GREEN OASIS

Architectural void regeneration in the complex reality of Shanghai.

Politecnico di Milano
Scuola di Architettura Urbanistica Ingegneria delle Costruzioni
Master in Architecture - Built Enviroment - Interiors
A.A. 2020/2021

Master Thesis Project
Supervisor : Prof. Marco Bovati
Cosupervisor : Arch. Gerardo Semprebon

Student : Andrea Cappelletti 926078

Acknowledgements

The work presented here is part of the topic explored by the Workshop "China Design" held by Shanghai Jiao Tong University in the summer of 2019.

It deepened and developed further during the attendance of the Workshop of Thesis " Oltreconfine: progetti di architettura sostenibile per luoghi altri, "whose aim was to work on the theme of the design and construction of architecture in different countries from Italy to stimulate the comparison between designers and other contexts, held by Professors Marco Bovati and Alessandro Rogora with co-supervisor Professor Gerardo Semprebon.

To them goes my gratitude for their constructive suggestions and infinite patient, especially in a challenging coronavirus period.

I would like to thanks also Politecnico di Milano for providing me the study environment and resource during my master study period.

TABLE OF CONTENTS

LIST OF FIGURES

1. Introduction

2. Project Background

3. References

4. Site Analysis

6. Theme

LIST OF PANEL

1. Localization
2. District Analysis
3. Existing Condition
4. Site Analysis
5. Strategy
6. Axonometry
7. Plan and Courtyards
8. Plan and Program
9. Plan and Short side
10. Plan and Vegetation
11. Plan and Material
12. Plan and Render Views
13. Long side

Italian

La riqualificazione urbana è un tema la cui importanza è aumentata nell' ultimo decennio su scala globale poiché riguarda alcuni aspetti chiave dell'abitare in città: propone un'alternativa allo sviluppo urbano attuale, riflette su soluzioni per mitigare le disparità sociali causate dalla differente distribuzione di risorse tra centro e periferie, contribuisce ad uno sviluppo ecologico, sottolineando l'importanza di avere elementi vegetali nei centri urbani, specie in quelli più densi.

La tesi ha come tema il progetto di riqualificazione di un isolato nel centro di Shanghai, ridefinendo architettonicamente un'area attualmente utilizzata come parcheggio.

La prima fase di lettura critica propone da un lato una necessaria introduzione al contesto cinese e un'analisi del sito, dall'altro una raccolta dei casi paradigmatici riguardanti sia l'identità architettonica cinese sia approcci più contemporanei ai temi principali della tesi. Questo primo momento ha portato alla scelta del tema principale del progetto, il cibo, la sua produzione e in generale l' alimentazione, e all' individuazione di una strategia che definisce un volume architettonico attraverso un processo di scavo, conseguenza di un confronto con il luogo, dello studio dell'identità architettonica cinese e del programma funzionale del progetto.

Il progetto consiste nel disegno di un complesso architettonico multifunzionale, il cui tema principale riguarda lo studio del cibo e della sua produzione, cercando di definire un equilibrio tra spazi vegetali e costruiti. Il progetto persegue alcuni obbiettivi specifici: migliorare la vita dei residenti stabilendo una nuova unione tra loro e i giovani lavoratori e turisti, tenere conto degli altri attori coinvolti, quali l'università Shanghai Jiao Tong, promotrice iniziale del progetto, e il governo cinese e le sue linee guida, dato il valore economico enorme del sito.

Data la complessità della realtà di Shanghai e delle richieste a cui si è cercato di rispondere, si è arrivati ad un progetto in cui convivono varie funzioni, attori e scelte architettoniche, tra cui si è cercato un equilibrio. In questo modo si è offerta la possibilità di una riqualificazione urbana sostenibile e consapevole, che tenga conto del luogo di progetto e delle diverse e complesse relazioni che lo coinvolgono.

Parole chiave : riqualificazione architettonica, Shanghai, cibo

English

Urban redevelopment is an issue whose importance has increased in the last decade on a global scale since it concerns some key aspects of living in the city: it proposes an alternative to current urban development, reflects on solutions to mitigate the social disparities caused by the different distribution of resources between the center and the suburbs, contributes to ecological development, underlining the importance of having plant elements in urban centers, especially in the densest ones.

The thesis focuses on the redevelopment project of a block in the center of Shanghai, architecturally redefining an area currently used as a parking lot.

The first phase of critical reading proposes on the one hand a necessary introduction to the Chinese context and an analysis of the site, on the other hand a collection of paradigmatic cases concerning both Chinese architectural identity and more contemporary approaches to the main themes of the thesis. This first moment led to the choice of the main theme of the project, food, its production and nutrition in general, and to the identification of a strategy that defines an architectural volume through an excavation process, a consequence of a comparison with the place, the study of Chinese architectural identity and the functional program of the project.

The project consists in the design of a multifunctional architectural complex, whose main theme concerns the study of food and its production, trying to define a balance between plant and built spaces. The project pursues some specific objectives: to improve the lives of residents by establishing a new union between them and young workers and tourists, to take into account the other actors involved, such as Shanghai Jiao Tong University, initial promoter of the project, and the Chinese government and its guidelines, given the enormous economic value of the site.

Given the complexity of the reality of Shanghai and the requests to which we have tried to respond, we have arrived at a project in which various functions, actors and architectural choices coexist, among which a balance has been sought. In this way, the possibility of a sustainable and conscious urban redevelopment was offered, which takes into account the project site and the different and complex relationships that involve it.

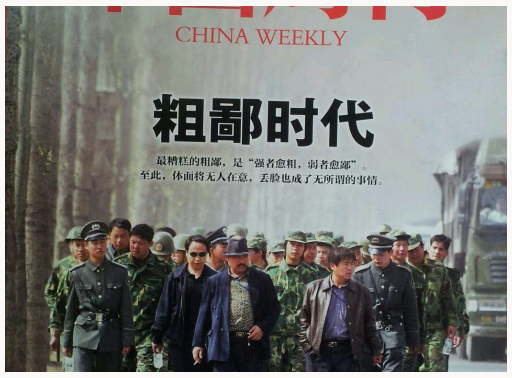
Keywords: architectural redevelopment, Shanghai, food

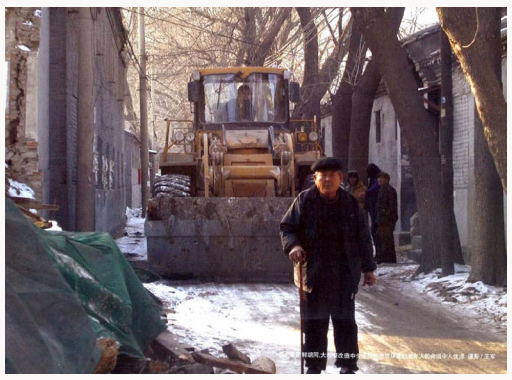
INTRODUCTION

A necessary introduction to the Chinese context

1. Chinese boom took place almost without time to think, causing the breaking of Chinese architecture, language, culture.

Country context





With five thousand year of architectural heritage, China boasts one of the most extended continuous architectural lineages in history. Yet, A hundred years after the dawn of the 20th century, the urban landscape of the world's most populous country has now been transformed completely.

In the last quarter-century, modernization revolutionized, or better destroyed and stop, Chinese architectural language and changed its urban fabric. Urbanization has emerged as a force of widespread social transformation. In contrast, a massive population shift from country to the city has brought about a dramatic revolution in China's culture, politics, and economy. The modernization of China was and still is of remarkable variety, striking contradictions and recurrent paradoxes caused by geographical, cultural, historical, and political circumstances.

The current situation of Chinese urban planning and architecture is different from the Western cases. The contemporary Chinese city is made of a complex system of interaction between different visions: the ambition to be the most modern form of urban modernization, the aspiration to be Chinese respecting the traditional values of Chinese culture, the aspiration to be oriented to be a social development.

In the last years, the world's most populous nation took center stage as a global superpower, with hundreds of millions of new urbanites flooding into rapidly swelling cities. But this urban boom, the construction of contemporary society, took place almost without time to think, causing the breaking of Chinese architecture, language, culture.

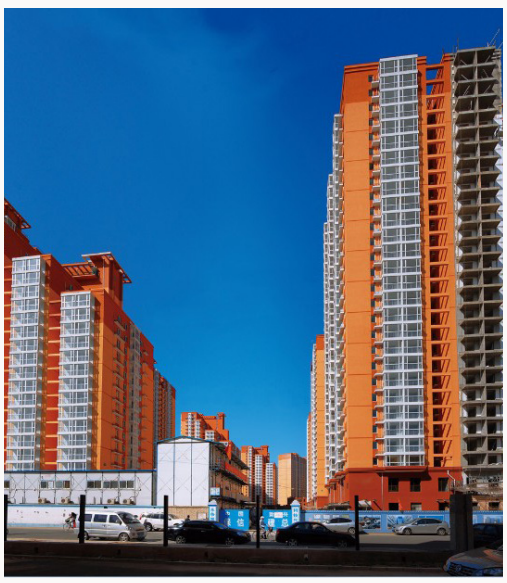
Now Chinese architects, sometimes together with international collaborators and the academia, are trying to guide this utopian creation by answering two main criticisms :

"Traditional architecture became obsolete without the content of a new way of life" [...] *"The newly imported Western architecture failed because it did not absorb the qualities of traditional architecture"*

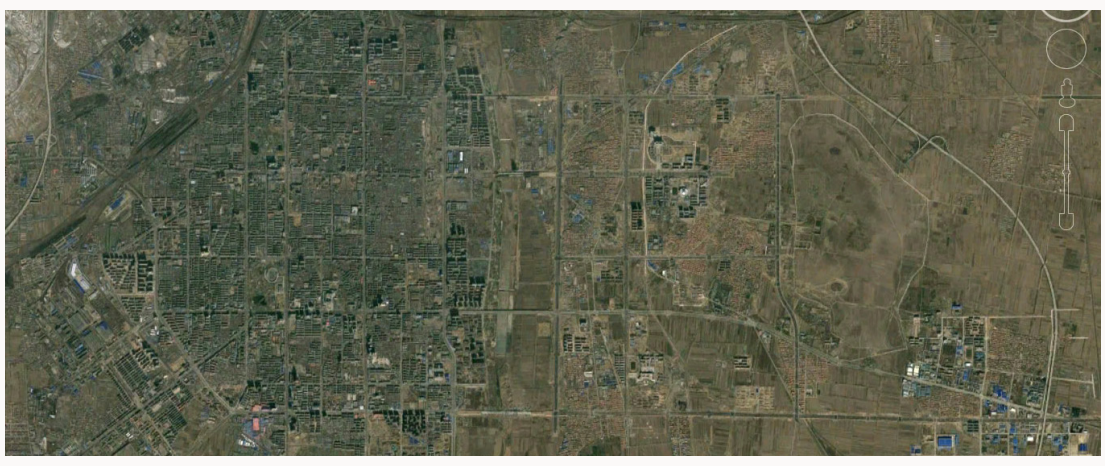
From "Chinese Architecture in Recent History and Architectural Style," Wang Shiren , 1978

2. The rapid transformation of China creates inequalities and contrast in all the country.

3. The community's base lifestyle and its values are still present among the Chinese population, is the context around it that was disrupted.



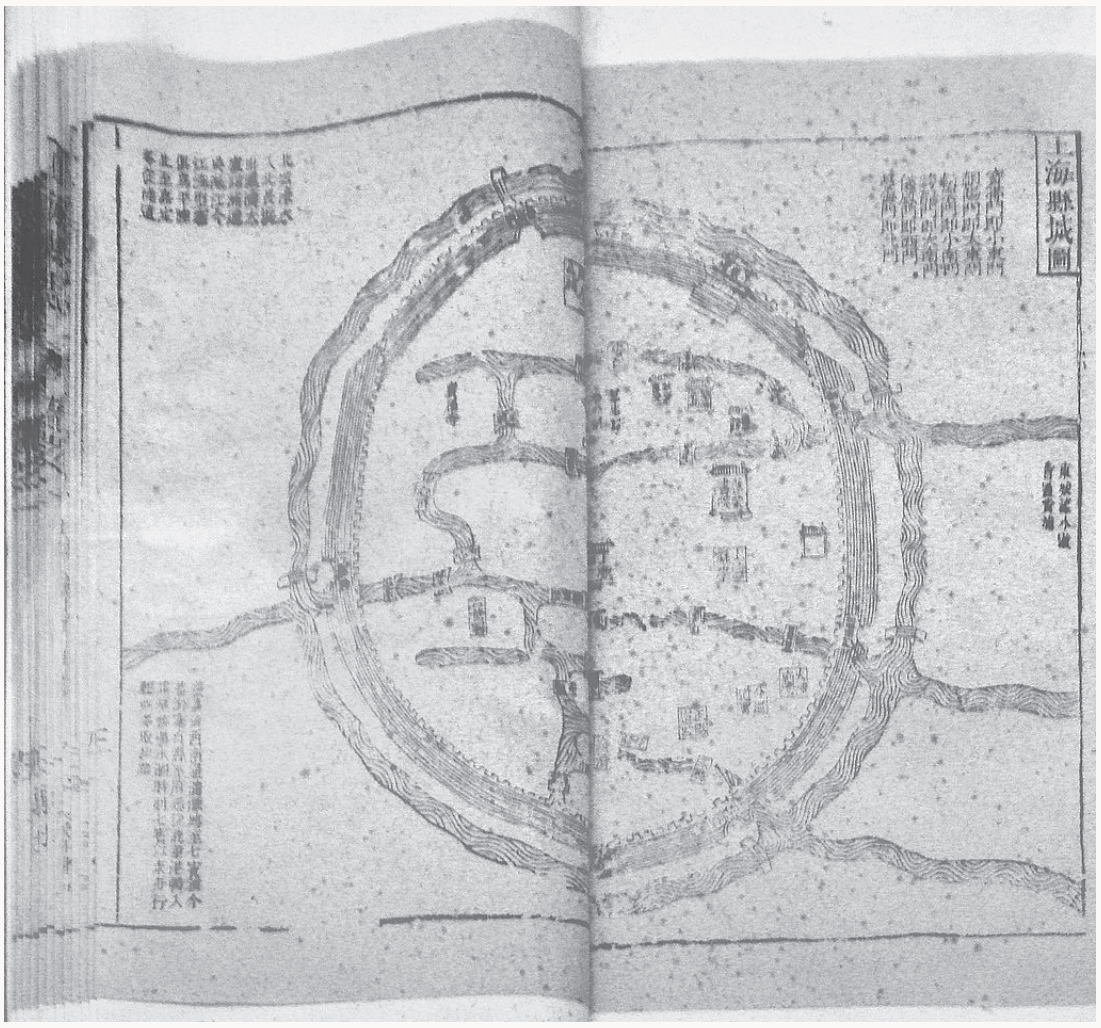
4. City of Datong urban changes (east side) in 7 years that caused the demolition of thousands of houses and the forced movement of half a million people (30% of the residents in the city).



Shanghai 上海

Early history

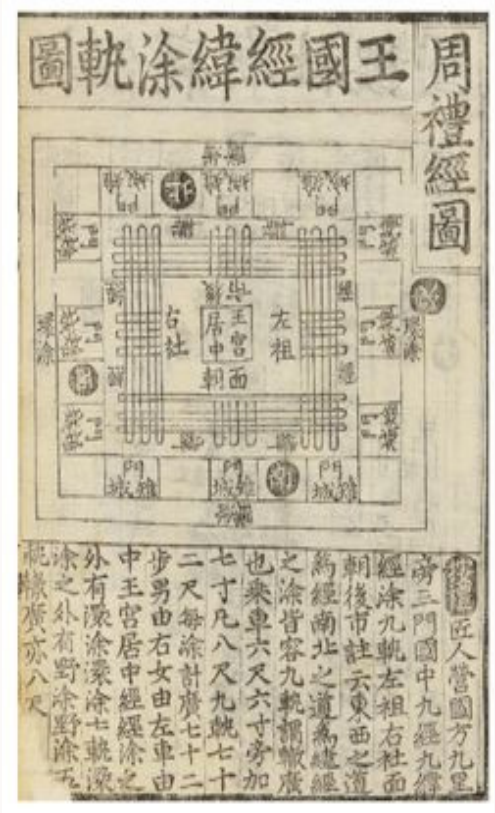
Shanghai is located in the Yangtze River region where, starting from the Sui dynasty (7th century), small ports developed along the tributaries and canals. At this time, the Hu village was formed at the confluence of the Huangpu River and Suzhou Creek. Three centuries later, during the Tang dynasty, it took the name of Shanghai, a term composed of two Chinese characters: Shang, which means towards, and hai, which means sea. Thanks to the administrative reorganization implemented by the Song dynasty, the Yangtze region developed, and the Huangpu River acquired greater importance. In 1074 Shanghai passed from village status to trading town, and in 1297, establishing itself as the largest port in the region was distinguished as an administrative district. Its development was mainly due to the cotton trade, which promoted the economy on a national scale, overcoming the previous market based on rice cultivation and fishing and starting the first historical phase of Shanghai.



5. Map of Shanghai in Shanghai Xianzhi (上海县志).

Walled city

During the 15th and 16th centuries, Shanghai's commercial strength attracted continuous and destructive pirate raids, which forced the Ming dynasty to encircle the city with a wall system in 1554. The walls did not enclose the entire town but formed a ring oval around the oldest part, separating it from the river. Crossing the dense constructions, the fortifications modified the paths of the canals by creating an external moat. The accesses to the city were through six portals. The walls had diversified the whole and divided it into two: an internal one, with the imperial garrisons and the administrative center, and an external one, with settlements on territory still indistinct and open to trade.



6. "Kao Gong Ji"

Urban Fabric

Shanghai in this period presented itself, from an urbanistic point of view, as a Chinese city. Accordingly, the Chinese town served as a form of urban planning that encompassed the built heritage of architecture and engineering and as the centerpiece of social order, religious belief, and political control, thereby governing the Chinese state's structure and operation as a whole.

The inner city was the political platform for the control and administration of the state; the palace in which the ruling house is located then becomes the political hub of the "head of state." Meanwhile, the outer town serves as a space in which the various functions of the city are: as the political center for the state, the center for economic administration, the center for military command, the center for the regular operation of cultural and ritual activities for officials and the masses and "services".

West / East

During the Qing dynasty, there was a profound economic, social and political development that included increased public services, schools, infrastructure, and commerce. Despite this, Shanghai was still less developed than its neighbor Suzhou, Hangzhou, and Nanjing. Most of the commercial relations of the city took place with England, which bought silk, cotton, porcelain, and tea, introducing opium to the Chinese market. The Opium Wars broke out in the mid-19th century due to China's trade disputes and drug bans. In 1842, with the treaty of Nanking stipulated following the Chinese defeat by the British in the first war, the history of modern Shanghai began. This date marked the opening of the city to trade and foreign presence.

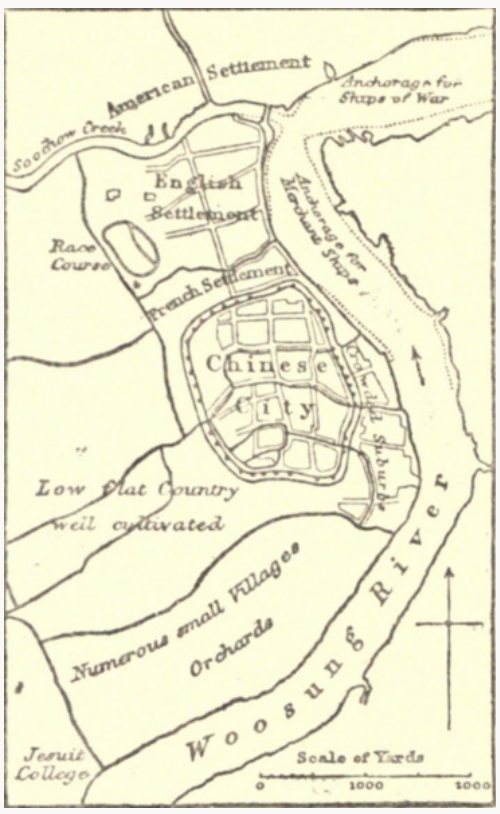
In the rural areas north of the Chinese city, first Britain and later France and the United States obtained the authorization to establish their citizens' residences and commercial activities. Foreign concessions were thus found in some regions of the city; these territories were given to foreign governments that could fix their control. The benefits were obtained on lease from the Chinese government, which gave them administrative and judicial extraterritoriality but nominally remained Chinese territory and, in this way, represented circumscribed foreign colonies within an invaded territory.

The urban planning of the English Concession will consider the orography of the place by identifying roads that led from the port to the hinterland and defining building lots, favoring the infrastructural aspect. In the same way, the urban structure of the French Concession developed, selecting, in this case, a system of transversal routes that connected the Chinese city to the English Concession.

7. Qing Dynasty, Shanghai.

Urban Fabric

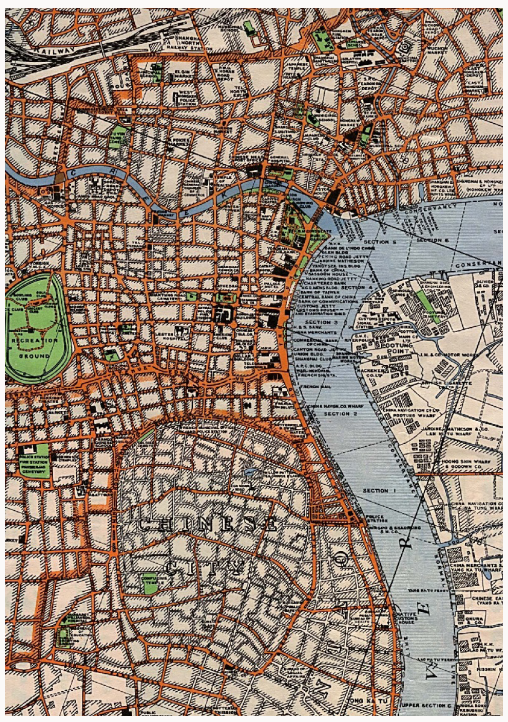
The concessions were formed in the image of the respective cities of the colonizers. The area reserved for the French Concession, just north of the walled Chinese town, is distinguished by broad road sections surrounded by tree-lined avenues similar to boulevards; the buildings facing the street were lower than those of the English concession where the roads have less extensive sections. The main routes of the French Concession are arranged from north to south, organized in such a way as to connect, at the time, the international concession and the walled Chinese city; the usual routes of the International Concession, on the other hand, develop mainly from east to west and follow the orography of the canals. Within the concession areas, numerous neighborhoods developed that housed the new residential typology of the longtangs: considered an interesting example of the contamination between Western and Eastern culture in the architectural field.



8. "Shanghai" Encyclopædia Britannica, 9th ed. 1886

9. Old longtang Neighbourhood near Datian Road

10. Jiujiang Road, Shanghai, late 1920s



11. 1933 map of Shanghai.

Urban Fabric

The desire to unify the territory materialized in the zoning plan for the new center of Shanghai, which established a further urban center north of the Bund. Expanding would absorb foreign concessions from outside. In the city, for the first time, different types still new for China appeared: large squares appeared, the first shopping centers along Nanjing Road, the Park Hotel, the first tower building, a racecourse where now there is People's Square, museums, libraries, theaters, and stadiums.

In 1863 the International Concession was born, formed by the union of the English and American ones. The city was distinguished by partitioning the territory into three areas subject to different administrations: the Chinese city, the French Concession, and the International Concession.

The International Concession was the most significant area under foreign control. At the beginning of the twentieth century, this area, crossed by the Suzhou River, was about 22 square km wide and stretched north of the Chinese city along the Huangpu River. Thanks to some of the residents, especially British merchants, the settlement was able, in a short time, to compete with the most innovative European cities. South of the international concession was the French one, smaller in size, about 10 square kilometers, and of lesser economic importance. Most of the luxury residences of the wealthiest Chinese and foreign social class were concentrated in this area and were characterized by the lively nightlife. Like the International Concession, the French one also underwent rapid modernization.

Recent History

In 1927 the Nationalist Party came to power to end unequal treaties and reaffirm Chinese sovereignty over foreign concessions. Therefore, a single municipal government was established in Shanghai that united all the urban areas, villages, and surrounding rural areas, putting an end to the fragmented management of the city. Foreign concessions continued to enjoy the previous agreements but began to gain awareness of their uncertain and precarious condition within the Chinese territory.

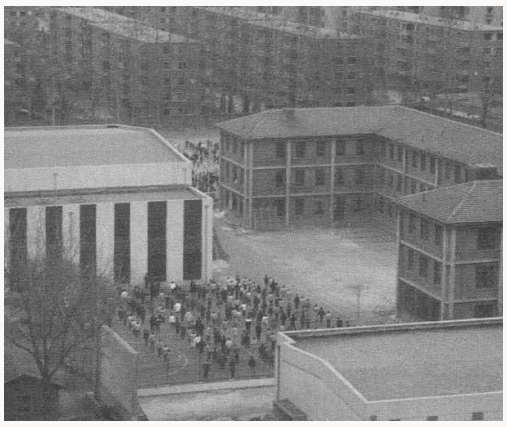
On August 13, 1937, the fighting for the Japanese conquest of the city began in Shanghai. The war lasted three months and claimed the lives of 300,000 Chinese soldiers. However, the Nationalist army could not stop the Japanese.

During the Second World War, the concessions disappeared because, losing the military support they had always received from Great Britain and France, they were occupied by the imperial armies. Then, with the Japanese peace accords in 1945, the city returned under the sovereignty of the nationalist government, and foreign concessions returned to be part of the Chinese territory.

In 1949 Mao Tse-tung founded the People's Republic of China; the communists conquered Shanghai and thus the power over the most important industrial and financial center of the country. Thus, the metropolis, with the new Maoist socialist planning system, passed from "pearl of the east" and "monument to imperialism" to "machine of industrial production." Towards the end of the Empire, China had seen an incredible demographic increase due to technological-agricultural innovations. However, the Communist Party faced an overcrowded country, mainly agricultural, and needed an essential and extensive reform. Mao chose the urban model of the Marxist Soviet city and industrialized the Chinese cities. The model envisaged the abolition of differences between town and countryside, that is, the abolition of cities and creating an industrialized territory, a homogeneous production network with agricultural areas and residential areas.

Urban Fabric

Shanghai's urban organization was highly standardized and divided into work units, the Danwei, which thus led it to become a factory city where life and work were unified into a completely organic system. In 1953 a new Masterplan was redacted based on the notion of a compact socialist city that excluded the suburbs from the urban design; however, only People's Square was built as a meeting place. Public residential construction's only provisions consisted of dividing the existing villas and longtangs into parts to allow us to live more families. The government also decided to build nine new villages in the suburbs. Very close to the industrial districts, they constituted real working-class towns with 400 thousand people. On the borders of the municipality, a network of seven satellite cities was also built, consisting of residential districts and production areas to unblock the metropolis on both the demographic and industrial level.



12. Typical Danwei, Beijing

13. Common gym activity in Danwei

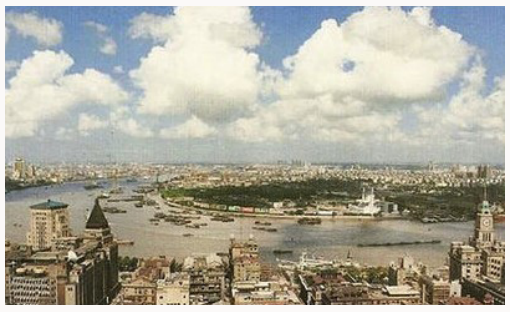
Globalization

With Mao's death in 1976, his successor, Deng Xiaoping, initiated policies of openness and modernization, and his first interventions were to de-localize some industries to make way for new residential interventions strongly needed by the workers. In 1994, the Ninth Five Year Plan was launched, which would lead the monocentric structure of the city to be transformed into a polycentric one with the construction of a series of New Towns. This new policy inevitably led to a process of

Urban Fabric

These interventions laid the foundations for the construction of the first satellite cities. In 1986, in a political and economic scenario completely changed from that of the past, the first plan was drawn up, which included a long-term vision of urban changes; the intent was to transform the city, within thirty years, into the new economic, scientific and cultural center of the world. The program included: the redevelopment of the central city, the construction of Pudong, the enhancement of the riverside, and the building of seven satellite cities. In the wake of these choices, in 1992, the Comprehensive Plan was drawn up to construct the new Pudong area, the driving force for the development of Shanghai. The plan divided the district into five parts: the financial center characterized by the skyscrapers

14. The Bund

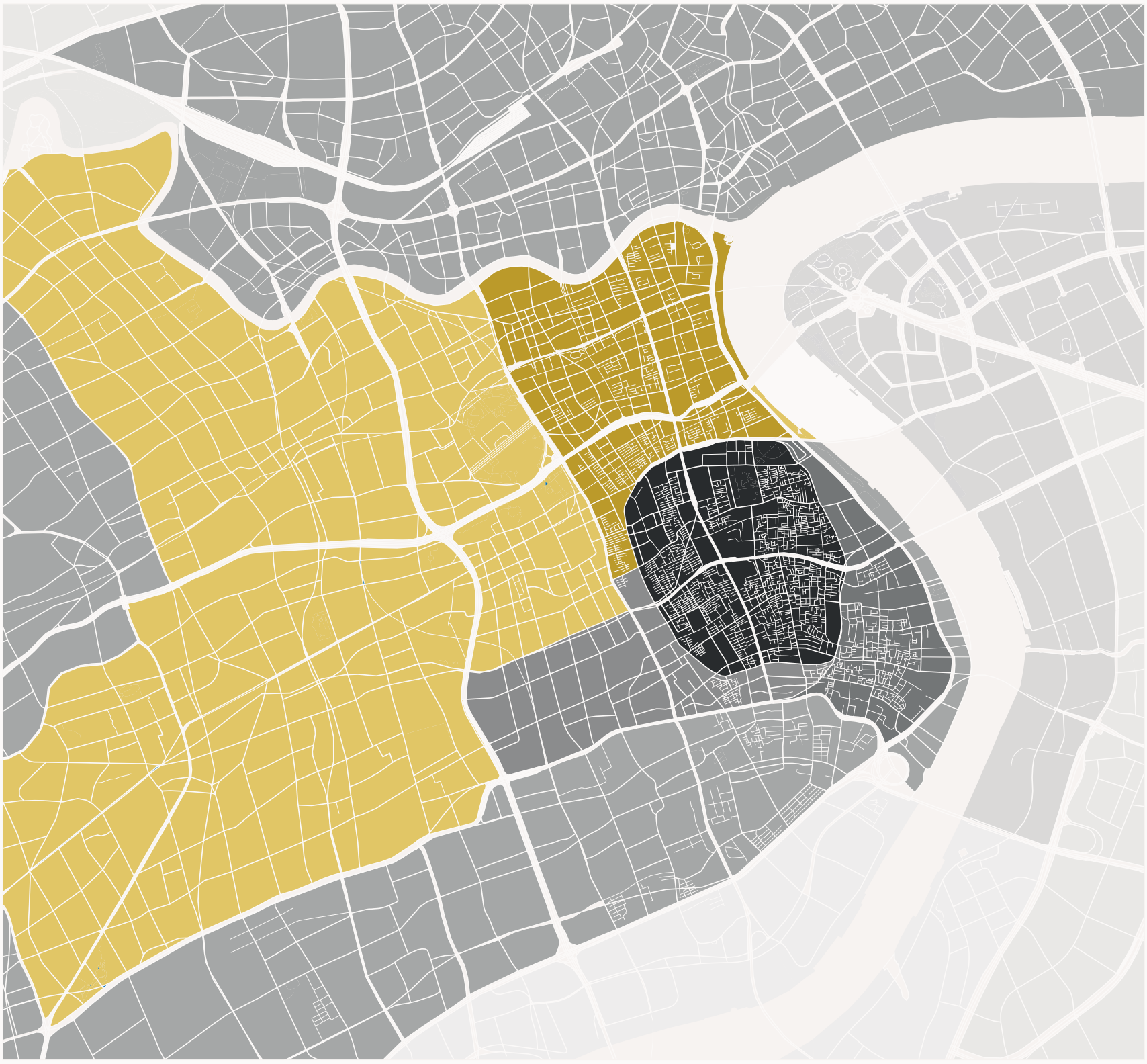


15. 1990

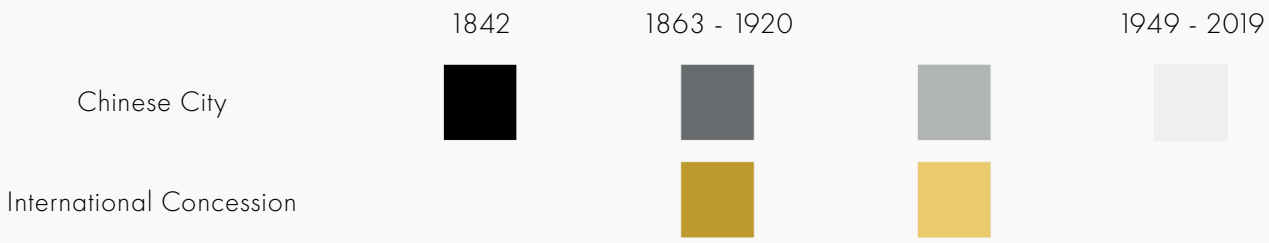
16. Today

that reflect on the river, the new commercial port, the area specializes in advanced technologies and the industrial regions. In addition to the construction of Pudong and the numerous territorial changes that characterized the 1990s, there was also the creation of the multilevel road system, elevated roads that housed secondary roads below, the construction of three rings that joined the municipal boundaries, the opening of bridges and the inauguration of the metropolitan system. Furthermore, with the uncontrolled development of new buildings and the increase in real estate demand, it was necessary to set expansion rules to decongest the urban center.

in the center were replaced with new skyscrapers, the population could no longer afford to reside there and was forced to move to the new satellite cities; in this way, the inhabitants of the historic center remained only the wealthiest ones. On the one hand, these displacements contributed to the affirmation of the center as an economic, political, and cultural nucleus at an international level, but, on the other hand, they led many inhabitants to find themselves in poverty and homeless. When China introduced property rights to homes, many were allowed to remain in theirs, with the proviso that local authorities could, at short notice, transfer them, subject to compensation.



