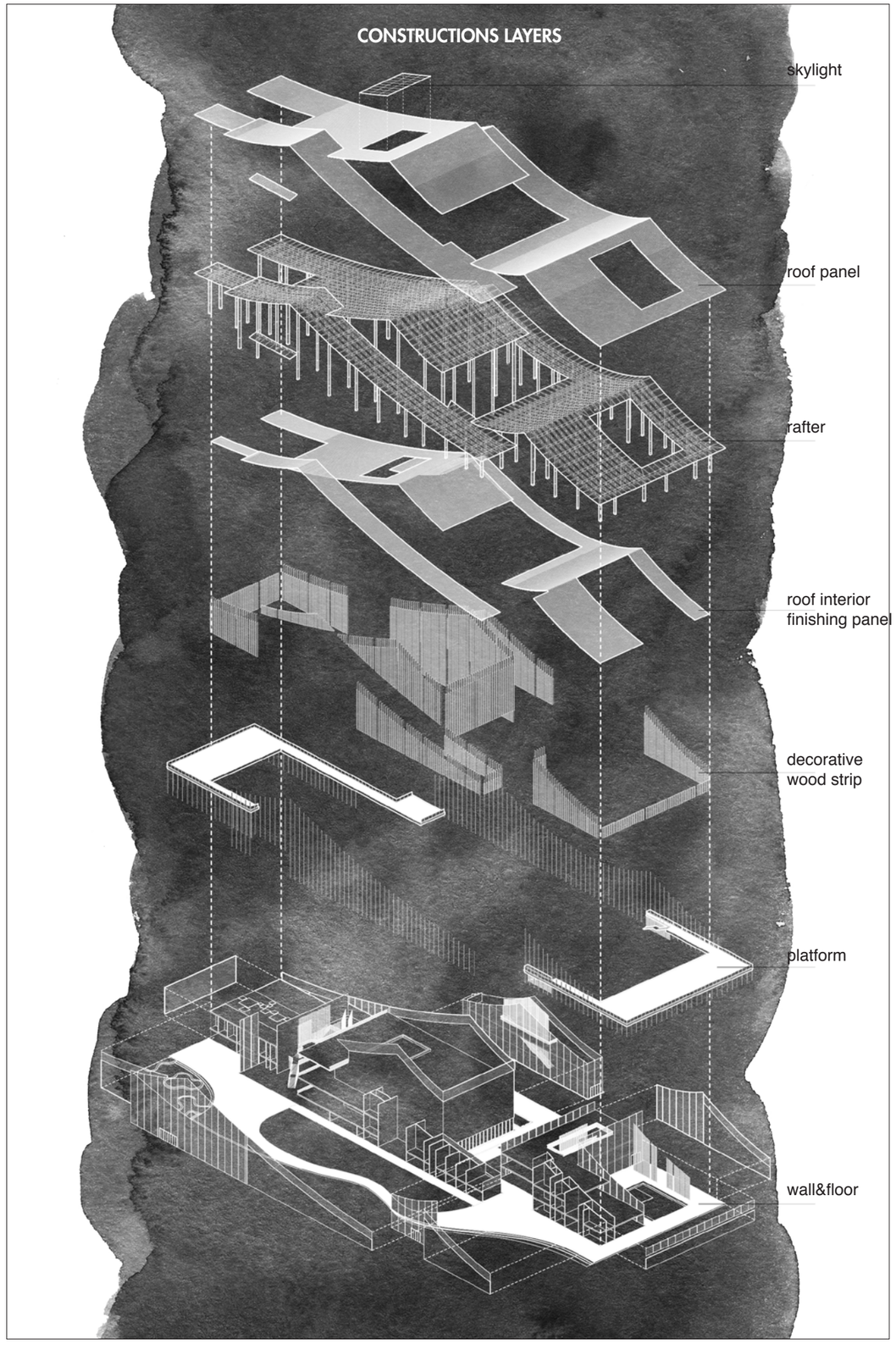




Looking from near to far forms the view of horizontal distance.



A sequence of spaces is created in general consideration of the activity, people's mood, viewpoint and the "sanyuan" theory.



ROOF STRUCTURE

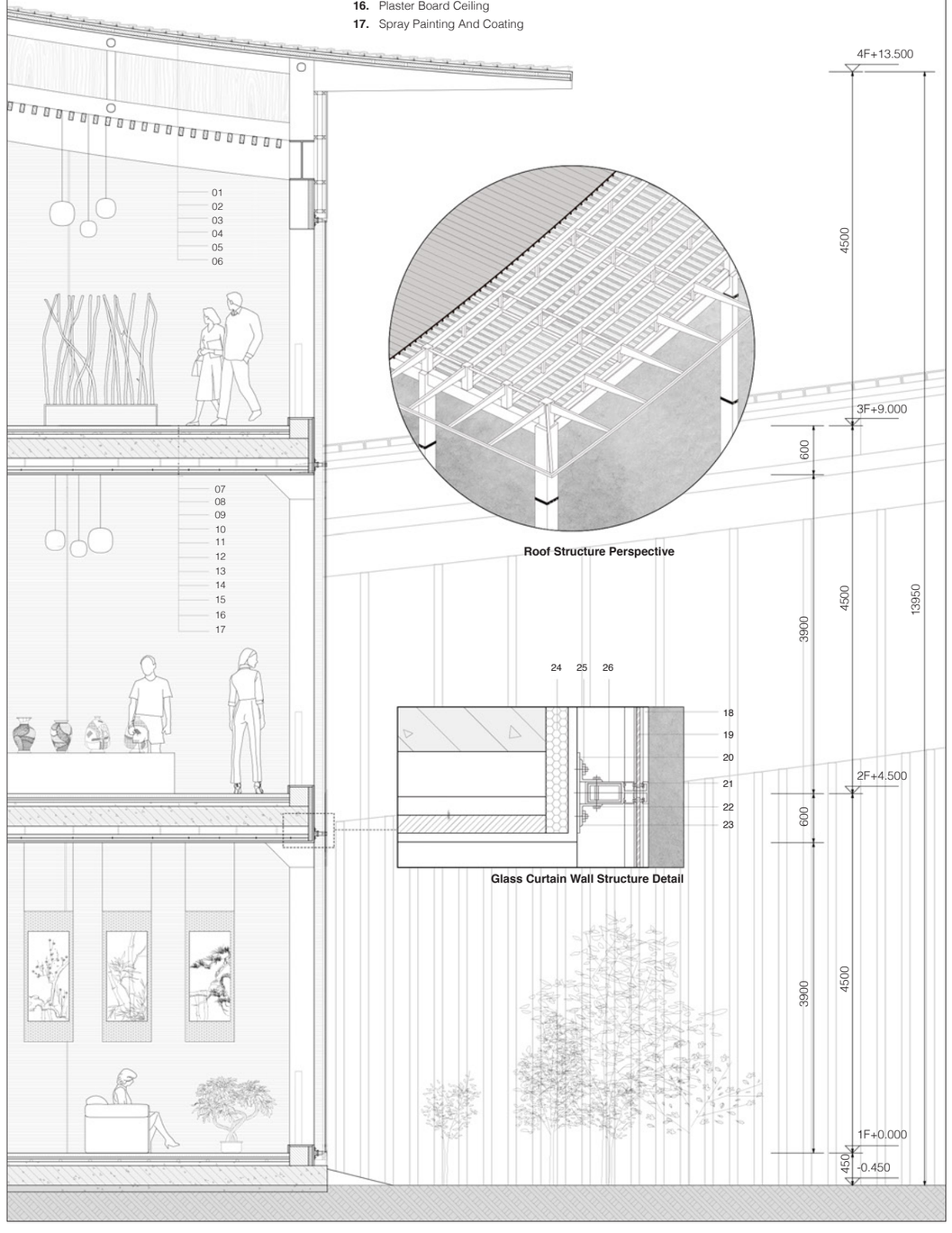
01. Bi-layer Glass Fiber Asphalt Layer
02. 3mm Polyethylene Waterproofing Roll Roofing
03. 20mm OSB Plate
04. Hollow Purlin Filled With Heating Preservation Cotton
05. Supporting Net
06. 60*90*3mm Galvanized Steel-tube

FLOOR STRUCTURE

07. Floor Tile
08. 20mm Floor Heating Pipe Layer
09. Waterproof Mortar
10. 20mm 1:5 Cement Mortar Screed-Coat
11. 30mm Concrete Cushion
12. 20mm Reinforced Concrete Floor
13. 100mm Flooring Angular Line
14. Round Steel Suspension Bar
15. Light Steel Cross Keel
16. Plaster Board Ceiling
17. Spray Painting And Coating

GLASS CURTAIN WALL STRUCTURE

18. Aluminum Alloy Centre Keelsheet
19. 6+9A+6 Hollow Toughened Glass
20. 200*300*8mm Hot Dip Galvanized Steel Sheet
21. Aluminum Alloy Connection
22. M6 Stainless Steel Bolts
23. 50*50*5mm Galvanized Angle Steel
24. Insulating Layer
25. M12*120mm High-Strength Expansion Bolt
26. Galvanized Square Steel Connection



