

As my mainly tool of thinking, Chinese characters usually bring new meaning when some individual letters meet each other. It is just in that process, the meaning beyond single vocabulary emerging, which contains not just two old meanings and one new meaning, but also the frozen process of reacting. Reread the vocabulary form this perspective, we can perceive the essence of construction, which is the initial power of architecture.

When I treat architecture as a subject, six major points can be separated. Through constructing ( ) a void ( ) at a certain time ( ) and place ( ), the implication beyond this behavior is try to build an isolated utopia ( ) within vernacular context ( ) ). In that process, new identity is polished from old unity, which form new unity together with its womb ( ) ).

Six points for an architecture as a subject: "Trace identity out of unity "



01

CLOUD NURSERY Classic New York landscape reborn with nature

2019.6-2019.8 GSAPP Summer Project Collaborator: Qifneg Gao Instructors: Jorge Ambrosi, Gabriela Etchegaray Site: Central Park, New York, USA

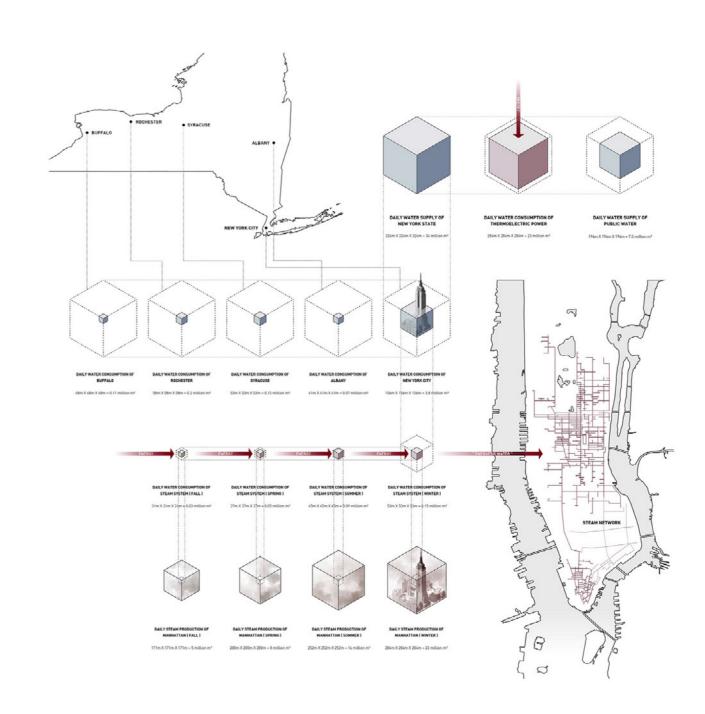
## Published in GSAPP'S ABSTRACT 2019

With the development of Urbanization, we are trapped in steel and concrete, and our connection with nature is greatly weakened. Today, we get water from pipes rather than rivers, and we can feel the wind from air conditioning rather than fields. In this studio, we think It is necessary for contemporary citizens rediscover the relationship between urban and nature. Steam, as a kind of water contain energy, running below NYC to transfer energy from nature to metropolis. Through releasing steam in Central Park, the monument of nature, a heat-landscape is created to nurture the awareness of city in relation to its natural origin. In this way, the Cloud Nursery serves as a receptacle for the natural conditions from which the city emerged, and connects us with a paradigmatic vision of nature and city as a whole.

### STARTING WITH STEAM IN NEW YORK CITY

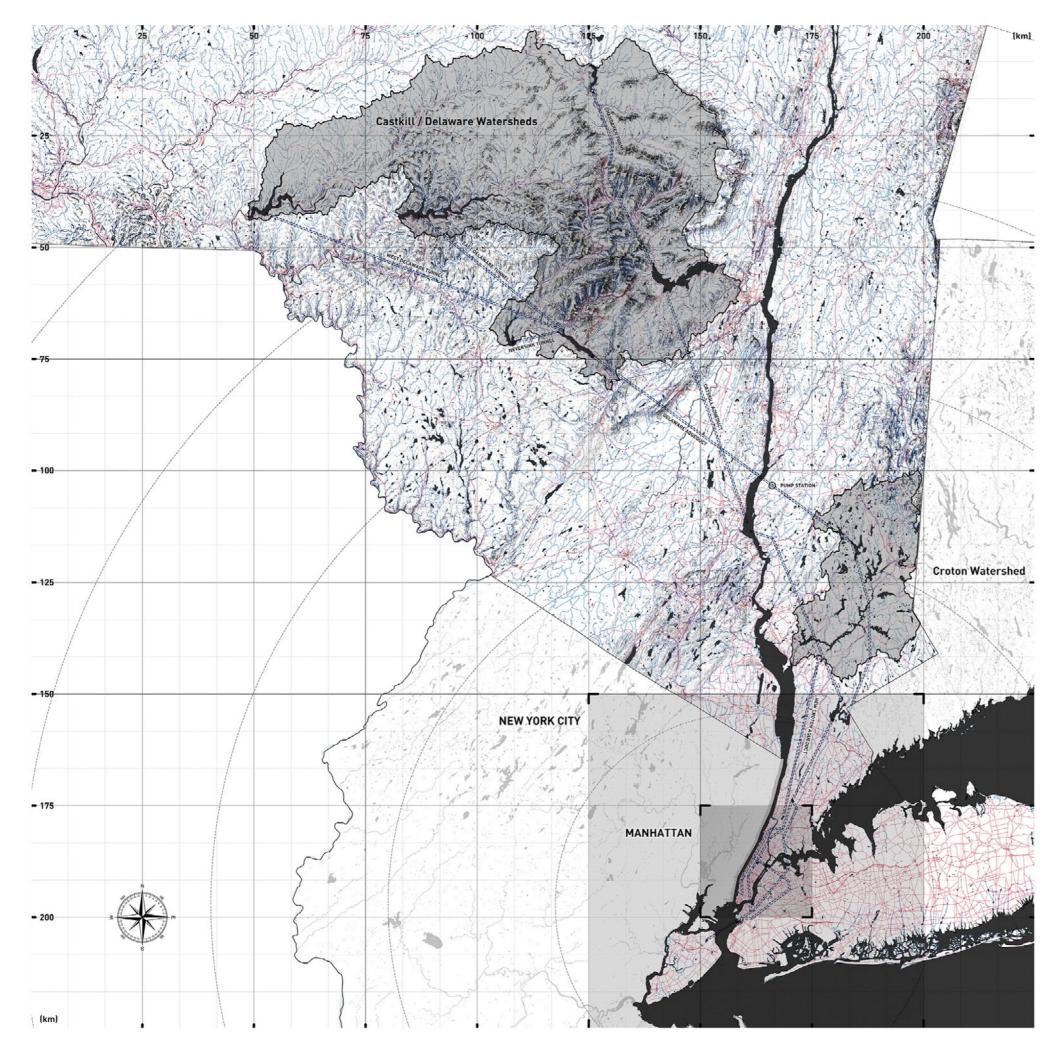
Will more than 100 miles steam pipes, the NYC steam system is the largest commercial steam system in the world, in fact bigger than the next nine combined. Before the establishment of the steam system, every building had to install its own gas boiler for heating, which made the skyline of Manhattan totally different from now days. So much smog floated above the city, which had caused a lot of climate problems. Nowadays, the steaming orange-white stakes show the existence of steam system to visitors and local residents. I never seen a streetscape like this before in other cities. Even artists will create some interesting works around them. This kind of spectacle offers NYC a distinctive identity from other cities. Starting with steam in NYC, we try use design to make people rediscover the relationship between nature and urban.





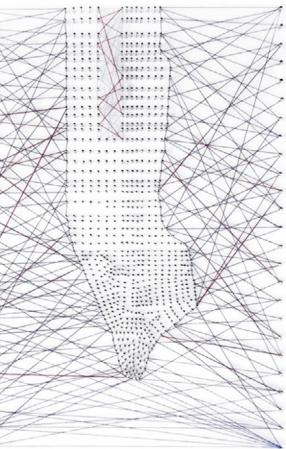
### WATER + ENERGY = STEAM = ENERGY + WATER

Steam, as a status of water, contains huge amount of energy and conveys them from nature to urban area. We perceive water as the vessel of energy, which work as steam state. The New York State consumes 34 million cube meters of water per day, among which most part (23 million) are used to generate electricity. Compared with other cities in New York state, New York City consumes the biggest part of water, that is 3.8 million cube meters. We use red color to represent energy involvement. The energy is filled into its vessel through electric cogeneration and steam generation. As we also can see that steam system distributes mainly in downtown and midtown area, which are buried underground and invisible to citizens.



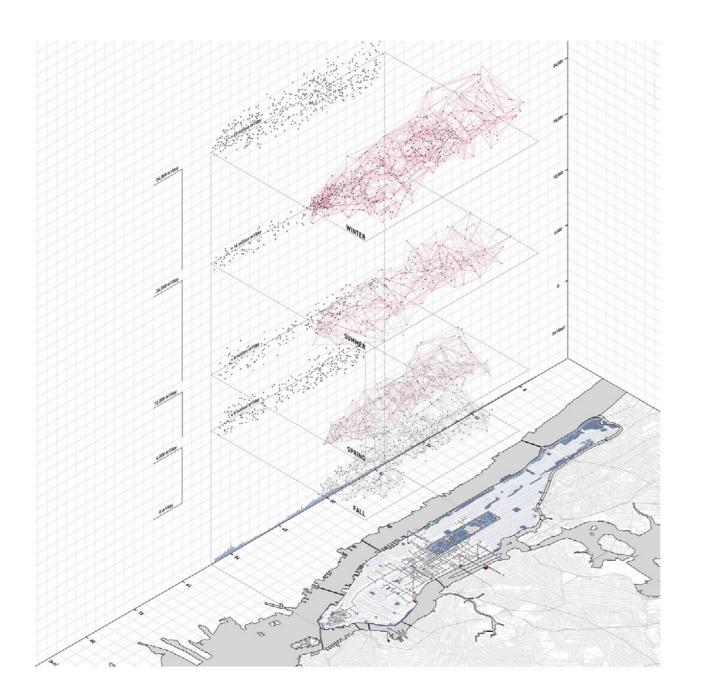
Domestic water in Manhattan is constantly transported from northern part reservoirs including Castkill/ Delaware Watersheds and Croton Watersheds, through tunnels, aqueducts and pump stations. The NYC is nourished by tracts of natural land. The blue line representing water is gradually transformed into red line representing the road, which imply how our city extract natural resources as a crazy machine.

The concept model illustrates the water and energy flow in nature and the Manhattan. The blue lines represent natural water and red ones are energy. The combination of the two elements turns out to be invisible steam in blocks, supporting the running of Manhattan. Detached from nature, we always acquire water from water pipes, but not river; acquire breeze from air conditioner, but not field. What our project do is to pour the energy contained in steam into nature again. Through a heatinglandscape, we try to discuss new relationship between nature and city.



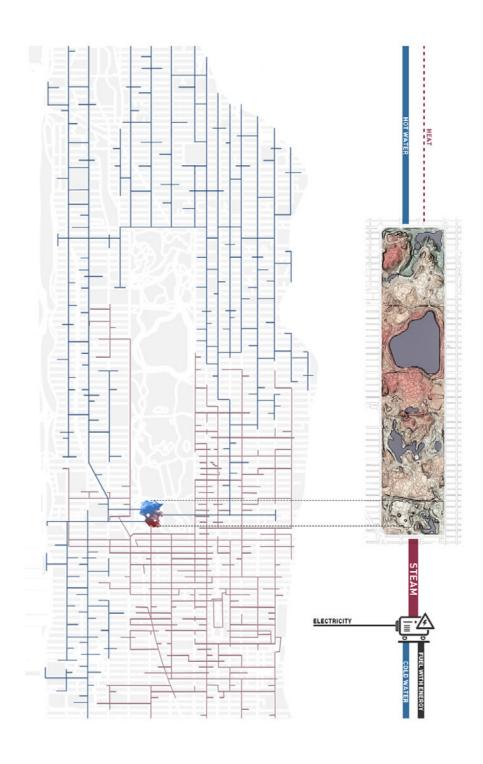
Pins and lines model on canvas 30cm x 40cm

### MANHATAN AND ITS WATER



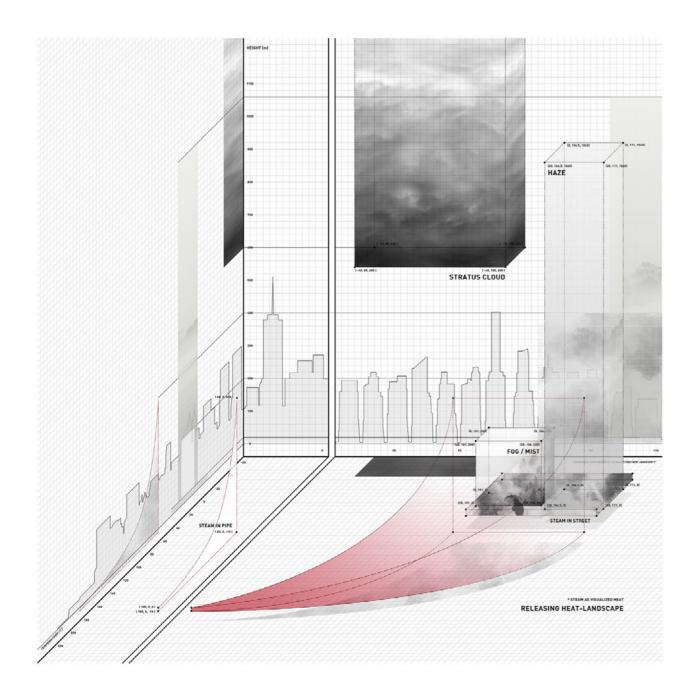
## STEAM CONSUMPTION IN NYC

According to the collective data from Co. Edison, the major clients of steam system are the massive buildings like skyscrapers and public buildings. The larger the building is, the more steam it consumes. The amount of used steam varies from season to season. mainly used in Winter. Based on these facts, we visualized the variation of steam consumption in different seasons by quantifying the steam volume. The Z axis represents the amount of steam used per hour, so the Winter cloud floats in a highest place, then the summer, and Spring and Fall clouds' height are similar. The distribution in z axis also coordinate with the skyline of Manhattan showed on one side. Meanwhile, as we can see, all the clouds float above the downtown and midtown Manhattan. It matches the location of steam system at present.



Steam system is a environmental-friendly, and also an economical system. With cogeneration technology, it both reduce air pollutants and carbon dioxide emissions. But it is inefficient in low rise buildings compared with hot water. We want to transfer steam system into hot water system in northern Manhattan through creating a convert-node to connect two systems. Central Park, a highly controlled nature area, and a monument of nature, will be the site of our project. We hope that the process of separating water vapor and energy can create a new landscape in the most famous natural landscape. Located in the lower terrain near the midtown, the project is easy to reach old steam system and form contrast with midtown skyscrapers.