17. Mapping of the major historical urban expansion of Shanghai urban fabric.



FIGURES RESOURCES

1. Movie frame, Prof. Chen Zhen, *China Urbanization*, 24 March 2014 *pag. 12*
2. Prof. Chen Zhen, *China Urbanization* and https://www.nytimes.com/2013/06/16/world/asia/chinas-great-uprooting-moving-250-million-into-cities.html *pag. 13*
3. Movie frame, Prof. Chen Zhen, *China Urbanization* *pag. 14*
4. Movie frame, *The Chinese Major* *pag. 14*
5. https://en.wikipedia.org/wiki/C._Y._Tung_Maritime_Museum *pag. 15*
6. https://www.salon24.pl/galeria/676276 *pag. 15*
7. https://it.wikipedia.org/wiki/Shanghai *pag. 16*
8. https://www.wikiwand.com/en/History_of_Shanghai *pag. 16*
9. https://www.researchgate.net/figure/An-Old-longtang-Neighbourhood-Near-Datian-Road-in-Shanghai_fig3_50257403 *pag. 16*
10. https://fi.m.wikipedia.org/wiki/Tiedosto:Shanghai1920s.jpg *pag. 17*
11. https://en.wikipedia.org/wiki/The_Bund *pag. 17*
12. Prof. Chen Zhen, *The Transformation of Chinese Cities, Beijing, Datong*, 20 February 2014 *pag. 18*
13. Prof. Chen Zhen, *The Transformation of Chinese Cities, Beijing, Datong*, 20 February 2014 *pag. 18*
14. https://en.wikipedia.org/wiki/The_Bund *pag. 18*
15. https://it.wikipedia.org/wiki/Shanghai *pag. 19*
16. https://it.wikipedia.org/wiki/Shanghai *pag. 19*

二 PROJECT BACKGROUND

The reason and events that led to the choice of the site and project objectives.

China Design Workshop

This thesis was given in the summer of 2019 by the Workshop " China design" held by Shanghai Jiao Tong in Shanghai, where students from different Universities reflected on new transformation scenarios for core areas of Shanghai.

In this course, professors and students from all universities involved worked together during two weeks of debates, lectures, critiques, fieldwork, and workshop design activities

The workshop was oriented to understand and propose new types of Urban equipment aimed to increase urban resilience, sustainability, and environmental complexity, through scenarios for social and commercial involvement. The course proposes an integrated design in a complex multifunctional building that focuses on providing environmental services, resource generation, open space design, and contextual relationships.

The uses and scales of the project must be a central issue to define a complex scenario that must consider the various actors and urban stakeholders involved.

In the different lectures, the students have been sided with an advisor from a local architecture studio to better understand and intervene in Shanghai reality.

During the course were underlined some aspects to pay more attention to :

• doing urban interventions focusing on the real through research and architectural design.

• generating an accurate detection and solving of real problems through participatory observation, community participation, and critical reasoning.

• reflecting and proposing design solutions related to the volume (total and voids relation, density), the ground floor relationships (block's porosity, connections with the roads' network, open spaces), the functional program in consideration of surrounding framework.

This experimental design workshop site is a derelict area close to Bund Riverside in Shanghai, currently used as a temporary parking lot. The proximity to different Central Business Districts makes this site a strategic location for the development of Shanghai.

In conclusion, as already stated at the beginning of this book, this project aims to regenerate the urban image of the derelict area finding a standard answer to the different requirements that came from the complex reality of Shanghai and its actors: the resident, Shanghai Jiao Tong, the Chinese government policy and urban strategy, the urban context.

3. The Site, currently used as parking.

Regenerate

But what does it mean to regenerate in the Chinese context?

It contains many approaches, but it is very common in Chinese architecture because of the gap and inequalities present in the country.

The most common inequality, and the one that architects try most to solve, is the between city and countryside.

4. New project in chinese countryside: archi-union's bamboo pavilion and AZL architects shitang internet conference center .

In China, the countryside has been invaded by architectural experiments. Drawn by the promise of boundless opportunity, architects, artists, developers, and capital flow are converging in rural areas across the nation.

Faced with mass-produced rural housing brought on by urbanization, architects attempt to find a middle ground between tradition and modernization, taking advantage of modern technology in search of a vernacular connection.

Now the fate of the Chinese countryside has been under the spotlight ever since president Xi Jinping declared the new national priority of "comprehensive rural revitalization." The past two decades of city expansion brought to "rural hollowing," with many villages disappeared from the map each day since 2000. Grandparents and babies were left behind by working-age adults flocking to the cities.

But inequalities have also been generated in the cities through unchecked urban expansion.

5. The contrast between old houses and the new expansion

In the past houses were granted to people by their work units in the days before a property market. When China implemented property rights, these people were allowed to continue using their houses . The local government decided to relocate them later, with some compensation.

But dissatisfaction with the compensation offered by local governments led to protests by residents. Residents who refuse to accept the buyout offer started protecting their homes from the attempts to remove them.

The result has often been architectural absurdities: tiny houses standing amid freeways, pedestrian malls, perched on concrete islands in the middle of pits excavated for underground parking lots, and part of the cities that remain in the past both for architecture and living condition. After this description it is clear what is very interesting about the site chosen by the workshop: also here is present a gap. As a consequence of this gap, which will be made more evident during the analysis, the site and the resident can be compared through an association of ideas to a ghost in the middle of the international city called Shanghai.

FIGURES RESOURCES

1. SJTU
2. SJTU, *Booklet Global Summer School* *pag. 25*
3. https://www.archdaily.com/959329/the-contemporary-transformation-of-traditional-chinese-architecture *pag. 26*
4. https://widerimage.reuters.com/story/shanghais-nail-neighbourhood *pag. 26*

REFERENCES

An analysis and description of two types of reference: a historical one and a modern one that tackles the objectives and requirements of the project.

1. Old and new courtyards

Chinese Courtyard

The social and geometrical centrality of the courtyard in traditional Chinese houses has long been established as the core concept of spatial planning.Surrounding this central element, social rituals are practiced, and domestic functions are ordered. Almost all buildings share this courtyard structure with different tasks in China.

Ancestral temples, academies, guild halls, and even the Empire's Forbidden City can be viewed as types of courtyards. Its north-south orientation, closed structure, clear axiality, and balanced side-to-side symmetry reflected the layout principle about the ideal environment according to the traditional Chinese philosophy. The traditional courtyard house thus represents a remarkable way in which the Chinese people have used space, symbolically and practically, to accommodate social functions in buildings.

The first part of this chapter provides a framework of vernacular architecture and types in China and, by analyzing some courtyard-based cases built in the area of Shanghai, identify this architectural type as one of the potential design pathways for contemporary architecture in China.

Social dinamic

The courtyard was and is the most functional living space of a family, routinely used for receiving guests, dining, family gathering, and performing ritual ceremonies.

The traditional upper-class houses were designed to accommodate extended families. A significant compound house consisted of two or more basic housing units with their courtyards, and each housing unit could hold one or more family units.

Due to the economic pressures, the extended family — its structure which generally consisted of three, four, or even five generations living together, the achievement of the ideal Chinese cultural model of a family — began to break down and was replaced by the nuclear family consisting of parents and children or just a husband and wife.

Later, the most traditional single-household courtyard houses were converted entirely into multi-household compounds and those multi-household compounds were further subdivided. This conversion was regarded as a good approach, which could relieve the new governments quickly from the acute headache of the housing shortage and execute the government's housing policy of abolishing private housing ownership, which was in line with the movement of the nationalization of ownership. Meanwhile, this approach helped the government alter the traditional Chinese family structure, which had been inherited from the old ideology of Confucian family ethics. The government criticized it as a feudal and corrupt way of life since the old family ethics of the hierarchical society were considered contradictory to, and in conflict with, the new proletarian and classless society.

Consequently, to cope with the further increasing housing shortage without the necessary investment in housing construction, private

2. Courtyard lifestyle in the old times as depicted in movies

homes were invaded. Thousands of families were given licenses to share the premises of other families. The traditional courtyard houses were divided up, that one family rarely occupied more than one room. The invasion was not only confined to the few single household courtyard compounds that were left, but it also spread to the multi-household courtyard compounds as well as multi-story apartments elsewhere. Even the inhabitants of the crowded houses had to make way for other families, turning over bedrooms to them and sharing cooking space and toilet facilities.

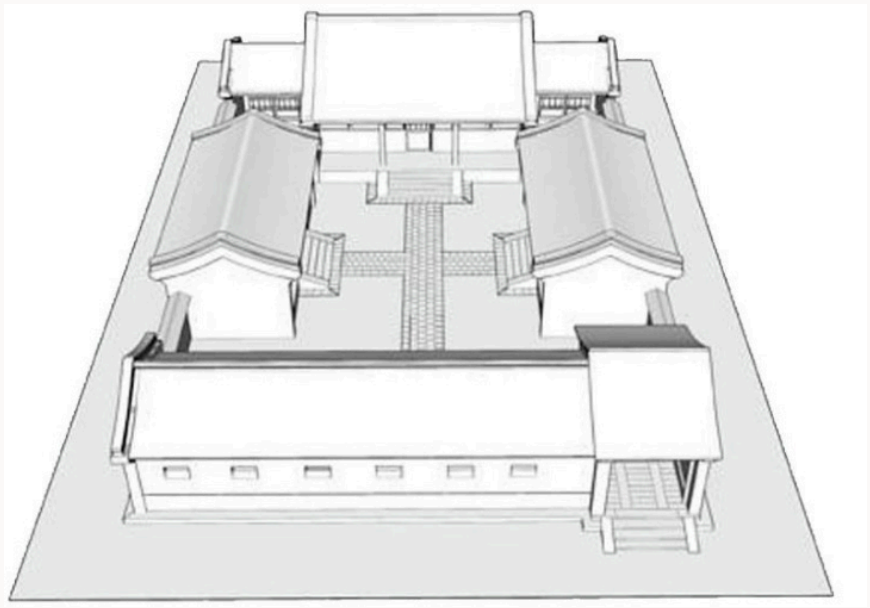
This situation made the already crowded nature of life in cities worsen and, at the same time, increase the social importance of the courtyard, now seen as a sort of a square in this multi-household compound that began to look more like a district than a single unit.

Cases

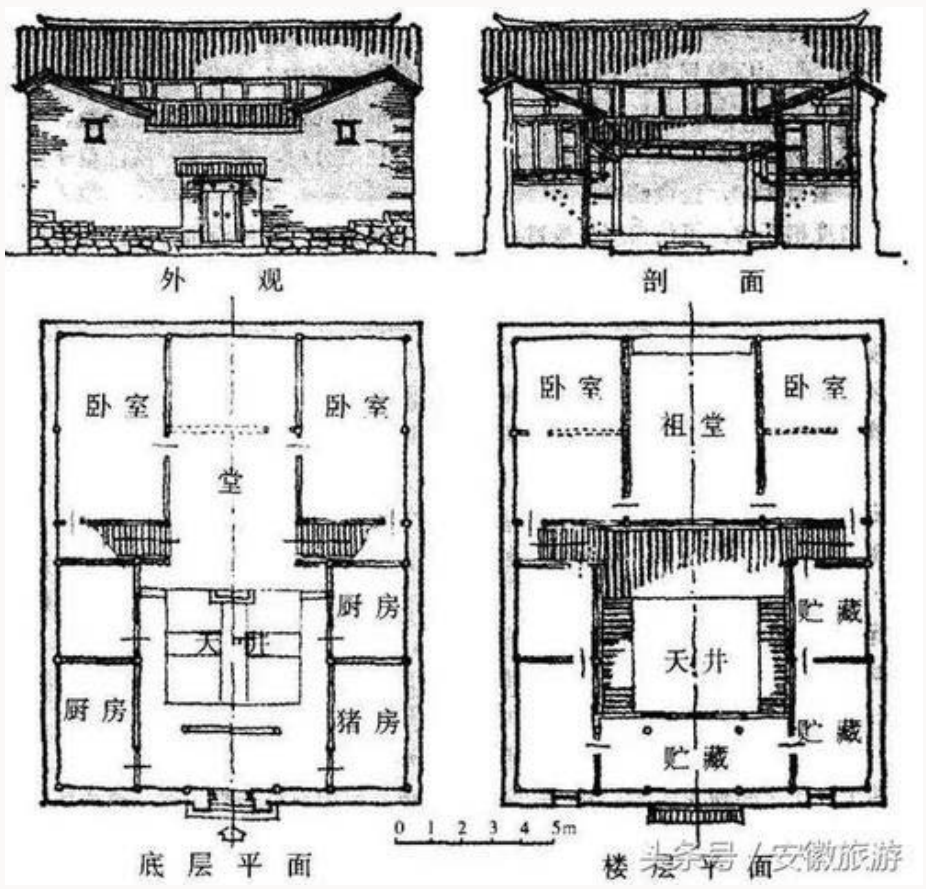
During the sweep of Chinese history, continuing migration and re-settlement carried this building form into different regions and re-contextualized it in local environments and climate.

But despite continuous modifications arising from its adaptation to local conditions like topography, climate, available building materials, and social customs, this regional contextualization does not seem to have created new house forms that deviated markedly from the type. Instead, a striking continuity in the reproduction of its basic spatial configuration has been maintained through generational uses and customary changes.

The idea of ordering spaces centered around the courtyard has mainly been preserved and reproduced in different parts of China. The basic courtyard unit and its variants have been employed almost as a module system in planning, either for compact building solutions constrained by the site or more significant compounds.



3. 3d view of a standard Siheyuan



4. Plan and section of a Hui house

Siheyuan

The northern Siheyuan has the most influence on other sub-types of courtyard houses in China because of its flexibility and adaptability.

One Siheyuan is made of one courtyard squarely enclosed by single-story buildings on all four sides.

Some large siheyuan would have two or more courtyards and even private gardens. Northwestern walls are usually higher than the other walls to protect the inside buildings from the winds in winter. The roof end curves downward so that rainwater will flow along the curve rather than dropping straight down. As a result, the rooftop provides shade in the summer while retaining warmth in the winter.

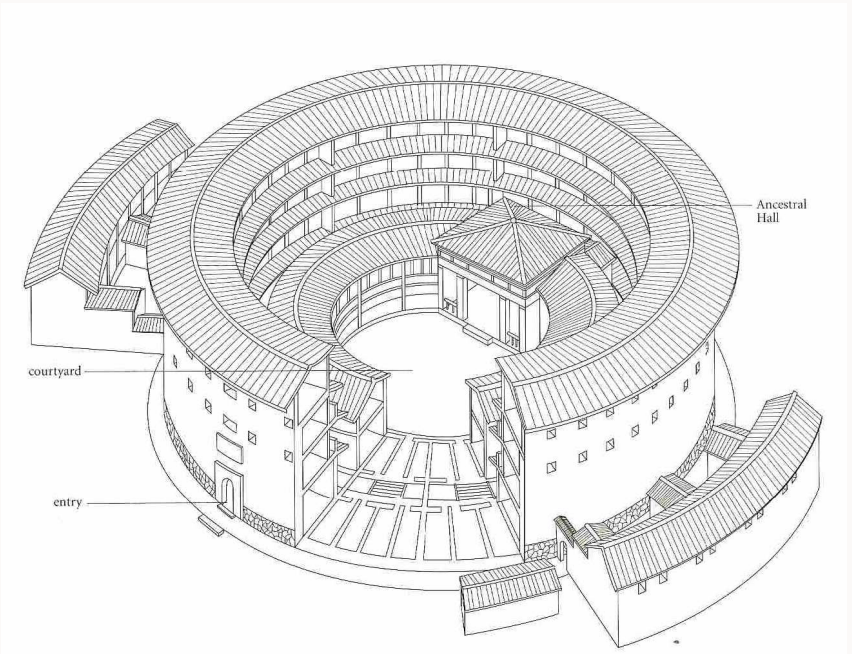
Hui

Hui style residences comprise several two-story buildings on three or four sides around one or more "sky-well" interior courtyards. These enclosed dwellings are represented by the "sky well," which is favored by Hui merchants. In Fengshui, water symbolizes the source of wealth; rainwater from four sides of the house can be guided through slating roofs into the courtyard - representing the inward flow of wealth. Thus, the process was known as "four waters returning to the hall." When a new couple married, they just lived with the old generation and the young generation. The new house was connected with the old one and with the separated patio. Gradually, all these houses formed a large compound.

Tulou

Tulou, literally meaning "mud building," is The earth dwellings of Hakka people in the mountainous areas of south China. Each building functioned as a village unit and housed many generations.

Rectangular or circular are large, enclosed, and fortress-like earth buildings around a central open courtyard. For defense, the Hakka people built Tulous with earth-packed walls, and windows are open only from the third to fifth story. Most Tulous usually have just one gated entrance that led into the central courtyard, and even there were underground tunnels to escape through.

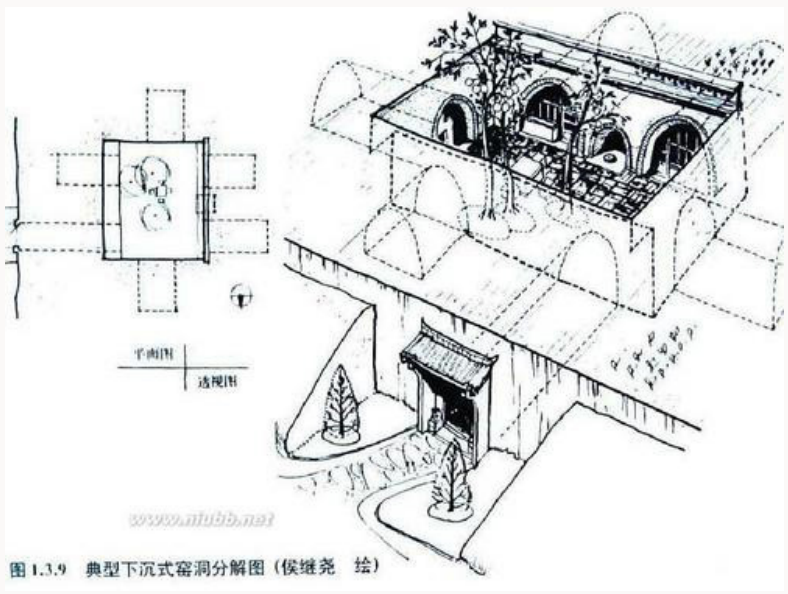


5. Exploded axonometric view of a Tulou

Yaodong

Most yaodongs are distributed along the sides of the cliffs and valleys to conform to the terrain. The most common type is cliffside yaodongs, which are dug directly into the cliffs.

The earth surrounding the indoor space serves as an insulator keeping the inside warm in cold seasons and cool in hot seasons. Consequently, very little heating is required in winter, and in summer, it is as cool as an air-conditioned room.



6. Axonometric view and schematic plan of a Yaodong

Shanghai

Traditional houses in old Shanghai had been built on a small scale by individual families who owned the land, followed the conventional house layout, and supervised and financed the construction. The most common house type in Shanghai and the surrounding rural area was Siheyuan, and its form was easily adapted to different needs. A new style of housing was developed when local developers adapted Western-style terrace houses to Chinese conditions. Migrant laborers from surrounding provinces entered Shanghai in large numbers with the establishment of Shanghai as a treaty port in 1843. With the increase in demand, property developers began to build many residential buildings for the new Chinese residents of the city. At first, these were wooden buildings that were cheap and quick to make. These wooden buildings were built as terraces and usually named with "Li" as a suffix, becoming the first Lilong buildings in Shanghai.

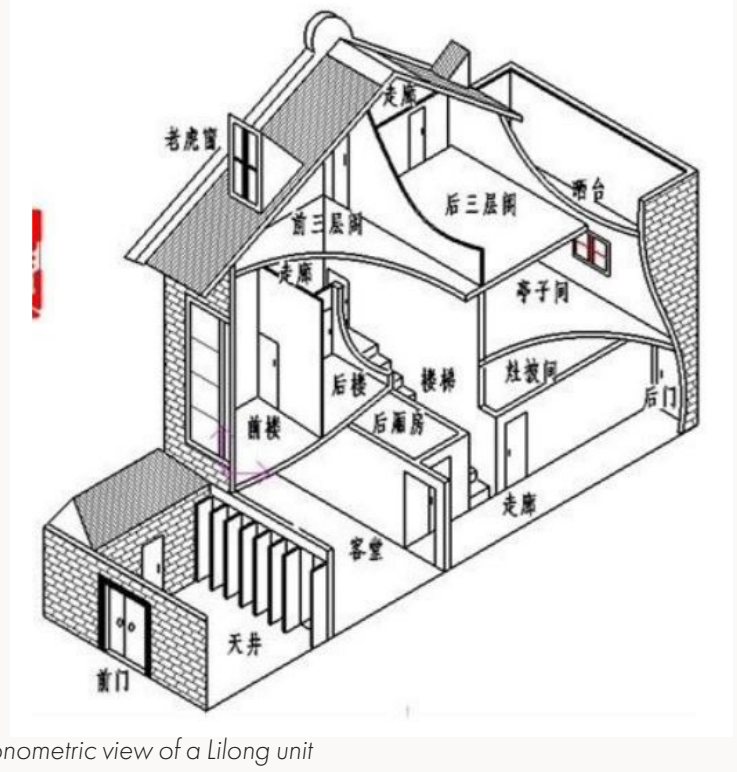
Lilong

In the Shanghai dialect, Long or Langtang means both an alley that connects houses and a group of places connected by alleys; "Long" means alley, and "tang" means a vital building or main room of the house. "Long" is another term of the Mandarin always used to describe this topology of places composed of the word "li," narrow street, and "long" alley. The term "shikumen" literally means wooden door with a stone frame, a typical element of the longtangs.

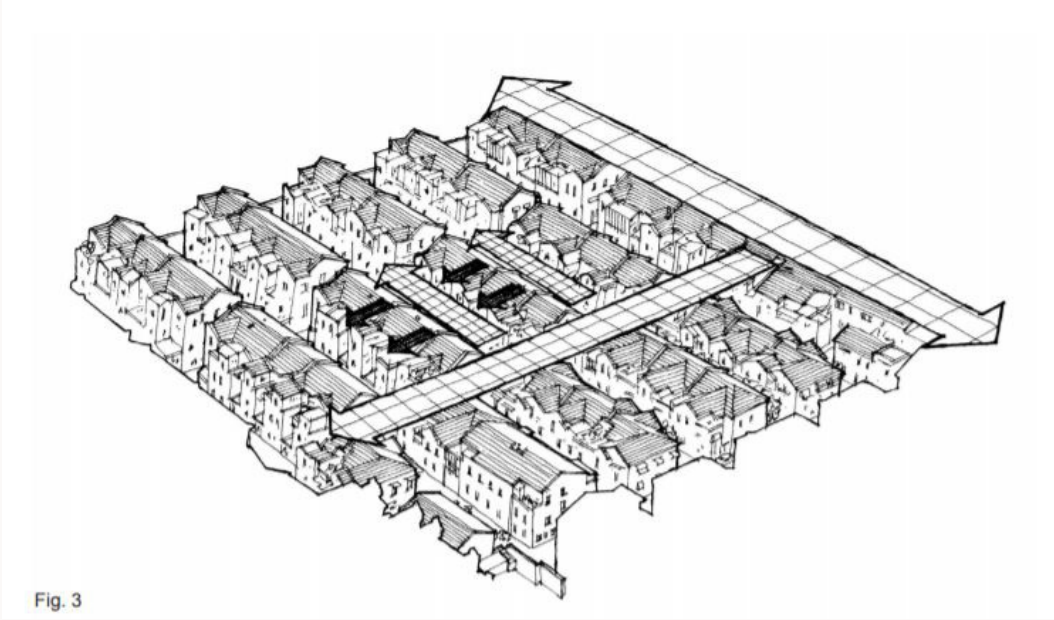
These houses are a unique architectural type, the result of the integration between Western and Chinese types, born to satisfy the need for housing due to the increase in the population and the arrival of refugees due to the nearby wars. They combine Eastern and Western characters both in the overall urban layout that refers to English terraced houses, and in the single unit that is repeated always aligned in the same way, forming main and secondary streets while maintaining the traditional Chinese courtyard. This characteristic is expressed in the words long, which means alley, and tang, which means important building or main room.

In the Langtang of Shanghai, the theme of movement is expressed in the words long, which means alley. They were a vibrant generator of street life. Unique to Shanghai, they occupied the ambiguous space between the traditional Chinese courtyard home and the street. The term 'graduated privacy'(Nelson I. Wu, " Chinese and Indian Architecture: The City of Man, the Mountain of God, and the Realm of the Immortals ") is an important one for any attempt to understand the use public space in the alleyway house compound. This term usually applied to the traditional Chinese courtyard house where it denotes the progressive sequence of areas that operated within a traditional

7. Lilong photos : birdview, shikumen, internal corridors



8. exploded axonometric view of a Lilong unit



9. Lilong axes schematic diagram

Chinese house, where the street was public; the semi-public entrance vestibule (a place for welcoming occasional visitors); friends and family would be allowed into the central courtyard and adjoining rooms, which were semi-private; while the deepest recesses of the house would have been reserved for family activities and were absolutely private.

The Longtang house complex or alley also followed this hierarchy to a considerable extent, with the main street completely public; the semi-public main alley (a place where casual acquaintances could interact or conduct small-scale commercial transactions); the side alleys are semi-private (a place where inhabitants can interact on a more intimate level, or engage in household chores - their homes are so small); and the house itself, which was completely private. The richness and liveliness of the Shanghai Alleyway House spaces were largely due to the subtly graduated but extremely rigid hierarchical system of alleys leading to the houses. This allowed the inhabitants to inhabit the alleys that connected the houses and, through them, the rest of the city. The alleys also act as a filter to control and protect compounds from unwanted contact.

Although many Shanghai residents would have considered Nanking Road to be the center of the city, it was a place they rarely, if ever, visited for the simple reason that they could get most of their daily necessities without having to walk farther than an alley or two. Their daily shopping activities took place within the confines of their alley complex, where there would invariably be shops such as the traditional sesame cake vendor. In this way, these shops behaved as if they were located in a typical market town, while Nanking Road operated at the level of the provincial metropolis.

Genotype

As we have seen, Courtyard has a broad impact all across China due to its flexible and extendable structure adapting to various site dimensions. The form of the courtyard house is more suitable than other vernacular dwellings types of adjusting to the natural environment and to meet the needs of living in most areas of China.

By analyzing in the previous pages all forms that the Courtyard has taken in China is possible to point out a Genotype: Siheyuan. The Courtyard is epitomized by the northern courtyard-based dwelling (named Siheyuan) where the principles of axiality, balance, and symmetry are well developed and represented.

Entrance

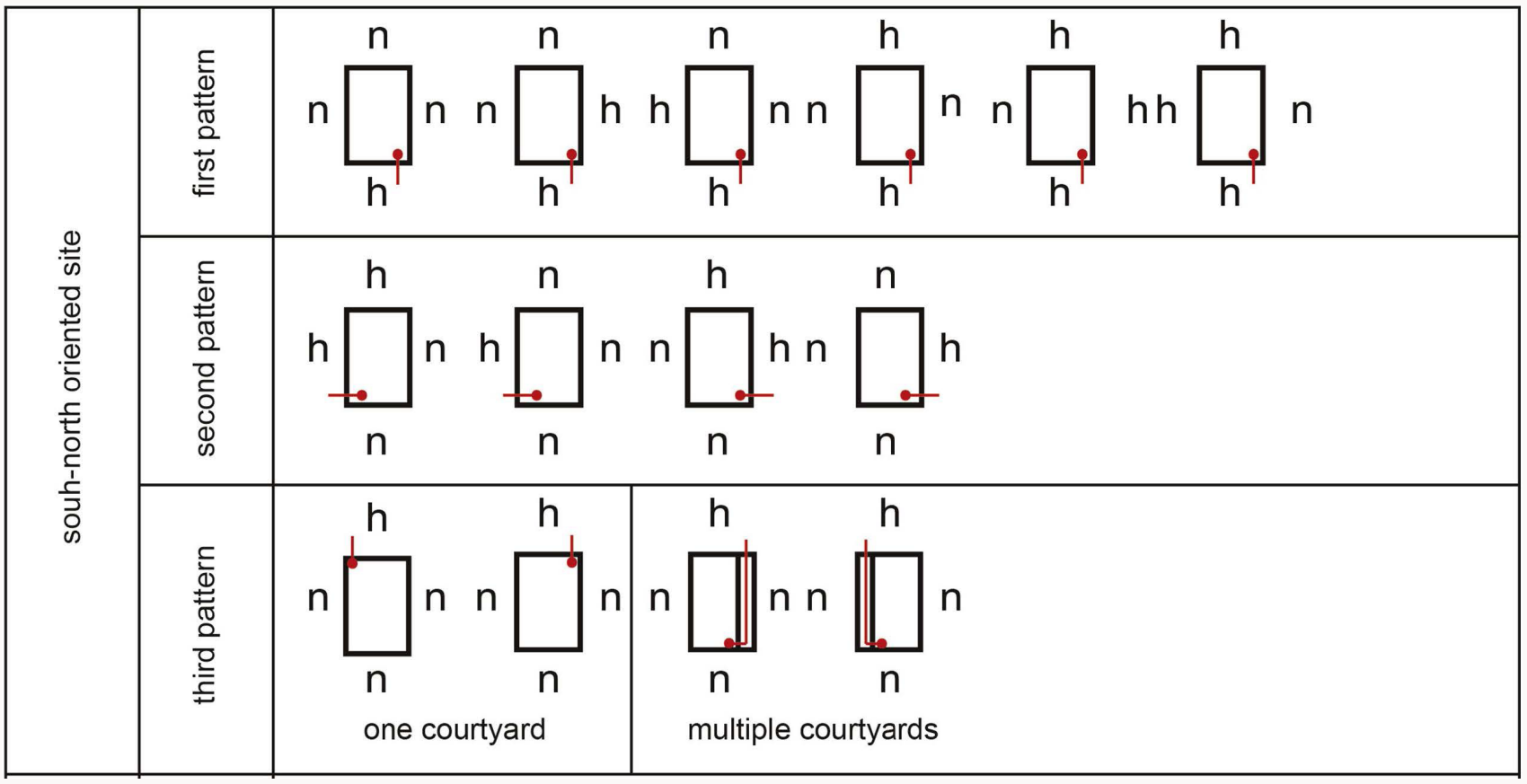
Two factors define the location of the gates: the site's orientation and the neighborhood's context. Usually, and in the standard case, the site's direction is north-south oriented. For the neighborhood's context, the adjacent area on the four sides of the site's rectangle can be occupied by neighboring buildings or accessible urban spaces, such as streets or alleys.

