



# DIALOGUE

Yinlei Pang's Portfolio  
Selected Works 2021-2022

# ~~PROLOGUE~~

## DIALOGUE

*Jiangyin city, where I grew up, is generally in a relatively traditional atmosphere of Chinese water town. Since childhood, people in my memory have been enjoying breeze in the alley, chatting across courtyards, splashing in the water at the ferry, and having dinner on the patio.*

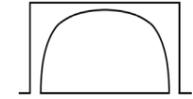
*Around 2008, with the development of economy, China carried out a vigorous wave of demolition and reconstruction. The new city and the old city stand back-to-back at the two ends of an era, and there is no possibility of dialogue between them.*

The demolition of my childhood neighborhoods has led me to my thinking of and pursuit in architecture that architecture should bring about a context that encourages **dialogue**. I often find it crucial in our time and a new building should convey a dialogue between collective memory.

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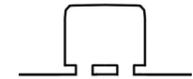
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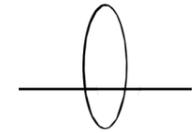
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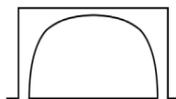
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Summer 2021



# 01

## Typification

*Design Studio in Columbia University*

*Type: Architectural Design*

*Type: Factory*

*Date: February-April 2022, 14 weeks*

*Collaborator: Siyu Xiao & Yuening Jiang*

*My Role: Chief Designer*

*Location: New York, United States*

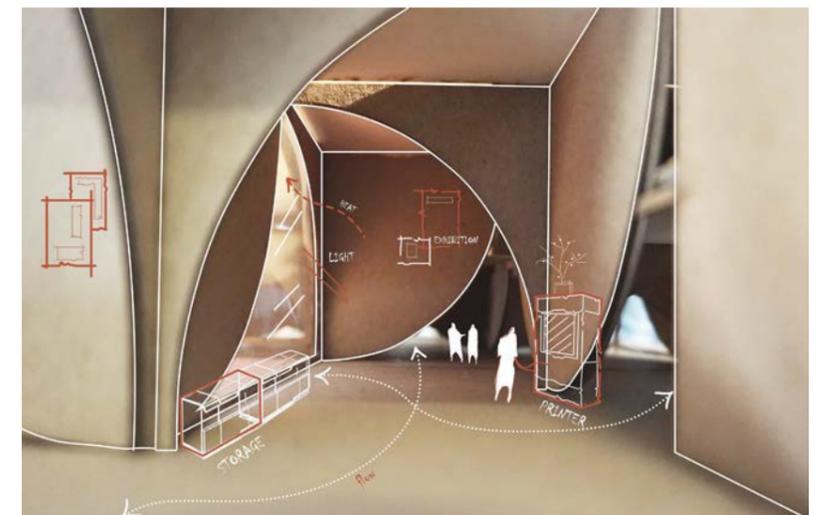
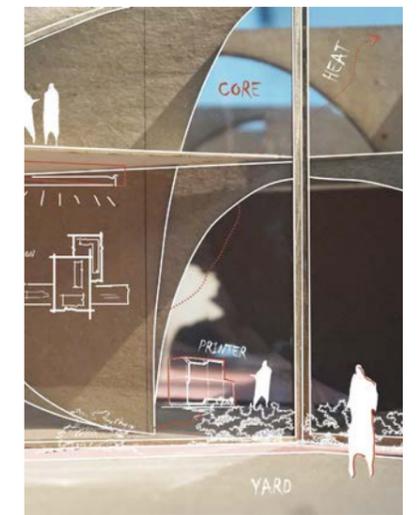
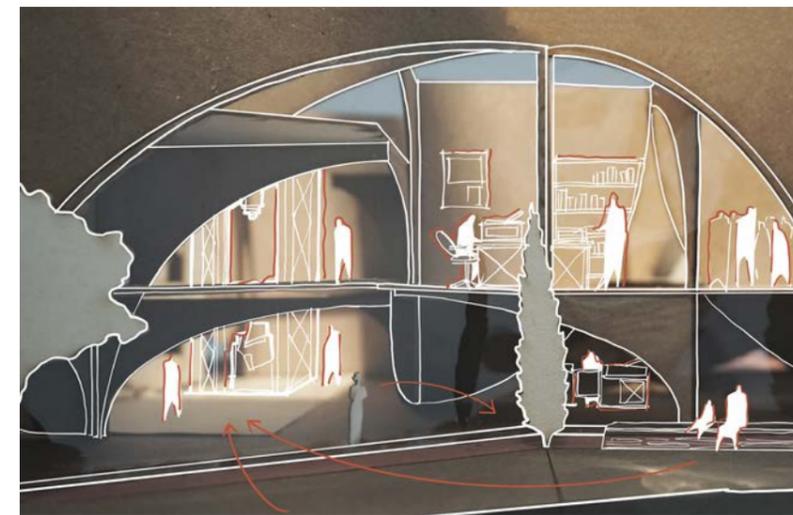
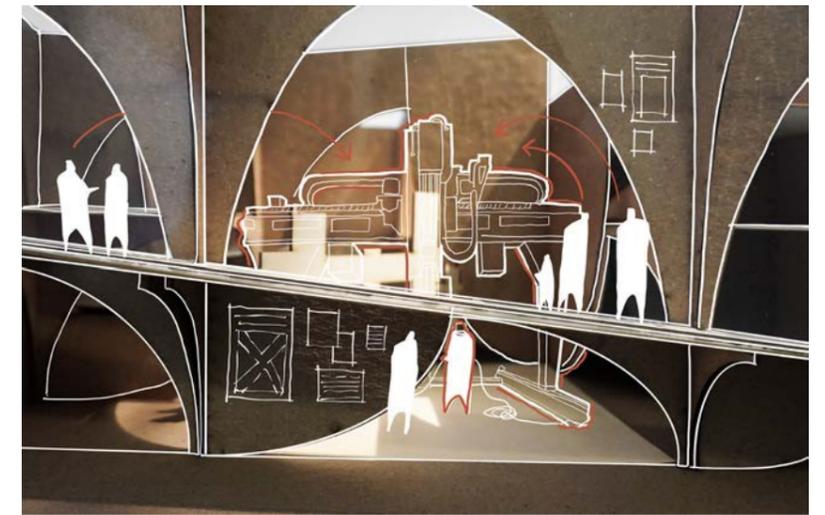
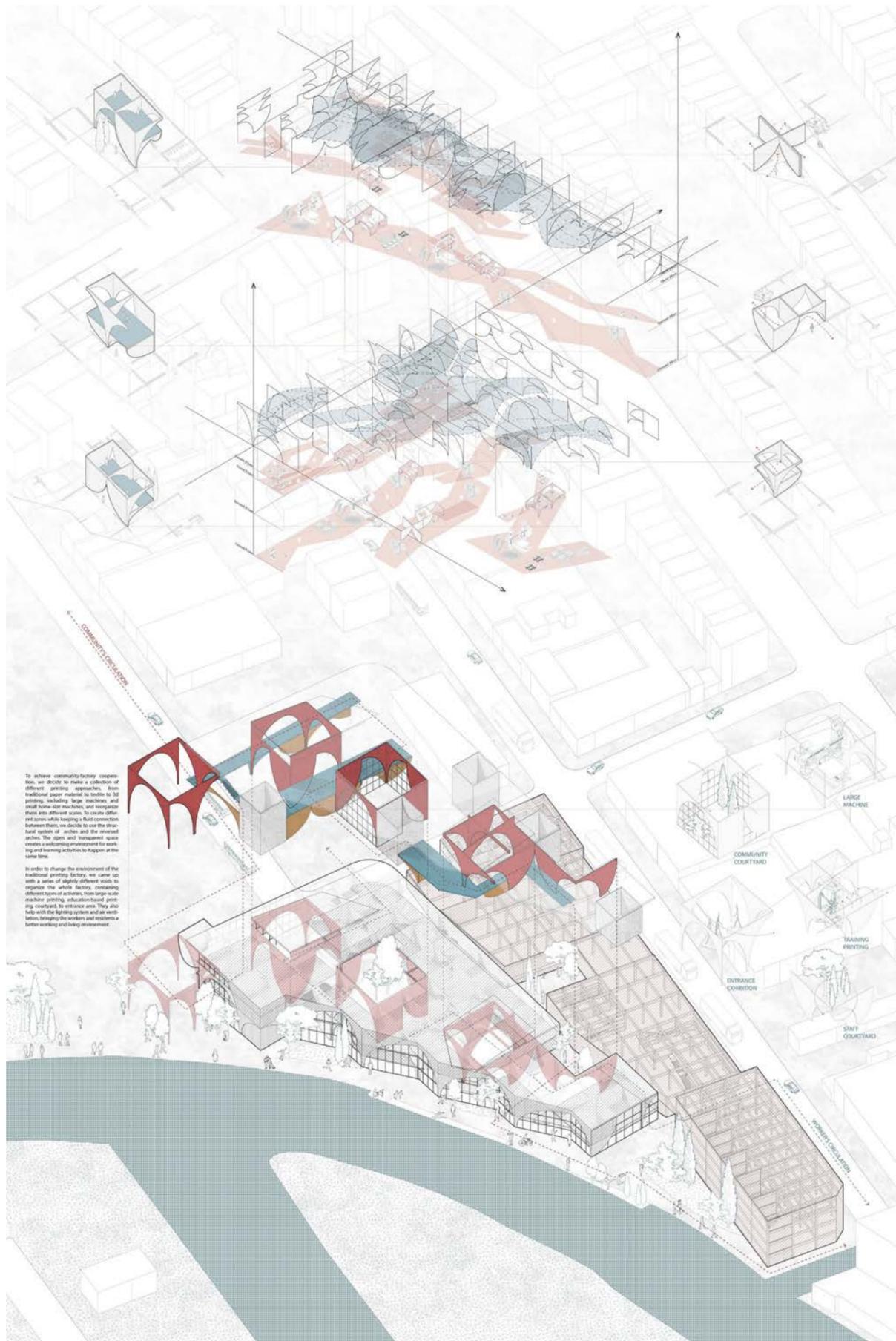
*Instructor: Mimi Hoang*

*This project focuses on the architectural corollaries and opportunities for innovation at the scale of the factory, its spatial components and its relation to the city and productive landscapes. It seeks to bring the factory back to the Gowanus Canal with its industrial memory and to find a new model of factory organization and the new architectural space it brings in the context of this era. The project is trying to propose a new typology for factories and a new role of factories within cities, as an educational amenity, to better serve the local community.*









### Spatial strategy

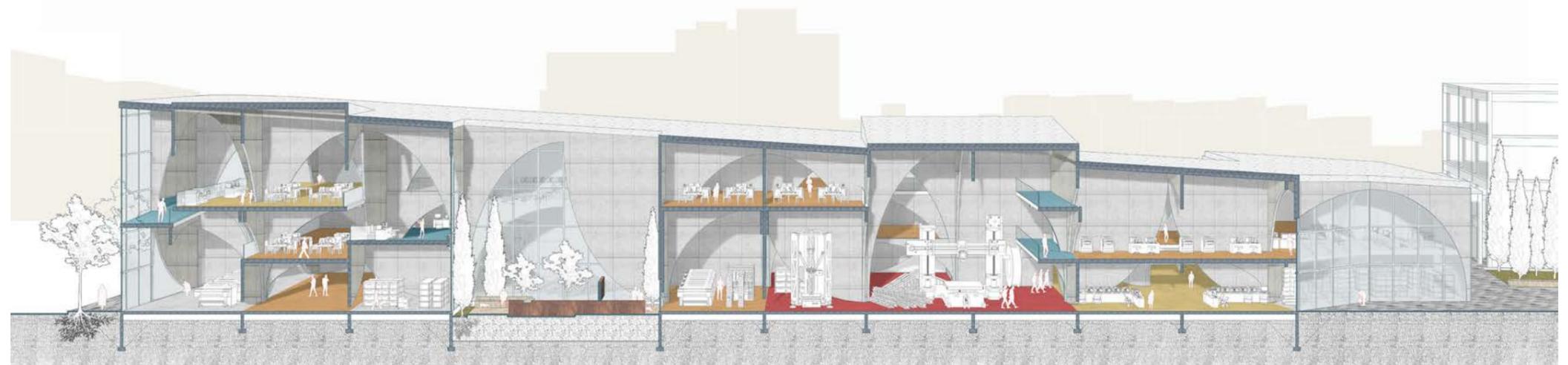
The project sits next to the existing buildings with a continuous shared backyard. The sequence of the interior space is dominated by 5 double height spaces, starting from the main entrance to the backyard. These spaces vary in shape, function and also indoor/outdoor, from Entrance open plaza, large-scale machine printing, inner courtyard, education-based printing to the backyard.

### *Spaces of different scales*

To create different zones while keeping a fluid connection between them, the project uses the structural system of arches and the reversed arches. Some spatial typologies here demonstrate the overlapping movements of visitors and workers. The open and transparent space creates a welcoming environment for working and learning activities to happen at the same time.

In order to better organize different scales of printing manufacture, the interior double height spaces act as cores to facilitate large-scale print. Surrounding these cores are some relatively enclosed spaces for small-scale and individual manufacture. Some of these small spaces are connected to the large space as a supplementary zone. Between these cores we develop some linear working zones, which also work as connections. The structure also highlights some gathering and dispersive spatial qualities.

The ramp system is layered on the structural system, existing both as an educational passage, exposing the printing process to the public, and a ceiling forming spaces with various heights to allow different scales of printing happening under.

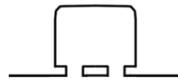




### *Flow Analysis*

The south facade of the factory uses the solution of folded arches, creating a welcoming waterfront passway. It also continues the porosity of our factory into the canal, reclaiming the waterfront as an attraction for local communities.

When a local resident comes to visit the factory, he will walk upstairs to the ramp next to the large-scale printing space, watching how workers print architectural components and furniture. He could also see other workers carrying raw materials might pass through the ramp on the other side. Then he arrives at the space for self-printing machines, uses paper printing and 3d printing machines. Pass along the linear printing space and walk down the stairs, he will breathe fresh air at the inner courtyard. If he continues his journey, he will meet artists and designers printing their work in a gathering zone.



# 02

## Invention

*Design Studio in Columbia University*

*Type: Architectural Design*

*Type: Public System*

*Date: September-December 2021, 14 weeks*

*Collaborator: Haotong Xia & Qingyang Yu*

*My Role: Chief Designer*

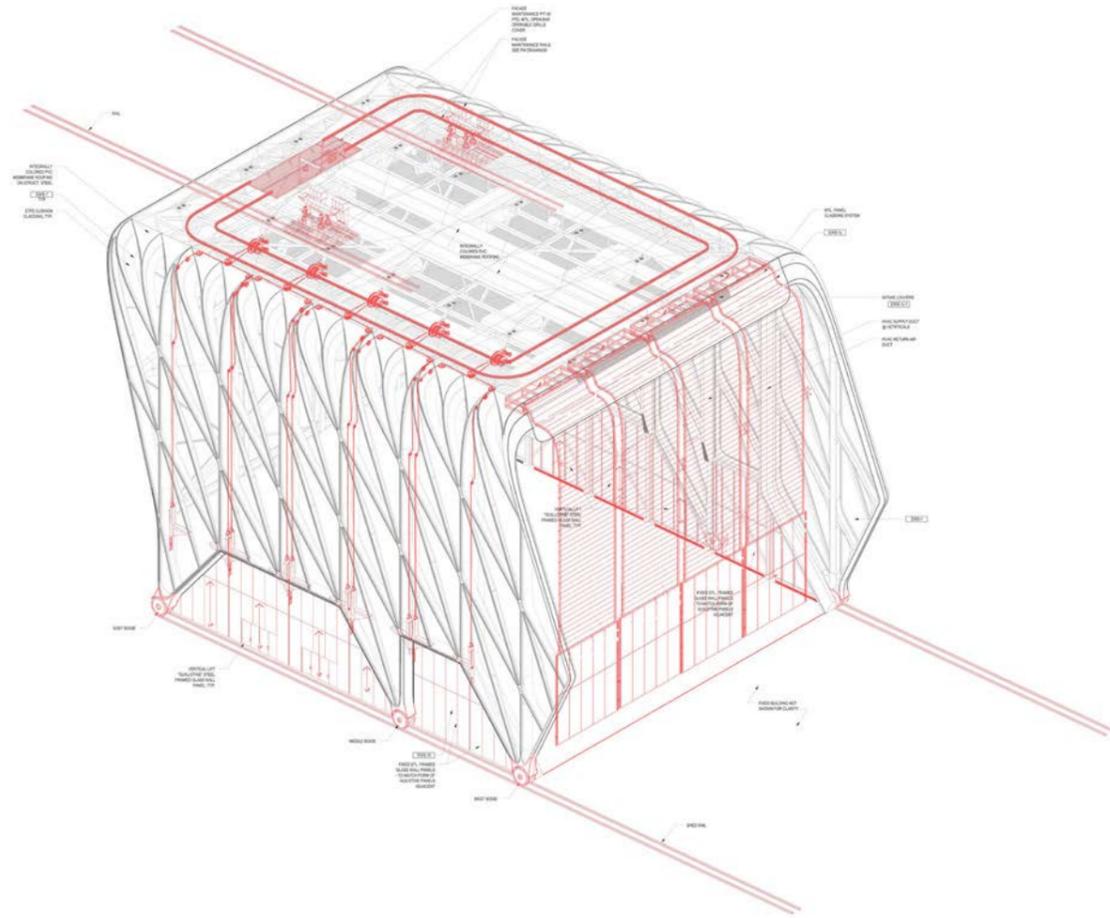
*Location: New York, United States*

*Instructor: Andrés Jaque*

*The politics of architecture are the politics of prescription. Prescription is in the details. This project begins by studying the details of the Shed. The Shed mobilises huge resources to achieve flexible architectural results. Politically, it moves as a strategy to privatize public resources. Its real attitudes against the public are contradictory to its concept of flexibility and bringing diversity to the city. This project is an invention which is counter-doing and constructing alternatives to the Shed with the funding limit that was invested for the Shed. But this one is intended to be, not only fictionally flexible but actually flexible.*



## Details of The Shed



## Concept - Actually Flexible

The design is counter-doing and constructing alternatives to the Shed with the funding limit that was invested for the Shed. But this one is intended to be, not only fictionally flexible but actually flexible.