Roof Structure Perspective

Glass Curtain Wall Structure Detail

04

2050 COW JOURNEY

A Future Mode of Beef Production

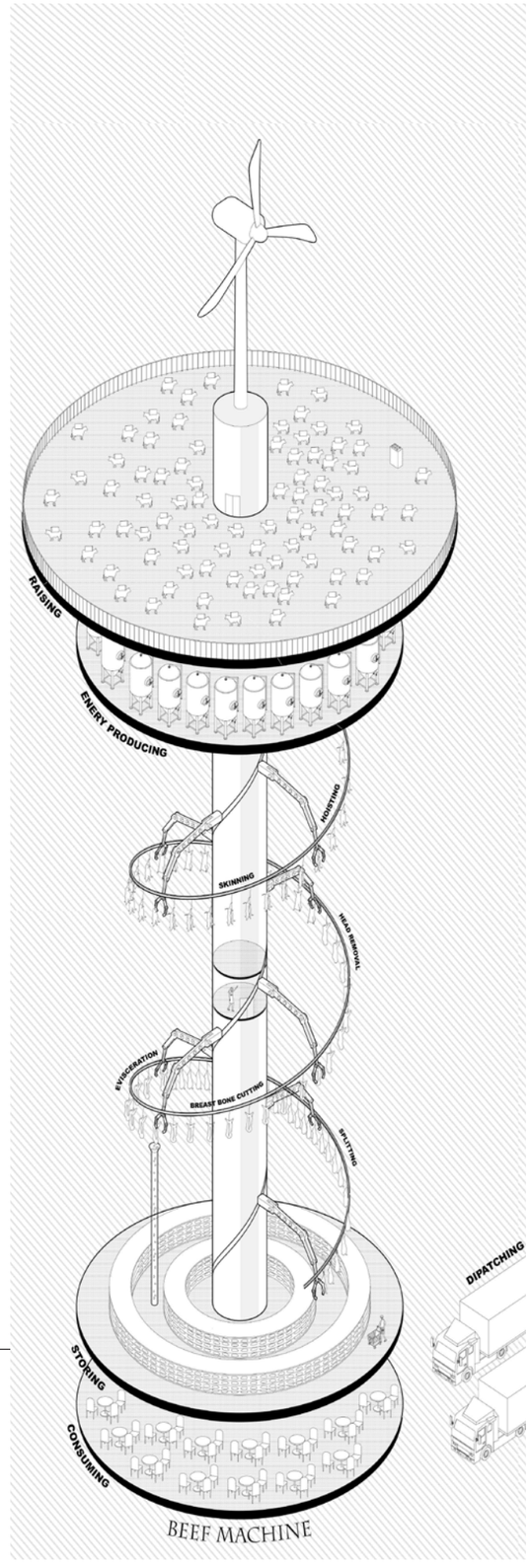
Individual work

Type | Academic, 2019 Autumn
Advisor | Marc Tsurumaki
(marc@ltlarchitects.com)
Location | Manhattan, New York City, USA

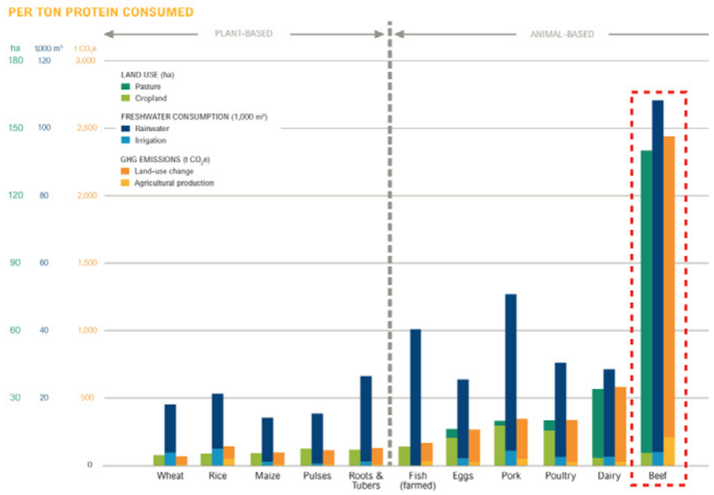
In 2050, in order to continue to feed our growing population with limited natural resources, we need to reduce land that used for beef production, which is really resource-intensive.

The project is exploring a future mode of beef production. To raise cow with limited natural resources, I bring cow back to New York citizens' daily life, pick some of the waterfront green green spaces as "cow harbor" to raise cow and use "cow ferry" for cow transportation.

With the aim of decreasing people's red meat consumption, the project focuses on the interaction between human and live cow.



AMERICAN FOOD CRISIS IN 2050— —NO BEEF SUPPLY



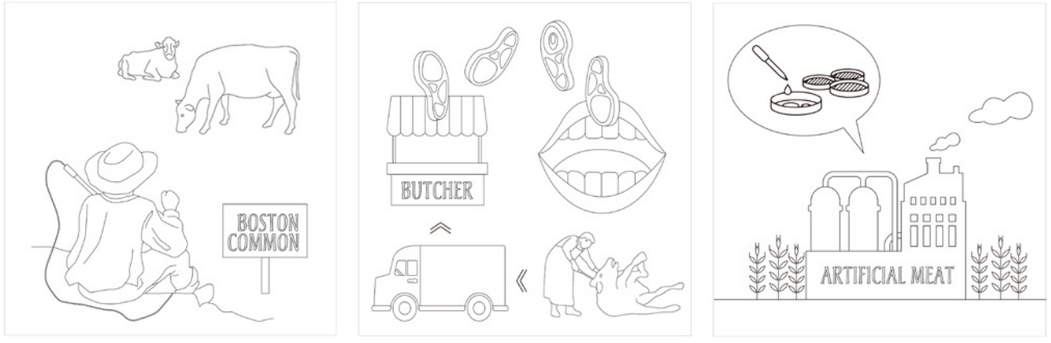
There is a fact that By 2050, we will need to increase global crop production by 70% to feed a larger population with increasing food demands. At this rate, farmers will need to produce more food than they have in the last 250 years combined to keep up with global demand. However, in the US, like most other countries, the amount of arable land has actually decreased.

Therefore, in 2050, in order to continue to feed our growing population with limited natural resources, we need to reduce the land used for some resource-intensive agriculture product, like beef.

Realizing this severe food crisis, I begin to think about if people can stop eating beef. However, it is difficult to change American's eating habits, the U.S. has a tradition of eating beef since 19th century. And the world's first beef hamburger and steak was born in New York. And there is also a research showing that people don't want to decrease the red meat consumption.

What's more, the beef meat production is also very important to the U.S. We can see from the chart that it has the largest fed-cattle industry in the world. So it will probably cause severe influence on economic and social prod uction if the U.S. has no land for beef production.

RELATIONSHIP BETWEEN COW AND AMERICANS



1800
Close Relationship

Many American's oldest public parks began as shared cow pastures. Parks were used to raise cows until the urban population vastly outnumbered the cows.