- a street or an alley is on the south of the site, the gate is located at or close to the east end of the south side of a Siheyuan.

- a street or alley on the east or west of the site but not on the south, the gate is located at, or close by, the southern end of the the boundary between the street/alley and the site.

- a street or an alley can only be found on the north, the gate is to be located at, or close to the end of the north edge.

Remarkably, in Siheyuan with multiple courtyards it is common for a north-south corridor to allow for a gate at the south end of the site, so the circulation starts with the courtyard on the south. Siheyuan houses with a back gate are rare. The back gate is usually located at, or close to, the end of an edge of the last courtyard, where it enables the circulation connecting from the Siheyuan interior to the exterior space. Usually, the front gate and the back gate cannot be located on the same edge of a Siheyuan.



10. Tab explaining all the regulation involving the position of the main entrance

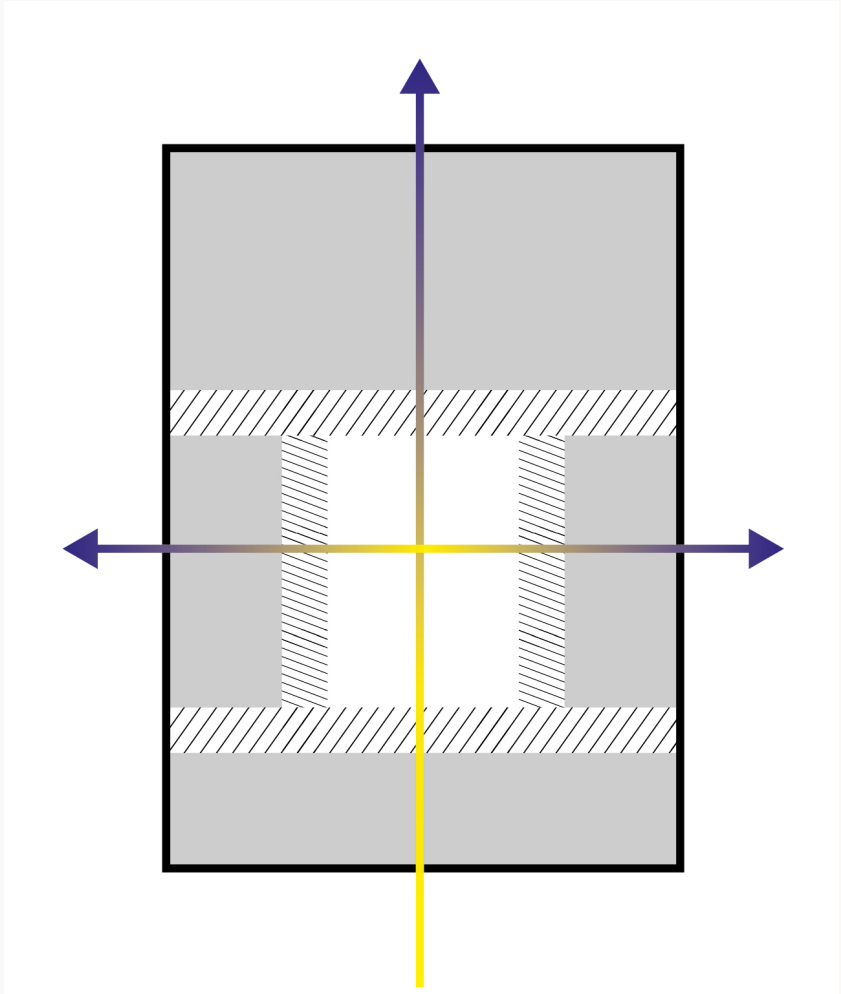
Conclusion

- The layout is organized around two-axis, between which the north-south is the main. The distribution of more public/ private space is linked with the two axes, private areas in North, East, West and public in South.

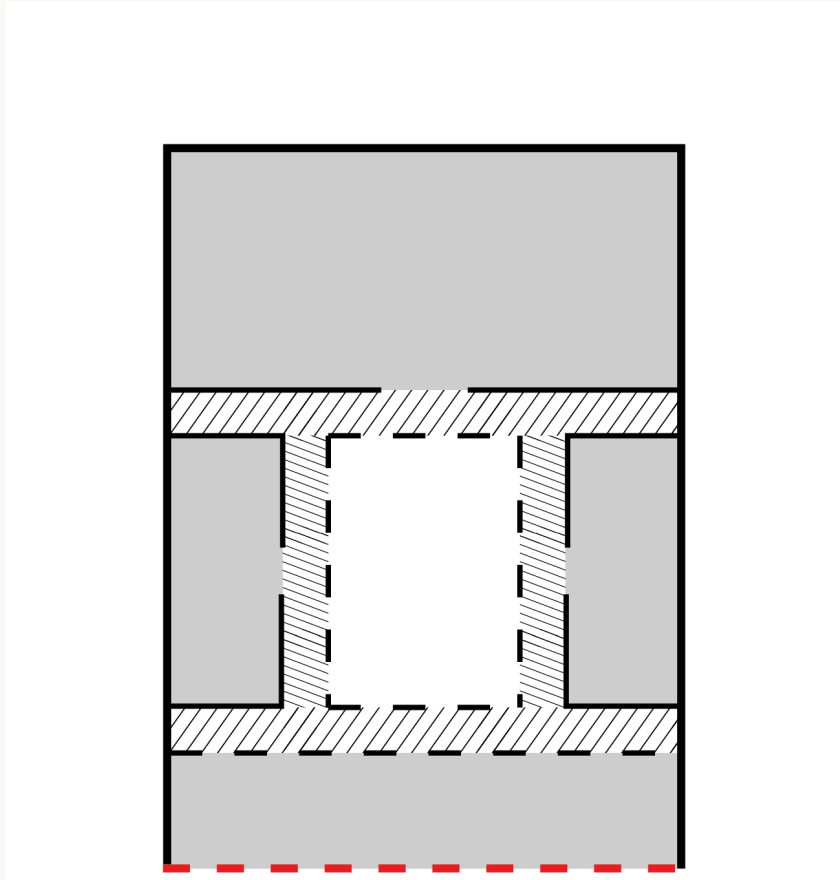
- Different types of closing and screens are inside the layout. Their organization follow the needs of privacy of the building owner, the function of the space.

- The number of courtyards increases as the size of the site increases. Moreover, in the north, there can be the presence of higher buildings.

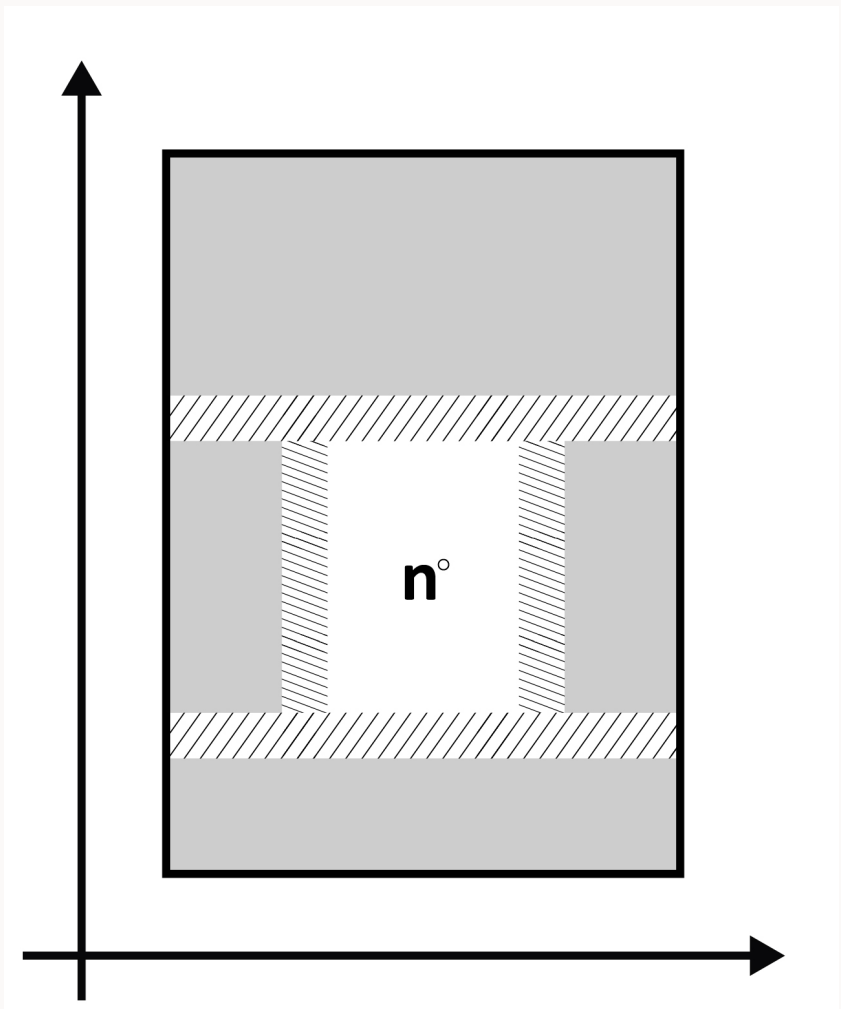
- The movement is along and around the central axis. Particular detail is the position of the entrance that is never on-axis to avoid a direct view of the layout.



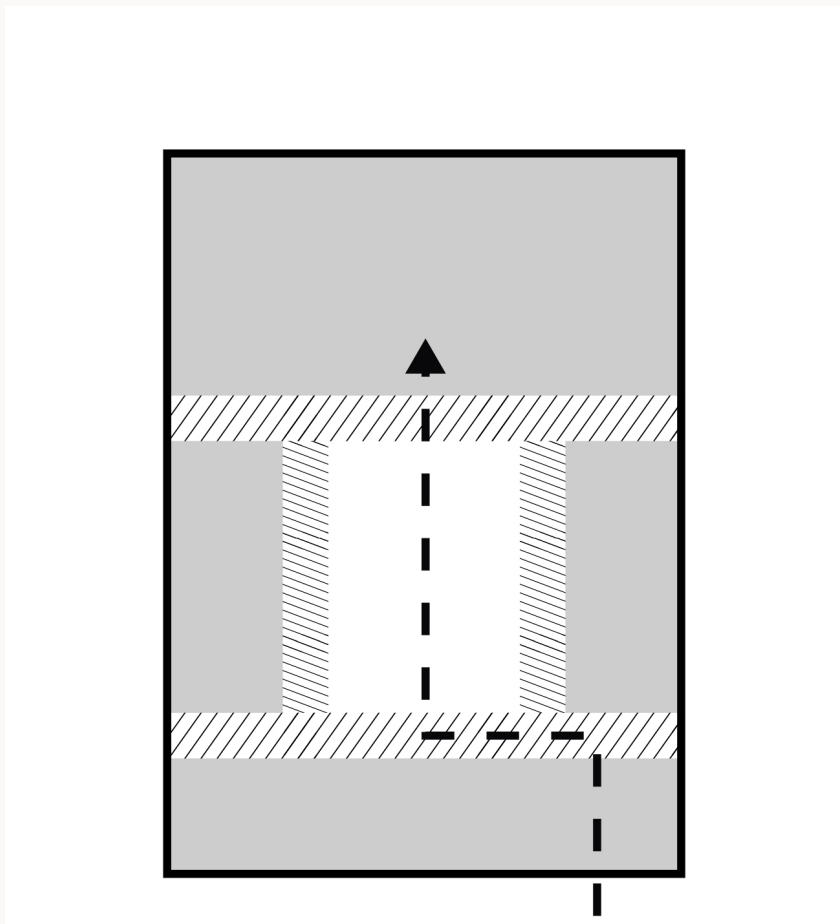
11. Public/Private



12. Closed/Open



13. Courtyards



14. Movement

Contemporary reference

This part tackles and describes. We chose references that tackle the 3 of the main objectives and requirements of the project background explained before: social involvement, complex multifunctional building, reinterpretation of local context.

Floating Fields

Architect: Thomas Chung

Place: Shenzhen, China

Year: 2016

Area: 3,200 m²

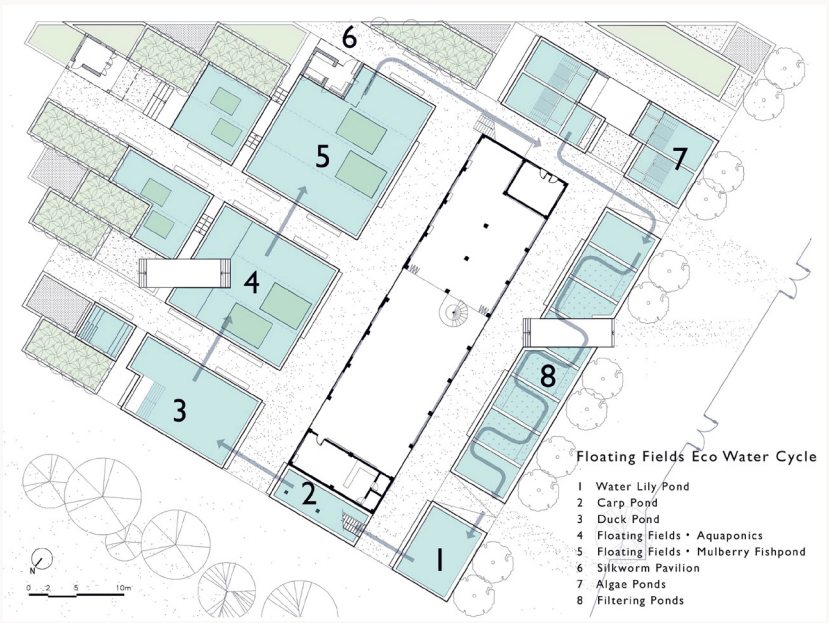
Floating Fields transforms an area of a former flour factory in Shenzhen into a productive landscape and enjoyable public space.

Drawing from the site and local traditions, the obsolete industrial site is revived by a self-cleansing eco-water cycle that integrates floating and rooftop plots, fish, duck, silkworm, algae cultivation with filtering ponds. The edible landscape is designed as a live laboratory researching regenerative design, urban food production, and low-carbon urban living aspiring to place-based, bio-social urbanism.

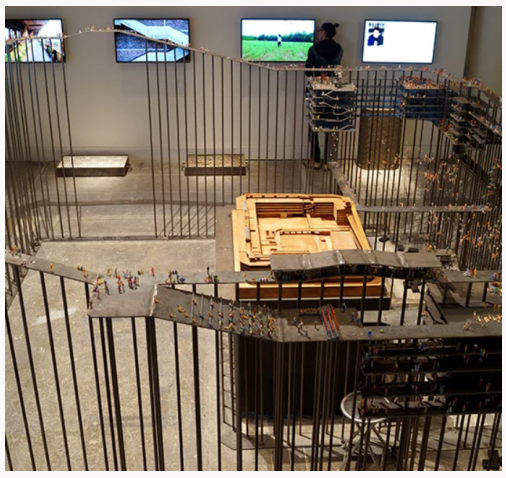
Floating Fields, in this way, generated events with great response and publicity from the community and media, boosting the social involvement in the area and the project.

It shows that it is possible and is becoming a trend in China, regenerating spaces for the community using the food concept in a megalopolis.

15. Floating Fields : pool views and birdview



16. Floating Fields : Eco water cycle



17. West Village : Exhibition maquette explaing the project, loop connection, open passageways

18. West Village : Birdview

West Village - Basis Yard

Architects: Jiakun Architects

Place: Chengdu, China

Year: 2015

Area: 135552 m²

This project creates a multifunctional complex with various cultural and commercial activities. It aims to organize a local collective-living space accommodating sports and leisure activities, cultural and artistic events, and fashion and creative industries. The project synthesizes collective memory, regional characteristics, and modern lifestyle to provide a contemporary arena for diversified lifestyles in modern cities. In addition, the project expects to fulfill social and practical needs with the ultimate goal of being a solid energizer for urban communities.

The project surrounds the entire block along the periphery to maximize the inner area of sports and green land and optimize visitors' circulation rate along the streets. Unlike typical centripetal commercial complexes, the enclosed courtyard is a 'green basin' containing diverse public life and carries on a traditional Chinese lifestyle.

This courtyard façade has continuous balconies that allow all users can share a view of the inner courtyard taking inspiration by the play of view in chinese traditional garden.

Shou County Culture and Art Center

Architects: Studio Zhu-Pei

Place: Shou County, China

Year: 2019

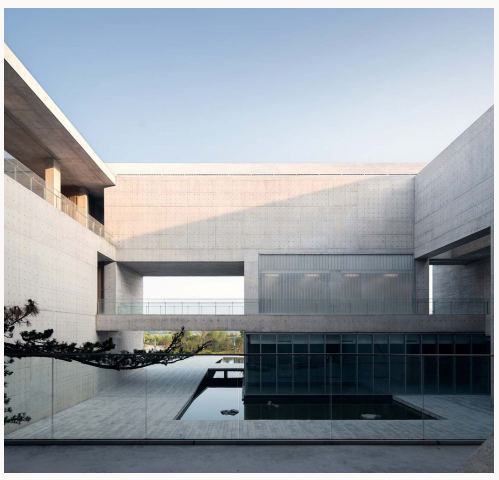
Area: 30010 m²

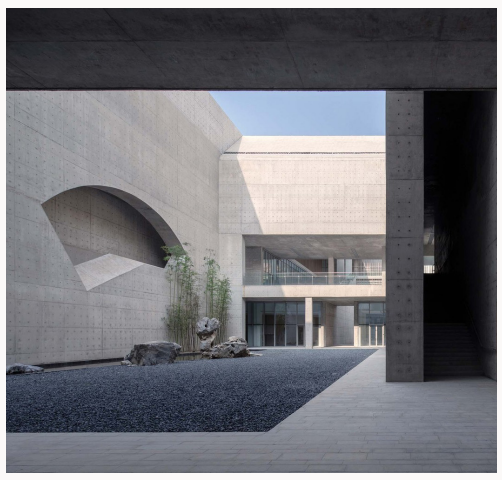
The buildings of the city are constructed in the courtyard house typology; this typology reflects the characteristics of the region's climate and the local culture and way of life.

Shou County Culture and Art Center is organized to attract people to discover and experience it.

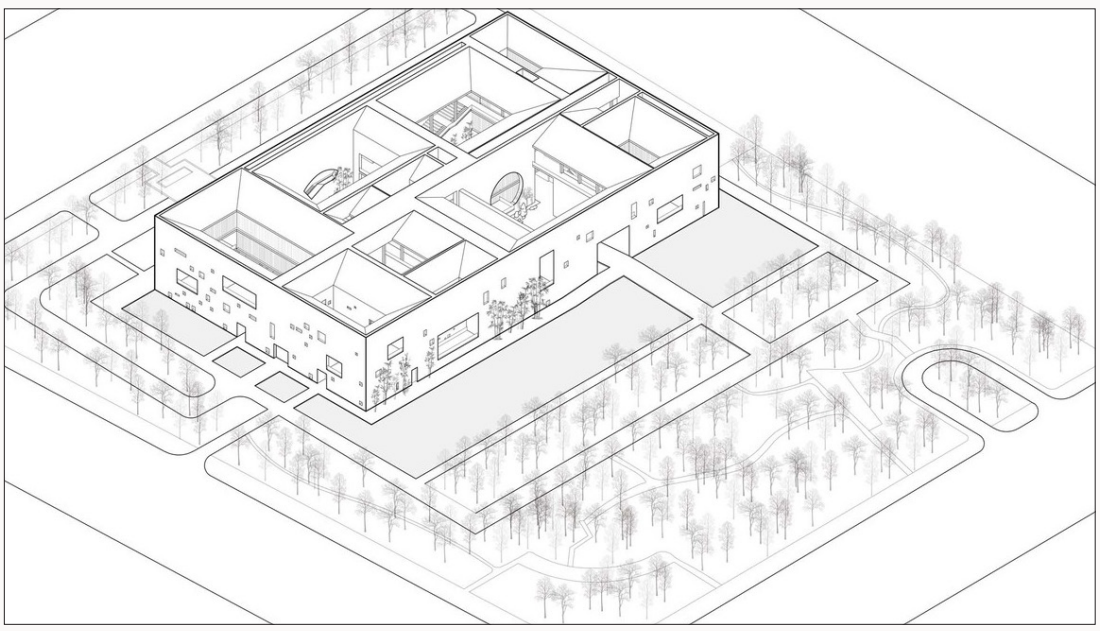
The vertical courtyard houses of the city , and the narrow lanes extending out in all directions connecting homes, reflect the local way of life and hint at the construction rules for local climate conditions. This living and spatial experience has been reimagined to help to insert Shou County Culture and Art Center in the context.

Different sizes courtyards are placed in a enclosed rectangular block. A public walkway connects them, a loop protected from the sun and rain. Walking along the loop, visitors can find themselves on different floors. The space is unpredictable, and light and shadow continually shift to surprise visitors, allowing them to have a feeling described by the principles of "hide, breath, cultivate and wander."





19. Shou County Culture and Art Center : birdview, main entrance, 2 courtyards where it can be seen the " loop "



20. Shou County Culture and Art Center : axonometric drawing

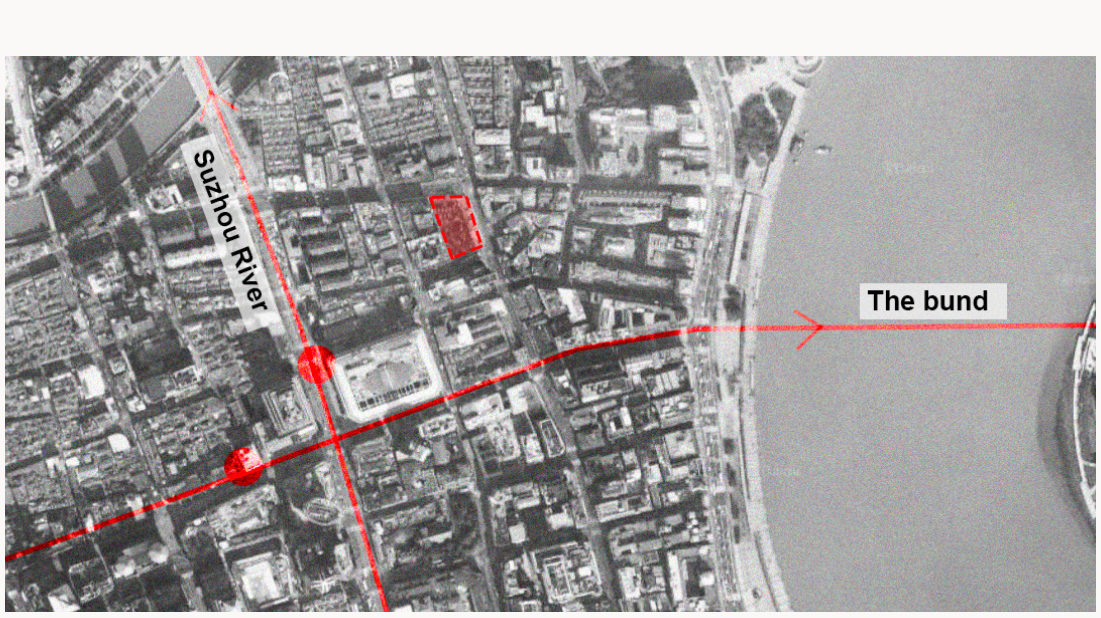
FIGURES RESOURCES

1. https://www.chinahighlights.com/travelguide/architecture/siheyuan.htm *pag. 30*
2. Movie frame, Prof. Chen Zhen, *China Urbanization*, 24 March 2014 *pag. 32*
3. https://www.163.com/dy/article/DC7G8TH805169LNR.htmln *pag. 35*
4. http://y.qichejiashi.com/tupian/7155871.html *pag. 35*
5. https://www.re-thinkingthefuture.com/architectural-styles/a2916-vernacular-architecture-of-china/ *pag. 36*
6. https://slideplayer.com/slide/10333795/ *pag. 36*
7. https://en.wikipedia.org/wiki/Longtang *pag. 38*
8. https://baike.baidu.com/item/%E4%BA%AD%E5%AD%90%E9%97%B4 *pag. 38*
9. L. Citterio, CHINESE HOUSING : residential typology analysis in Shanghai city, Master of Science in Architecture, Politecnico di Milano and Tongji University, a.a. 2013 - 2014, relatori Prof. Di Pasquale Joseph and Prof. Wang Fangji. *pag. 39*
10. Huang B. X., Chiou S. C., Li W. Y., Study on Courtyard Residence and Cultural Sustainability: Reading Chinese Traditional Siheyuan through Space Syntax, Sustainability 11, n.6 2019 *pag. 42*
15. https://www.archdaily.com/783314/floating-fields-wins-shenzhen-uabb-award-and-is-set-to-continue-through-2016 *pag. 46*
16. https://www.archdaily.com/783314/floating-fields-wins-shenzhen-uabb-award-and-is-set-to-continue-through-2016 *pag. 46*
17. https://divisare.com/projects/326479-jiakun-architects-west-village-basis-yard *pag. 47*
18. https://divisare.com/projects/326479-jiakun-architects-west-village-basis-yard *pag. 47*
19. https://www.archdaily.com/934401/shou-county-culture-and-art-center-studio-zhu-pei?ad_medium=gallery *pag. 48*
20. https://www.archdaily.com/934401/shou-county-culture-and-art-center-studio-zhu-pei?ad_medium=gallery *pag. 48*

四 SITE ANALYSIS

A site presentation through further analysis to get the most meaningful information for the development of the project.

1. Site view from South east



2. inside of the site

3. Outside of the site

4. Bund riverside

Site Introduction

Sichuan Middle Road, Huangpu District, Shanghai

The site is a derelict area close to Bund Riverside in Shanghai currently used as a parking lot. The parking is in a corner, with both open sides and closed ones, and its presence interrupts the continuity of the existing urban fabric violently.
This interruption is particularly significant for all the parts involved because of the site's strategic location for the development of Shanghai, very close to different Central Business Districts.

The parking has still maintained this function because of the land policy in China that rent public land for a certain period to private people and, in the case of the governor, other developers want to use the area differently before the natural conclusion of the contract, need to compensate the owner.
The site was rented a long time ago when the Govern tended to give a long time contract and with the urbanization of Shanghai, so now there is the research of a suitable project and a fair compensation price for the area.

The Bund Riverside is one of the central areas of Shangai that attract both locals and tourists in particular after a new elevated pedestrian walkway, which was built in the nineties and renovated recently, from where you can admire a view of the Pudong business district.

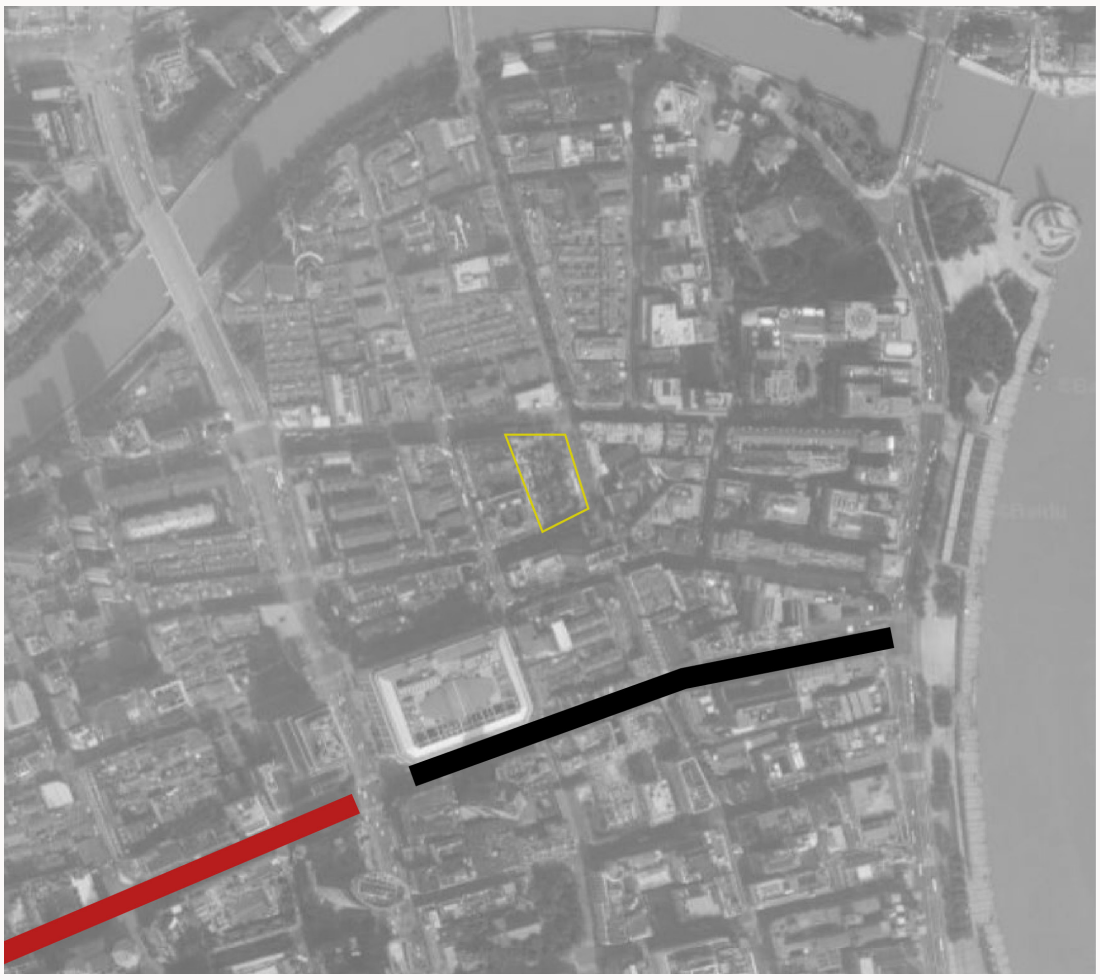
The location is surrounded by "International style" Skyscrapers and Historical colonial buildings. It is s placed, as shown later, very near the intersection of the two central axes of development of Shangai.

Nanjing East Road

One of the most fundamental physical changes in 1980s was the re-establishment of specialized commercial streets, particularly in cities' central districts. Numbers of walled danwei compounds were torn down and taken over by shops facing the former streets.

Large-scale pedestrianization has thus been intensively adopted as a practical approach to upgrading the existing infrastructures and shaping new public spaces in these central areas. Nearly all large Chinese cities, for example, Beijing, Shanghai, Harbin, Nanjing, and Chongqing have initiated their respective Central-Pedestrian-District schemes since then.
The ambition of the government was multifold. In an idiomatic expression of Chinese authority, they stated their aims as 'three meanings, four requirements and five functions'
The three meanings were that the pedestrianization of the Road was indeed to facilitate the development of the surrounding CBD area, to enhance the symbolic position of the Road itself in terms of commerce and public use, and to sustain better and make the most use of the historical buildings and street layouts. The four requirements were that the pedestrianization should help Shanghai achieve an 'international economic and trading center,' help Shanghai keep its first place in internal commerce in China, help to enhance local tourism, and help to attract more local consumers. And the five functions designated to the Road were shopping, tourism, offices (attracting noted companies), promotion (gathering and exhibiting famous brands), and culture (displaying the unique commercial identity of the Road).

Their approach was to provide a series of coherent 'paths and places' by laying a 4.2-meter-wide linear pavement made of lightened and dark-red granites, termed the 'Gold



5. Public uses in Nanjing Road in early 1980s: people crowding on the walkways and doing morning exercises, or strolling on the extremely congested street in the evenings.