TRANSFER STATION IN CENTRAL PARK



## RELEASING HEAT-LANDSCAPE

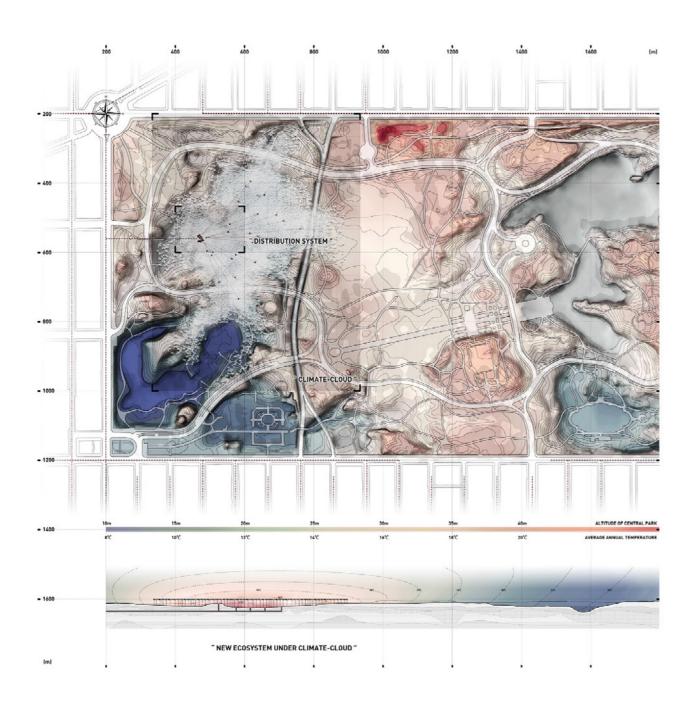
In order to get deep understanding of different status of water in urban space, we categorized different status of water in one coordination system. The x, y, z axis separately represents temperature, coagulation nodule concentration and height. Different status of water including haze, stratus cloud, fog/mist, steam in pipe and in street, locates separately in the coordination. The red volume shows the heating-landscape existance potential during the process pouring energy within steam back to nature. With the rapid decrease of steam temperature, its visibility is greatly enhanced.





# CLIMATE CLOUD

Discovering that steam is the vessel of energy and the symbol of industrial civilization, we want to separate them apart within a natural area. Making full use of the released heat and saturated water vapor, we give more bio-diversity back in central park, which bio-diversity exterminated by industrial civilization when it extorts energy and water from whole natural world. In the process of releasing high-temperature steam from steam pipeline to our environment, energy and water will be separated rapidly. Energy will heat the air. Saturated water vapor will combine with suspended particulate matter in the air to form visible mist. In this way, a new high-temperature and 100% humidity micro-climate will be created in city.



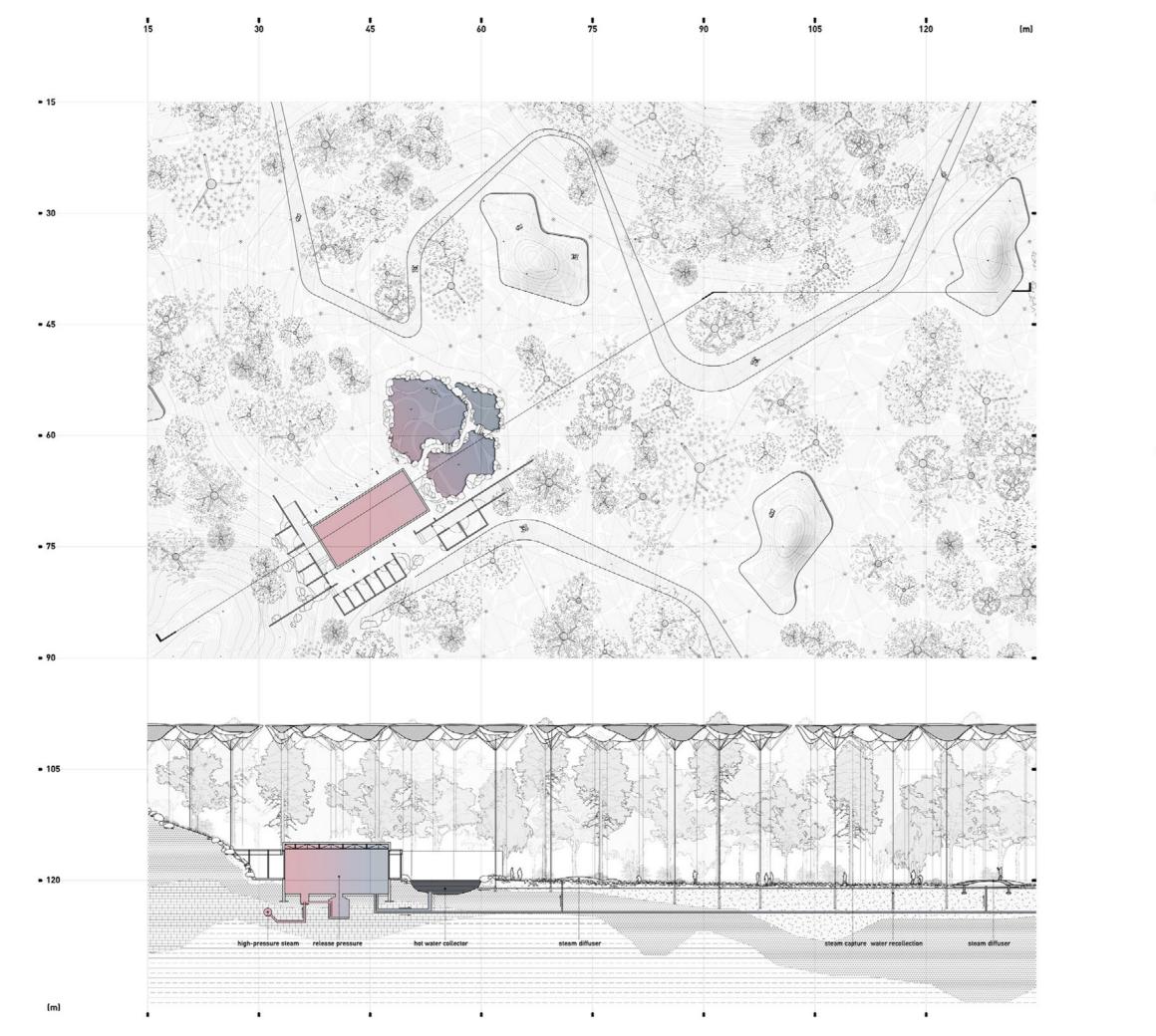
## CLOUD NURSERY

Our project works as a plant nursery. We use helium balloons to create a boundary with everchanging gaps, which keeping most of water vapor below but also allowing some can escape to form floating mist ocean. Energy contained in steam is released as heat under it, with the humidity that steam creates, a new ecosystem within the temperature range of 16 centigrade to 20 centigrade is formulated. For citizens running in the upper layer in the central park, they will see steam permeate upward through the gaps between balloons, they rise, diffuse and form a sea of steam. Visitors are able to be aware of the steam sea but have no conscious of what is happening downside. Below balloons, human can wander in nursery without clear sight of surroundings while seeing unusual plants in NYC.

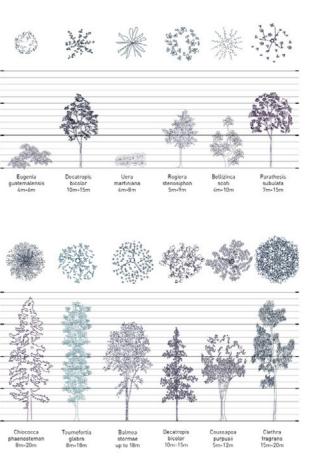




UNDER MIST OCEAN



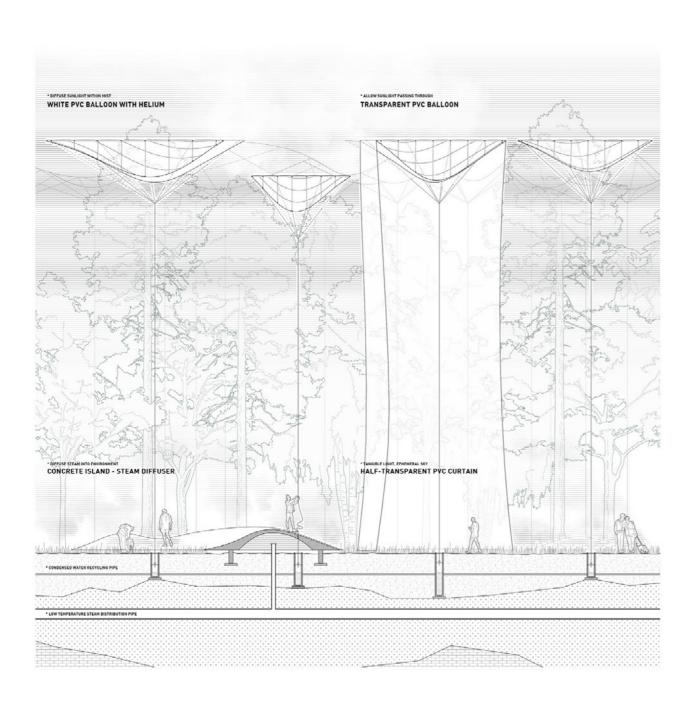
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### SPECIES & HOW SYSTEM WORK

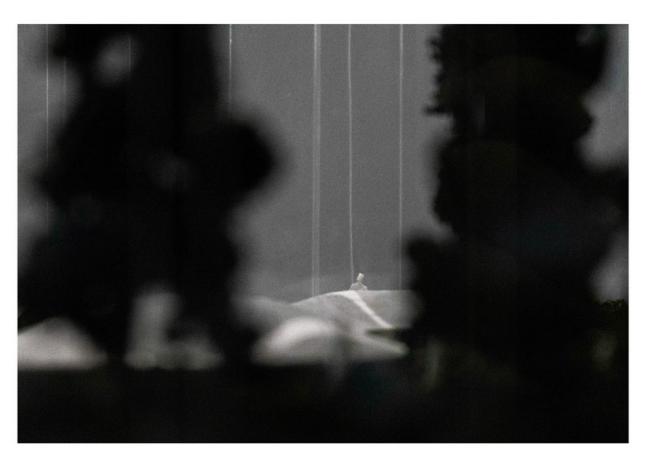
This micro-climate is suitable for some species which never appears in the NYC to survive. Some rare species of plants normally live in cloud forest have possibility to be nourished under our floating boundary.

The station get steam from the system and lower the pressure which releasing hot water and low temperature steam at the same time. The released water and energy will cooperate to maintain the temperature and humidity of our micro-climate. Low-temperature steam is transported to concrete islands and released into the air. Mist condensate collected under balloons and then transported back to pool through underground pipelines. Coordinating with the organic ecosystem inside our project, the steam vents are designed as concrete island, spreading on the ground. After cooled down, steam is released from the organically shaped boundary slowly and then fulfill the entire space. The island also serves as infrastructure, people can lean on it, sit beside it and touch its warm surface.



## DETAIL OF FLOATING BOUNDARY

All balloons will have its own Carbon fibre skeleton and PVC surface. Most of them will be white one, which can diffuse sunlight within mist, providing enough light for plants to grow. Some of them will be transparent one with anti-water curtain, which creates spaces with clear sky without mist. When people under balloons drag the string, the slight sway will change the gap space and furthermore the light condition, at the same time releasing more mist and change the scene of mist ocean above balloons. This interaction between human being and balloons make this scenery even more vivid and vibrant.





# MODEL PHOTO FROM BIRD VIEWPOINT

MODEL PHOTO FROM HUMAN VIEWPOINT

02

FLOWING STILLNESS A lakeside public hall made of concrete

2019.9-2019.12 GSAPP Fall Project Architecture Design: Individual Project Instructors: Paul Preissner, Melissa J Frost Site: Oakwood Beach, Chicago, USA

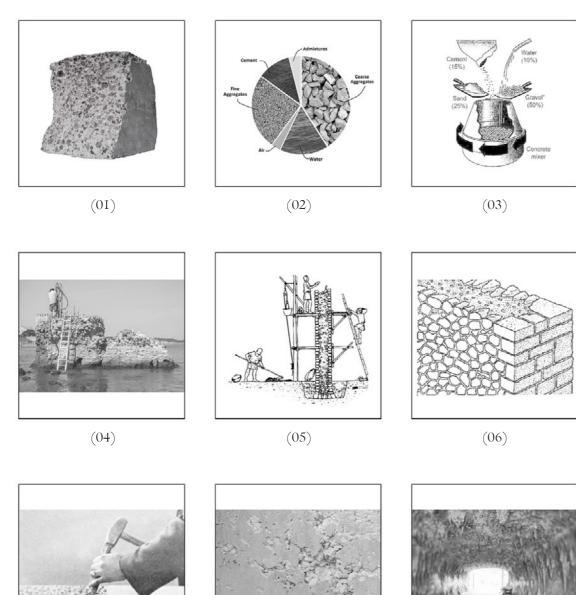
Published in GSAPP'S ABSTRACT 2019

This project starts from the research of one material. With my choice, concrete, I focus on its essence as artificial mixture of sand and aggregates. Knowing that two main factors decide the final form is its aggregates and formwork, I develop my material trial based on two reversed concept, temporary aggregate and fixed formwork. A standard box(6m\*6m) filled with sand is used as the units' formwork. Through digging in negative void space in wet sand, concrete's fluidity can be expressed with the help of gravity. Every unit have clean surface, which shows its identity as artificial thing, and cave-like surface, which shows its essence as a fluid stone. Based on these units, a new building language of concrete is developed. Architects can write brand new composition with nature and human together.



### STARTING WITH CONCRETE

As an artificial mixture material, concrete can be spread and poured into molds to form a stone-like mass on hardening. The most important materiality of concrete is its fluidity and hardenability. When we look at a concrete block, we will notice that the section shows its essence as a mixture, and its stonelike hardness. At the same time, we will notice that its plane façade, which shows its nature as an artificial material. In the process of casting, formwork is the most important thing which define the form of concrete. Except that, physical treatment on surface and chemical reaction under surface can also bring changes of form to concrete. When we look back to when concrete first used in human history, roman usually built formwork and concrete together, which means the formwork also express itself with concrete.



(07)

(08)



(09)







Based on the research of concrete, aggregate and formwork are two major things which define form of concrete. I choose two concepts to develop my material trials, which are temporary aggregates and fixed formwork. In most of time, we use solid aggregates to make concrete can resist strong compression. Through using ice as aggregate, the releasing heat of hardening melt the ice. The clean section of the block shows the fact that cement use every water within it, which bring water can be used in creating new concrete casting process. Melted wax and burned paper bring two kinds of different space within concrete blocks, which enlighten me use intermediate state of concrete to create marvelous space.

(01) TEMPORARY AGGREGATE: ICE

(02) TEMPORARY AGGREGATE: WAX

(03) TEMPORARY AGGREGATE: PAPER

### TEMPORARY AGGREGATE



(01) FIXED FORMWORK: DIRT



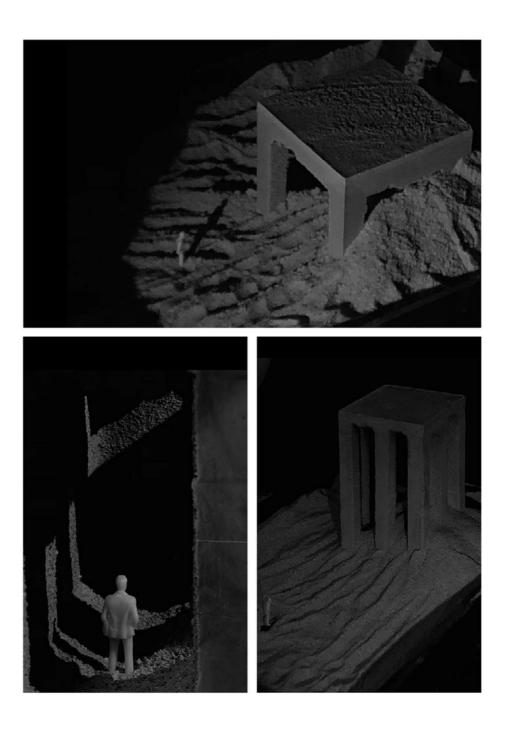
(02) FIXED FORMWORK: WAX



(03) FIXED FORMWORK: SAND

## FIXED FORMWORK

In three experiments with the concept of fixed formwork, I choose dirt, wax and sand as formwork. Gravity bring natural shape to concrete with the help of loose formwork material. In the second experiment with wax, concrete's temporary materiality as a kind of fluid was frozen by time. In the first experiment and the third one, the invisible gravity was shown by two kinds of material with fluidity. In these six experiments, I work with earth materials and basic processes and configure them into a structure that does not reference or represent anything, it's not an abstraction or a metaphor, but exists as a physical reality, it is it. The very reality of the architecture lays with the material produced and the process of its production.



