

**TRANSFORMATION OF THE COURTYARD HOUSE:  
Low-Rise High Density Urban Housing in Korea**

by

Gene S. Park

B.S. Architectural Studies  
University of Illinois, Urbana-Champaign  
1983

Submitted to the Department of Architecture in partial fulfillment  
of the requirements of the degree  
**MASTER OF ARCHITECTURE**  
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Gene S. Park  
Department of Architecture  
May 8, 1987

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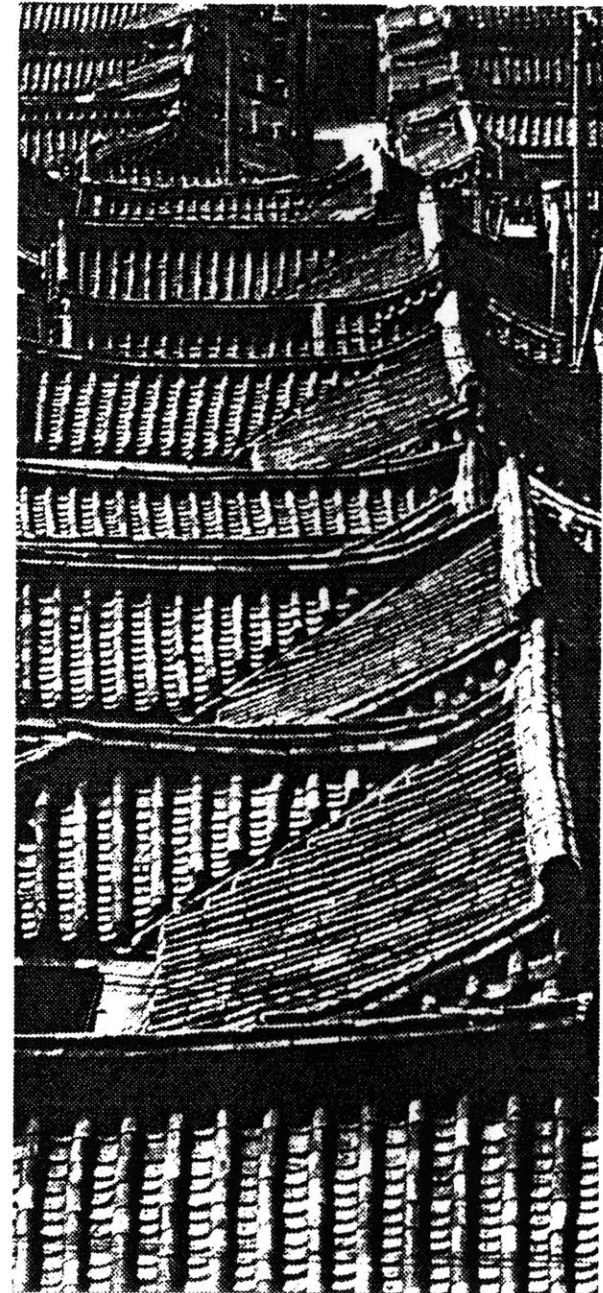
John R. Myer  
Professor of Architecture  
Head of the Department

Accepted by

Julian Beinart  
Chairman  
Departmental Committee for Graduate Students

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The idea of low-rise high-density urban housing is based on two fundamental objectives: 1) To provide higher density by intensifying land use as urban growth escalates at an unprecedented rate. 2) To reconsider the essential qualities of house - a house with a garden, light and air.

Modern high-rise apartments provide greater density and improved living conditions in terms of proper sanitation, electricity, and open space. But it lacks individuality and promotes a high degree of anonymity leading to limited social contact between neighbors. It dissociates the house from the ground and creates ambiguous open space between buildings. Single-family detached houses provides individuality and open space but detachment is not only meaningless but highly inefficient in terms of land use

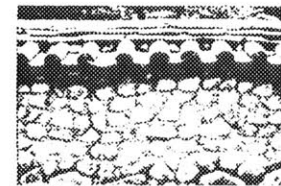
The courtyard house provides an alternative solution by combining advantages of individual house and high density housing.

Its introverted nature allow dense clustering while maintaining a private open space. The design takes this traditionally horizontal aggregation of dwellings one step further to increase its potential density. It proposes a vertical courtyard house while maintaining access to light and air, visual and acoustical privacy, efficiency of construction, and a revitalization of street life and open space.

Thesis Supervisor: John R. Myer  
Title: Professor of Architecture  
Head of the Department

## **ABSTRACT**

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The term *low-rise* housing refer to dwellings which are directly associated with the ground. The direct link consists of internal stairs or a door leading to a private garden or in some cases a semi-private garden shared by surrounding houses. This contrasts with multi-story housing which utilize stair or elevators. Urban low-rise housing may be defined as *high-density* housing where each dwelling is directly linked with a private open space. It is this intimate association between dwelling and open space which qualify as low-rise high-density urban housing.

The term *courtyard house* refer to a dwelling type where all rooms face inward to the court and no rooms face out to the street. It provides individuality, security, and privacy, an inner world where one can find peace and seclusion. All rooms depend on it for light and air. This contrasts with row housing which open out to the public street.

*Urbanity* and courtyard housing are synonymous. Its introverted form allows for greater density by packing them side-to-side and back-to-back.

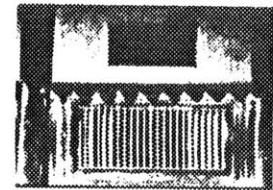
This thesis explores through design a prototype for urban housing, by combining the advantages of individual house and high density housing. It is in no way suggesting all new housing should take this form but to demonstrate that a house in the city can still have a garden.

The design shown here is prototypical, i.e. non-site specific. However, to test the idea, the Korean context is chosen. Korea is chosen because I am more familiar with its housing situation. This proposal is not limited to Korea but could extend to other housing developments.

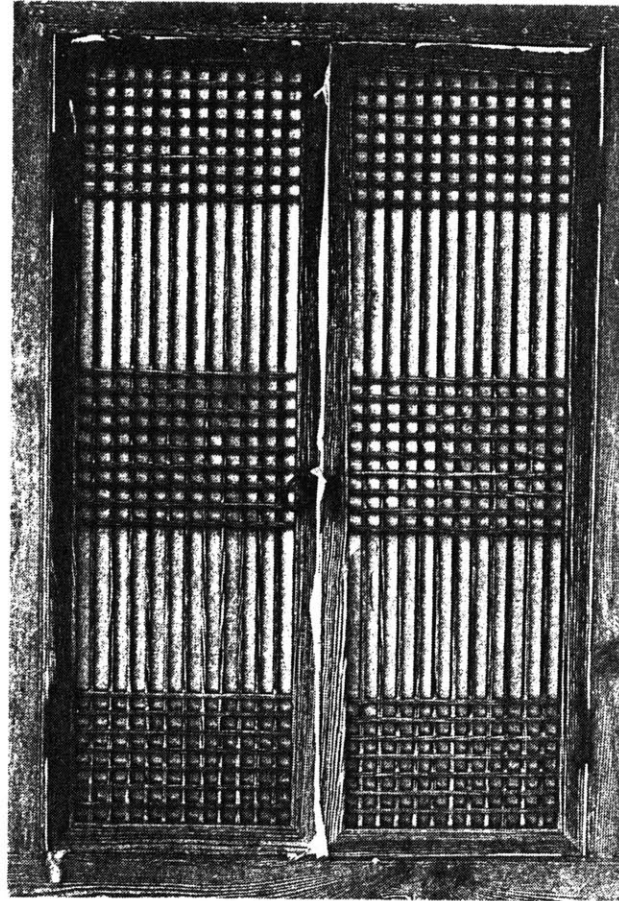
The site is abstracted from a real situation. Support structure such as roads, parks, schools, shopping and hospital are given. Otherwise the actual configuration is simplified. Again, this thesis is not an answer to a specific problem for a specific context but a prototype for urban housing.