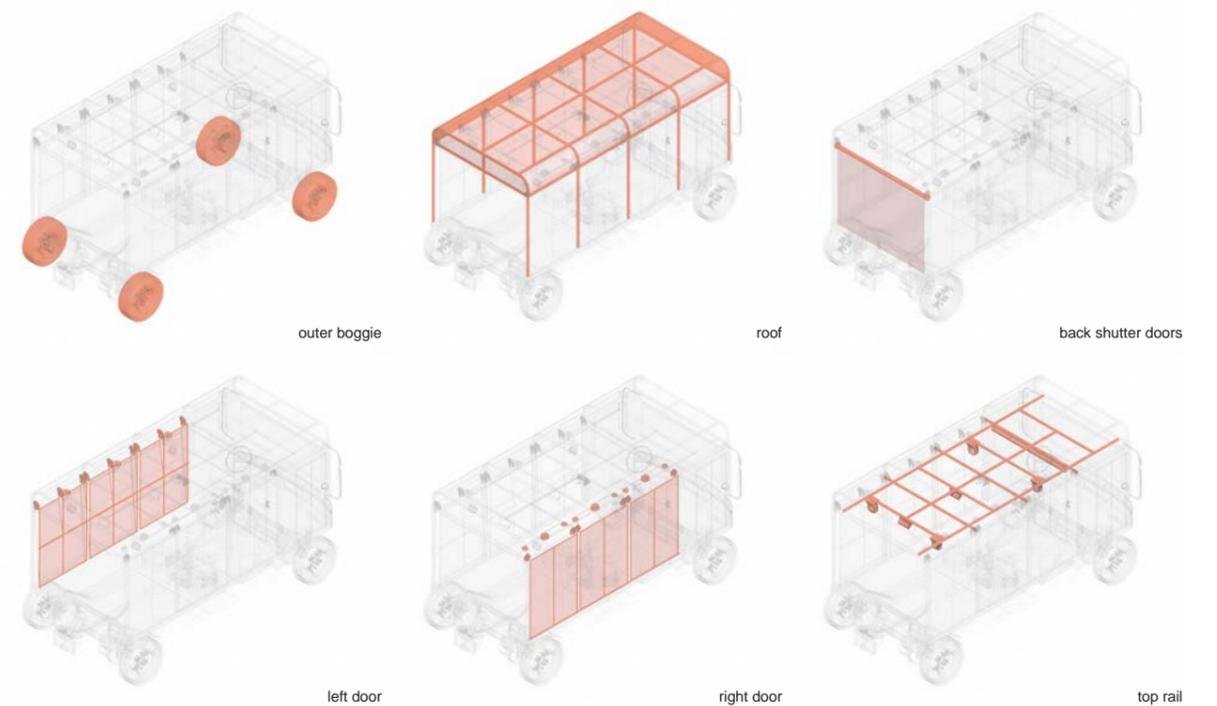
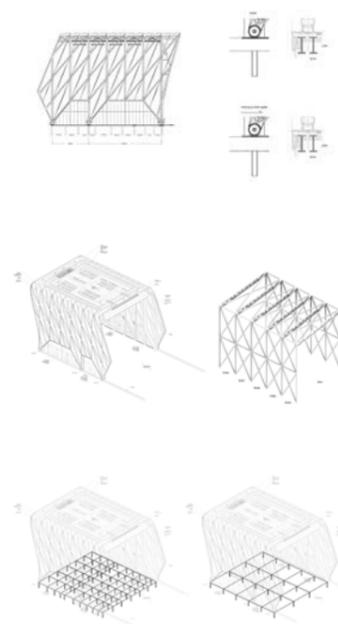
Here is the design - Possibility Maker. Each of them has an engine to support its transformations, and all the mechanical systems in the Possibility Maker learn from the Shed, but on a smaller scale and are used with different proposals. Instead of occupying and privatizing public space, the Possibility Maker is unfolding publicness as a means for collective emancipation. The bogie system in Possibility Maker is to help it break the limits of rails and travel to every corner of the city. The kinetic system helps it to extend the interior space vertically to respond to different conditions. The toothed wheel system opens both sides of Possibility Maker to let the space flow from interior to exterior. The drive wheel and roller system enable the shutter door on the back to be rolled up to open the interior space. The wheel and track system is under the roof in Possibility Maker, which allows the lights and projection to move and reposition them for different demands.

## Analysis of the Shed - From details

When looking at the details of the Shed, we find it is full of wheels. Eight wheels at the bottom called bogies and a rack and pinion system on the roof of the base building allow the Shed to deploy on a rail and occupy the public plaza. The Toothed Wheel system allows the Shed to operate the side glass doors and elevate the windows while deploying. The drive wheel and roller system allow the Shed to deploy curtains and control the inside space. The wheel and track system on top of the Shed allows the window cleaning machine to adapt to different positions and contributes to the maintenance of this shiny icon.

Moving is a big thing for the Shed, but moving is also making things complicated, which means additional cost: The dynamic conditions will lead to thicker beams and more columns of the foundation, more steel materials in the deployable frame, and a more complex structural system. In total, moving added 1666 ton steel, 168,100 kilojoules of energy, 4277 ton Co2 emissions, and about 3 million dollars cost.

Politically, the Shed moves as a strategy to privatize public resources. Its real attitudes against the public are contradictory to its concept of flexibility and bringing diversity to the city.





System I

Rail length:1,660,000 meters

Number of cars in total:1000



System II

Rail length:1,590,000 meters

Number of cars in total:1500



System III

Rail length:620,000 meters

Number of cars in total:500

### *Design of system*

The Shed is not located where the public really needs an art atmosphere. We first mapped out all the art institutions in New York City. Obviously, Manhattan is already full of them. Who really needs public space are the areas out of Manhattan Island. The design aims at taking advantage of the existing rail system. We summarized 3 systems from the existing ones, within which all rails are connected. The first system connects most of the rail stations and it majorly serves new arrivals to NYC. The second system connects Manhattan and the rest. And the third system majorly travels in Manhattan Island. New carriers we propose will be traveling on this rail system, and this new design of the carrier will be flexible enough to offer different types of public space to the whole city.

### *Management Systems*

Practically speaking, Possibility Maker requires three different management systems: one under MTA's management, one cooperates with some NGOs, and one online to respond to immediate needs.



Dance Floor



Location: Abandoned station  
Abandoned station platforms will be used as temporary dance floors for low-income people who cannot afford a formal club. Tables will be placed on the cars at the time, and people will be picked up at other locations and dropped off here.

Exhibition



Location: Street end  
Exhibition for individual artists will be held at the dead ends of the rail system. The special rail creation offers an opportunity to request available space by setting two parallel cars and connecting them through the deployment of the side panels.

Interview



Location: Street parking  
The car carries interview booths such as artificial lighting, sound recording equipment, cameras and chairs. The flexibility of the car helps it effectively respond to emergencies. Artists at the scene can take and conduct interviews quickly.

Library



Location: Subway station in use  
The car can be used as a special library car. It will only stop at a few smaller stations and have specific passengers, such as students living far away from the school. Books, magazines, video or audio will be placed in the car to turn into a small library to provide activities for students.

Photography



Location: Street end  
The special condition of the dead end provides the possibility to have a temporary photography studio to provide necessary public welfare and artistic photography for low-income people. The two cars will be side and connected provide opportunities for close-up and medium-range photography.

Daycare



Location: Public park  
In many low-income communities, people need to work a few jobs at the same time in order to support their families. The car can drive to these communities to provide daycare services.

Education



Location: Public park  
Not all communities have their own community centers, and many poor communities do not have an available space to do the necessary for preparation and basic science opportunities for their kids. The car provides them with a temporary place to carry out these educational activities.

Festival



Location: Public park  
As a multi-ethnic city, New York is inhabited by residents of all ethnic groups. Cultural traditions from these rich festivals, some of which will inevitably be ignored. Cars can provide a suitable space for these traditions to hold their festival celebrations.

Gym



Location: Street parking  
The car provides a small gym for children who live far away from school, so that children can exercise on their way to school and home from school.

Laundry



Location: Public park  
Cars regularly stop in poor communities in a planned way and provide public welfare nearby services for homeless and low-income people at a fixed time every week.

Medical Care



Location: Street parking  
The cars stop regularly in poor communities to provide advanced medical services for low-income people and the elderly and children with convenient travel. In special times, the cars can also go to every corner of the city to provide vaccination services for residents.

Movie Theater



Location: Public park  
The car stops in a public park and turns into an open-air cinema. The flexibility of the car helps it bring the artistic atmosphere to the edge of the city and bring it to every resident of the city no matter poor or rich.

Shared Kitchen



Location: Public park  
The car stops in a public park and turns into a shared kitchen for homeless and low-income communities. It will not only be a place for sharing facilities, but also a place where people can get connected with each other.

Shared Sports Facilities



Location: Abandoned station  
Abandoned station platforms will be used as temporary platforms and other shared sports facilities for low-class groups.

Translation



Location: Street parking  
New York has a large number of ethnic minority communities, and not all of its residents can speak English fluently. The car will stop by the street when necessary to provide them with necessary translation services.

Emergency Care



Location: Street parking  
The flexibility of the car allows it to be used as an emergency treatment in very occasional cases of necessity. The car can be used as a practical candidate for the existing emergency care system. In case of special circumstances and gaps in emergency resources, it can immediately get deployed in the activities.

Flood Protection



Location: By the river  
New York City is a city threatened by floods. The car can provide flood protection support for the city and participate in flood relief operations during flood seasons.

Package Picker



Location: Street parking  
The car can be used as a supplement to the left-handed of New York and can help to strengthen the delivery system. This function can be used as an additional task during the return journey of competing other activities.

Shared Public Bikes



Location: Street parking  
The car can help the city to dispose public bicycles under special circumstances. For example, in the case of large-scale gathering of people such as gatherings, parades, celebrations and sports events, the car can regularly dispatch public bicycles for them to help alleviate the crowd.

Sightseeing



Location: Street parking  
The car can be used as an urban publicity tool for New York City. At the end of the subway system, such as South Station, the railway track is walled on the bridge in the form of light rail, which provides the possibility for the car to be used as a sightseeing car.

Vote



Location: Street parking  
Under various special circumstances, a large number of residents choose not to go to the polls, which reduces the coverage of democratic elections. The car can drive to these communities to provide temporary polling stations for these areas.

Dinning Car



Location: Public park  
During activities or gatherings, the car can be dispatched to these places to provide food for people. This is not a profitable business, but should be regarded as an auxiliary service to help other major activities go smoothly.

Grocery



Location: Public park  
Grocery aims to provide temporary selling places for farmers in New York state. Car rental itself is not for profit. It is more to provide convenience for farmers and provide health agricultural products for some low-income communities.

Flower Shop



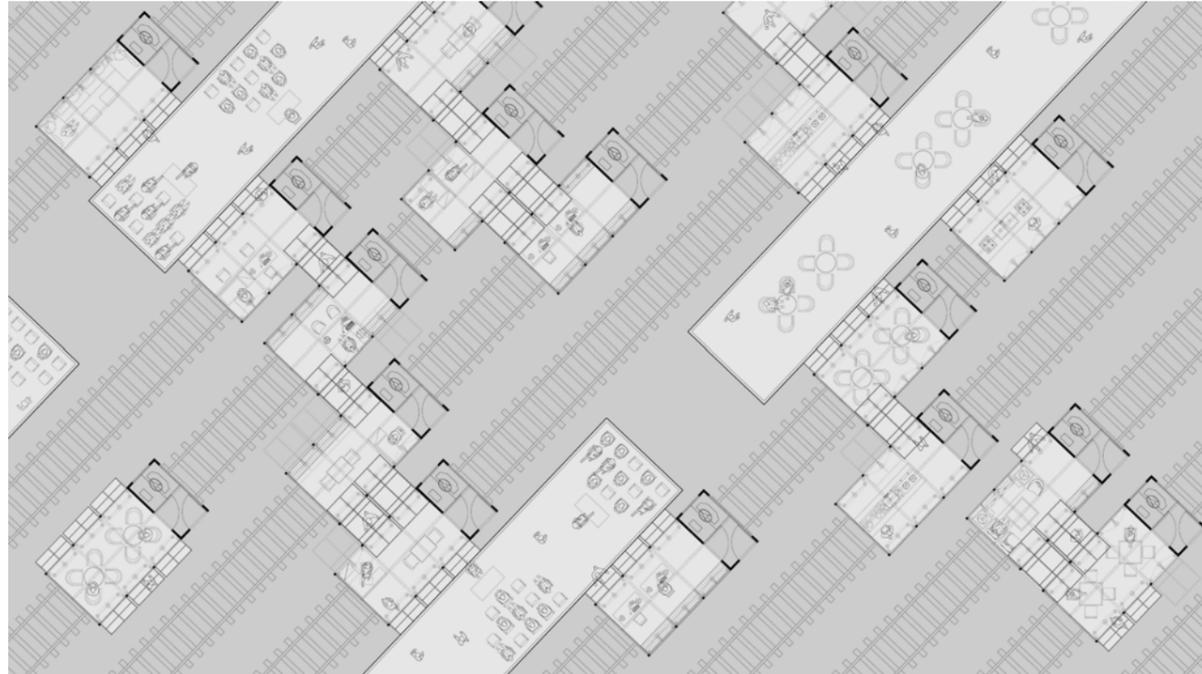
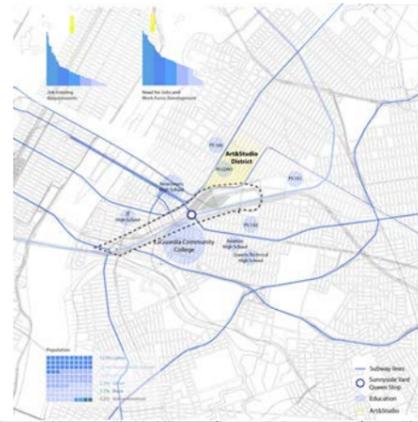
Location: Abandoned station  
In some abandoned stations that people can still walk into the platforms, cars can help transport goods and transform these platforms into small shops, such as an underground flower shop.

## Condition I : Deadend

### Site: Sunnyside Yard Queens

Deadend provides space for long-term deployment and a place for the rail-to-road transition.

Sunnyside Yard Queens is in a diverse neighborhood with a number of schools around. There are huge demands on job training and workforce development. Possibility makers will come to the area, expand themselves, connect with each other, let the space flow, and offer platforms for education and training, babysitters for people who come with their kids, and shared kitchens for dining.

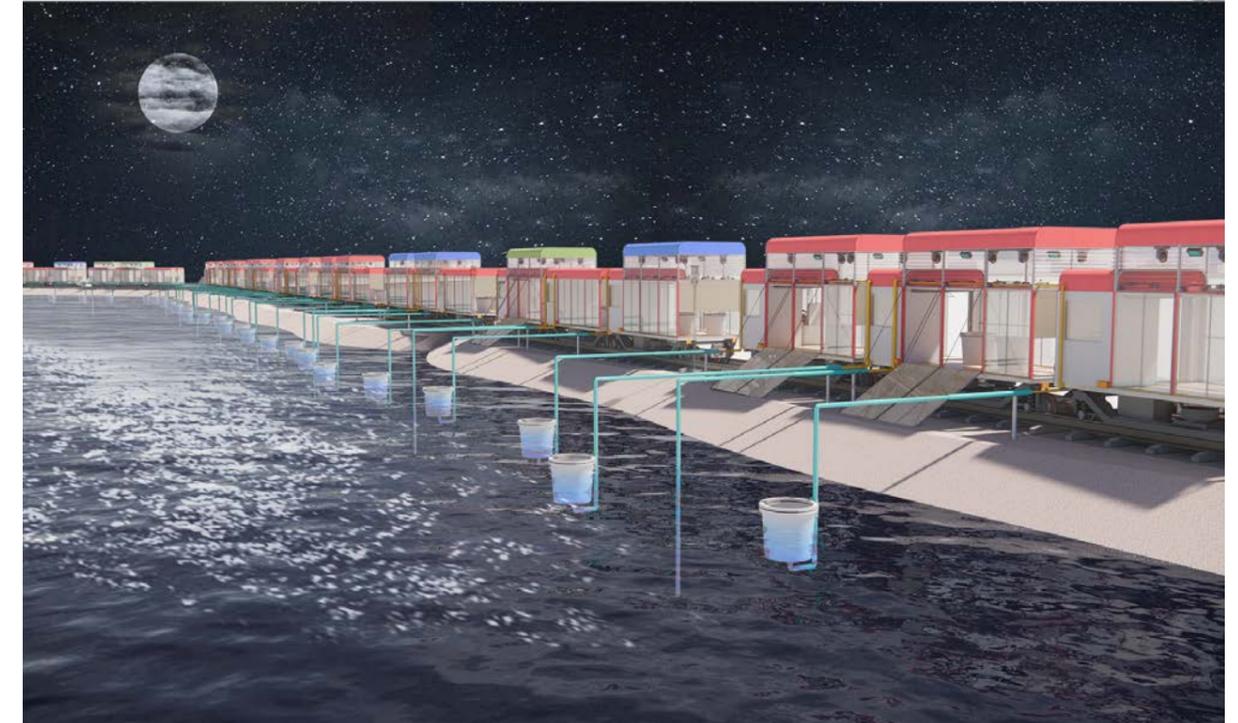
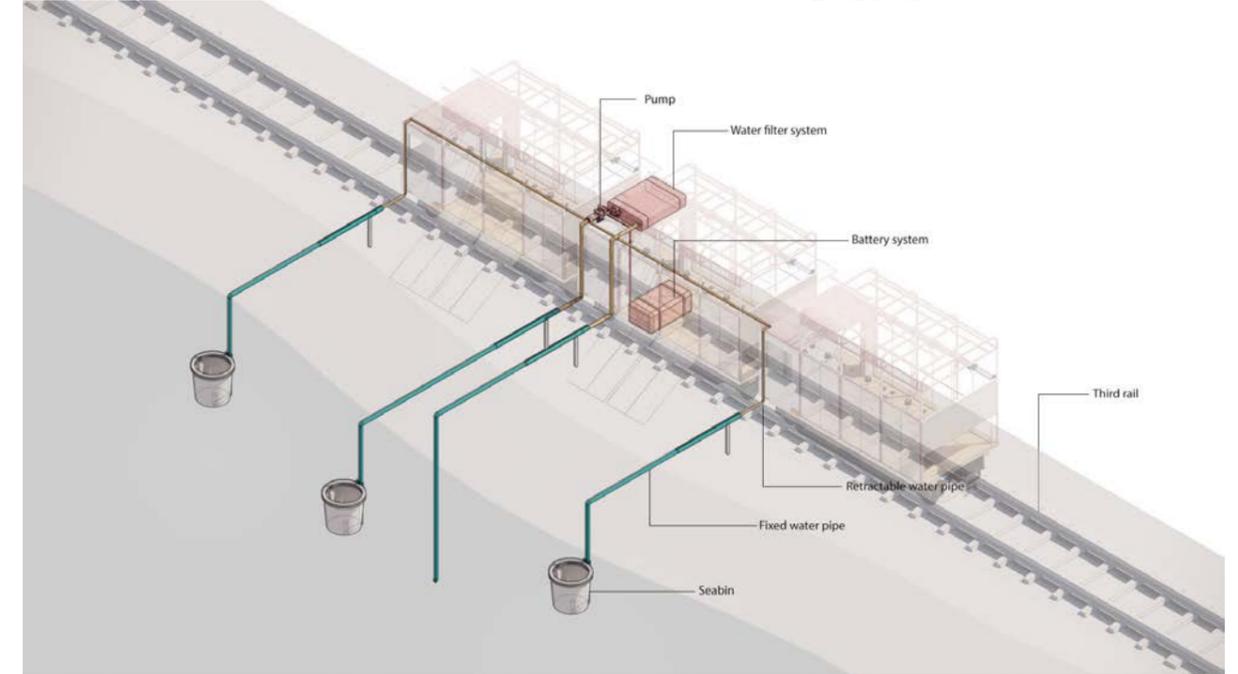


## Condition II: By the River

### Site: Jamaica Bay

There is a pollution problem in Jamaica Bay. When demand for public service is low at midnight, Possibility Makers will be dispatched to the waterside and cooperate with NGOs to help purify the water.

The trash collectors are fixed on the rails to collect trash, and when the Possibility Makers come at night, pipes on the cars will be connected to the collectors, and the purification will start. Every night, 300 million gallons of water will be purified by 1200 cars.

