



# TRANSFORMATIONS OF THE COURTYARD: an Exploration in Chinese Architecture

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Submitted to the Department of Architecture in partial fulfillment of the requirements of the Degree of Master of Architecture at the Massachusetts Institute of Technology, June 1989.

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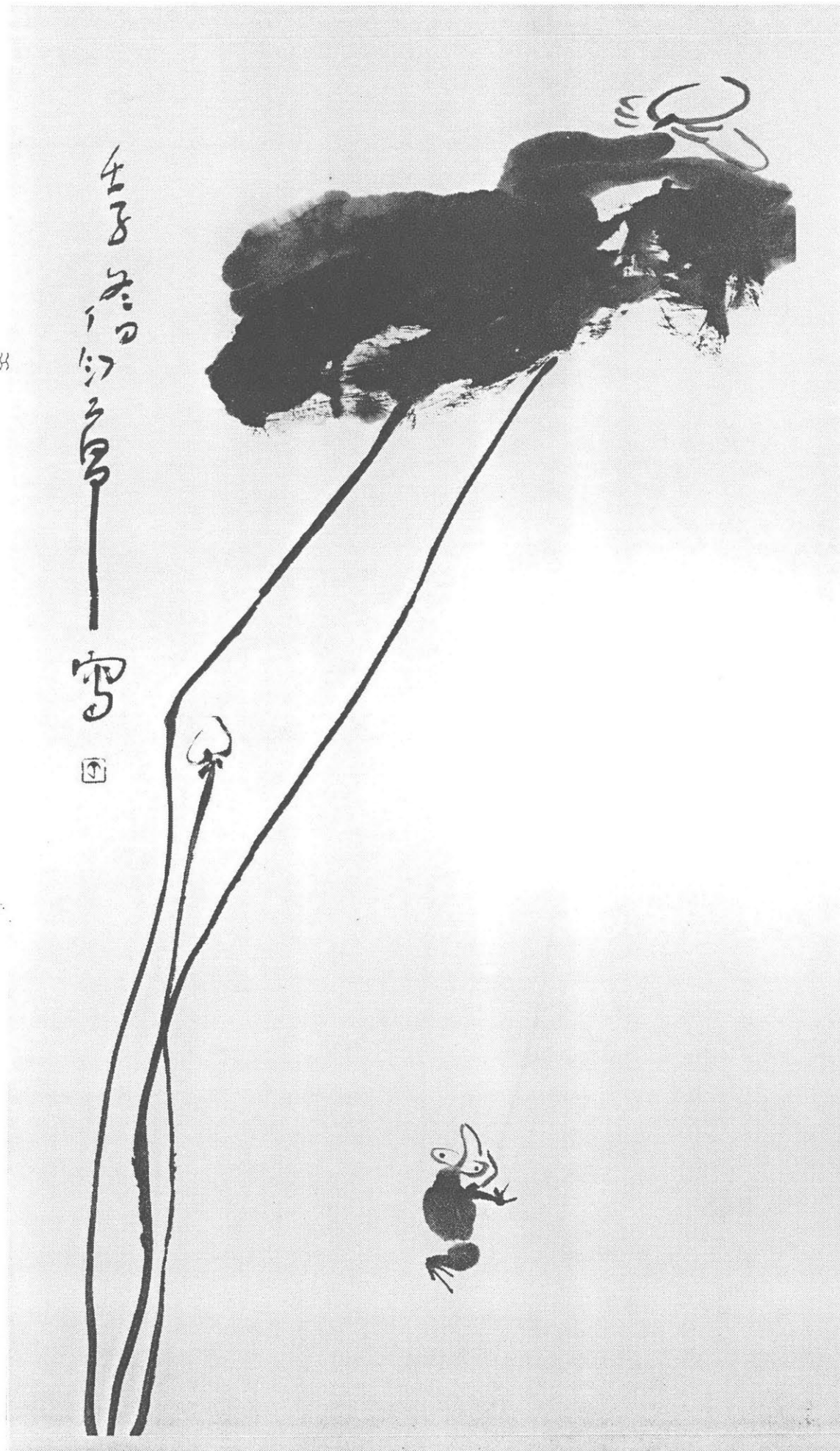
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# ABSTRACT

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by Yuri Kinoshita

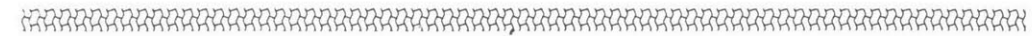
Submitted to the Department of Architecture on April 5, 1989  
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This thesis deals with the design of a large hotel with modern facilities in Suzhou, China, using a reinterpretation of traditional Chinese architecture.

This was approached by analyzing the city fabric in Old Suzhou, isolating several characteristics in terms of ordering, spatial definitions, architectural experience and quality of space, and transforming an existing system to become a new.

Thesis Supervisor: Imre Halasz  
Title: Professor of Architecture

*For God,  
my life, my strength, my love.  
You annoint my head with oil;  
my cup overflows.*



My heartfelt thanks to:

**Mom and Dad**, for your love, for your total support of me in all my dreams, for pouring out your lives for me these last twenty four years.

**Fernando**, for being my guru and friend. From you I have learned how to look at architecture. Thanks for BFO, for Cordoba, for the charettes, and for those talks on everything under the sun.

**Imre**, for your insight, direction and support in this thesis. You are amazing. Without you I would still be struggling. Honest.

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**Mr. Zhan, Xiao He and Mr. Gao**, for being my teachers and gracious hosts in Suzhou. I truly appreciate how much you have given to me.

**David Lung and Uncle Chung Wah Nam**, for sharing with me your expertise on Chinese architecture and gardens.

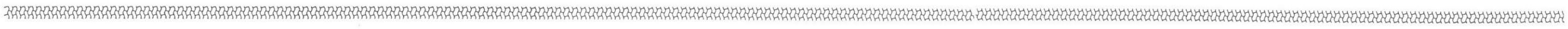
**Sharon**, for the encouraging "rocks" and calls, and for all your help in making the written part a little more coherent.

**Ted**, for believing in me and always being there for me. Thank you for those many late nights, all the E={ dinosaurs, ducks and adams}, Ps, and TLC. Truly I am blessed. ☺

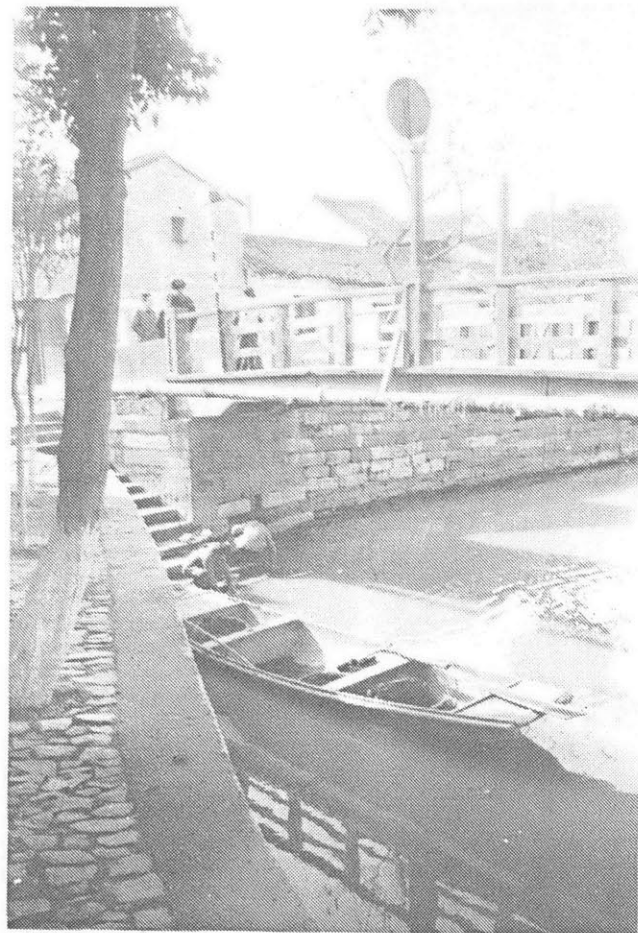


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## INTRODUCTION



*A rainstorm sweeps down on this northern land,  
White breakers leap to the sky.  
No fishing boats off Chinwangtao  
Are seen on the boundless ocean.  
Where are they gone?*

*Nearly two thousand years ago  
Wielding his whip, the Emperor Wu of Wei  
Rode eastward to Chiehshih; his poem survives.  
Today the autumn wind still sighs,  
But the world has changed!*

--Mao Tsetung, 1954

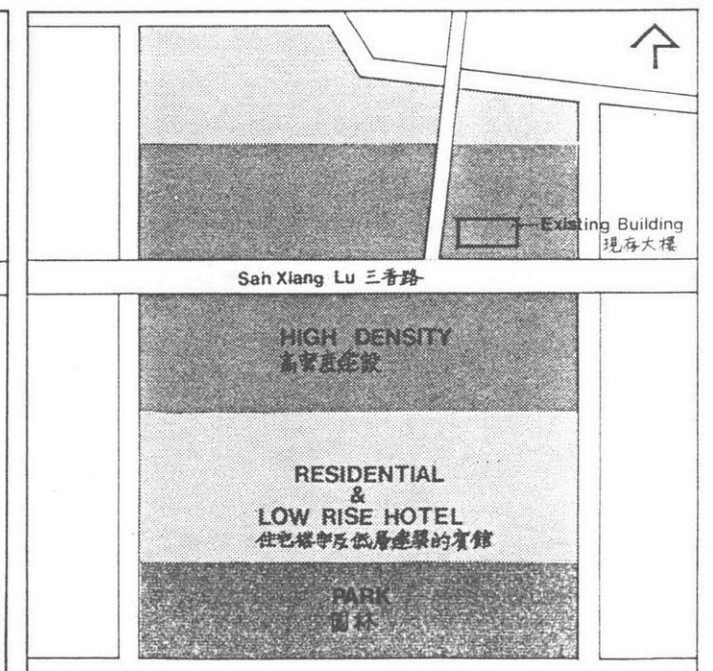
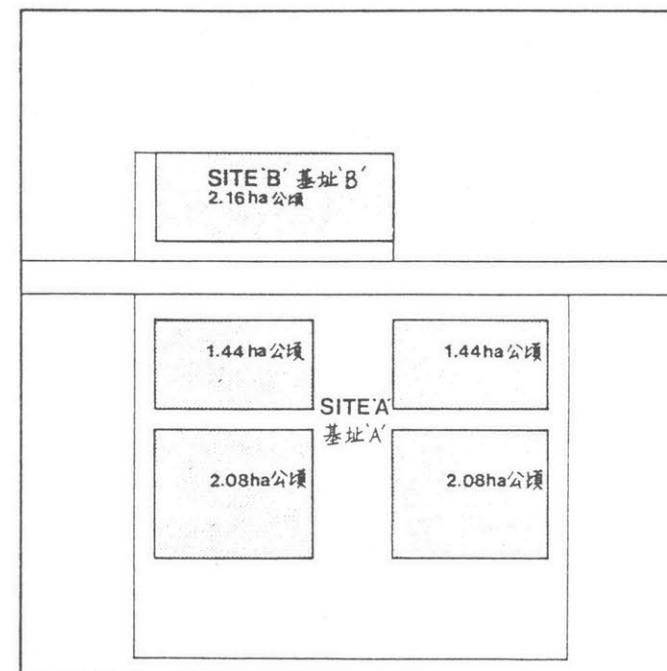
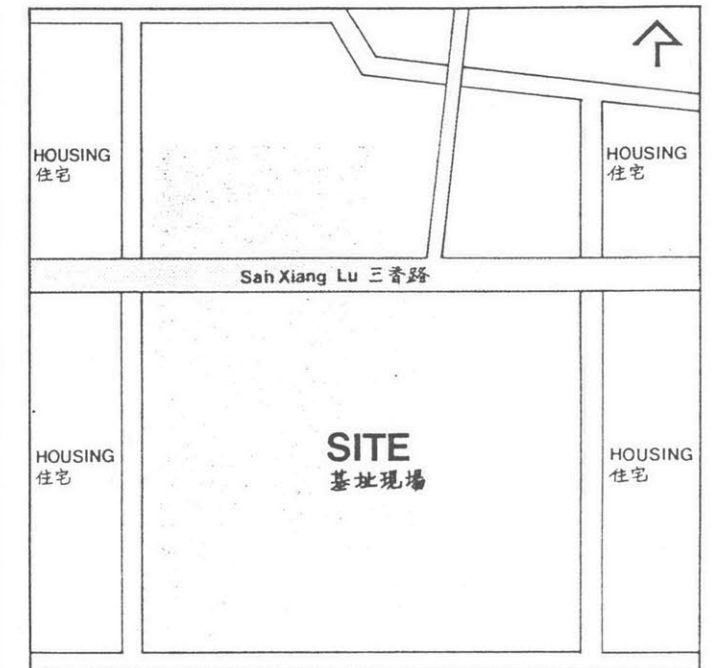
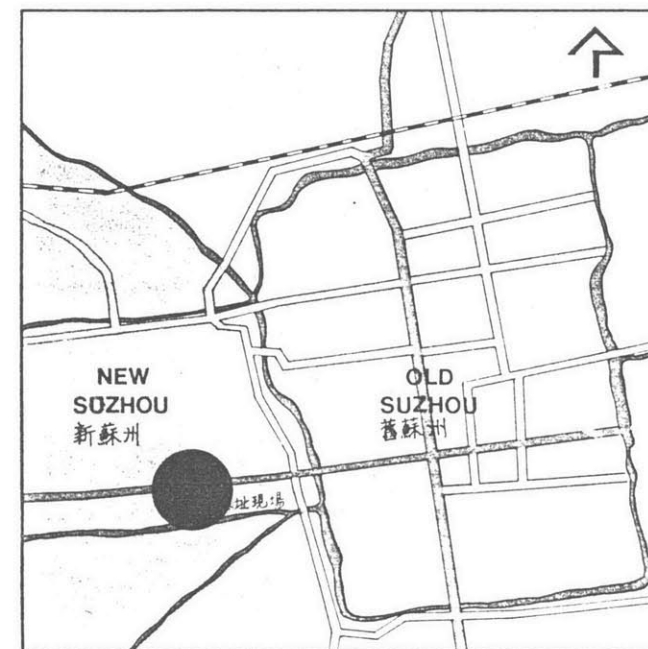
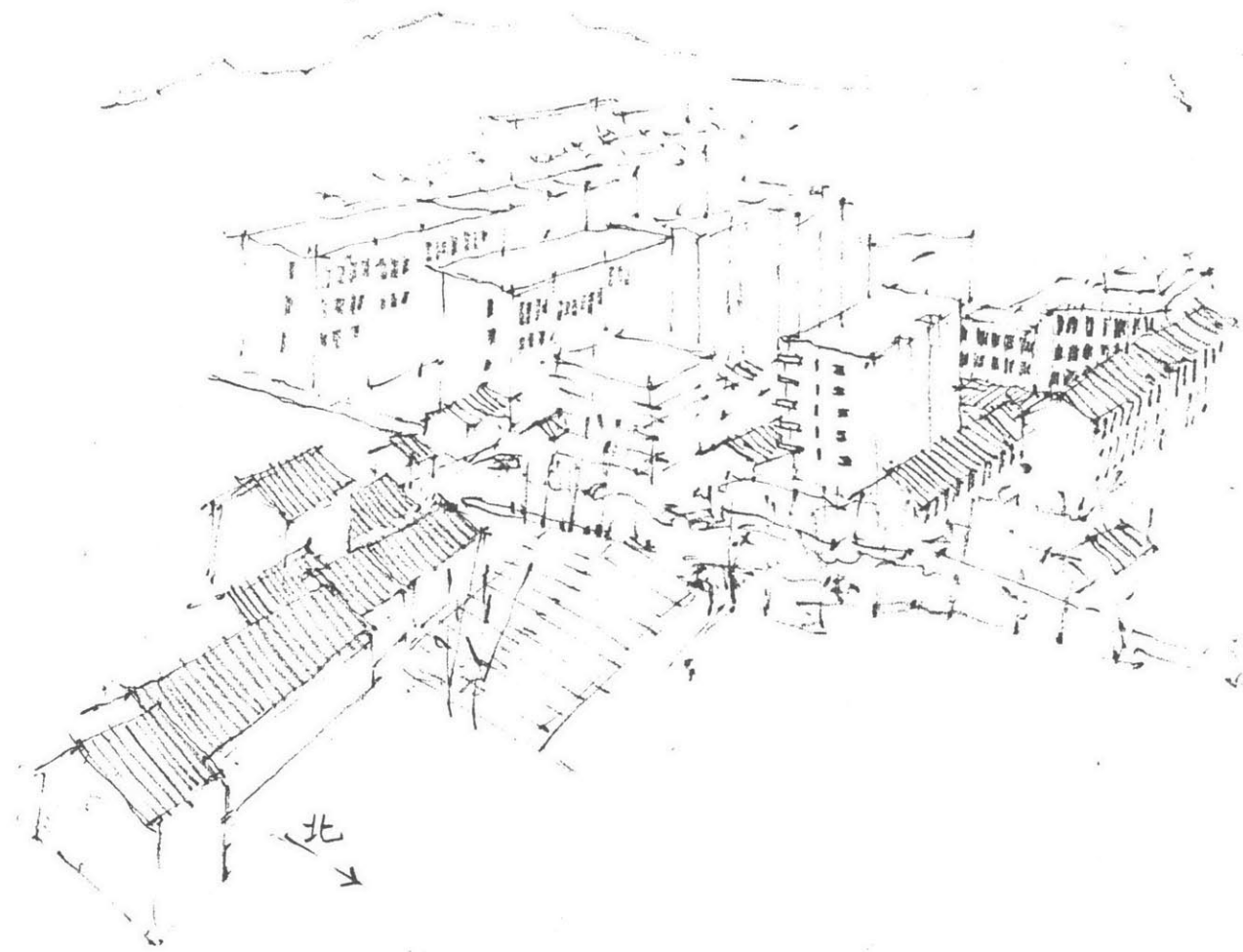
China is a country with a tremendously rich cultural heritage. Her fine arts, crafts, literature, music, dance, developed by the society and philosophy of different eras, have maintained a certain continuity throughout the ages. Architecture, also, is an art deeply rooted in social customs and values, a physical manifestation of a lifestyle and culture.