## HUMAN-SCALE SAND BOX

Bring the scale into human size, I crated a huge sand box(6m\*6m\*6m) to cast several structures shaped by sand and box inner façade. In the process to create void in sand, I have to add water into sand to make them can be shaped. The loose and porous nature of top surface sand makes the ceiling of structure present an ancient cave-like surface. With cave-like inner surface and clean outer surface, the contrast between concrete as an artificial material and its nature as a mixture of natural materials is emerging. Brief columns and walls bring the reality of construction without redundant reference and representation.





(01)







(02)



# DEVELOPE SAND BOX PROPOSAL

Human-scale sand box allow people to dig out a structure form earth. The manmade structure can be gradually seen as a natural object by people in the digging process. With 6m as the basic modular, I make several units to show different way of resisting gravity. Different units can be assembled together to create a sequence. In this way, the new building method can be viewed as the way to create letters, architects can use the new language to write their own composition.

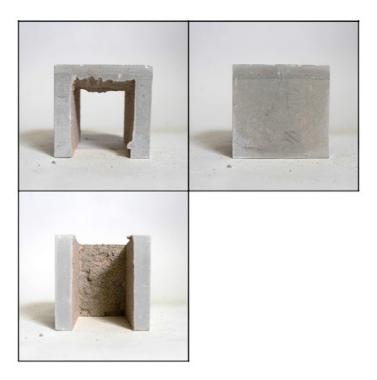




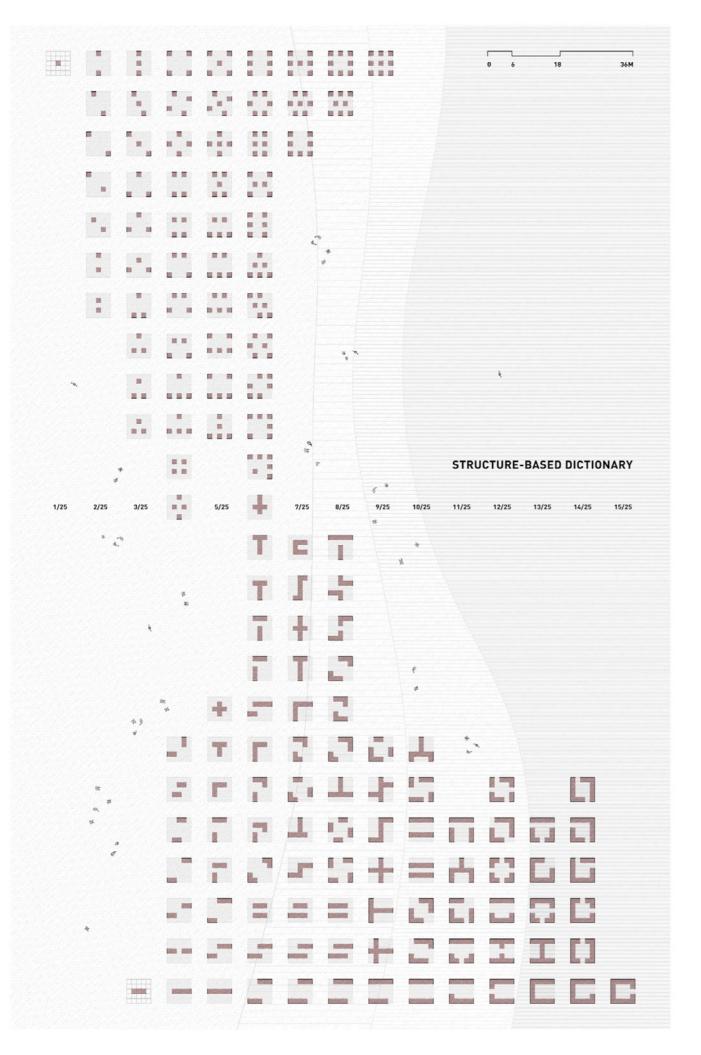


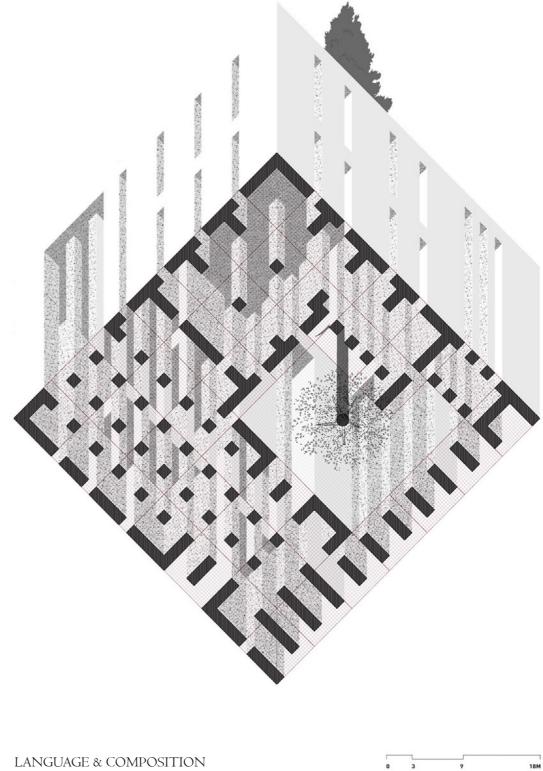


(04)



(05)





### LANGUAGE & COMPOSITION

architects to find the specific self-standing letter they need. I chose some of them and write my own composition on right. Through the contrast between sand surface and clean surface, the finished structure has a contradictory space sequence compared with the sequence we read from plan. Through organizing the contrast as rhetoric, I create a new building in a real site.

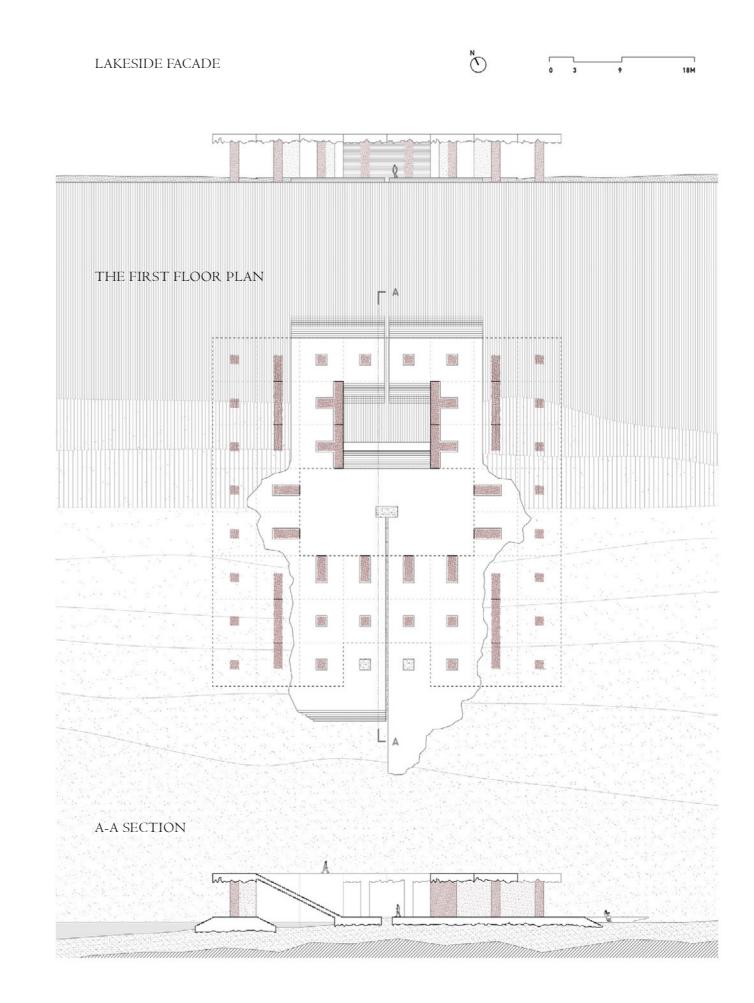
Based on the ratio of area connected with earth to area of ceiling, I develop a alphabet to help

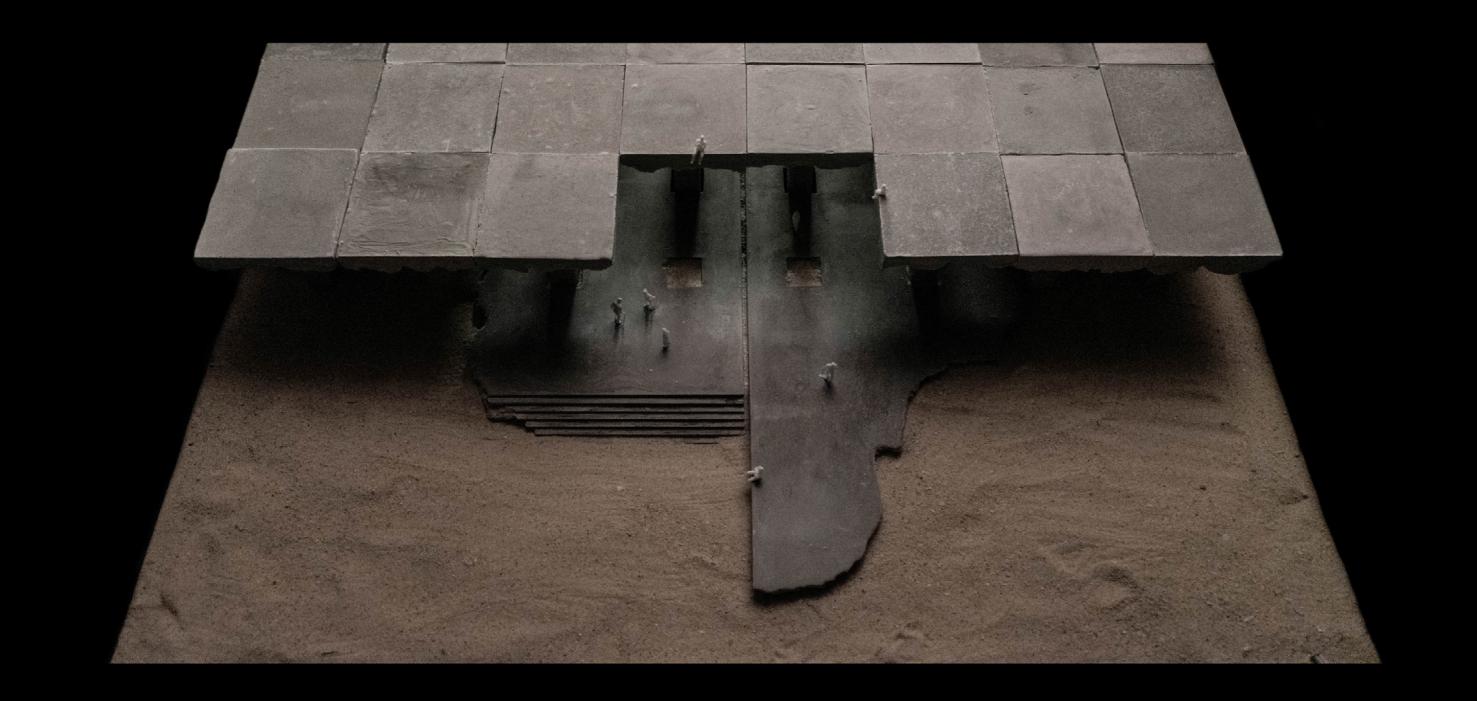
18N



### THE PUBLIC HAL

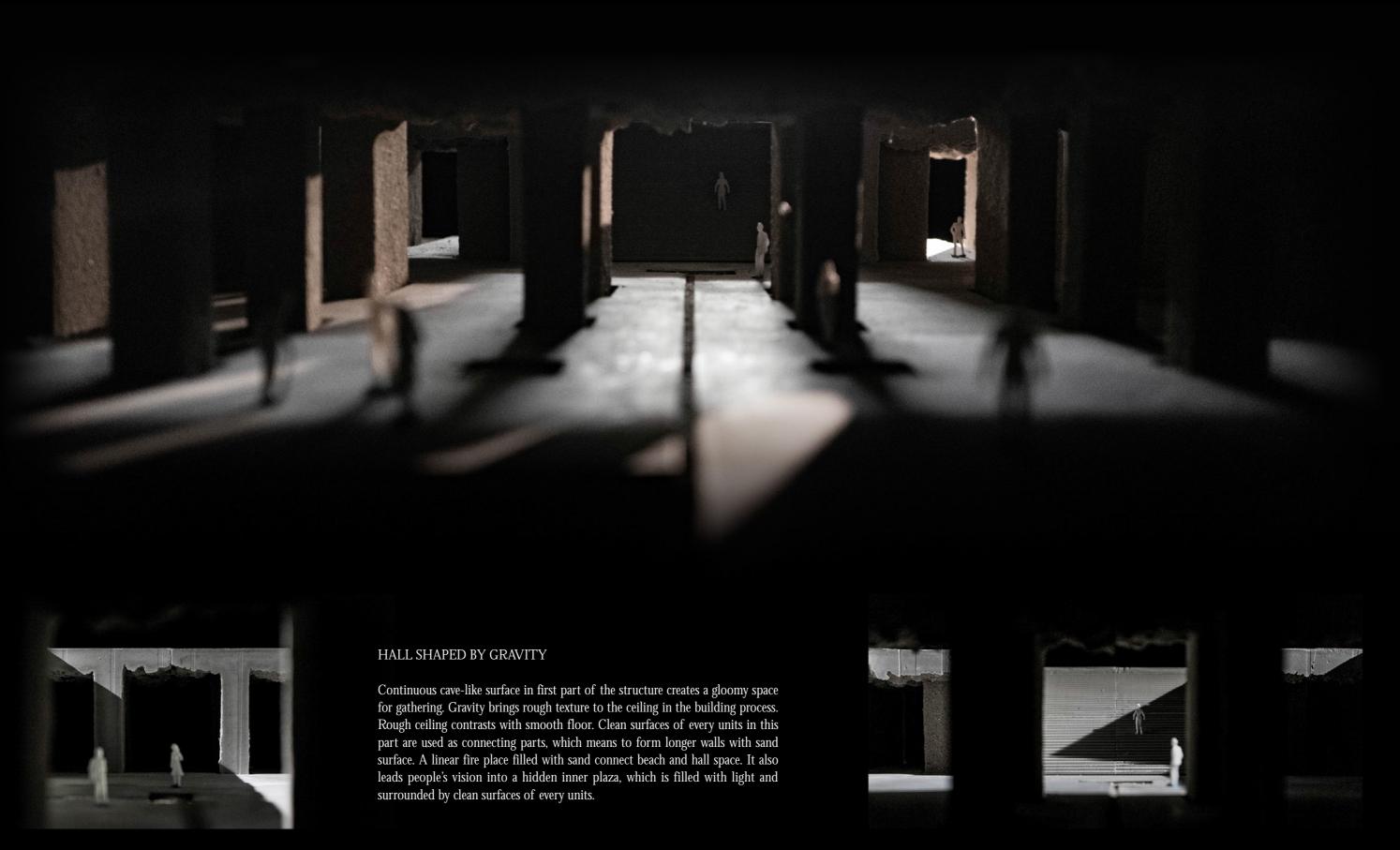
The history of modernity is the history of democracies and this history of democracies is the history of the Public Hall, which exists as possibly the most confused of all contemporary programs; lost of any purpose, both intended to soften interactions and formalize them. The hall is the truly inauthentic program in todays world, unable to be anything else but a host to communal social space, collective experience and unpracticed democracy. It is an embassy of expectation within the urban space; always populated by locals. Located in Oakwood beach in Chicago, the architecture work as a public hall. The design using unadulterated excavated materials, and simply approaches towards structure. The user populations of weary residents, recreating foreigners and goal-driven transients opens a world of confusing social space, transactions and negotiations which needs a proper home.