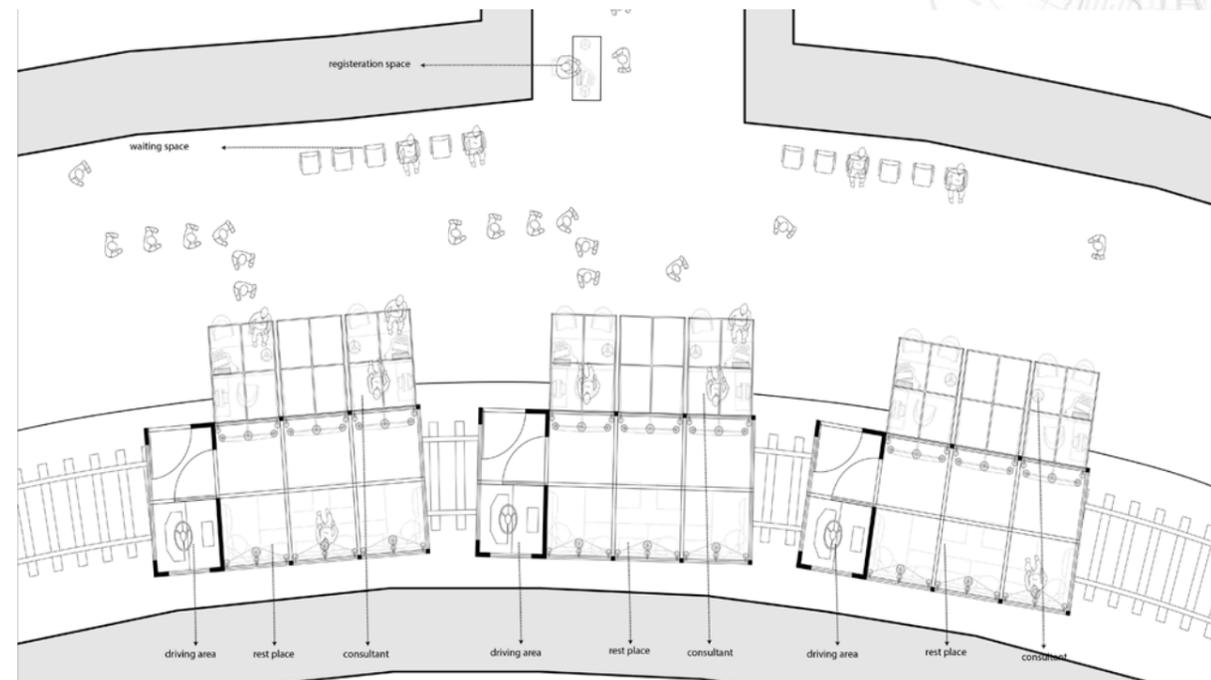
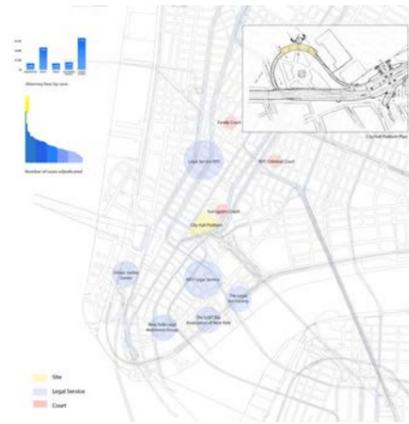


### Condition III : Abandoned Stations

#### Site: City Hall Station

There are 12 abandoned stations around the city. Some of them are totally blocked from the rail system. And some of them are still accessible for subways, only the platform is abandoned.

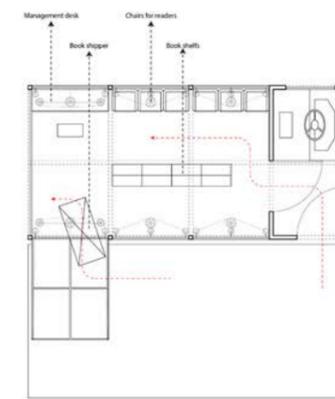
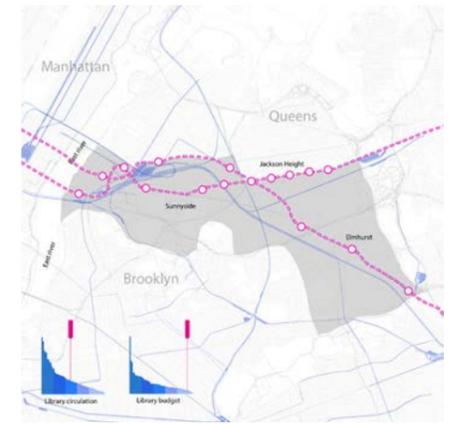
This City hall station is partially abandoned, which sits around three important city courts in downtown Manhattan. Most of the current legal services are located south of the city hall, far from the courts. Therefore, possibility makers will be sent to this station and offer non-profit legal services for people in need.



### Condition IV : Stations in Use

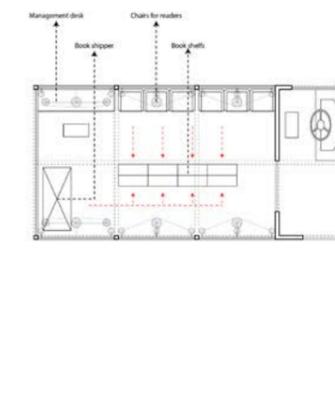
#### Site: Stations in Sunnyside and Elmhurst

The library circulation among students in Sunnyside and Elmhurst is higher than the average of New York City. However, the library budget in this area is at the lowest level in New York City. Therefore, we set some of the traveling possibility makers passing through stations in this area as libraries on the rail to supplement the gap between budget and usage.



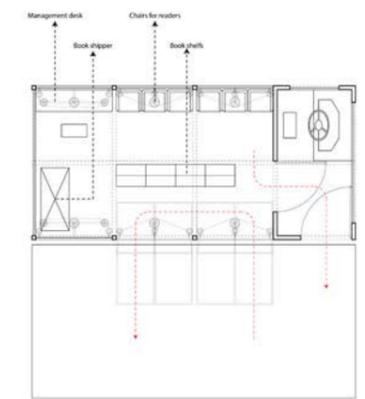
Stations around Manhattan Libraries

When Libraries in Sunnyside and Elmhurst receive requests for books they don't have, they will contact libraries in Manhattan. Library staff will bring all the ordered books to the Possibility Maker with a book shipper. When the Possibility Maker stops by the platform, the book shipper will be pushed into the car, and readers are also allowed to enter the car.



Travelling

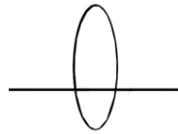
When the Possibility Maker leave the station, manager on car will open the book shipper take the books out and place them on the book shelves. Books ordered by readers who read in the Possibility Maker will be placed on the half facing reading areas, and books for pick up will be placed on the half facing the side doors.



Stations in Sunnyside and Elmhurst

When the Possibility Maker arrives the stations in Sunnyside and Elmhurst, the side doors will be opened to allow people enter the car. Readers who order books but don't plan to read in the car will come and pick up the books they order. And readers who have stayed in the car and read the books they order can now leave the car.





# 03

## Intervention

*Design Studio in Columbia University*

*Type: Individual Architectural Design*

*Type: Urban ecological complex*

*Date: June–August 2021, 10 weeks*

*Location: New York, United States*

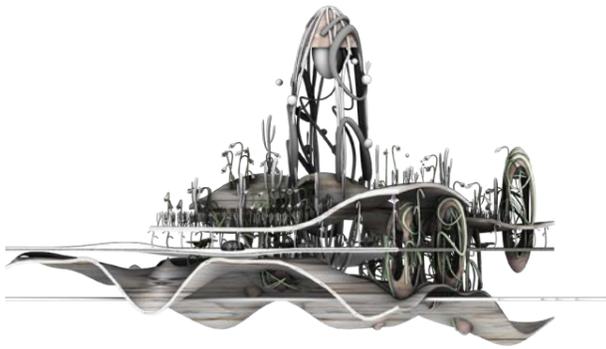
*Instructor: Michael Loverich & Antonio Torres*

*As an integral part of an ecosystem, water is often present in the various parts of the system's circulation, connecting various organisms. For a city, the water supply and purification system are hidden in the pipes that connect various buildings. When we think of New York City as a vast ecosystem, the water cycle is a vein hidden behind the grand architectural facade. This design doesn't water to be internalized but a visible and spatial component of the City. The design introduces ecological thinking to the hidden water purification system of NYC, expressing ecology in a poetic way and in that process the project creates a wild urban space.*

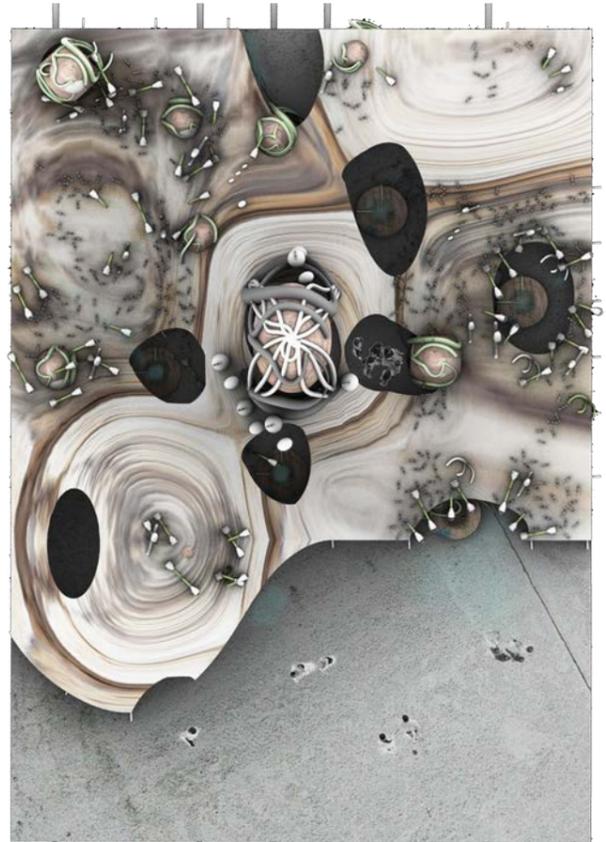




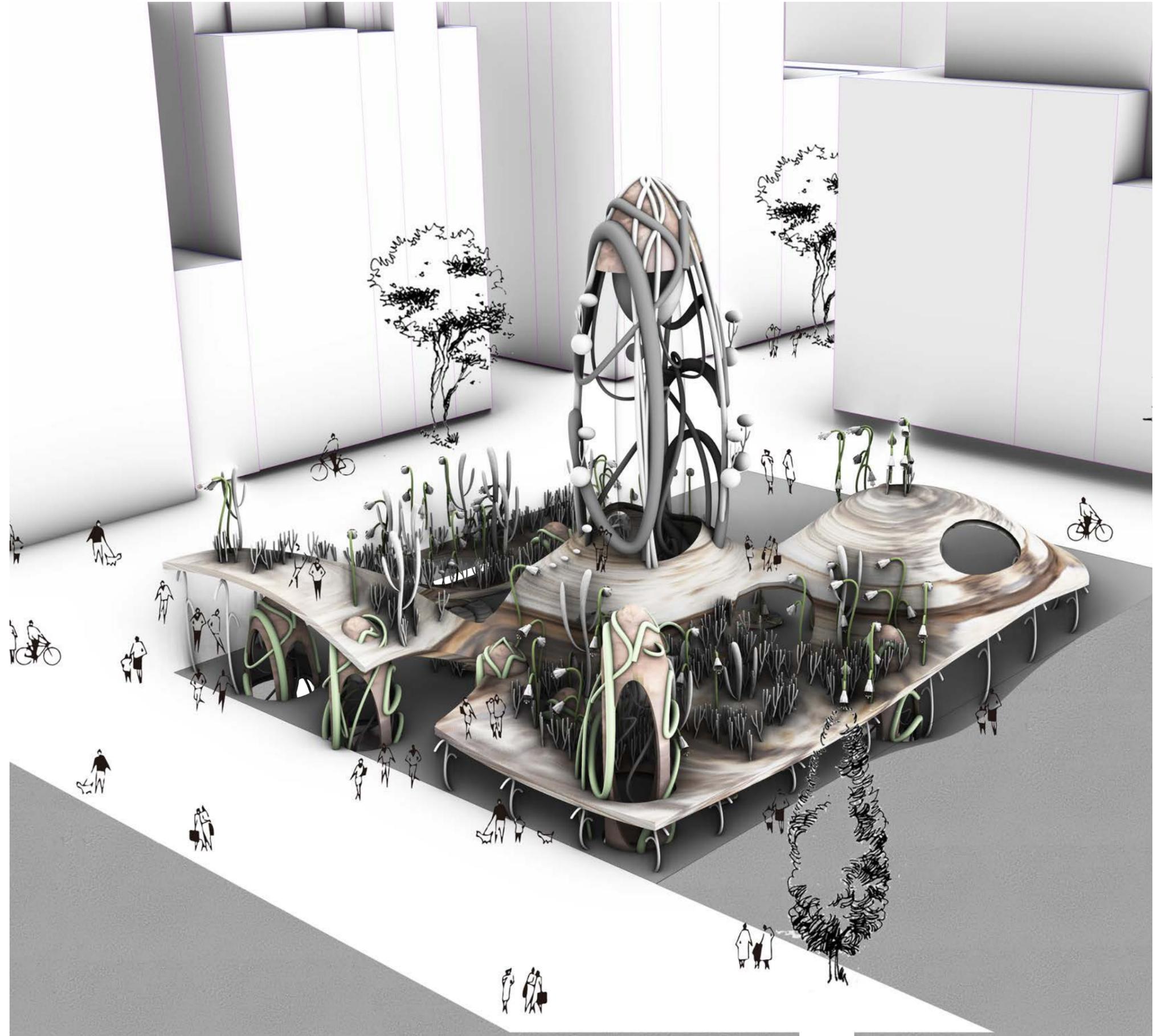
Site Plan



Section



Plan





### *System Intervention*

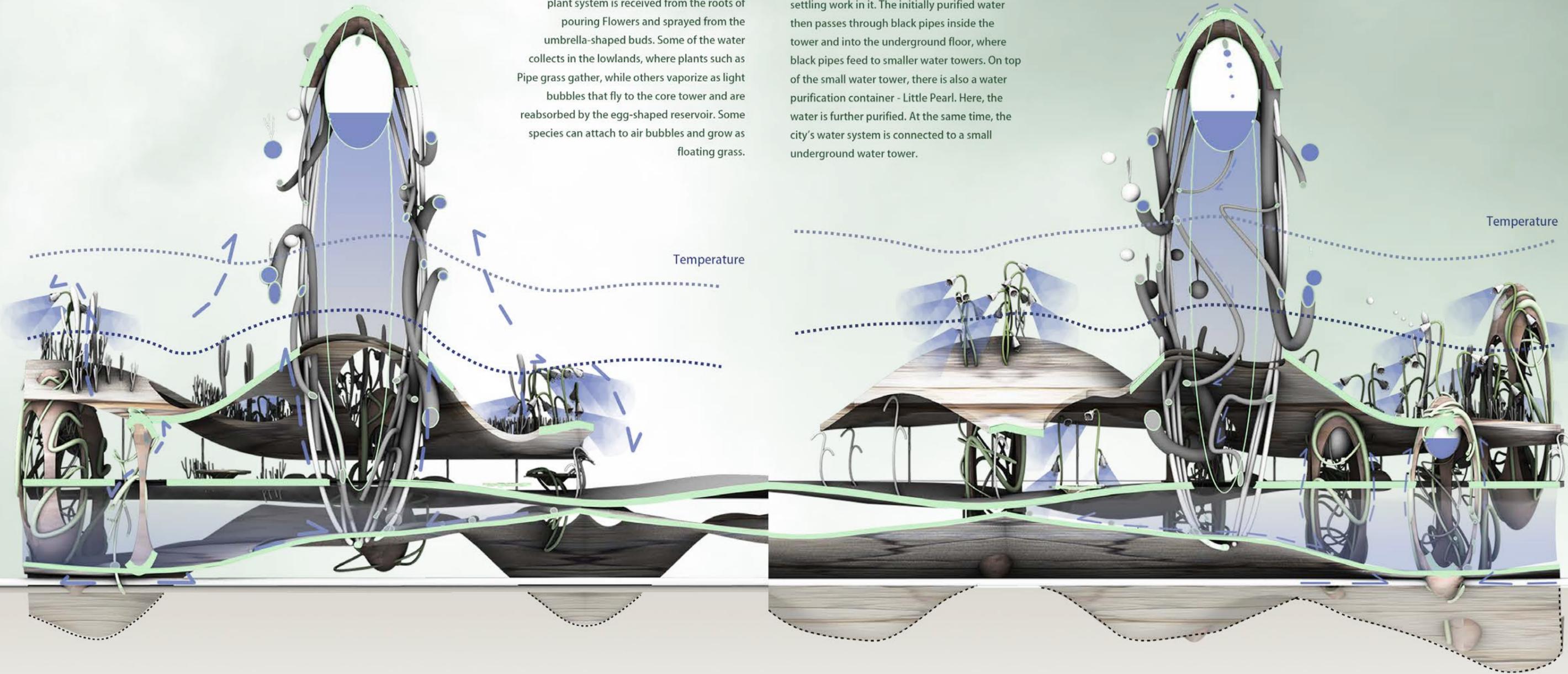
In New York City's underground plumbing system, 2 billion gallons of water flow back and forth every day, but the structure of the circulators is often unknown. In the design of the ecosystem, I have focused on the circulation and evolution of water, its connection to the urban water supply system with the site, and translate the water tower-water pipe system in an ecological way, so that it can be perceived and paid attention to by the city in a more intuitive way both above and below the ground. This is visually and spatially expressed by the combination of the following elements: water towers used for storage, expressive piping for distribution and various landscape features including artificial plants to disperse water or topography to collect the water.

## Circulation - Part 2

-The little Pearl of the small water tower is connected to Filamentous plants attached to its skin, and some of the water is transported to the plant system, while the rest goes straight back to the core tower. The water delivered to the plant system is received from the roots of pouring Flowers and sprayed from the umbrella-shaped buds. Some of the water collects in the lowlands, where plants such as Pipe grass gather, while others vaporize as light bubbles that fly to the core tower and are reabsorbed by the egg-shaped reservoir. Some species can attach to air bubbles and grow as floating grass.

## Circulation - Part 1

-The water tower in the center of the site is the core tower. At the top of it, there is an egg-shaped water storage tank similar to a pearl, which can adjust its size with the amount of precipitation and complete the initial water settling work in it. The initially purified water then passes through black pipes inside the tower and into the underground floor, where black pipes feed to smaller water towers. On top of the small water tower, there is also a water purification container - Little Pearl. Here, the water is further purified. At the same time, the city's water system is connected to a small underground water tower.



### *Circulation of the system*

The whole site is organized by several vertical water towers that punctuate an undulating topography. The water tower is a development from the shells of the first two Projects of Go Wild, while the terrain as a whole adopts the layered form of the second project. The water tower in the center of the site is the core tower. At the top of it, there is an egg-shaped water storage tank similar to a pearl, which can adjust its size with the amount of precipitation and complete the initial water settling work in it. The initially purified water then passes through black pipes inside the tower and into the underground floor, where black pipes feed to smaller water towers. On top of the small water tower, there is also a water purification container - Little Pearl. Here, the water is further purified. At the same time, the city's water system is connected to a small underground water tower.

Then, the little Pearl of the small water tower is connected to Filamentous plants attached to its skin, and some of the water is transported to the plant system, while the rest goes straight back to the core tower. The water delivered to the plant system is received from the roots of pouring Flowers and sprayed from the umbrella-shaped buds. Some of the water collects in the lowlands, where plants such as Pipe grass gather, while others vaporize as light bubbles that fly to the core tower and are reabsorbed by the egg-shaped reservoir. Some species can attach to air bubbles and grow as floating grass.



### Pipe Grass

- Pipe grass grows around the water tower and absorbs the water sprayed by pouring flower, providing good ecology.