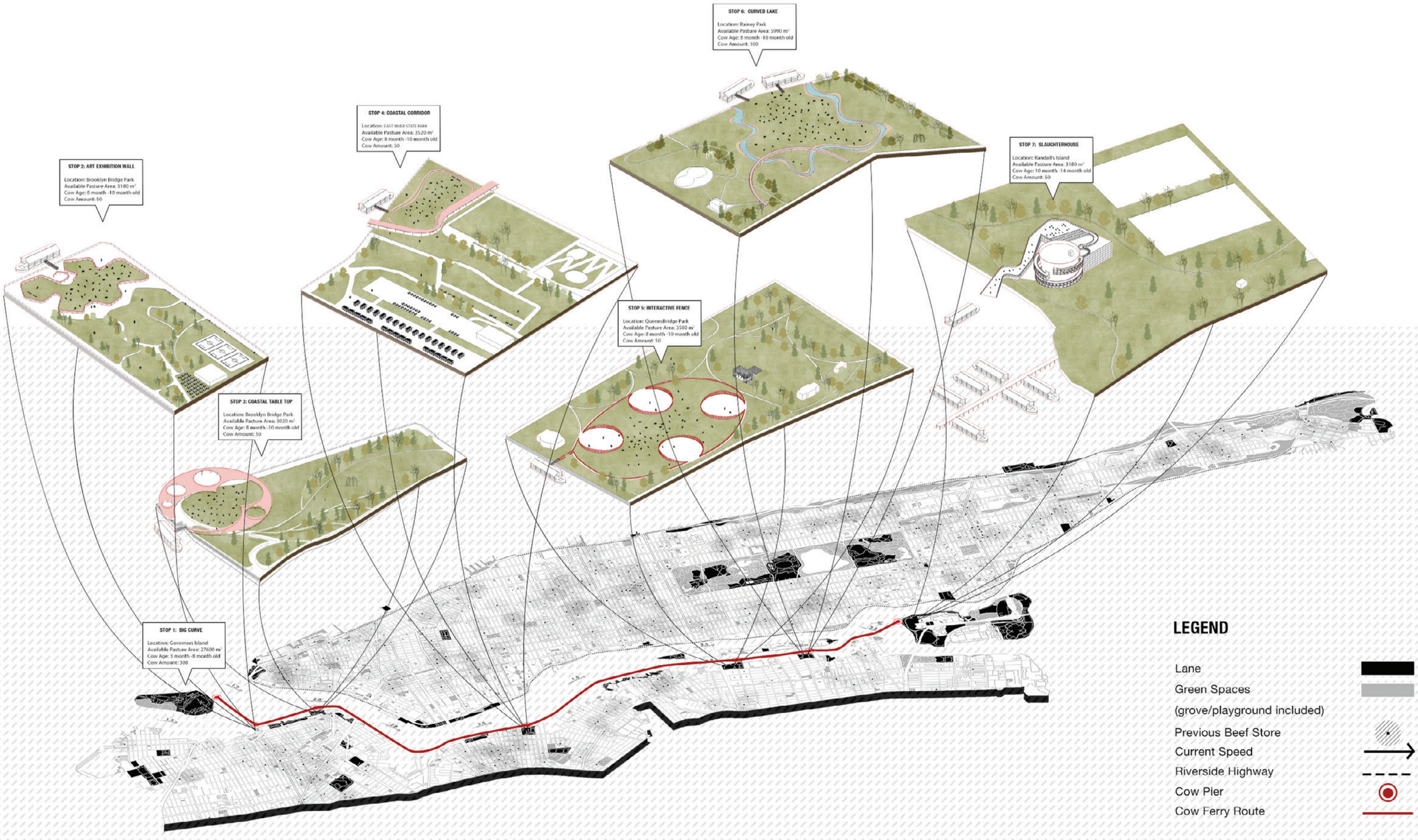
2020
Distant Relationship

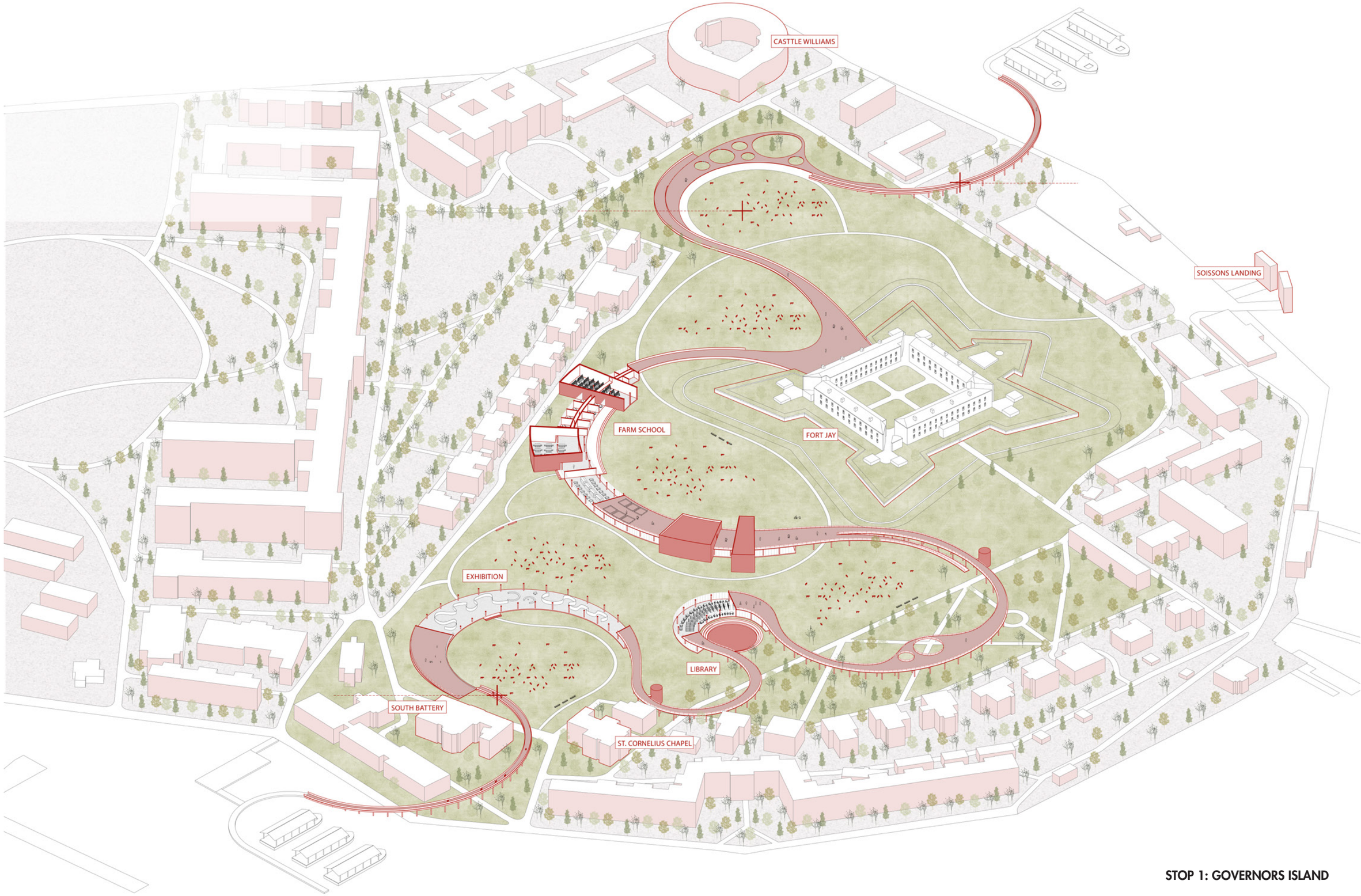
Pastures and slaughterhouses have moved from the city to the unknown. Since everything is invisible except packaged meat in the supermarket shelves, consumers are eating excessive beef without any awe to animals.

2050
No Relationship

In order to feed the growing population with limited natural resources, we have to use all land to grow grain instead of raising cattle. No beef will be supplied in 2050, which will make the world get into a mess.

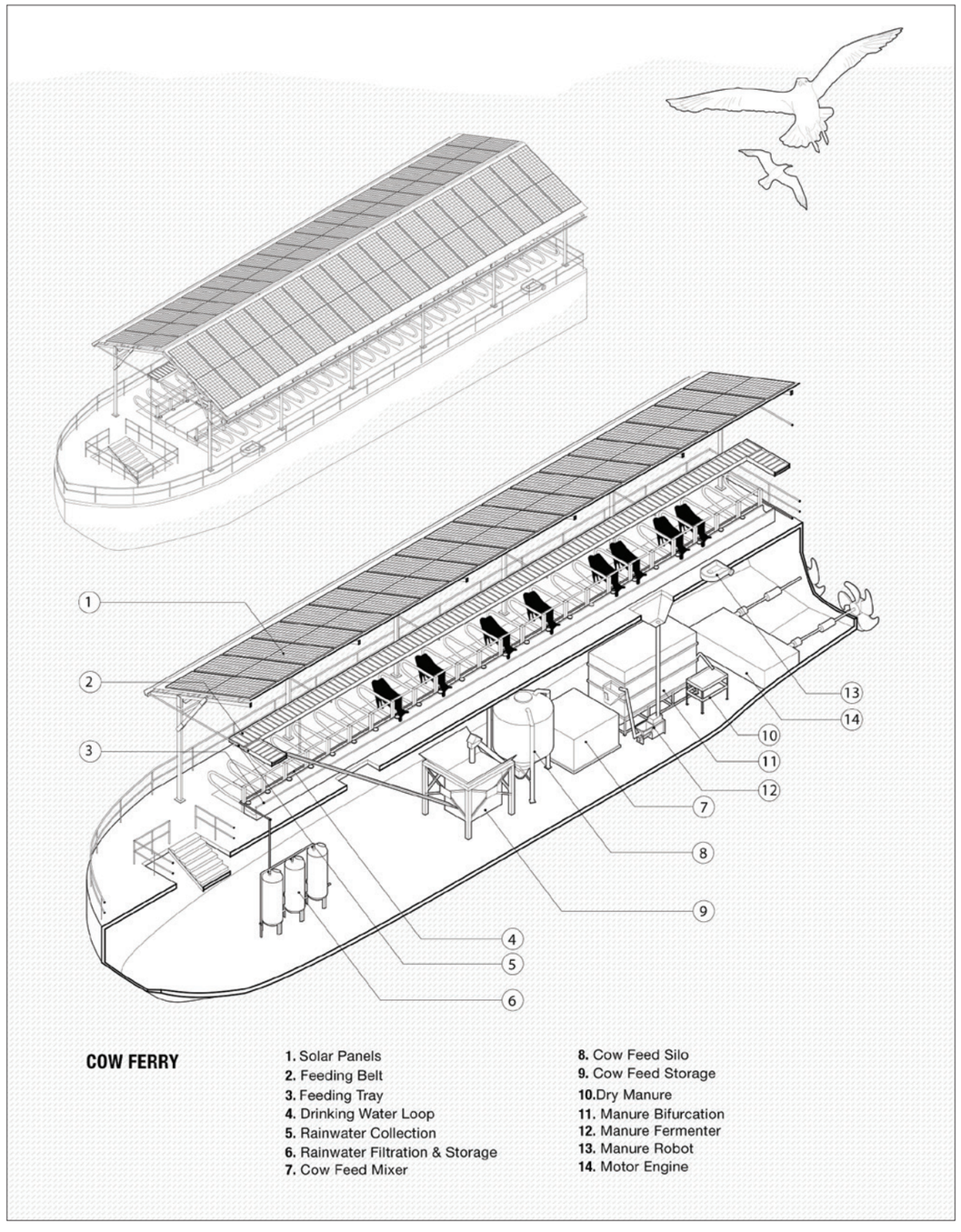
NEW YORK CITY CATTLE PARK MAP





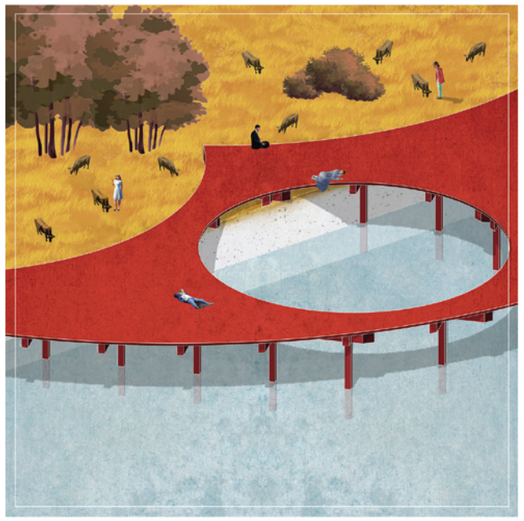
STOP 1: GOVERNORS ISLAND

COW FERRY —— A NEW MODE TO RAISE COW IN 2050



COW FERRY

1. Solar Panels
2. Feeding Belt
3. Feeding Tray
4. Drinking Water Loop
5. Rainwater Collection
6. Rainwater Filtration & Storage
7. Cow Feed Mixer
8. Cow Feed Silo
9. Cow Feed Storage
10. Dry Manure
11. Manure Bifurcation
12. Manure Fermenter
13. Manure Robot
14. Motor Engine