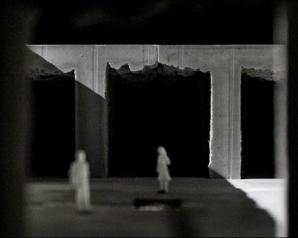




## FLOWING STILLNESS

Using sand on beach and artificial panels as formworks, the entrance platform seems like flowing out from inner space. The natural curve of boundary implies the powerful tension of time. Stairs on left cut the panel like a knife shows Human behavior's intervention to nature. Clear roof boundary also implies how we lift a brief shelter to resist natural power from anywhere.





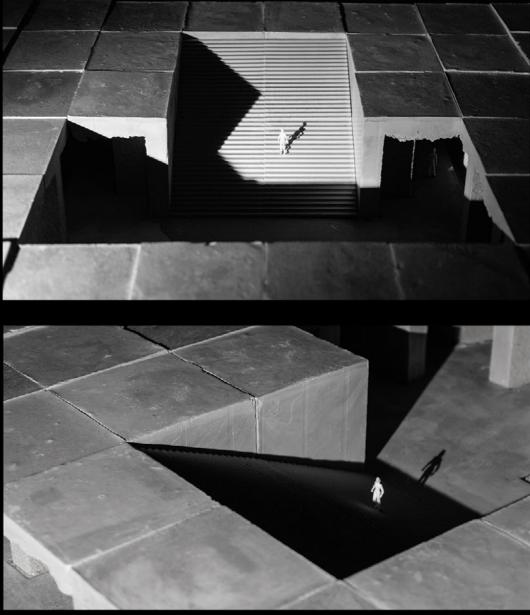


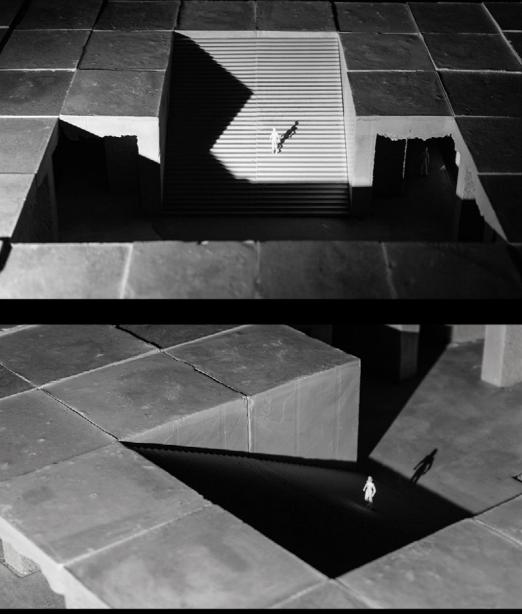




# THE HIDDEN ROOM

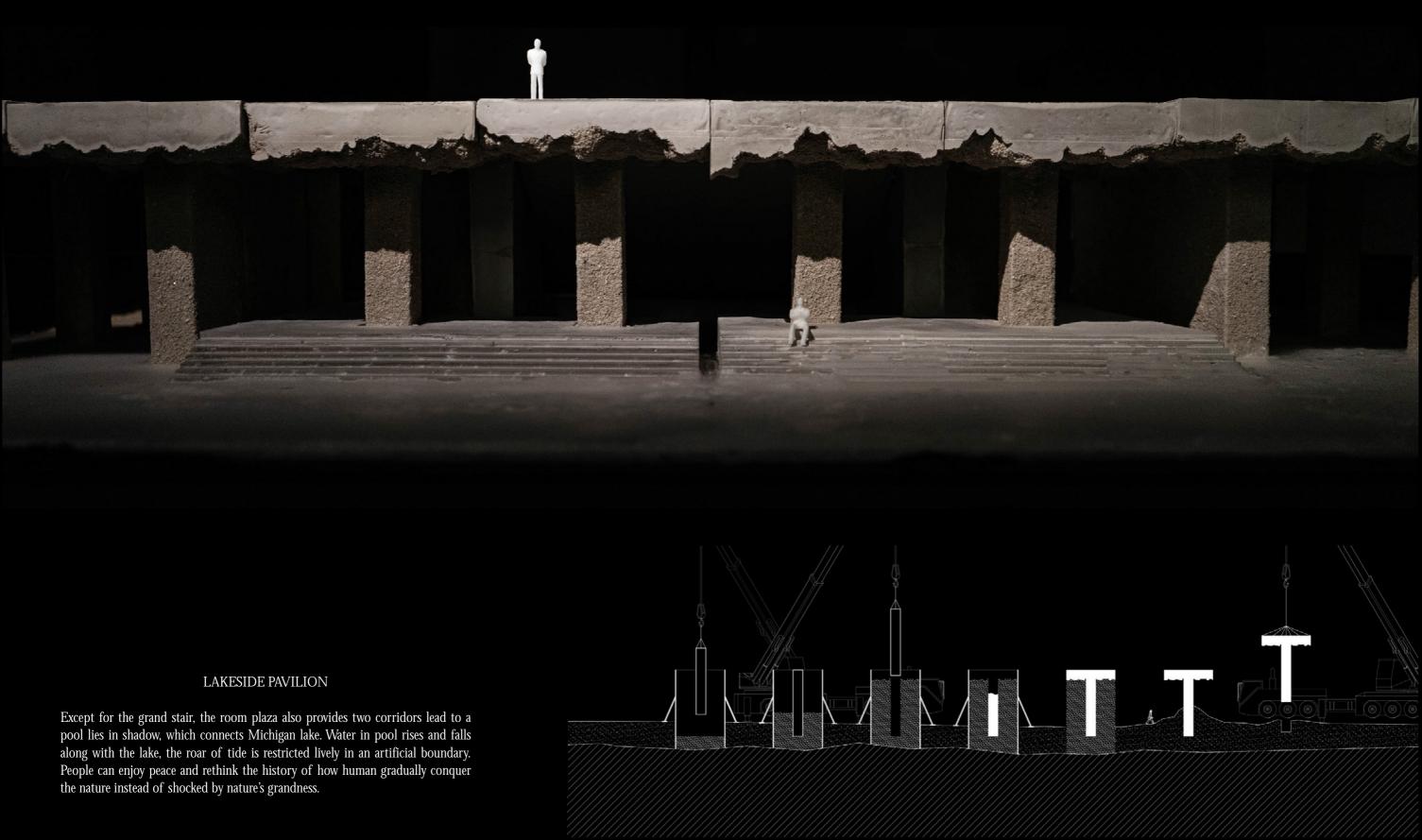
The central plaza with a rectangular fireplace using sky as its ceiling. Clean surfaces of surrounding units create an ancient colonnade and define a space full of artificial marks. Although only this area not covered by roof, the pure void contained within whole volume miraculously creates a space which can be recognized as a room in infinite nature.

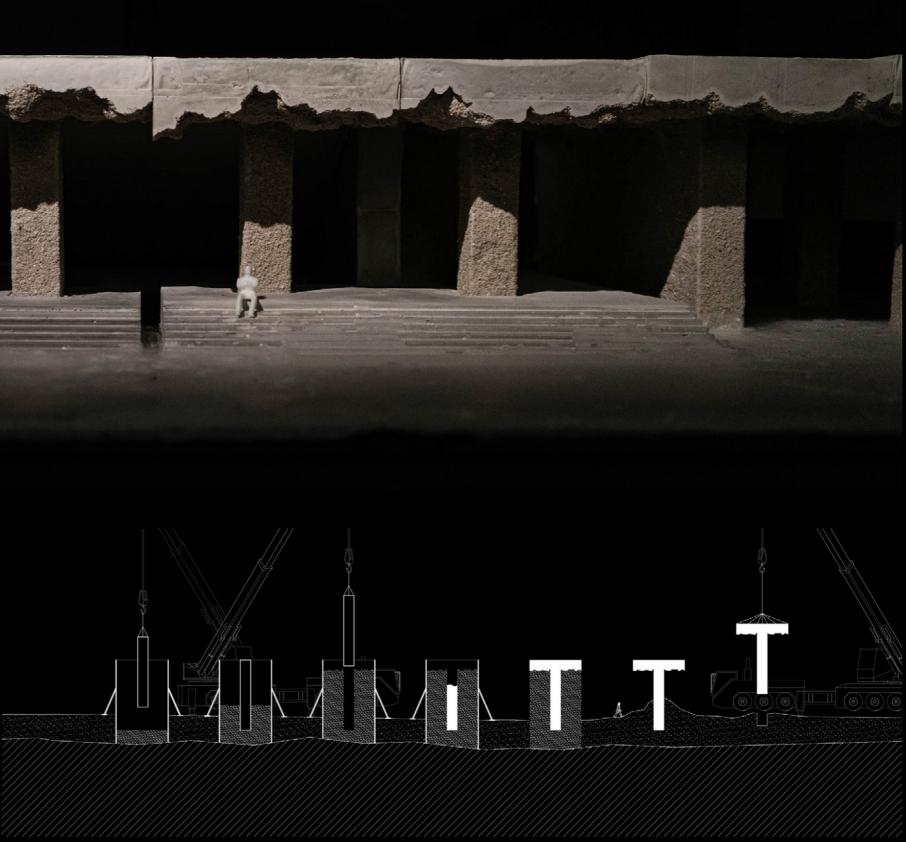


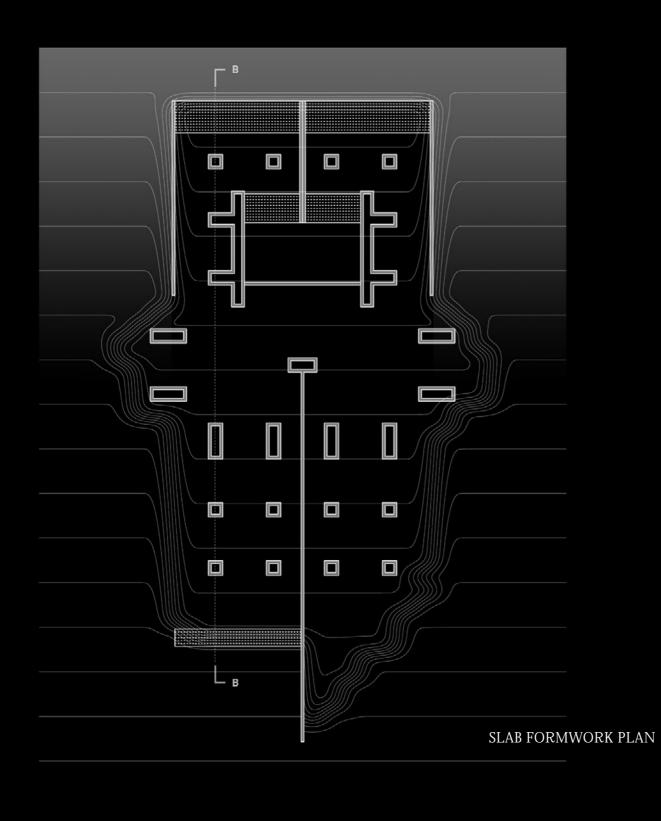


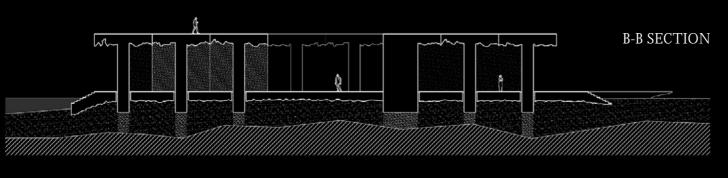
# TO INFINITY

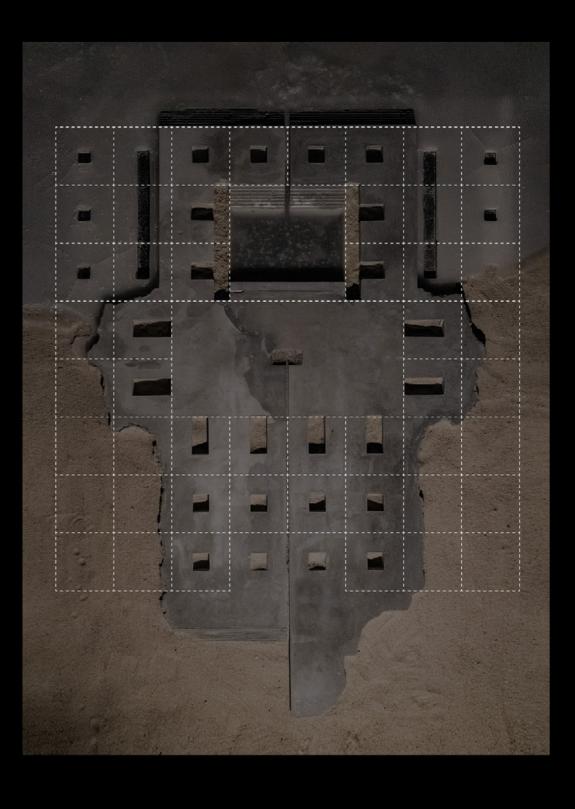
A stair with 40 steps connecting with "the room". People can walk up to feel magnificent lake and the infinity of nature. From a cave-like space to a room-like space and eventually reach a space only have a plane under foot, the whole sequence end with nothing but nature's grandeur.











# GRAVITY-PLANE

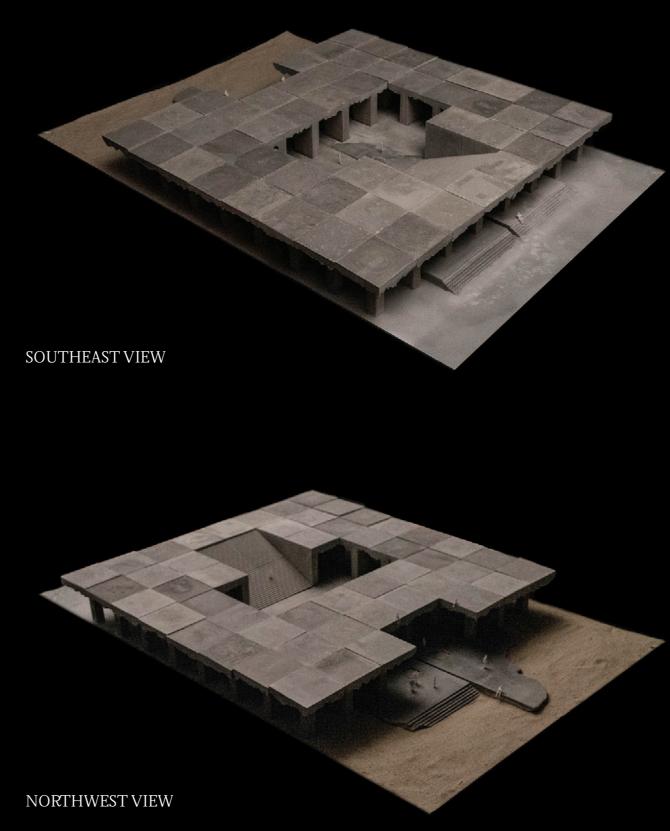
All behaviors organized between two huge planes. The upper plane is combined by 50 units with same size. And the lower plane is casted one time which have no seams on it. Both of these two planes are shaped by gravity. We just define its boundary and gravity will bring the surface which human can live on to us.