## PREFACE

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In 1944, the population of South Korea was not more than 16 million, but by 1960 it was 25 million and in 1983 it was over 40 million people. The acute housing shortage following the Korean War resulted in a pressing need to provide housing at unprecedented numbers. Endless rows of high-rise slab apartment buildings have transformed rural communities south of the Han River in Seoul .

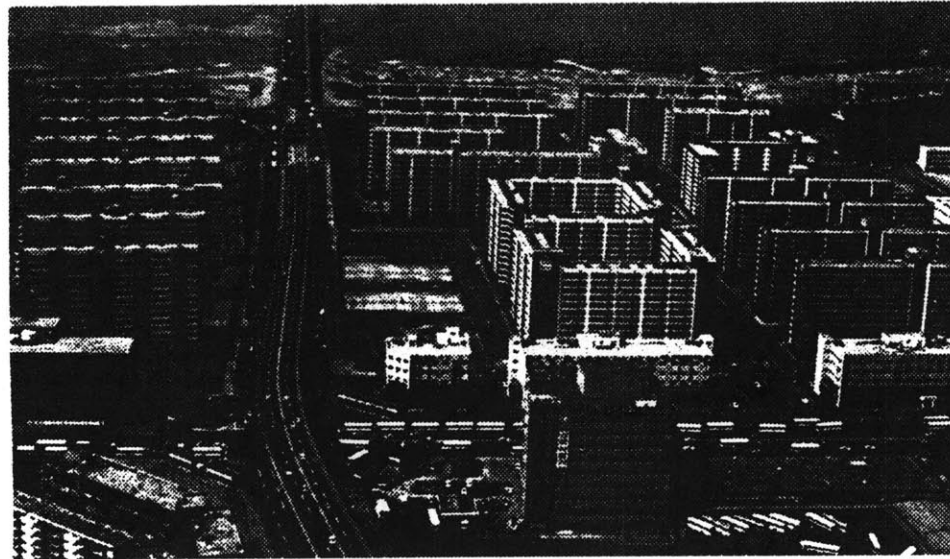
High-rise slab construction is an efficient and economical solution. It provides improved living conditions in terms of cleaner and larger space, utilities, more light and air, and open space for cars and play. The construction industry is well geared for this type of housing and any changes in the system can prove to be difficult.

Single-detached dwellings still provide 85.5 percent of the housing in Seoul. These neighborhoods are often congested, dirty, and overcrowded.

## **BACKGROUND**

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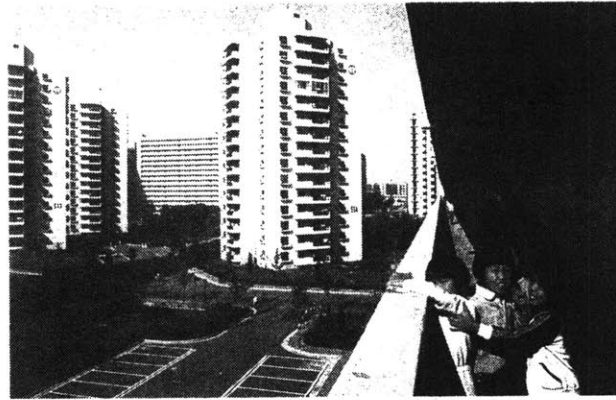
**Ban-po apartment complex**  
*One of Seoul's largest*



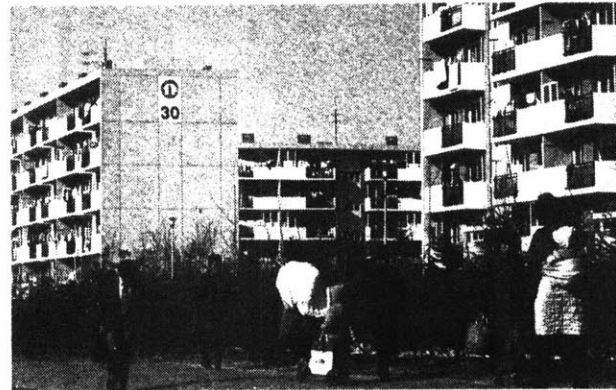
**Chamsil**  
*10 Km from the heart of Seoul*  
*is a new residential district*  
*of two hundred and fifty thousand*  
*people.*