05

LIFE WITH(OUT) WINDOW

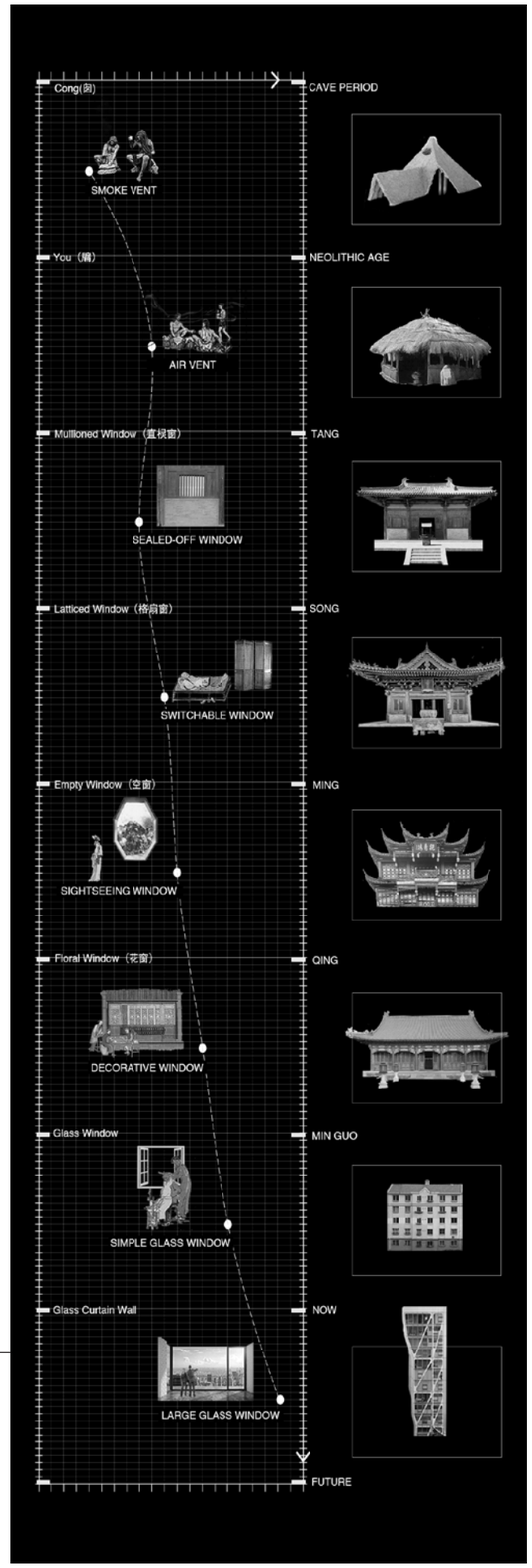
A theater design of Chinese traditional culture

Individual Work

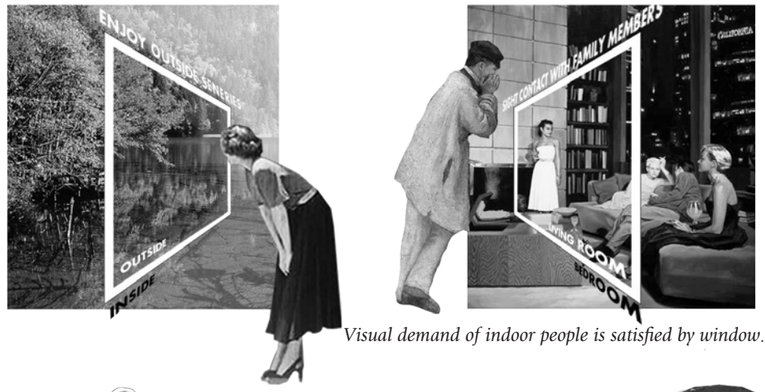
Type | Competition, 2016 Fall
Advisor | Rong Lin(linrong@home.swjtu.edu.cn)
Location | Chengdu, Sichuan, China

Window, a see tool of people inside, exposes their privacy at the same time. However, is removing all windows the best way to protect privacy? According to the theory of psychologist I.Altman, it is not the inclusion or exclusion of others that is vital to self definition, it is the ability to regulate contact when desired. "If I can control what is me and what is not me, if I can define what is me and not me, and if I can observe the limits and scope of my control, then I have taken major steps toward understanding and defining what I am. "

Inspired by this, I designed a house that people inside could choose the level of seeing and being seen. And with the completely contrary character of the inside space and outside facade, the house satisfied the visual demand of people inside to the most extent without privacy exposure



CONFLICT BETWEEN SEE AND BE SEEN



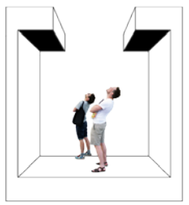
Visual demand of indoor people is satisfied by window.

Privacy of indoor people is being invaded by window.

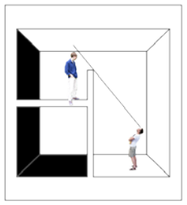
HOW TO SEE FROM WINDOWS WITHOUT BEING SEEN?

Low window makes people indoors could see outdoor scenery without being seen by passengers.

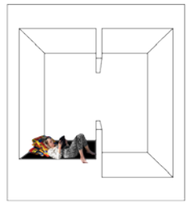
High window makes people indoors could see sky without being seen by passengers.



Skylight makes people indoors could see sky without being seen by outdoor people.



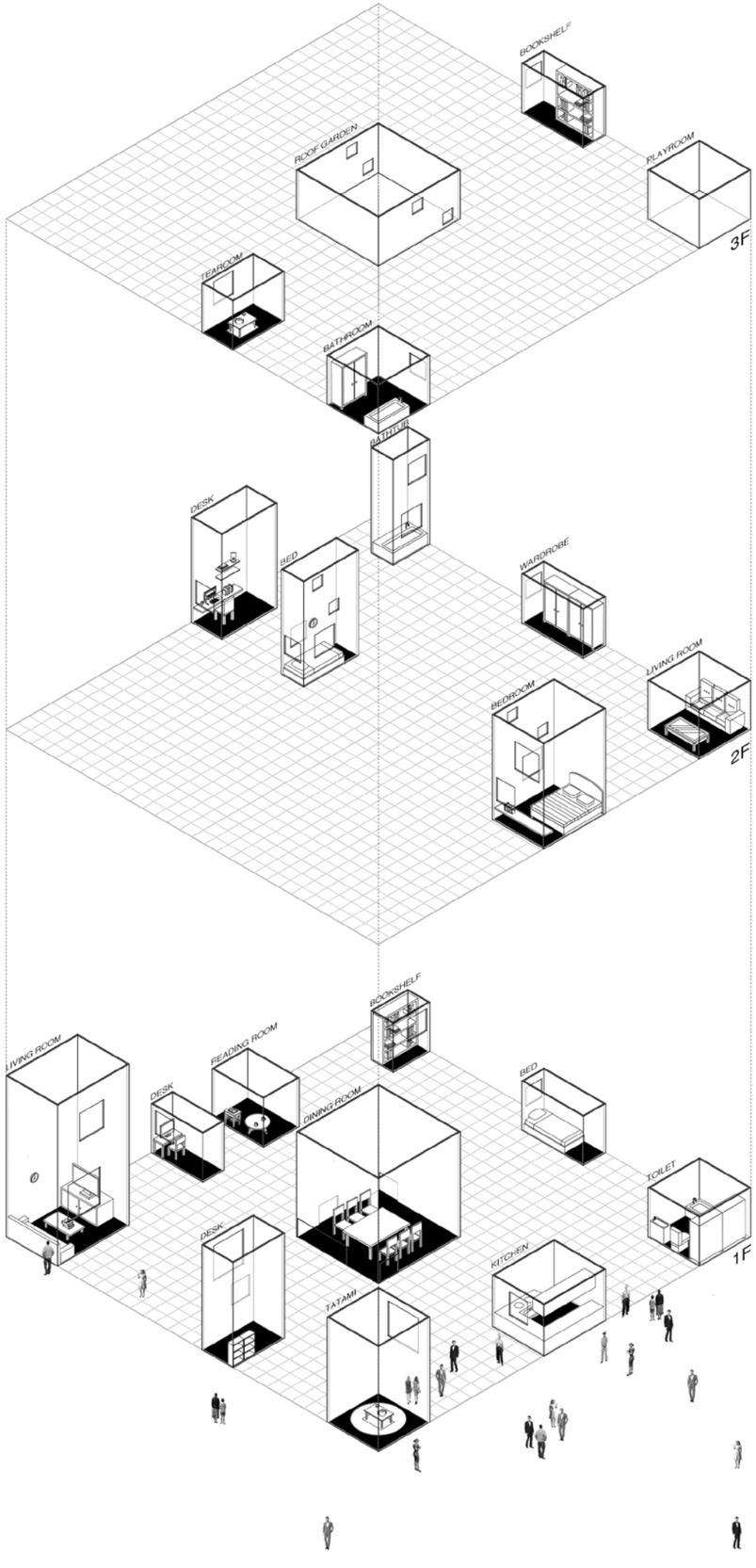
Adjusting aspect ratios of rooms could make people on second floor see public activities without being seen by people below.