With the Revolution and then the surge in economic growth, China has found herself in need of new buildings, modern buildings with complex programmes or high densities. How will new building types, western amenities and building operations affect the evolution of Chinese architecture?

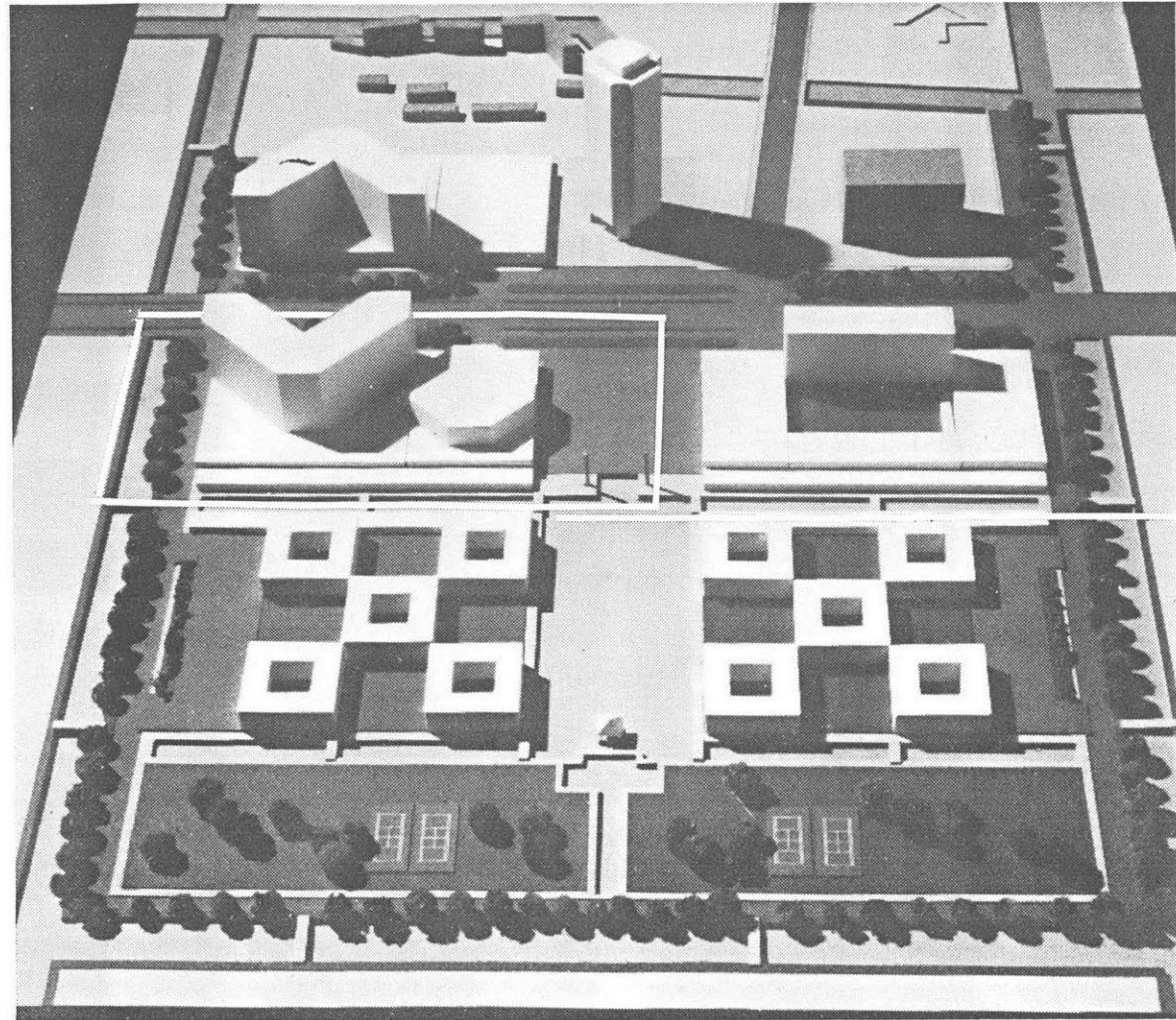
The result has been varied. Some buildings are essentially "western" with adaptations inherent to the Chinese sensibilities; buildings such as the housing units all over New Suzhou. These are concrete blocks, six or more stories high, single loaded, facing south for the sun and the *qi*, and shifted in alignment, thus not encouraging the bad spirits. Other buildings, public buildings such as cultural centres or department stores, are "western" with Chinese motifs, found in roof forms and decorations. Then there have been courageous attempts at using traditional spatial organizations and experiences. For example, I.M. Pei uses the courtyard as organizing element in his Fragrant Peace Hotel in Beijing, and adopts the Chinese garden as theme. Perhaps this building has come the closest to linking the present with the past in Chinese architecture.

However, is it possible to start with a traditional building type, and transform it sensibly to fulfill a different function? To take one building or building type, understand its system of organization and the sequence of experiences, and then multiply and alter according to the needs of a new programme seems to be an alternate approach to design. This is my thesis.

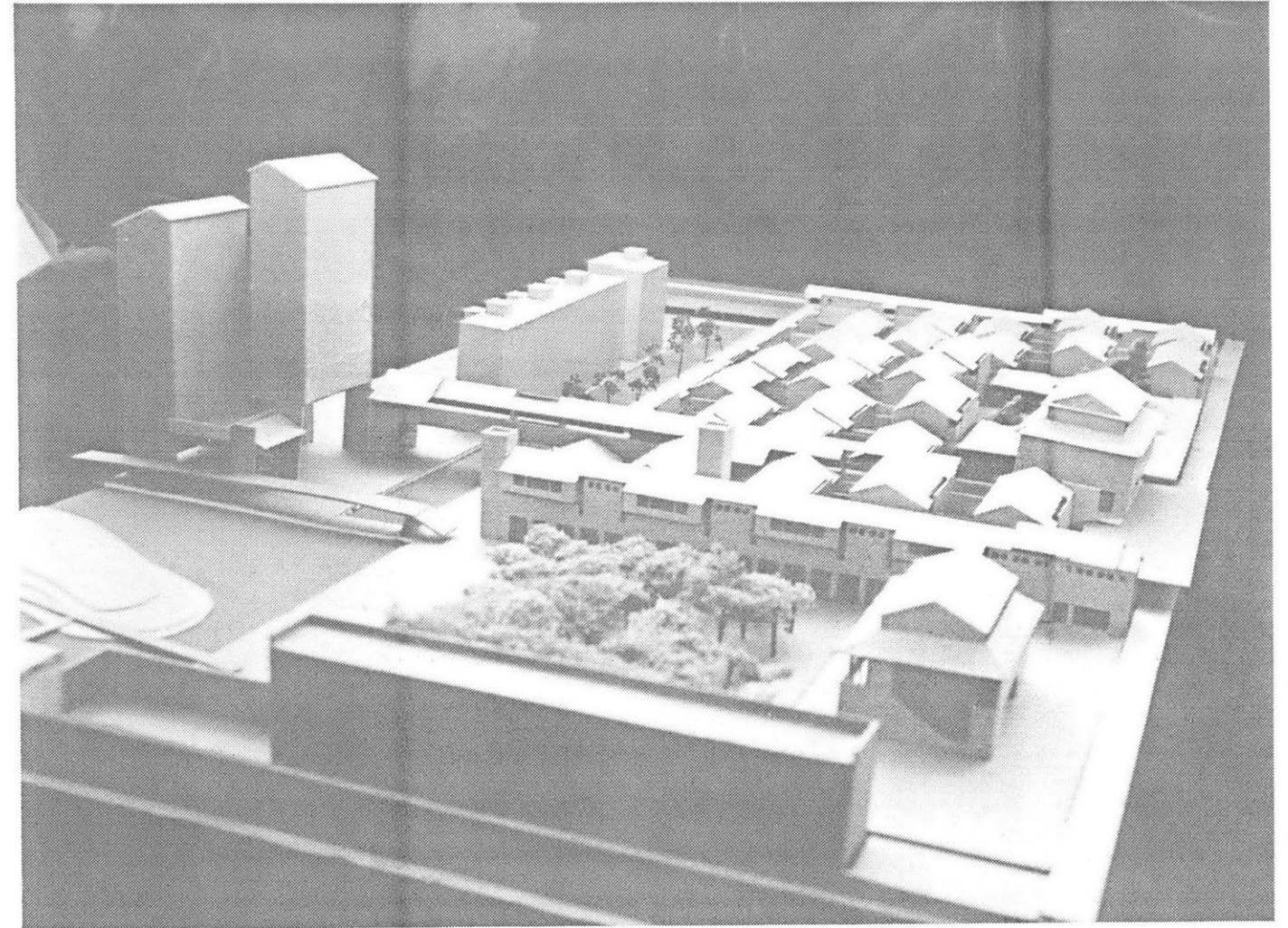
THE SITE







## TRANSFORMATIONS

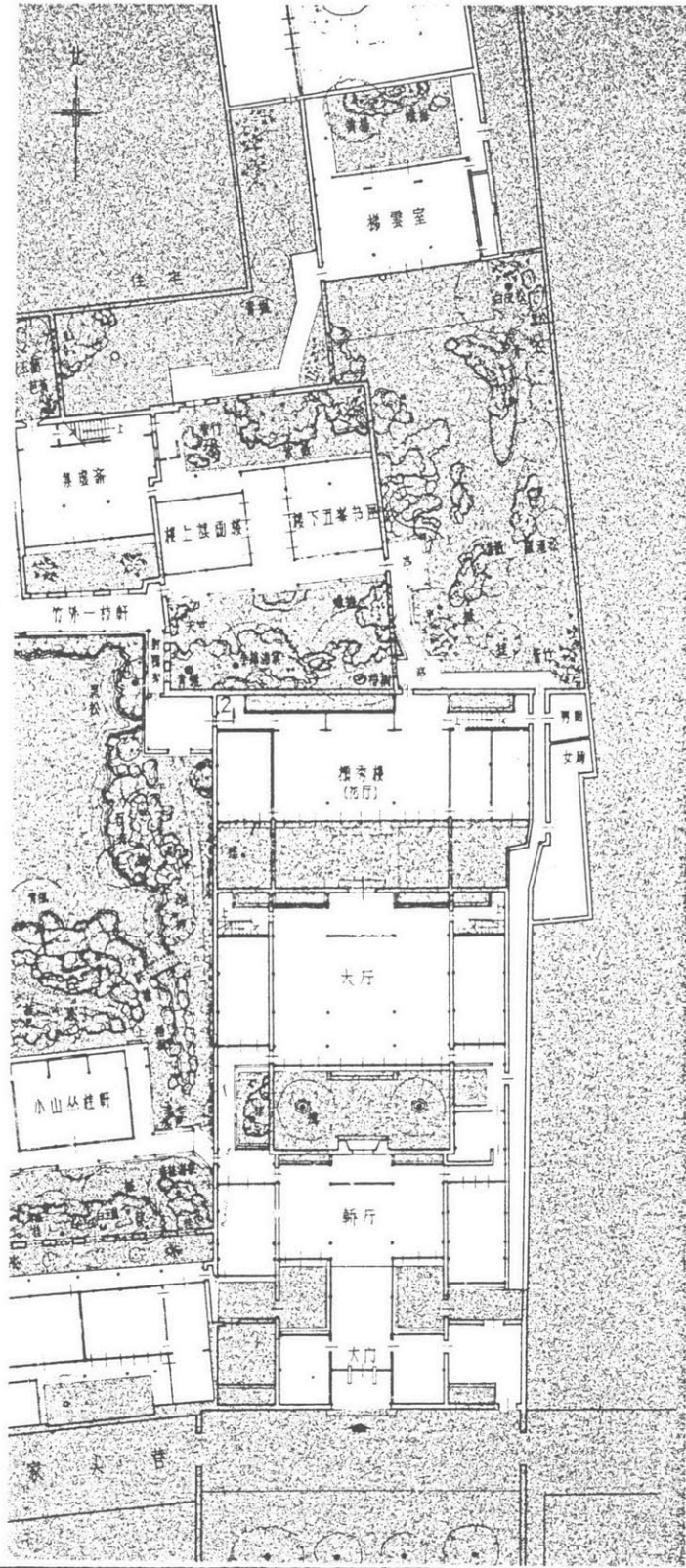


P&T Architects, a firm practising in Hong Kong, was commissioned to design a five hundred room hotel in New Suzhou, and also the masterplan for the area. An office tower and another hotel have been designed by local architects in accordance with the masterplan and are close to completion, but the hotel proposed by P&T has not yet been built. I have adopted the site and the programme of this hotel for the design project fairly exactly, but have taken slight liberties with the masterplan.

The exploration starts in Old Suzhou, in the streets, gardens and temples, in search of revelation. What was found were common themes, recurring in homes and markets and gardens. Then, with a notebook full of chicken-scratch and a real life programme, the exasperation starts. (The details are recorded in the appendix.) Through this process, what was learned was that transformation needs to be *of the traditional within* the themes, that is, using the themes as design constraints; it is much harder to introduce the themes to a foreign notion.

*In the transformation and growth of all things, every bud and feature has its proper form. In this we have their gradual maturing and decay, the constant flow of transformation and change.*

(Chuang Tzu, chpt .13)



## HARMONY

Man's physical environment is seen as part of a larger system of cosmology, a result of the interaction of spiritual forces. Harmony with the surroundings is evident in traditional architecture and planning, buildings interacting as to intensify the qualities of the landscape. Principles of *feng shui* determine siting, orientation, building form, even furniture layout; yet it is the principle of opposites that brings about harmony through the built vocabulary.

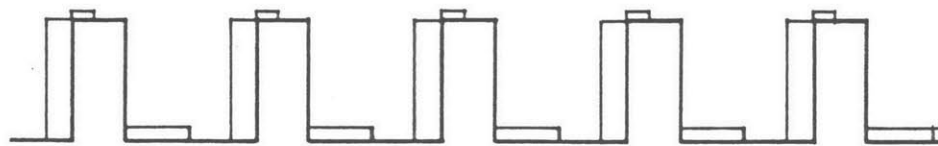
Completion is achieved when Yin and Yang coexist. Built and Unbuilt, Light and Dark, Wall and Roof, Round and Square...