*Corridors and stairwells  
become play areas for children*



*Walk-up apartment buildings  
of 5 to 6 stories are not  
uncommon*



*Typical road intersection in  
new residential districts*

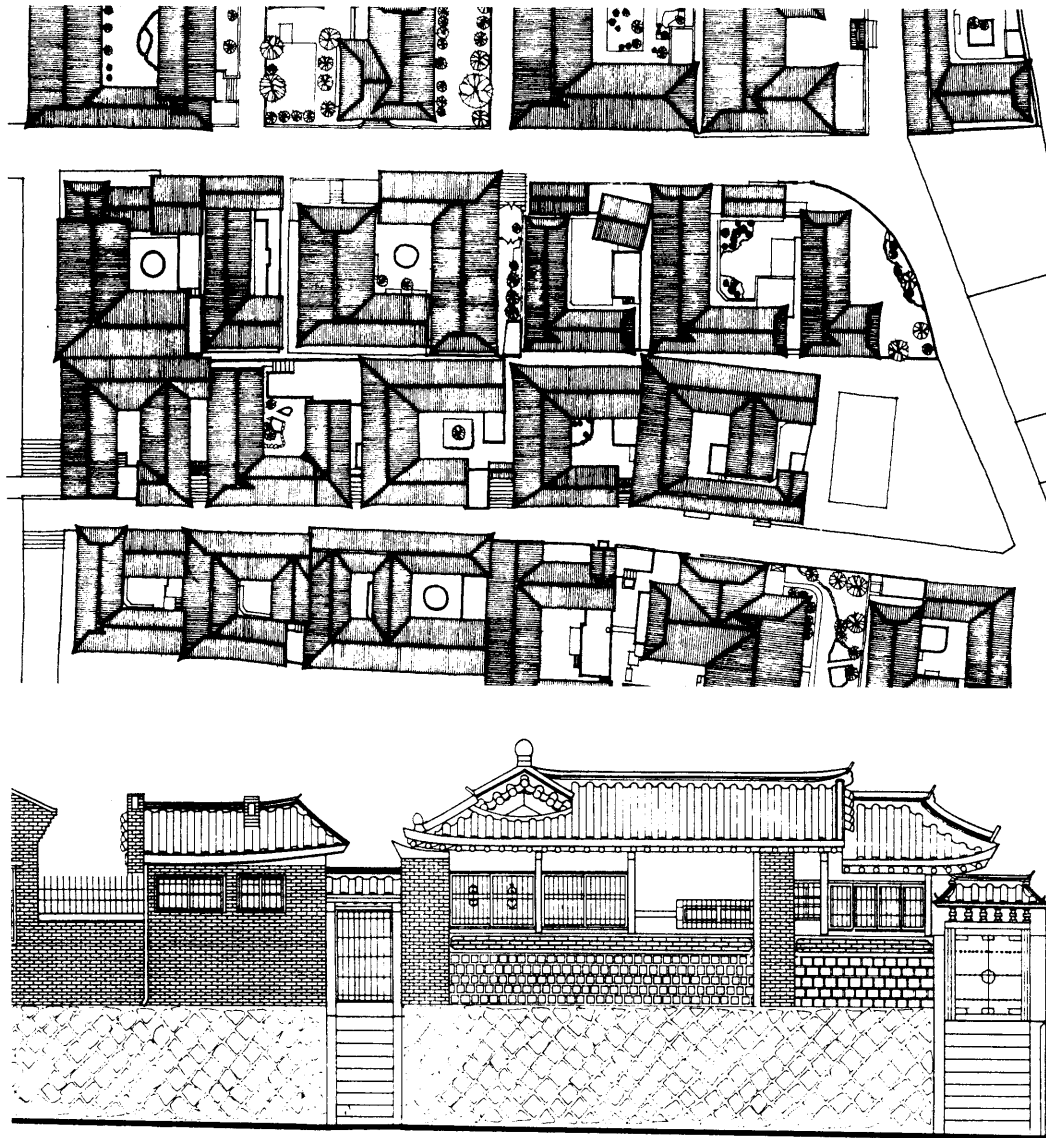


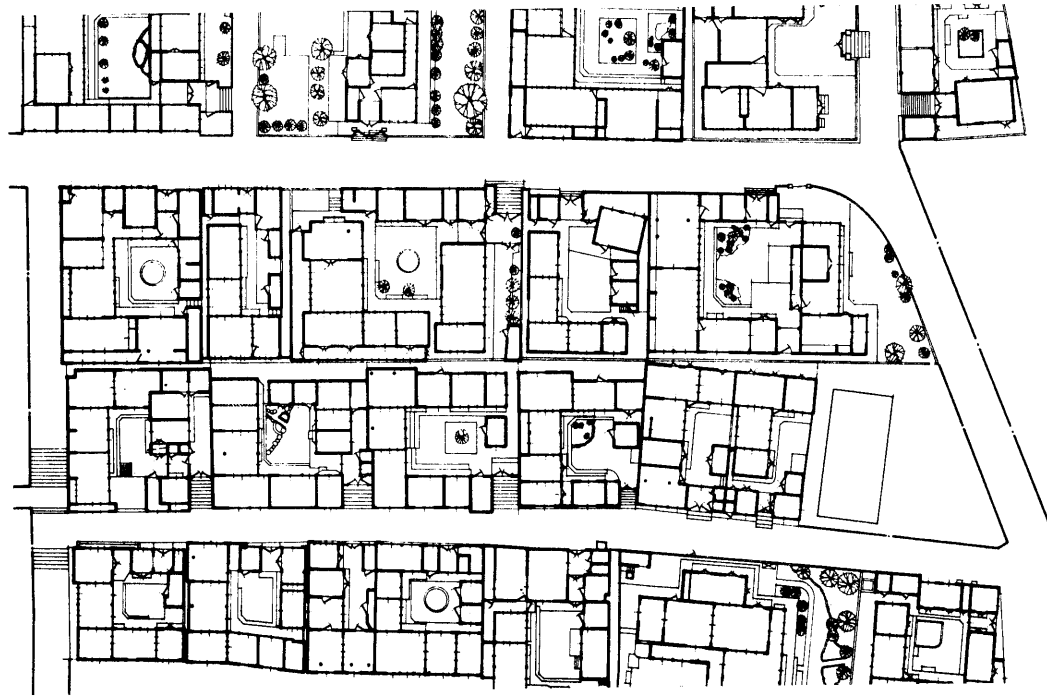
Many have been divided into multi-family houses for either financial reasons or to accommodate the extended family. Interior renovations indicate the need to provide modern amenities of electricity, hot water, indoor bathrooms and kitchens, and western furniture.

Although modernization and westernization takes place, old habits still remain. People still prefer to sit and sleep on the heated floor, receive guests in the *an-bang*, and eat wherever the portable dining table ends up. The small balcony in apartment buildings is usually filled with large jars containing dried and pickled foods and laundry. Children play among traffic in large paved open spaces mostly devoted to parking. All the buildings are single-loaded corridor type by code to provide cross ventilation and more importantly to receive south light.

The traditional urban courtyard house developed during the turn of this century. These neighborhoods have a clear separation of commercial activity and residential streets. Typically a residential neighborhood is enclosed within a commercial street. Once inside, the street is free from high car traffic except for occasional taxi cabs making their drop-offs. It is characterized by narrow alleys or *gol-mok*, the main public open space, barely wide enough to accommodate vehicular traffic although no space seems too small for a car owner to park. The street is an architecture of walls, screens, and roofs punctuated by entrances to individual houses. The front door is a prominent element of the street elevation. It is the only expression of the household to the public domain. Openings to the street is not really for visual connection but more for ventilation.

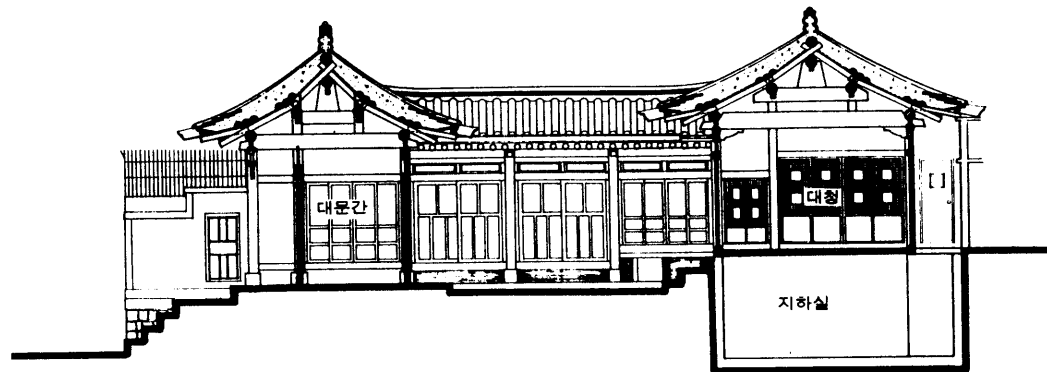
Inside, the courtyard is the center of the house where all rooms open to it. The





size of the court depends on the wealth of the owner. But regardless of size the courtyard provides an extension of the otherwise small rooms. All views and light are dependent on it for no windows open to the street except for ventilation.

Functionally, the court provides a space to tend a small garden, a safe place for kids to play within parents close supervision, a place to store and prepare dried and pickled foods, and to move around from room to room eliminating the need to provide a corridor. Before modernization, the court was also a place to bath.



The interior Rooms are multi-functional. They seem cramped compared to western standards but because it is minimally furnished - usually a chest to store clothes and blankets - the size is just right for sleeping by night and lounging by day. Openings to the court are not windows but screens which span from structure to structure. The wall, floor, and

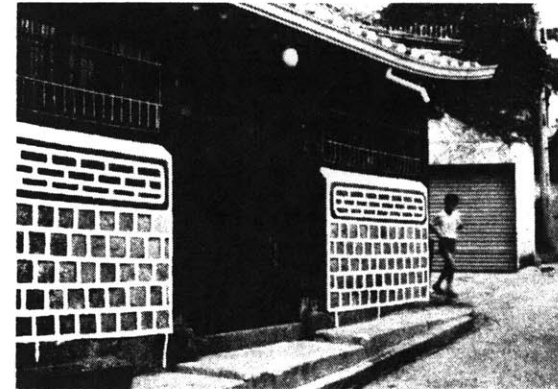
ceiling plane extend beyond the dimensions of the room to the court increasing its perceptual size.