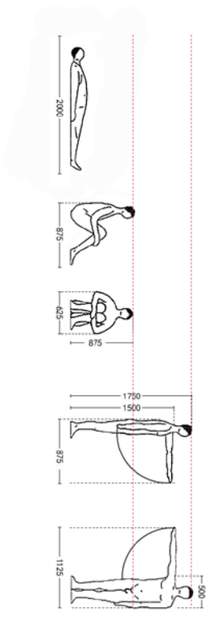


The height and size of window could be defined by people's different behavior of different privacy level, so that people could hide their body when sleeping but can have a eye sight communication with other family members when sitting in a same room with the same opening styles.

DEFINE ROOM BY MINIMAL HUMAN SCALE

Each room is compressed to the minimal size that accommodates only one or two furniture. In this strategy, the family member's behavior in a room is limited, and the function of each room is naturally fixed, which enhance the privacy of every behavior.

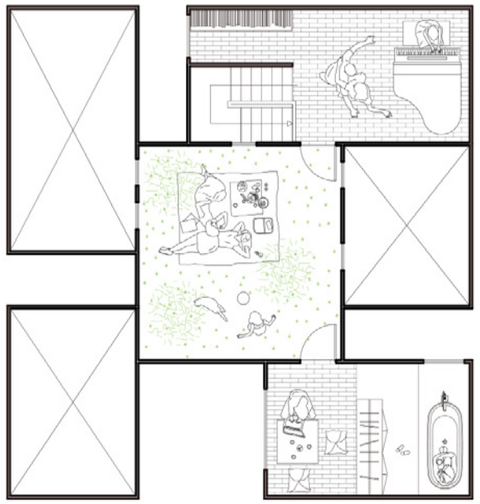




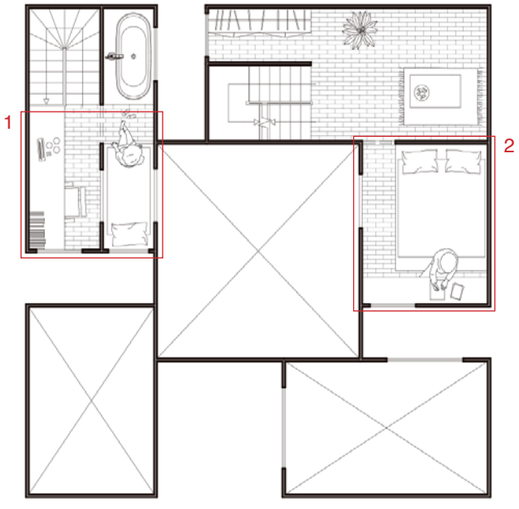
DEFINE WINDOW HEIGHT BY PEOPLE'S ACTIVITIES

People with different activities have different window demand. And a proper window height could hide people's boby when they are in relatively private behavior.

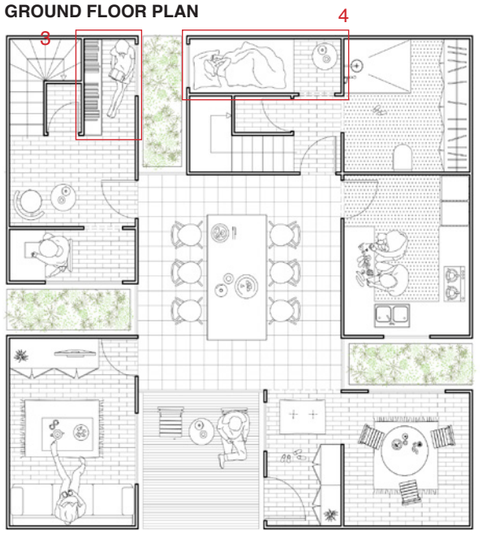
THIRD FLOOR PLAN

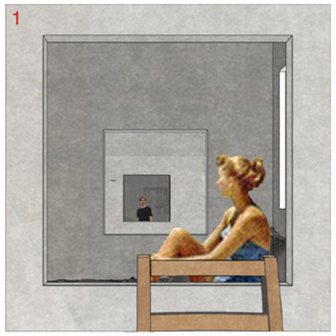


SECOND FLOOR PLAN



GROUND FLOOR PLAN





INTERIOR COMMUNICATION

Residents in second floor bedrooms have sight communication with each other.

DECIDE YOUR EXPOSURE LEVEL

With the proper height of windows, people have option to hide their body when sleeping or reading.

COLORFUL LIFE

Family members in different rooms communicate and share life through windows.

DIFFERENT CHARACTER

The closed exterior and open interior provide different character, and satisfied different demand.of people.

06

BETWEEN MOUNTAINS AND WATERS

A Hotel Design Conforming to the Environment

Teamwork with Zhiyi Xu

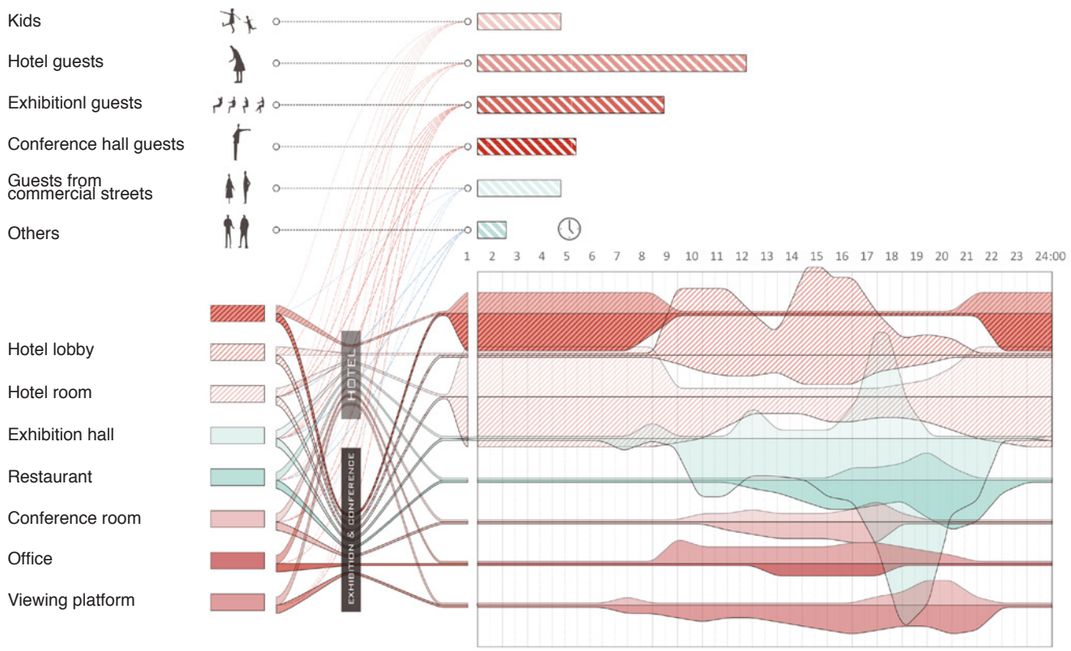
Type | Academic, 2019 Spring
Advisor | Jingsong Shi(sw.sjs@163.com), Tao Xu(xt2012@home.swjtu.edu.cn)
Location | Maotai, Guizhou, China
Role in Team | Team Leader/Typology Research of Chinese paiting/Conceptual Design/ Technical Drawings/Presentation

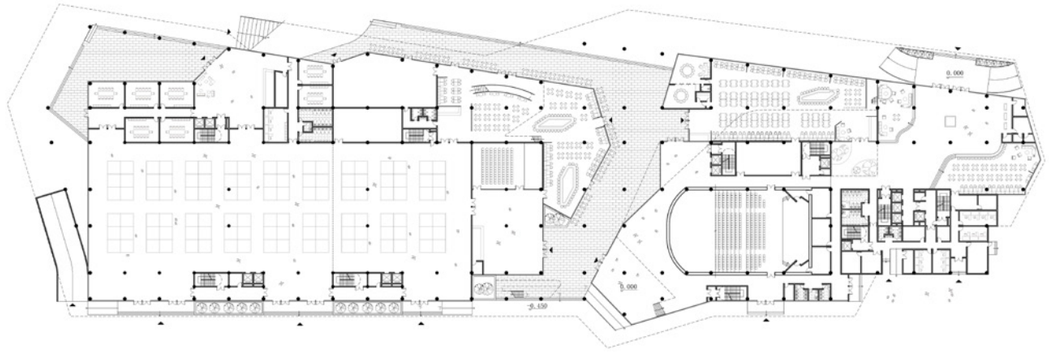
The project is situated at the juncture of the new and old urban districts of Ya'an, China. Combining hotel, exhibition hall and convention center as a whole, it plays an important connecting role between the two districts.

Fronting water and with hills on the back, the design uses "stones in the river" as model image, making itself fully integrated into the natural environment. Also, the streamlined podium attracts people from the nearby commercial street.