6. Nanjing Road : street views, schematic diagram esxplaining the organization.

en Line', through the whole street, while the pavements alongside the Line were projected to be finished in light and grey materials. The side sections were to be used as 'paths' on which people could move fast over the street while the Line itself was to offer 'places' by accommodating concentrations of seats, plants, booths, lamps, and so on so that people could linger inside this area without disturbance from the moving groups. Besides the ground, the street sections with affiliated building facades and landscapes were also carefully considered to achieve the 'Golden Line' concept comprehensively.

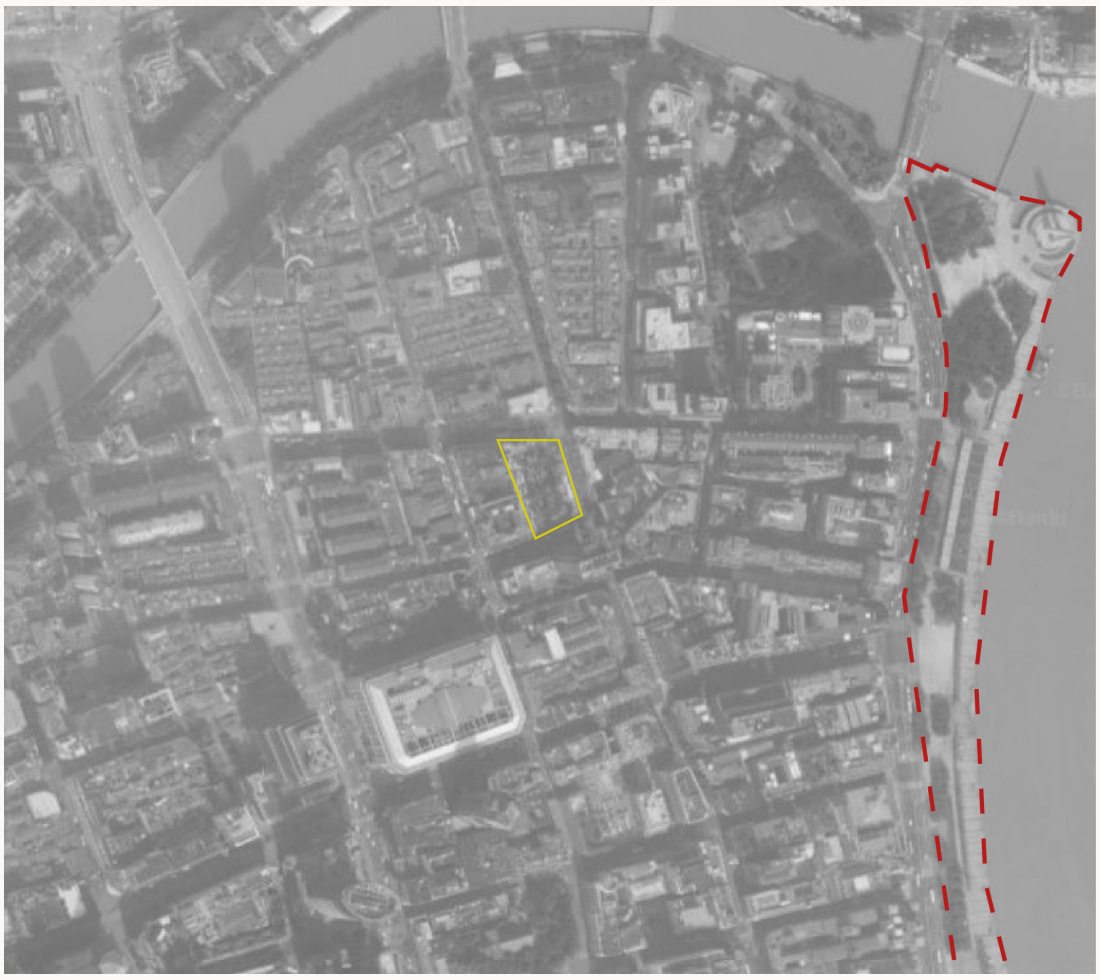
However, the last part of Nanjing Road, the one south of the site, has nothing to do with the " Golden Line." This part allows the car to pass again, and so it becomes full of traffic. This creates an awful experience for pedestrians giving space to improve and make a new way to reach the Bund.

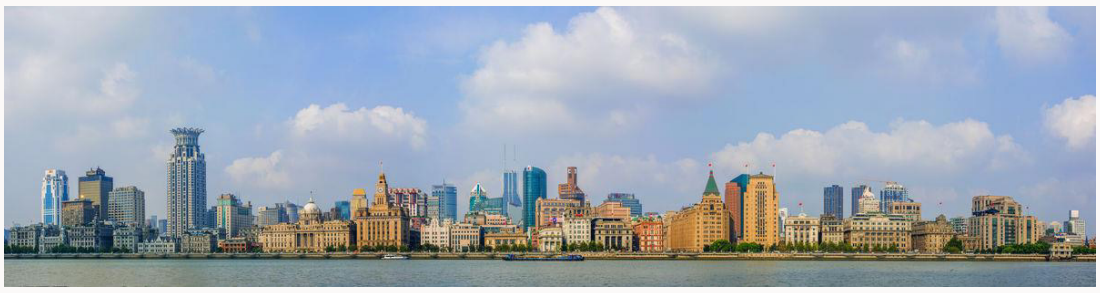
The Bund

The Shanghai Bund comprises historical buildings lining the Huangpu River that housed numerous banks and trading houses, and consulates from colonialist countries. The Bund lies north of the old, walled city of Shanghai. It was initially a British settlement; later, the British and American settlements were combined in the International Settlement. Around the turn of the 20th century, the Bund developed into a major financial center of east Asia.

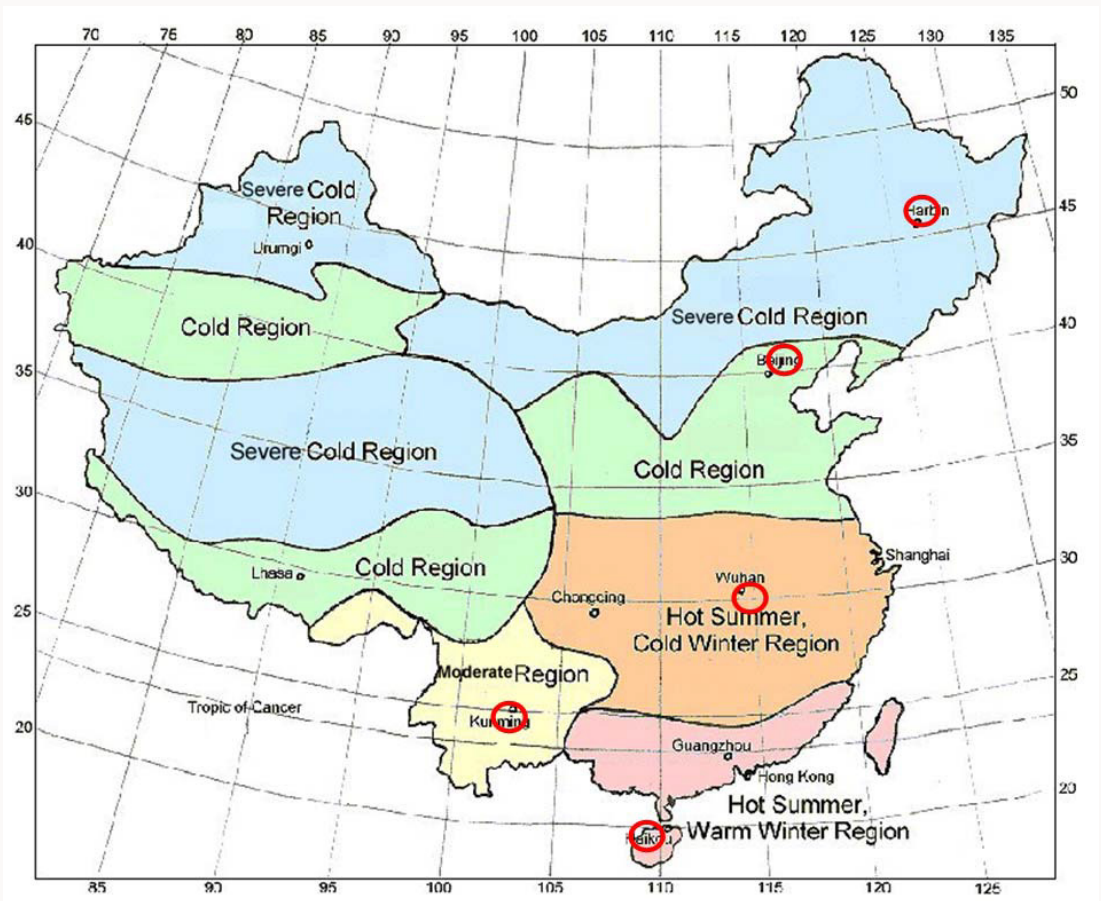
From 2008, The bund was involved in a major reconfiguration of traffic flow and restoration process.

The Bund was reopened to the public on Sunday, 28 March 2010, after restoration for the 2010 Expo.





7. Bund : view of all building facade, view in different period and crowd sizes.



8. Climatic zones

Location	Lat. (north)	Long. (east)	Elev. (m)	Dry-bulb temperature (° C) Annual average	Annual diff.	HMA	CMA	Rel. humidity (%) HMA	CMA	Sunshine Hours
Hong Kong	22° 18'	114° 10'	33	23	13	28.8	15.8	80	71	1948.1
Guangzhou	23° 08'	113° 19'	6.6	21.8	15.1	28.4	13.3	83	70	1906
Kunming	25° 01'	102° 41'	1891.4	14.7	12.1	19.8	7.7	83	68	2470.3
Shanghai	31° 10'	121° 26'	4.5	15.7	24.3	27.8	3.5	83	75	2014
Beijing	39° 48'	116° 28'	31.5	11.5	30.4	25.8	-4.6	78	45	2780.2
Harbin	45° 41'	126° 37'	171.7	3.6	42.2	22.8	-19.4	77	74	2641

CMA = coldest month average; HMA = hottest month average; annual diff. = HMA - CMA

9. Climatic datas

Climate

The climate of China is divided into five main types. The country can be divided into several climatic regions: - Freezing temperatures, where the main problem is the lack of heat, - Cold climates, where there is a long period of underheating and a short period of overheating - Hot summer cold winter climates, where there is a seasonal variation between underheating and overheating with both extremes - Warm weather, - Warm-humid climates, where overheating during summer and it is aggravated by high humidity and slight diurnal temperature variation.

Shanghai is in the hot summer and cold winter region, where the prevailing climate is a long period of hot, humid summer and a short and cool winter. Also, this is a densely populated area, which includes more than ten massive conurbations, like apart from Shanghai, Wuhan, and Chengdu.

Sun, F. Chinese Climate and Vernacular Dwellings. Buildings 2013

Shanghai has a humid subtropical climate, with an average annual temperature of 15.8 °C (60.4 °F) for urban districts and 15.2–15.7 °C (59.4–60.3 °F) for suburbs. [60] The city experiences four distinct seasons. Winters are chilly and damp—northwesterly winds from Siberia can cause nighttime temperatures to drop below freezing. Each year, there are an average of 6.2 days with snowfall and

2.8 days with snow cover. Summers are hot and humid, and occasional downpours or freak thunderstorms can be expected. On average, 8.7 days exceed 35 °C (95 °F) annually. In summer and the beginning of autumn, the city is susceptible to typhoons. The most pleasant seasons are generally spring, although changeable and often rainy, and autumn, usually sunny and dry.

This climate and the urbanization of Shanghai have increased the problem of Urban Heat Island, as shown in the image.

Traditional Climate Architecture

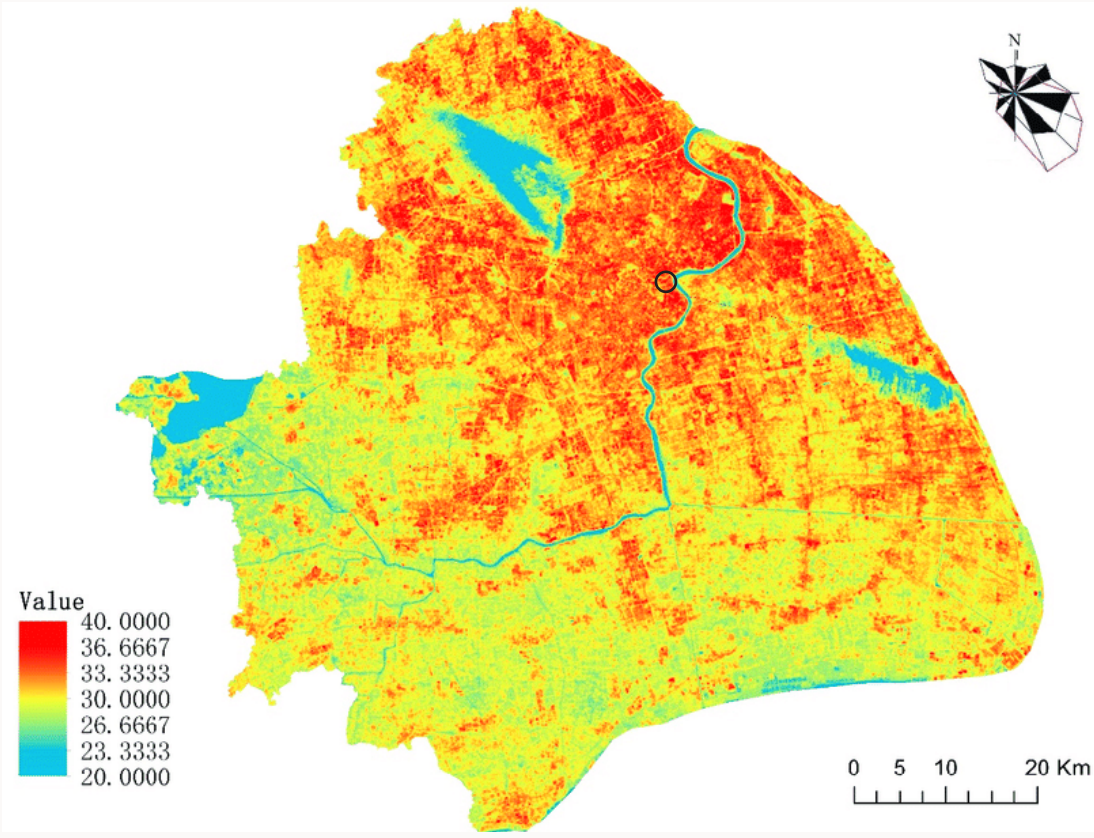
Like the cold region, the wood and brick siheyuan courtyard has remained typical of vernacular architecture in this region for a considerable amount of time. However, the siheyuan here was much more compact than it was in the north of the country and usually appeared in compressed clusters to control solar gain.

The siheyuan were arranged side by side along the main road, while the part of the road facing the building was used for the shops and the rear part for the residence. This compact site layout demonstrates effective solar control as the clustered buildings create narrow streets with whitewashed walls and shaded verandas to deflect the sun's rays, thus cooling off during the hot season.

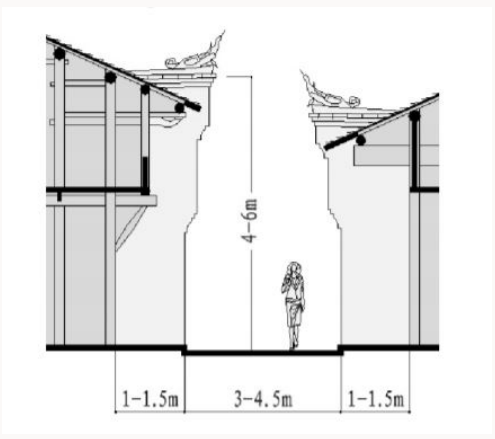
Firstly, being a deep plant, the skylights bring sufficient light inside the house, allowing warm air to escape from the top to ventilate the building. Interestingly, limestone is usually found in the semi-open courtyard, and its purpose is twofold: weather forecast and a place to cut firewood. This is because in hot, humid climates, tiny drops of water can be seen on the cold surface of the limestone before it rains, and the floor is usually made of bricks, which do not provide a solid enough

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min (°C)	2	4	7	12	17	22	26	26	22	17	11	5
Max (°C)	8	10	14	20	25	28	32	32	28	23	17	11
Min (°F)	36	39	45	54	63	72	79	79	72	63	52	41
Max (°F)	46	50	57	68	77	82	90	90	82	73	63	52

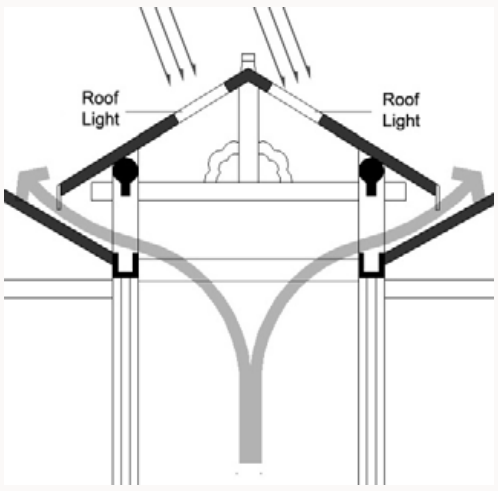
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Prec.(mm)	75	60	95	75	84	180	145	215	85	55	50	45	1165
Prec.(in)	3	2,4	3,7	3	3,3	7,1	5,7	8,5	3,3	2,2	2	1,8	45,9
Days	10	9	12	11	10	13	11	12	9	7	8	8	121



10. Ground Heat Map of Shanghai



11. Siheyuan road arrangement section

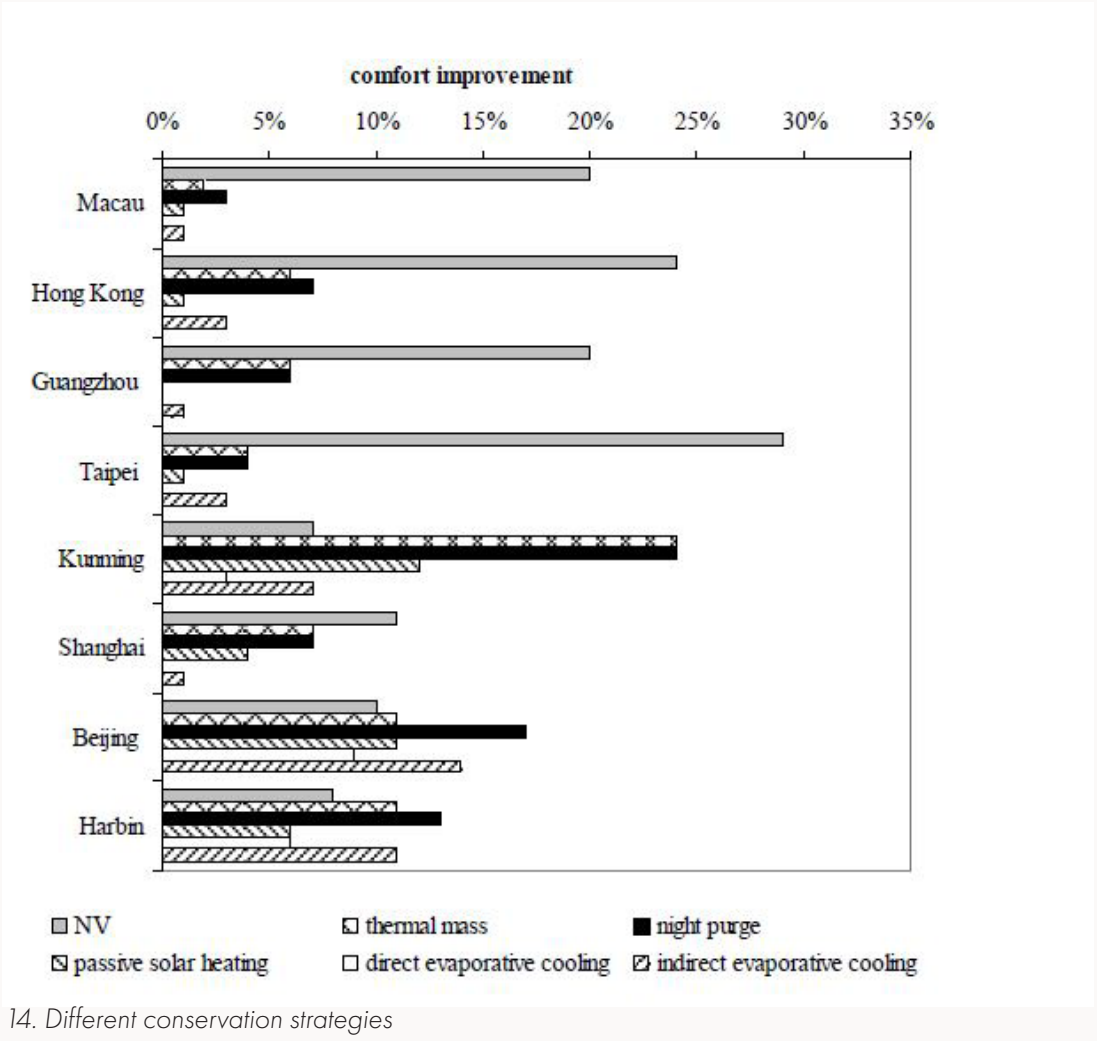


12. Traditional roof scheme and photo

Table 3: Analyzed locations with degree days, optimum orientation and NV potential

location	HDD	CDD	SED	optimum orientation	NV potential
Macau	252	1395	1076	172,5	20%
Hong Kong	162	1405	997	192,5	24%
Guangzhou	432	1453	793	175,0	20%
Taipei	242	1443	1021	175,0	29%
Kunming	1256	154	1083	177,5	14%
Shanghai	1680	772	935	170,0	12%
Beijing	2770	611	1154	175,0	13%
Harbin	5197	239	1223	172,5	13%

13. Analysis of different locations with degree days, optimum orientation and NV potential



14. Different conservation strategies

New Climate Architecture

Climate determines the amount of solar radiation and indicates the outside temperature of a building. The environment also affects the amount of energy used for heating and cooling and the amount of energy used for lighting. There is a solar excess which determines the amount of solar energy that is not required in the building. With increasing amounts of glass and a glazing system that allows for significant solar heat gains, the impact of orientation is substantial.

As in the cold region, passive building designs for this climate should focus on energy balance regarding summer comfort, as evaporative cooling will not be a compelling prospect during hot months. Apart from obtaining passive solar gains and reducing heat loss during the winter, sufficient solar controls, promoting adequate ventilation, and passive cooling by natural means should be the priority for climate-responsive buildings.

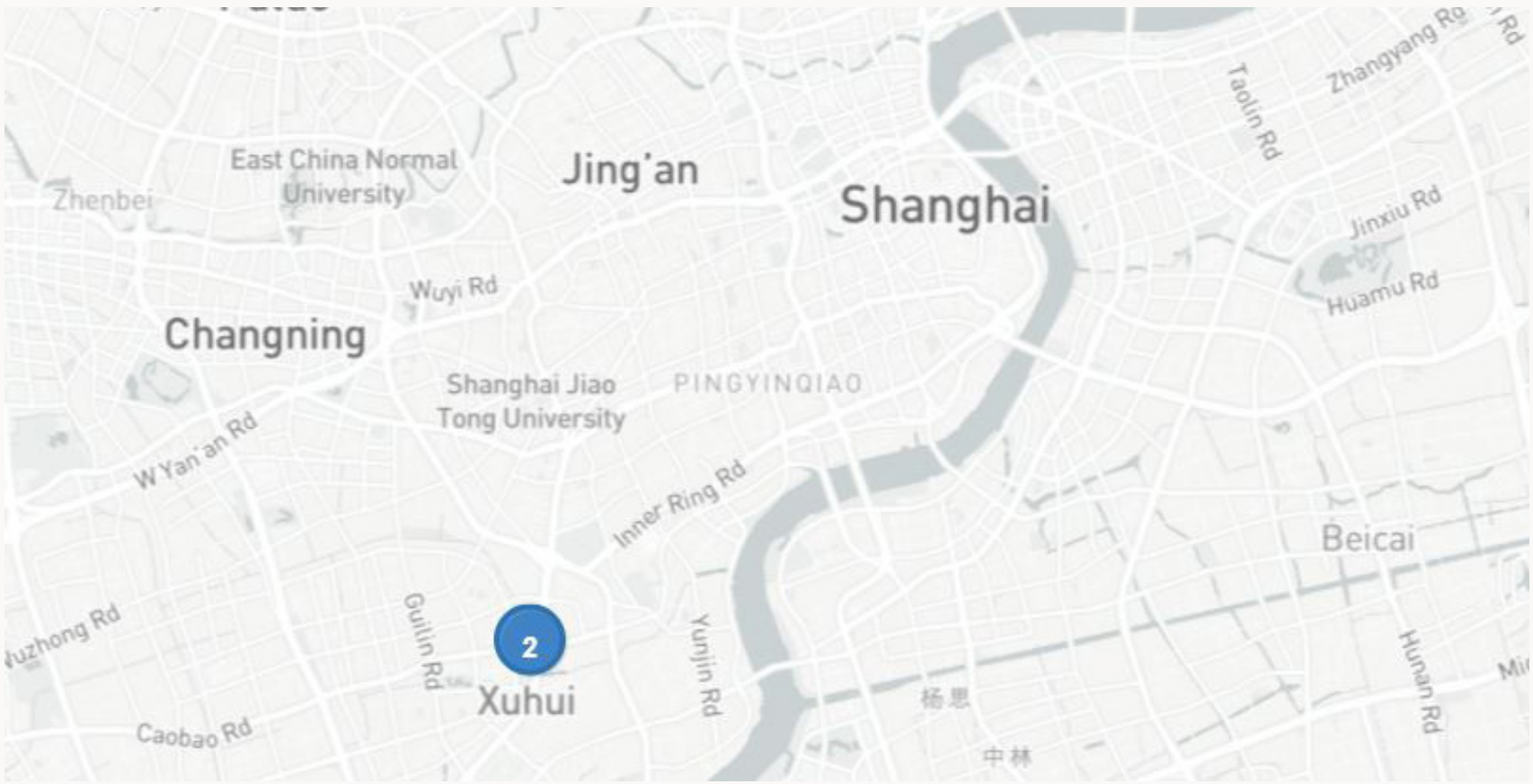
Climate Consultant

Climate Consultant is a simple to use, a graphic-based computer program that helps architects understand their local climate. Climate Consultant translates raw climate data into dozens of meaningful graphic displays. The data are taken from EnergyPlus Weather Files (.epw); the weather data have been collected in a site very close to the project location in the project case.
One of most noticeable results from One of the most noticeable results from the Climate Consultant is that the comfortable temperature range (21°C - 26°C) is in the summer month.

The most interesting of all the charts is the psychometric chart showing dry bulb temperature across the bottom and moisture content of the air up the side. The color of each dot can represent whether or not the hour is Comfortable (green) or Uncomfortable (red), according to the inputs defining Comfort on the Criteria screen. At last, it shows the Best Set of Design Strategies, which will use an algorithm that selects from among similar strategies the smallest set that eliminates the most significant number of Heating and Cooling hours.

- The most effective strategy is artificial air conditioning.

- Others are Internal Heat gain and Sun shading.



15. Climate consultant position and data

(next page)

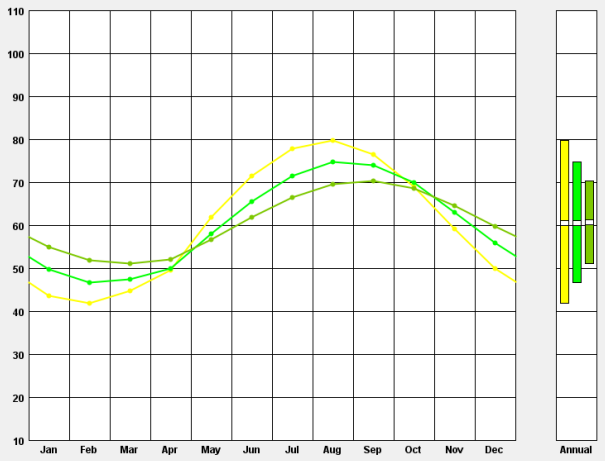
GROUND TEMPERATURE (MONTHLY AVERAGE

LOCATION: SHANGHAI/HONGQIAO, -, CHN
Latitude/Longitude: 31.17° North, 121.43° East, Time Zone from Greenwich 8
Data Source: SWERA 583620 WMO Station Number, Elevation 22 ft

LEGEND

DEPTH (feet)
1.64
6.56
13.12
(Surface is freshly mown grass.)

TEMPERATURE RANGE:
10 to 110 °F
Fit to Data



Back Next

ILLUMINATION RANGE

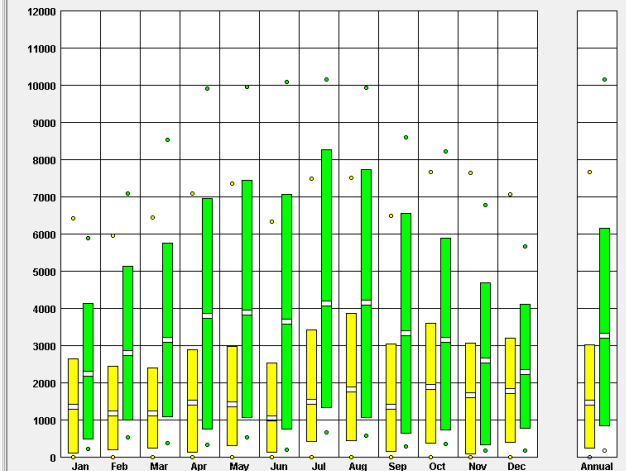
LOCATION: SHANGHAI/HONGQIAO, -, CHN
Latitude/Longitude: 31.17° North, 121.43° East, Time Zone from Greenwich 8
Data Source: SWERA 583620 WMO Station Number, Elevation 22 ft

LEGEND

HOURLY ILLUMINATION
DAYLIT HOURS ONLY

RECORDED HIGH -
AVERAGE HIGH -
MEAN -
AVERAGE LOW -
RECORDED LOW -

RECORDED:
DIRECT NORMAL
GLOBAL HORIZONTAL
(footcandles)



Back Next

MONTHLY DIURNAL AVERAGES
ASHRAE 2005

LOCATION: SHANGHAI/HONGQIAO, -, CHN
Latitude/Longitude: 31.17° North, 121.43° East, Time Zone from Greenwich 8
Data Source: SWERA 583620 WMO Station Number, Elevation 22 ft

LEGEND

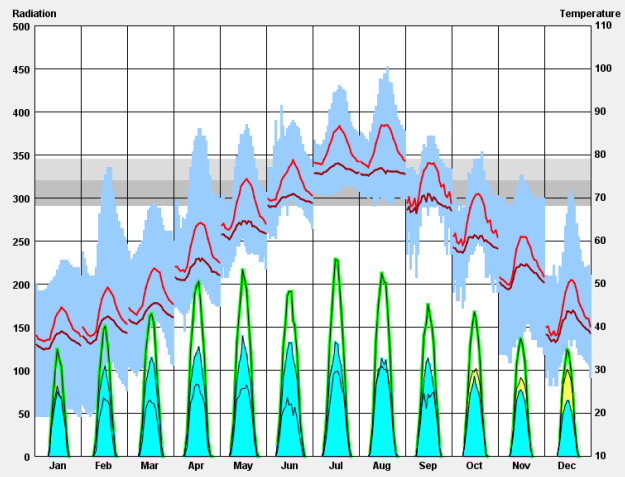
HOURLY AVERAGES

TEMPERATURE: (degrees F)
DRY BULB MEAN
WET BULB MEAN
DRY BULB (all hours)
COMFORT ZONE
SUMMER
WINTER
(At 50% Relative Humidity)

RADIATION: (Btu/sq.ft)
GLOBAL HORIZ
DIRECT NORMAL
DIFFUSE

Display Dry Bulb Temp (all hours)

TEMPERATURE RANGE:
10 to 110 °F
Fit to Data



Back Next

TEMPERATURE RANGE
ASHRAE 2005

LOCATION: SHANGHAI/HONGQIAO, -, CHN
Latitude/Longitude: 31.17° North, 121.43° East, Time Zone from Greenwich 8
Data Source: SWERA 583620 WMO Station Number, Elevation 22 ft

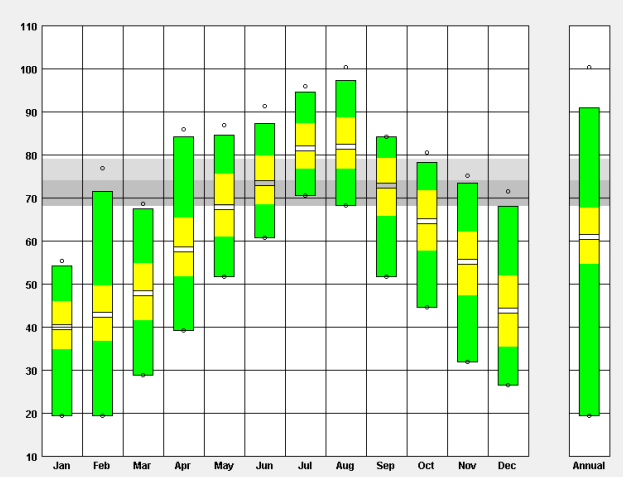
LEGEND

RECORDED HIGH -
DESIGN HIGH -
AVERAGE HIGH -
MEAN -
AVERAGE LOW -
DESIGN LOW -
RECORDED LOW -

COMFORT ZONE
SUMMER
WINTER
(At 50% Relative Humidity)

DESIGN HIGH: Residential
1% of Hours Above
.5% of Hours Above
0% of Hours Above
DESIGN LOW: Residential
1% of Hours Below
.5% of Hours Below
0% of Hours Below

TEMPERATURE RANGE:
10 to 110 °F
Fit to Data



Back Next

RADIATION RANGE

LOCATION: SHANGHAI/HONGQIAO, -, CHN
Latitude/Longitude: 31.17° North, 121.43° East, Time Zone from Greenwich 8
Data Source: SWERA 583620 WMO Station Number, Elevation 22 ft

LEGEND

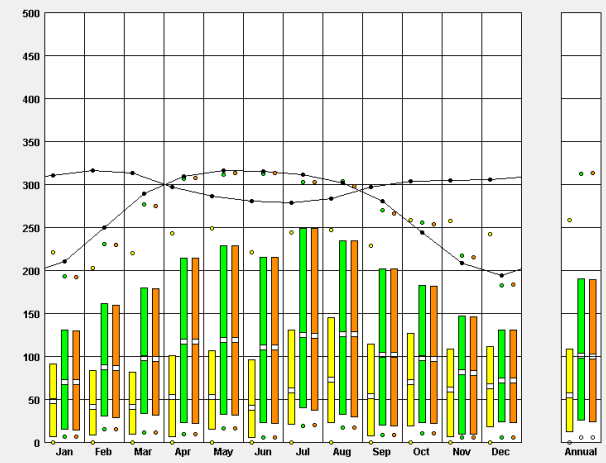
HOURLY AVERAGES
DAYLIT HOURS ONLY

RECORDED HIGH -
AVERAGE HIGH -
MEAN -
AVERAGE LOW -
RECORDED LOW -

RECORDED:
DIRECT NORMAL
GLOBAL HORIZONTAL
TOTAL SURFACE
(Btu/sq.ft per hour)
THEORETICAL:

Tilted Surface Radiation Input:
0.0 Tilt degrees from Horizontal (Vertical = 90°)
0.0 Bearing degrees from South (South = 0°,West = +90°)
20.0 % Ground Reflectance (20% = grass)

PLOT:
Hourly Avg
Daily Total



Hit ENTER to replot if you change Tilted Surface Radiation parameters.