Coexistence occurs, but without compromise. The building part of the complex is very ordered, densely packed and "built"; the garden part is intensely landscaped to give a sense of natural disorder. Their boundary is an abrupt edge and not a zone: there is no continuity of space making the transition. Reversal does occur, however (there is always a little Yin in the Yang): pavilions are scattered in the gardens and trees planted in the courtyards.

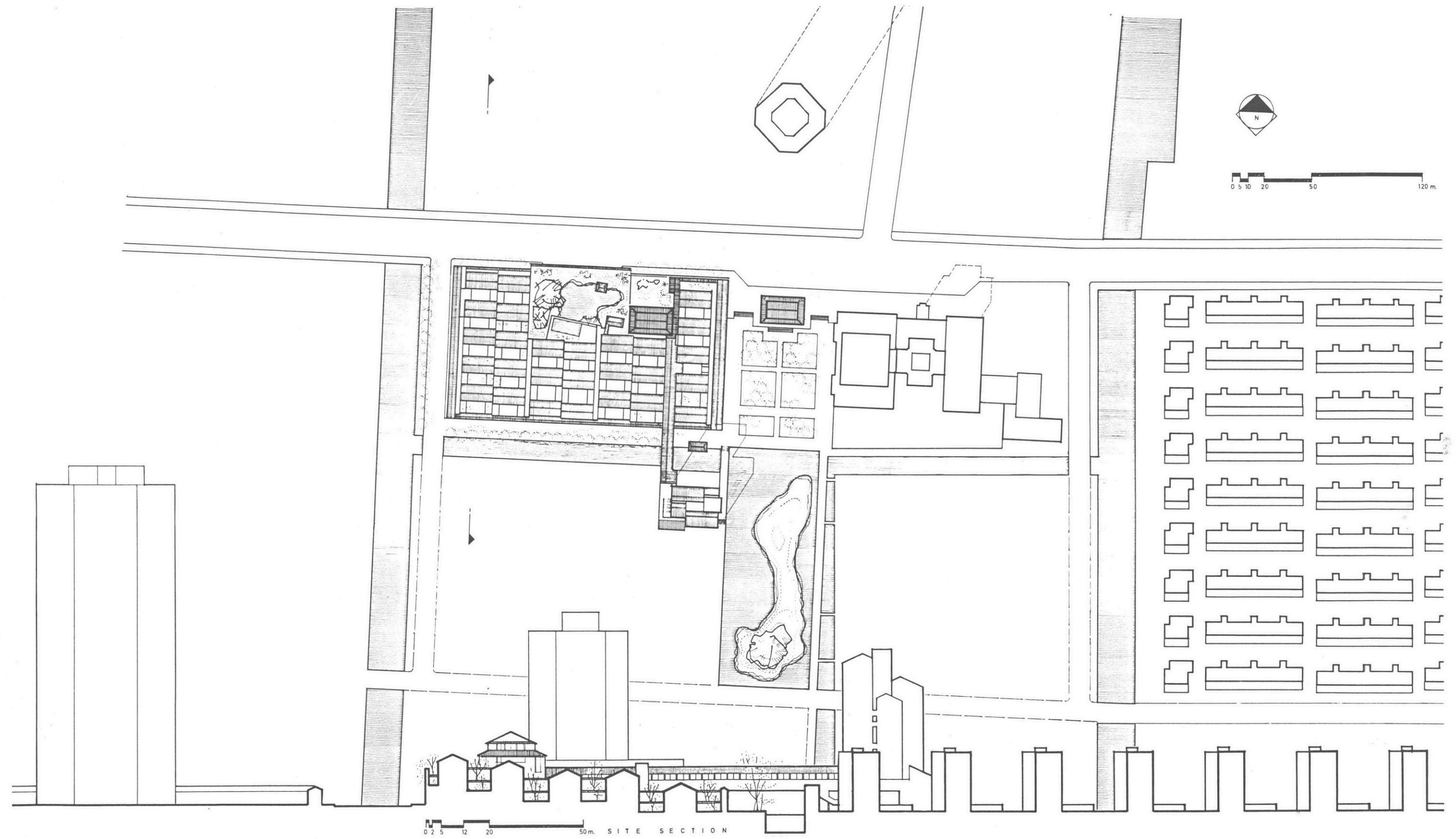
Similarly, a complex is contained within itself, discontinuous with the context in terms of perception yet responding to it in terms of use and form. Walls provide that separation between public and private, or private and private.

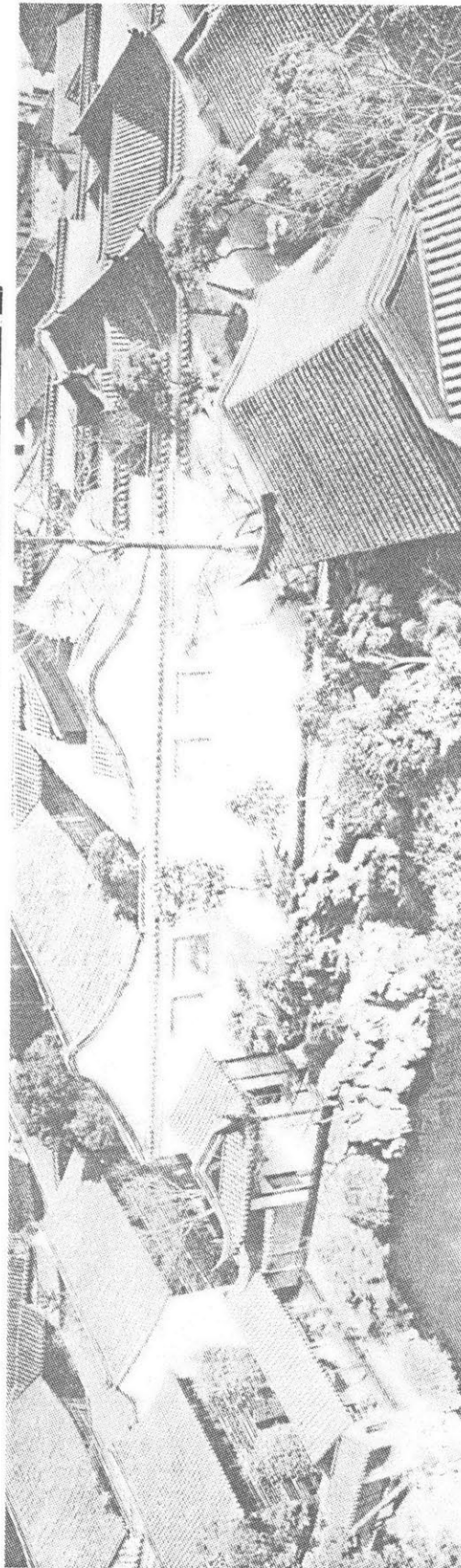
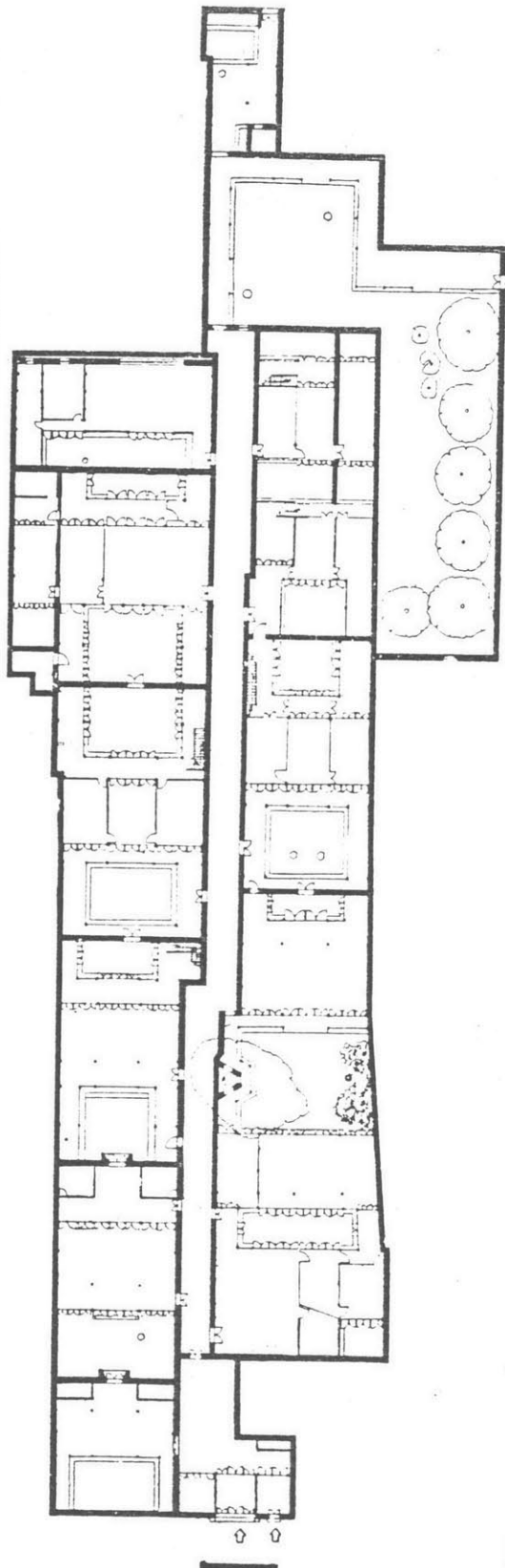
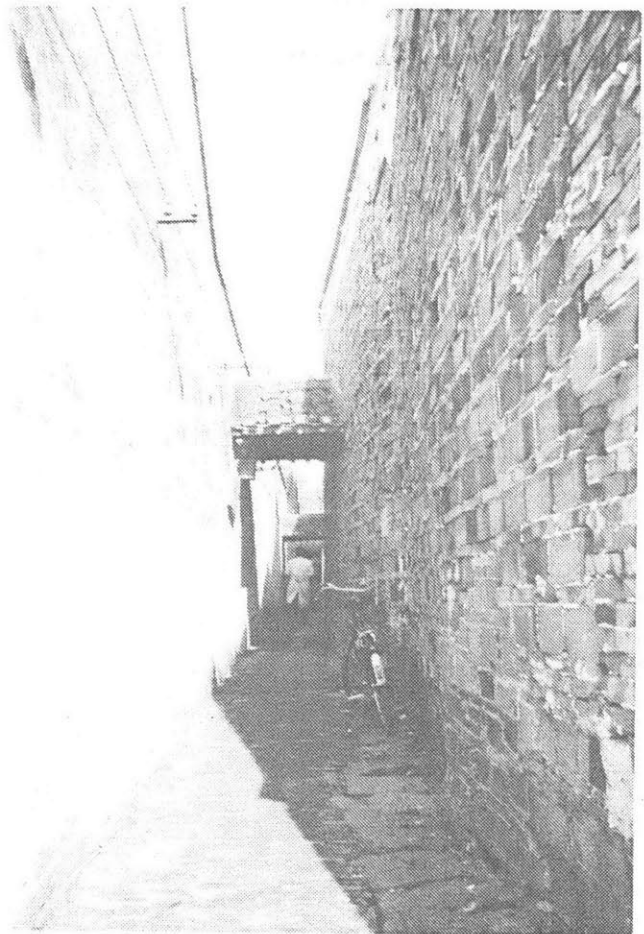
To carry this principle further, a complex could be both traditional and western in terms of quality of space and organization, as long as the different parts are distinct yet interact. This discovery was a great relief, since it was soon realized that some functions, such as parking or huge service areas, are more reasonably accommodated in less traditional structures.

The design project indeed contains both western and traditional type spaces. The main entrance, lobby, and services form the western part, a "mountain" on which the more traditional room units sit. A high-rise, containing the remainder of the room units, is the displaced part of the western, and is also a counterpoint to the horizontal nature of the project. The entire project is contained by walls transformed to become commercial spaces, but a pavilion (the local Chinese restaurant) appears in the plaza.



As yin and yang unite, all things are complete in heaven and earth. The sky and sun rotate, and the weak and strong interact...  
(Yang Xiung, *Tai Xuan Qing*, chpt 9)





## FIRST MOVE

△ The urban fabric of Suzhou is composed of systems of walls and timber framing. Interior spaces and courtyards are defined by a combination of both.

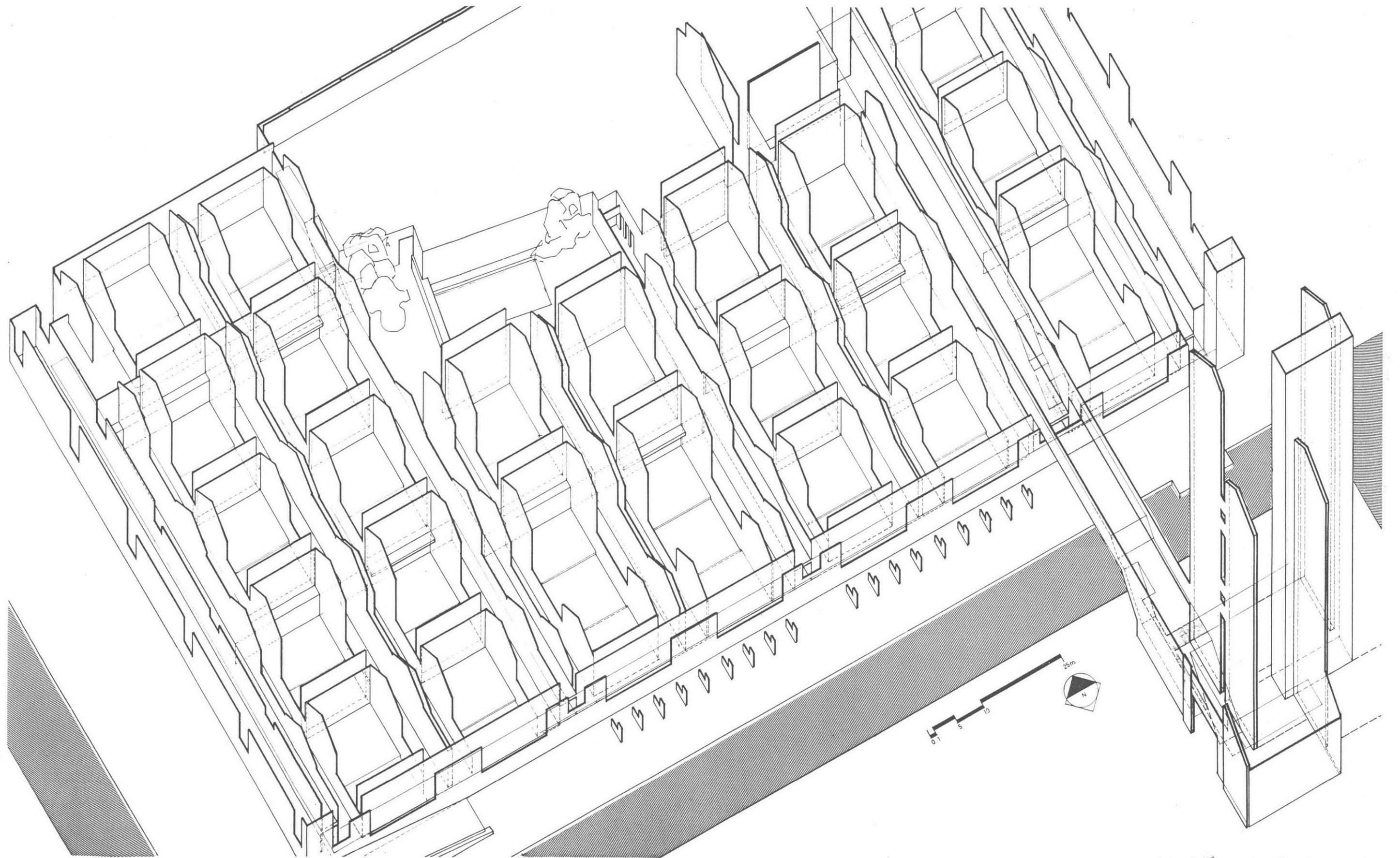
However, the walls have a greater importance in the creation of space: the wall system has the first move, and the framing system is secondary to it.

The walls are predominantly continuous and in the north-south direction (thus forming a directional field). Spaces therefore tend to relate in a linear manner, more or less so being dependent on the density of the field. The walls are often distanced one building dimension apart, in which case the spaces alternate between building and courtyard in a linear sequence, with only the minimal connections against the field in an east-west direction.