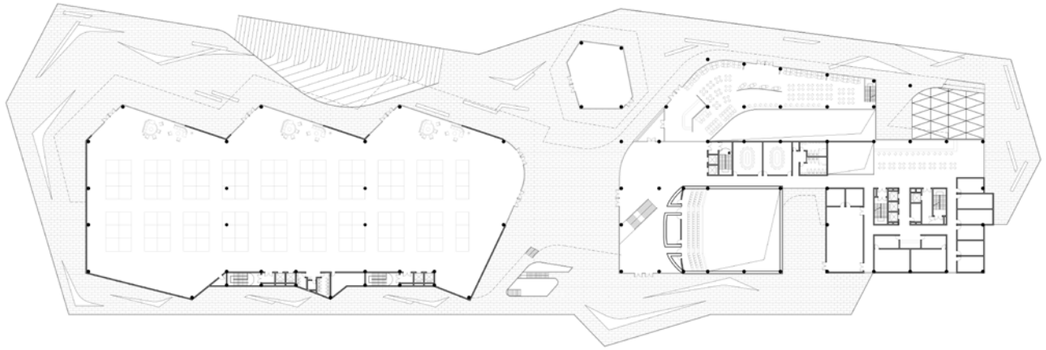
ENVIRONMENT

USERS & FUNCTIONS





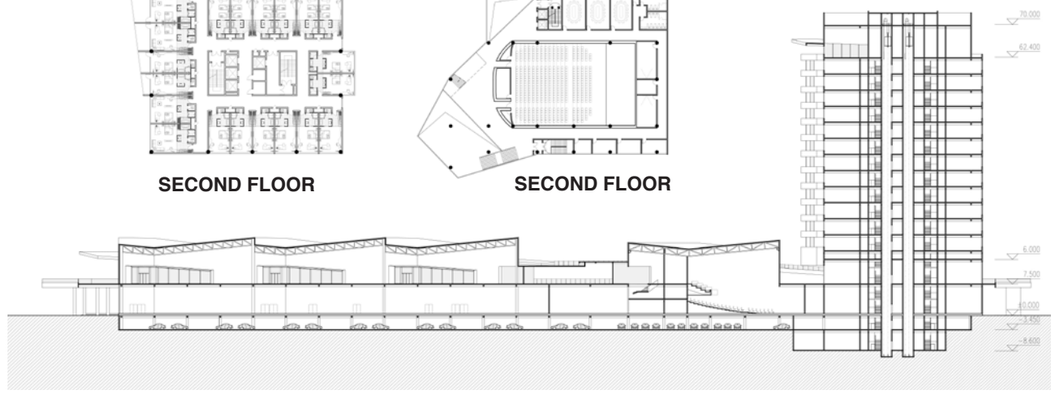
GROUND FLOOR



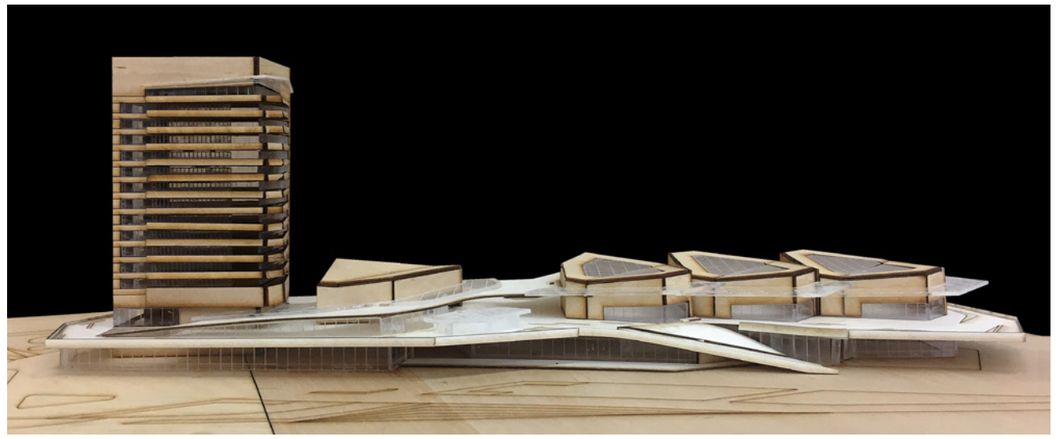
SECOND FLOOR

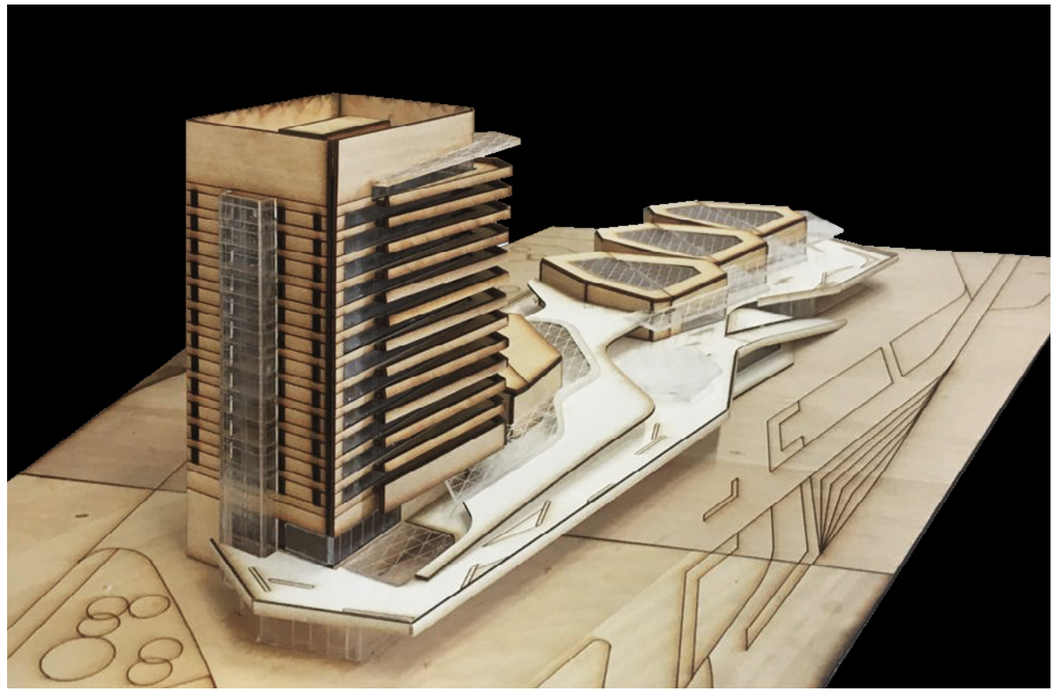
SECOND FLOOR

SECOND FLOOR



SECTION





RIVER VIEWS

RAMP VIEWS

MOUNTAIN VIEWS

ENTRANCE VIEWS

INTEGRATED WITH NATURE

Fronting water and with hills on the back, the design uses "stones in the river" as model image, making itself fully integrated into the natural environment.

07

FOREST-LIKE ROOM

Teamwork with Jingyuan Zhang and Jingjing Wu
Type | Visual Elective, 2020 Spring
Advisor | Danil Nagy

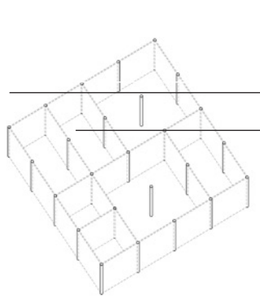
(Reference: KAIT Workshop by Junya Ishigami)

In the development of modern science and technology, the traditional one-on-one design method has not worked with architecture, while the regular change pattern has not affected the public's esthetic orientation either. So free and variety has increasingly become a trend in architecture today.

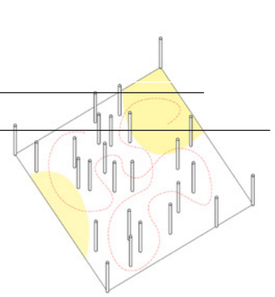
That is the reason why we choose to create one forest-like room with irregular-arranged columns rather than divide space by regular walls. In a forest, everything is just random; it's hard to figure out the distribution of each plant, but the uncertainty and ambiguity of nature is exactly what makes people relaxed.

To simulate this random natural space, a regular column-grid frame is not applicable at all, so we choose Grasshopper and Discover in case that no pattern is repeated.

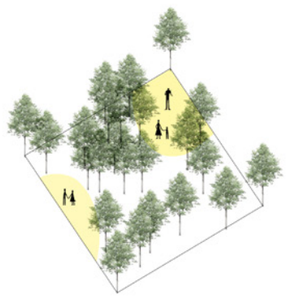
Additionally, we need to define "certain" in "uncertain" to make our space be better used, so one or more big spaces defined by several remote columns is indispensable. Just as in a forest, vertical elements are more distanced from each other in some areas to create glades that host different activities.