Back Next

PSYCHROMETRIC CHART
ASHRAE 2005

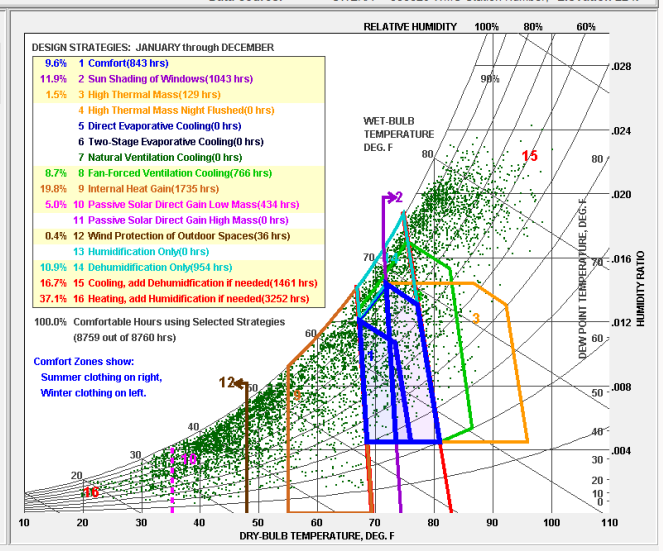
LOCATION: SHANGHAI/HONGQIAO, -, CHN
Latitude/Longitude: 31.17° North, 121.43° East, Time Zone from Greenwich 8
Data Source: SWERA 583620 WMO Station Number, Elevation 22 ft

LEGEND

COMFORT INDOORS
100% COMFORTABLE
0% NOT COMFORTABLE

PLOT: COMFORT INDOORS
Hourly
Daily Min/Max
All Hours
Select Hours
1 a.m. through 12 a.m.
All Months
Select Months
JAN through DEC
1 Month JAN Next
1 Day 1 Next
1 Hour 1 a.m. Next

TEMPERATURE RANGE:
10 to 110 °F
Fit to Data
Display Design Strategies
Show Best set of Design Strategies



Click on Design Strategy to select or deselect.

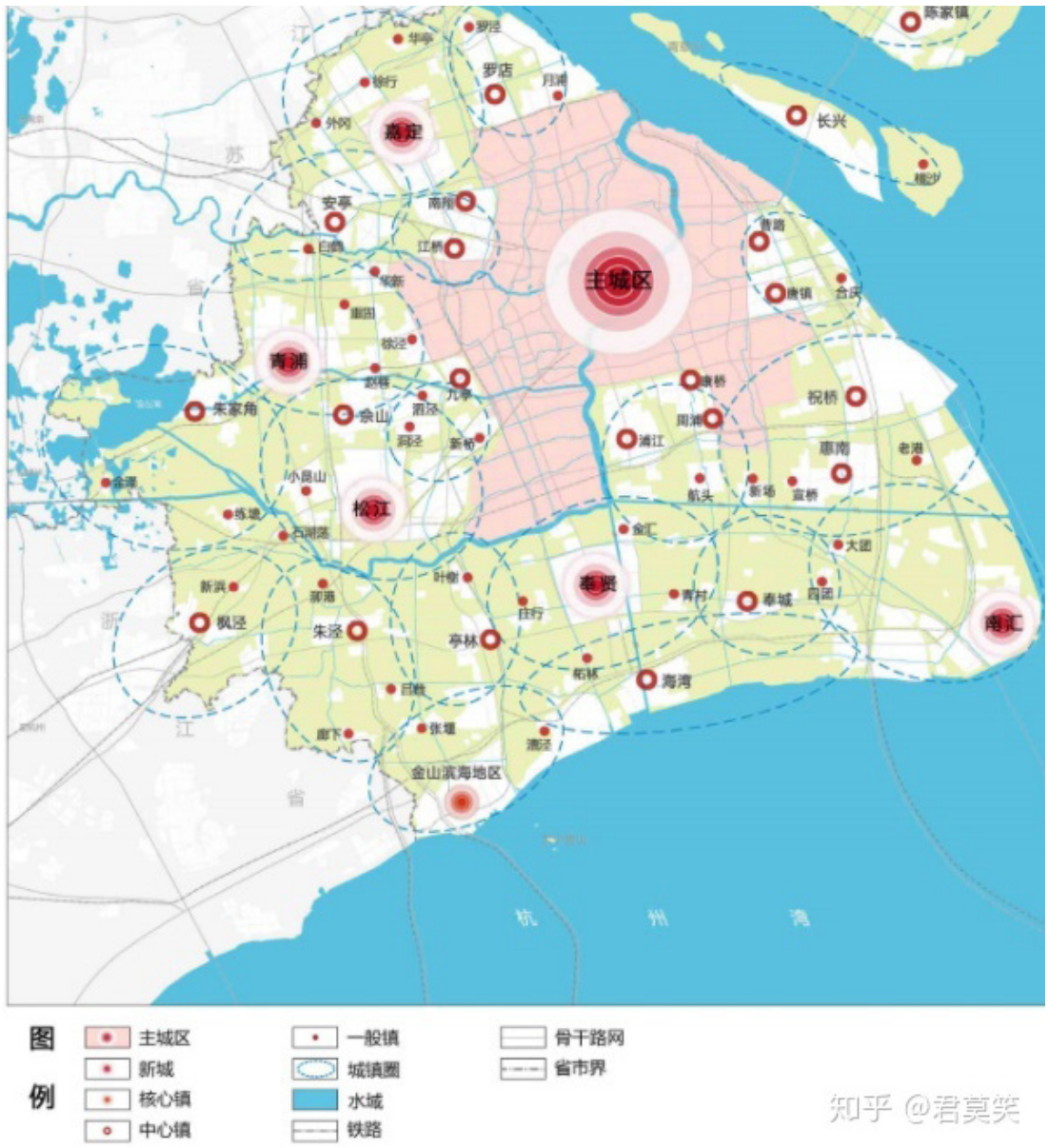
Back Next

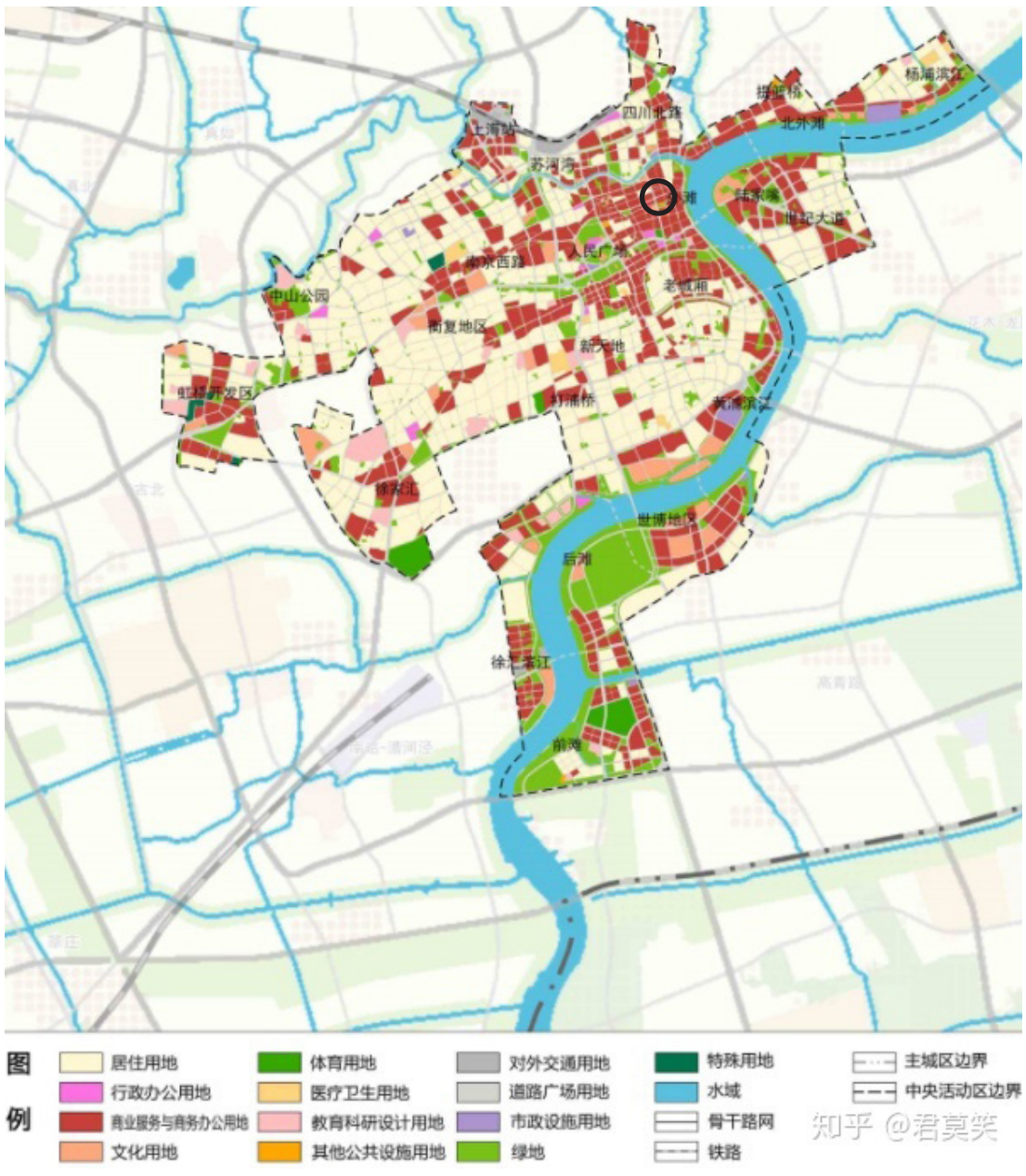
Laws and Regulation

The leading resource used in this paragraph is the "Shanghai Masterplan 2017-2035," or, in the official word of the document, organized and prepared by the Shanghai Municipal People's Government and approved by the State Council. It serves as the basis and official record for urban planning and an important document to guide Shanghai's future development and development project to achieve "Better City, Better Life."

The Masterplan foresees the development of Shanghai around several urban centers (called City and Village). The project area, Huangpu (黄浦区), is considered part of the central city, the most important hierarchically and "leading carrier of global urban functions, not only including finance, commerce, business, culture, leisure, tourism, and other areas. Functional, but also of connection with the global network and at the service of the entire municipality ".

The functions provided by the municipality for the area are: commercial and offices (red color in the second map, (商业 办公区) : retail space and offices



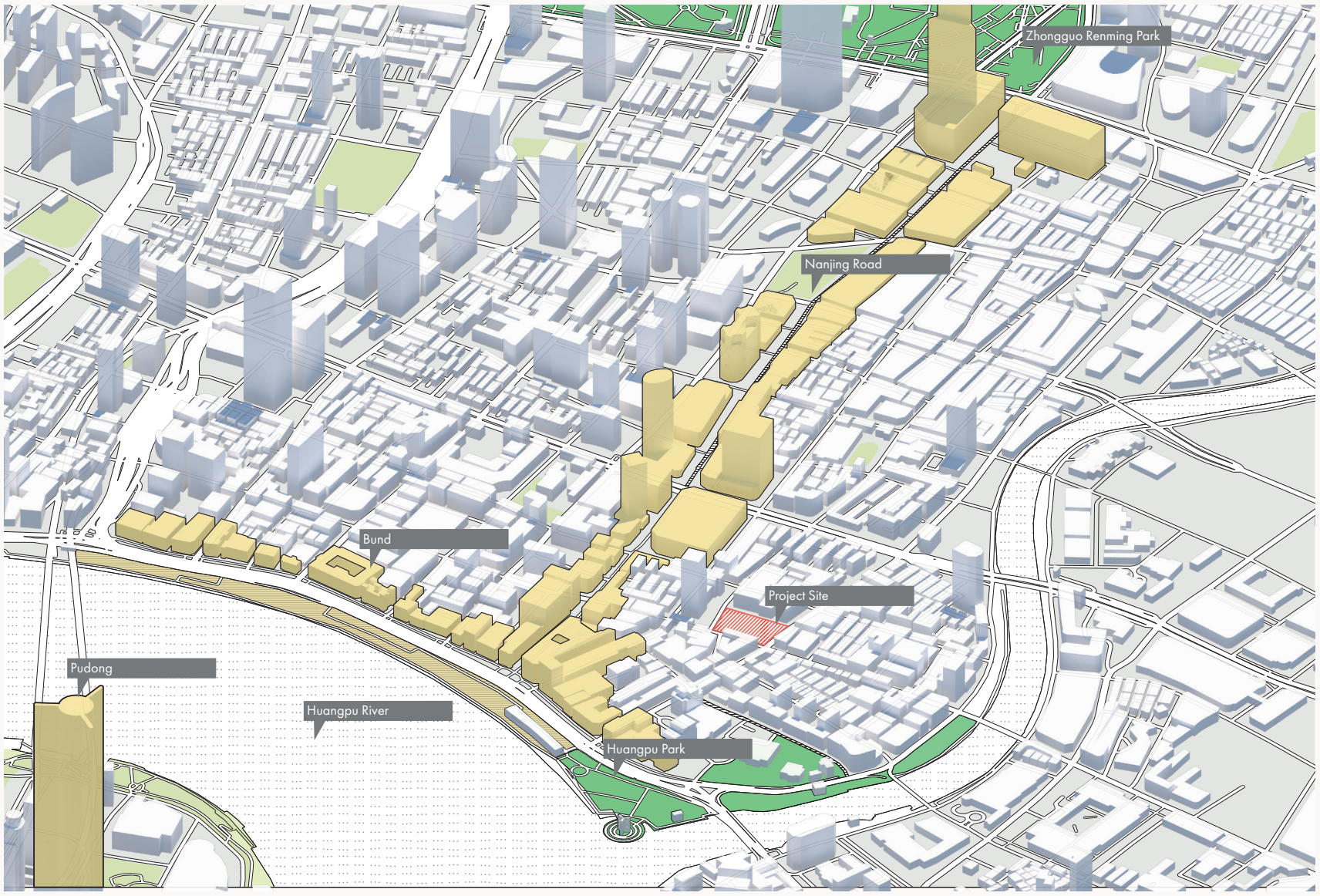


16. Map 1: development diagram
Map 2: Zoning map

City

On an urban scale, the site is between two of the most important green space of ShanghaiShanghai Renmin Park and Huangpu Park. Shanghai Renmin Park is two museums (Shanghai History Museum and Museum of Contemporary Art Shanghai), a large pond, and several other attractions. An interesting fact is a site also of the marriage market or "blind date corner" since 2004, in which marriage advertisement listings are publicly posted each weekend. Huangpu Park was the first park in China open to the public, designed in European style. It was remodeled in the 1990s with the addition of the Monument to the People's Heroes and the Bund Historical Museum.

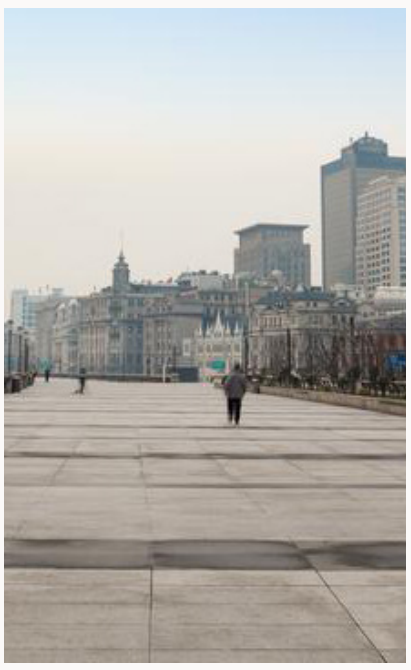
The site is enclosed by the green and purple metro line, in the south part by the Nanjing Road, the main shopping street of Shanghai. On the other side of the Huangpu River, the main attention point is the Pudong district, the finance and business district where all the famous skyscapes of Shanghai are, particularly the Oriental Pearl Tower.



17. Nanjing Road

18. Zhongguo Renming Park

19.Bund riverside



20. Pudong District

District Function

The site is surrounded by all types of functions, especially on the east side of the office. The residential part is strictly connected to the Langtang derelict areas, usually surrounded by other buildings and hidden away from the public. Prominent is also the presence of Hotel, or Airbnb, mostly in awful condition and overpriced.

Commercial

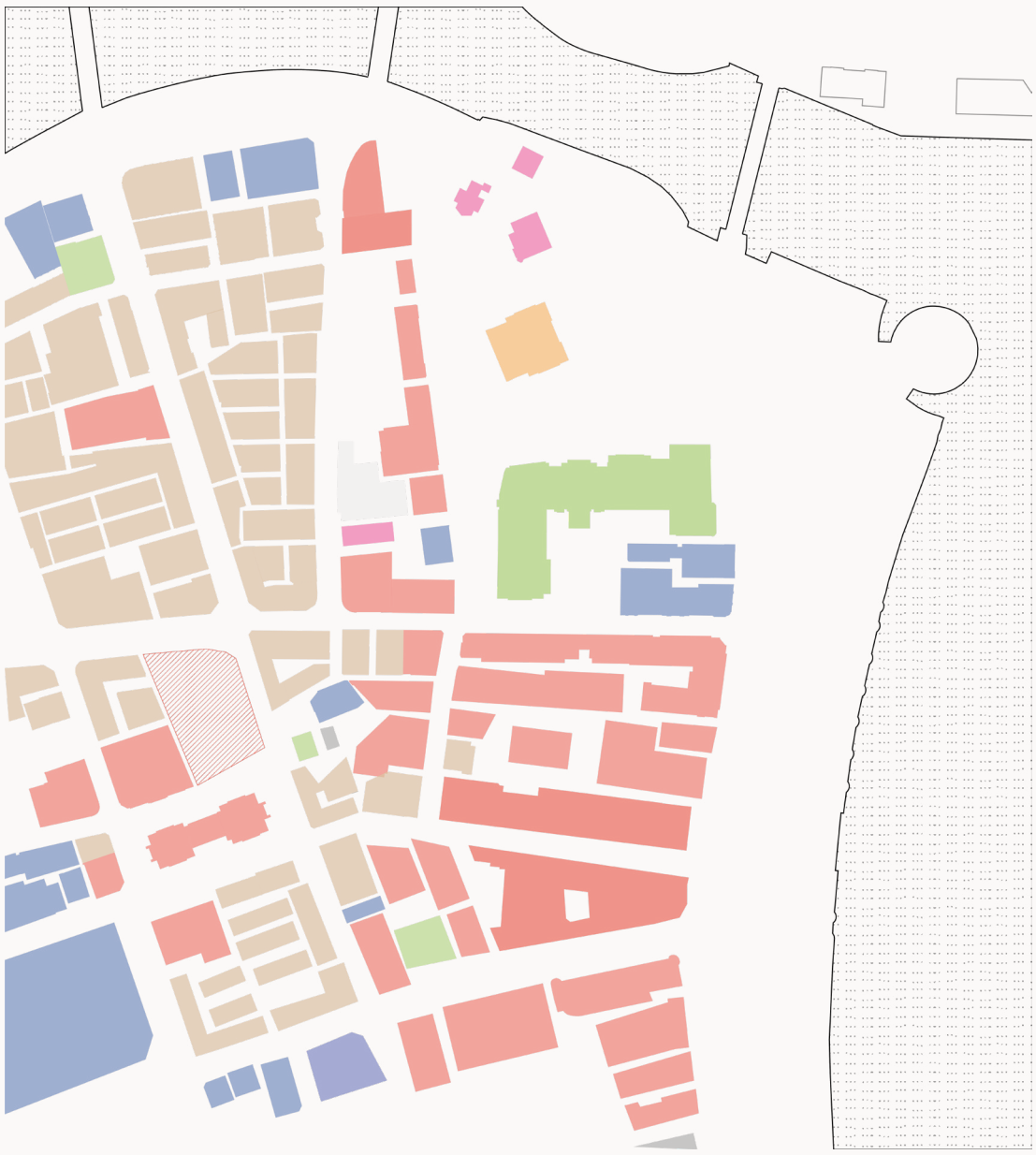
Office

Food

Cultural

residential

Hospitality



District Height

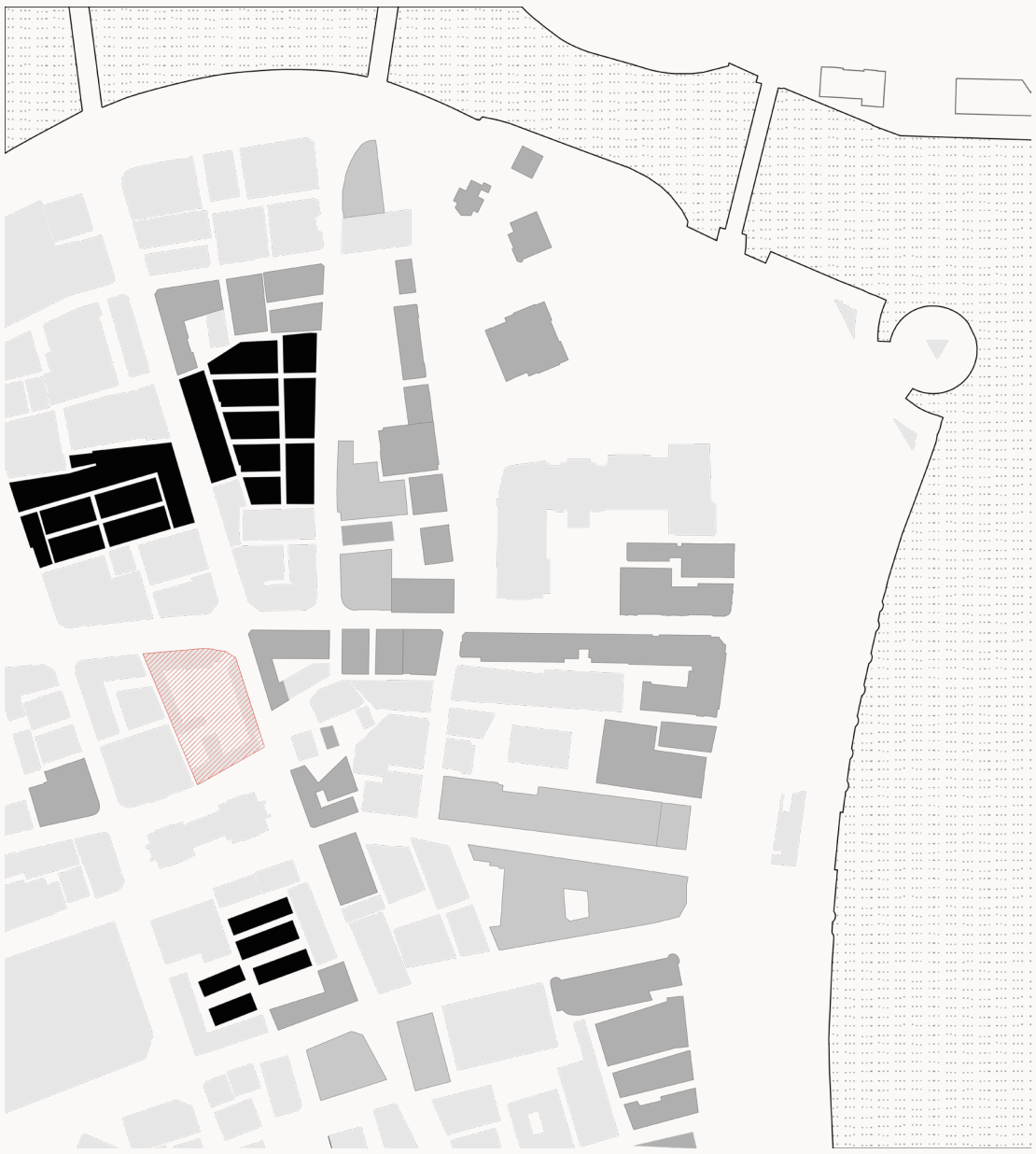
The highest building is on the east side of the site. Moreover, it must be underline a recently built skyscraper sitting on the south side of the parking one of the tallest construction.

+ 20 floors

+ 15 floors

+ 10 floors

+ 5 floors



District
Heritage

The site is surrounded by some colonial period buildings from a typological view, mainly in the east riverside. However, the colonial building in the inner areas became home to the locals, and because of the lack of restoration are now in harmful conditions.

Moreover, what stands out in the presence of a typical urban texture of old Shanghai: Longtang. Langtang is a combination of Chinese and Western urban texture with local of Shanghai. These urban textures attached great importance to the relationship between buildings and streets and were adapted to different functions. In our area are devoted to residential function for locals..

Hutong

Colonial

Post Opening

21. Old photo of Longtang

22. Entrance of Longtang

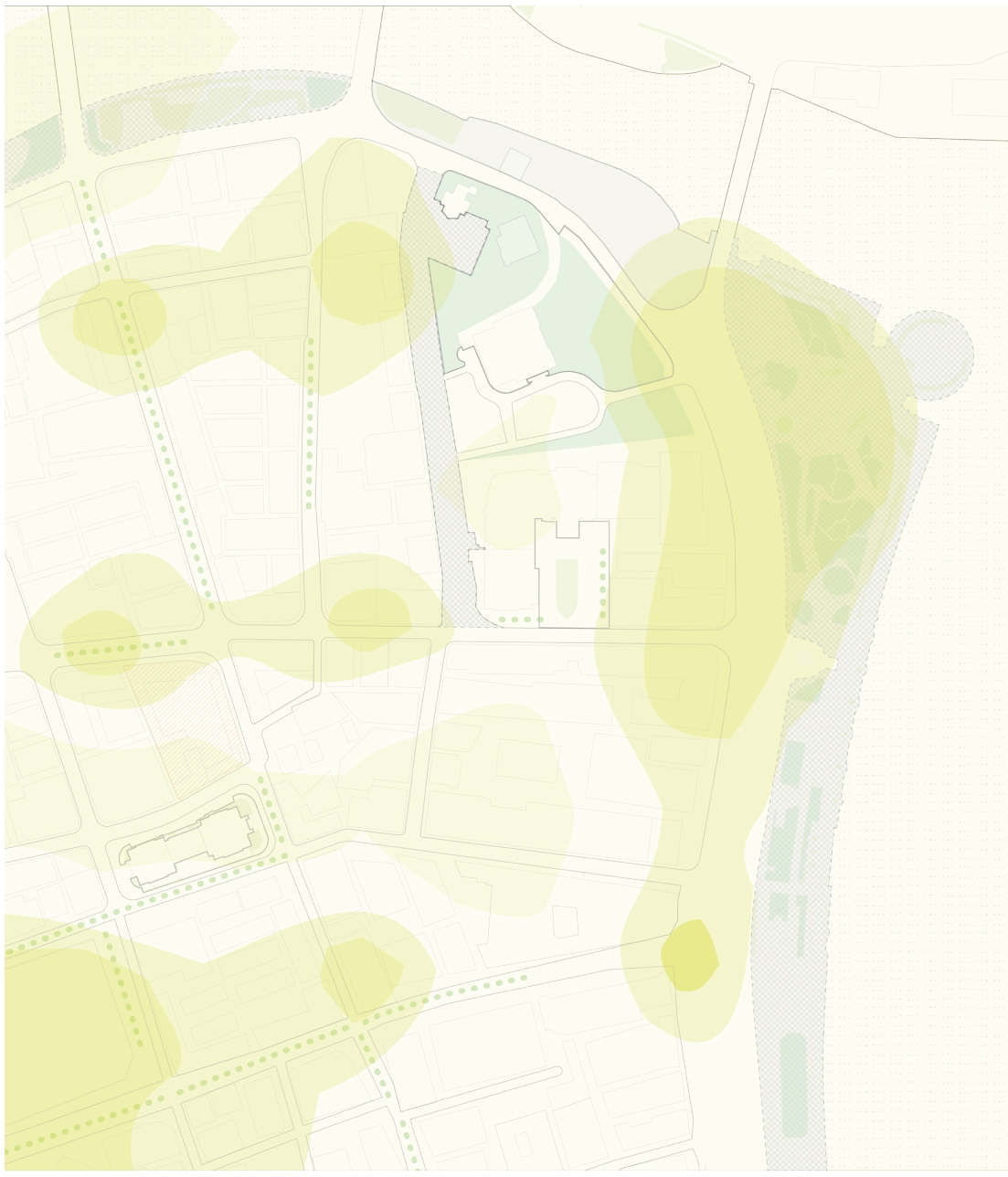
23. Colonial building

24.Colonial building devoted to residence

District Attraction

The main attraction area is the Bund riverside, with a maximum where it is possible to admire the Pudong district.