The proportion of interior spaces is based on a person sitting on the floor. Thus, the heights of the ceiling and the sill of an opening are lower than western standards.

All traditional courtyard houses are single-story. There are no definite reasons for this development but one can associate it to a need for south light. The higher a building, the less light it will receive. Geomancy dictated the location and orientation of a building. The ideal site would be a south facing slope surrounded by mountains on either side and a view of water in the distance. A house today without south light is undesirable and not marketable.

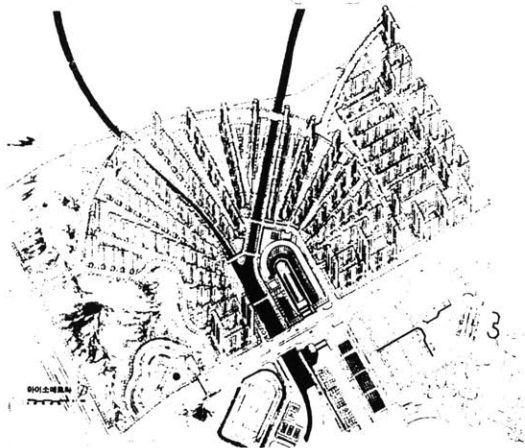
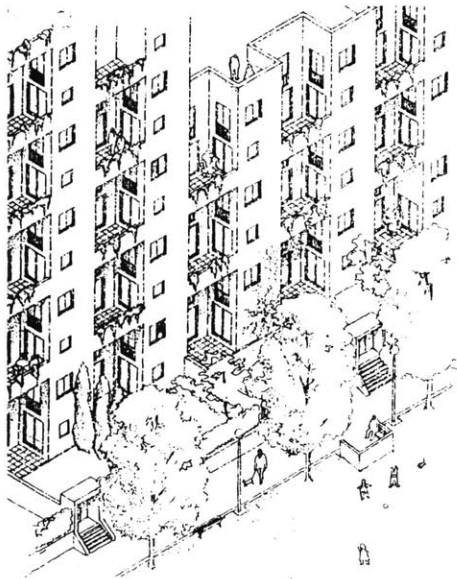


*Typical street in older residential neighborhoods*



*1988 Olympic Athletes' and Reporters' Village, Seoul, Korea. 5700 units of housing and support facilities.*

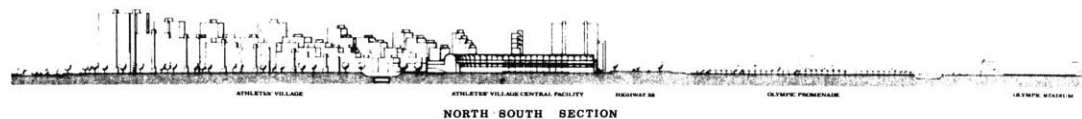
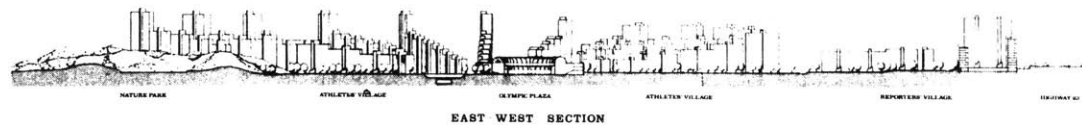
*Woo and Williams*



As these traditional neighborhoods make way for modern high-rise buildings, there are questions about the quality of human habitation. The essential qualities of urban dwelling - individuality and communication - that characterized earlier development, is in jeopardy. Modern facilities are popular as people escape from deteriorating conditions of older neighborhoods. There are no other affordable alternatives except for the wealthy.

The issue of urban housing is at a critical point. The single-minded solution might alleviate immediate problems of housing shortage but the

consequences over time in terms of the deterioration of urban life is serious. A balance between the advantages of single-family dwelling and high density housing might provide a viable solution. One development has taken the first step towards this integration. In the 1988 Olympic Athletes' and Reporters' Village in Seoul by Woo and Williams of Cambridge, the design attempts to provide the qualities of a courtyard house, maintaining intimacy in the streets and open spaces, within an urban context.







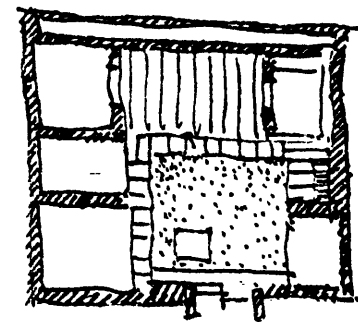
The development of a low-rise high-density prototype is based on several criteria which combine the advantages of individual house and higher density housing : 1) To provide each unit with a private outdoor room which has access to light and air, 2) access and connection to the ground and street, 3) acceptable space requirements, 4) A 1:1 parking ratio and adequate space for recreation.

The key to higher densities is a vertical aggregation of units. Walk-up units of 5 to 6 stories are acceptable by Korean standards but access to light become problematic with courtyard units. The design attempts to answer a simple question: What is the maximum appropriate density of courtyard housing within contemporary urban context ? Issues relating to construction techniques, ownership and affordability are considered but not in depth.

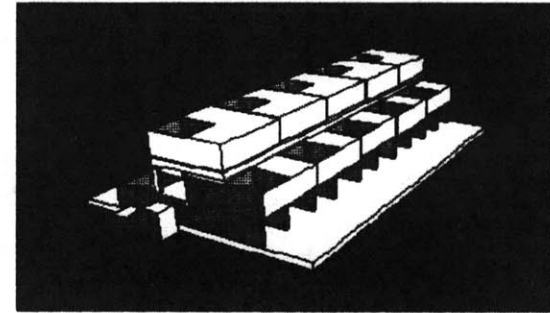
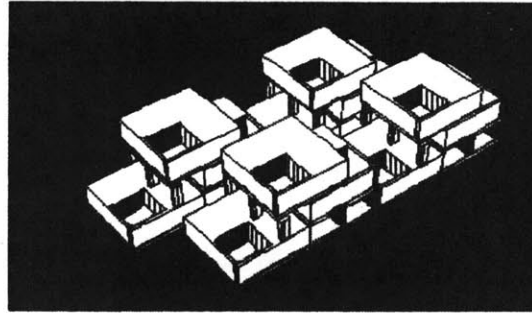
Design issues:

A. *Unit/Building* - vertical aggregation, access to south light, ventilation, visual and acoustical privacy, unit organization, function.