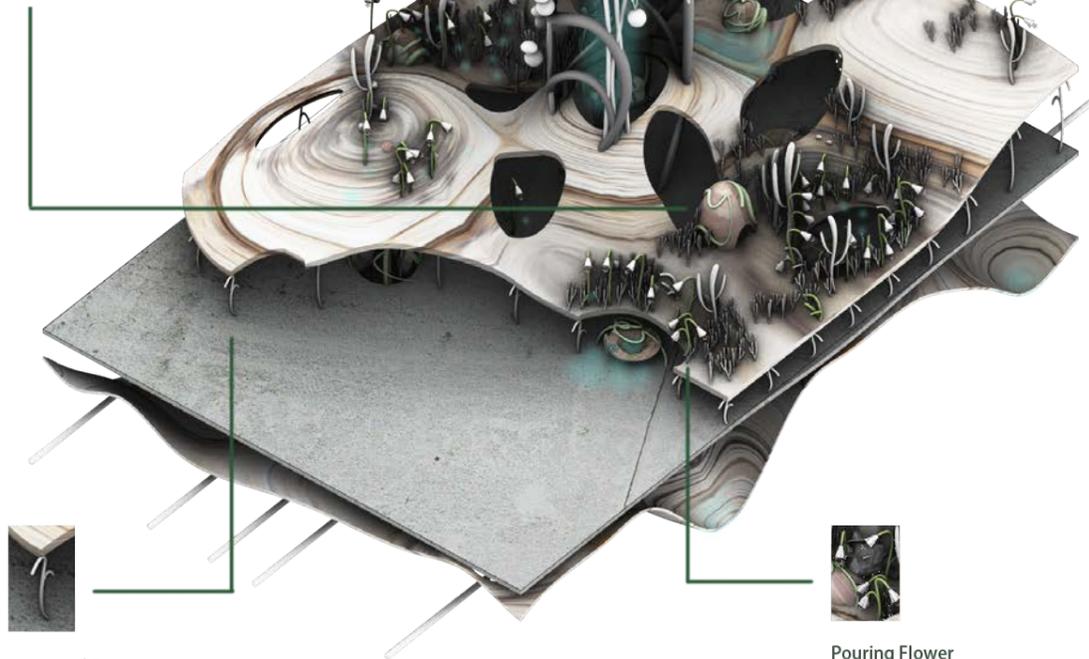
### Floating Grass

- Some of the bubbles flew out of the pouring flower, converging like water towers. Small seeds fall on the bubbles and grow light grass.



### Filamentous Vegetations

- Filamentous plants wrap around the water tower, collecting the purified water from the tower and delivering it to different locations.



### Structural Tree

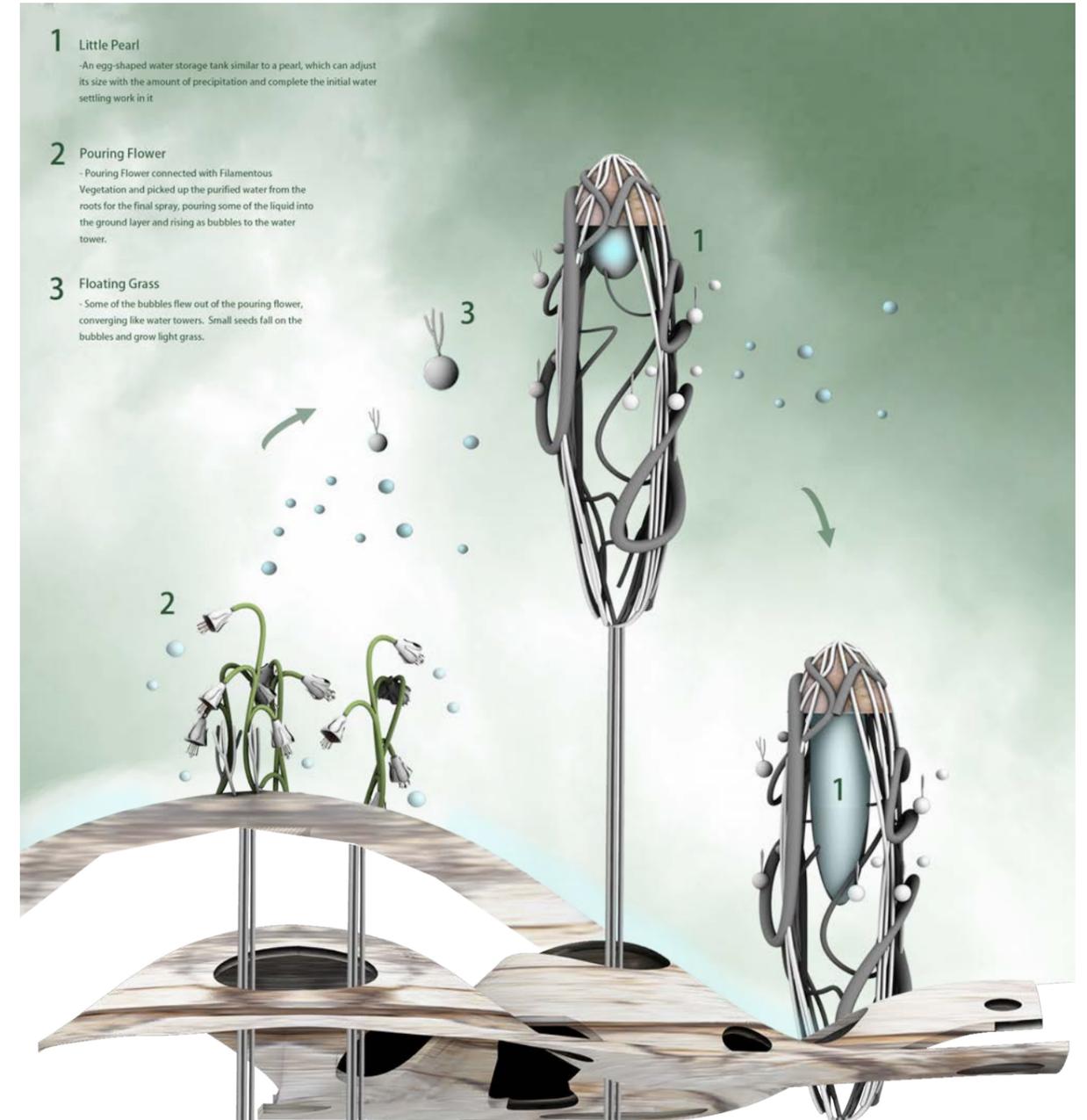
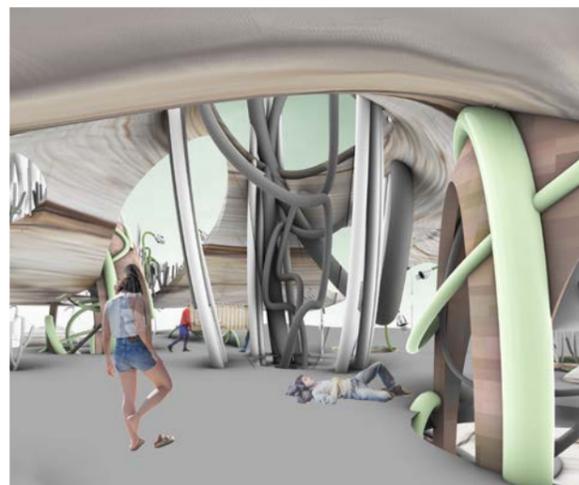
- The upper roof is supported by the part of the plant that grows from the tubular plants.



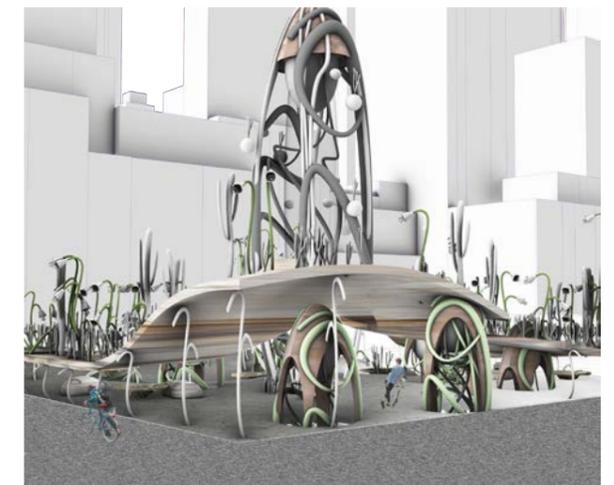
### Pouring Flower

- Pouring Flower connected with Filamentous Vegetation and picked up the purified water from the roots for the final spray, pouring some of the liquid into the ground layer and rising as bubbles to the water tower.

## Planting Plan



## Changes of Tower



04

Works in summer

*Argument Essay and Transscailities Workshop*

**The Boundary of The Test**

Yinlei Pang

Arguments Workshop

Caitlin Blanchfield

MSAAD

08.12.2021

In Noortje Marres's lecture, she paints a unique picture of reality. In an era defined by computational innovation, testing has become ubiquitous, and it is routinely deployed as a form of governance, a marketing tool, a tool for political intervention, and a daily practice of evaluating oneself.<sup>1</sup> The boundaries of testing are expanding, moving from the laboratory to the social environment, and even directly and deliberately altering the social environment. She was obviously wary of the change. In *Put to the Test*, she referred to nuclear tests as an example. In this test, individuals cannot refuse to be included in the nuclear test because they share the atmosphere and environment.



*Figure 1: The boundaries of nuclear testing are often unclear<sup>2</sup>*

This essay focuses on the boundaries of the tests. In the past, boundary was often discussed as a physical property in architecture. Is there a boundary for tests, and should it be clearly defined? Where should the sensitivity of the individual to the crossing of the tests' boundary be obtained when the experiment is unwittingly entered? Our group had some discussion about this.

<sup>1</sup> Marres N, Stark D. Put to the test: For a new sociology of testing[J]. *The British Journal of Sociology*, 2020, 71(3): 423-443.

<sup>2</sup> Radioactive carbon from Cold War nuclear tests has been found deep in the ocean <<https://edition.cnn.com/2019/05/13/asia/bomb-carbon-deep-ocean-scn/index.html>>



*Figure 2: OMA's Architectural Approach to Blurring Boundaries<sup>3</sup>*

First, since the physical boundary in the architectural definition is actually slightly different from the boundary in the test, some analysis of the definition of the boundary is necessary. Heidegger said in *Bauen Wohnen Denken*: "A border is not a place where something stops, but rather, as the Greeks realized, a border is the thing from which something begins its essence."<sup>4</sup> For architecture, as The Austrian architect Christoph Alexander said in *The Language of Architectural Patterns*, "It is important to think of the edge as an 'object', a 'space', an area with volume, not as a line without thickness."<sup>5</sup> The boundary space outside the building, as the space for the direct contact between the building and the site environment, is the first place for people to perceive the surrounding environment of the site, and also the space for the direct connection between the building and people.

When defining the boundaries of test, we assume that there are several characteristics. The first is incompleteness. For Test, it is also a space attached to the virtual platform in a sense, and its boundary is actually the boundary of a virtual body. The second is ambiguity. The development of science and technology makes the investigation from the physical space to the virtual space online, but also makes its boundary become blurred and difficult to define. As an important object to define the object of test, the fuzziness of boundary lies not only in the vagueness of non-entity, but also in the lack of explicit judgment. Taking nuclear tests as an example, the experimenter may claim that there is a certain area limit to the object of the experiment, but the actual scope of the object affected is the scope of the boundary frame of the experiment. This range is difficult to define precisely. The third is hybridism. As mentioned above, the boundary has a characteristic of fuzz, and the things that exist at the boundary often have the properties contained by test that are not clear enough, that is, it may have some features in the boundary, but also have some characteristics excluded by the boundary.

<sup>3</sup> <https://www.cobosocial.com/dossiers/oma-architectural-approach/>

<sup>4</sup> Heidegger M, Buschor M. *Bauen, wohnen, denken*[M]. Pfullingen: Neske, 1954.

<sup>5</sup> Alexander C. *A pattern language: towns, buildings, construction*[M]. Oxford university press, 1977.

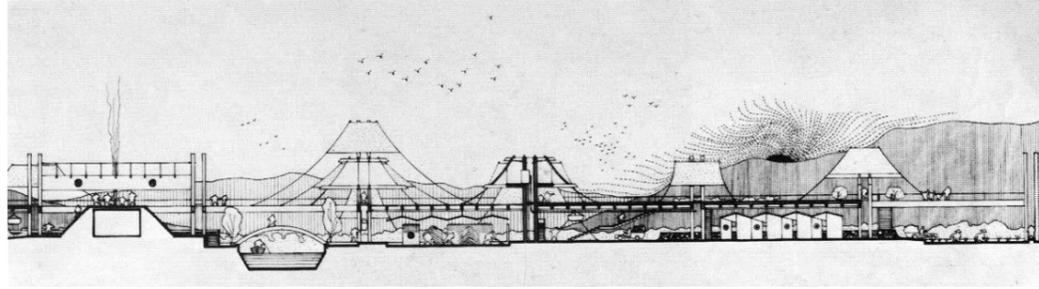


Figure 3: Kisho Kurokawa's grey space design<sup>6</sup>

Second, is it necessary to talk about borders? At this point, the author argues that because of the dual nature of boundaries, they tend to be forward-looking when discussing the problems they face. On the architectural scale, the discussion of architectural boundary is persistent and enthusiastic. The development of modernist architecture and the introduction of the concept of grey space<sup>7</sup> have made a corresponding annotation for the research on the fuzziness of architectural boundary, and the research on the boundary has also promoted the development of architectural design. On the urban scale, when reading and discussing Rem Koolhaas's treatise on the countryside<sup>8</sup>, many students mentioned the boundary between the city and the countryside. If the relationship between rural and urban is to be redefined, the role of the boundary zone should not be ignored. A good place to start is from the border to find the conditions for urban and rural coexistence. As for the test involving virtual body, the boundary definition can provide some possibilities for the individual perception to enter the tests. This is beneficial to the protection of individual rights. At the same time, the discussion of boundaries can better define the purpose of test itself to prevent data abuse.

Third, how is the function of the boundary affected by the change from the physical space to the virtual space? From the physical boundary of the building to the digital virtual space boundary, there are often different attributes. But the function of borders remains similar. The first is qualification. Although the boundary often has the characteristic of fuzziness, but the boundary can play the role of limitation. The boundary of the building has the implication of spatial feeling, and the boundary of test should also have the function of limiting the scope. The second is protection. In classical architecture, firmness exists as a principle of architectural design, and the boundary is actually a space divided between inside and outside, representing a concept of being sheltered inside the building. In test, the participants should have some kind of contract or agreement with the experimenter, then the boundary is the anchor point where the agreement begins to take effect, and the function of protection should be practiced. However, when the boundary is transitioned from entity to virtual body, its experiential nature decreases. Since many tests do not have entity boundaries, individuals are often unwittingly participants and are unknowingly collected for analysis, which is an inevitable drawback of the information age. This is one of the sources of Noortje Marres's reference to the possibility of test influencing social patterns.

<sup>6</sup> <https://www.studionicholson.com/blogs/features/modular-thinking-kisho-kurokawa>

<sup>7</sup> Kurokawa K. Kisho Kurokawa, Architect and Associates: Selected and Current Works;[edited by Andy Whyte][M]. Images Publishing, 2000.

<sup>8</sup> Ciavattini G, Guerreiro F, Garrido de Oliveira C. Rem Koolhaas:'Delirious Countryside'[J]. 2021.

With the advent of the information age, a new concept of space has been brought about, and many originally materialized concepts have become difficult to be defined. The generalization of Test will improve the efficiency of social operation, but it also brings the possibility of individual rights and privacy being violated. Just as we pay attention to the boundary space when discussing architectural design and urban and rural development, we should also pay attention to the boundary definition when assessing the social impact of tests, even though the definition and characteristics of the boundary have changed.

## Stone as a Material: An Analysis of Stone Matters

Yinlei Pang

Transscalarities Workshop

Yara H. S. Saqfalhait

MSAAD

07.14.2021

Stone Matters is an architectural project located in the Palestine. In this project, the architects paid particular attention to the use of stone in the Palestinian territories. As a common material in Palestine, stone has a long history of use and tradition. However, in recent years, stone has increasingly become a decorative material, attached to the surface of the structure as a skin. At the same time, it also brings about the decline of stone construction techniques. The main motivation for the project was to bring back to the public the traditional identity of stone as a building material.<sup>1</sup>



Figure 1: The exterior of Stone Matters<sup>2</sup>

Was this recovery successful? This essay hopes to compare and discuss from three aspects. The first is the role of stone in architecture. In traditional Palestinian architecture, stone is often used as a structure. The Church of Saint Anne is a relatively typical example. Stones constitute the column, wall and arch system. In most of the new buildings that architects object to, stone no longer has a structural role. Because the British mandate policies have made stone cladding part of the building code, stone is frequently used as veneer and decoration. In Stone Matters, stone is reintroduced as a structural material. From this point of view, the change of role can well express the designer's intention, the stone as a support system to reappear.

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<sup>1</sup> "The research aims at including stone stereotomy – the processes of cutting stones – construction processes in contemporary architecture. It relies on novel computational simulation and fabrication techniques in order to present a modern stone construction technique as part of a local and global architectural language. "

<https://www.archdaily.com/870512/stone-matters-aau-anastas>

<sup>2</sup> "Stone Matters / AAU ANASTAS" 03 May 2017. ArchDaily. Accessed 14 Jul 2021.

<<https://www.archdaily.com/870512/stone-matters-aau-anastas>> ISSN 0719-8884

<https://www.archdaily.com/870512/stone-matters-aau-anastas/590a1a6de58ece2d8a000054-stone-matters-aau-anastas-photo>



Figure 2: The Church of Saint Anne<sup>3</sup>

The second aspect is the study of construction techniques. In traditional Palestinian architecture, stone masonry is constructed in layers to take advantage of the good compressive properties of the stone and to avoid its poor tensile strength. In this project, the stones were numerically divided into different masonry blocks to form the vault. It relies on novel computational simulation and fabrication techniques in order to present a modern stone construction technique as part of a local and global architectural language. Although modern technology is adopted, this approach of building a whole structure from a single unit is essentially the same as the traditional construction mode. In addition, in the process of processing the stone, the designer maximized the use of local factories and processes for processing and mold assembly, so as to achieve the location of the construction level.<sup>4</sup>

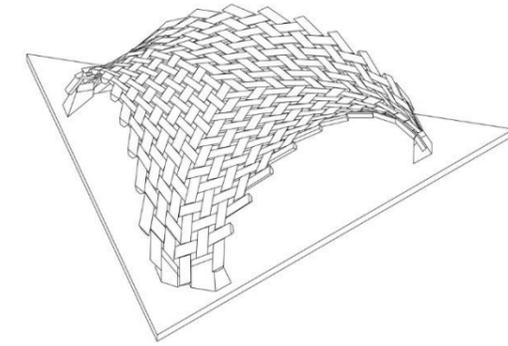


Figure 3: Different masonry blocks forming the vault<sup>5</sup>

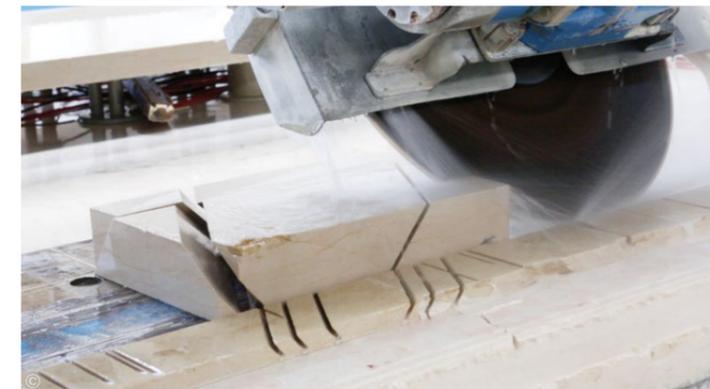


Figure 4: The cutting of the stone is still done with local techniques<sup>6</sup>

The third aspect is the study of space effect. For some of the traditional architecture of Palestine, it has been influenced by the pursuit of eternity because of religion since the classical period, so it pursues a sense of weight in architecture. As the main load-bearing structure in traditional western architecture, stone walls also show people with the image of "heaviness". But in this project, a sense of lightness is expressed by the stone. "Heaviness" and "lightness" are opposites, which intuitively reflect a difference between some traditional architecture and modern architecture in expression. In modern architecture, the technological and aesthetic changes make the stone have the conditions and demands to pursue "lightness".