Regular Column-Grid Frame

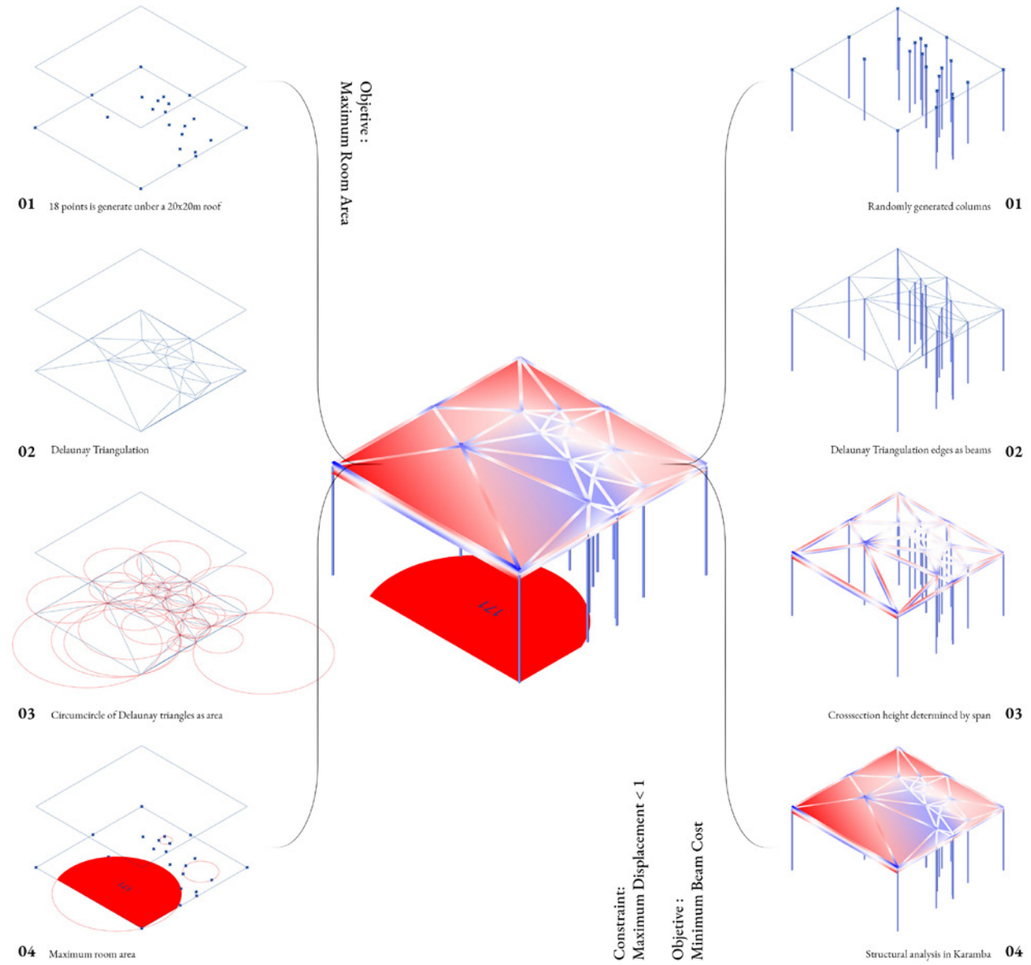


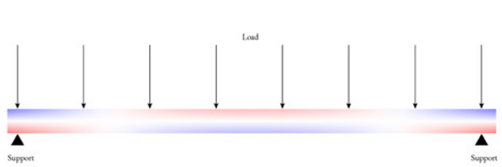
Aim: Irregular-Arranged Columns

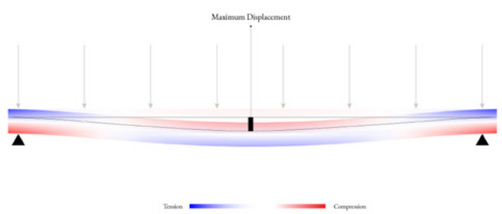


Metaphor: Forest-like Space

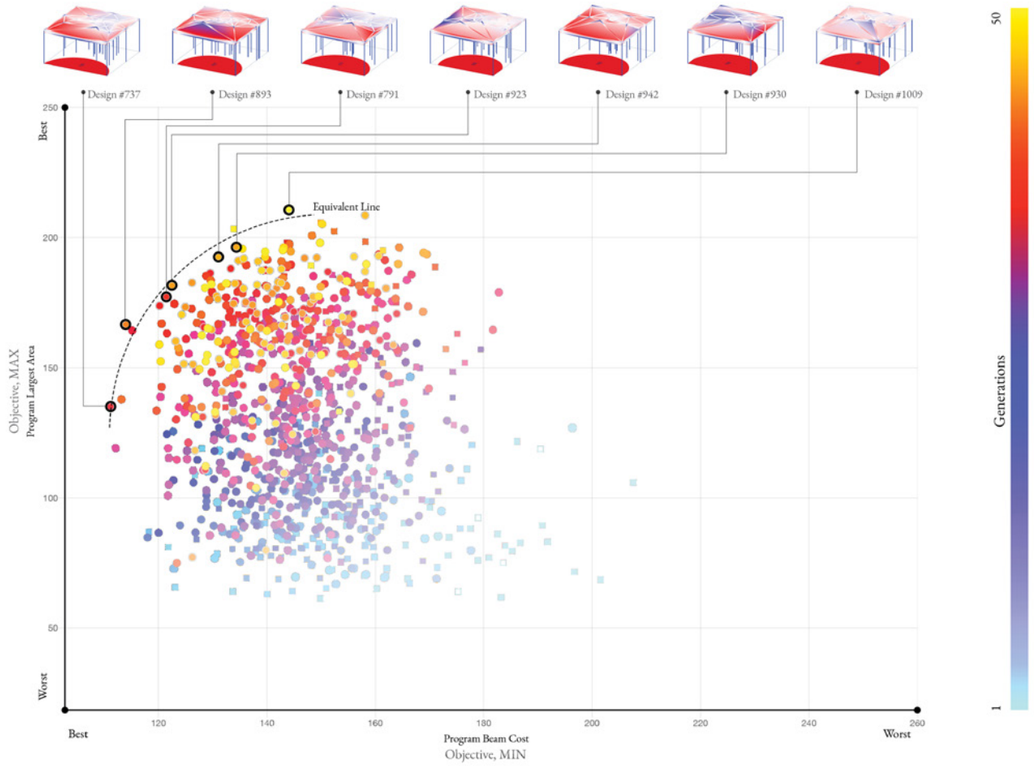
METHODOLOGY



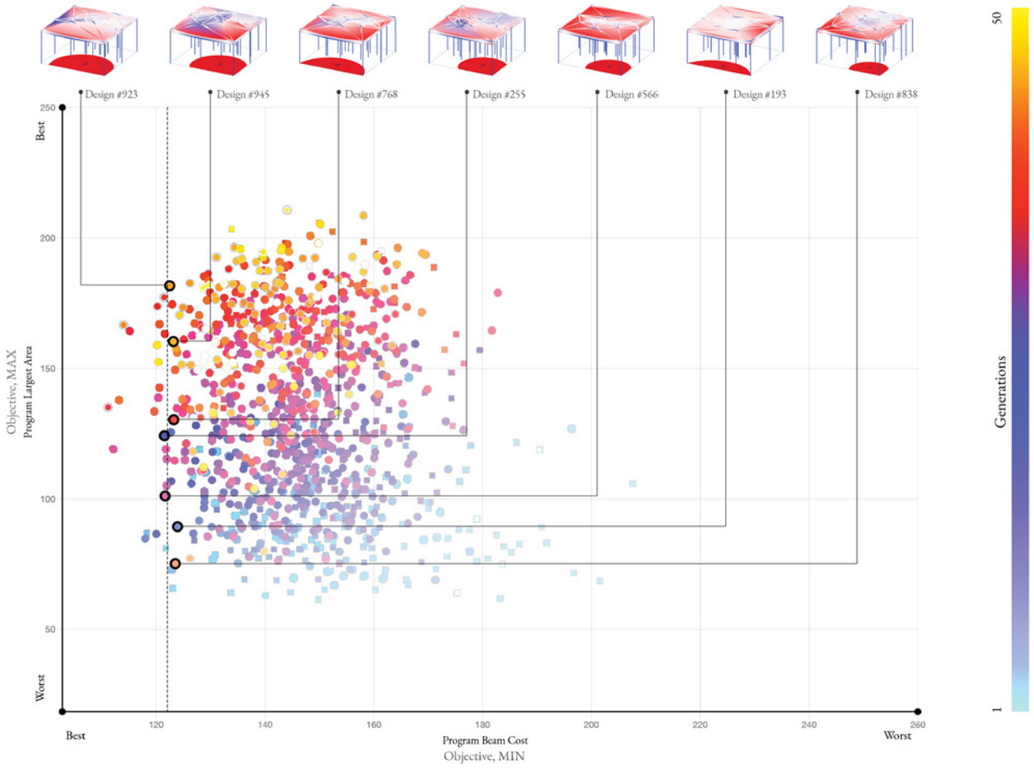


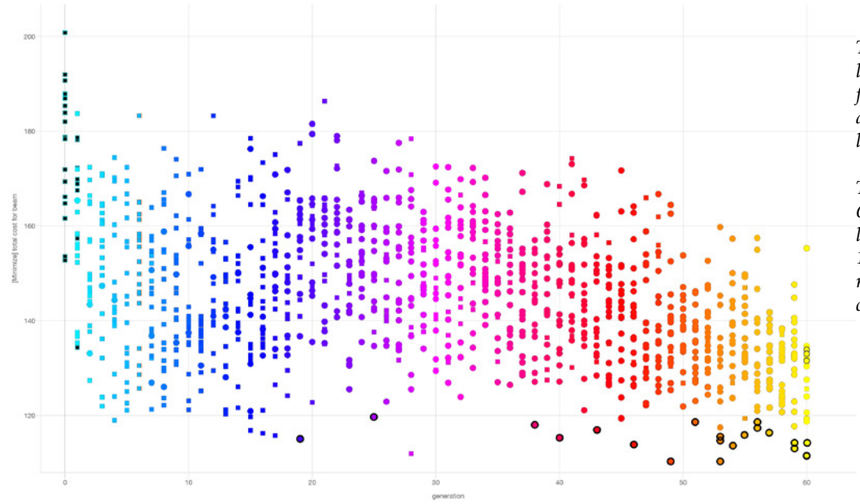


MODEL PERFORMANCE [Largest Area VS Beam Cost]