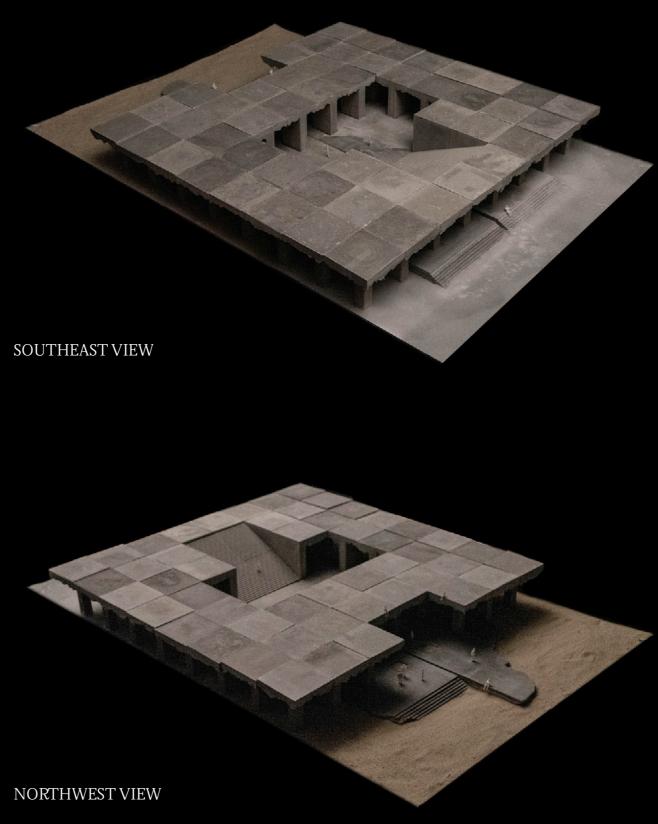




# MEET OF THREE LIQUID

Concrete, sand and water meet each other in this project. Concrete, as a temporary liquid is frozen by time. Sand, as a lazy liquid gradually shaped by water and people's movement. Water, the eternal liquid representing nature lap against the artificial structure forever.







## TEMPLE OF HUMAN & NATURE

Consider the possibility of a world where buildings have never existed; a place ignorant to the single-family home or the shiny steel skyscraper. Here there has never been the concept of classicism nor modernism. There is no idea of what an office or a subdivision or a museum should be. How could we design an architecture if anything was possible and nothing had been established as conventional construction? This project looks to advance the nature of compositional arrangements without the facility of engineered materials, structures, frames and other ways to reinvent the notion of architecture. The relationship of human and nature is gradually polished by washing of lake. 03

# FIRE ESCAPE STAIRS: SILENT MITOSIS BEHIND THE SCENES Mix-use living complex for artists

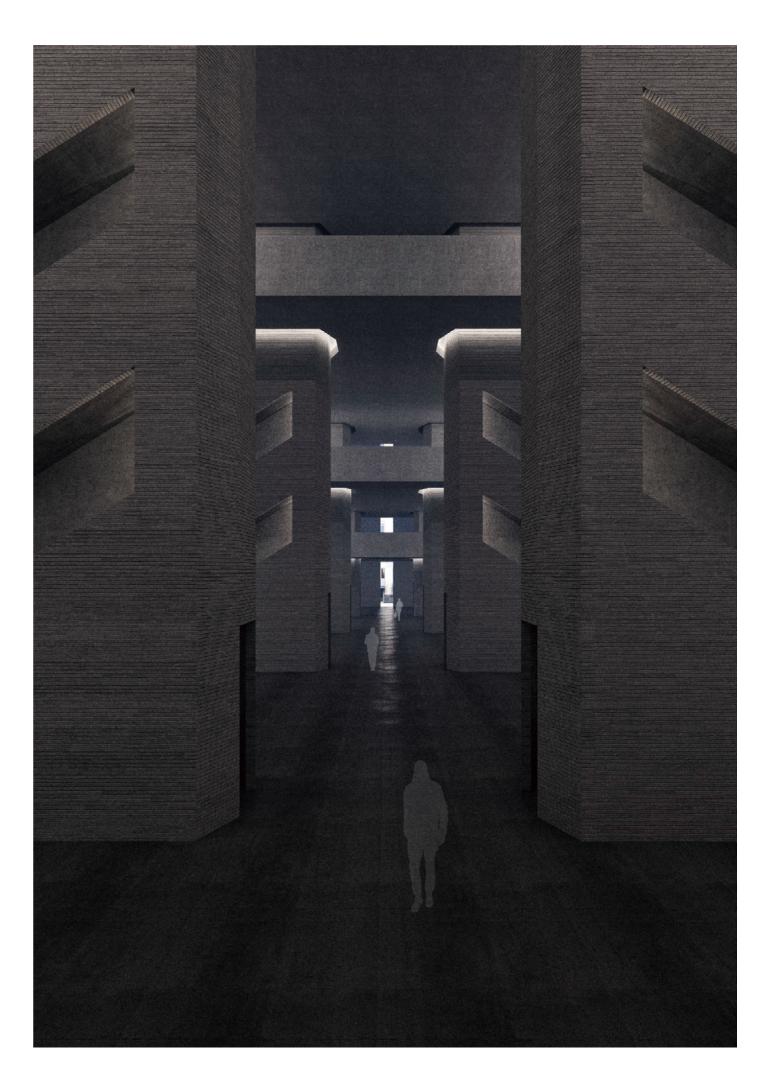
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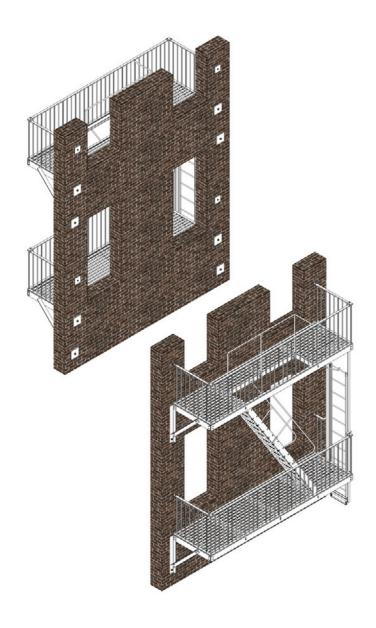
GSAPP Spring Project Architecture Design: Individual Project Instructors: Hilary Sample Site: City Center DC, Washington DC, USA

Derive from ground plan and grow in different directions, stairs can be seen as a time-lapse mitosis process, a collective form of self-replication. When treated as a basic architectural vocabulary, what stairs do is freezing beauty and order of vertical growth. But not every mitosis process of stairs has the chance to be viewed as an exhibit. Different from daily sculptural interior/exterior stairs which are closely related to architectural plot, fire escape stairs are usually absent from our vision with other equipment. The existence of these hidden parts makes architecture can be viewed as a stage play. One part is decorated meticulously to be seen while another part is sealed as a black box and hidden out of sight.

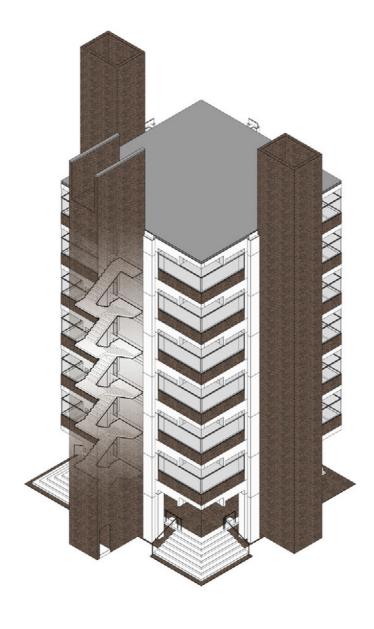
Always located in backstage of architectural space, fire escape stairs never really been organized into spatial plot because of its inherent low utilization property. Based on its nature, I try to use fire escape stairs as a tool to break the traditional dichotomy of the stage and backstage in architecture. Cutting through as the new relationship between architecture and fire escape stairs makes backstage space can be viewed as the skeleton of front stage in a kind of "perceptible hidden" state. Fire escape stairs regain its historic urbanity in city and take part in architectural plot in an implicative way.

If we treated architecture as an organic body, we already get used to design the torso with thin cladding like an endoskeleton mammal with smooth skin like us. But in this building, I try to find out the possibility of creating an exoskeleton body form. Shells, snails, and tortoises are the objects I learn from. With minimum essential cladding to protect fragile organs, the building is identified by its ecosystem with rough shape of bones rather than smooth surface of skin. Such a building has an innate sense of permanence, which is durable in the dimension of time. Even if time has wiped out its flesh, human can still read its identity and story from its skeleton, like read an ancient oracle bone.





(1). Typical old apartment, New York, USA, 1900s



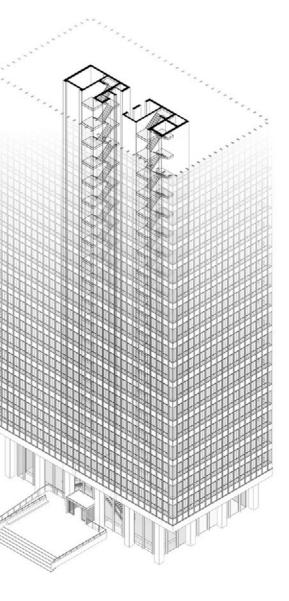
(2). Richards Medical Center, Philadelphia, USA, 1957

Vary with scale and times, the relationship between fire escape stairs and main body of architecture presents three basic states.

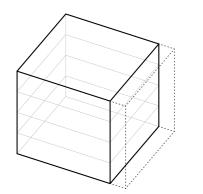
(1). Old fashioned steel stairs hang on exterior walls of typical NYC old apartments share the original relationship with architecture. Treated as an additional component, these fire escape stairs are isolated from the pre-organized space plot of the building. But they unexpectedly show vigorous vitality in urban space at that time. The behavior of residents sleep outside on the landings triggered the plot premise of Alfred Hitchcock's 1954 movie "Rear Window".

(2). In Richard medical center designed by Louis Kahn, fire escape stairs started work as parts of building volume and being juxtaposed with main functional space within architecture. The traces of life are sealed into several boxes and disappear from urban space. Fire escape stairs of different elevations organized efficiently as a volume and became an independent formal vocabulary in the context of architecture. At the same time, they play calm roles in spatial plot and add unique identity to the architecture.

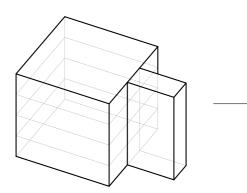
(3). With the rise of skyscrapers and the explosive growth of interior space, one architecture started being horizontally divided into hundreds of independent stories. The break of vertical continuity of spatial plot deprive the role fire escape stairs could have been played. In now days, they are integrated into the core tube structure, which makes them completely isolated from spatial plot and imperceptible without a fire. The order and beauty of the silent vertical growth no longer has an interface to be read.