<sup>3</sup> "Stone Matters / AAU ANASTAS" 03 May 2017. ArchDaily. Accessed 14 Jul 2021.

<<https://www.archdaily.com/870512/stone-matters-aau-anastas>> ISSN 0719-8884

[https://www.archdaily.com/870512/stone-matters-aau-anastas/590a19fce58ecef43f0000dd-stone-matters-aau-anastas-photo?next\\_project=no](https://www.archdaily.com/870512/stone-matters-aau-anastas/590a19fce58ecef43f0000dd-stone-matters-aau-anastas-photo?next_project=no)

<sup>4</sup> <http://aauanastas.com/project/stone-matters/>

<sup>5</sup> "Stone Matters / AAU ANASTAS" 03 May 2017. ArchDaily. Accessed 14 Jul 2021.

<<https://www.archdaily.com/870512/stone-matters-aau-anastas>> ISSN 0719-8884

<https://www.archdaily.com/870512/stone-matters-aau-anastas/590a1c59e58ecef2d8a00005a-stone-matters-aau-anastas-axonometric>

<sup>6</sup> "Stone Matters / AAU ANASTAS" 03 May 2017. ArchDaily. Accessed 14 Jul 2021.

<<https://www.archdaily.com/870512/stone-matters-aau-anastas>> ISSN 0719-8884

<https://www.archdaily.com/870512/stone-matters-aau-anastas/590a1a0ae58ecef43f0000de-stone-matters-aau-anastas-photo>



*Figure 5: Stone Matters provides a sense of lightness<sup>7</sup>*

## **Changes of shared courtyard**

### **An Analysis of West Village-Basis Yard**

Therefore, in my opinion, the designer successfully makes the use of stone restore a local architectural language. However, they are still creating a new formal language through this material and pursuing lightness in the context of modernist architecture. This pursuit is contrary to the traditional construction in the Palestinian area, but it also provides a possibility for the material and construction method to become a part of the global context in the future.

Yinlei Pang

Transscalarities Workshop

Yara H. S. Saqfalhait

MSAAD

08.07.2021

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<sup>7</sup> "Stone Matters / AAU ANASTAS" 03 May 2017. ArchDaily. Accessed 14 Jul 2021.  
<<https://www.archdaily.com/870512/stone-matters-aau-anastas>> ISSN 0719-8884  
<https://www.archdaily.com/870512/stone-matters-aau-anastas/590a1a31e58ece2d8a000050-stone-matters-aau-anastas-photo>

West Village-Basis Yard, designed by Jiakun Architects, is a development center for the cultural, artistic and creative industries. The project aims to integrate various social events, such as sports and leisure activities, cultural and artistic activities, fashion and creative industries, into a local collective living space that can meet various practical needs and continuously revitalize the urban community.

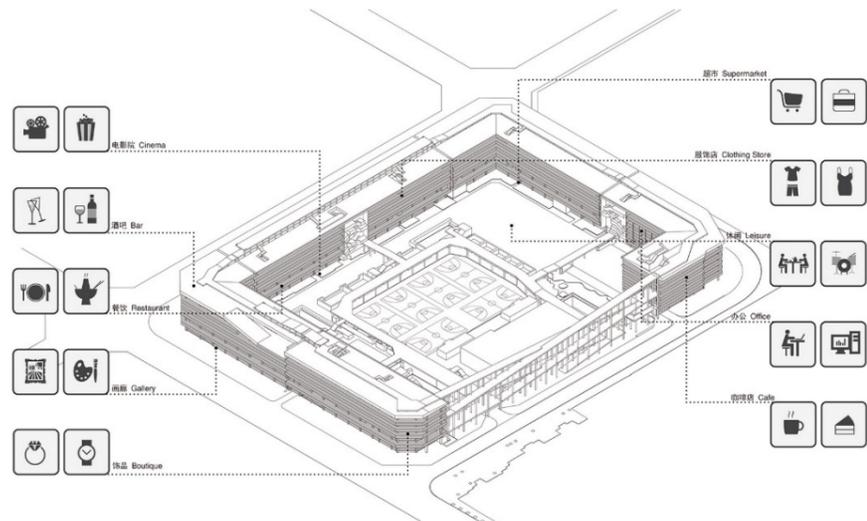


Figure 1: Function layout of West Village-Basis Yard<sup>1</sup>

From the perspective of the designers' design ideas, West Village-Basis Yard follows the architectural philosophy of "contemporary style and historical spirit" and refers to the spatial prototype of collective living quarters in the era of planned economy (1950s to 1980s).<sup>2</sup> Under China's planned economy system in that era, housing construction adopted the mode of unified investment and welfare distribution, and enterprises and institutions built and distributed workers' housing by themselves. Unit residential area had become the mainstream mode of urban living form. The architects also try to transfer this kind of community space with the color of idealism collectivism to the current architectural language.



Figure 2: Shared courtyard interior<sup>3</sup>

However, due to the change of times, both the history and the urban context of the shared courtyard have changed. This essay hopes to find out the changes of the courtyard in the modern urban context by comparing them.

Among the earliest traditional architectural types in China, courtyards are often introverted and closed, such as ancestral halls, guild halls, academies, etc. They serve as activity spaces for collective life in the Acquaintance-society<sup>4</sup>. Acquaintance-society is the organization mode of traditional Chinese society. The social life maintained by blood ties makes economic activities often carried out in the unit of clan. Then, from the 1950s to the 1980s, the "neighborhood" layout of courtyards, as a western-influenced housing type, was no longer dominated by single families, but as a public space to establish new neighborhood relationships. Courtyard becomes a spatial carrier reflecting the collectivism consciousness after the founding of New China in 1949. It reflects the urban form in a specific period to some extent, and is the most basic social and spatial unit in the city.

<sup>1</sup> <https://www.goood.cn/west-village-basis-yard-by-jiakun-architects.htm>

<sup>2</sup> West Village - Basis Yard / Jiakun Architects" 03 Oct 2017. ArchDaily. Accessed 21 Jul 2021. <<https://www.archdaily.com/880868/west-village-basis-yard-jiakun-architects>> ISSN 0719-8884

<sup>3</sup> <https://www.goood.cn/west-village-basis-yard-by-jiakun-architects.htm>

<sup>4</sup> "Acquaintance-society" is a famous scholar, Mr. Fei Xiaotong believed that traditional Chinese society is a "society of acquaintances."

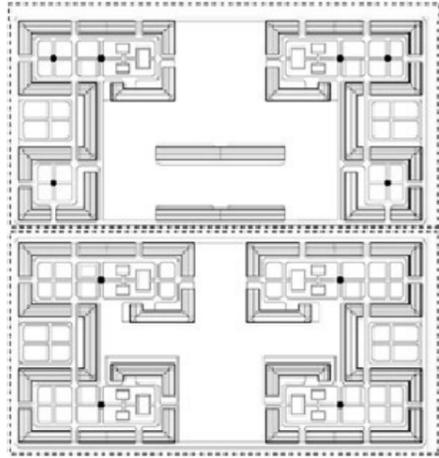


Figure 3: Typical flat courtyard layout<sup>5</sup>

As the space carrier of the collective life, the courtyard also reflects the closure of space and the richness of activities. On the one hand, as a public space, the courtyard of the compound only serves the interior, while the exterior is isolated from the city streets by closed courtyard walls or thick volume, reflecting its closed and introverted side. On the other hand, the courtyard builds the daily routine of collective life through the maximization of public space. It becomes the "stage" for the daily life of residents in the courtyard. Daily social activities such as drying, leisure and sports are staged in the introverted courtyard, which greatly improves the good communication atmosphere in the courtyard.

However, in the urban context, although the courtyard of Xicun is enclosed by a huge volume on three sides, the courtyard penetrates in all directions at the bottom, and the remaining side breaks the sense of closure of the enclosed courtyard with a continuous three-dimensional runway, and becomes a part of urban public life with an open attitude. Larger scale urban activities are therefore introduced into the compound, and the participants of the activities are not limited to the residents of the compound, but the whole city residents are radiated into it.

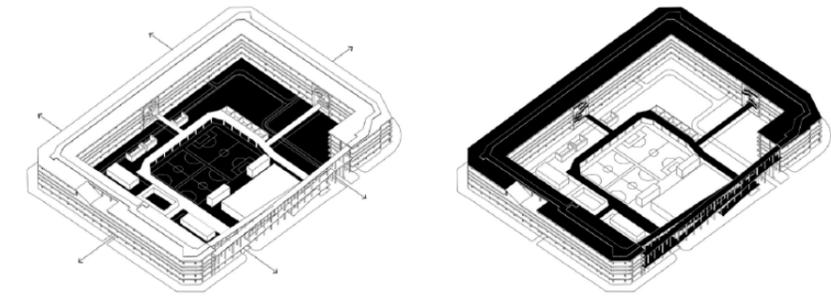


Figure 4: The courtyard of West Village-Basis Yard was open<sup>6</sup>

From this, a conclusion can be drawn that courtyards, as a common form in Chinese architecture, are gradually changing their spatial properties. The privacy of courtyard space is gradually opened in today's urban context. This is due to the changes in the economic system, from the earliest family as the production unit, to the planned economy to the work unit as the living unit, and then to the more active urban relations under the market economy, the nature of the courtyard is constantly changing. Economic evolution has also brought about changes in the way people interact with each other. The collective courtyard in Chinese traditional architecture is the spatial carrier of the sense of belonging in the social environment of acquaintances. However, in the current modern urban context, courtyard space represented by West Village-Basis Yard is a place based on the collective memory of the urban public, triggering the sense of urban cultural identity and regional belonging, and has more urban attributes.



Figure 5: The courtyard of West Village-Basis Yard<sup>7</sup>

<sup>5</sup> <https://www.goood.cn/west-village-basis-yard-by-jiakun-architects.htm>

<sup>6</sup> <https://www.goood.cn/west-village-basis-yard-by-jiakun-architects.htm>

<sup>7</sup> <https://www.goood.cn/west-village-basis-yard-by-jiakun-architects.htm>

**ANALYSIS OF *TRANSPARENCY***

05

Works in fall

*HOT Essay and Lines not Splines*

Yinlei Pang

The History of Architectural Theory

MSAAD

02.22.2021

The transparency of architecture is one of the characteristics of modern architecture. As an architectural feature, it has been gradually expressed in architecture since before 100 AD and has evolved in various forms. The theory of transparency as a system began in the 1950s by Colin. Rowe, who has published articles titled "Transparency I" and "Transparency II." The theory elaborates the connotation and denotation significance of the transparency theory and shows a way of interpreting modern architecture.<sup>1</sup>

The concept of "transparency" comes from early 20th century Cubist painting, where "transparency" was used to understand the fragmented approach to painting. Cubism was one of the most important avant-garde movements of the 20th century, and it has influenced, in varying degrees, all subsequent modernist art. Cubism focused on the question of how to paint three-dimensional natural forms with three or even four degrees of space on a flat surface.<sup>2</sup> Later, painters adopted a scientific approach to the representation of nature that was more adapted to modern ideas. This method is to reconstruct the image of the object according to its structure. As Braque once said in this regard: " I must, therefore, create a new sort of beauty, the beauty that appears to me in terms of volume of line, of mass, of weight, and through that beauty interpret my subjective impression."<sup>3</sup> In Cubist works, it is the implication that is the basis for

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<sup>1</sup> Scientific Research Publishing. "Symbolic Meaning of Transparency in Contemporary Architecture: An Evaluation of Recent Public Buildings in Famagusta." *Current Urban Studies*. Scientific Research Publishing. Accessed February 22, 2022. [https://www.scirp.org/html/8-1150155\\_61923.htm](https://www.scirp.org/html/8-1150155_61923.htm).

<sup>2</sup> ". " *Encyclopedia of Modern Europe: Europe 1789-1914: Encyclopedia of the Age of Industry and Empire*. . Encyclopedia.com. 24 Jan. 2022 . " Encyclopedia.com. Encyclopedia.com, February 22, 2022. <https://www.encyclopedia.com/literature-and-arts/art-and-architecture/european-art-1600-present/cubism>.

<sup>3</sup> "Cubism: Cubism Quotes." USEUM. Accessed February 22, 2022. <https://useum.org/Cubism/Cubism-Quotes>.

painting. We see disassembled and reconstructed geometric compositions, with the original motivation being the desire to express through disassembly a collection of impressions of objects in motion in different states of existence at different moments, to express the state of combination of decent parts of objects when viewed from different angles, and to organize these images in different states, in a painting or a sculptural work. <sup>4</sup>In Cubist works, one can see the passage of time and experience the different speeds at which this passage is possible. A way to depict movement and time is mapped out on a two-dimensional plane.<sup>5</sup>

Josef Albers first investigated transparency in art and painting, and also used these studies in his teaching practice. in *Formulation: Articulation*, Albers once said, "In my work, I am often willing to use simple colors and palettes to compose complex color charts to go beyond my own perceptions."<sup>6</sup> A rich color system can be created by transparently superimposing multiple simple colors. The science of seeing focuses on the study of lines and contours, brightness, transparency and visual freedom. In a classic example of transparency, Albers asks his students to use a translucent piece of colored paper over a colored piece of paper to make it appear transparent or opaque, to obtain

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<sup>4</sup> "Cubism: A New Vision." *Cubism*. Accessed February 22, 2022. [https://www.mdc.edu/wolfson/academic/Artsletters/art\\_philosophy/humanities/cubism/cubism%20front2.htm](https://www.mdc.edu/wolfson/academic/Artsletters/art_philosophy/humanities/cubism/cubism%20front2.htm).

<sup>5</sup> History.com Editors. "Cubism History." *History.com*. A&E Television Networks, July 26, 2017. <https://www.history.com/topics/art-history/history-of-cubism>.

<sup>6</sup> Albers, Josef, and T. Rosenthal. *Josef Albers: Formulation: Articulation*. First Edition, Thames & Hudson, 2006.

a visual relationship that is not really transparent.<sup>7</sup> The goal is to create a more complex and varied visual color system and graphic relationships through the use of transparency, a complexity that relies on a certain knowledge of color science.<sup>8</sup> Through his research and practice, he has shown that the introduction of transparency is an important tool for innovation in painting and color research and the creation of complexity and diversity, and that his research on transparency has inspired a large number of architects to study transparency.

In addition, Rudolf Arnheim, a renowned perceptual psychologist and art theorist, responded to the mid-20th century phenomenon of art being overwhelmed by empty theories and art becoming increasingly detached from life through its obscure articulations by arguing that art is a tool that everyone can understand and use in their lives, and attempting to find a generalization and summary of art. Transparency is one of them. In *Art and Visual Perception*, Rudolf Arnheim argues that transparency breaks with two principles of realist painting - overlap and the typical projection plane.<sup>9</sup> The overlapping of two objects embodies an expression of spatiality and an expression of spatial order. Arnheim's understanding of transparency was dialectical and evolved, mentioning that "all so-called reality is nothing but the action of the hand, the eye, and

the mind"<sup>10</sup>, a materialist view that, like Albers' perception of color, illustrates the spontaneity and epochality of art or transparency.<sup>11</sup> The birth of cubism represented the beginning of modern art, and the development of post-cubism, stylisms, Dadaism, and modern architecture was the result of the convergence of the aesthetic concepts of history and the times, and the rejection of traditional perspective and the destruction of order and style was only as irresistible and as resistant to judgment of right and wrong as any other period in history.

Furthermore, in 1944, Gyorgy Kepes described transparency in *The Language of Vision*: "If a person sees two or more figures superimposed on each other, each trying to appropriate the common part, that person encounters a kind of dilemma in spatial dimensions. To resolve this dilemma, he must assume the existence of a new visual property. These figures are considered to be transparent; that is, they are capable of interpenetrating each other while ensuring that there is no visual destruction of each other. Beyond the visual characteristics, however, transparency implies something more, namely, an expansion of the order of space. Transparency implies the simultaneous perception of a series of different spatial positions. In continuous motion, space is not only receding but also shifting. The transparent figure is ambiguous; one sees each of a set of overlapping figures at the same time, and this is true for the near ones as well as the distant ones." Kepes draws on the metaphor of political penetration to explain the

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<sup>7</sup> "Josef Albers Formulations: Articulation." Josef Albers Formulations: Articulation | Boston University Art Galleries. Accessed February 22, 2022. <https://www.bu.edu/art/exhibitions/past/josef-albers-formulations-articulation/>.

<sup>8</sup> Liesbrock, Heinz, et al. *Josef Albers: Interaction*. Yale University Press, 2018.

<sup>9</sup> Arnheim, Rudolf. *Art and Visual Perception*. Amsterdam, Netherlands, Amsterdam University Press, 2004.

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<sup>10</sup> "The Aesthetics of Photographic Transparency." *Arguing About Art*, 2013, 249–61. <https://doi.org/10.4324/9780203717448-25>.

<sup>11</sup> Popova, Maria. "The Magic and Logic of Color: How Josef Albers Revolutionized Visual Culture and the Art of Seeing." *The Marginalian*, March 19, 2019. <https://www.themarginalian.org/2013/08/16/interaction-of-color-josef-albers-50th-anniversary/>.

pervasiveness of penetration at the social level, where the concept of transparency, although based on the artistic, spatial level, contains a richer social meaning and functional properties. In the mid-20th century, the development of science, technology, humanities, and art was jumping around, lacking a continuous order, and transparency was the bridge and tool that linked literature, cinema, architecture, and painting, and could serve as a guideline for natural science, philosophy, psychology, and physics, which was inseparable from the nature of transparency that allowed the elements to interpenetrate and overlap. Kepes talks about the characteristics of transparency in architecture, arguing that the organization and use of transparent elements in architecture and the clever design of architectural spaces integrate as much of the architectural landscape as possible. In addition, he believes that the use of light and shadow contributes to the layers of transparency.<sup>12</sup>

The first person who had a similar concept of transparency at the level of architectural design was Sigfried Giedion, who made a preliminary analysis of transparency in *Space-Time-Architecture - The Growth of a New Tradition*. First, Giedion argues that modern architecture, represented by the emerging generation of modern architects such as Gropius, Corbusier and Mies van der Rohe, has two endeavors, "one for the combination of vertical surfaces suspended in space, so that our feelings about spatial relations are satisfied; and the other for the great transparency, so that inside and outside can be seen simultaneously, both as front and The second is the great transparency that

allows the inside and the outside to be seen simultaneously, both front and side."<sup>13</sup>This is followed by the example of the girl in the city of Alai, where Giedion argues: "The simultaneity of the technique used by the Cubists can be seen from the head, where an object shows two sides at the same time, in this painting there is both a front and a side. Also characteristic is the transparency of the overlapping surfaces."<sup>14</sup> Giedion draws an analogy to Gropius's Bauhaus schoolhouse, with its winged corners, where the overall glass façade blurs the corners of the building, allowing the view to penetrate the floor behind, a sense of weightlessness and transparency that corresponds to the suspension and overlap that characterize modern painting.<sup>15</sup> At the same time, Giedion argues that the overall row design of the Bauhaus school building - the windmill-like relationship of the blocks and the large glass façade - is a response to the levitating relationship of modern art. When it comes to the approach to reading the Bauhaus, Giedion emphasizes the importance of the bird's eye view, a deep spatial level of perception, because a complete reading of the complex subject of the Bauhaus cannot be accomplished from a single viewpoint. The windmill-like composition of the building and the sense of motion that extends outward emphasize the capture of movement in space, which corresponds to the multifaceted nature and movement in Cubist painting. Through the above analysis, Giedion's perception of modern architecture is also based on features found in modern painting, and the reading of

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<sup>12</sup> Kepes, Gyorgy, S. Giedion, and S. I. Hayakawa. *Language of Vision*. Whitefish, MT: Literary licensing, 2014.