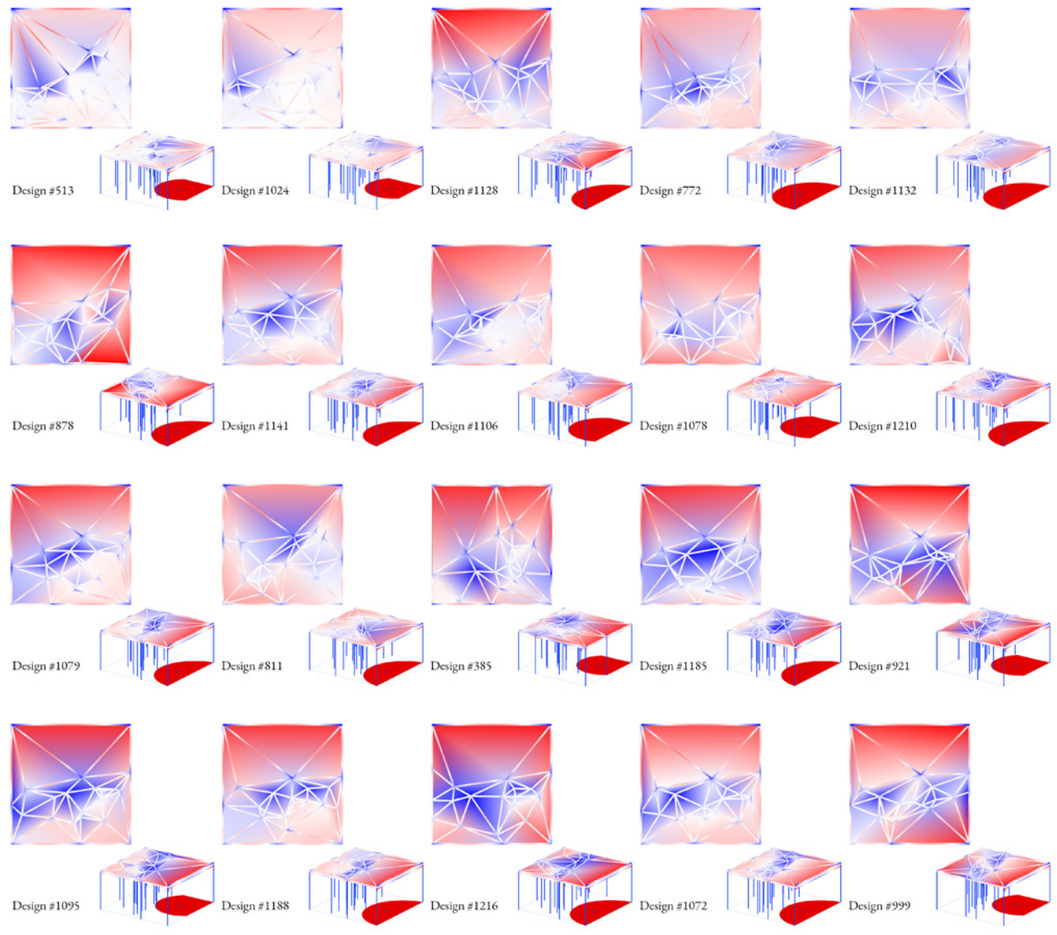
MODEL PERFORMANCE [Largest Area based on similar beam cost]





This inspires us that in our case long beams should just be used for creating the largest circle and we should have only one large space.

To test this idea, we run another 60 generations in which the largest area must be larger than 120, and structure displacement must be smaller than 1, so beam cost is the only objective.



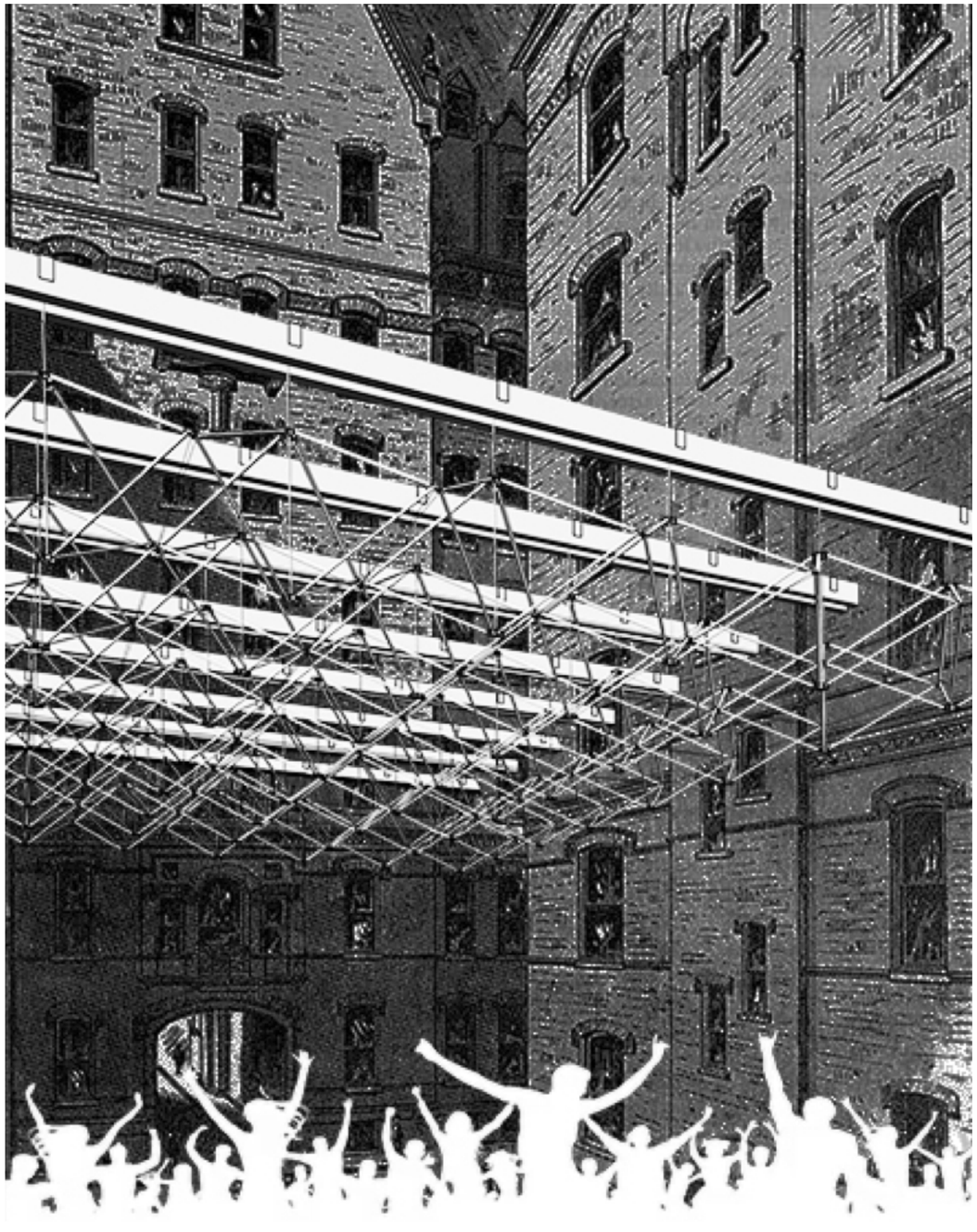
Generally generations are behaving better and better. The best design appears around the 50th generation. Because our goal is to find patterns of beam setting with lower cost, we just find 20 best designs and compare them with each other.

Except for design #385, of which the largest area is relatively small, the beam settings of other designs are similar -- the long beams just work for the largest area and other beams are comparatively short, creating some smaller space, not overturning our speculation.

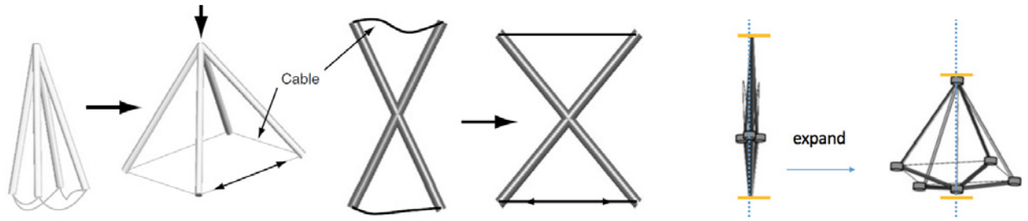
08

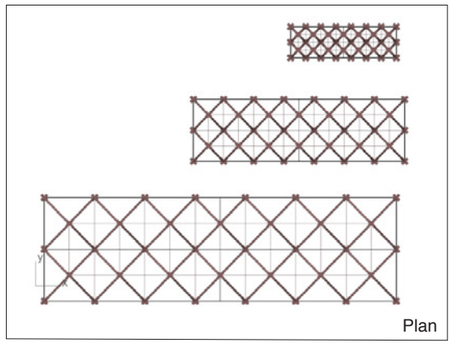
SHRINKAGE SKY

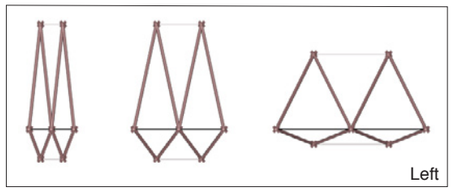
Deployable Tensile Struts
Teamwork withXiaoxuan Li
Type | Visual Elective, 2019 Winter
Advisor | Matthew R. Davis

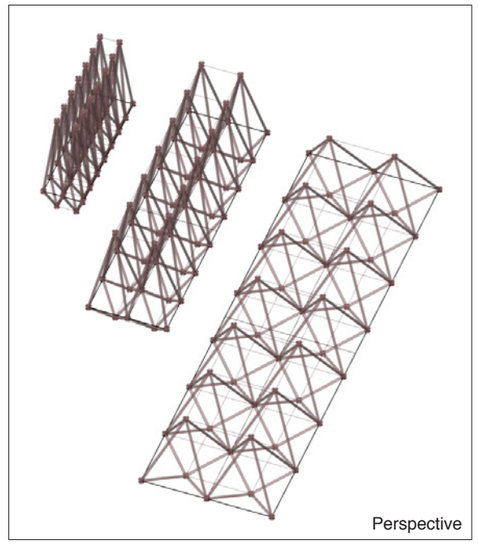


TENSION STRUT UNIT









FLEXIBLE ROOF