The walls are continuous planes: they do not fold or change directions. This causes territorial boundaries to be abrupt and movement to be well defined. Within the building complex, however, the planar character of the walls is not sensed because the articulation of openings within the wall transforms the system of walls to become a system of screens. One's visual focus never rests on the wall but is drawn to the layer behind, giving an incredible depth of perception.

Within a traditional urban block, two complexes are separated by a service access. Here the planar and continuous quality of the walls can truly be sensed, and is indeed accentuated by the close distance between the walls. These access spaces are real corridors, severe and claustrophobic in a way, yet also exhilarating in the extreme sense of movement and the ability to realize a longer dimension, the full length of the walls.

Therefore the first move in the design project is the establishment of a field of walls in the north-south direction, which is also the direction of the slope of the site. These walls are anchored in the service "mountain", and are contained by a pair of walls on the south side, with the exception of the set that pulls across the canal and becomes the structure for the high rise. The south pair of walls also defines an access which, together with a system of north-south paths, forms an access system that organizes the site.



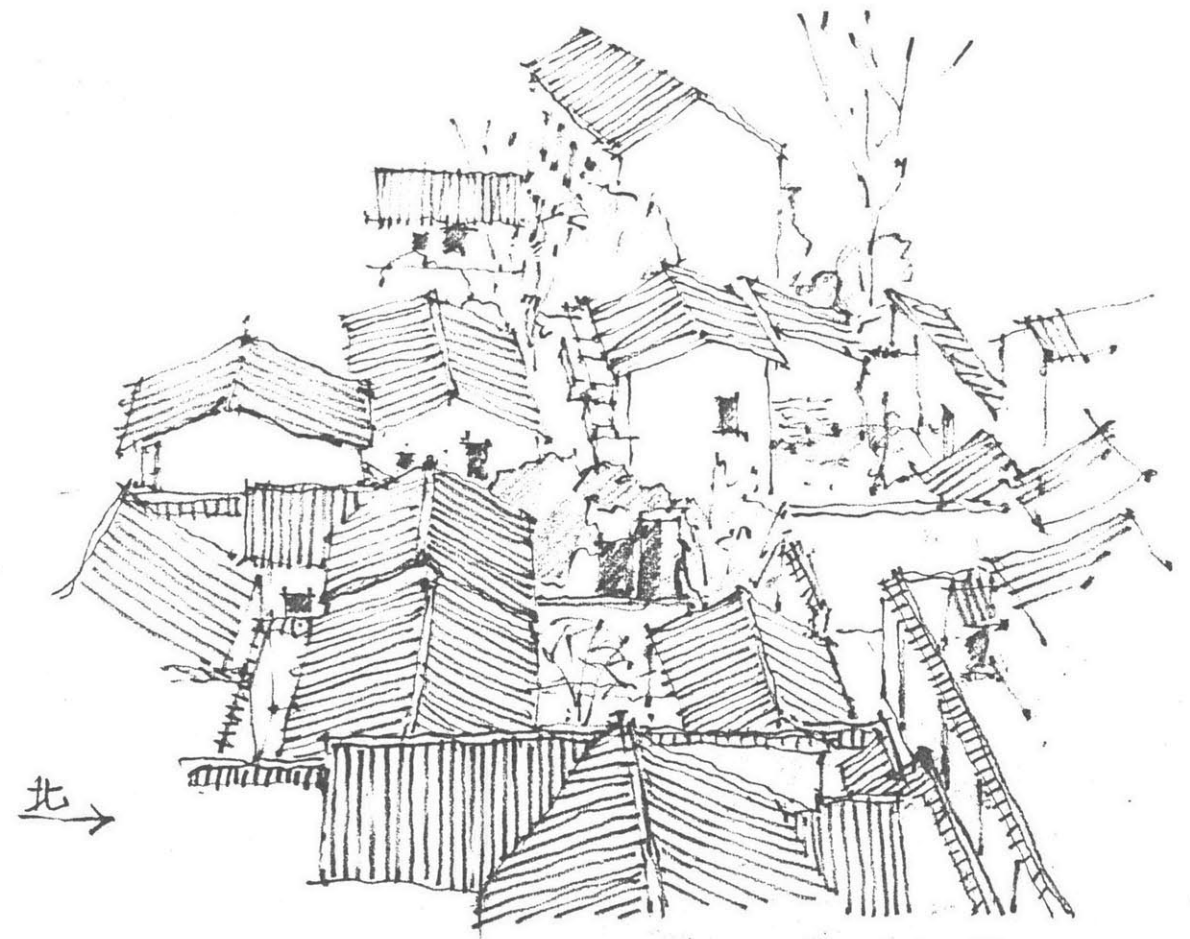
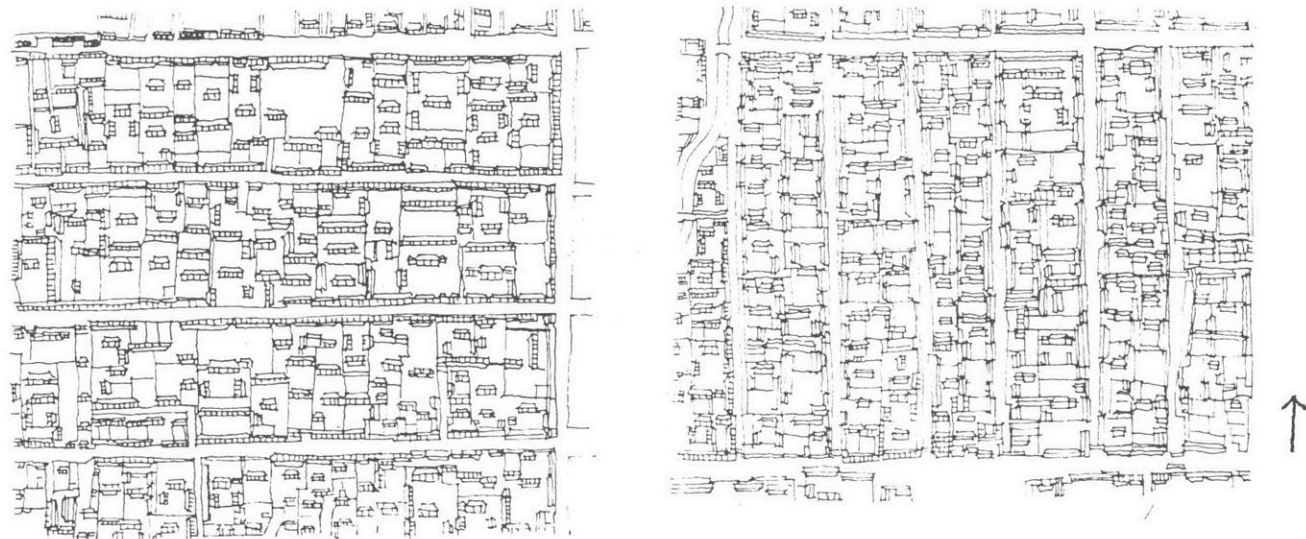


**SECOND MOVE** ~~~~~

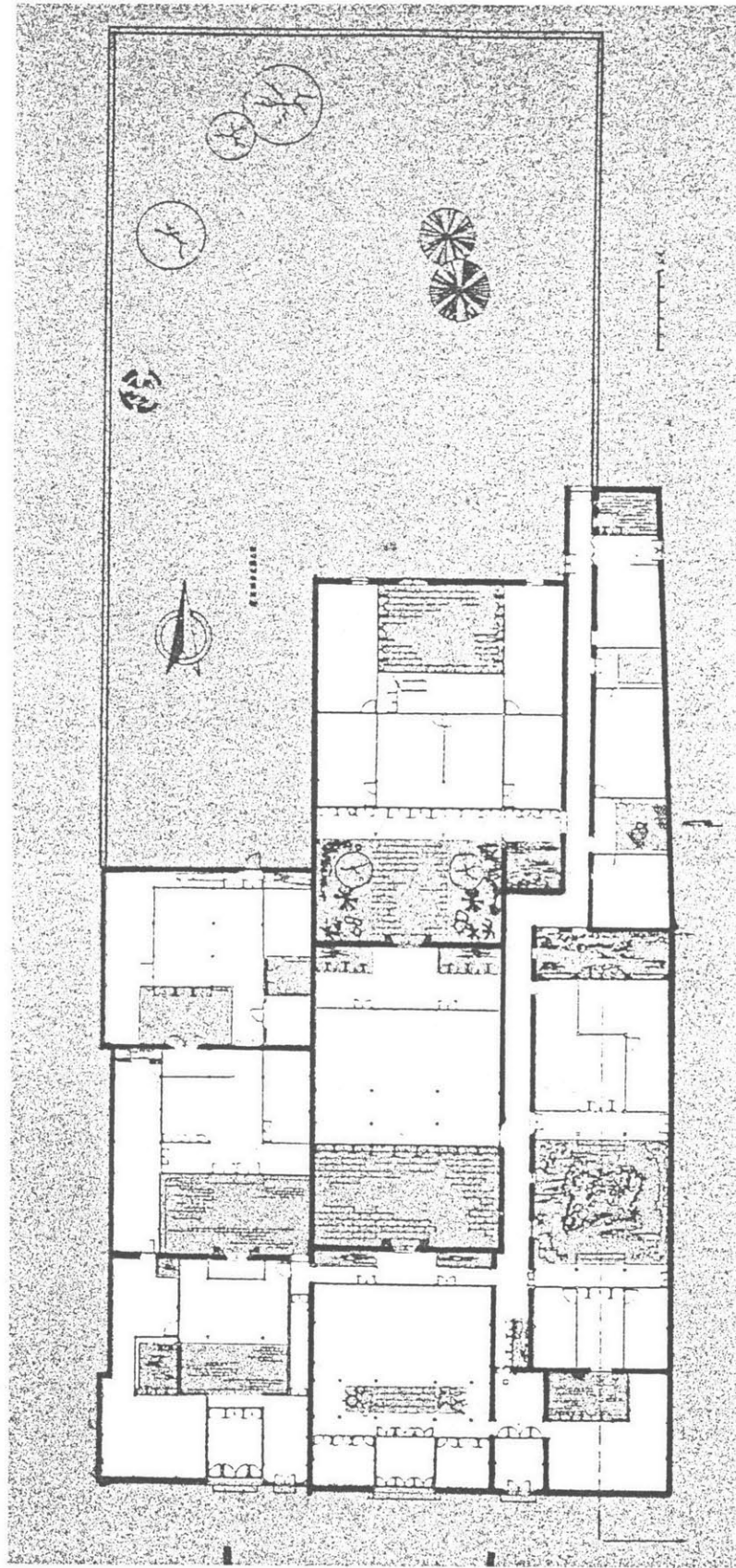
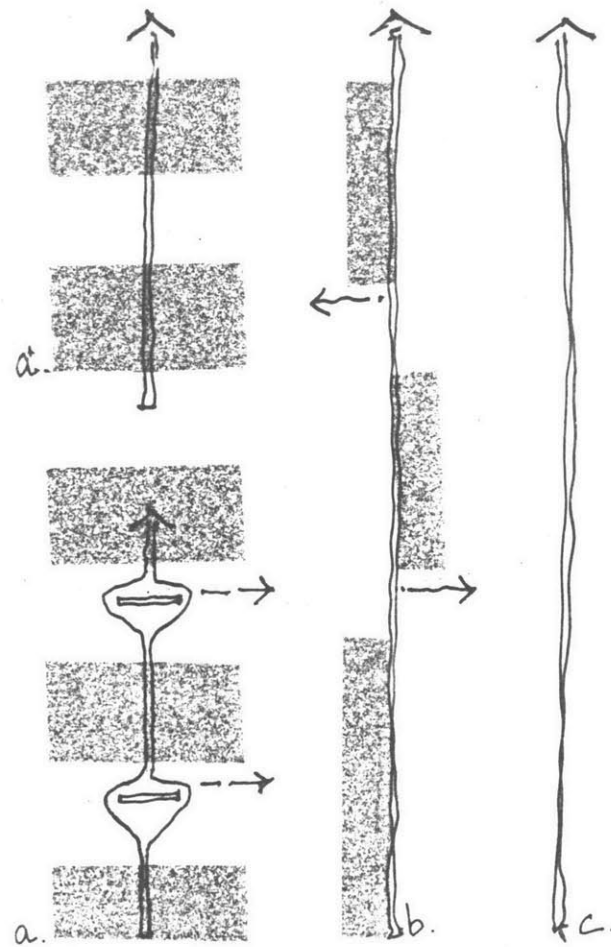
The walls provide the direction, and the pavilions (that is, the framing, roof and infill) act against that direction, defining the place.

The end result is a dense system of buildings and courtyards, the buildings having a maximum of southern exposure and retaining their individual scale since they do not add end on end to give a larger dimension.

In terms of building construction, the framing system is dependent on the walls mainly for stability. If the construction system is transformed so that the framing system could be stabilized within itself, then it would be independent of the walls, and hence result in a tremendous amount of freedom in the articulation of both walls and framing.







## SEQUENCES

As one moves through the site crossing through courtyards and pavilions, one experiences alternations of inside and outside, closed and open, light and dark. Although the path is long, the experience is that of a series of smaller paths, a sequence of events.

Situation (a) generally occurs along the main access of residential complexes. The spirit screens physically break up the distance and better define the spaces. Although one has to move around the screens, the sense of movement in the north-south direction is still the dominant. Because of the meandering journey, one is made aware of the paths which transverse this main access. On occasion (the reception of guests, etc.) the screens are removed, leaving situation (a'). This movement is one of procession and, because there is no change in direction at all, does not acknowledge the other paths normal to it.

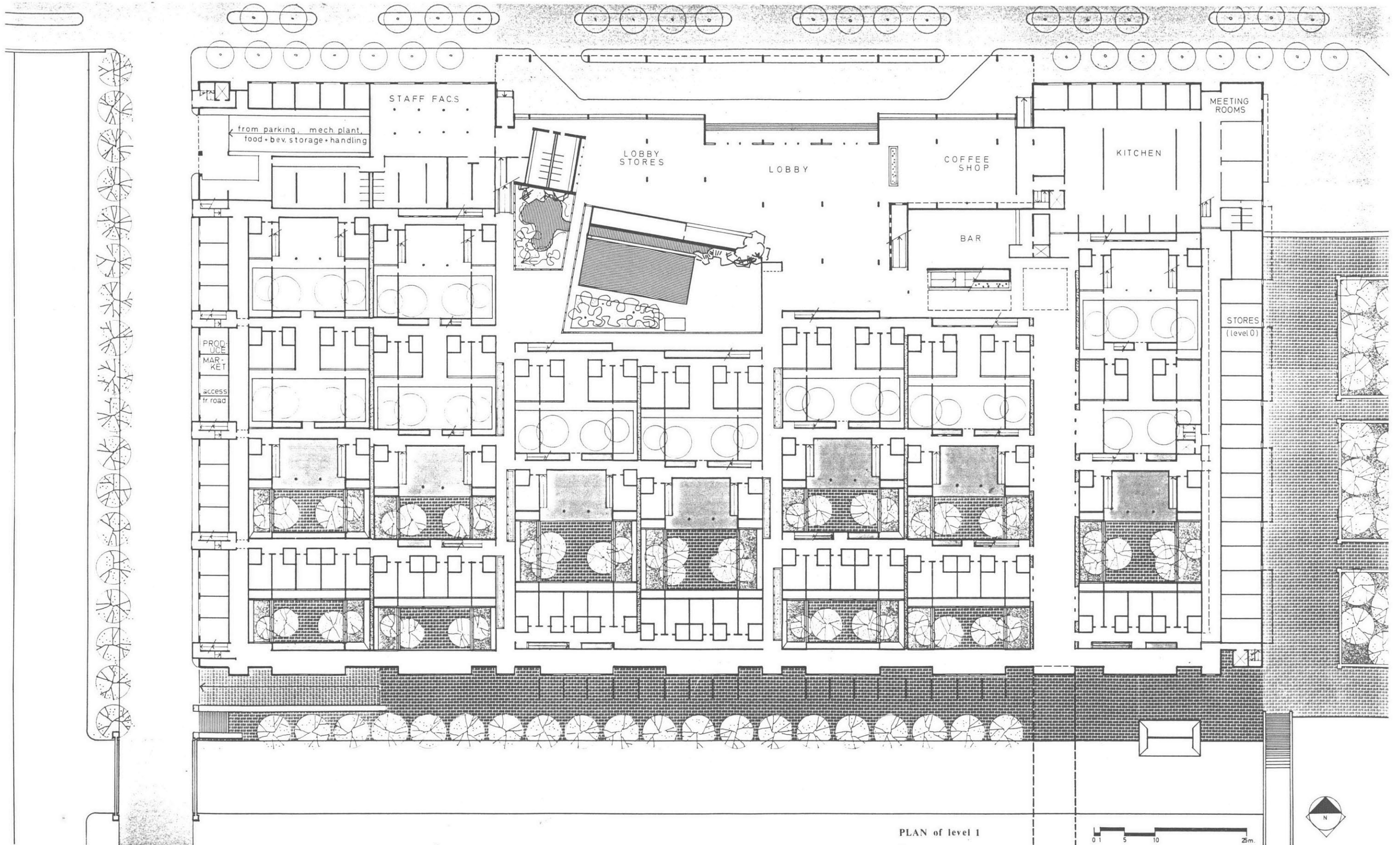
The secondary access experiences another type of alternation (b). Because it bypasses courtyards instead of going through them, the alternation of light is from side to side, either directly from an open space, or from a lightwell, or through a screen in a wall. Often the occurrence of light marks an entry, a place where two paths meet.