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<sup>13</sup> Giedion, Siegfried. *Space, Time and Architecture. The Growth of a New Tradition*. Fifth, Cambridge : Harvard University Press, 1967, 1967.

<sup>14</sup> Gabriel, Radu. "Space Time Architecture." Academia.edu, January 9, 2018. [https://www.academia.edu/35624142/Space\\_time\\_architecture](https://www.academia.edu/35624142/Space_time_architecture).

<sup>15</sup> "Bauhaus by Walter Gropius at Greatbuildings." GreatBuildings. Accessed February 22, 2022. <http://www.greatbuildings.com/buildings/bauhaus.html>.

modern architecture is modeled on the way modern painting is created: multifaceted reading, deep spatial perspective, motion capture, and volume suspension.<sup>16</sup> Giedion's analysis of the connection between modern architecture and modern painting involves a partial reflection on space, which is inseparable from the spatial theme of the book, but there is no thorough analysis regarding the deep spatial structural relationships.

It is in this context that the architectural theory of transparency is proposed. In 1955, Colin Rowe was teaching at the University of Texas at Austin and conceived the concept of "transparency" with Robert Slatsky, who was also a "Texas Ranger" at the time. Robert Slatsky was also a painter, a researcher and creator of Cubism, and a deep researcher of Gestalt psychology. Colin Rowe, a follower of modernism in the 1920s, has been engaged in the study of modernist forms, trying to find the connotations and historical context of modernism, and his research has been influenced by his teacher Hitchcock and Wittkowitz.<sup>17</sup>

Rowe and Slatsky argue that there are two distinctions between transparency in Cubism itself, the visual permeability that Giedion analyzes, and the transparency of phenomena that Giedion ignores. Through their analysis of György Kepes' concept of transparency and Moholy-Nagy's analysis of the properties of transparency in *Vision in Motion*, Rowe and Slatsky argue that transparency itself has two distinctions: the physical and the phenomenal.<sup>18</sup> Physical transparency refers to a visual transparency, i.e., the literal

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<sup>16</sup> GIEDION, SIGFRIED. Sigfried Giedion: *Liberated Dwelling*. LARS MULLER Publishers, 2018.

<sup>17</sup> "Colin Rowe - Alchetron, the Free Social Encyclopedia." Alchetron.com, November 28, 2021. <https://alchetron.com/Colin-Rowe>.

<sup>18</sup> Rowe, Colin, Robert Slutzky, Werner Oechslin, and Bernhard Hoesli. *Transparency*. Basel: Birkhäuser, 1997.

meaning of transparency, while phenomenal transparency refers to a permeation and superposition of spatial order that requires visual-based perception and imagination. In explaining transparency, he refers to Cézanne's late work *Mont Saint-Victoire*, in which "the parallel perspective of the frontal viewpoint is highly emphasized and the elements that clearly suggest depth of field are greatly reduced, with the result that foreground, middle and background are compressed and squeezed into the same compact picture. The sources of light are clear and varied; further examination of the image gives the viewer the impression of a large number of objects pouring into the space, which is reinforced by the painter's extensive use of opaque and high-contrast colors."<sup>19</sup> The book shows the paintings as they were originally painted, and the author's textual analysis is used in conjunction with each other to argue the case. The whole painting feels as if it has been broken into tiny pieces and then colored at random, and then cemented back together. The painting loses its sense of space and three-dimensionality. By looking at the picture, Cézanne must have disassembled it after it was completed, and it is possible to see both the physical transparency and the indistinguishable but imaginative transparency in the whole painting, probably brought about by light.

Later, Rowe and Slatsky argue for two distinctions of transparency through Picasso's *The Clarinetist* and Braque's *The Portuguese*. According to Moholy-Nagy, Picasso's paintings tend to be composed through a simple method in which the planes in the picture are separated but still superimposed, while Braque's paintings use a complex system of interwoven planes, which is consistent with Rowe and Slatsky's view. In *The Clarinetist*, the contour lines defined by thick lines are independent of the background,

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<sup>19</sup> Rowe, Colin, Robert Slutzky, Werner Oechslin, and Bernhard Hoesli. *Transparency*. Basel: Birkhäuser, 1997.

while the subject exhibits a visual transparency; in *The Portuguese*, Braque establishes a set of planar order with a highly interwoven grid of lines, the broken images are scattered in the grid, and the viewer must gradually investigate the spatial depth and image through visual observation, combined with imagination. The former is a physical transparency, while the latter is a phenomenal transparency.

In terms of architecture, Slatsky argues that "only Corbusier was truly conscious of modern aesthetics and serious about painting"<sup>20</sup>, and here Rowe and Slatsky analyze Corbusier's Villa Gachet and compare it with Gropius' Bauhaus schoolhouse. First of all, Rowe and Slatsky emphasize the façade of Villa Gachet facing the garden, and emphasize the frontal analysis and the spatial conclusions obtained through analysis and imagination, and then go deeper into the plane, and compare it with the previous imagination to find that the space is not guided by the façade, but shows a confusion between the façade and the internal space, which is a contradiction in the spatial dimension, which is one of the characteristics of what Kuipers calls transparency One of them. "Between fact and allegory, the dialectical back and forth never stops for a moment. The reality of deep space is constantly countered by the suggestion of shallow space, resulting in a growing tension and a drive for deeper interpretation. The five spatial levels that cut the building volume vertically and the four spatial levels that cut it horizontally call for attention all the time, and such a network of spaces will eventually lead to endless dynamic interpretations."<sup>21</sup> The ground floor of Villa

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<sup>20</sup> Sanz Esquide, José Ángel. "Reckoning with Colin Rowe: Ten Architects Take Position." *ZARCH*, no. 7, 2016. *Crossref*, doi:10.26754/ojs\_zarch/zarch.201671533.

<sup>21</sup> Rowe, Colin, Robert Slutzky, Werner Oechslin, and Bernhard Hoesli. *Transparency*. Basel: Birkhäuser, 1997.

Gachet's advancing façade is wound up through two free walls on the roof, where the roof terrace ends; the same depth-controlling maneuver is achieved on the side façade through a set of glass doors, which become the end of a long horizontal band of windows. In this way, Corbusier introduced the notion that there is a narrow parallel space immediately behind the ribbon glass; and reasoned that it further implies another notion—that there is an interface on the inside of this narrow space, immediately adjacent to it, where the ground floor wall, the free wall pieces of the roof, and the inner door side walls are all an integral part of it. Obviously, this interface is not real, it exists only in concept and imagination, and we can ignore it, neglect it, but cannot deny it. Unlike the direct presentation of the spatial organization of the glass curtain wall on the side of the Bauhaus studio, what Villa Gachet expresses is more, through the continuity and restriction of the glass and the wall, we derive the implied spatial organization behind it, which is one of the spatial expressions of the transparency of the building - the implication.

I see the value of transparency theory in three main ways: First, it demonstrates a calm and precise positivist technique that is rare in twentieth-century architectural studies. Second, for more than half a century, architects and critics alike have witnessed a dizzying evolution in architecture, a never-ending process in which the avant-garde has in fact contributed to the very emergence of almost everything new. However, few have made the effort to explore and distill directly from the large number of existing design solutions the particularities and individuality of individual works, and to extract transferable and evaluable insights and methods. Third, the concept of "architectural transparency" opens the door to the possibility of cleansing distinctions and simplicity, and its applicability is broad, allowing for multiple levels of interpretation.

At the same time, Colin Rowe always maintains an objective and dispassionate approach to the study of the exploration of transparency. He does not give a restrictive definition of transparency, but rather presents an analysis of physical and phenomenal transparency in a variety of ways, leaving it more to the reader to think for himself, even at the end of his essay: The preceding discussion is intended to illustrate the spatial conditions that make the transparency of phenomena possible. But this is not to say that phenomenal transparency is necessarily a necessary component of modern architecture; nor is it to be taken unthinkingly as a test paper for the degree of architectural orthodoxy. Their motive is simple: to complete the identification of the "category" and to warn against the confusion of the "category".

However, this theory also has its limitations. In reading Villa Gachet, Rowe and Slatsky deliberately emphasize the reduction of access to information, including the emphasis on shallow spaces and the separate consideration of flat elevations. Common sense dictates that the three-dimensional nature of the building itself makes the best way to read the building should be on a three-dimensional level, not a two-dimensional one. Rosalind E. Krauss argues that the reason for the absurdity of Rowe and Slatsky's transparency analysis is precisely the confusion between three and two dimensions, ignoring the principle of "uniqueness of the medium", that is, the distinction between the analysis of different arts.<sup>22</sup> In addition, Tim Benton suggests that many of the changes and graphic design of Villa Gachet are due to the change in the mission statement from two residences to one.<sup>23</sup> This largely negates Rowe and Slatsky's

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<sup>22</sup> Krauss, Rosalind E. *Passages in Modern Sculpture*. Cambridge, Mass: MIT Press, 2007.

<sup>23</sup> Benton, Tim. *The Villas of Le Corbusier and Pierre Jeanneret: 1920-1930*. Basel: Birkhauser, 2007.

analysis of the transparency of Villa Gachet, which, in general, is based on Cubism and Gestalt psychology with a great deal of subjective conjecture attached to it. According to Picasso, Cubism is the language of art that "deals with the problem of form", while Gestalt psychology emphasizes the subjective perception obtained through visual perception. The study and analysis are undoubtedly a secondary creation of Villa Gachet.

With regard to physical transparency, Colin Rowe and Slatsky argue that physical transparency is only apparent, formal, and not intrinsic, and has no deeper, more interesting meaning. In her paper "*Unclear Vision*", Beatriz Colomina argues against this, arguing that physical transparency is not the process of seeing through glass, but the process of seeing reflected and "entangled" by the layers of glass, and that physical transparency refers to the visual and psychological sensation brought by this illusion.<sup>24</sup> I think this is more acceptable than the explanation of Rowe and Slatsky. This is because it does not see transparency as just one property, but as a composite property brought about by the material. It appears to have a broader perspective.

Colin Rowe cites pre-modernist cases such as the classical period, and through his analysis finds that the organizational approach of transparency was not spawned by modernism and cubism, but is a formal feature that has existed since the creation of architecture, only taking cubism as the starting point for his study. I think that in the theory of transparency, Colin Rowe himself seeks the connection between modern architecture and traditional architecture, gives modern architecture a period continuity, and explains the creation of the form of modern architecture. Therefore, the formal

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<sup>24</sup> Bell, M. and Kim, J., 2009. *Engineered transparency*. New York: Princeton Architectural Press.

organization of transparency is itself a new perspective to look at architecture, a new law that is free from history, free from style, and free from individuality.

At the same time, the architectural transparency summarized by Rowe and Slatsky mainly emphasizes the concept of phenomenal transparency, and they consider physical transparency as a mere appearance of transparency without the necessity and interest of deeper exploration. Rosemary Hager-Bright has criticized this simple generalization and the thick and thin statement that "physical transparency and phenomenal transparency cannot provide a new universal definition."<sup>25</sup> There is nothing wrong with this statement; after all, Rowe and Slatsky's concept of transparency is itself very limited, and the analysis of architecture has strong shades of Gestalt psychology and cubist painting, that is, it is in a kind of transitional stage of architecture, painting and psychology.

In addition, I think Rowe and Slatsky lack respect for the objective state of architecture in terms of the transparent understanding of phenomena, and all analyses are based on subjective perceptions, and many accidental cases are used as explanatory cases, lacking authenticity and persuasiveness. In terms of architecture itself, creativity always comes first. Hitchcock believed that the styles of architecture in history always correspond to a certain historical period, and there is no priority, nor is there a superior or inferior one, but the real leading role is played by the architect. This view has the limitations of its time because it puts style before architect design, but many times it is the design of multiple buildings that form the definition of style. And this definition more often comes from architectural theorists than from the architects themselves.

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<sup>25</sup> Bletter, Rosemarie Haag. "Paul Scheerbart's Architectural Fantasies." *Journal of the Society of Architectural Historians* 34, no. 2 (1975): 83-97.

In many cases, the emergence of a certain style is the accidental creation of an architect, as in the case of Colin Rowe's study of 16th century Mannerism and Modern Architecture, which is mostly the accidental creation of an architect, but Rowe's analysis expresses the similarity between modernism and Mannerism and foresees the development direction of postmodern architecture, which seems too subjective on some level.

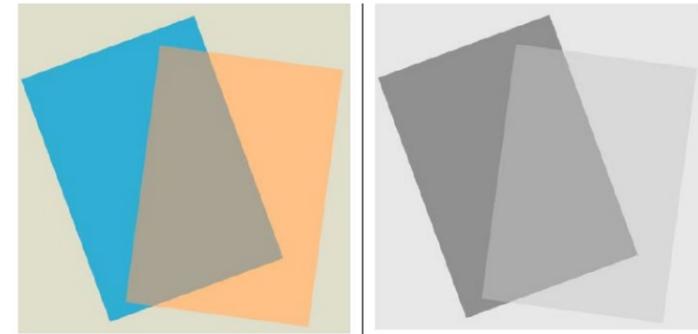
However, I think the theory of transparency is still a very important cornerstone in the history of architectural theory. Before the theory was proposed, the concept of transparency has been in a vague state, despite the diversity and complexity of its meaning, and people have implied the meaning of transparency from various perspectives: the relationship between transparency and spatial organization, but no more systematic and reasonable theory has been formed. In the field of architecture, people's perception of transparency is still limited to the light transmission phenomenon shown by transparent materials such as glass.

As Bernhard Hoesli points out: "the first generation that grew up under modern culture has now matured, and they urgently feel that it is no longer tolerable to treat modernist discourse as the only creed and norm. Since this cannot be the case, they have to examine it systematically and methodically, seeking to promote its spectacle in order to broaden the scope of identification and permission. "<sup>26</sup> Just as cubist culture deconstructs and so on, there is an urgent need to expand our thinking rather than limit it to one level. We need to expand our thinking rather than limit it to one level. I think transparency theory practices this idea well.

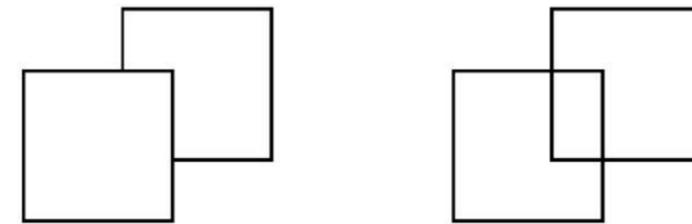
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<sup>26</sup> Rowe, Colin, Robert Slutzky, Werner Oechslin, and Bernhard Hoesli. *Transparency*. Basel: Birkhäuser, 1997.

The theory of transparency still provided the basis and the space for discussion for the subsequent development of architectural theory. For Rowe and Slatsky, transparency was merely a test of modern architectural standards, but with the efforts of Hoysley and others, transparency inexorably evolved in a methodological direction, and a host of architects analyzed the connotations of transparency, making it not an obscure architectural term but a powerful tool for creating complex, rich architectural systems. The development and succession of people or groups such as Hoysley, the Texas Rangers and the New York Five were important nodes in the development of transparency, and their efforts enabled the study of transparency to move away from the visual study of two-dimensional planes and to be truly integrated with architectural space.<sup>27</sup>



*Figure 1: Albers' transparency experiment*



*Figure 2: Arnheimer's transparency model*



*Figure 3: The girl from Alay City*

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<sup>27</sup> "Transparency: The Unspoken Design Element -- How Levels of ..." Accessed February 27, 2022. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.674.803&rep=rep1&type=pdf>.



Figure 4: The girl from Alay City

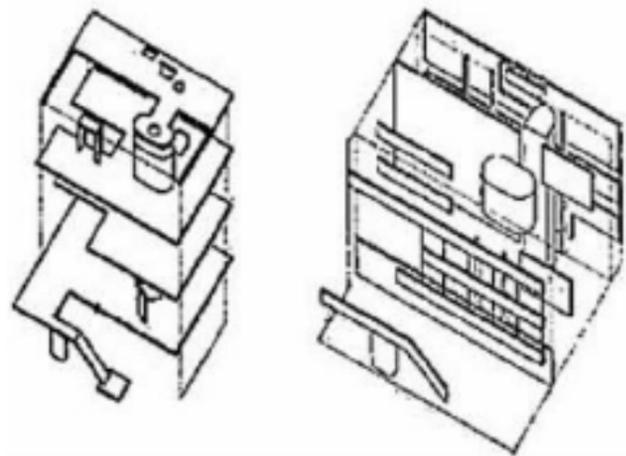
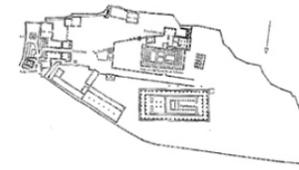


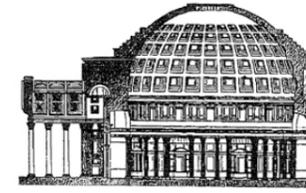
Figure 5: Colin Rowe and Robert Slatsky's Transparency Analysis of Villa Gachet

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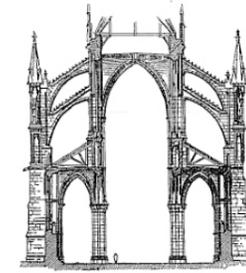
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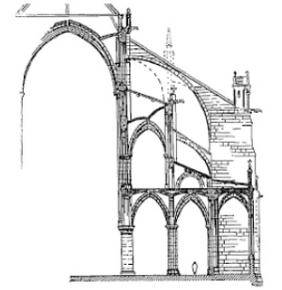
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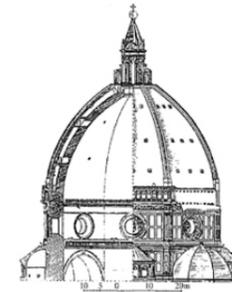
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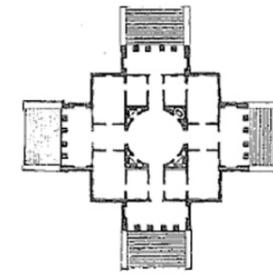
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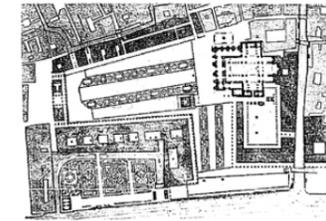
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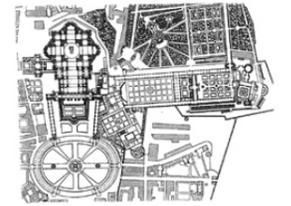
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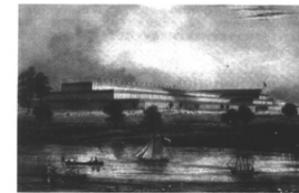
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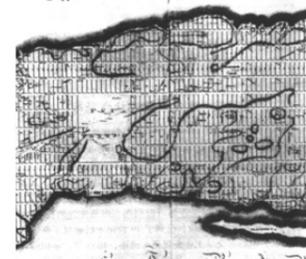
The Piazza of S. Mark