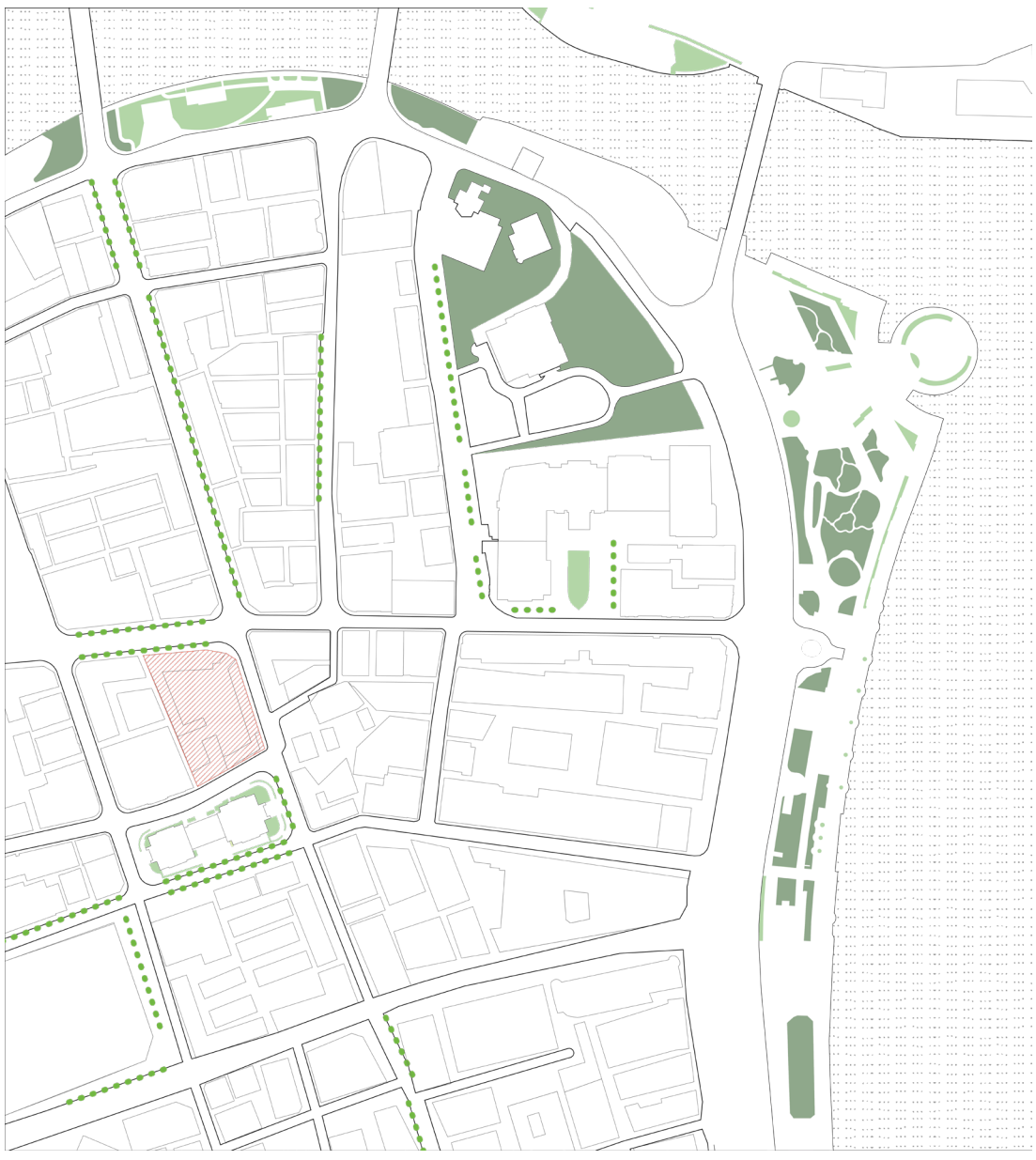
The site area is entirely invisible in terms of attractive points except for a commercial hall in the southwest.



District
Green space

The vast green public area is the Huangpu park and the Bund Riverside in the far east.

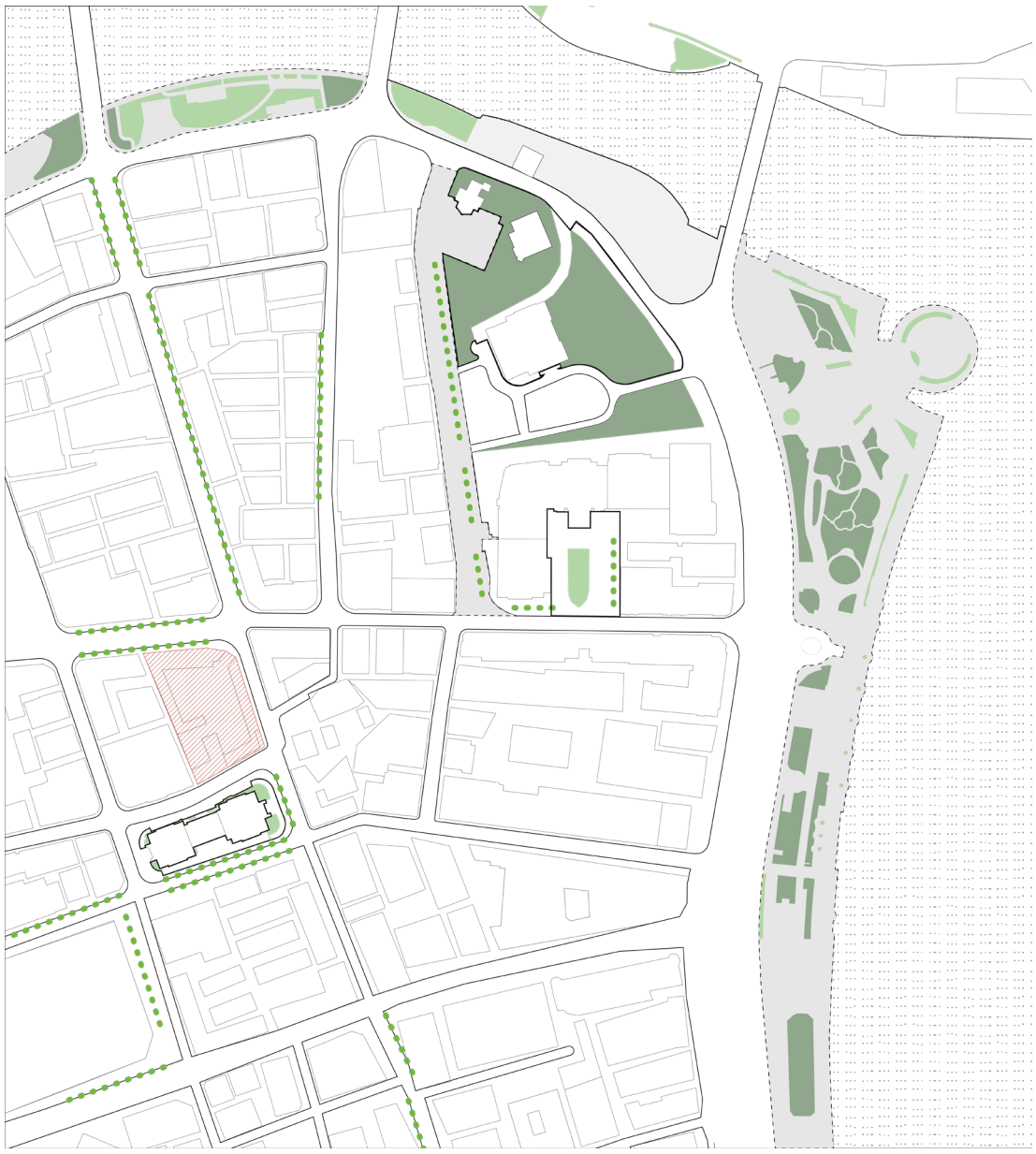
Around the area site, there is a lack of extended public green, but there is some green boulevard.



Highway

Primary

Tree rows



District

Public/private space

The space open to everybody are the Bund Riverside and the Huangpu Park.

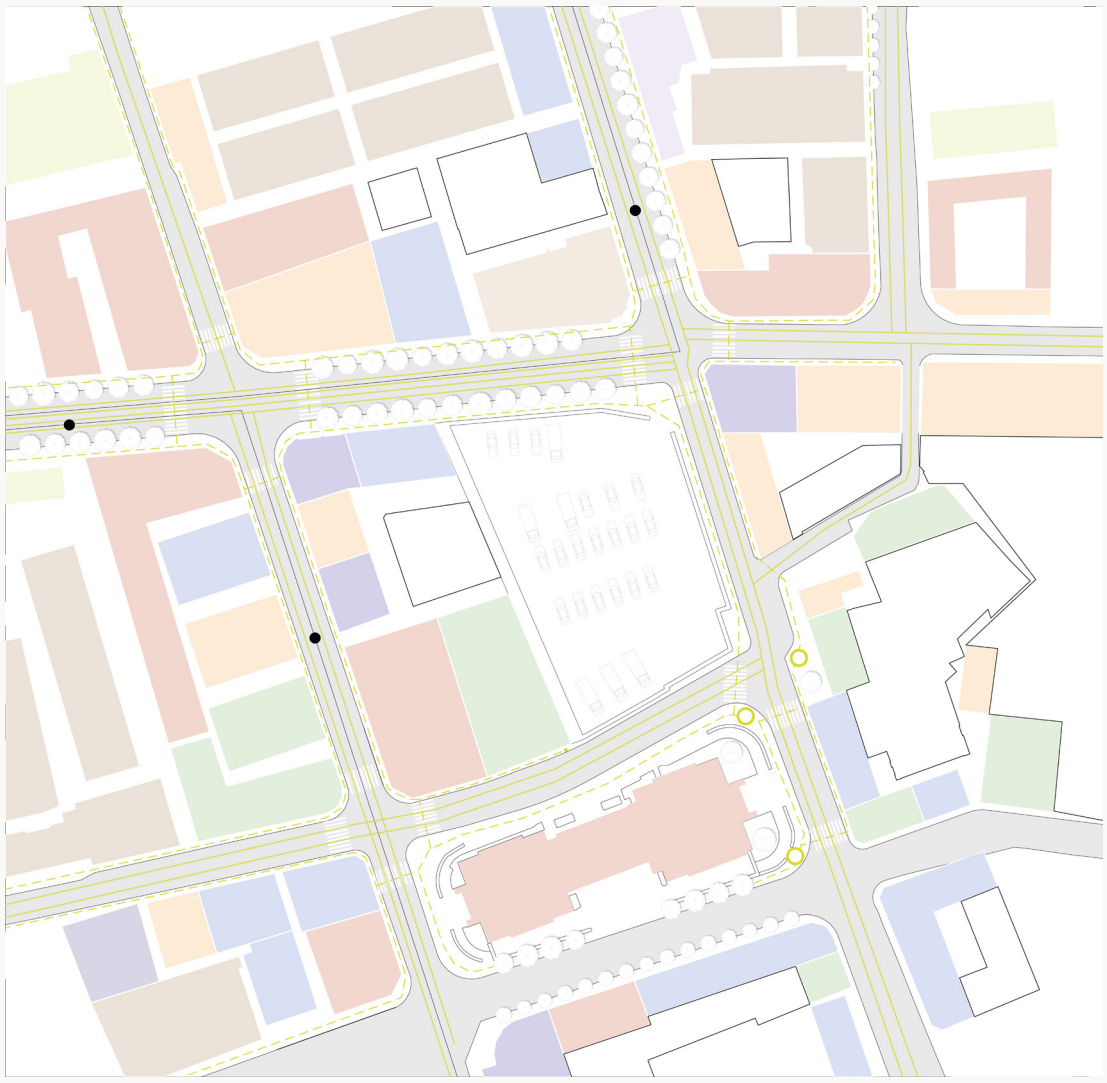
Around the site, there is a considerable lack of public space around the site in favor of private and enclosed space around the site.

Pedestrian

Not Accesible

Site Street Level

There is an apparent lack of resting public space and a huge traffic load with multiple ways, so there is the need to provide in site public space and improve the movement of people around it. Ligustrum whirling in four seasons, with sparse branches, dense foliage, and neat tree shape, is a commonly used ornamental tree species in gardens. It can be planted alone or in clusters in the courtyard and also used as a street tree.



Commercial

Hospitality

Cultural

Food

residential

Special

Pedestrian

Car

Meeting Point

Local Resident

During the visit of the site some surveys were presented to the local residents aimed to collect more specific information such as the perceived needs of the neighbourhood, the social life, economic activity and cultural activities.

In total, 18 people were consulted, 8 men and 10 women who's ages range between 30 to 70 years old.

The absence of younger residents was explained by the residents as the area is old and lacks the potentialities of other areas in shanghai. The residents also mentioned the fact that building are old, some of them dating back to the 1950's and many are catalogued as architectural heritage of the city. Reason why their intervention is subject of strict regulation or simply prohibited. They cannot modify them, this is why of poor living condition and the use and adaptation of space at a community level.

On the negative side, the residents all agree on the living conditions. Both the high-rise residents and the Langtang are dissatisfied with the state of their residences. Some of them are long overdue for restoration or refurbishment.

The most crucial common area is always the kitchen, used by all the residents of the building, due to lack of space. Therefore, each older building has a more shared kitchen.

Most agree on the positive aspects of the neighborhood's location, the imagery and the sun and wind currents available in the area. Among the residents interviewed, all grow ornamental plants; 61% percent grow their own consumer products alongside decorative ones.

Community issues

In the surrounding area, we notice a considerable lack of urban furniture that brings the people to use their own. Moreover, there are people not working in the local community due to the presence of golden age residents, so they need to consider this.

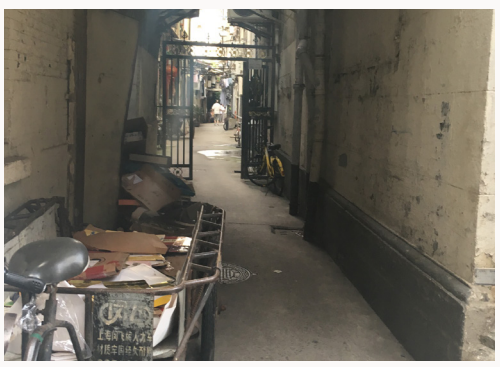
Old and new coexist side by side, but they never touch; tourist and local community never interact, creating a split space, an empty one.











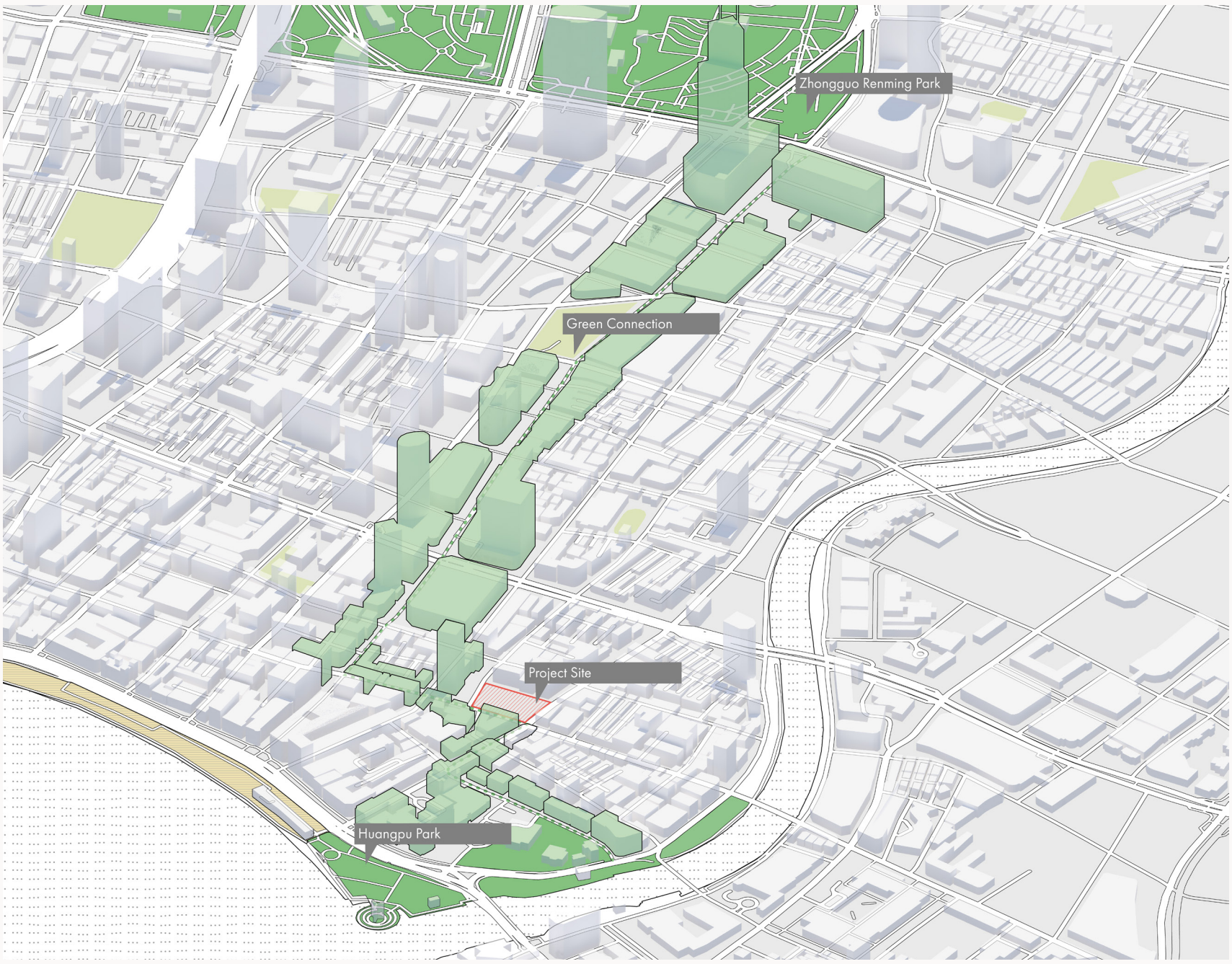
25. SIte photo taken from the auhor i during his site visit in 2019, when he had the possibility of entering in some old houses.

FIGURES RESOURCES

1. SJTU *pag. 52*
2. SJTU *pag. 53*
3. SJTU *pag. 53*
4. https://it.wikipedia.org/wiki/Bund_(Shanghai) *pag. 53*
5. https://www.pinterest.it/wangzi4375/china-60s-80s/. *pag. 54*
6. https://www.pinterest.it/wangzi4375/china-60s-80s/ *pag. 55*
7. https://it.wikipedia.org/wiki/Bund_(Shanghai) *pag. 56*
8. https://www.climate-zone.com/climate/china/celsius/shanghai.htm *pag. 57*
9. https://www.climate-zone.com/climate/china/celsius/shanghai.htm *pag. 57*
10. https://www.mdpi.com/2071-1050/10/8/2706/htm *pag. 58*
11. https://www.mdpi.com/2075-5309/3/1/143 *pag. 58*
12. https://www.mdpi.com/2075-5309/3/1/143 *pag. 58*
13. https://www.mdpi.com/2075-5309/3/1/143 *pag. 59*
14. https://www.mdpi.com/2075-5309/3/1/143 *pag. 59*
15. Climate consultant *pag. 60 - 61*
16. https://www.shanghai.gov.cn/newshanghai/xxgkfj/2035003.pdf *pag. 62*
17. https://it.wikipedia.org/wiki/Shanghaid *pag. 63*
18. https://it.wikipedia.org/wiki/Shanghai *pag. 63*
19. https://it.wikipedia.org/wiki/Shanghai *pag. 63*
20. https://it.wikipedia.org/wiki/Shanghai *pag. 63*
21. https://en.wikipedia.org/wiki/Longtang *pag. 65*
22. https://en.wikipedia.org/wiki/Longtang *pag. 65*
25. SIte photo taken from the auhor i during his site visit in 2019, when he had the possibility of entering in some old houses *pag. 70*

五 DESIGN INTENTIONS

A base concept that proposes to include the site in a system as a central stop, by improving the already present system of the green boulevard to start a regeneration process.


Zhongguo Renming Park
Green Connection
Project Site
Huangpu Park

Design intentions

The architectural definition of this site is very peculiar and interesting. The existing conditions studied in the analysis pose different questions to be answered together with tremendous opportunities.

Looking at the locals, we can find three main problems: the lack of public space, living conditions, and involvement in the site.

To counteract the lack of public space in the area, the building must not occupy the entire plot to create more public spaces in the building.

Considering the previous questionnaire, it has been proposed to the locals the idea of offering productive installations that hypothetically would provide access to agricultural production mediums (soil, hydro/aeroponic systems). The acceptance rate of such a hypothetical structure was relatively high among residents and workers of the area who also expressed their willingness to participate in this Installation and previous public space.

In fact, in the narrow alleys of historic shikumen housing in Shanghai, the residents make full use of their small planter beds. They packed them with squash vines, figs, tomatoes, peppers, and several other unidentified greens.

About the living conditions, we notice a lack of service in the resident's homes, so to boost their involvement, the building program can include a helpful function in people's daily lives.

From the analysis, it was clear that although its central position, the site is avoided by the non - locals creating a sort of invisible ghetto in the center of Shanghai.

From Zhongguo Renmin square and to reach the bund and hangout park. To attract them or at least insert the site in this path, a task should be to insert a green part to make it an intermediate step.

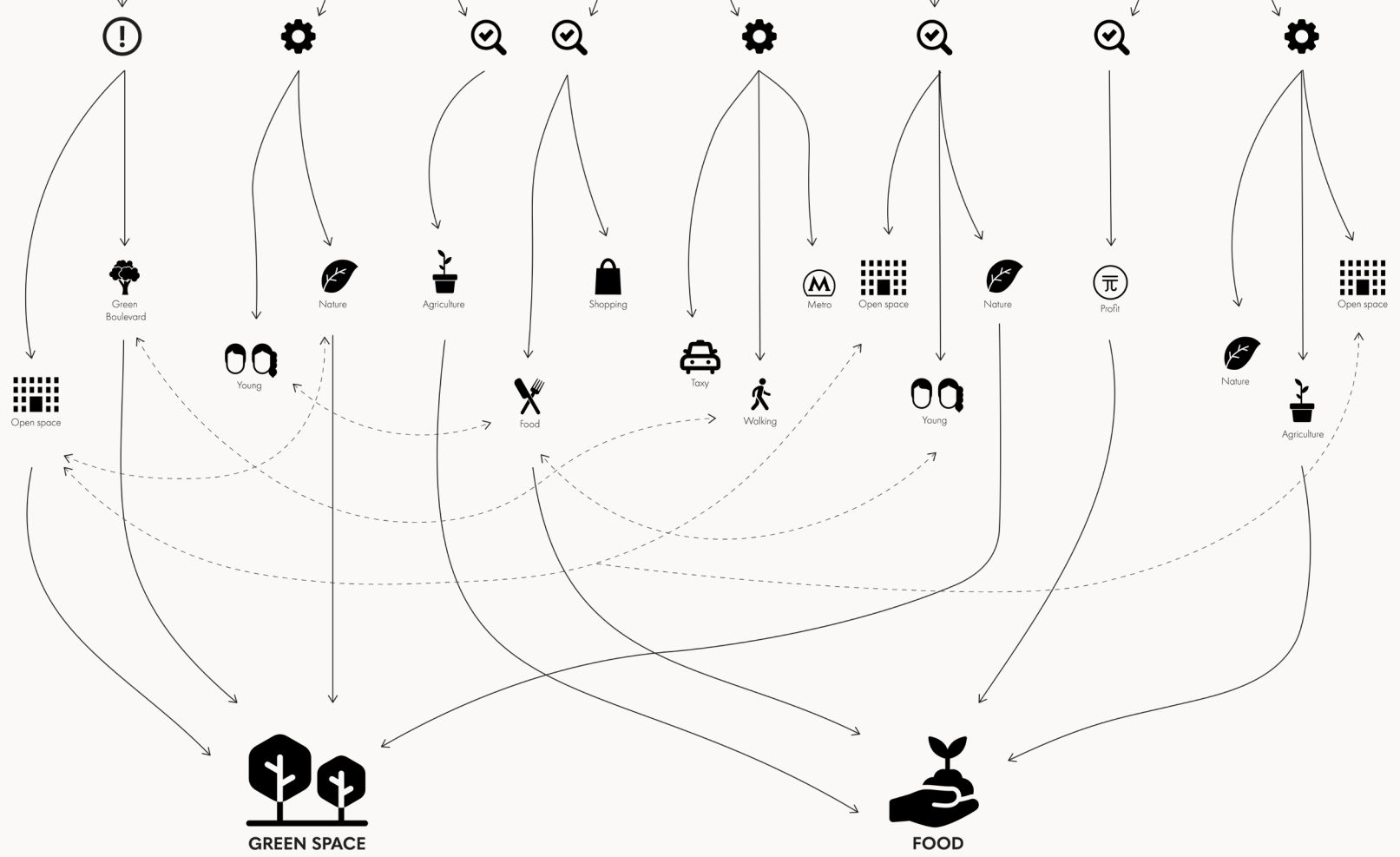
The request from the promoter (SJTU) focuses on providing environmental services, resource generation, open space design, and contextual relationships. It hopes to integrate biomimicry principles, participatory design, community, and ecological improvement.

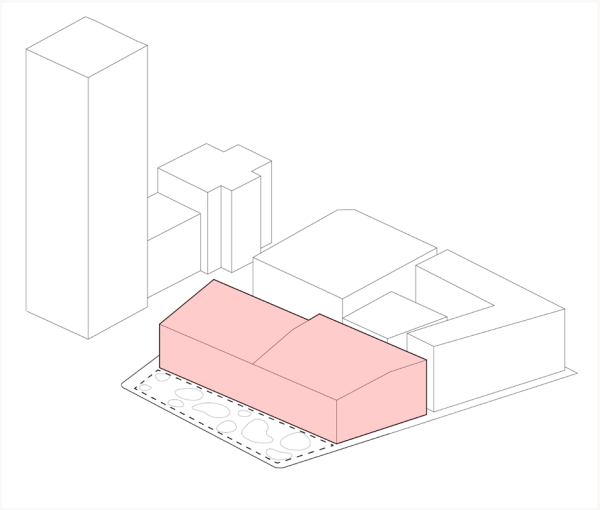
Moreover, the Shanghai government is pushing for an increase in environmentally friendly urban organization and food production.

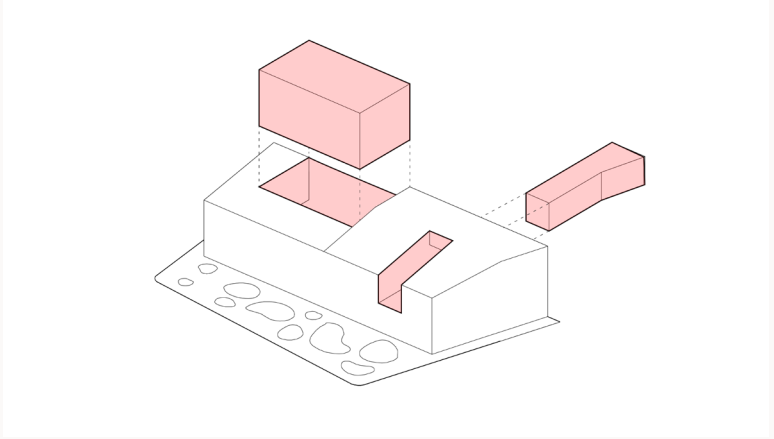
The Shanghai 2035 plan to improve the city's environment, protect its rural land, and position Shanghai as a leader in urban food production and innovation.

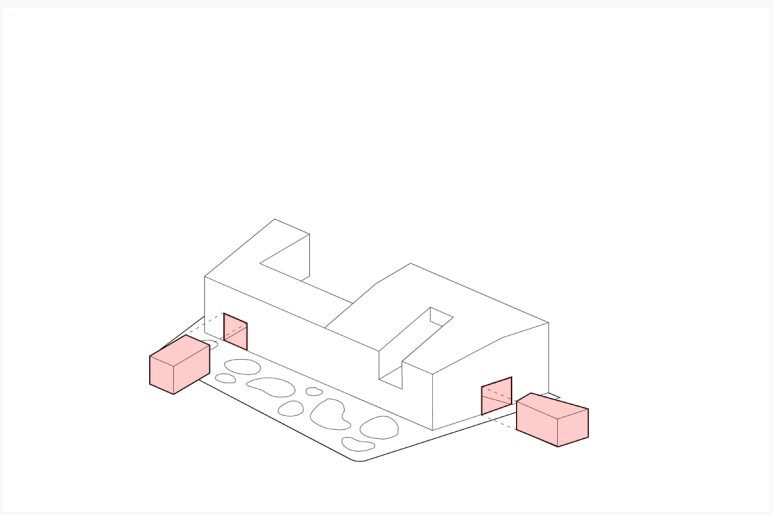
Last but not least Chinese Government will acquire the land, the trend and the market value of the site force us to create a volume to exploit.

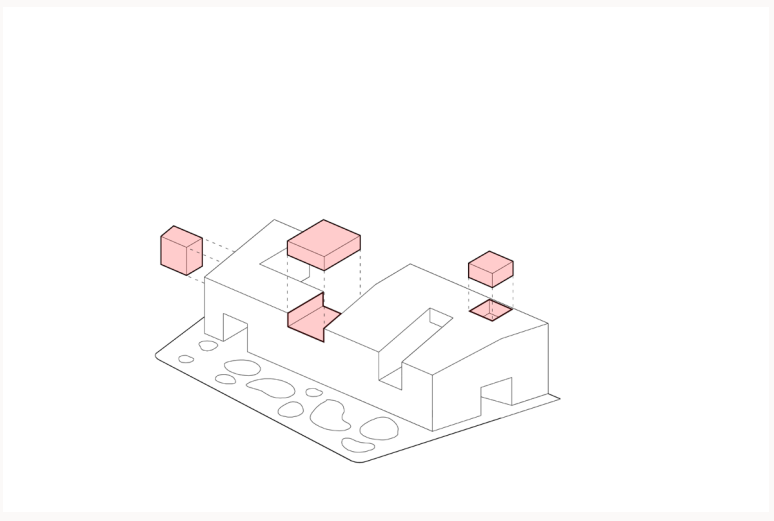
DESIGN INTENTION
Design Intention











Strategy

The volume and site organization (local) have followed different steps to consider the whole complexity of previously explained intentions.

1 . Create a green space

To make the site a main green point space, the project has been receded, leaving room for creating a green space.

The width of this recess follows the line of the open space nearby to connect it in the green system of the boulevard.

2 . One leading quality of the site that the residents are sunlight, and enough damage was made by the nearby tower: the maximum expansion Olin eight of the project is the right of the nearby building.

3. After setting the limit of the volume it has been started a process of excavation :

Primary excavation

To let the sunlight reach the building behind and doo not break the view connection.

Secondary

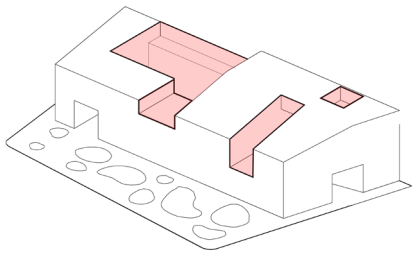
Linked with the access point and the people movement. To free the sideway from more crowd of people and to connect them visually with access points to the site.

Tertiary

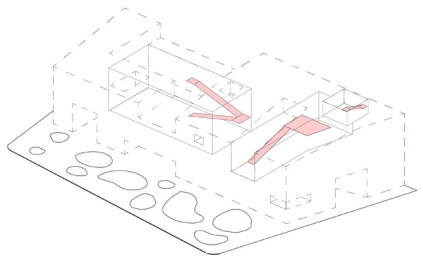
It is linked with the architectural organization of the building to improve the quality and interior climate.

This cut of the building matter allows us to continue and enforce the first intention of the project: green and sunlight etc.

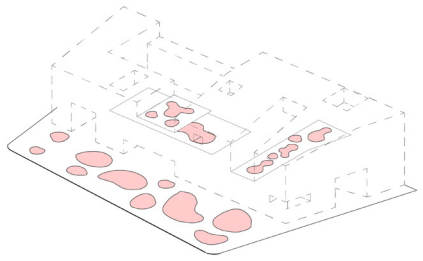
In this excavation, we can insert more green spaces like a grass growing after inside the stone of Shanghai."