Not all paths have alternations of light (c), but have other means of demarking distance through subdividing the path. Walls that form alleys, for example, often have a series of openings, an alternation of solid and void.

The project utilizes transformations within all three sequences. With the movement through the courtyards (a), the meandering quality is produced with a level change in place of a spirit screen to separate the courtyards, the stairs up being close to but displaced from the axis. By introducing level changes in the ground plane, by creating a "mountain" as ground, it is no longer a single plane, and therefore cannot be seen as a reference for access. The horizontal reference level, the main level for access into the rooming units, is the first floor, also the entry level from the road. The main access system for the project is therefore one which bypasses the courtyards (b), and uses lightwells to break down the movement and mark the entries into the units. The large circulation, the "spine" that reaches across the canal, predominantly uses the third sequence (c); the understanding of distance and the marking of the entrances is achieved in the articulation of the walls.



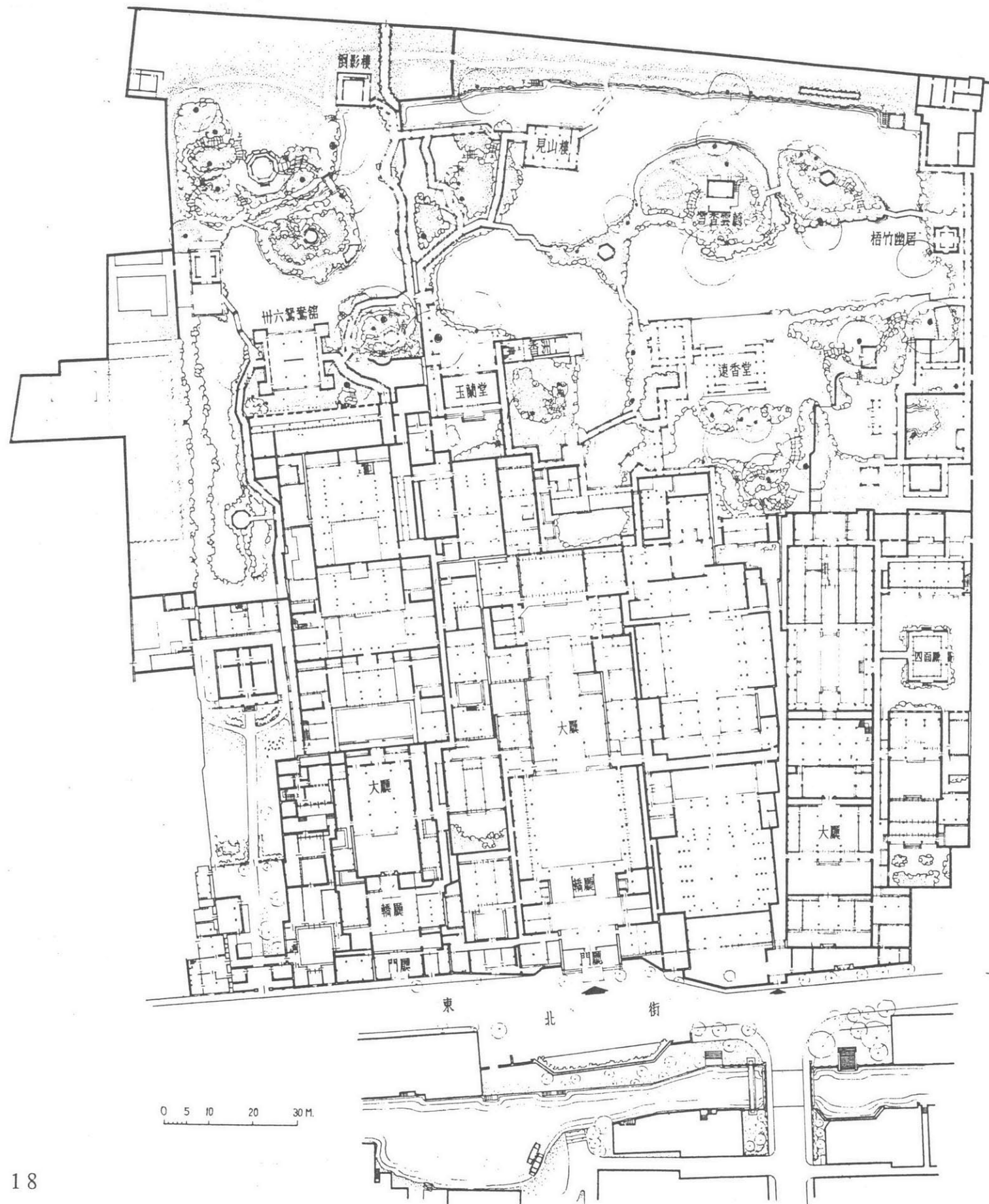




PLAN of level 1

0 1 5 10 25m





新建東園

**DISCOVERY**

The traditional Chinese garden is extremely private, a place of seclusion for meditation. Unlike the western garden, there is no visual connection between the buildings and the garden. While within the built part of the complex, one is unaware of the presence of a garden, so that one stumbles upon it with surprise.

Because the gardens are most often to the north of the complex, they occur as summations of the major direction of movement. The procession is ended, however, not by the garden but by a space within the built, and then, after an obstacle or two, one discovers the garden in its full splendour.

In the hotel project, the main paths are separated from the garden by a level change as obstacle. Because movement is in the same direction (northward and up), it is still part of the same system though is discovered on arrival.

In the case of Wang Shi Yuan where the garden is to the side of the built, one is able to see the garden as one approaches the doorway. However, one's vision is limited by pavilions or by the posts of an arcade so that only after having passed through the doorway can one sense the entire space. This play with tight and open spaces occurs within the garden as well as on entering. The path is one of sequential experiences, each enhanced by their suddenness.

Larger gardens are subdivided by arcaded walkways which are often walled on one side. These act as screens, allowing a restricted sight into another part of the garden. At certain set places, there is the opportunity to look through several of these screens. Although one can't see what is happening in the far part of the garden, the ability to perceive its entire extent when spatially constricted and partly lost is an unexpected event.

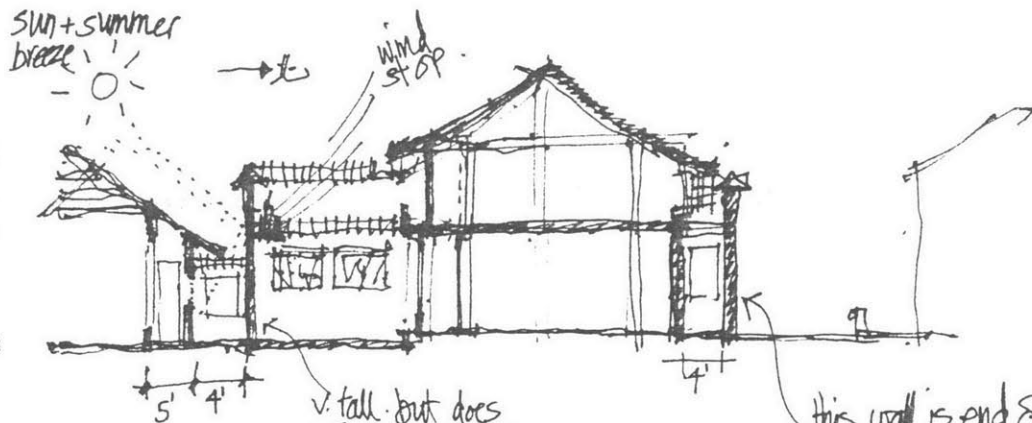
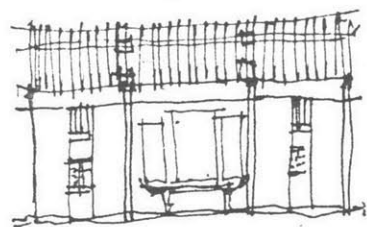
*In order to contrast a thing, one should surely expand it first.  
 In order to weaken, one will surely strengthen first.  
 In order to overthrow, one will surely exalt first.  
 In order to take, one will surely give first.  
 This is called subtle wisdom.*

(Lao Tzu, *Tao Te Ching*, chpt .36)



PLAN of level 2

North walls & bldg  
(E-S facing).

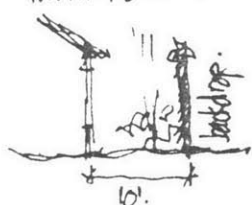


These light-and-vent-wells are quite miserable: damp and mouldy. Are they still relevant today?

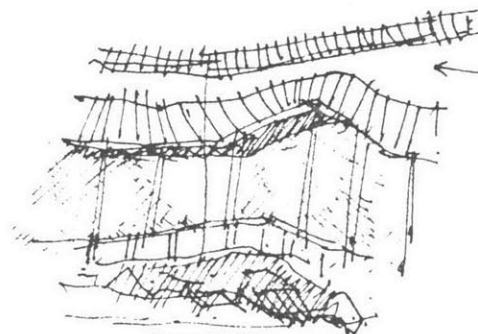
✓ tall but does not extend past width of bld.

this wall is end of ladies' living quarters. Very continuous: no holes except 1 door to NE gdn.

Pavilions work better: 10' ± court.

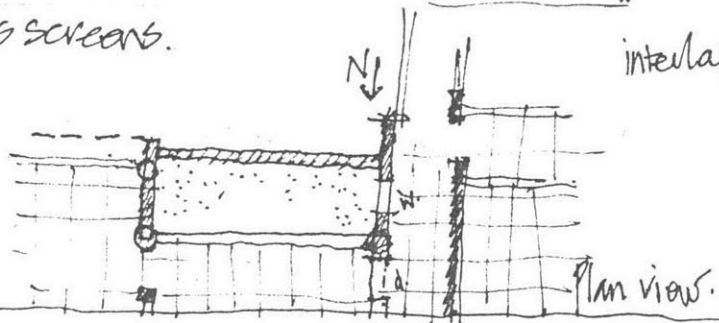
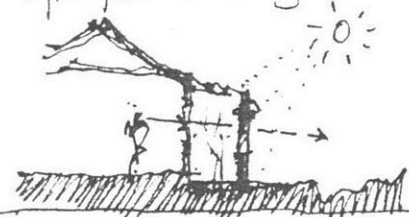


(the other eq. opposite part works: has window, is a screen not wall)



wall higher than walkway: allows light flooding when roof pulls away. Also provides horizontal ref.

- Walls in EW direction make as screens. Often free-standing.



interlap, forward + back.

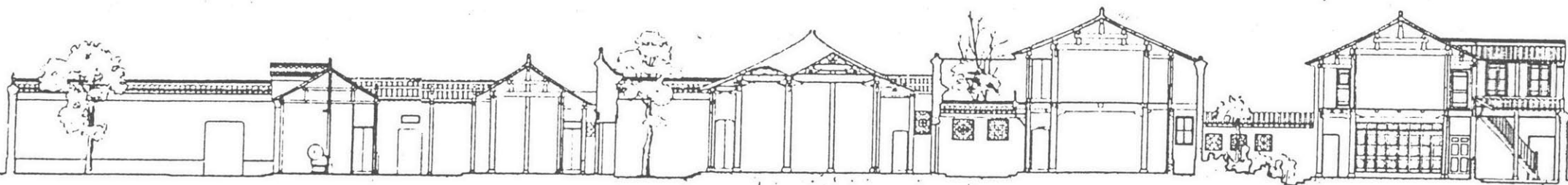
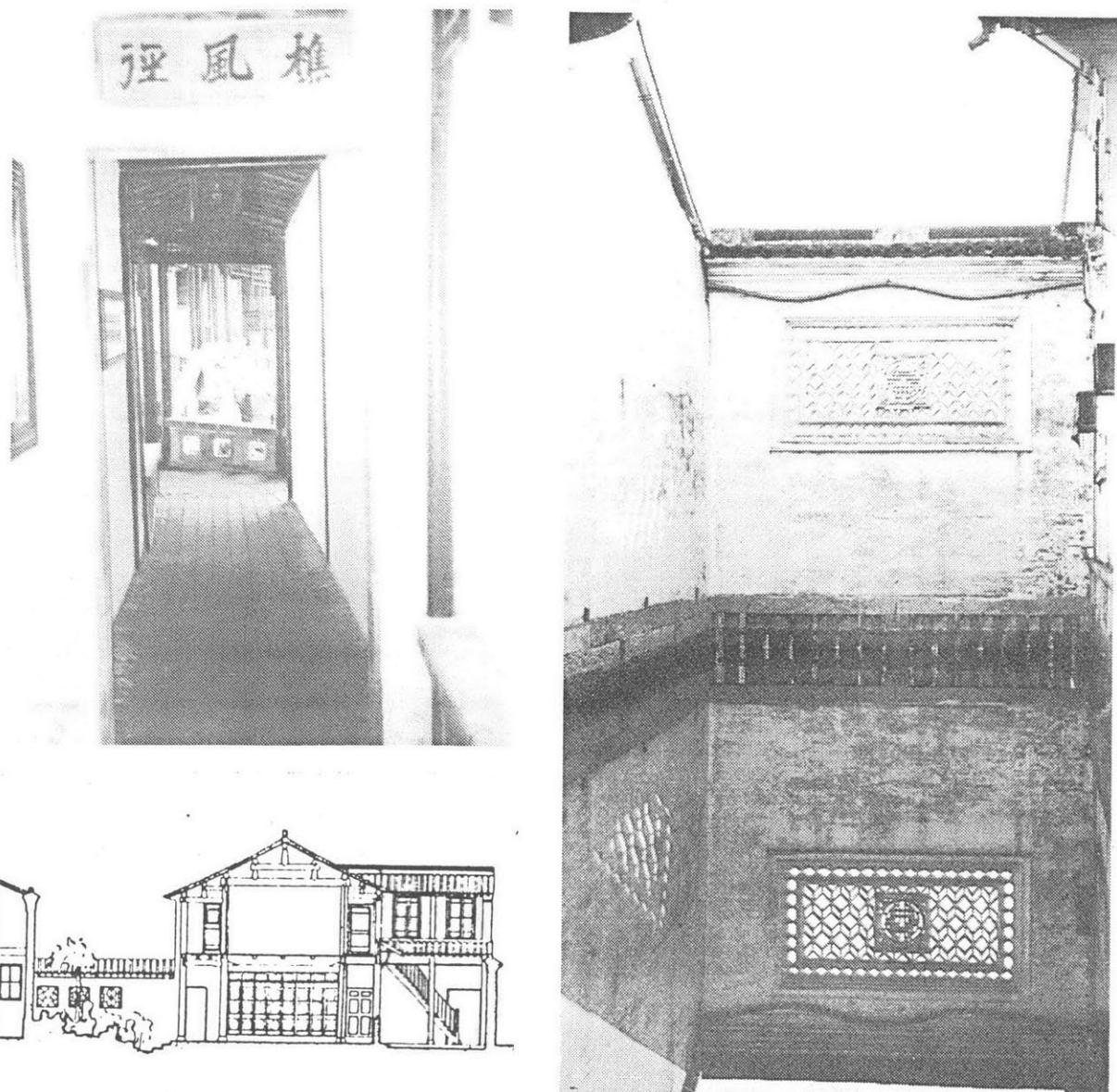
Suzhou Wáng shū Yuán