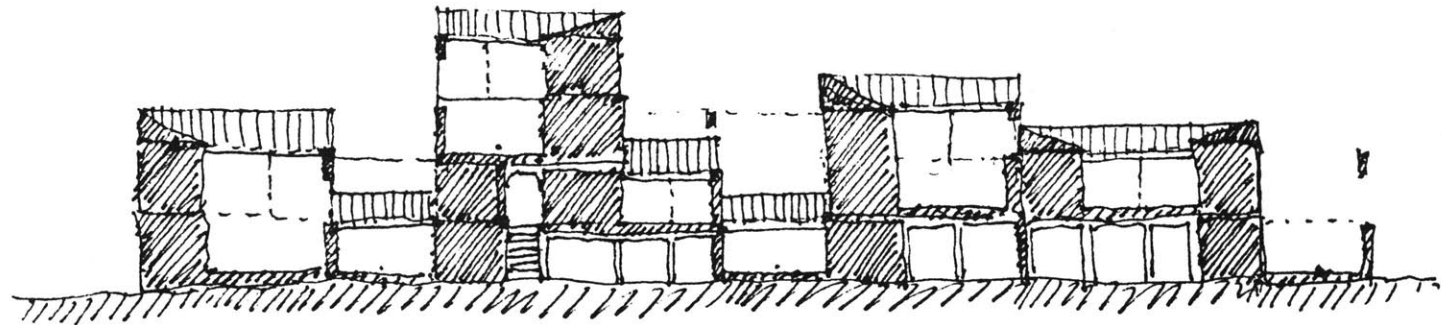
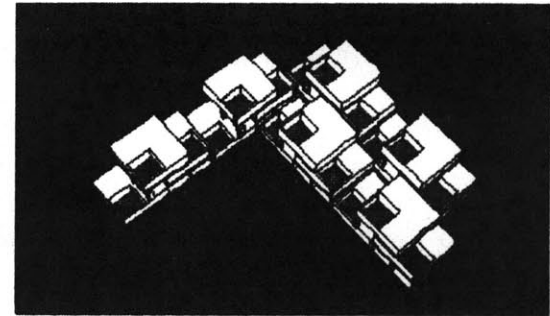
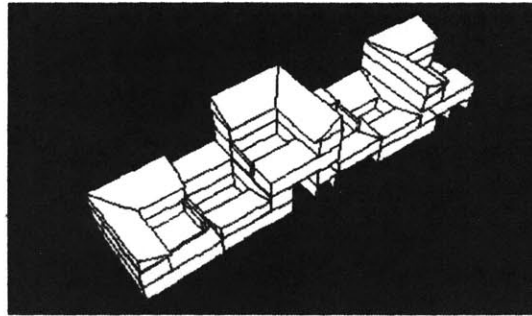
B. *Neighborhood* - hierarchy of streets and open spaces, street life.



*Study sketches of vertical aggregation*  
Aggregation of a single unit type into a cluster. Flexible combinations but lacks unit variations and creates empty spaces below upper units.

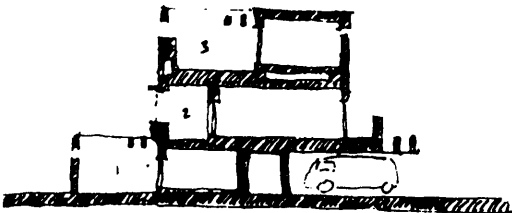
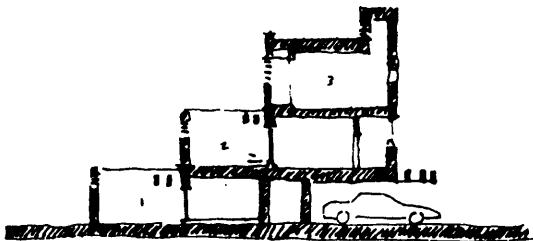
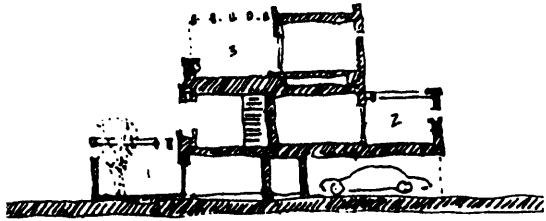


*Combination of flat and duplex courtyard units allow many possible combinations but access to upper units are difficult*



E-W SECTION.

*Sketch Section study  
Variations of vertical aggregation  
with single orientation units*



**A. UNIT / BUILDING**

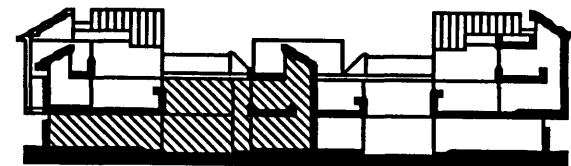
**Vertical Aggregation**

The courtyard must be open to the sky to receive light. Simply stacking one unit on top of the other is not possible. Units are instead staggered, always keeping the courts open. To receive direct south light, a single orientation to the sun is preferable. In section, this suggests a diagonal scheme, much like housing on a south facing hill. However, on a relatively flat site the space created under units are in question. Parking is a logical solution but when this pattern continues in rows at the neighborhood scale; the space between becomes primarily for automobile access. One advantage this solution fails to realize is the possibility of maximizing density by clustering units side-to-side and back-to-back.

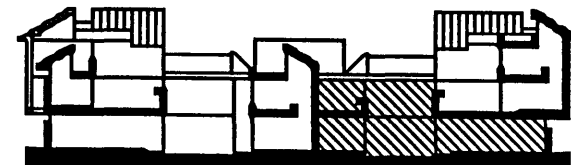
The proposed design maintains a diagonal profile for maximum solar access and also takes advantage of its efficient clustering order. Ground units

A and B are back-to-back but flipped to have street access. The court act as a well of light making possible for multiple orientations to the sun. The massing of units above are flexible enough to accommodate the best profile for solar access to all units.

The height is limited by two factors: First, each unit should have direct access to the street, and second, the diagonal profile should allow light in the worst condition, in winter. Possibility of vertical expansion can be accommodated over time if communal attitudes about light change.



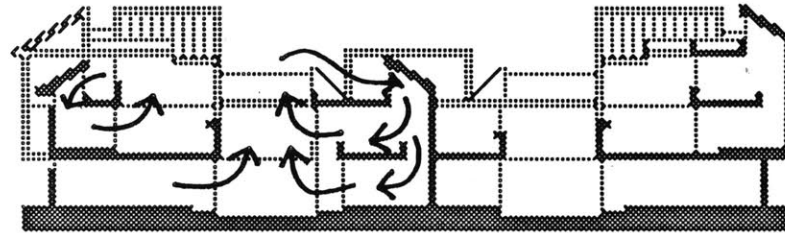
UNIT A



UNIT B

*Sun angle diagrams*

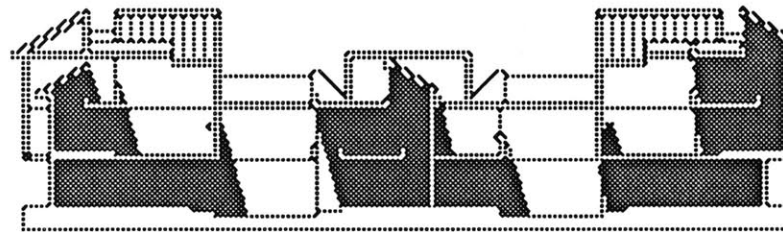
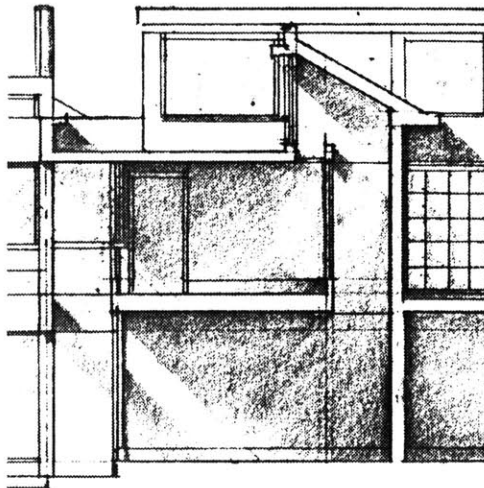
*Korea is located between 33 - 43 degrees north latitude. Angle of sunshine at winter solstice is 22.44  
Weather is mild with four seasons*