Light



Vegetation



Connection

六 THEME

Local agriculture

In the narrow alleys of historic shikumen housing in Shanghai, the residents make full use of their small planter beds. They packed them with squash vines, figs, tomatoes, peppers, and several other unidentified greens.

Food safety concerns and the high cost of organics in Shanghai are driving some city residents to grow their vegetables clean, safe, cheap and fresh. With growing concerns about food safety in China, it has become popular with urbanites to grow their own vegetables - they're safer, fresher and cheaper - and the balcony creates a beautiful garden.

2. Rooftop and alley cultivation

species	1	2	3	4	5	6	7	8	9	10	11	12
Kale	★	★			★			★	★	★	★	★
April slow										★		
May slow	★									★	★	★
potato	★	★						★	★			
tomato	★		★	★								★
cabbage	★	★	★	★	★	★	★	★			★	
Chinese cabbage	★							★				
Winter melon		★	★									
spinach		★	★					★	★	★	★	
celery		★	★	★	★	★	★	★	★			
Shepherd's purse		★	★	★				★	★	★		
radish		★					★	★	★			
Cabbage		★										
Kale		★		★		★	★					
Feminine			★	★	★	★	★	★	★			
small carrot			★									
Chives			★	★	★	★		★	★	★		
lettuce			★	★	★	★	★	★	★	★		
pumpkin			★	★								
Chrysanthemum			★	★				★	★			
Grass head			★					★	★	★		
parsley			★	★		★	★	★	★	★		
carrot			★				★	★				
Water spinach			★	★								
Night blossom			★									
Edamame			★	★	★	★						
Sword Beans			★					★				
Lettuce			★		★	★	★	★	★			
cucumber			★	★	★		★	★				
leek			★									
Chives			★	★								
Hangzhou cabbage				★	★	★	★		★			
Mi Amaranth				★	★		★	★				
cowpea				★	★	★	★					
Green onions				★				★				
Guangdong cabbage				★	★	★	★	★	★			
Lentils				★	★							
Cauliflower						★	★	★			★	★

3. Seasonal cultivation in Shanghai

Urban Farming

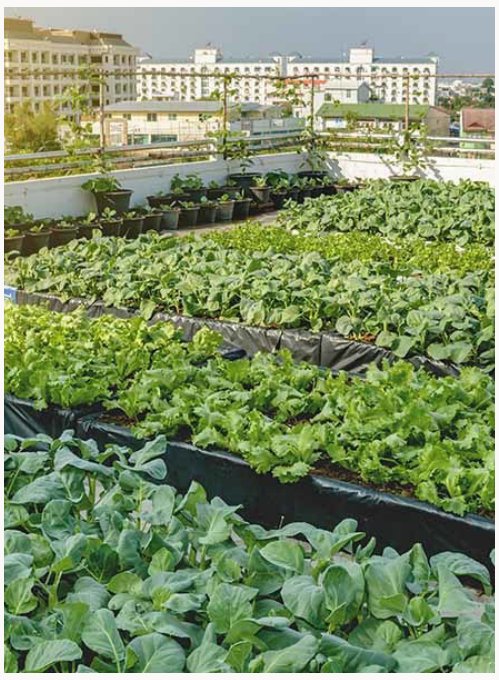
Technique

The different urban farming methods include community-supported agriculture, city farmers markets, indoor Farming, Vertical Farming, and a host of other alternative means to produce or deliver food in an urban environment. Understanding the tradeoffs from an economic, health and safety, and environmental perspective is imperative to selecting suitable urban farming options for a particular locale.

4. Community garden

Community gardens are an emerging form of urban agriculture. They often result from bottom-up self-organized movements and "guerrilla gardening" in response to social or economic crises. Such gardens can vary in size, from single plots in a vacant lot to neighborhoods with larger projects. These types of gardens are often used to experiment with a combination of agricultural and social practices. They are increasing recognition for improving social inclusion and strengthening social networks in cities.

Indoor Farming was the precursor to the high-tech indoor farming developments currently growing in popularity and consist of simply greenhouses. Many have increased their germination and yields by controlling light, temperature, fertilization, and other growing conditions in an enclosed area.



5. Rooftop cultivation

The roof garden includes raised beds, greenhouses, or even animals such as chickens. It all depends on what the building owner is comfortable with allowing you to do with space and local laws. Care should be taken to ensure that adequate support is available before starting a rooftop farm. Soil can weigh thousands of pounds when you have everything in one place, so you need to pay attention to how a rooftop farm is organized to ensure the roof can carry the load. Installing or dismantling a

rooftop farmhouse can be difficult, as absolutely every part of the operation needs to be gradually brought to the roof using an elevator if you're lucky or the stairs if you're not. This includes lifting all the soil you need, plus something to contain it.

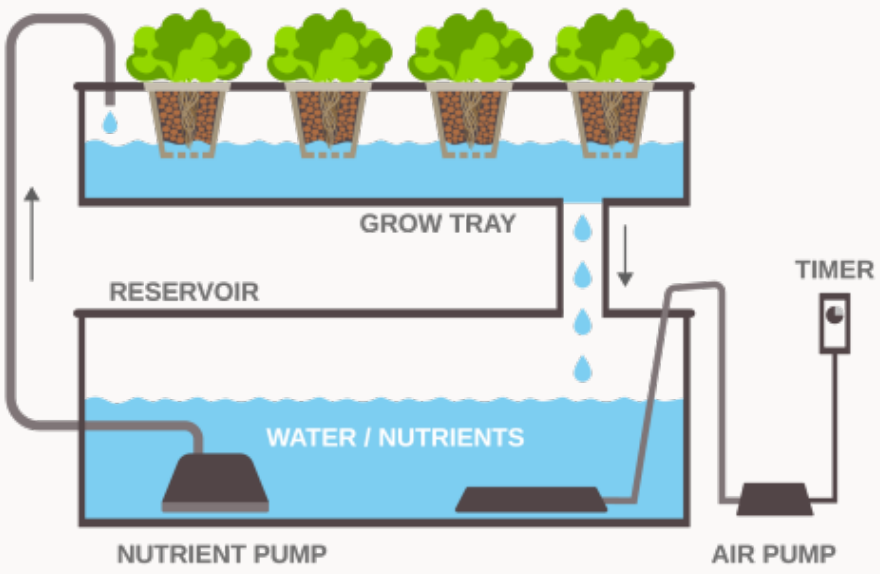
Vertical Farming is soilless culture, defined as any method of growing plants in the absence of soil, in which plant nutrients are dissolved in and supplied with irrigation water. The resultant solution is referred to as "nutrient solution." Soilless culture is usually used since it enables the grower to automate and optimize irrigation and fertilization management, save labor, improve product quality, and fit multilayer cultivation. Soilless systems can be classified according to the type of root support into substrate crops (artificial, mineral or organic, or a mix of these) and yields without substate or hydroponics, in which the root system is either immersed in a nutrient solution or simply accessible in the air and suspended in a fine mist of nutrient solution applied continuously or intermittently.

Hydroponics is the oldest of the three because soilless installations have existed since the Hanging Gardens of Babylon age.

A hydroponic system has two main parts: the grow beds and the reservoir. The reservoir holds the nutrient solution or water mixed with various nutrients that plants need to grow in the medial bed successfully. On the other hand, grow beds contain supports and "cups" that will hold the plants in place. To clarify, the growing media will replace the soil in a hydroponic setup. There are many types of growing media to choose from: coconut, perlite, organic polymer composites, rock wool, etc. The type of soil used in a hydroponic system is critical because it will determine how efficiently the plants will absorb nutrients from the solution.

6. Vertical Famring

7. Hidroponic examples



8. Aquaponic schematic diagram, detail photo and exaple of its use in Floating Fields.

The problem with hydroponics is that it uses relatively more water because, after a while, the accumulation of salts becomes too much for the system, and the water must be replaced not to kill the plants. Also, you need to check the electrical conductivity of the water every day to make sure the pH of the water is correct. Fluctuations in the water's pH level can damage plants and eventually cause death.

Aquaponics is a hybrid system that combines the best of aquaculture and hydroponics. It looks like a hydroponic system from a system perspective, but instead of relying on the main tank that holds a nutrient solution, the nutrient source will be a tank of live, swimming fish. When you feed fish, the fish naturally excrete waste. The waste mixes with the water, increasing ammonia levels. This waste must be mediated and reduced in order not to kill the fish. Usually, aquariums are regulated by biological filters and other types of filters that neutralize ammonia and reduce the impact of feces on fish. In an aquaponic set up, the fish tank water is recirculated throughout the system to pass through the grow beds, where the crops are constantly grown. Plants absorb nutrients dissolved in the water and process ammonia, which is highly toxic to fish at high levels. Bacteria residing in the roots of plants and good bacteria from the fish gut work together to establish a balanced ecosystem in which both fish and plants will survive.

After about six months, the mini-ecosystem formed by an aquaponics plant will show signs of high-level self-regulation. This will be the time when both the fish and the plants will begin to truly bloom. There will be significant increases in fish yield and plant yield, and system maintenance will become even more affordable.

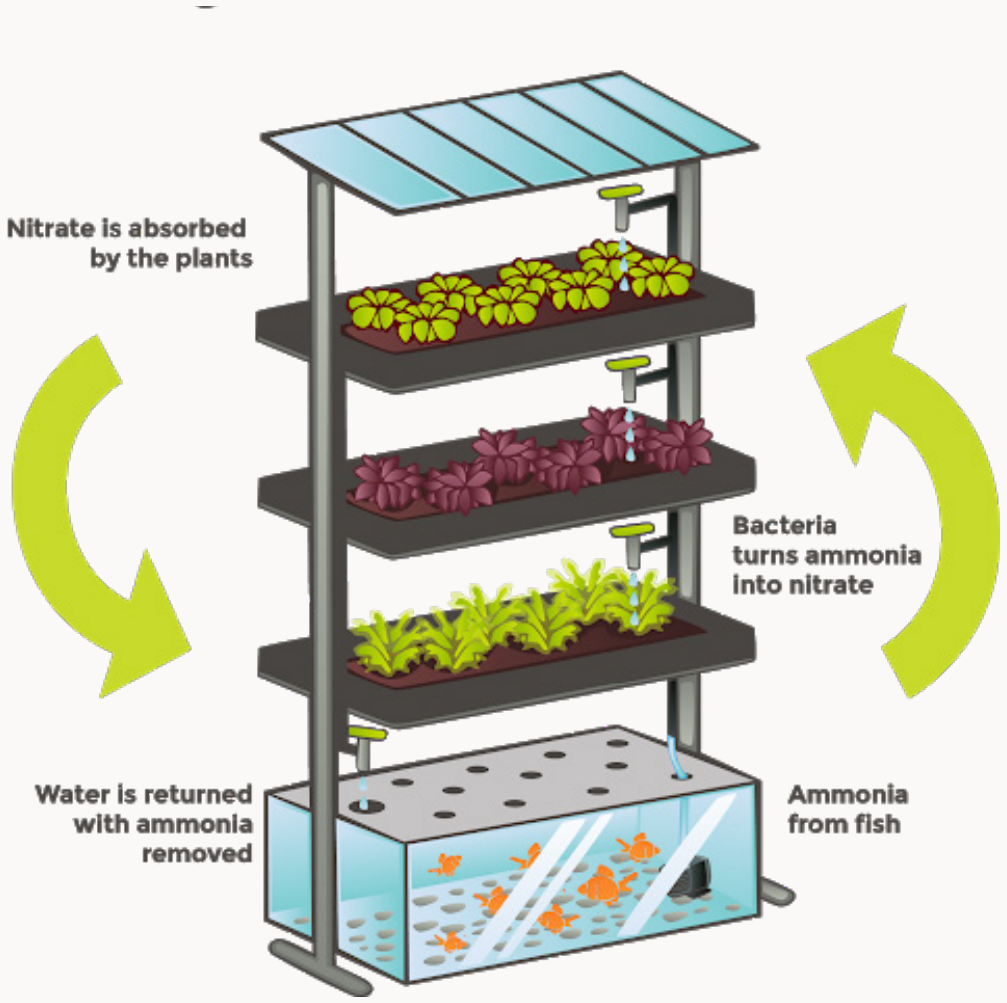
The best thing about aquaponics is that you will essentially be hitting two birds with one stone - you will be raising fish and growing crops simultaneously. Fish waste, which

is regulated in aquaculture, will no longer be considered a problem because it becomes a coveted source of nutrition for plants. Without fish waste, plants would have no nutrients.

On the other hand, the plants will act as a 24/7 ammonia control center for the aquarium, reducing the ammonia load and preventing toxicity in the water. Fish are sensitive to ammonia, and even a slight increase in ammonia content in the water can cause stress, shock, and disease. Additionally, aquaponics growers are now adding red worms to grow beds to increase the efficiency of waste breakdown and, consequently, nutrient distribution to plants. The red worms are first developed on the soil and, after adulthood, are then soaked/ washed and then transferred to the growth bed of an aquaponics plant. In addition to helping to improve the nutrient levels of the water supplied to plants, there is another big reason why red worms are now routinely included in aquaponic systems: and. Coli. E. coli is a common pathogen/ bacterium found in fish feces. E. coli infections can bring down a healthy adult and take him to the hospital.

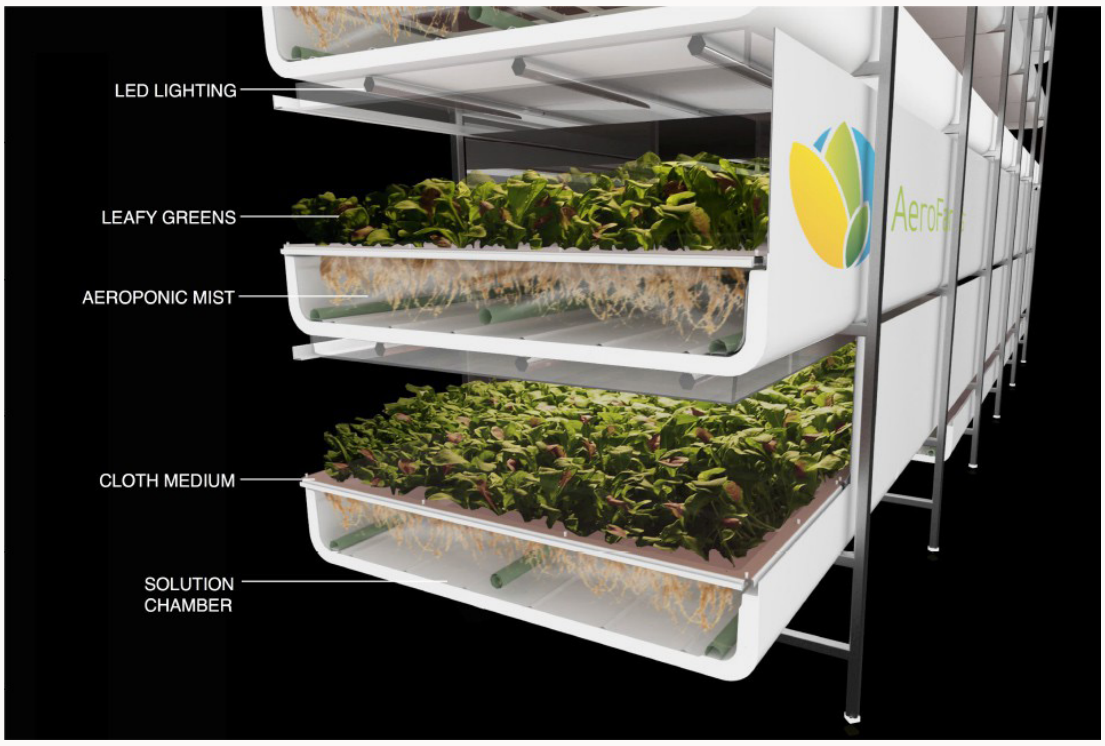
One of the downsides of aquaponics culture is that you have to be very specific with the system's design so you won't have to shut it down during the winter.

Aeroponics is a variant of hydroponics. Instead of using a grow bed filled with soil, the plants are suspended, with the roots facing an irrigation system connected to the main nutrient reservoir. Depending on the implant and design, aeroponic systems generally use little or no support. One of the limitations of hydroponics is because the roots are also immersed in water, and there is often poor oxygenation in the media, which hinders the growth of plants. Aeroponics solves this problem by ultimately freeing the origins of plants and allowing them to come into contact with pure air.



9. Aquaponic schematic diagram

10. Aeroponic



11. Aeroponic schematic diagram

The advantage of this system is that the crops grow incredibly fast, and the yields are high. Aeroponics requires the least amount of water over time, and excess water that is not handled by plant roots is drained into the nutrient reservoir.

Aeroponics is highly dependent on the misting system. Therefore, if something should happen to the misting system, the plants can die quickly due to dried-up roots.

Production data

Yield (also known as "agricultural productivity" or "agricultural production") is a measure of the amount of a crop or product such as wool, meat or milk produced per unit area. The seed ratio is another way of calculating agricultural productivity. The units by which the yield of a crop is measured today are kilograms per hectare or bushels per acre.

Plants you should avoid include climbing plants. Other plants you may not want to grow hydroponics are types of bushes like squash and zucchini. Climbing and bushy types of crops take up a lot of space and can occupy the area. Corn is another one you shouldn't grow hydroponics due to its height.

One of the best plants to grow for hydroculture is lettuce since it brings a lot to the table. In addition, by increasing lettuce, you can learn a lot about how your plants' root systems work without much effort.

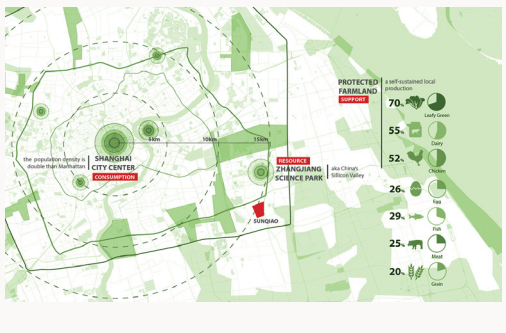
In Shangai, agriculture production is varied. In the image, they have been selected the vegetables cultivated for the longest period during the year.

Name of crop	Hydroponic equivalent per acre	Agricultural average per acre
Wheat	5,000 lb.	600 lb.
Oats	3,000 lb.	850 lb.
Rice	12,000 lb.	750-900 lb.
Maize	8,000 lb.	1,500 lb.
Soybean	1,500 lb.	600 lb.
Potato	70 tons	8 tons lb.
Beet root	20,000 lb.	9,000 lb.
Cabbage	18,000 lb.	13,000 lb.
Peas	14,000 lb.	2,000 lb.
Tomato	180 tonnes	5-10 tonnes
Cauliflower	30,000 lb.	10-15,000 lb.
French bean	42,000 lb. of pods for eating	-
Lettuce	21,000 lb.	9,000 lb.
Cucumber	28,000 lb.	7,000 lb.

species	1	2	3	4	5	6	7	8	9	10	11	12
Kale	★	★			★			★	★	★	★	★
April slow										★		
May slow	★									★	★	★
potato	★	★						★	★			
tomato	★		★	★								★
cabbage	★	★	★	★	★	★	★	★			★	
Chinese cabbage	★							★				
Winter melon		★	★									
spinach		★	★					★	★	★	★	
celery		★	★	★	★	★	★	★	★			
Shepherd's purse		★	★	★				★	★	★		
radish		★					★	★	★			
Cabbage		★										
Kale		★		★		★	★					
Feminine			★	★	★	★	★	★	★			
small carrot			★									
Chives			★	★	★	★		★	★	★		
lettuce			★	★	★	★	★	★	★	★		
pumpkin			★	★								
Chrysanthemum			★	★				★	★			
Grass head			★					★	★	★		
parsley			★	★		★	★	★	★	★		
carrot			★				★	★				
Water spinach			★	★								
Night blossom			★									
Edamame			★	★	★	★						
Sword Beans			★					★				
Lettuce			★		★	★	★	★	★			
cucumber			★	★	★		★	★				
leek			★									
Chives			★	★								
Hangzhou cabbage				★	★	★	★		★			
Mi Amaranth				★	★		★	★				
cowpea				★	★	★	★					
Green onions				★				★				
Guangdong cabbage				★	★	★	★	★	★			
Lentils				★	★							
Cauliflower						★	★	★			★	★

12. Production data : how much and what.

13. Jiangsu Meiyang Ecological Farming & Forestry Co. rents almost half the 988 acres.



14. Shanghai agriculture

15. In Jiangsu province, Feng Jiafeng pledged his land-use rights as collateral for a loan so he could open a supermarket

Urban Policy

In the past, most vegetables were produced no more than 10 km from the point of sale in China, where they appeared within a day of being harvested. Thus, most cities were almost self-sufficient from a food point of view. However, during the past decades of China's urbanization, Chinese cities have safeguarded this system by expanding urban farmland at the same pace as urban growth.

This is especially true of Shanghai, which has been planning and managing food production in the municipal region since the 1950s, a system that provided all the city's fresh vegetables and significant portions of other food demands until the 1980s. However, due to rapid urbanization, the loss of agricultural land, and changes in policies, the level of self-sufficiency has decreased. In the mid-1990s, nearly 100% chicken, egg, and milk, 80% freshwater vegetables and fish, and 50% pork were produced in a green ring around Shanghai.

Since the turn of the millennium, the Shanghai Municipal Government has made a renewed effort to safeguard food self-sufficiency by controlling local production and distribution and regulating land use to preserve agricultural land. The agricultural investments of the city have quintupled in the last ten years; with the help of taxes and subsidies, the food supply was protected. The loss of agricultural land was partly offset by modernization and mechanization. As a result, the deterioration of urban and peri-urban agriculture has largely been halted. Shanghai now still produces more than 55 percent of its greens and 90 percent of its leafy greens, according to the municipal government, and food production is on the rise in most areas.

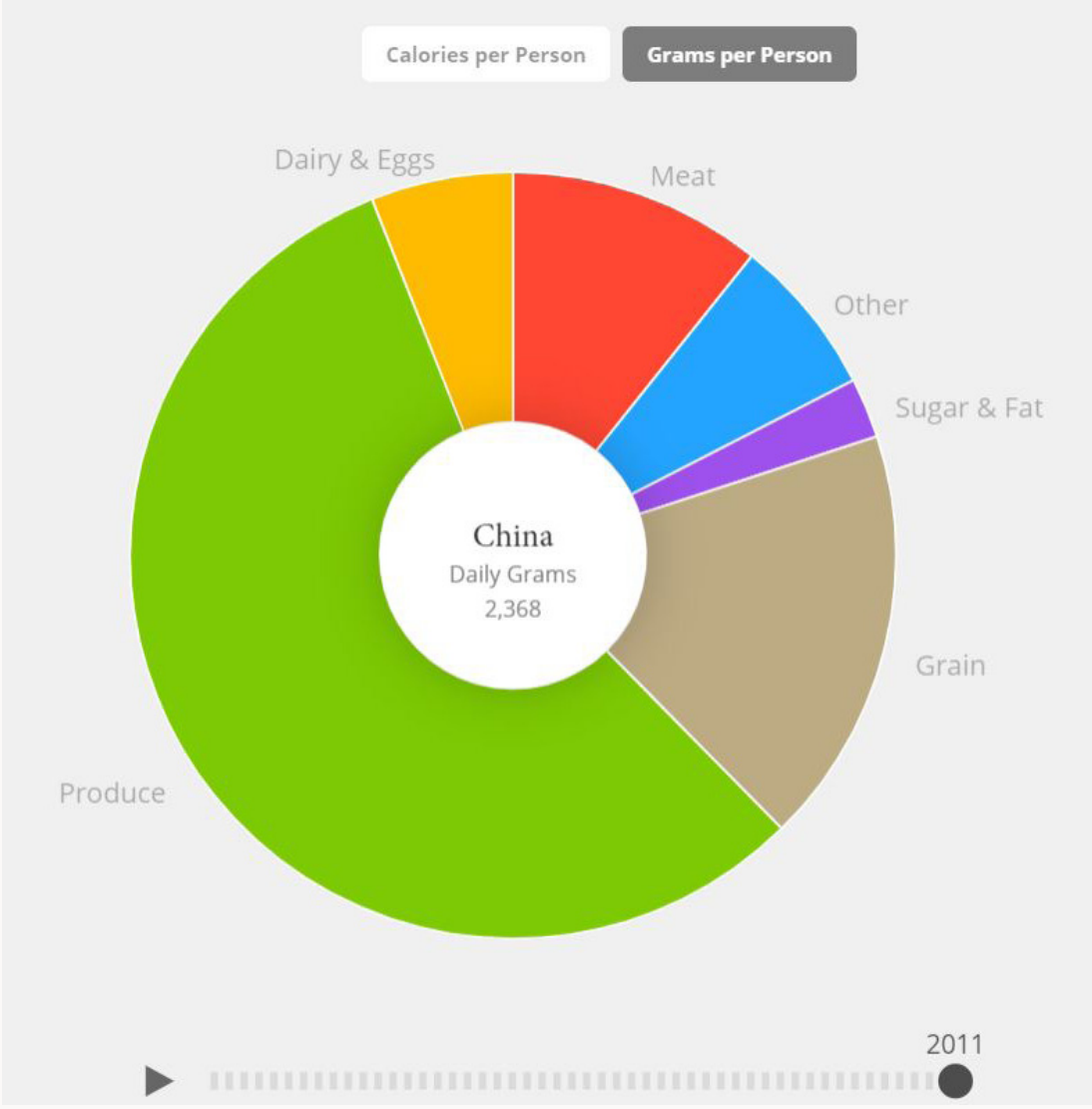
In addition, the Shanghai government has launched a series of programs to create a modern and sustainable system of urban and peri-urban agriculture:

- Quality control systems have been established, among other things, in an attempt to build "vegetable gardens" in nine suburban districts.
- Ecological and circulatory agriculture was introduced, which mixes agriculture and livestock farming.
- The cultivation of vegetables on roofs and balconies was promoted.
- Projects with biodynamic agriculture are supported and integrated into the ecological policies of the city.
- Two recreational agricultural areas have been created, where high-quality productions, environmental protection, and agritourism are mixed,
- The number of agricultural enterprises has increased, and 9 000 new jobs have been created in the farm sector
- Several new funding schemes have been established.

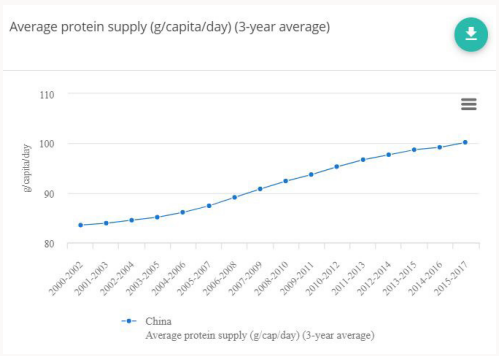
Consumption data

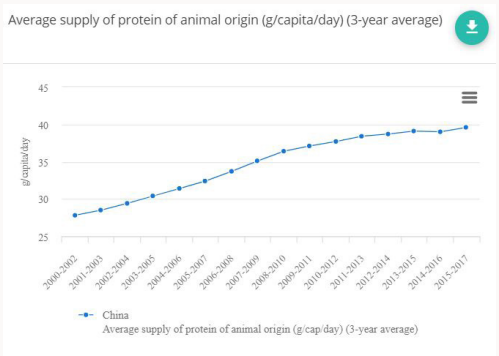
Produce is an umbrella term for many crops grown on the farm, including fruit and vegetables (even cereals, oats, etc. are sometimes considered to be products). More specifically, the term produce often implies that products are fresh and generally in the same state in which and when they were harvested.

The caloric intake of the average Chinese person has more than doubled in the last 50 years. In addition, in China in 2011, people ate the highest quantity of produce in the world.



16. Consumption data and diagrams





Agriculture : New Trends

The new support to Agriculture by the municipality also creates a further opportunity for business and connection between young and elders, tradition and innovation.

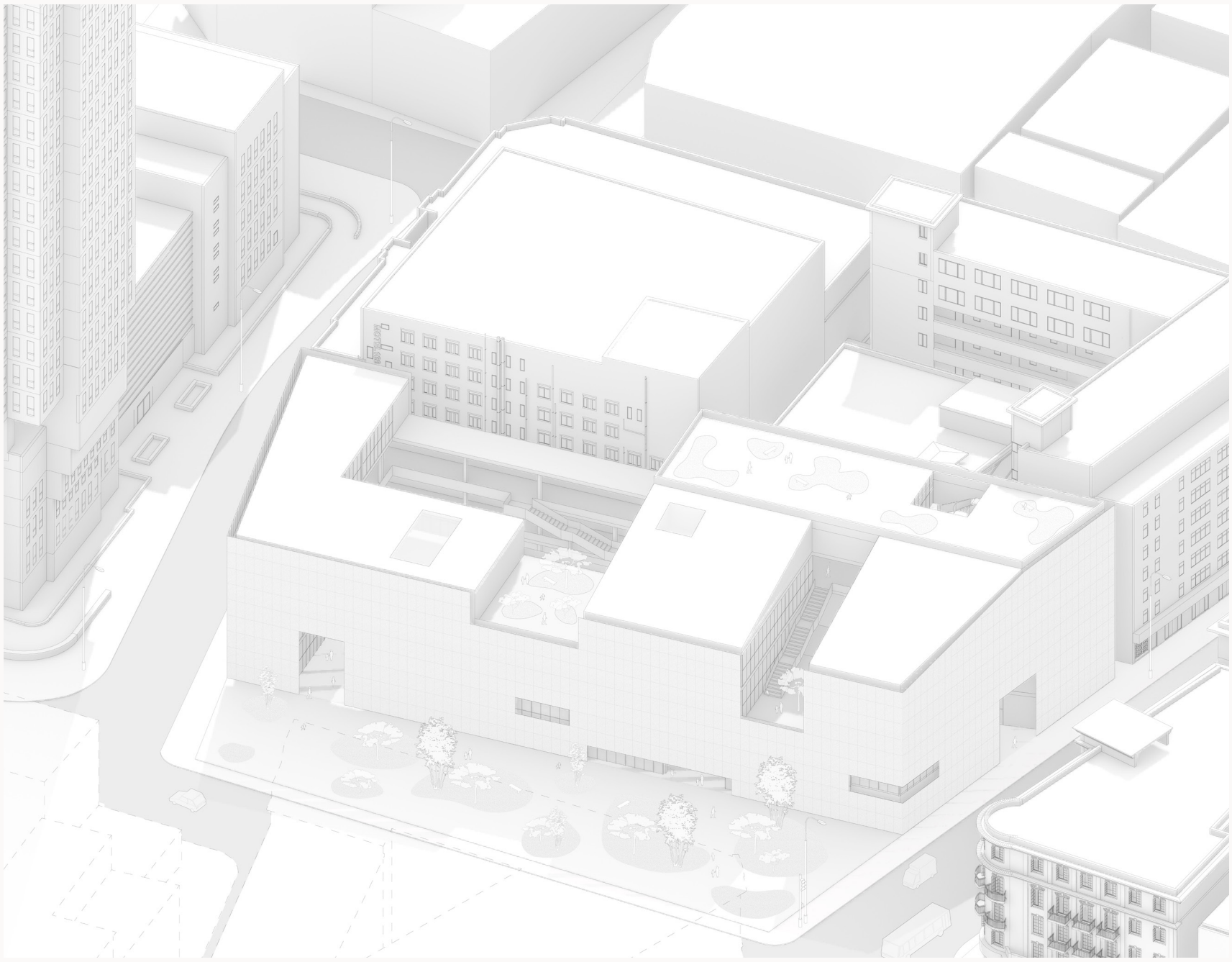
In particular, a new trend is farm renting: people can rent online land cared for by locals and obtain the vegetables and fruit from it, in special strawberries, or farm tours and picking events based on what's in season. Moreover, they can help during the harvest period.