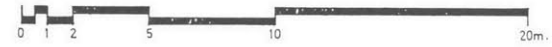
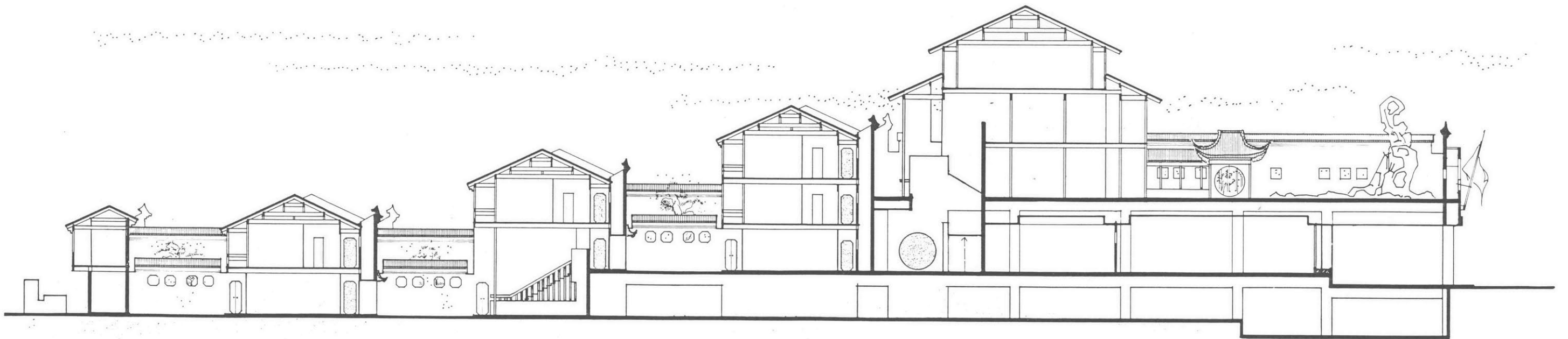
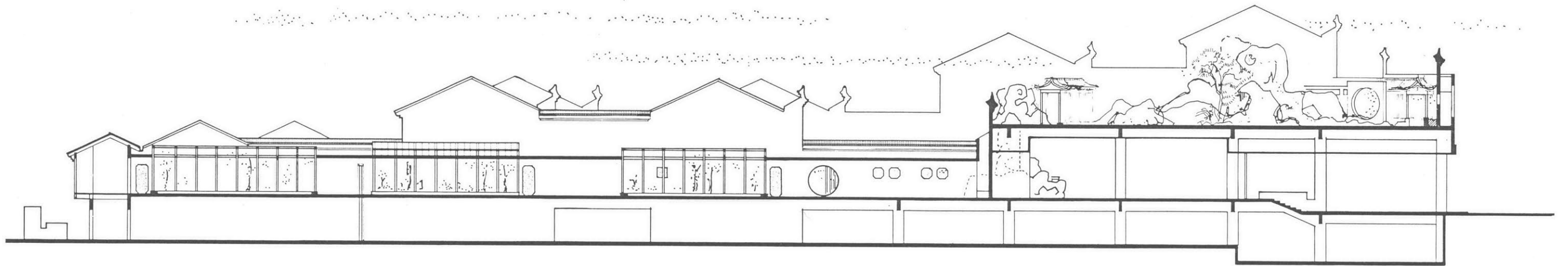
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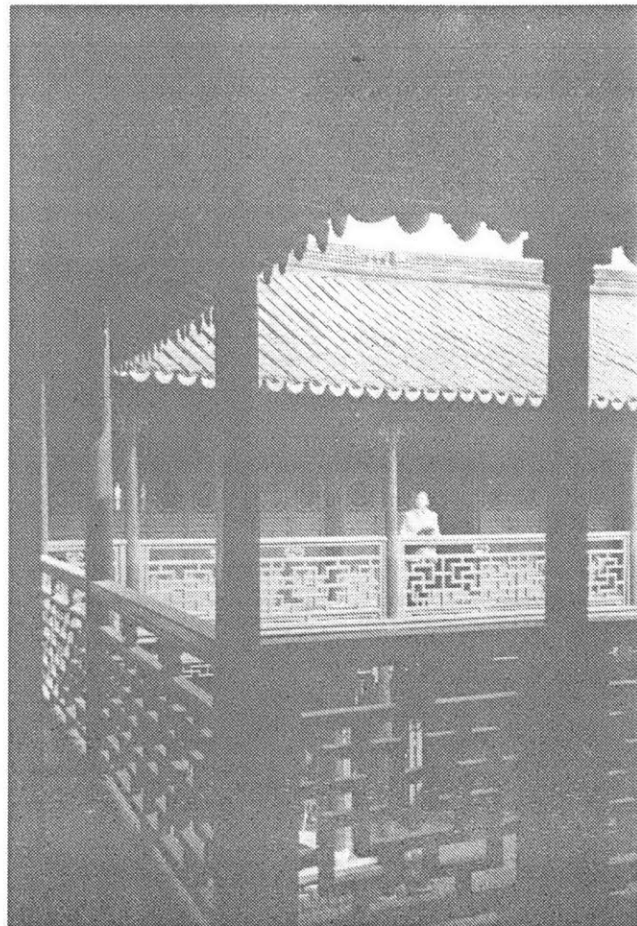
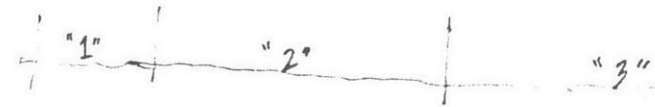
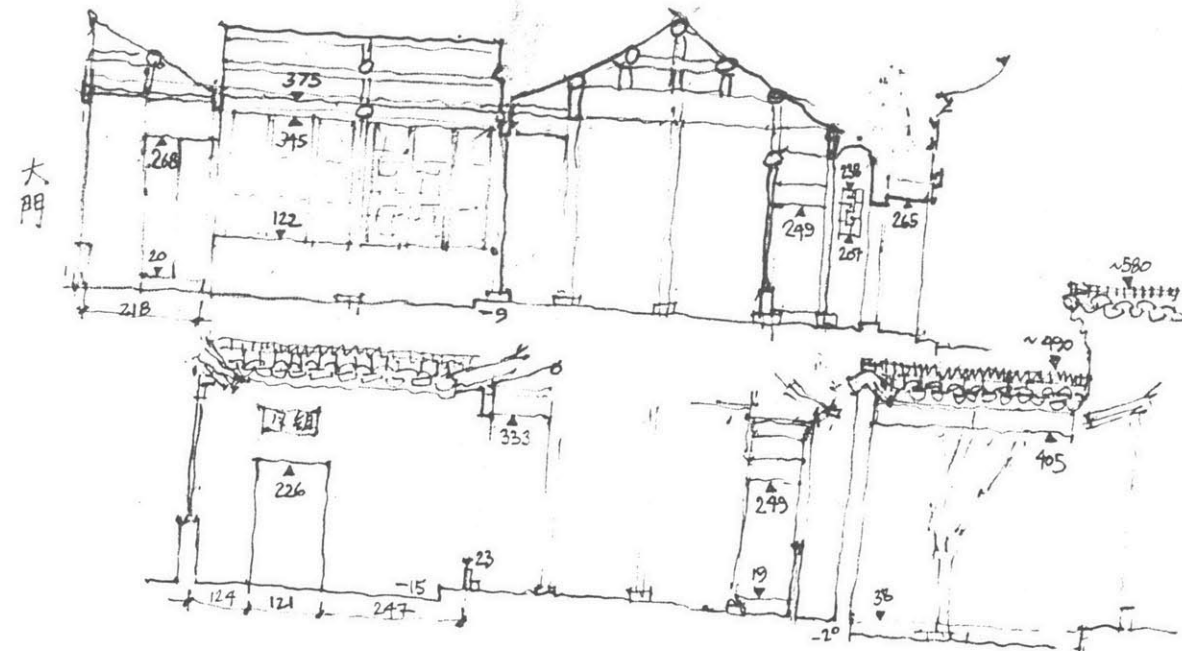
**LIGHT**

One of the many ways light is used in the traditional setting is in the flooding of walls. With the use of light, the plain wall is an aesthetic entity. In the gardens, when the arcaded paths move away from the walls, the light breaks up the flatness of the walls. The north side of buildings are often closed by a pair of walls: the first is a screen looking into the flooded one behind. Therefore the light is the real ending to the space.

Light is also used to direct movement. In the axis of a courtyard system, it is not easy to know which side is the public and which side is the service access without light. Even while having to make the choice of whether to go around the screen to the left or to the right, one has the tendency to turn towards the light.







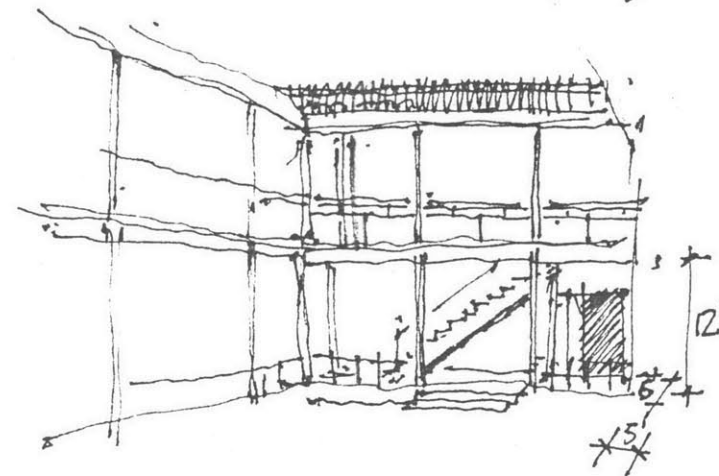
## DIMENSION

Transformations at the unit level are that of use, privacy, and hierarchy of spaces. Dimensions remain much the same as the traditional since scale is related to the quality of a place.

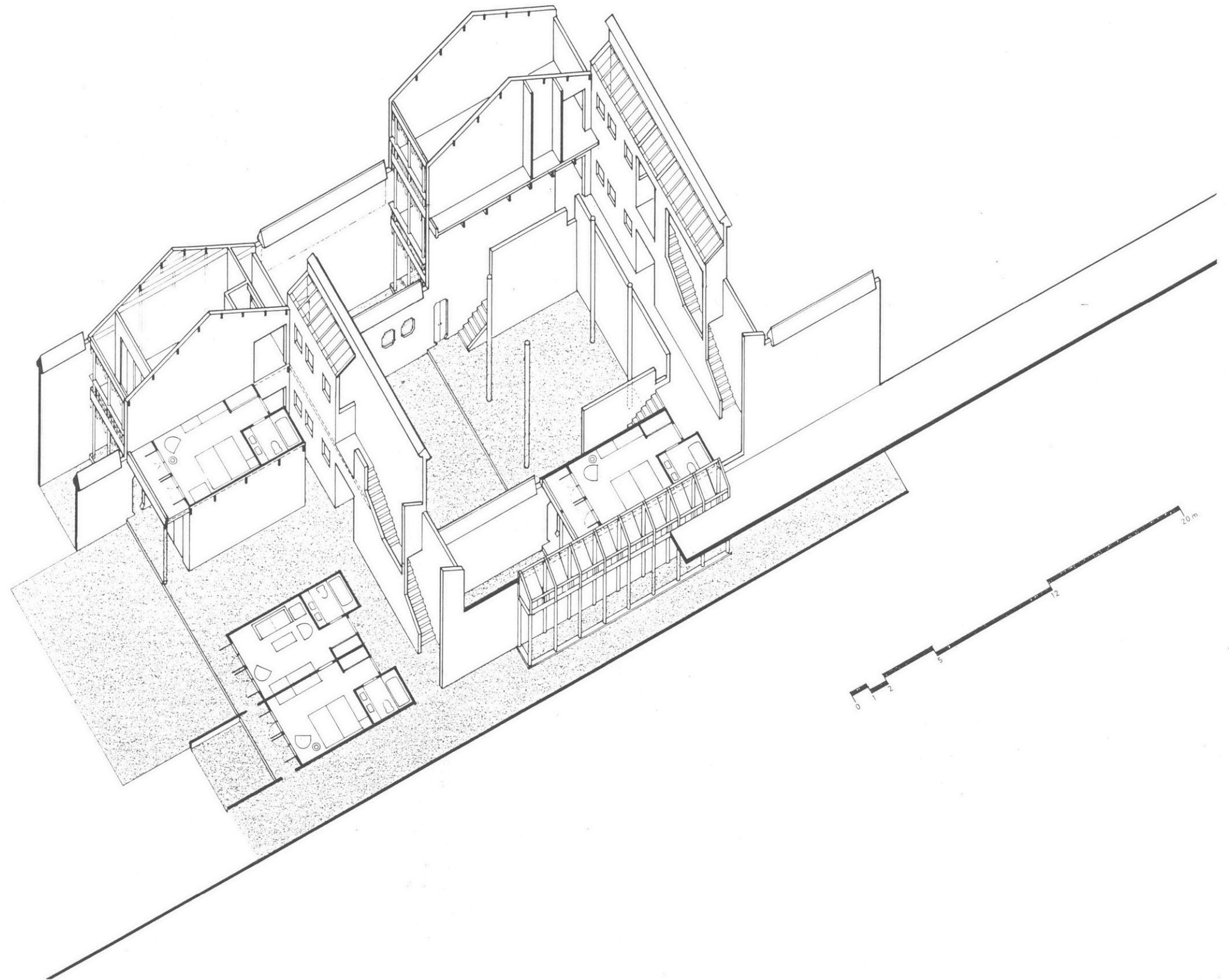
The basic unit of the hotel is an adaption of a unit of Wang Shi Yuan. The most relevant transformation is one of circulation. By moving the major access to the side of the units, the courtyard becomes private to the guests of the units though accessible to others. This also gives each unit and courtyard an equal importance since each have an equal degree of privacy.