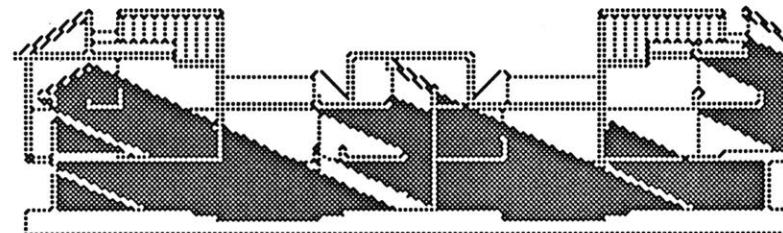
VENTILATION

*Light Chimney*

*To provide an even illumination by light reflected from courtyard and form light chimney*

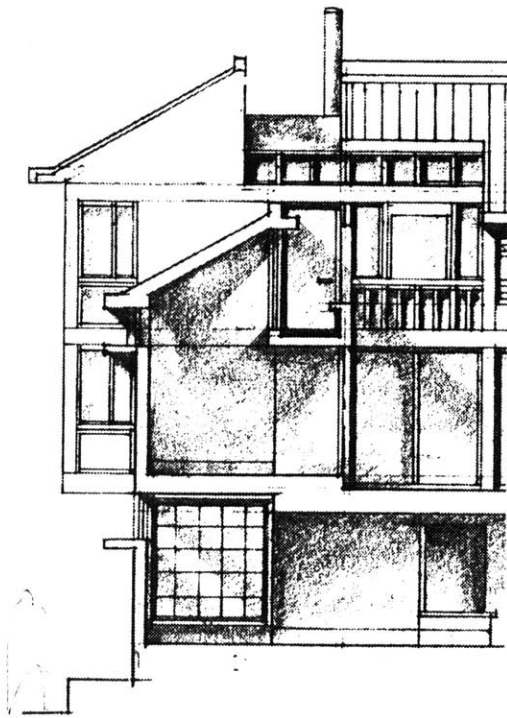


SUMMER SHADE



WINTER SHADE

*Rooms along the street receive direct light through clerestory windows or reflected light from the court*



### **Access to Light and Air**

The courtyard is the heart of the house. All rooms depend on it for light. Light is an essential part of dwelling. Where direct light is difficult, a system of light chimneys are utilized. Rooms can extend out into established zones to reach up to the sky. Openings to the street are above eye level to maintain privacy yet receive light. A combination of translucent glazing and screens also help visual privacy. Reflected light contributes to the overall illumination of a space, either through light chimneys or reflected against the surface of the courtyard. It is especially important in winter.

Trellises provide shade in the summer and in winter a system of enclosure can provide extra living space.

The roof pitch responds to the sun and the rain. In general, it slopes in toward the courtyard to reduce the vertical dimension and to prevent water draining into neighbor's house. Roofs

along the street also slope in. In unit D the roof pitch allows light to enter the room while in effect reducing the effective height of the street.

Cross ventilation is provided in all rooms. Summer months are more humid than hot and air circulation is crucial to comfort. The light chimney gives sun in winter and draws air out in summer. The courtyard acts as a breeze catcher and to maximize its effect it would have to be orientated to prevailing wind.

## Visual and Acoustical Privacy

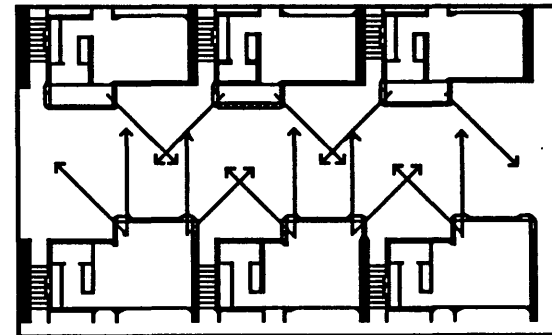
With high-density living, a greater need to provide individuality and security within one's house is necessary. When houses appear above others, there is greater risk of intrusion into neighbor's private space. One solution is to raise the height of the wall of the court above eye level. This cuts the angle of view out while maintaining an inward focus. Capping the wall, as in traditional garden walls, establishes a clearer boundary between neighbors.

Openings along the street emphasize lateral and corner views to prevent direct visual contact with neighbors. Screens and translucent glazing allow light but not view.

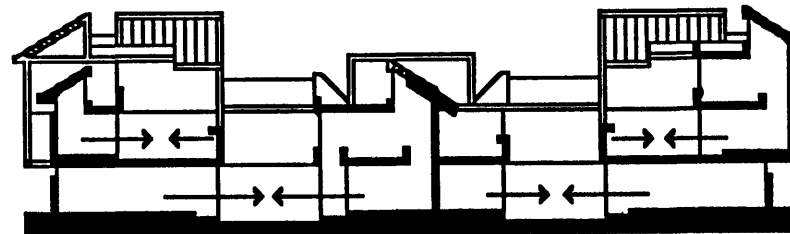
Acoustical privacy is even more difficult to control. Building soundproofing materials are limited in high-density living. The best control device is a friendly neighborhood social contract.

*Angle of view diagram  
section through courtyards*

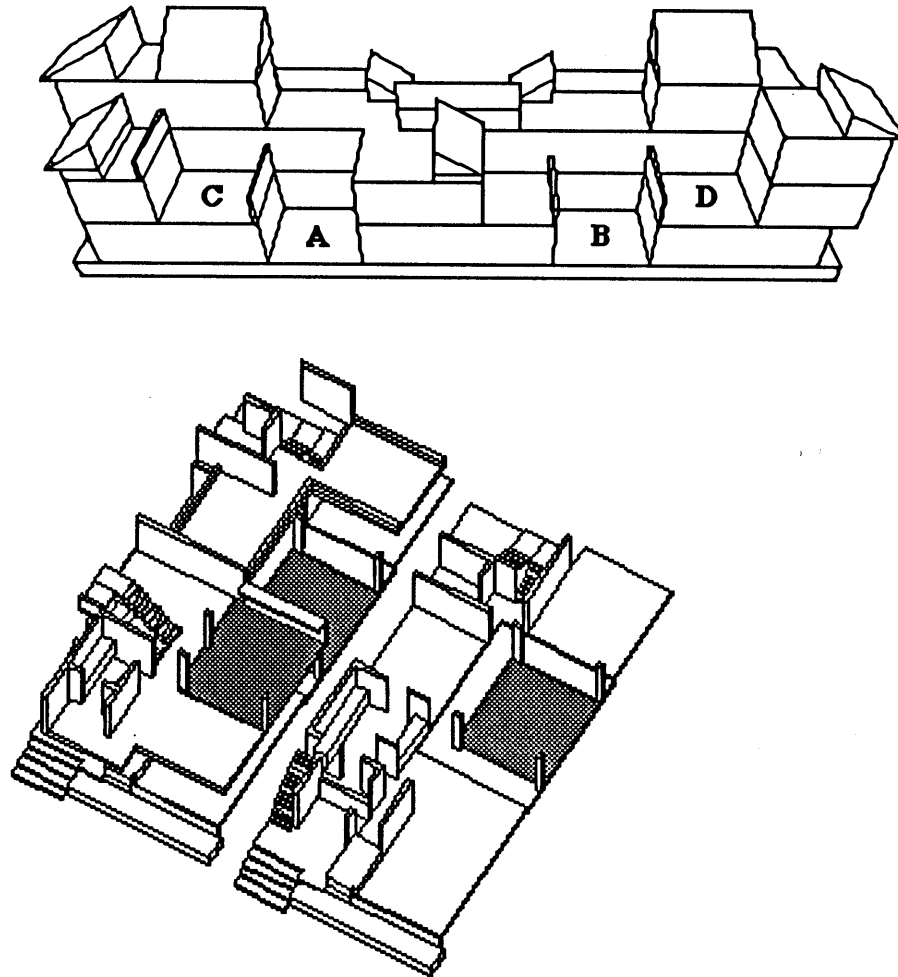
*Bay windows along the street  
provide light through translucent  
screens and allow lateral and  
corner views*