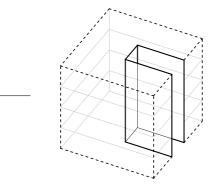
(3). Arts Tower, Sheffield, UK, 1 965



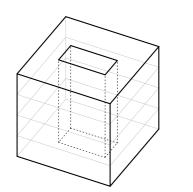
(I). Attached to: Urban interface



(2). Juxtaposition: Architectural identity

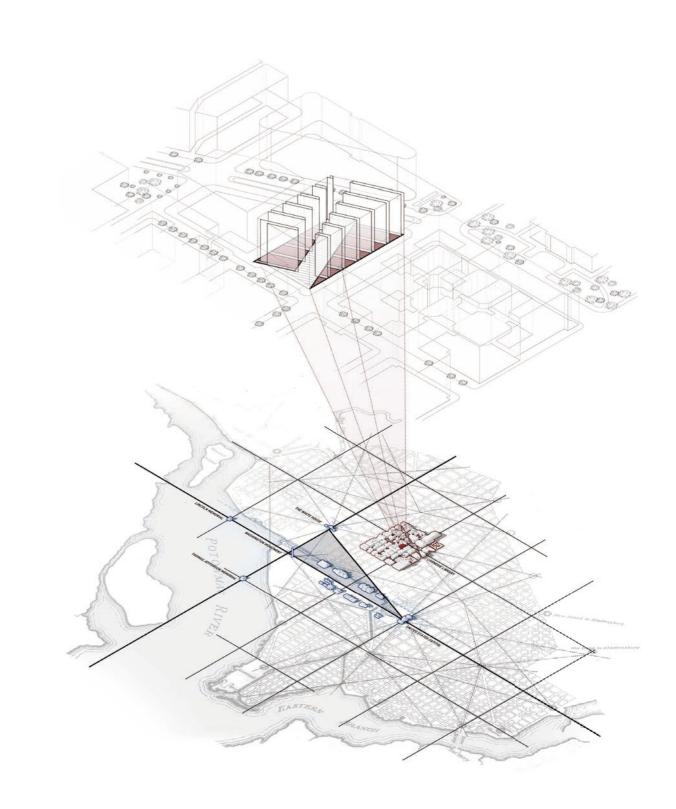


(4). Cut through

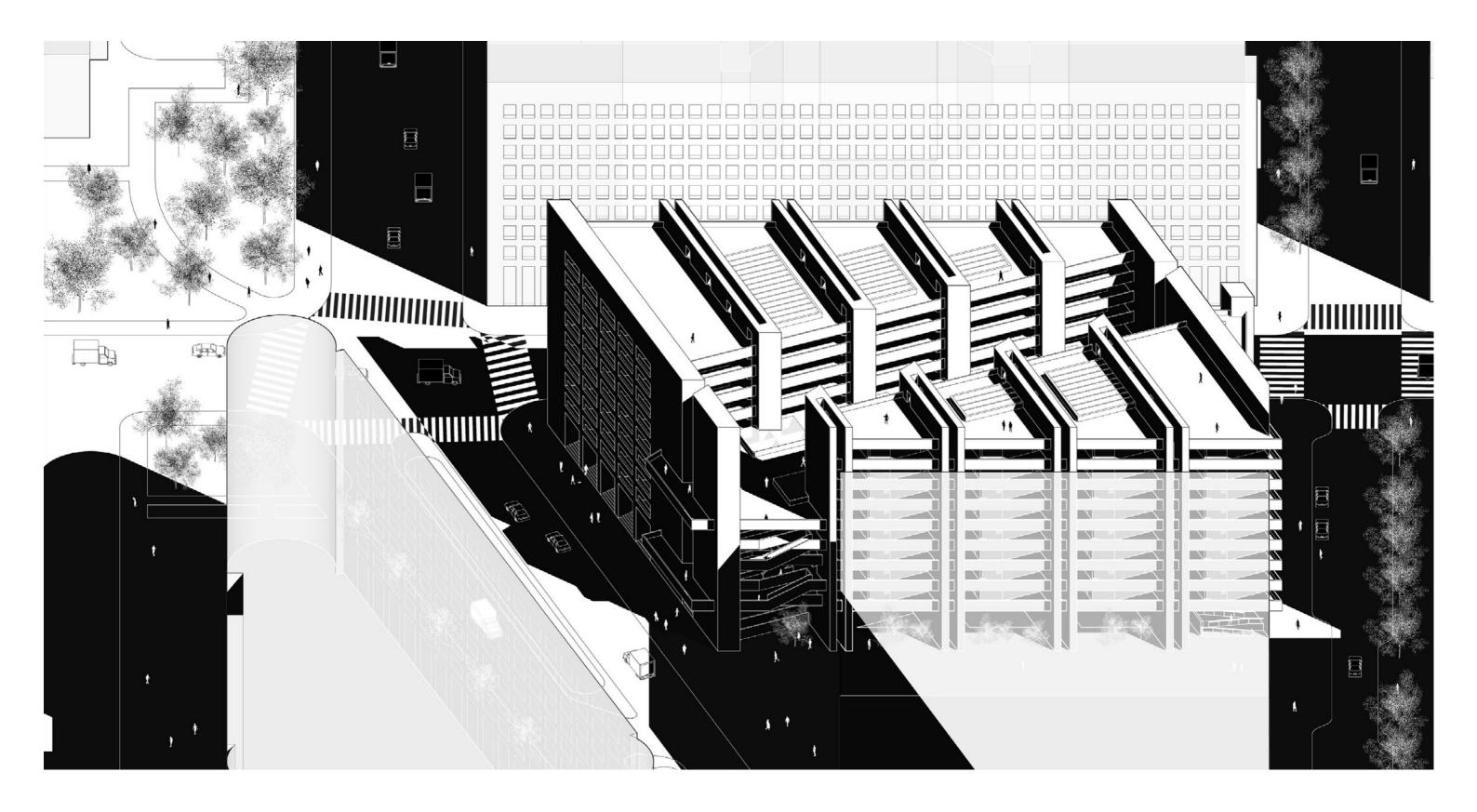


(3). Hidden: Circulation as structure

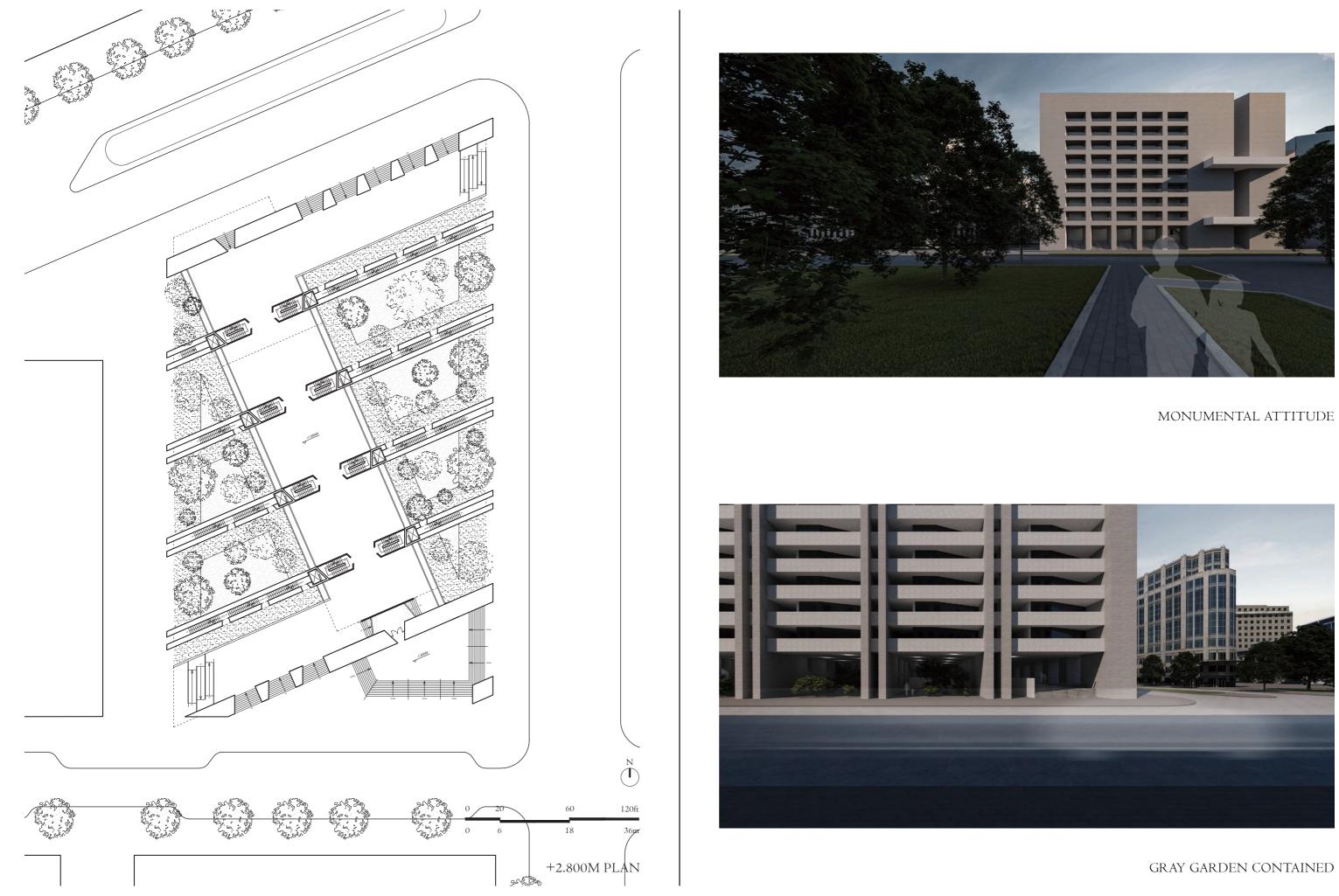
# FIRE ESCAPE STAIRS & ARCHITECTURE



# INSERT INTO DC'S BAROQUE FRAME



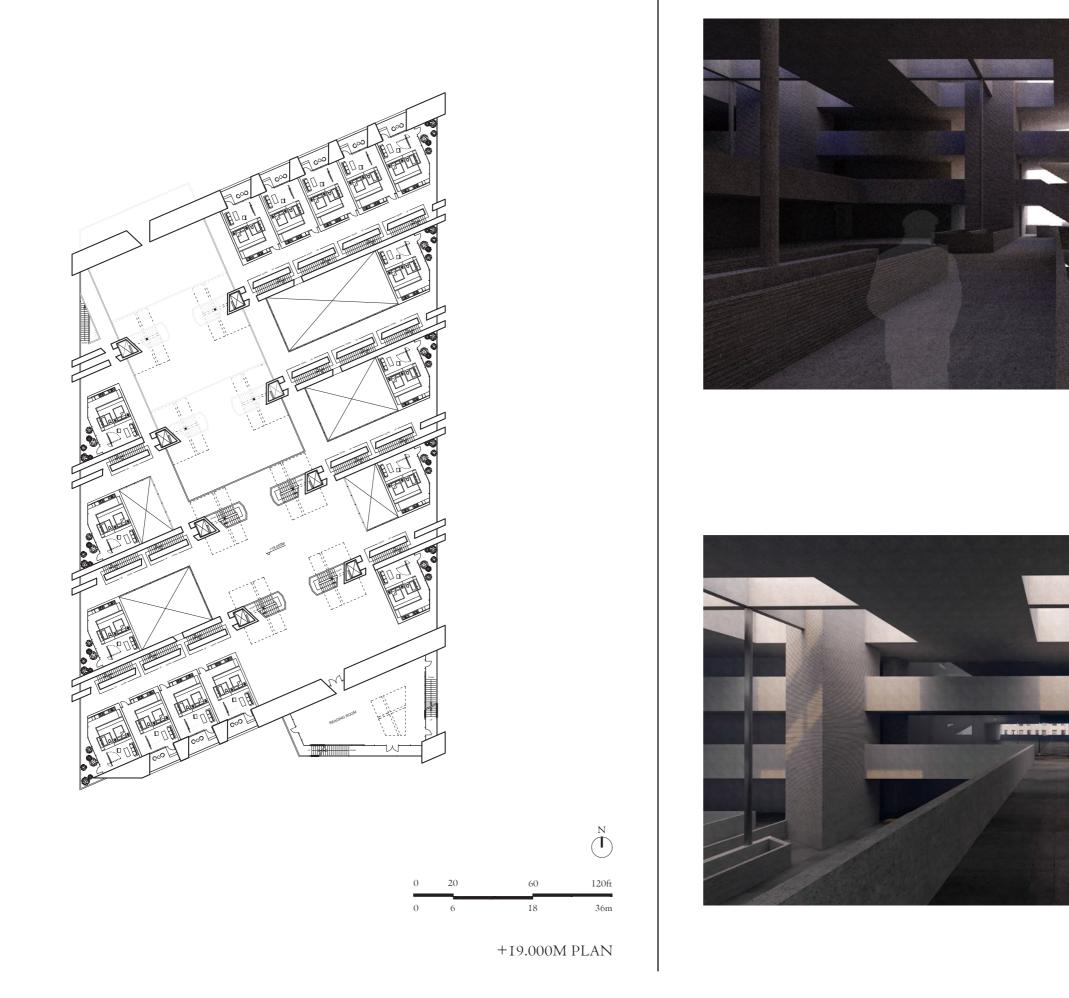
AXONOMETRIC DRAWING

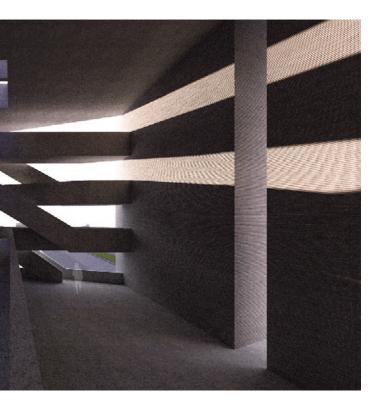






# STUDIO WITHIN LIGHT WELL

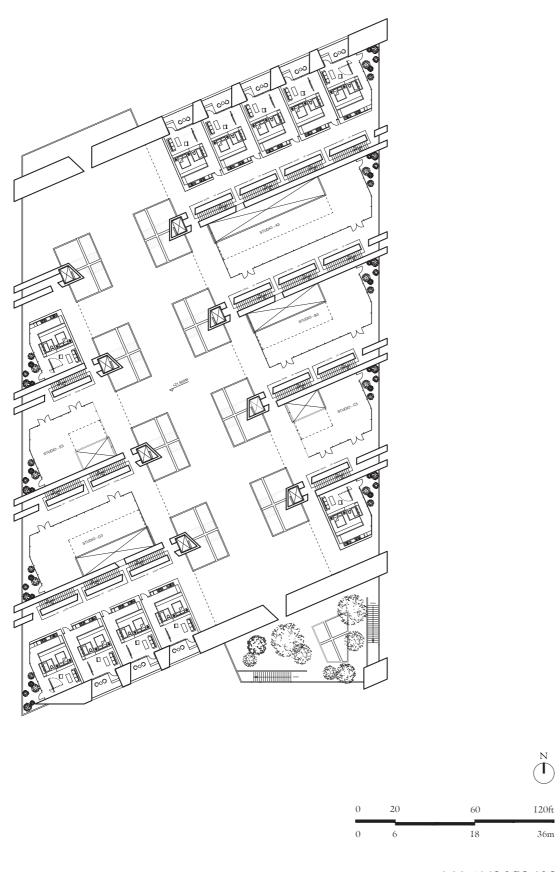




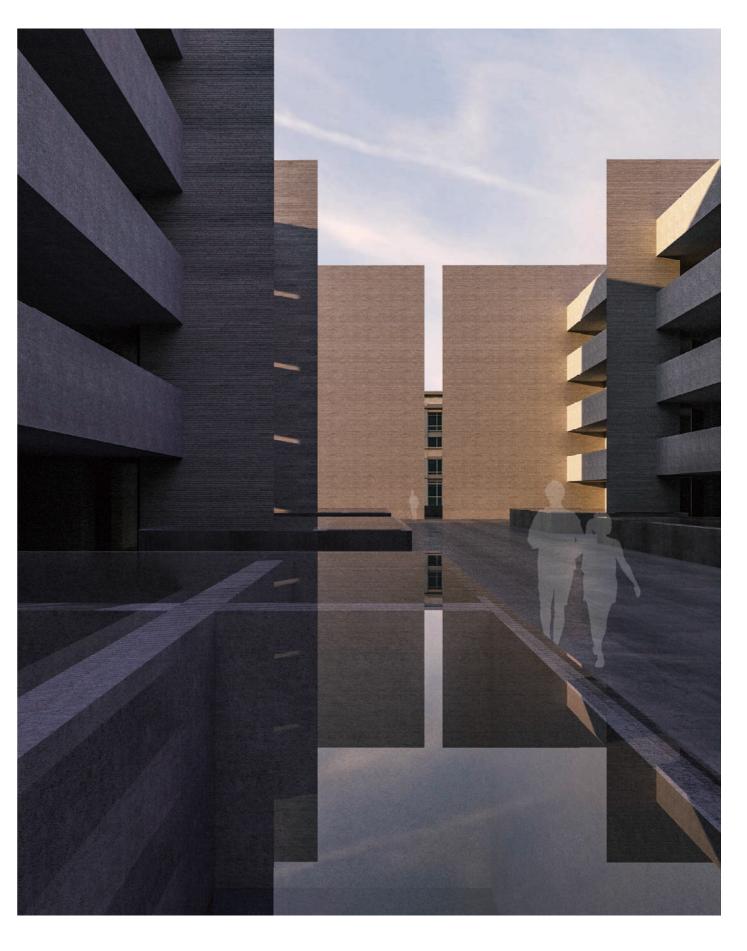
# EXHIBITION AREA II



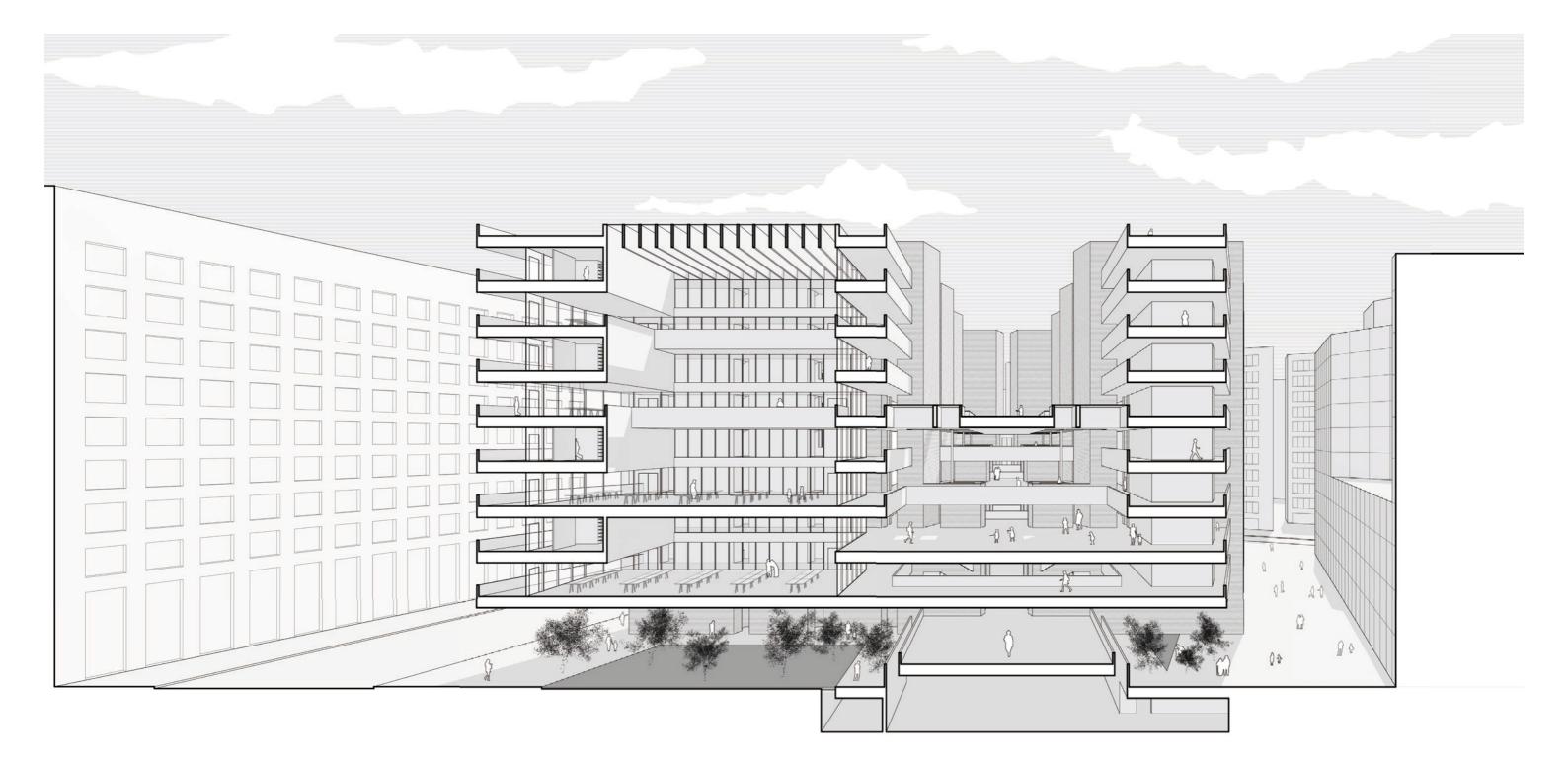
# EXHIBITION AREA III



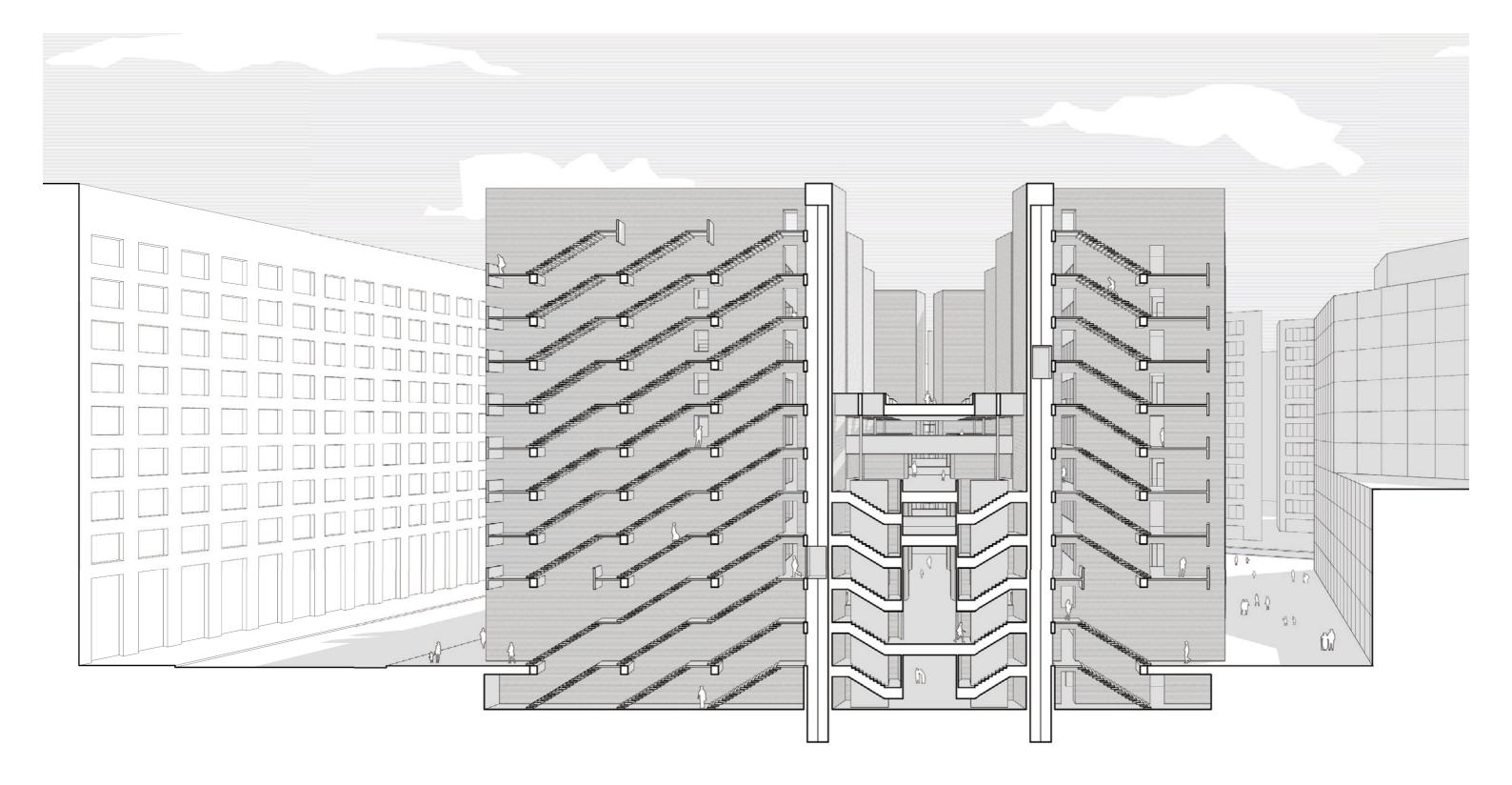
+22.600M PLAN



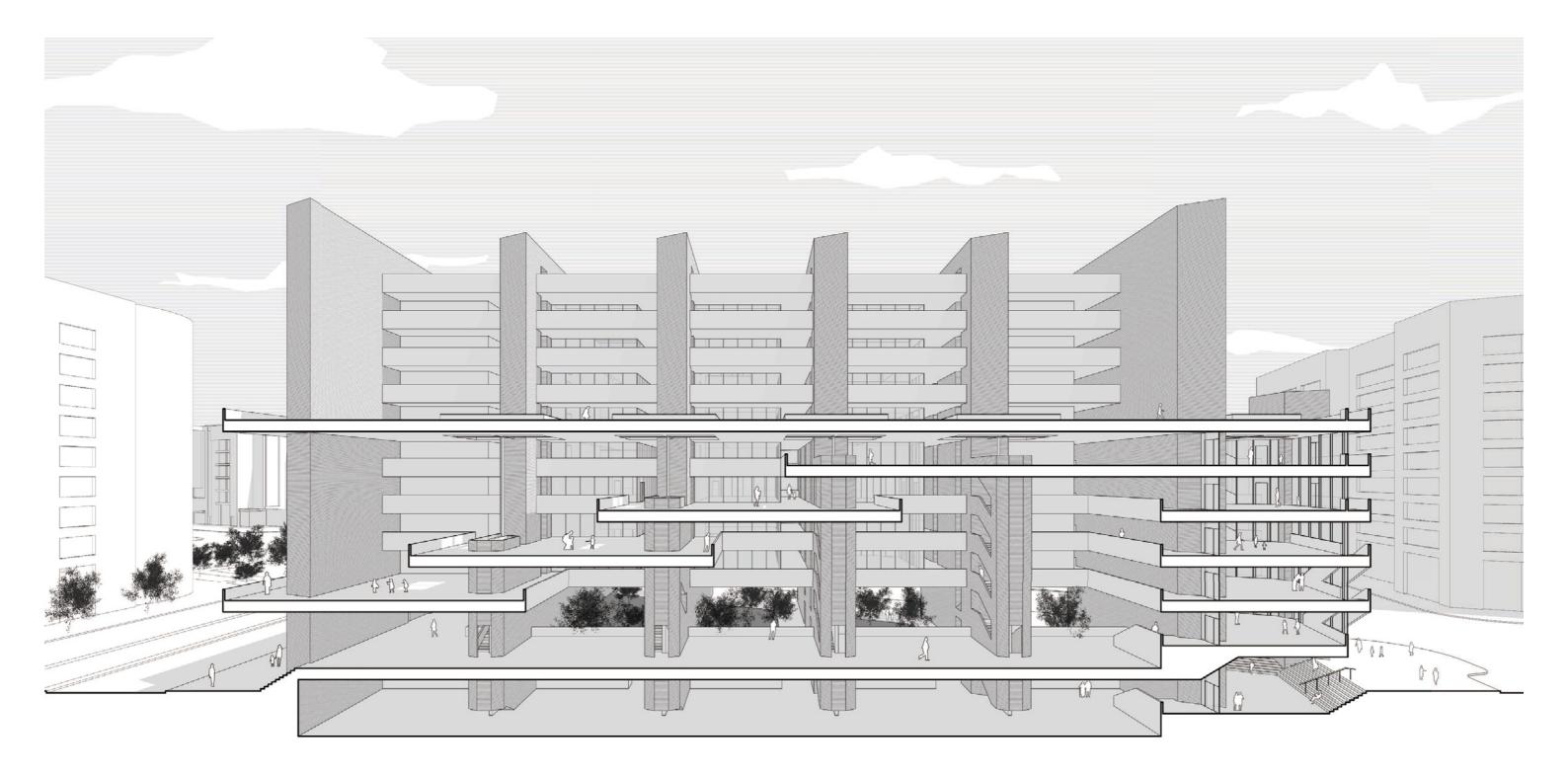
# COURTYARD IN SUNSET



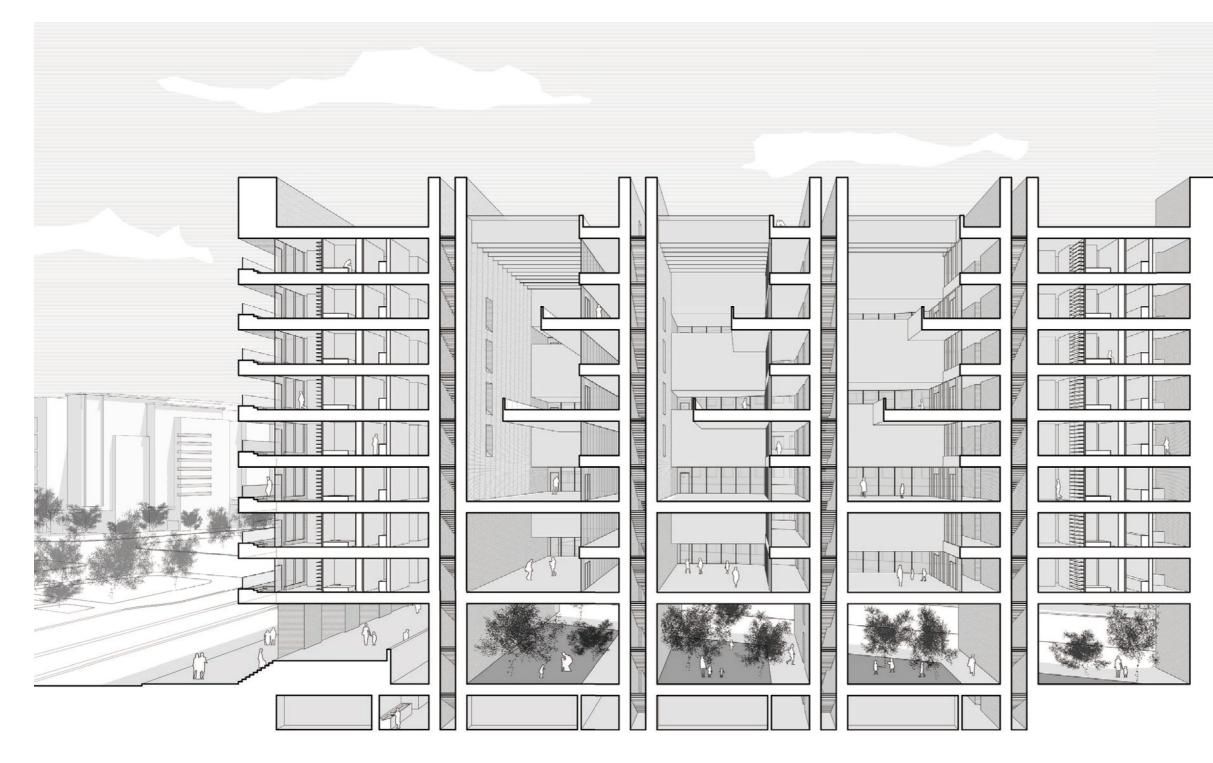
HORIZONTAL SECTION I



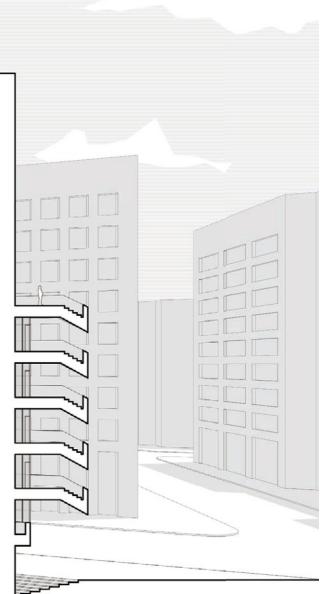
HORIZONTAL SECTION II

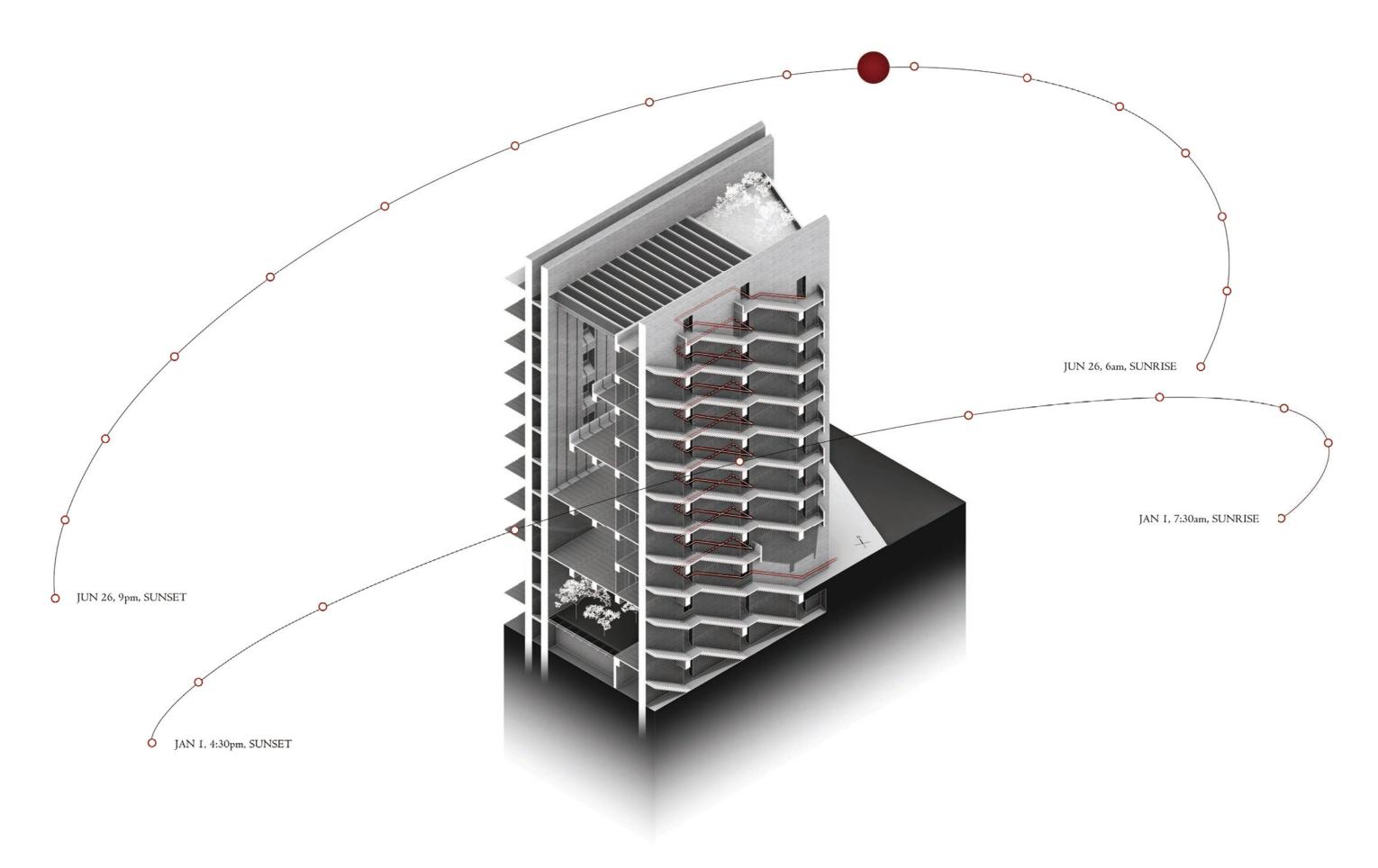


VERTICAL SECTION I

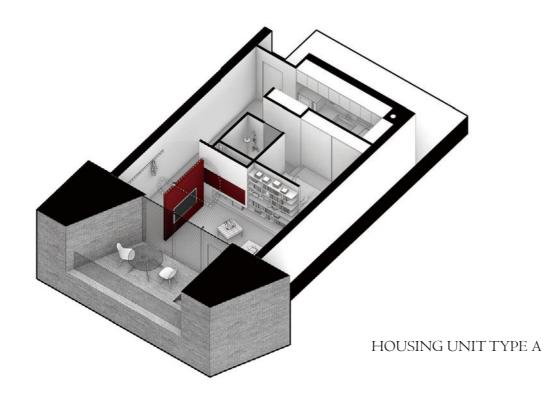


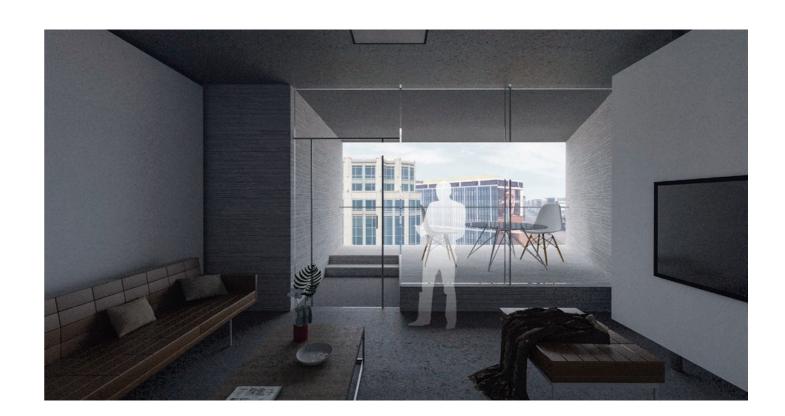
VERTICAL SECTION II

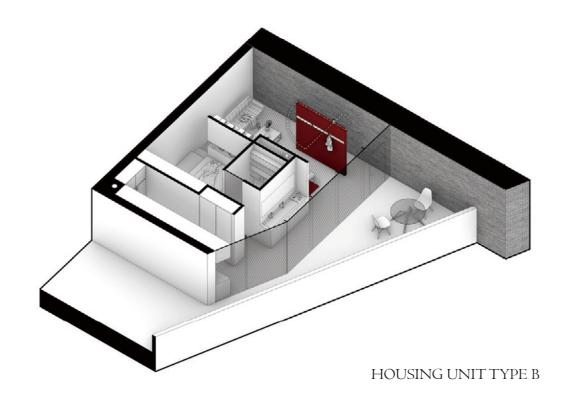




# STRUCTURE, LIGHT, CIRCULATION



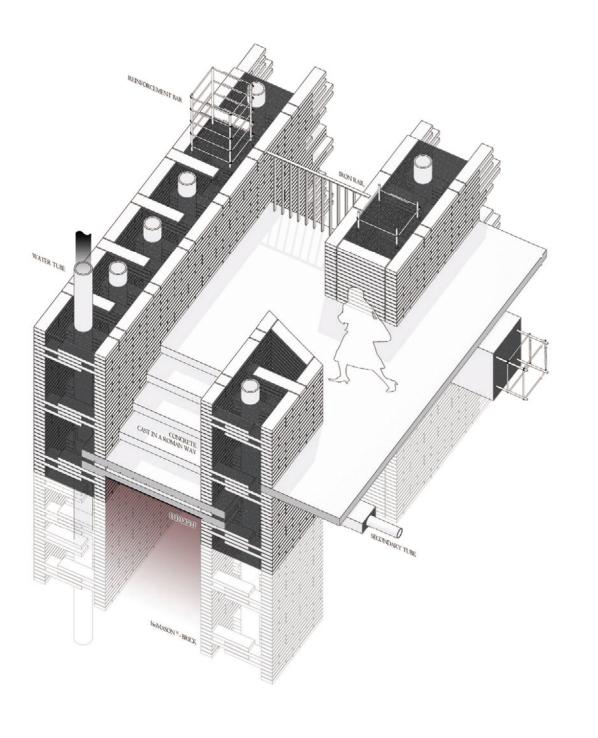






# ABOVE MIST OCEAN

# ABOVE MIST OCEAN



## ASSEMBLE CONSTRUCTION SYSTEM



# MONUMENTAL ATTITUDE

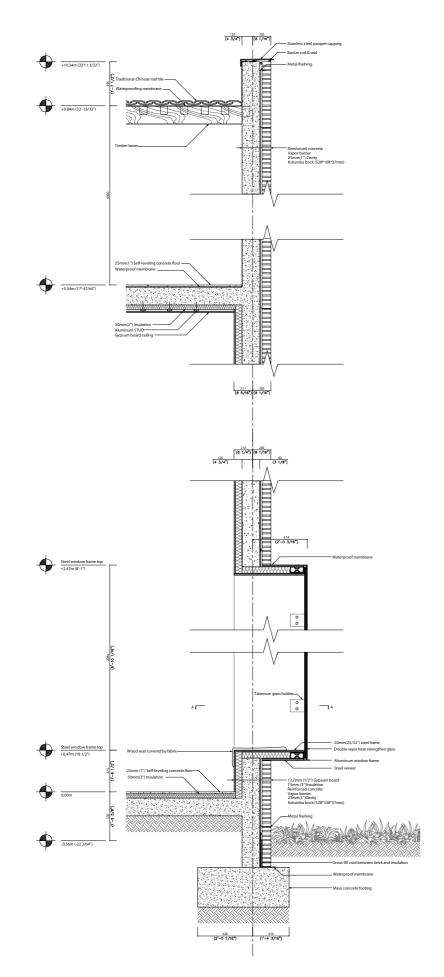


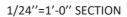
MONUMENTAL ATTITUDE

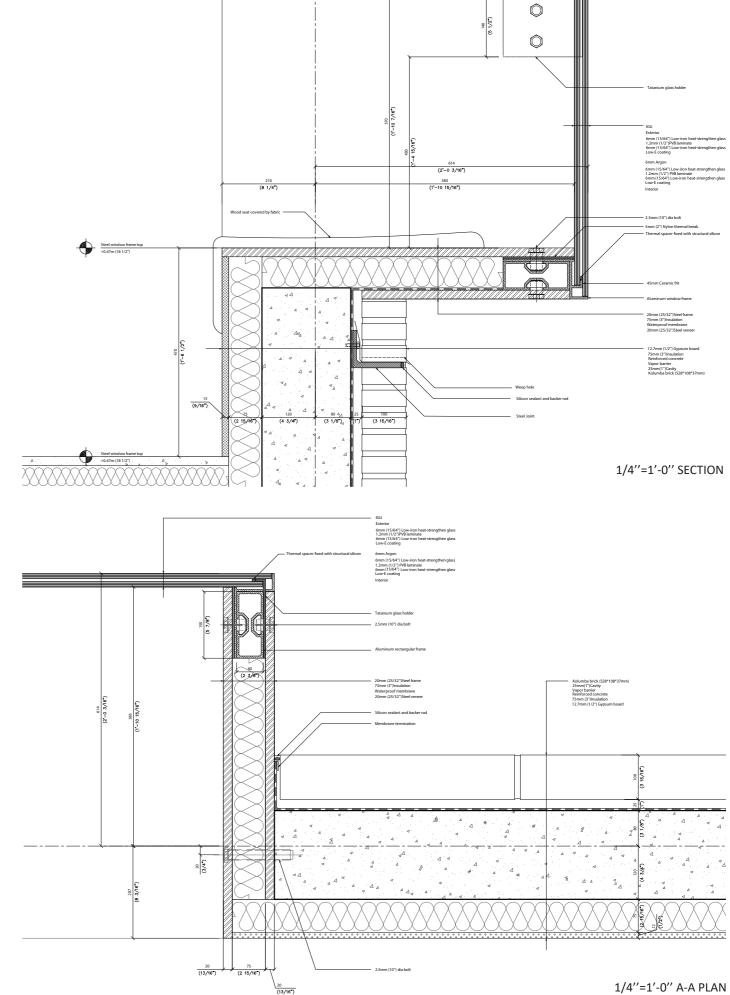
# FAÇADE DETAILING: A MATERIAL UNDERSTANDING

Facade detail design based on brick