Saint Peter's Basilica



Crystal Palace



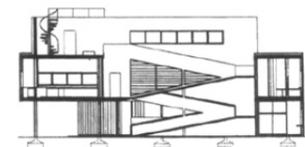
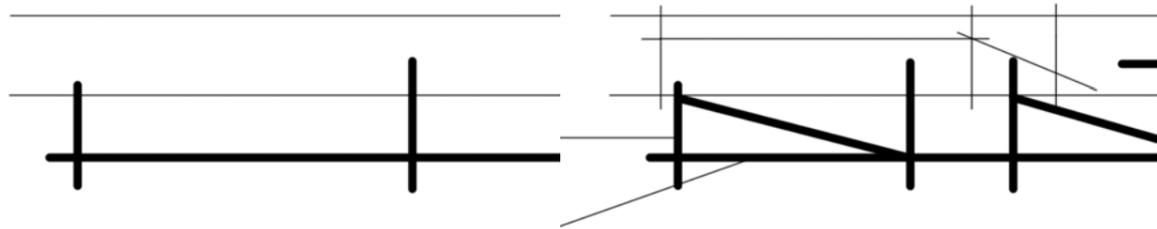
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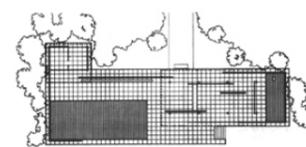
AEG Turbine Factory



The Bauhaus schoolhouse



Villa Savoy



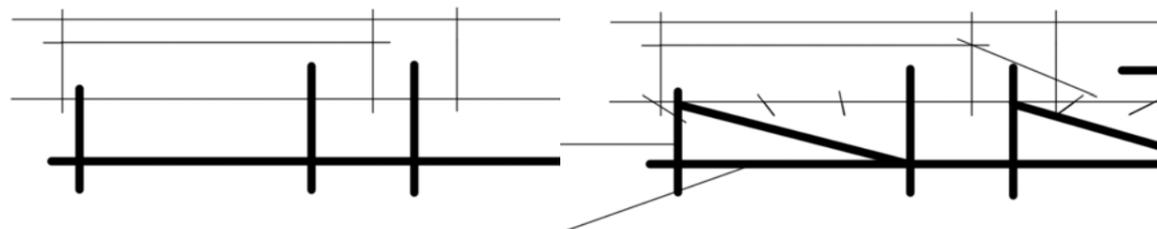
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Vanna Venturi House



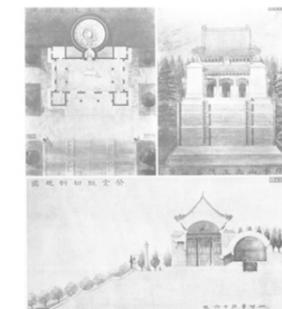
Delirious New York



First Type



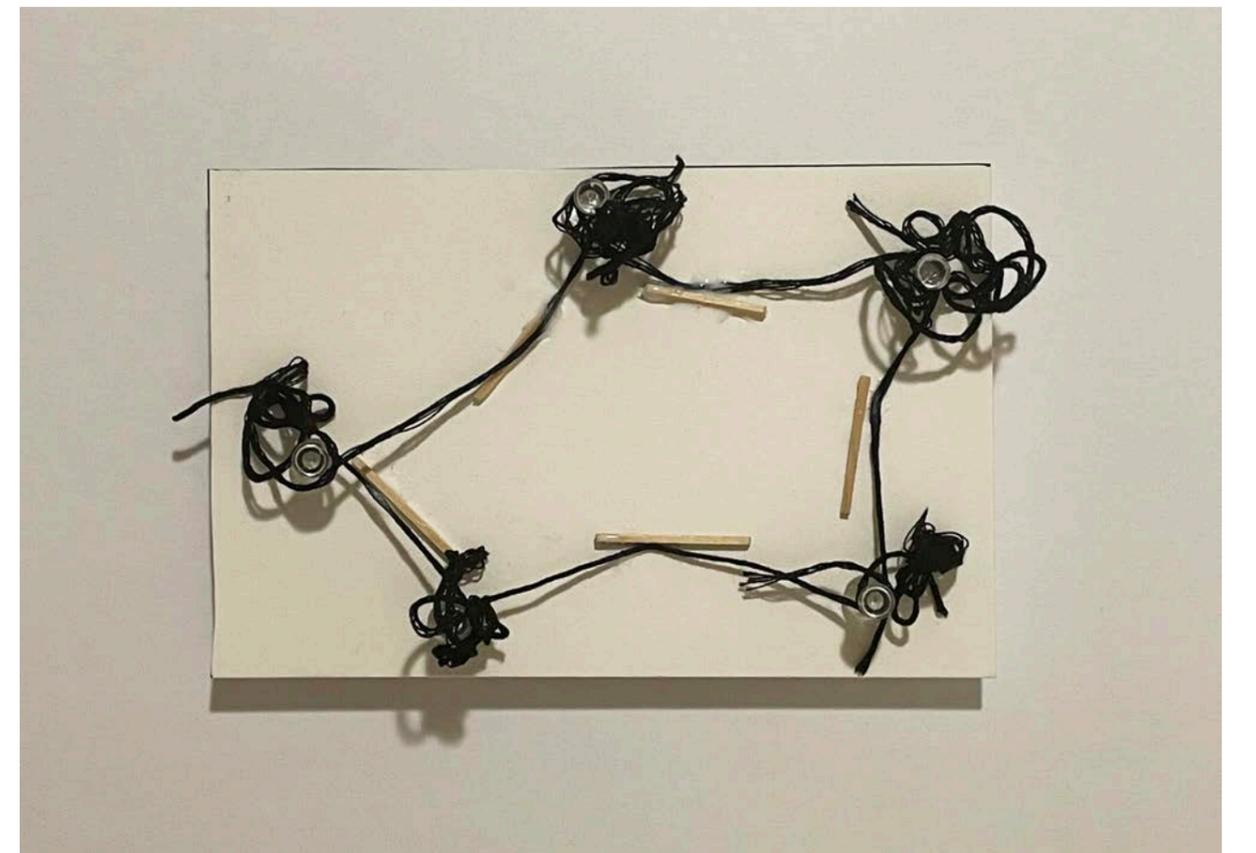
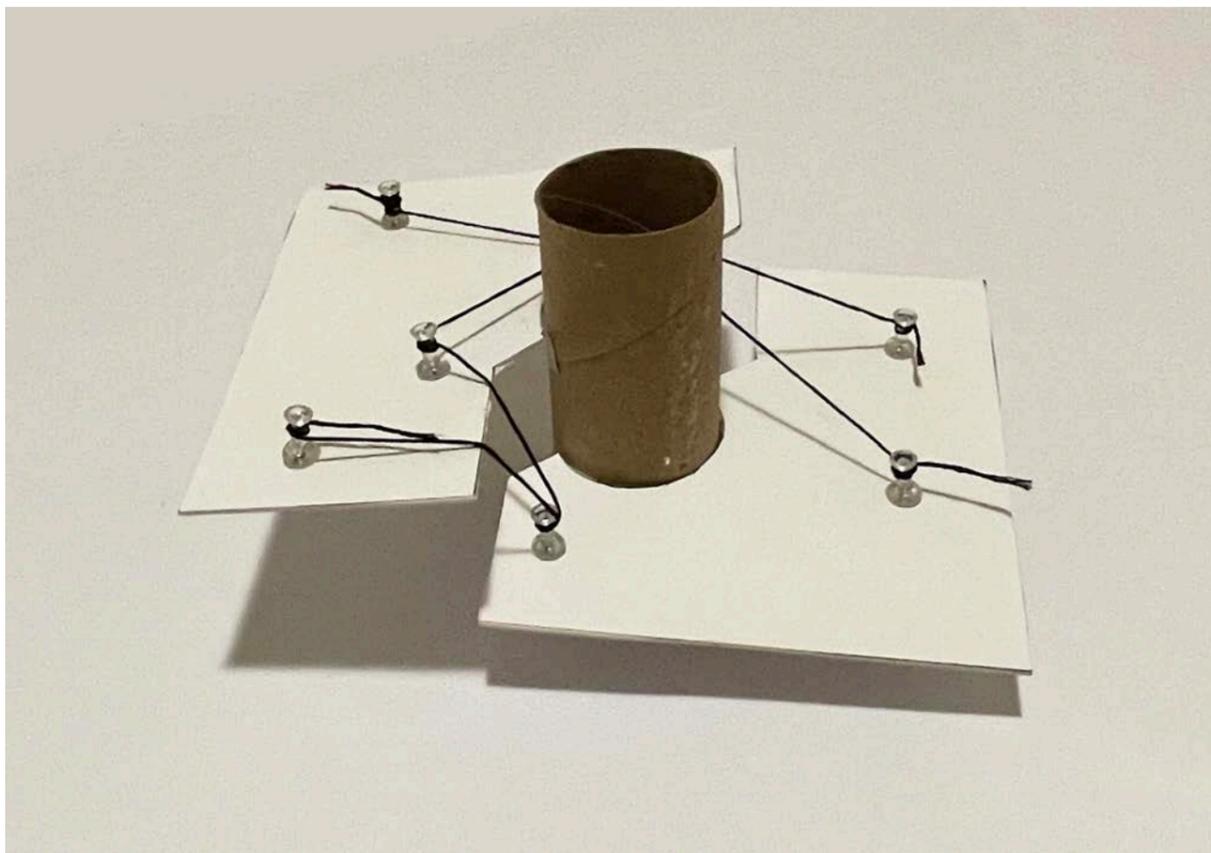
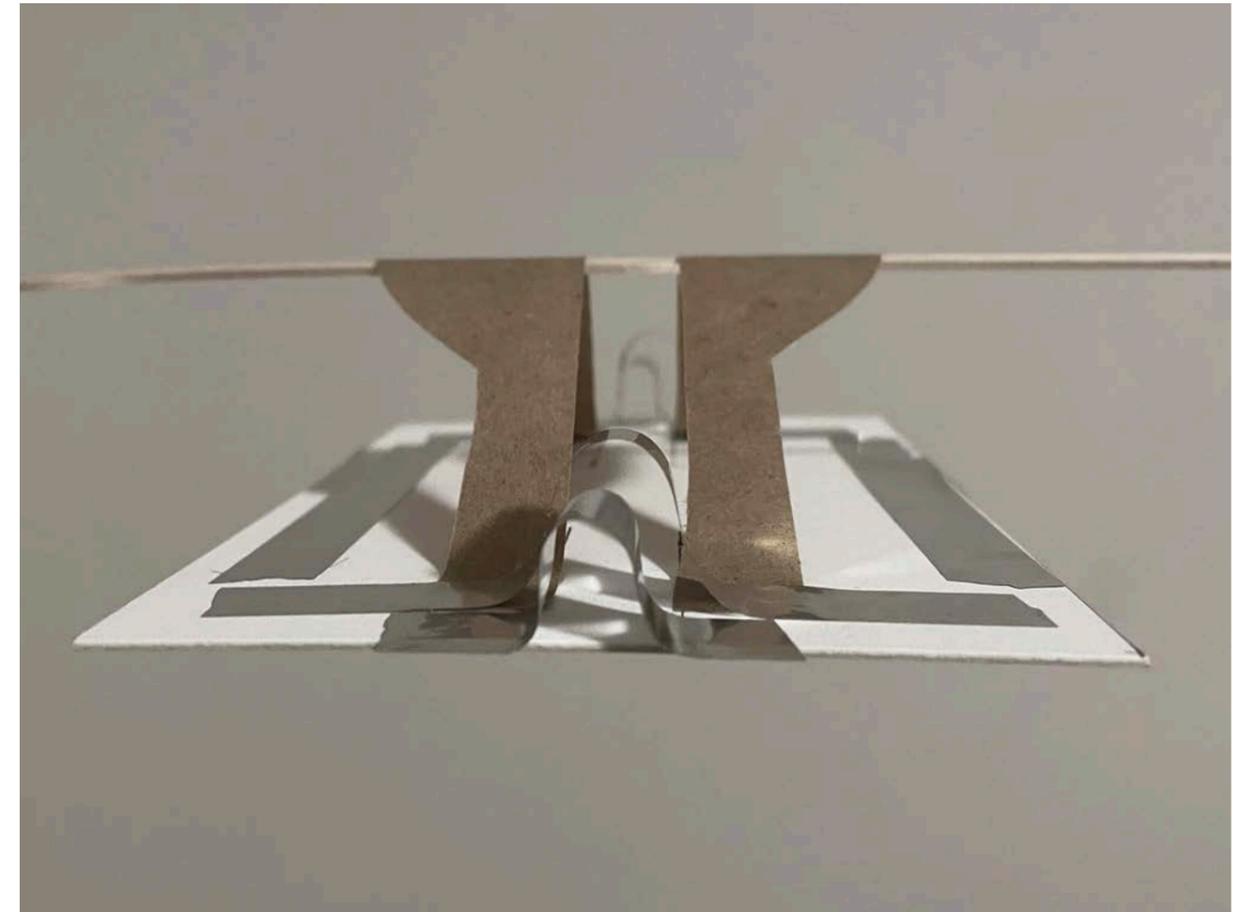
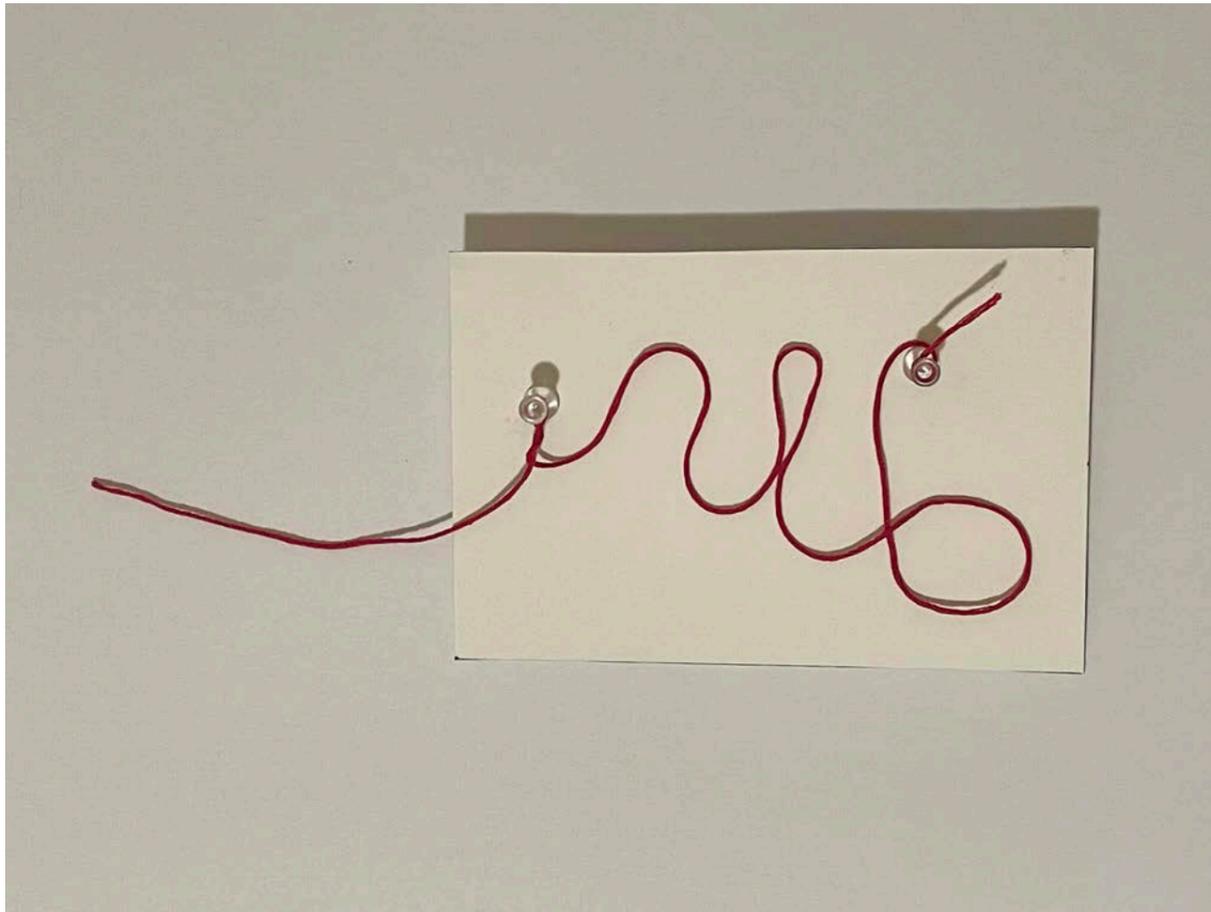
Second Type



Third Type



Fourth Type



**Analysis of Huizhou Traditional Architecture Brick Carving**

06

Works in spring

*Generative Design and CN Essay*

Yinlei Pang

PRE 1800 CHINA:  
TWINING ARCHITECTURES, MELDING MEDIA AND METHODS

MSAAD

04.30.2022

**Abstract:**

This essay mainly outlines the origin, development process, background and basic characteristics of Huizhou brick carving. It also meticulously describes the carving techniques, carving subjects and production processes of Huizhou brick carving, composes and summarizes all the previous research results, and analyzes the classification and characteristics of Huizhou brick carving decorative graphic language symbols. This essay also summarizes the specific parts of Huizhou brick carving which are often applied in architecture, elaborates the application types and decoration of brick carving in each part of traditional Huizhou architecture, and analyzes the application parts and brick decoration of Huizhou brick carving based on the research results of some cases in southern Anhui Province.

**Keywords:**

Brick carving, Huizhou, History, Transformation, Techniques

The long history of Chinese brick carving was first discovered in the ruins of the Zhou Dynasty. During the Spring and Autumn and Warring States periods, brick carvings appeared mainly as decorative markings on floor tiles and molded tiles, and generally in tomb buildings. These brick carvings were crude and simple, with animal, auspicious character and geometric patterns as the main motifs. During the Qin and Han dynasties, brick carving developed rapidly along with social, cultural and economic changes, and the bricks used changed from earthen bricks to fired bricks. During the Qin Dynasty, brick carving was exquisite and colorful, with generous, diverse and regular shapes. During the Han Dynasty, the content and themes of brick carving were further enhanced, including quaint and elegant humanistic stories, colorful myths and legends, and natural scenery of courtyard views, etc. The development of Chinese brick art reached a peak at this time. During the Wei, Jin and North-South dynasties, the application of brick carving was extended to tomb architecture and Buddhist architecture. The prevalence of Buddhism led to the appearance of a large number of Buddhist buildings, and brick carvings began to be applied in Buddhist buildings such as pagodas and monasteries, with carved themes basically including Buddhist stories, plants, animals, Buddha statues, etc. In the early Tang Dynasty, social economy and cultural technology were developed abundantly, and brick carving also entered into a high-speed development stage. The prosperity of the society and the developed economy made brick carving full of grandeur. At this time, brick carving was mainly prevalent in tile and flower tile pavement, and the motifs of the pattern were mainly Bao Xiang Hua, Lotus, and Lonicera. The brick carving process used the technique of molded printing and then fine carving, and the brick carving was rounded and plump, three-dimensional and fine, with rich and magnificent patterns and vivid images, showing the extravagant style of the Tang Dynasty. During the Song dynasty, the architectural patterns and styles began

to develop in terms of dexterity and refinement, and the brick carvings of this period also showed this tendency. There was a shift from a way in which mold printing and carving complemented each other to a way in which all of them were finely carved and chiseled. During the Yuan dynasty, the building types prevailed in courtyards and hutongs, and brick carving was mainly applied to the roof ridge and connected parts decorated with beasts and other fine decorative elements. The application of brick carving was further expanded to a whole new space. It was during this period that brick carving began to enter the civilian residential architecture. By the Ming and Qing dynasties, society was no longer in a stable stage of unrest for a long time, the continued development of social culture and economy became extraordinarily prosperous, and the history of Chinese architecture also had a brilliant long-term development stage. During this period, brick carving was not only used in large numbers in large buildings such as palaces, gardens and temples, but also spread widely in civil residential architecture. Thereafter, the art of brick carving gradually integrated the people's simple ideas, concepts, morals and the pursuit of a better life.<sup>1</sup>



*Figure 1: A typical Huizhou brick carving<sup>2</sup>*

Huizhou brick carving has been an important part of traditional architectural decoration in Huizhou for thousands of years. Huizhou, abbreviated as "Hui", was known as Shezhou and Xin'an in the south of present-day Anhui Province. Huizhou Prefecture contains six counties, including She County, Yixian County, Xuning, Jixi, Qimen and Wuyuan. Except for the present Wuyuan County, which belongs to Shangrao City of Jiangxi Province, the rest belong to present-day Anhui Province. Huizhou's unique history and culture as well as rich building materials have created distinctive local style and rich architectural culture connotation under such geographical environment conditions. Huizhou brick carving originated in the Song Dynasty, and emerged and developed in the Ming and Qing Dynasties. After a large number of folk craftsmen worked hard to carve and create, Huizhou brick carving developed its own characteristics in continuous improvement and became a school of its own, becoming a beautiful brick carving masterpiece, which promoted the prosperity of Huizhou

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<sup>1</sup> Song, Zilong, and Shiyun Ma. *Huizhou Zhuan Diao Yi Shu = Kishu No sencho Geijutsu = Engraved Bricks in Huizhou District*. Hebei Shi: Anhui mei shu chu ban she, 1990.