17. Farming tours

FIGURES RESOURCES

1. https://wwf.panda.org/?204455/Shanghai-urban-farming *pag. 82*
2. http://valentinloeffler.blogspot.com/ *pag. 83*
3. https://wwf.panda.org/?204455/Shanghai-urban-farming *pag. 83*
4. https://masshort.org/education-events/urban-gardening-lecture-2/ *pag. 84*
5. https://masshort.org/education-events/urban-gardening-lecture-2/ *pag. 84*
6. https://www.morningagclips.com/dubai-is-getting-the-worlds-largest-vertical-farm/ *pag. 85*
7. https://sensorex.com/blog/2019/10/29/hydroponic-systems-explained/ *pag. 85*
8. https://www.archdaily.com/783314/floating-fields-wins-shenzhen-uabb-award-and-is-set-to-continue-through-2016 *pag. 86*
9. https://university.upstartfarmers.com/blog/aquaponics-vs-hydroponics-which-is-better *pag. 87*
10. http://www.overhorizon.it/le-colture-del-futuro/ *pag. 87*
11. http://www.overhorizon.it/le-colture-del-futuro/ *pag. 88*
12. https://wwf.panda.org/?204455/Shanghai-urban-farming *pag. 89*
13. https://www.baidu.com/ *pag. 90*
14. https://wwf.panda.org/?204455/Shanghai-urban-farming *pag. 90*
15. https://www.bloomberg.com/news/articles/2017-09-26/china-s-reforms-allowing-villagers-to-rent-out-land-have-boosted-incomes *pag. 90*
16. http://www.fao.org/3/U8050t/u8050t03.htm *pag. 91*
17. https://www.baidu.com/ *pag. 91*

七 GREEN OASIS



Axonometry

Project Program

The project program is a direct consequence of the design intentions. Therefore, it can be divided into three main topics: Food, Public, Green.

Each of the themes has been studied to organize all the required functions in the best way possible.

Food because of the design intentions about its production.

To establish a good food theme without entering into competition with the other project made by SASAKI, the food in this project will be studied and exhibit, not produce.

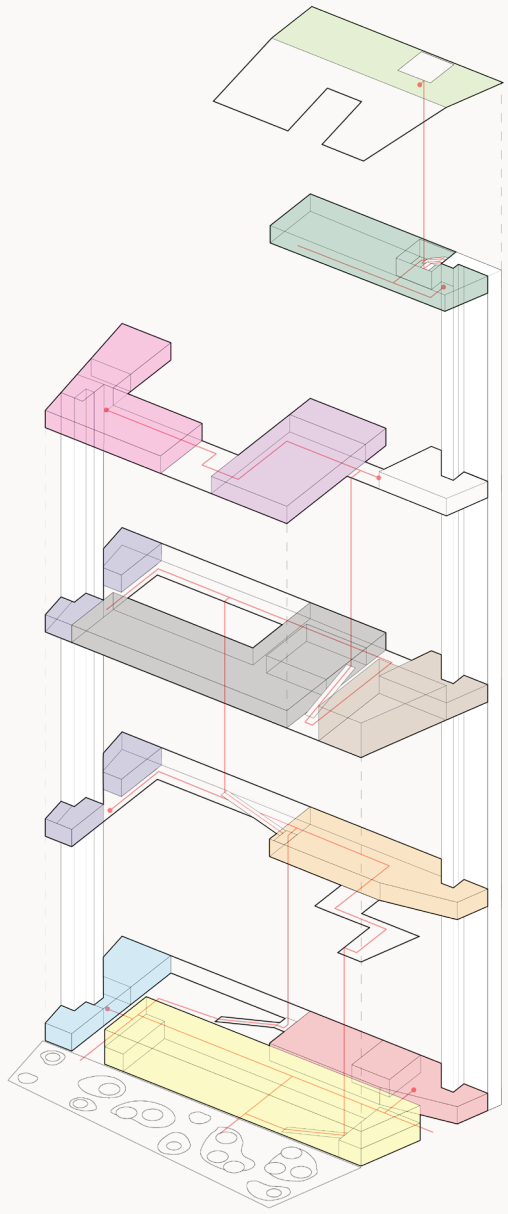
Moreover, a market is established allowing selling the agriculture product created in the alley and a canteen to provide jobs to the locals and improve their living conditions without disrupting their tradition.

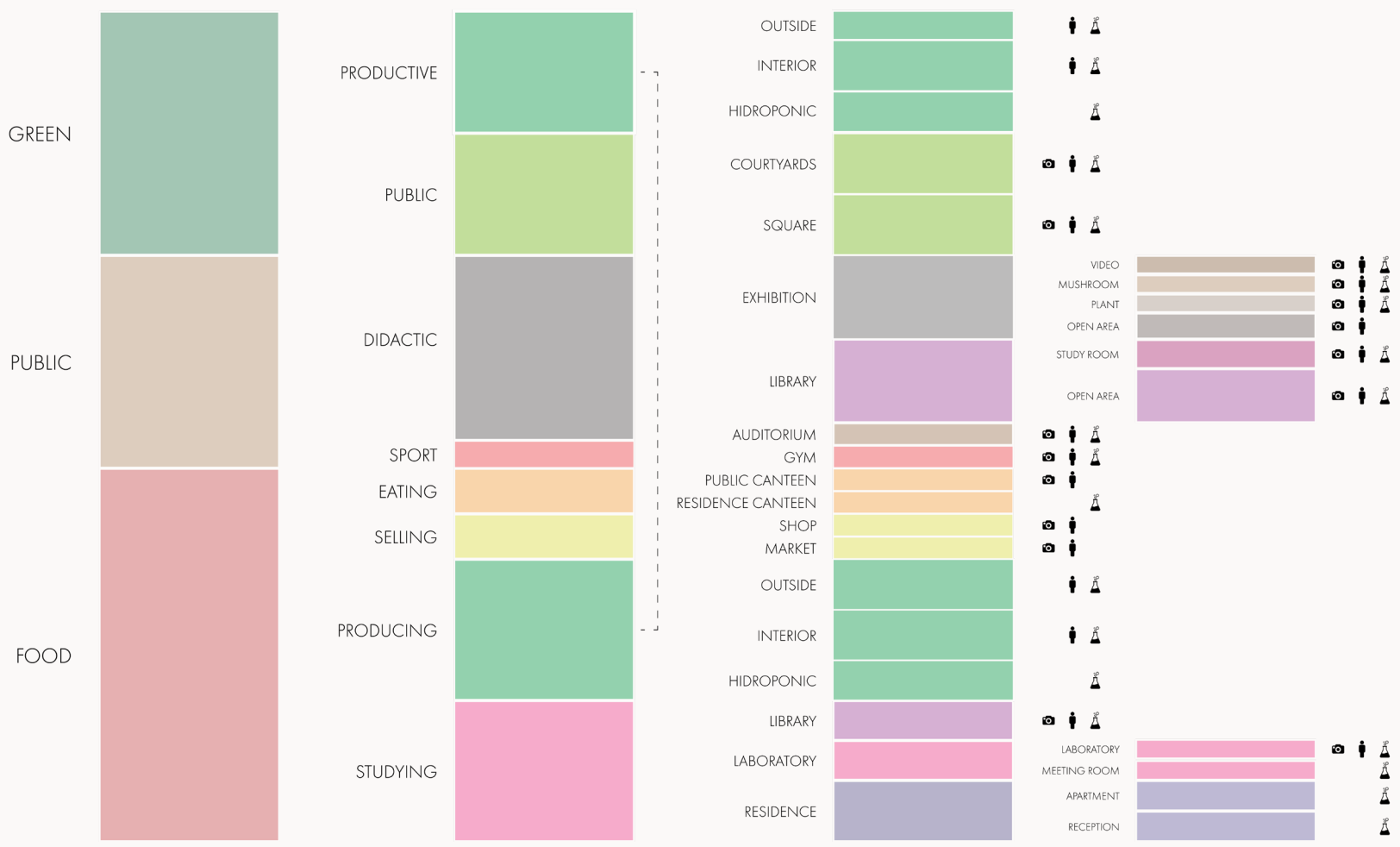
Public because of the aim of the project to involve the resident and at the same time attract new visitors.

Green because of the need for public spaces in the project.

After all this reasoning, it was clear that a division between more private and more public space was necessary due to the different users of the project.

The vertical connection and the excavation help us to achieve this goal. In particular, one side of the project is for the researchers; the other one is more public.




GREEN
PUBLIC
FOOD
PRODUCTIVE
PUBLIC
DIDACTIC
SPORT
EATING
SELLING
PRODUCING
STUDYING
OUTSIDE
INTERIOR
HIDROPONIC
COURTYARDS
SQUARE
EXHIBITION
LIBRARY
AUDITORIUM
GYM
PUBLIC CANTEEN
RESIDENCE CANTEEN
SHOP
MARKET
OUTSIDE
INTERIOR
HIDROPONIC
LIBRARY
LABORATORY
RESIDENCE
VIDEO
MUSHROOM
PLANT
OPEN AREA
STUDY ROOM
OPEN AREA
LABORATORY
MEETING ROOM
APARTMENT
RECEPTION

Floors organization

The Floors organization follows the previously mentioned division between the actors involved in the project: the most used function should be the nearest to the ground.

So a sort of division between private and public has also been made both in Eight, both in each floor's subdivision and the excavations.

There are a market, sports facilities and the canteen and administration of the residence on the ground floor..

The access point to the ground floor has been placed to free the street from the crowd and follow the inspiration from Chinese courtyards, where the access to each function is internal.

Consequently, only the market has direct access to the outside of the building, only because it is on the newly created public square, and so the crowd can be avoided.

On the first floor, there is the residence apartment; on the other, there are the public canteen and the double eight of the market.

The double eight was chosen because of the importance of the market, since it is direct access, for illumination and too divided clearly with a floor of air the leading public and crowded space with the rest of the building.

The second floor consists of the apartment and the other side, the main didactic area of the project with the exhibition and the auditorium.

It can be noticed on tertiary excavation always in the apartment area. This excavation was made to provide a leisure area for the residence inhabitants, improve internal ventilation, and create an access point from the leading private vertical connection.

The third floor and fourth floor contain the research topic: a laboratory side and the library.

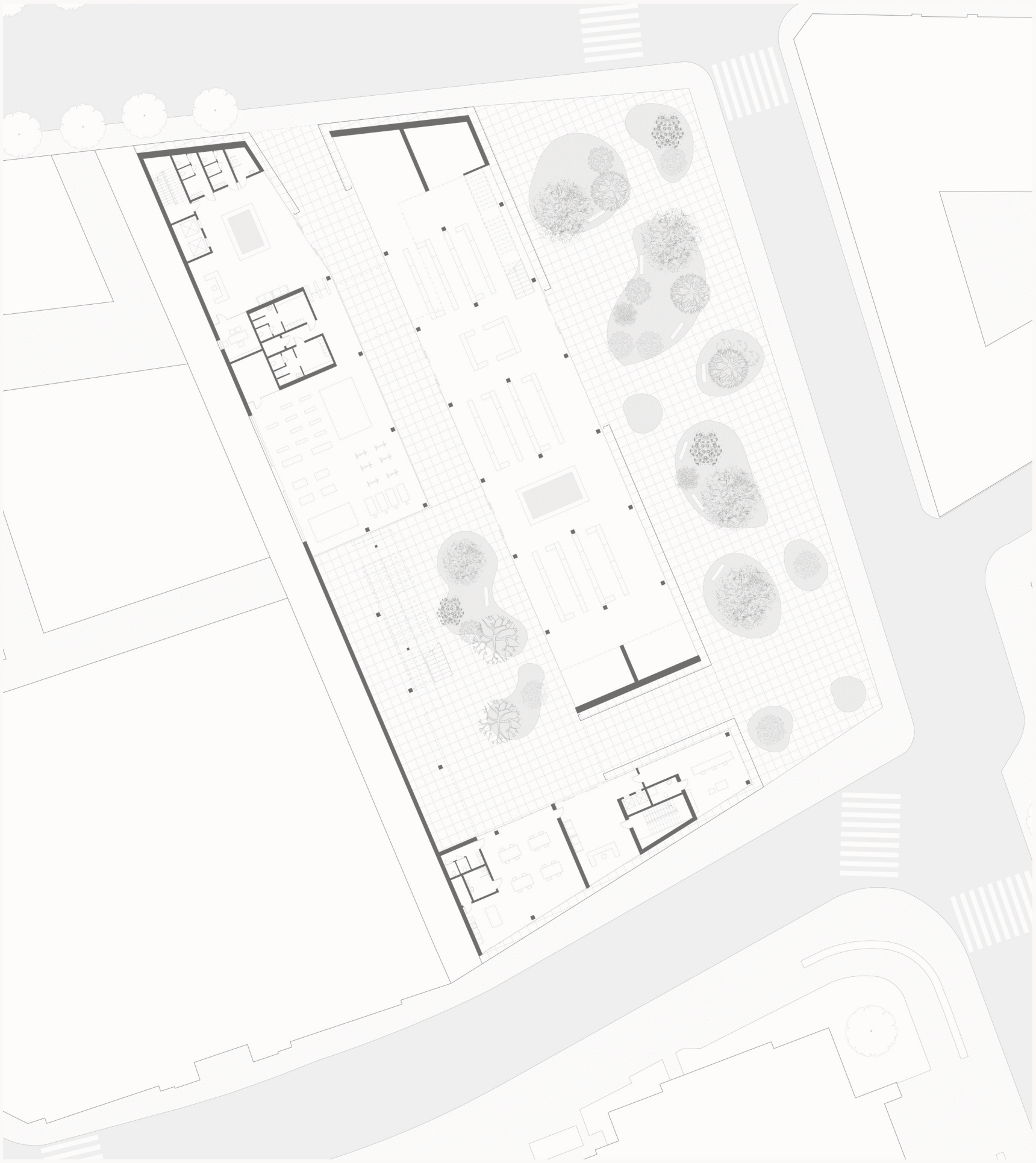
Also, on this floor, excavation help to divide more clearly the most private areas, laboratory, with the more public one, the library.

This division is not straight; it still allows the exchange and interaction between the two-part.

On the fourth floor, the hydroponic production primarily serves, given its size, the laboratory research.

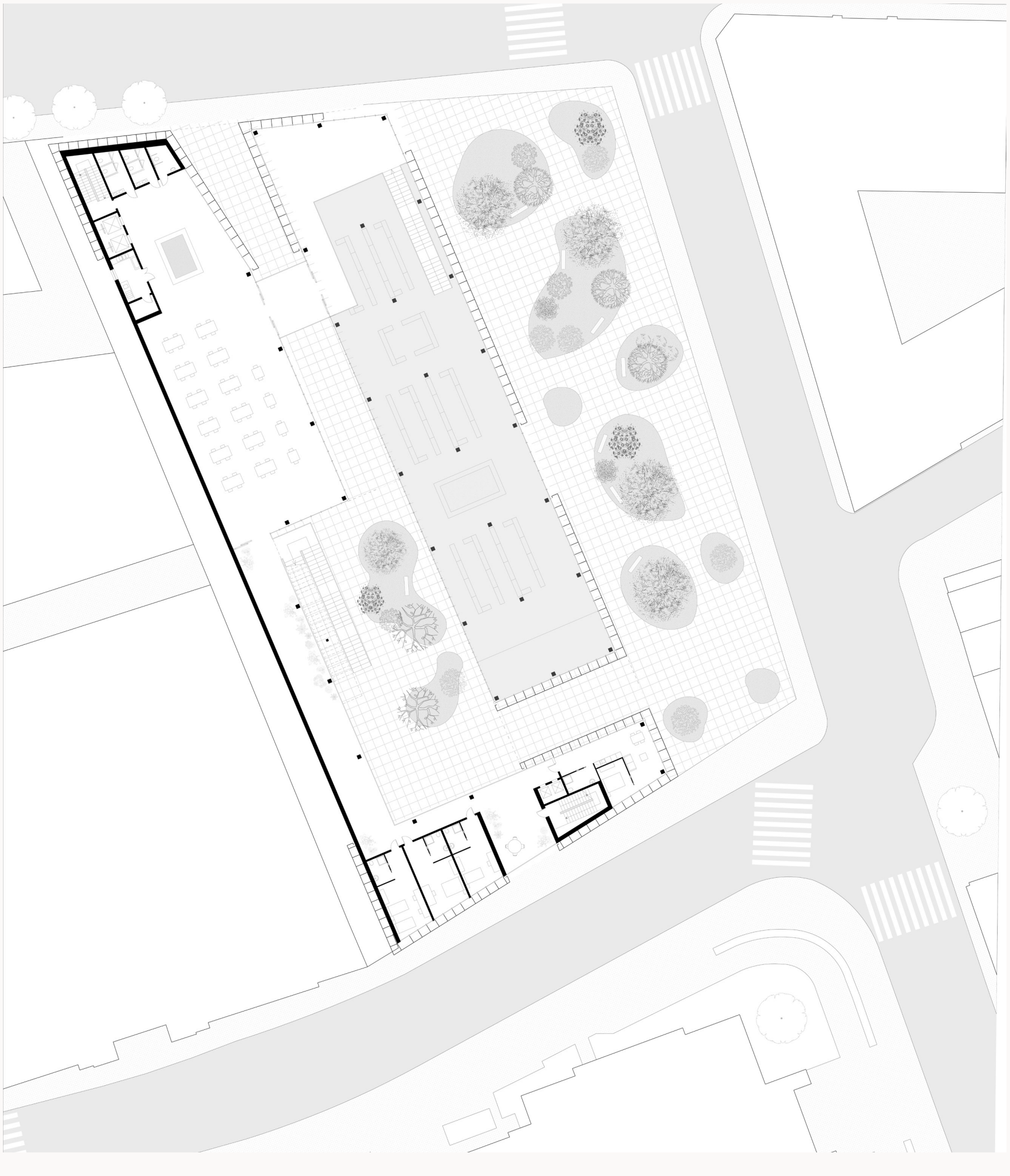
On the top, due to the view possibility of the bund and Huangpu river has been placed a green balcony.

This roof does not have trees since it is not an excavation.



Ground Floor

GREEN OASIS
Floor Organization



First Floor

Second Floor

Third Floor

Fourth Floor

Roof

Elevation

In the elevation, the function of the skin is made clear. It makes us able to give the perception of a unique excavated volume.

Moreover, the rhythm of opening and excavation has been studied for a long time, almost like a musical composition.

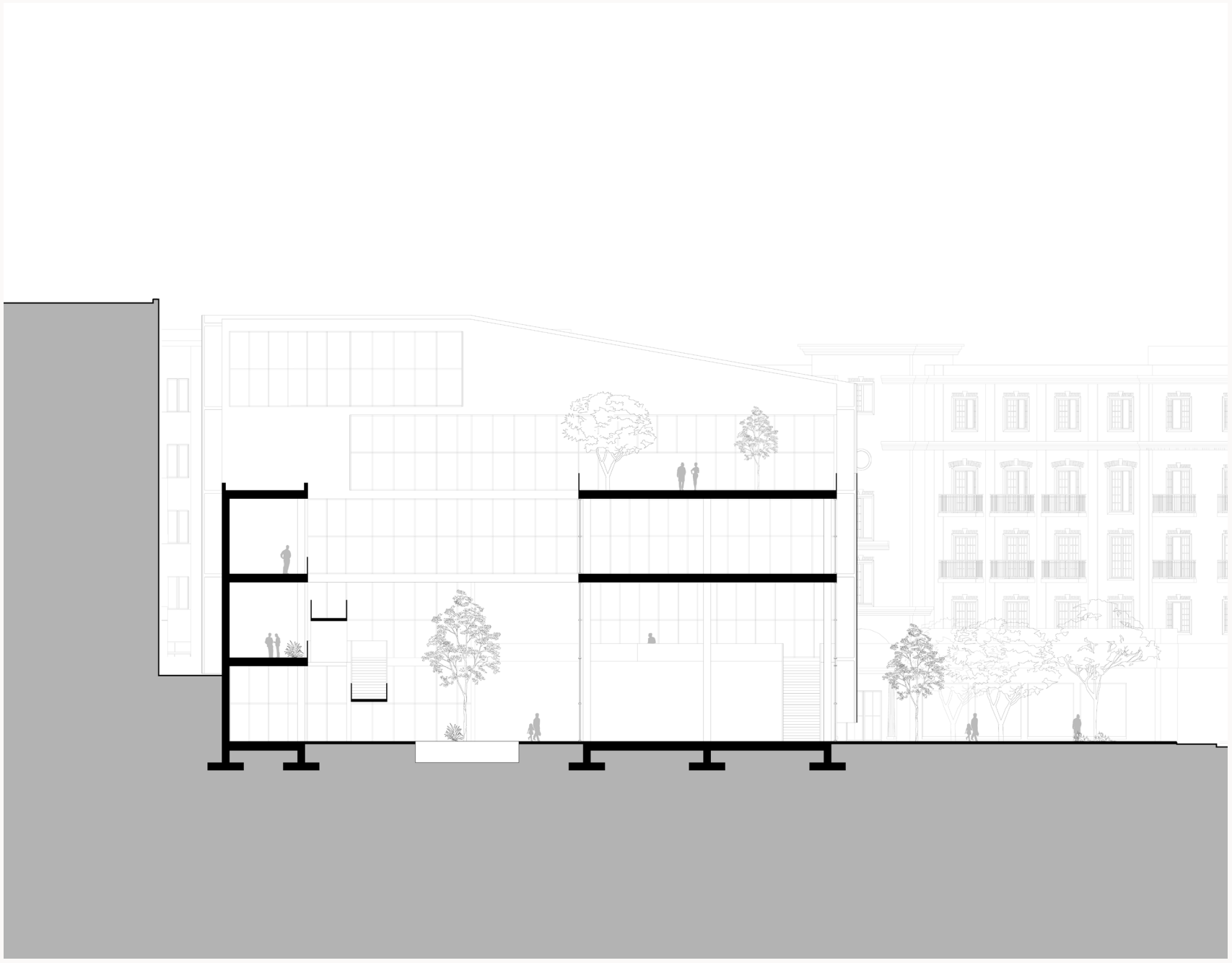
North Elevation

South Elevation

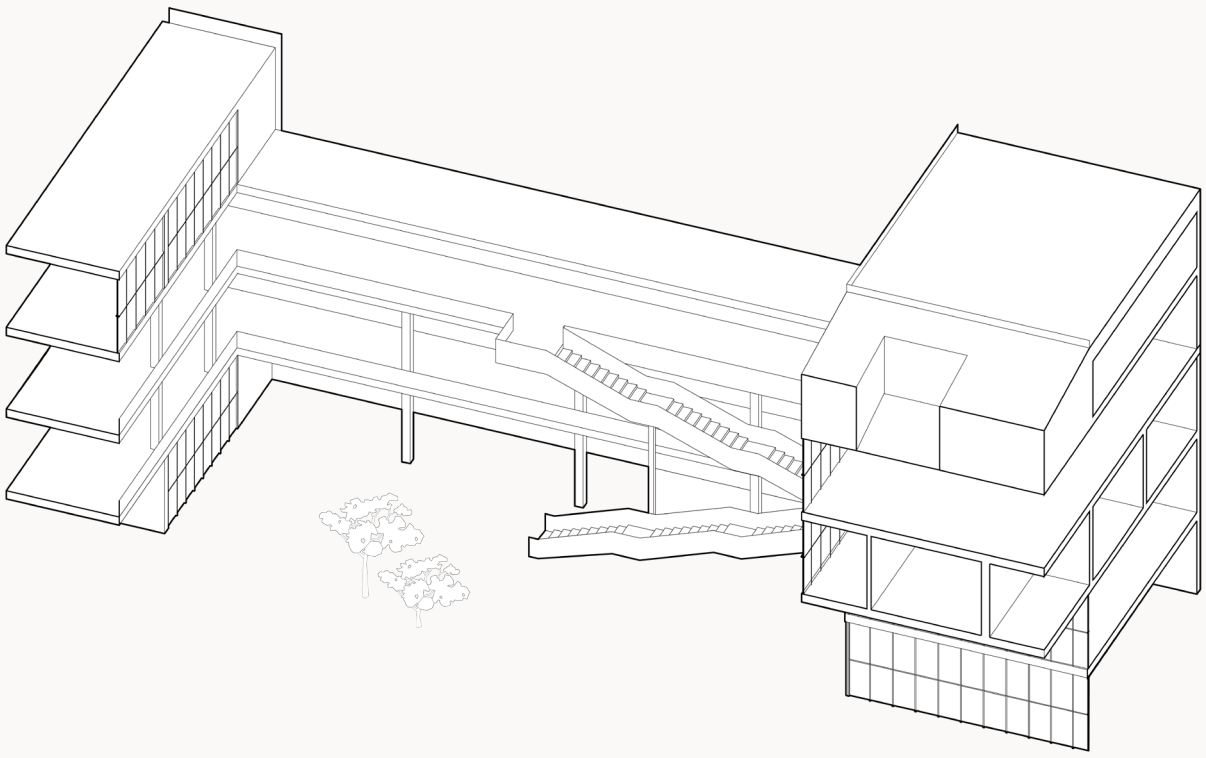
Section

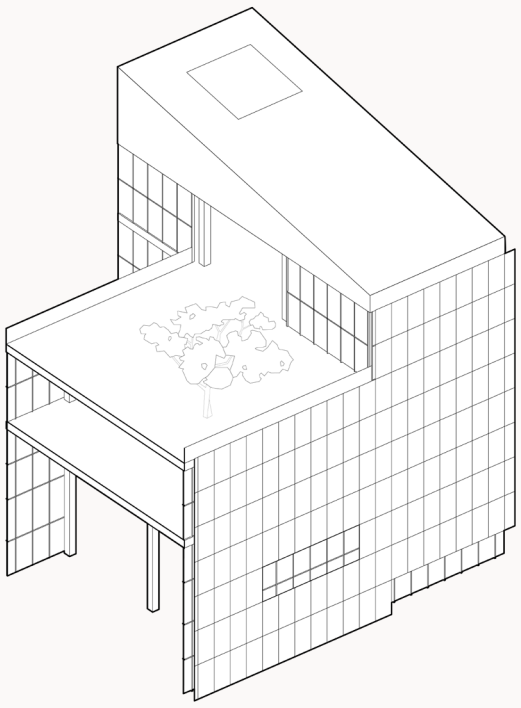
The section make visible the play of cut inside the building.

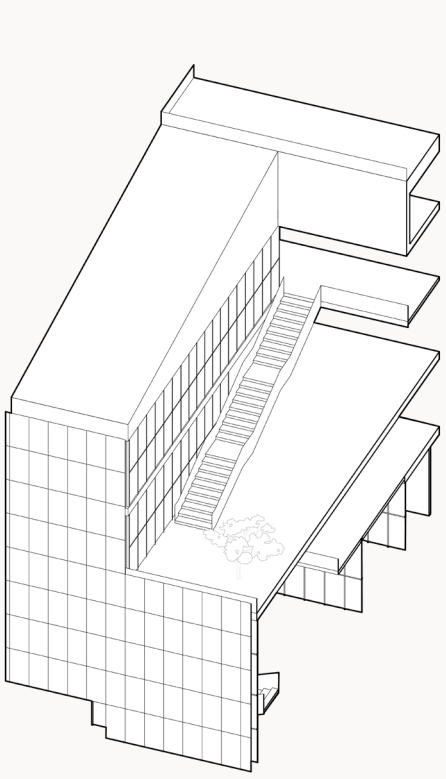
Moreover , they show the complexity of the project and its different height and places.



Short section







Conclusion

To regenerate a void in the middle of Shanghai, the Project was worked as a sculpture, procedurally, determining the rational and functional logic and based on the interpretation of the characters of the context.

The complexity of it gives birth to a project that tries to answer to a lot of influences and requirements and at the same time create a balance between them. This last aim can make the fake perception of the Project a simple one that instead contains a lot of choice and details.

During the Project, it has been studied and understood the complexity and the new rising of the food production topic, particularly in China.

The problem of regenerating an urban space, one of the most important for the future of architecture and the world, does not have an easy solution.

It is one of the most complex challenges due to the complexity of the contextual requirements that it needs to consider to provide a meaningful solution.

Books

- Peter G. Rowe, Seng Kuan, *Essenza e forma: l'architettura in Cina dal 1840 a oggi,* Postmediabooks, Milano 2005
- Edward Denison, Guang Yu Ren, *Modernism in China: Architectural Visions and Revolutions*, John Wiley & Sons Inc, New York 2008
- Koonchung Chan , *The Fat Years,* Random House Publishing Group, New York 2009
- Peter G. Rowe, *East Asia Modern: Shaping the contemporary City,* Reaktion Books, London 2005
- John Friedmann, *China's Urban Transition,* University of Minnesota Press, Minneapolis 2005
- Neville Mars, Adrian Hornsby, *The Chinese Dream: A Society Under Construction,* Nai Uitgevers Pub, Rotterdam 2008
- Yu Hua, *La Cina in dieci parole,* Feltrinelli, Milano 2015
- Lou Qingxi , *Chinese Gardens*, China Intercontinental Press, Beijing 2003
- Qiu Xiaolong, *La misteriosa morte della compagna Guan,* Marsilio, Venezia 2011

Thesis and Essays

- A. Pontiggia, *LOW-RISE, HIGH-DENSITY - Research and design on Shanghai housing,* Master Thesis in Science in Architecture, Politecnico di Milano and Tongji University, a.a. 2013 - 2014, relatori Prof. Remo Dorigati and Prof. Zhi Wenjun.
- L. Citterio, *CHINESE HOUSING : residential typology analysis in Shanghai city*, Master of Science in Architecture, Politecnico di Milano and Tongji University, a.a. 2013 - 2014, relatori Prof. Di Pasquale Joseph and Prof. Wang Fangji.
- Haase M., Amato A., Heiselberg P. , *Climate Responsive Buildings in China*, Sichuan - Hong Kong Joint Symposium, Chengdu June 30 2006

Articles

- Song A. , *Shanghi's nail neighbourhood*, Reuters, London 13 May 2016.
- Jian Gao, *China Unleashes Its Farmers,* Bloomberg, 26 September 2017
- Xiang Zhou, Yanbo Li, Yuning Cheng, *Neighborhood, community and consumption: Study on the socio-spatial structure during two boosting epochs in Shanghai*, Frontiers of Architectural Research,Volume 9, Issue 2, 2020,
- Lia Warner, *Chinese Perceptions of Urban Public Space: Remaking Self by Remaking City,* Urban Demos, 16 May 2019
- Brian Barth, *How Does Aeroponics Work?,* Modern Farmer, 26 July 2018
- Rebecca Gross, *Could Architecture Help Educate Kids On Urban Farming?,* HabitusLiving, 31 March 2020
- Scarlett Miao, *The Diverse Scales of "Green" in Chinese Urbanism* , ArchDaily, 28 February 2021
- Jeff Desjardins, *How Vertical Farming Works,* Visual Capitalist, 4 July 2016
- Sun, Feifei, *Chinese Climate and Vernacular Dwellings*, Buildings 3, n.1 2013
- Huang B. X., Chiou S. C., Li W. Y., *Study on Courtyard Residence and Cultural Sustainability: Reading Chinese Traditional Siheyuan through Space Syntax*, Sustainability 11, n.6 2019

- Jiang, Yunfang & Hou, Luyao & Shi, Tiemao & Ning, Yuemin, *Spatial Zoning Strategy of Urbanization Based on Urban Climate Co-Movement: A Case Study in Shanghai Mainland Area*, Sustainability 2018

Website

- Han Shuang, *Shou County Culture and Art Center / Studio Zhu-Pei , in https://www.archdaily.com/934401/shou-county-culture-and-art-center-studio-zhu-pei?ad_medium=gallery*

- Herbert Wright, *"Floating Fields" Wins Shenzhen UABB Award And is Set to Continue Through 2016, in* https://www.archdaily.com/783314/floating-fields-wins-shenzhen-uabb-award-and-is-set-to-continue-through-2016

- *JIAKUN ARCHITECTS WEST VILLAGE · BASIS YARD, in* https://divisare.com/projects/326479-jiakun-architects-west-village-basis-yard

- *2019 Shanghai Statistical Yearbook,* in http://tjj.sh.gov.cn/tjnj/zgsh/tjnj2019en.html

- *Historic Shanghai,* in https://www.historic-shanghai.com/

- *PERF PATTERNS,* in https://www.hendrickcorp.com/architectural/resources/arch-perf-patterns/