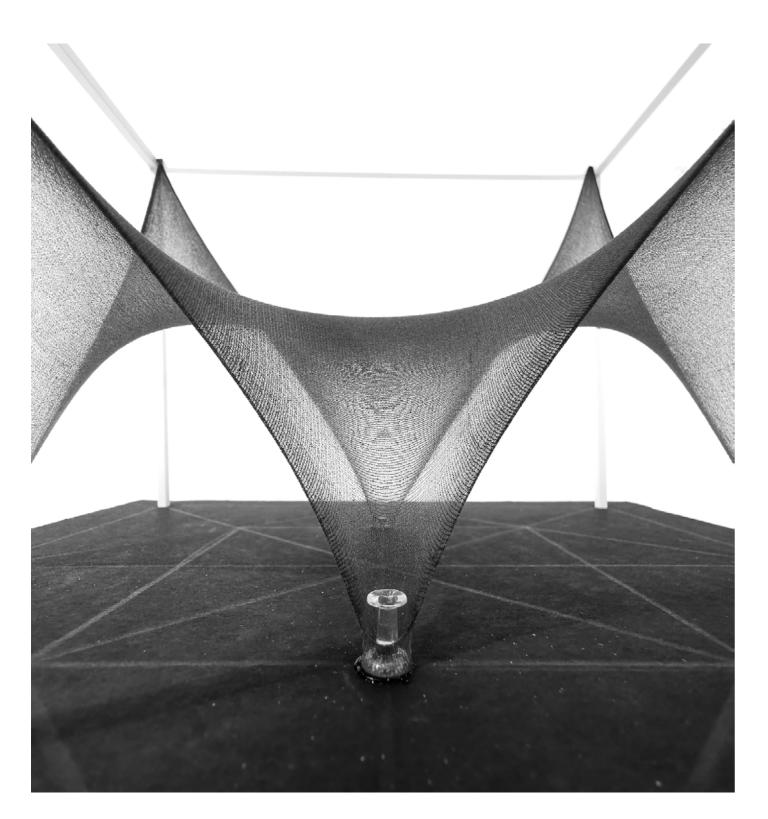




### 1/4''=1'-0'' A-A PLAN

TENSILE/COMPRESSION SURFACES IN ARCHITECTURE Pavilion design with two kind of forces

2020.I-2020.4 GSAPP Tech Seminar Project Collaborator: Qifeng Gao, Shengyang He Instructors: Robert Marino







From now on, it's time to go towards a priori...

## \* One questionnaire about architecture

RCR's test of an architecture exam plays an important role in the evolution process of my design argument thinking. Brief questions and fragmented answers construct a values-collage together which can be perceptual reading by others. Based on old questionnaire, some ambiguous answers are clarified while some convincing answers are denied in the process of self-argument. New questions waiting their own clear answers also emerge. If you can agree with me the truth that same words usually evoke different echoes in different minds, I believe that a fragmented questionnaire can convey my real feeling about architecture and the world compared with a carefully written manifesto.

			What differ space and place?
(501	ne new emerging questions and old questions whose original answers have been denied)	A10.	It clearly in last answer, it's culture, history, so
		Q11 <sup>.</sup>	Compare architecture's body with organic bod
Q1:	To start with the most classic but also the most boring one: what is architecture?		We get used to design architecture's body with
	A void constructed in a specific time and a specific place.		ike us. I 'm looking for new reference like s
			nsion of time naturally.
Q2:	Where is the beginning		, i i i i i i i i i i i i i i i i i i i