2ND FLOOR PLAN ALONG STREET



### *Axonometric of Typical Cluster*

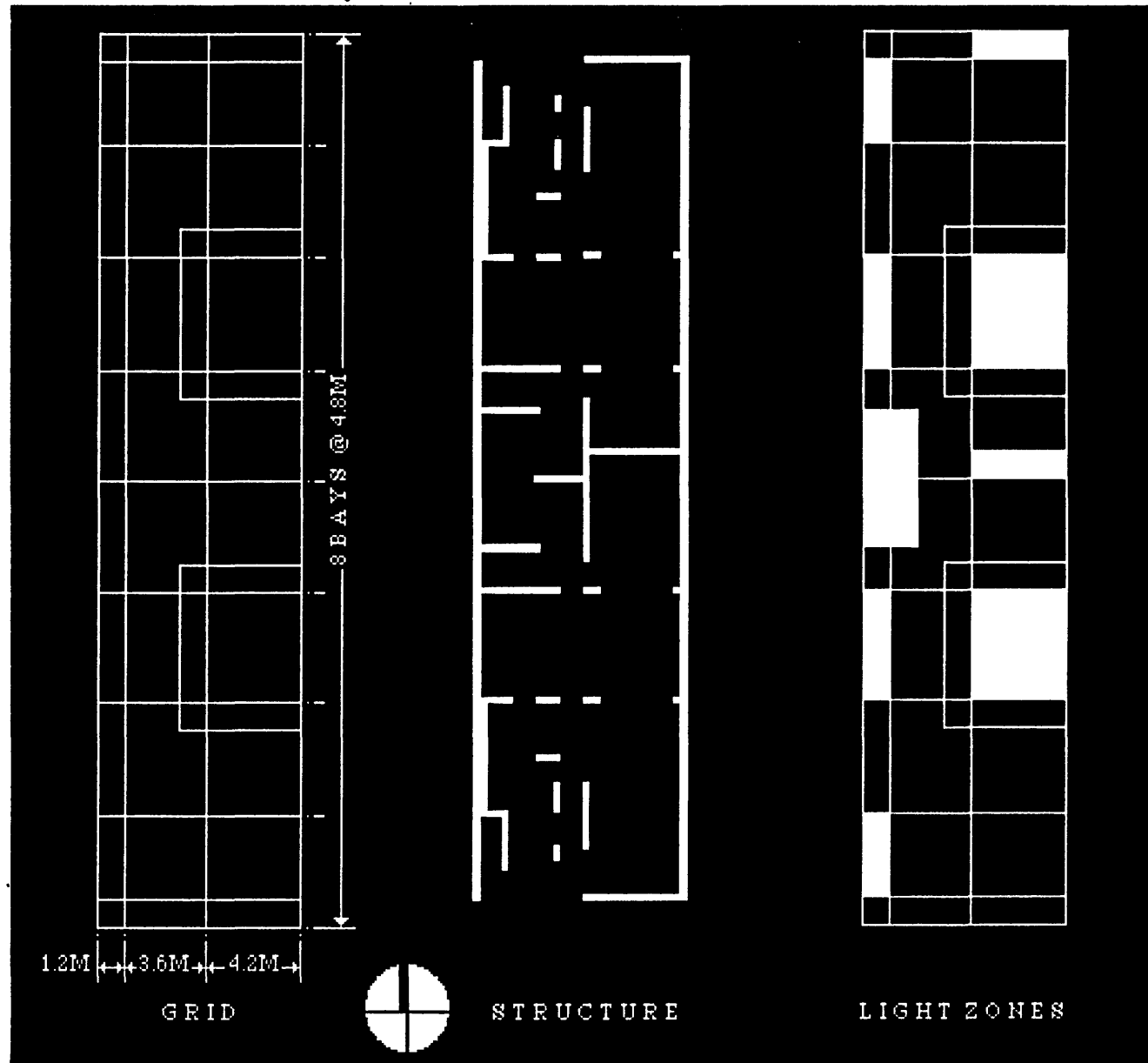


### **Unit Organization**

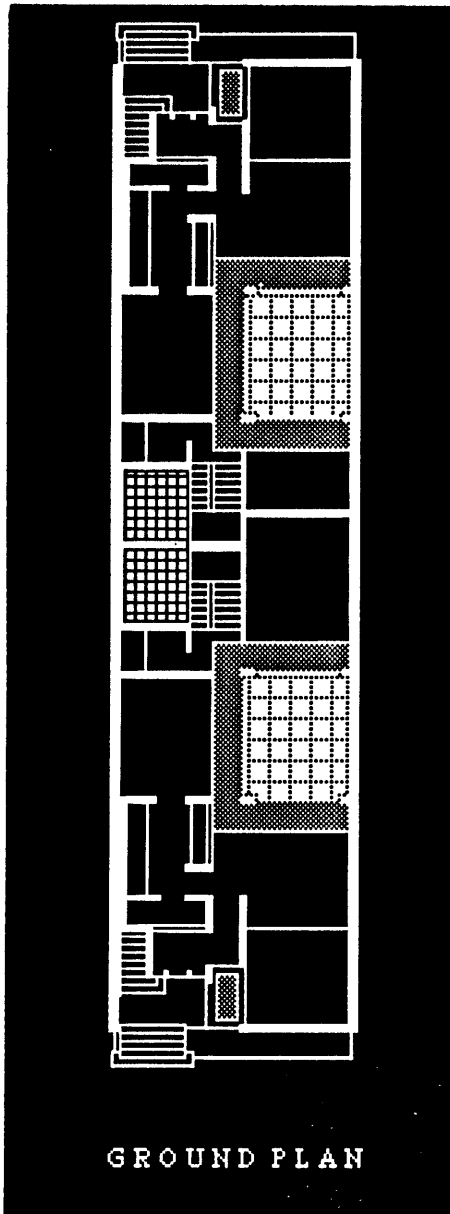
There are essentially two unit types - a larger ground unit, A and B, and a smaller upper unit, C and D. Units A and B are organized around a U-shaped plan where living, dining, and master bedroom occupy three sides of the court. Service spaces such as entry, stair, bathroom, and kitchen occupy the corners. A second level accommodates two more bedrooms for each type as well as access to a roof deck. Upper units C and D are organized around an L-shaped plan with living-dining, entry, and a bedroom at the courtyard level.

Common steps off the street leads to both the ground unit and the upper unit entrances. With little structural modification, this entry organization allows for ownership variations. It could be a two-family house with a rental unit, a condominium, a large single family residence, or rental apartment units.





### *Structural Diagram*



A structural grid organizes a typical row or cluster of units. From north to south are 8 divisions of 4.8m bays with each end bay of 3.6m at the ground level. This allows extensions of 1.2m at the upper floors. From east to west are 4.2m, 3.6m, 1.2m zones respectively. The main courtyard always occur in the 4.2m X 4.8m bay while entry, utility court kitchen, bathroom, and bedrooms occur in the 3.6 m zone.