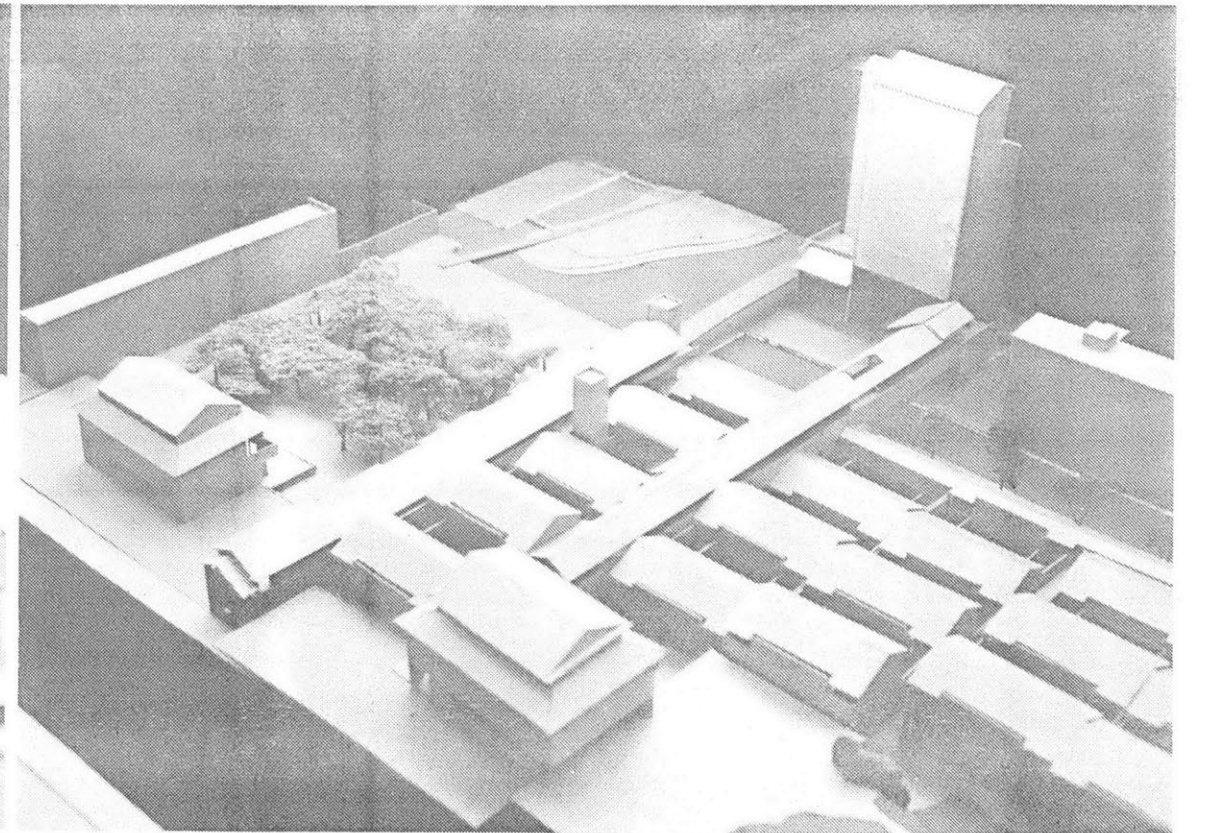
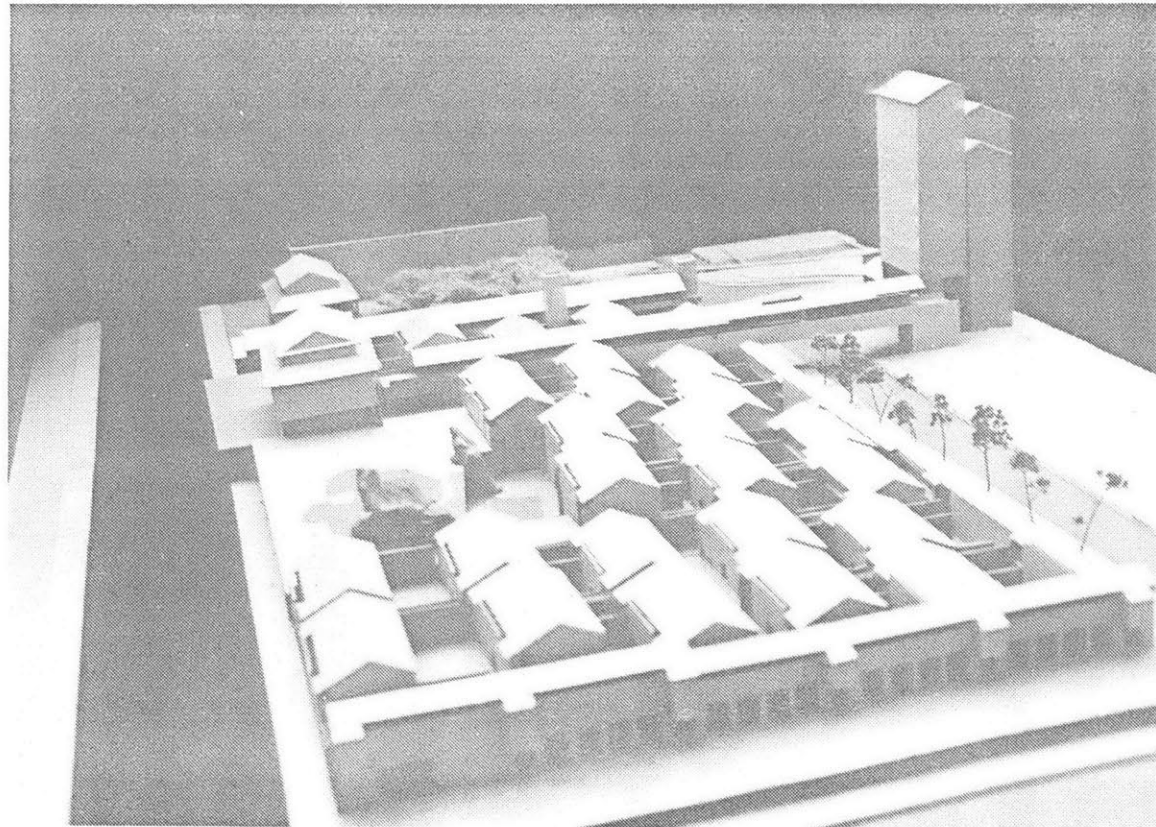
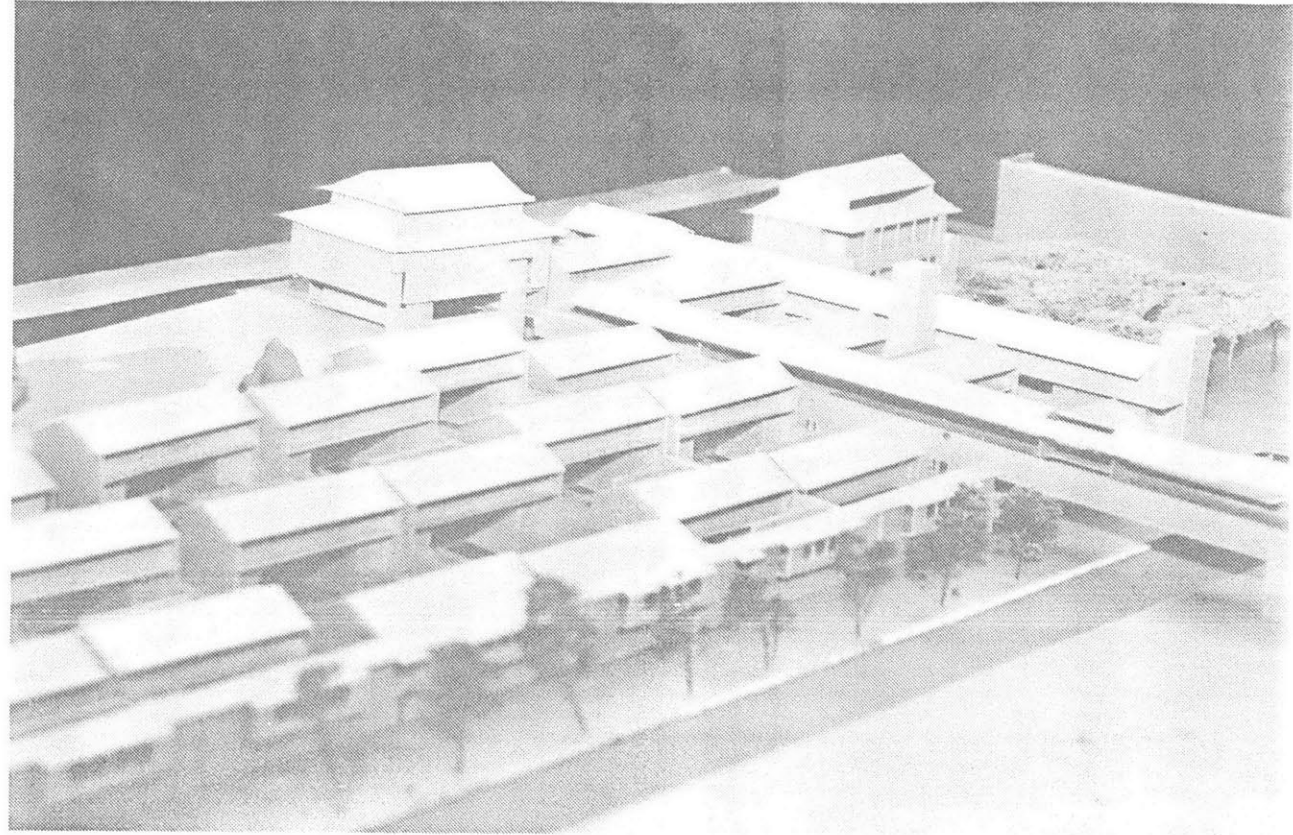
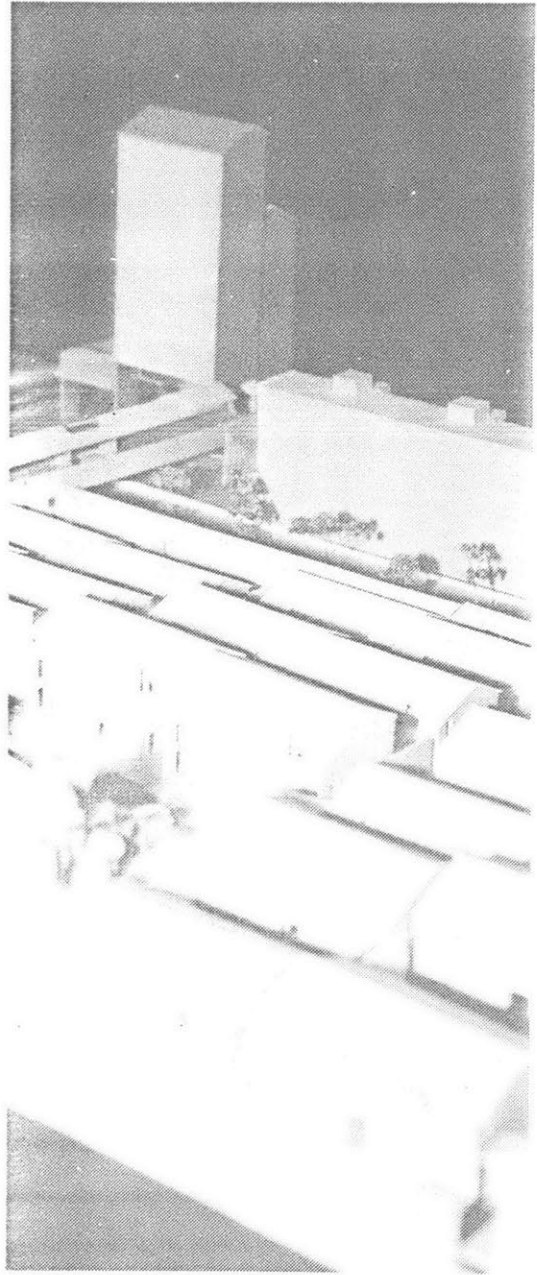
The dimensions of the courtyard vary from house to house. The courtyard in Wang Shi Yuan was of a cozy size, almost claustrophobic on the ground level but perfect from the upper floors. On closer study it was observed that the dimensions of the courtyards and the buildings were equal. The distance from the spirit screen to the columns of the next building gets counted as the dimensions of the courtyard. For the housing units that faced one another, the reference was taken from another complex with that organization.