A2:	Usually catching the vibe within time and context.		What will be left after we take both temporal
		A12:	Solidified trace of human.
•	How a vibe materializes into an architecture?		
A3:	Through mediating in residence.	•	Give a definition of architect's work.
04.	Descentifications and one as analytication?	A13:	Trace identity out of unity.
	Does architecture end up as architecture? No, architecture must end up as landscape.	$\bigcap 1 I$	Find a word to illustrate architecture.
A4.	ivo, arcintecture must end up as ianuscape.		Mo[nu]ment, monument of moment.
ດ5 <sup>.</sup>	What should architecture do?	/114.	Molnument, monument of moment.
•	Architecture do totally different thing in city and countryside and nature at present.	Q15:	Do you have an clear direction for your future
	j o j j i		For now, towards a priori.
Q6:	If in city?		•
A6:	To work as a political tool for balancing capital and public spirit.		
	If in countryside?		
A7:	To work as a silent dialogue between individual and community.		
08.	If in nature?		
<del>д</del> 0.	n mature.		

- A8: To work as an artificial niche to contain the spark of human culture.
- Q9: Do we create, find or organize?
- A9: We find space. We organize culture. We create place. Then we can be found and organized and created.

Shenghui Mao 10, May, 2020 Answered at the night before graduating from GSAPP

society, memory, which can conclude to human.

with thin cladding like an endoskeleton mammal with smooth e shells, snails, and tortoises, whose body is durable in the

al context and spatial context off from architecture?

ure work after school?