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<sup>2</sup> 浅谈徽州砖雕艺术在现代艺术中的传承与创新\_文化, November 20, 2020. [https://www.sohu.com/a/432568080\\_717847](https://www.sohu.com/a/432568080_717847).

culture and art.

During the Song Dynasty, the society of Huizhou region gradually settled down and the people lived in peace and affluence. In such a general environment, people's life and the economy of the society generated demand, so the Huizhou region began to use brick carvings to decorate buildings. During the Song Dynasty, Huizhou brick carving inherited the ancient style of Huizhou stone carving. Its carving technique is mostly deep and shallow relief carving, with rough and simple lines, and is distinguished by its brightness, simplicity, simplicity and naturalness. During the Ming Dynasty, the simple style of society was greatly revived, and the social economy was also vigorously restored and developed. At this time, Huizhou culture and Huizhou merchants developed rapidly, and Huizhou brick carvers began to try to carve brick works with rich picture layers and colorful contents on square inch thick brick billets in order to solve people's demand for rich and simple decoration, to be applied to the decoration of building walls. During the Qing Dynasty, in the relative stability of several hundred years, the socio-political and natural economy of the Huizhou region continued to develop and prosper, the Huizhou merchant culture became popular, and extravagance in economic life and social politics once prevailed. Huizhou brick carving embodies the pursuit of richness and elegance, gorgeous and soft, and attention to detail in design and production. In fact, "Huizhou brick carving originated from the Song Dynasty. In the Ming Dynasty, it was still ancient and simple, with relief carving and single-level mainly. The Qing Dynasty tends to be multi-layered carving, fine skills, and the materials used are mostly water-rubbed bricks" is a fairly accurate summary of the style changes of Huizhou brick carving in the Song, Ming and Qing Dynasties. At the end of the Qing Dynasty and the beginning of the Republic of China, Hui merchants and Hui merchant culture were brilliant for a long time, and the extravagance in economic life

and social politics did not subside for a while. At this time, Huizhou brick carving was in its heyday, and the art of brick carving presented exquisite, complicated, rich, delicate and other characteristics.

In a broad sense, Huizhou brick carving refers to the art of green bricks and tiles for the purpose of decoration. In folklore, the common term is "trick"<sup>3</sup>. Brick carving is an architectural decorative art used for walls and roofs in buildings. In terms of sculpture techniques, it includes openwork, deep relief, relief carving, flat carving, round carving and other techniques. In the selection of artistic themes, it includes landscapes, words, birds and animals, humanistic stories, mythological stories, auspicious patterns and so on. To sum up, Huizhou brick carving is a special kind of clay with high iron content, processed by a variety of processes and calcined by low temperature to become a decorative craft art.

In a narrow sense, brick carving refers only to the carving in "trick", commonly known as "hard trick", which belongs to the post-kiln process, requiring direct carving on the whole brick. Carving brick is more time-consuming and labor-intensive, but the finished product is multi-layered, clear and delicate, suitable for decoration in parts of the building that often appear under the line of sight. The "soft trick", as it is popularly known, is the pre-kiln process. The kiln process is simpler and more convenient than the kiln process, this brick carving process is usually used clay plasticity or clay mold printing so that the brick adobe on the pattern, and then directly into the kiln for low-temperature firing. Although the pre-kiln process is simple and labor-saving, but the

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<sup>3</sup> Li, Jie. *Ying Zao FA Shi = Yingzao Fashi*. Beijing: ZHongguo shu dian, 2006.

carving is rough and the overall modeling level is less, only in the inconspicuous parts of the building for decoration.

In the study of ancient architectural brick carving in Huizhou, this essay has studied and analyzed three aspects of its carving themes, production techniques, and carving techniques.

The brick carvings of traditional Huizhou buildings are rich and diverse, and the main common carving themes are birds and animals, auspicious patterns, landscapes and words, characters and stories, etc.<sup>4</sup> The themes of carving patterns of Huizhou brick carvings often use metaphor, symbolism, harmony and allegory to achieve the perfect combination of spirit and form.

In order to express auspiciousness, Huizhou brick carvings with bird and animal motifs are mainly composed of dragon, tiger, lion, phoenix, crane, kirin, ao fish, goose, dog, horse, cow, sheep, monkey and rabbit. The brick carving of this theme is full of vitality, elegant, dignified, atmospheric, full of tension and strength, mainly used in the doorway, door cover, corner edge and other parts. In addition, Huizhou brick carving also adopts the imagery of "unicorn sending son", "two lions grabbing country ball" and "two dragons playing pearl" to express the auspicious meaning, and some of the images also adopt the Chinese harmonic Some of the images also use the Chinese harmonics to express the auspicious meaning. There are also many lion motifs in the brick carvings,

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<sup>4</sup> Li, Lihe, Yunlong Li, and Huilan Jiang. "Investigation of the Current Situation of Huizhou, China Na- Tional Scenic Spots and Discussion on Countermeasures for Future Development in the New Situation." *城市建设理论研究—园林景观* 5, no. 1 (2020): 26–28. <https://doi.org/10.26789/yljg.2020.01.009>.

such as lions tumbling, lions dancing against each other, lions rolling embroidered balls, and various lions in a seated posture. There are also descriptions of field life, such as herding cattle, raising chickens, pigs, and pushing carts. In addition to carving auspicious birds and animals, there are also lifelike flowers and birds. Huizhou brick carving often uses purely floral motifs, such as bamboo, pine, plum "three friends of the year", plum, orchid, bamboo, chrysanthemum "four gentlemen" symbolizing noble virtue. In addition, most of the Huizhou brick carvings use single pattern, suitable pattern, scattered flowers, folding branches, flowers, two-sided continuous, four-sided continuous and other expression techniques.



*Figure 2: Lion motifs in the brick carvings*

Huizhou brick carving with auspicious motifs mainly adopts some geometric pattern motifs, such as cloud pattern, spiral pattern, swastika pattern, back pattern, curly grass pattern, etc. Usually, one or two or three ornaments are combined into a new ornament, and then the combination is repeated up and down or left and right, or repeated four times to form a complete brick carving pattern. The brick carving of auspicious patterns tends to be simple, plain and delicate, with relatively simple content but strong auspicious meaning in the composition. The content of various auspicious patterns in Huizhou brick carvings is mainly the essence of human nature, natural forms, etc.,

usually expressed by symbols, metaphors, harmonies, fables and words. In addition, the auspicious motifs class brick carving patterns also include bogu, eight treasures, artifacts and text patterns. The auspicious patterns of Huizhou brick carving have a long and colorful history, and are closely related to folk customs, national totems and literati interests. It connotes good moral quality, and with its unique vernacular language and decorative style, it brings people infinite aspiration and pursuit of a better life and great spiritual trust.

Huizhou brick carving with landscape as the theme, usually the pattern is mostly taken from the representative beautiful natural scenery of Huizhou, such as "Huangshan Mountain cloud and sea", "Welcoming pine" and so on. These themes are very popular among the public, and the craftsmen are very familiar with these themes and are good at using them. Therefore, these carvings not only show the beautiful natural scenery of Huizhou, but also reflect the strong local cultural atmosphere.

The Huizhou brick carvings with the theme of characters and stories also account for a large proportion, mostly with folk stories, opera atlases, folk customs, anecdotes of famous people, religious myths and legends, literary stories, etc. Most of the Huizhou brick carvings have strong folk colors, not only the students studying hard, the merchants traveling far and hard, the elegant paintings of literati poets, the noble life of emperors and generals, but also the village girls weaving hard, the shepherd boys herding cattle outside, the farmers cultivating daily, the woodcutters cutting firewood on the mountain, and the folk color scenes such as the children playing in groups of three or five, the festival of dragon and lion dances. Interestingly, no matter which subject matter, from the overall design, composition and traditional techniques, we can find the same language of excellent traditional cultural elements in Huizhou opera,

Huizhou wood carving, Huizhou prints and so on among them.

Huizhou brick carving process can be mainly divided into pre-kiln process and post-kiln process. The pre-kiln process and post-kiln process can also be called brick sculpture process and brick carving process. Before the kiln process is an ancient kiln processing process, it is first pinched with clay molding or pressed out with a mold ornament, and then put into the kiln firing out of the kiln is completed. It is characterized by simple processing, but the modeling levels are few and relatively rough. It is usually applied to architectural components at a distance of sight. The post kiln process is a technique of carving on the basis of the complete brick. The post-kiln process is time-consuming and labor-intensive, but the finished product is multi-layered, delicate, and exquisite, and is usually used for architectural components that are closer to the line of sight. From the brick's entry to the kiln, from the brick's selection to the carving, each stage, each process, each link, all show the hard work, sweat and wisdom of Huizhou craftsmen for thousands of years.

Huizhou brick carving requires different carving techniques due to the different forms of expression, contents of expression, volume and levels. Even the shaping of different parts of the same object requires different techniques. The carving techniques of Huizhou brick carving mainly include plane carving, shallow relief carving, deep relief carving, hollow carving, round carving and so on.



*Figure 3: Plane carving of a flower*

In the plane carving, the concave bottom and convex carving surface is smooth and even, and the most carved lines on the convex carving surface, the depth of concave and convex is about 1 cm. The texture is simple and exquisite, with a sense of rhythm. Shallow relief carving convex surface is not very obvious, there is no hollow part, generally will be carved on top of the concave flat bottom some patterns, so that it looks more layered. Deep relief is a three-dimensional sense of relief, in some positions will take the hollowing process, basically there will be three levels. This kind of brick carving will often be used in some medium-sized traditional buildings to decorate the top. Openwork carving, also known as see-through carving, carving will have some difficulties, and the three-dimensional effect is stronger. It will be hollowed out in many places, basically there are about 5 levels, and the skill and precision required is also higher. It is basically carved out on a five-centimeter brick, except on the back and the top where it is not normally seen, and other places will be carved out together with the picture, in some rich families can often see this brick carving on the doorway. In addition to the side of the building with the hollow carving, other places are carved with the hollow carving. The three-dimensional picture can be viewed from all angles, and

in some places, after being carved with great skill, it is even possible to rotate some of the brick carvings such as doors and windows. The round carving is a three-dimensional brick sculpture that is carved on the front and back, left and right sides, and has a real sense of volume. Generally, the audience can see all sides of the object from different angles through the diagonal supports of the building.

Most of the traditional Huizhou buildings are decorated with Huizhou brick carvings, and the corresponding Huizhou brick carvings and carving subjects are different for each part of the buildings.<sup>5</sup>

The brick carving decoration of the roof area mainly includes the tile drip part and the ridge part. There are not many tile pendants and drip patterns in the Huizhou region, and its main decorative patterns are some specific animal patterns and plant patterns. These patterns are now unified into one or several specific patterns, which makes the decoration more convenient and ensures the quality and image of the tile pendants and dripping water. The tile pattern of Huizhou region is mainly divided into three forms: animal face pattern, plant pattern and auspicious character pattern. From the word "Wang" in the middle of the tile, we can see the pattern of the animal like the head of a tiger, which is found on the eaves and doorways of Huizhou region. It extracts the characteristics of various animals, integrates the commonality, describes the simplification, exaggerates the elements, and changes the shape, and creates the pattern of beast face with this change. In ancient times, people believed that with the help of

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<sup>5</sup> Feng, Li. "Column Carving Art in Ancient Huizhou Architecture." Proceedings of the 2018 8th International Conference on Social science and Education Research (SSER 2018), 2018. <https://doi.org/10.2991/sser-18.2018.20>.

animal motifs they could communicate with the gods to help people get rid of their sufferings and misfortunes. With the development of aesthetics, later people hoped to convey an auspicious wish of happiness by means of animal motifs. The plant pattern tiles mainly include chrysanthemum, plum blossom, lotus flower, peony, begonia, narcissus, pomegranate, gourd and other plant patterns. Because of the influence of Confucianism, Huizhou people most often decorate tiles with plum blossoms, lotus flowers, chrysanthemums, orchids and other botanical patterns to express the pursuit and aspiration of the way of a gentleman. Among them, the lotus botanical pattern is the most evolved botanical pattern. In Chinese history, Buddhist culture was extremely prevalent, and the image of lotus is a symbol of Buddhism, which has profound religious historical significance and reflects the ancient people's sense of worship for the lotus. The long history of lotus botanical pattern has been the incarnation of religious philosophy, and under the influence of this thought, the connotation and form of lotus botanical pattern presents adaptability and inclusiveness. In addition, the lotus plant pattern has been widely used in folk architecture because of its unique aesthetic and unique intrinsic value. The auspicious character tiles in Huizhou region mainly use the character "longevity" as the pattern design, and people never stop expecting longevity in their lives. People will eat "longevity noodles" on their birthdays, old people will be called "longevity" on their birthdays, and congratulatory messages from younger generations to their elders on festivals are often with the word "longevity", such as. " Live Longer than South Mountain" and " Good fortune and longevity". All these can be seen that auspicious words have become a kind of good luck, and longevity represents people's good wishes for longevity and health.

Ridge brick decorations in Huizhou traditional buildings are mainly embodied in ancestral gate towers, corridor bridges, pavilions, etc.; for example, Ye's Branch

Ancestral Hall in Nanping Village of Yixian County, Bao's Ancestral Hall in Tangyue Village of She County, Wu's Ancestral Hall in Beiyan Village of She County, Zhou's Ancestral Hall in Changxixia Village of She County, Da Guan Ting in Xu Village of She County, Sha Ti Ting in Tang Touch Village of Huizhou District, Tang Touch Gaoyang Corridor Bridge, etc. The roof ridge decoration of traditional Huizhou buildings is elegant and solemn, and it is self-contained. At the two ends of the main ridge, the kissing beasts are generally adopted, such as "ao fish", "feeding chicken beast", "looking at the sky dog" and "looking at each other dog".<sup>6</sup> Ridge beast. The ridge decoration is an important element to shape the elegant and solemn appearance of Huizhou architecture, and the exquisite brick carvings such as ridge animals on the ridge make the appearance of the building more solemn and exquisite, which not only enriches the skyline contour line, but also makes the overall appearance of the building not lose its liveliness.

The brick decoration of the door and window parts mainly includes the door tower part and the leakage window part. The brick carving decoration of the doorway of traditional Huizhou building mainly consists of door cover and plaque. Among them, the door cover includes fish kiss, tile, moon beam, door pin, horizontal square, etc., and the plaque includes plaque, hanging down, pendant column, etc. The Huizhou people gradually improved the functional components of the building, and the traditional forms of pagodas and gates evolved, eventually producing brick decorations that only retained the "beauty elements" of the traditional building components. Brick decoration is an

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<sup>6</sup> Sun, Qiang, and Cong Cong Guan. "Existing Condition Analysis and Countermeasures of Huizhou Traditional Architecture Construction." *Applied Mechanics and Materials* 209-211 (2012): 18–22. <https://doi.org/10.4028/www.scientific.net/amm.209-211.18>.

inseparable link between the good life and the blessings of personal life, and a cultural expression of people's pursuit of individuality and beauty.



Figure 4: Door tower part<sup>7</sup>

Leaky windows are brick carved windows on the wall that make the inside and outside transparent and beautiful. In ancient times, Huizhou has been famous for its commercial and cultural prosperity. During the Ming and Qing dynasties, the commercial culture of Huizhou reached its heyday. Most of the rich merchants and literati who entered the officialdom chose to build houses back home. Due to the small area and large population in Huizhou, the form of courtyard architecture can only choose the form of high density, and the setting and application of the leaky window can consider the privacy and permeability of the internal space of the courtyard, in addition to the economic support and craftsmanship of Huizhou merchants. The visual form of the leakage window of traditional Huizhou residential architecture mainly produces a

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<sup>7</sup> “徽州砖雕的制作方法 with 建筑用途.” 徽州砖雕的制作方法 with 建筑用途- 古建中国. Accessed May 4, 2022. <https://m.gujianchina.cn/news/show-6470.html>.

changing and hidden visual scene through the integration of natural factors such as light, shadow, wind and rain. The mutual reference between the leaky window and the landscape increases the richness of Huizhou traditional residential architecture, improves its visual feeling, and gives the courtyard a certain depth with the combination of reality and imagination. In addition, there are various shapes of the funnel windows, such as round, square, fan, leaf, and so on. The windows are also carved with plum, bamboo, pine and other patterns, which decorate the whole building with simplicity and elegance and exude a strong bookish atmosphere. The outer outline of the windows of traditional Huizhou architecture is in various forms, including round, fan, ruyi, vase, pomegranate, begonia, bell, polygon, square, etc.<sup>8</sup>, and various irregular single geometric shapes. The decorative patterns of Huizhou traditional building window are mainly composed of natural patterns and geometric patterns. The natural patterns mainly include animals such as bats, lions, cranes, deer, tigers and dragons, plants such as bamboo, pines, plums, grapes, pomegranates, gourds and plantains, as well as stories of characters such as Tao, Buddhism, Confucianism, Romance of the Three Kingdoms, Dream of the Red Chamber and Water Margin. The geometric class is not so much mixed, mainly with straight lines and arcs for the arrangement and repetition of the combination for the pattern.

Huizhou brick carving is not just an ancient folk craft, it also has a strong cultural connotation and unique ideology. Huizhou brick carving is the embodiment of a spirit, the wisdom crystallization of every person living in the land of Huizhou, and it closely

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<sup>8</sup> “Cultural Treasure of Traditional Architecture-Collaborative Innovation of Inheritance of Plaster Carving of Guangzhou.” 2017 International Conference on Humanities, Arts and Language (HUMAL 2017), 2018. <https://doi.org/10.25236/humal.2017.75>.

unites all aspects of the Huizhou region, touching on a wide range of fields, the many styles of brick carving, and the huge amount of information that is difficult to analyze and summarize in a comprehensive and detailed manner.<sup>9</sup>Therefore, the author believes that many aspects of Huizhou brick carving still have great value for exploration and research, and that further detailed and in-depth research can be conducted in terms of architecture, carving, cultural connotation, and locality.

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<sup>9</sup> Zhou, Yufeng. “Research on Sustainable Development View Based on Huizhou Brick Carving.” *Landscape Architecture* 2, no. 1 (2019): 1. <https://doi.org/10.31058/j.la.2019.21001>.

Yinlei Pang  
MSAAD, Columbia University, United States  
BArch, Southeast University, China  
Tel: +1 5184282881  
Email: [yp2600@columbia.edu](mailto:yp2600@columbia.edu)  
Mailing Address: 110 Morningside Drive, Apt 64C  
New York, NY, 10027