courtyard 30' x 55' including arcade.  
Nice dimension

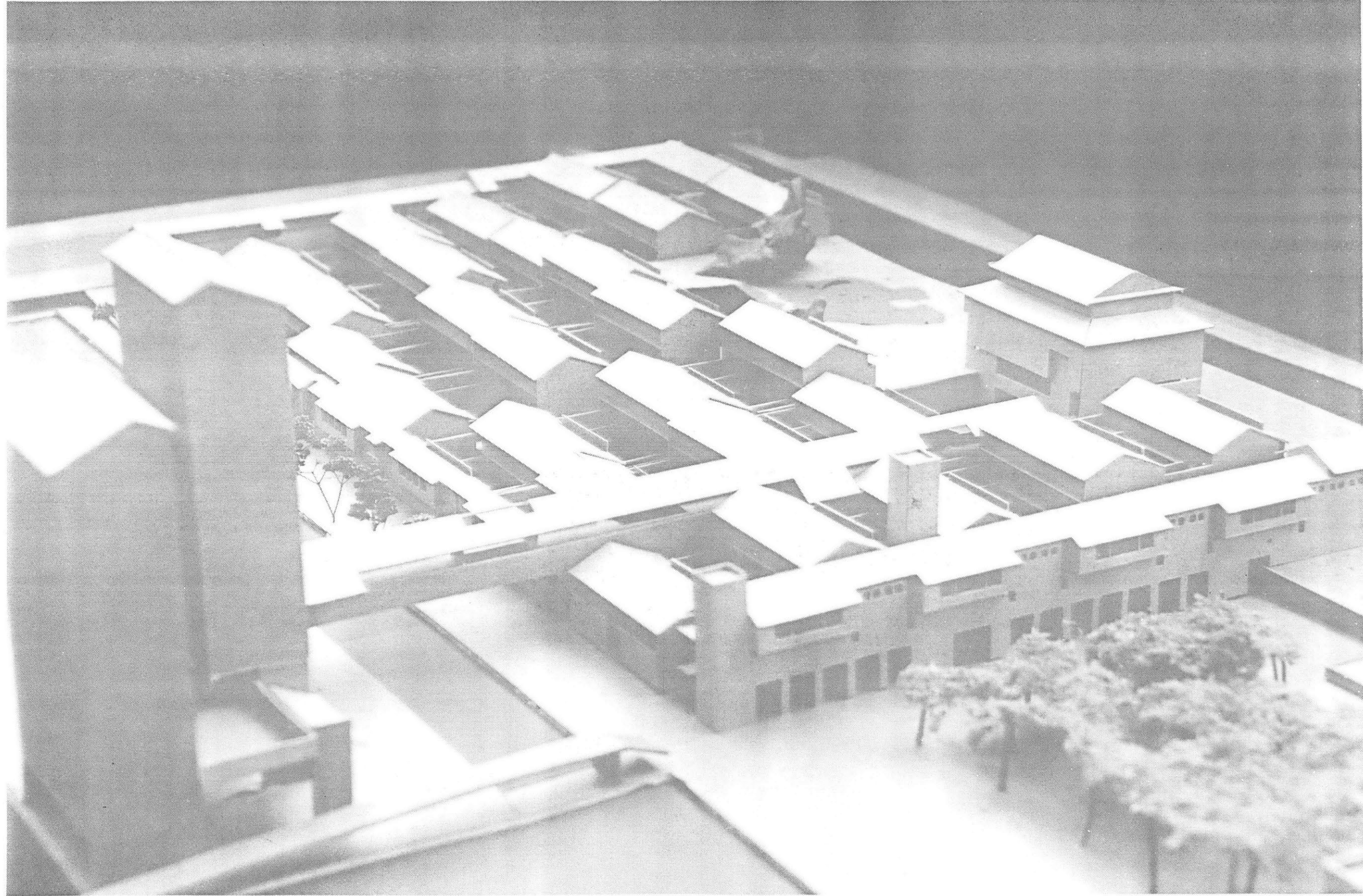


同里退思園



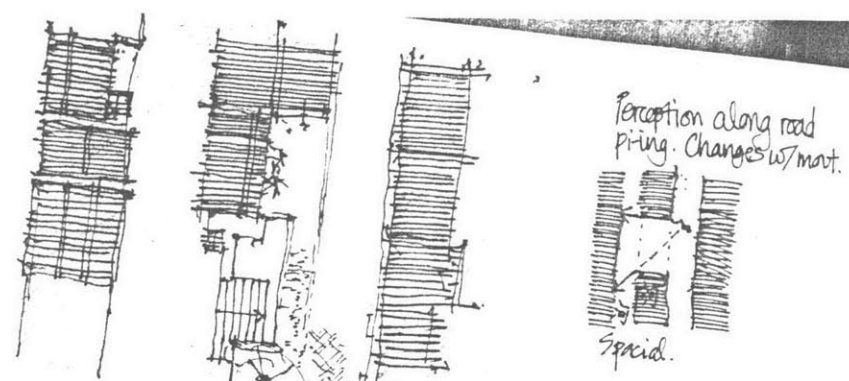
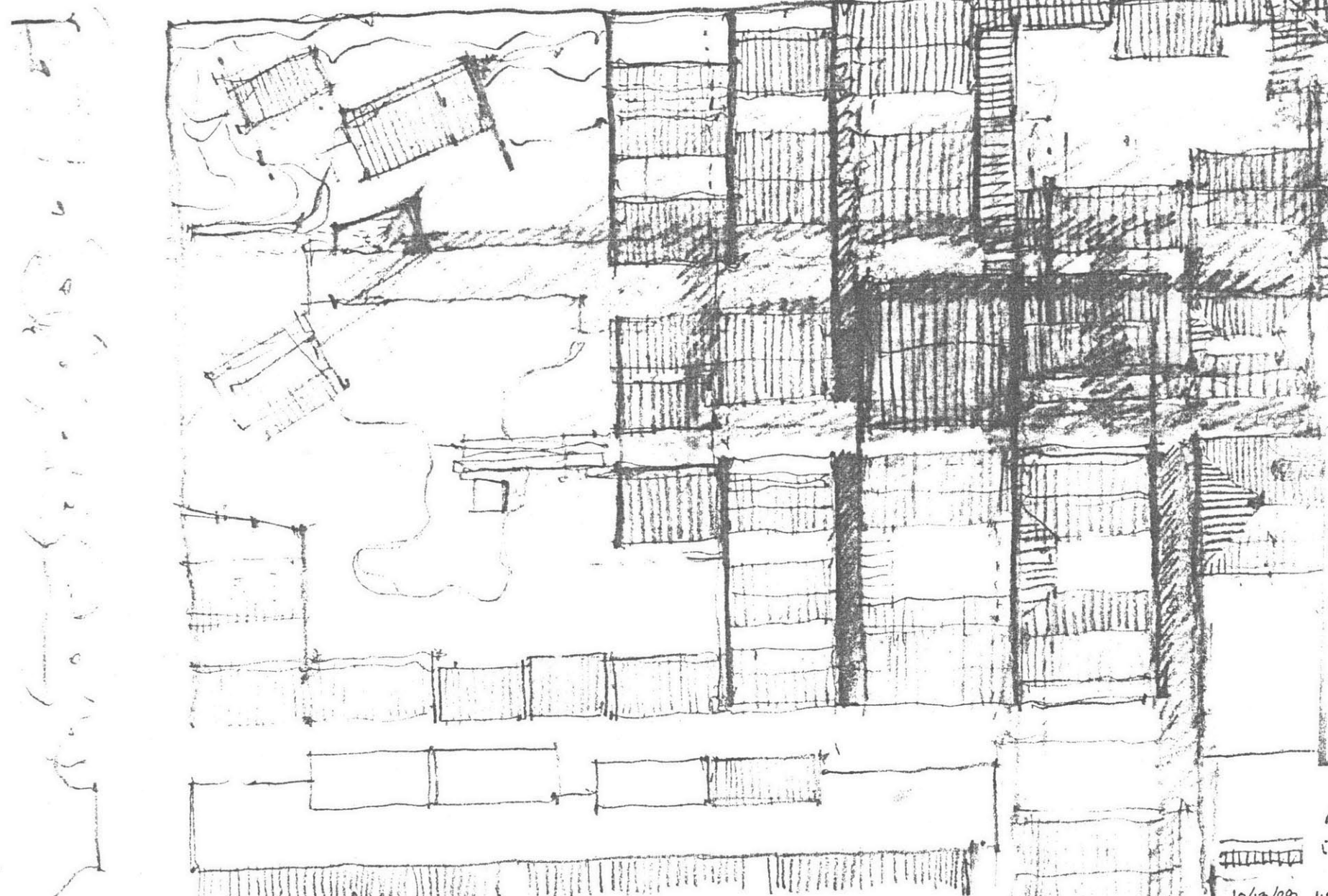




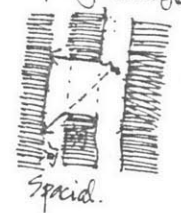


# APPENDIX

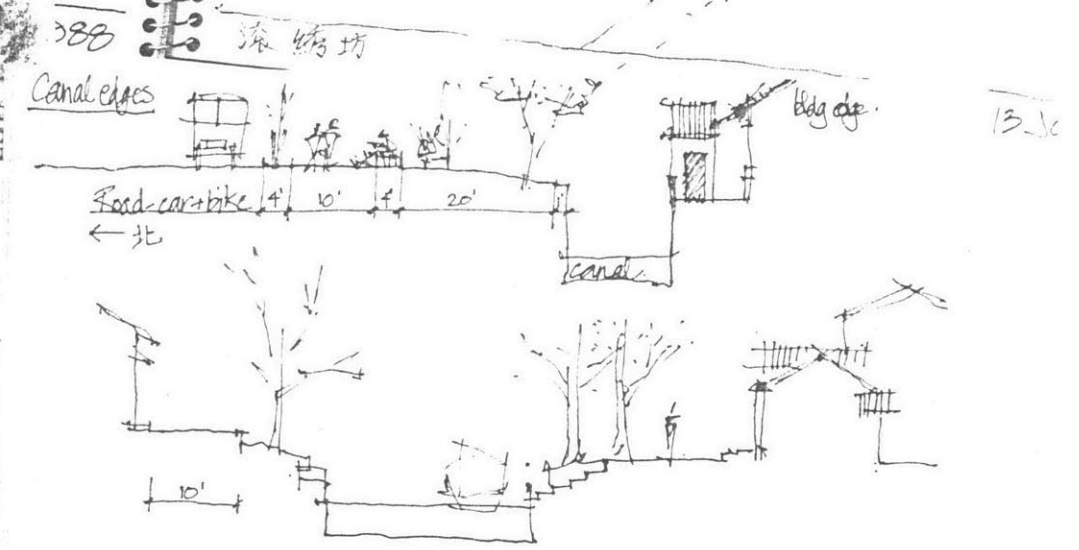
## THE JOURNEY



Perception along road  
p-ing. Changes w/mov.

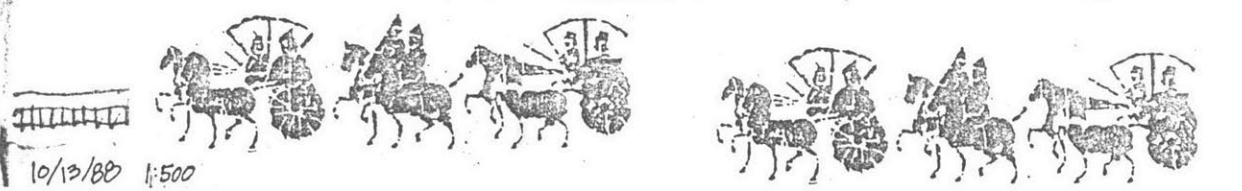


River activities

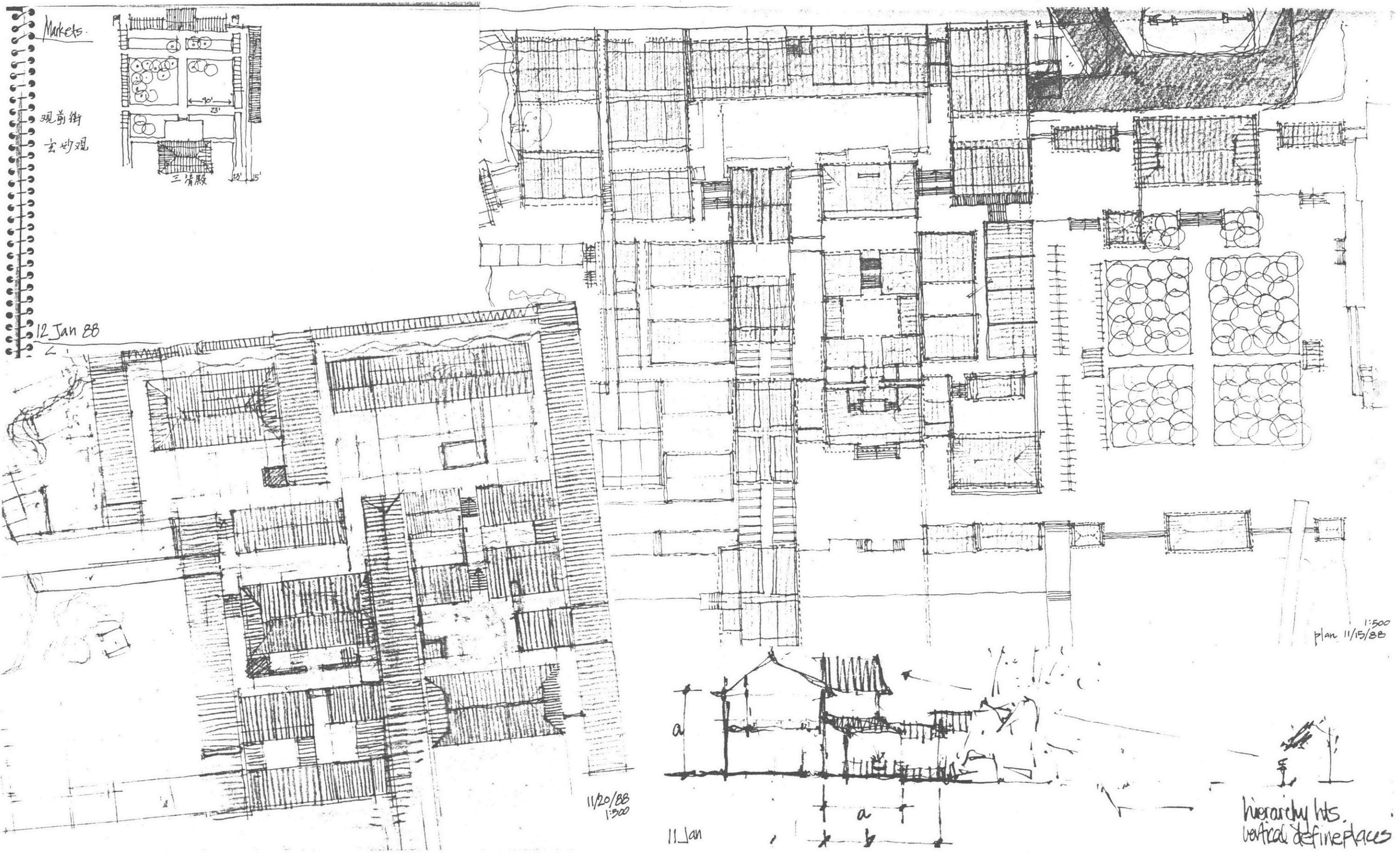


Suzhou canal edges

Jan 12, 1988



10/13/88 1:500



Markets

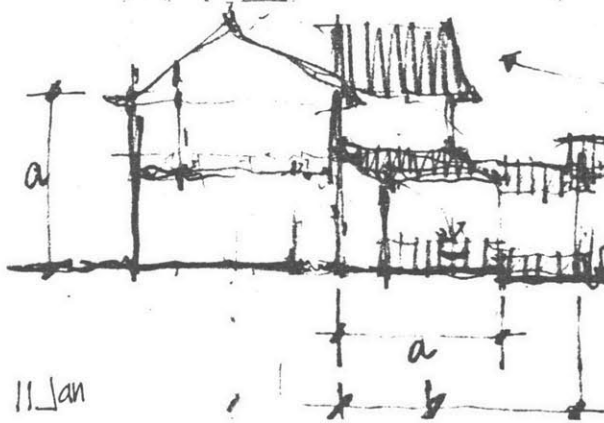
观前街  
玄妙观

三清殿

12 Jan 88

11/20/88  
1:500

1:500  
plan 11/15/88



11 Jan

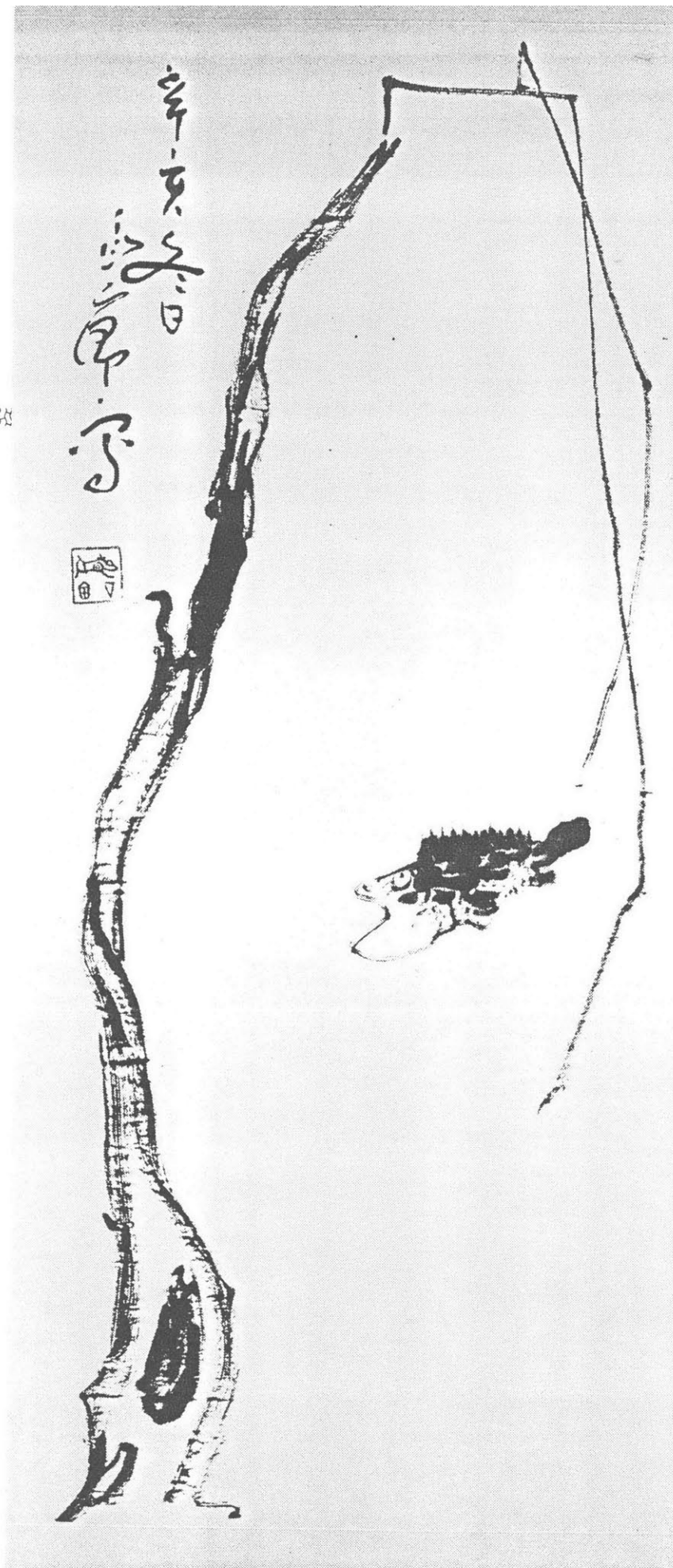
hierarchy hts.  
vertical define places

## THE PROGRAMME

PUBLIC AREAS AND GUEST FACILITIES.....	2,035m <sup>2</sup>	MANAGEMENT.....	650m <sup>2</sup>
Lobby with Seating	800	Reception and Administration	500
Business Centre	100	Staff Management, Security Control	100
Shops	600	Operator/MDF/PABX	50
Beauty and Massage Parlour	120		
Clinic for Guest and Staff	50	STAFF FACILITIES.....	850m <sup>2</sup>
2 VIP Rooms	90	Changing rooms	450
5 Meeting Rooms	125	Staff Dining for 250, two shifts for 500	250
Toilets and Cloak	150	Staff Dining Kitchen and Storage	150
RESTAURANT AND KITCHEN.....	2,030m <sup>2</sup>	ENGINEERING OFFICE AND M&E PLANT.....	2,540m <sup>2</sup>
Main Chinese Restaurant for 250 Persons	350		
Chinese Restaurant for local use, for 150 Persons	200	CIRCULATION & MISC. PLANT AREA.....	3,000m <sup>2</sup>
Speciality Restaurant for 90 Persons	150		
Coffee Shop for 150 Persons (Indoor)	250	HOUSEKEEPING/LAUNDRY.....	1,000m <sup>2</sup>
for 100 Persons (Outdoor)	200		
Lobby Bar for 60 Persons	100	F&B STORAGE AND HANDLING.....	1,040m <sup>2</sup>
Bar/Dance Area for 70 Persons	120		
Main Kitchen and Pantry	500		
Coffee Shop Kitchen	200		
		<b>GRAND TOTAL.....</b>	<b>33,545m<sup>2</sup></b>
GUEST BEDROOMS.....	20,400m <sup>2</sup>		
391 Typical Bedrooms at 30m <sup>2</sup>	1,1730		
50 2-Bedroom Suites	3000		
3 3-Bedroom Suites	270		
Circulation, Mechanical and Service Areas	5,400		

*When I applied my mind to know wisdom, and to see the business that is done on earth, how neither day nor night one's eyes see sleep; then I saw all the work of God, that man cannot find out the work that is done under the sun.*

*(Ecclesiastes 8:16-17)*



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