The 1.2m zone is critical to the life of the cluster. Within this free zone are stairs leading to upper units, smaller rooms extend out to it, and major rooms reach out and up via light chimneys to receive light and air. This zone is reminiscent of the dead space between party walls in traditional courtyard housing. Its invention was a result of subdivision laws but function as ventilating spaces as well.

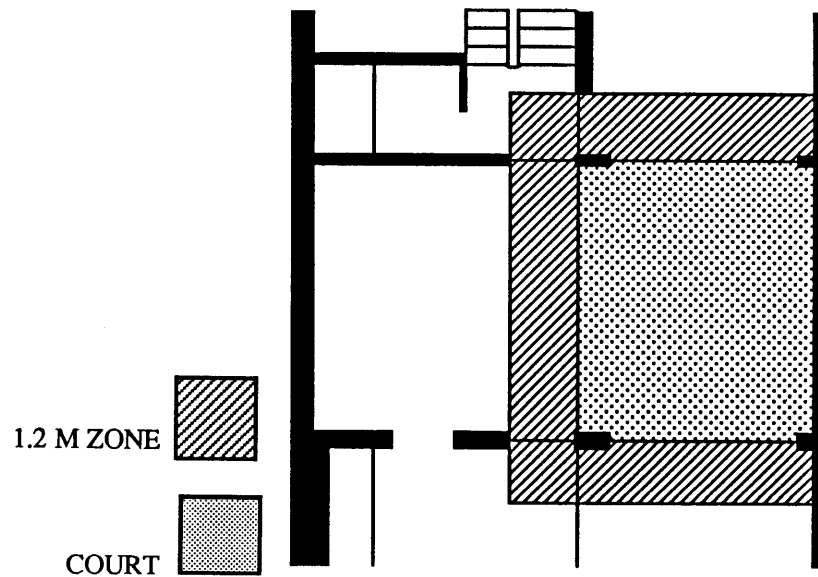
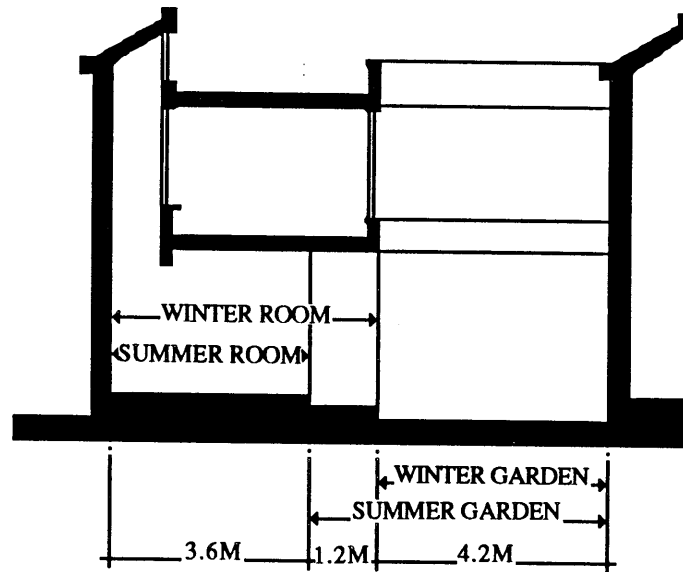
The major grid dimension can be subdivided to accommodate modifications within the structural

system. A 3.6m zone, a bedroom dimension, can be divided into 1.2m and 2.4m zones for a corridor and bathroom or stair. These modifications are confined within the width of a row of 9.0m. This dimension remains constant except for end units which has freedom to respond to its surroundings.

The depth of each row is 38.4m or two ground units of 19.2m. This dimension can accommodate double row of parking at 18.0m (6.0m @ 2 with 6.0m lane).

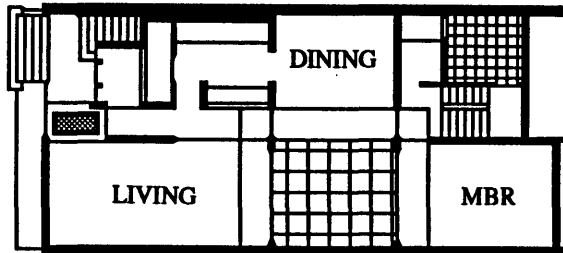
*Multi-dimensional characteristics of the 1.2m zone around the courtyard during summer and winter periods.*

*Courtyards extends the perceptual depth of rooms beyond its boundary*

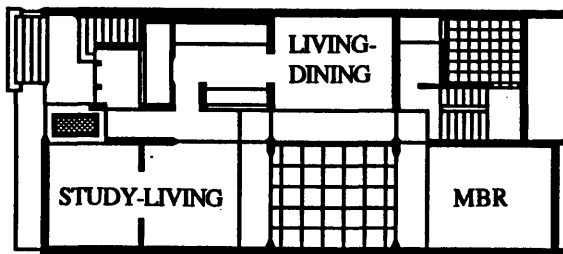


***Variations within a standard ground unit***

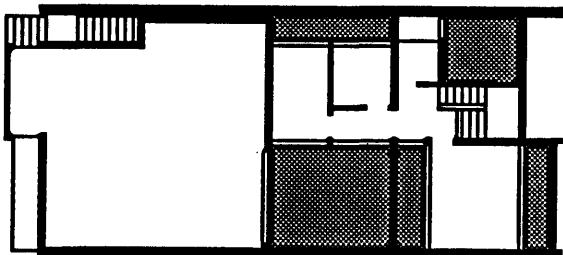
**Function**



STANDARD GROUND UNIT



VARIATION



UPPER LEVEL

The courtyard is an extension of the otherwise small rooms which surround it. Space is precious and efficiency in planning is key to success. The challenge is to make small rooms bigger and allow flexibility with its use. Traditionally rooms were void of furniture allowing for multiple uses. Dining can occur in any room - there is no formal dining room. A portable dining table follows where dining might happen. The heated floor is used to sit as well as to sleep. People buy furniture but still prefer the old way.

In unit A, there are essentially five major rooms; three at the courtyard level and two above. The living room can be one large room or divided into two smaller rooms, a study and living. The dining could be used as a living room. The larger room above can be used as a family room, a large bedroom, or two smaller bedrooms.

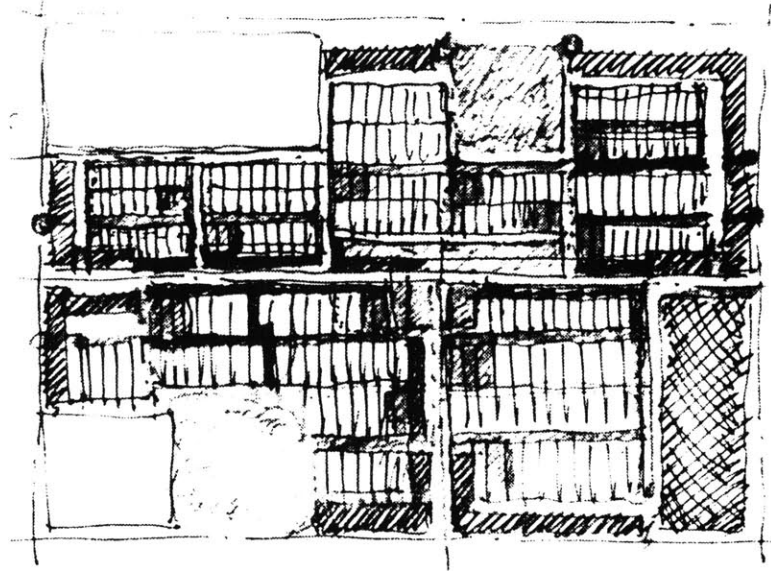
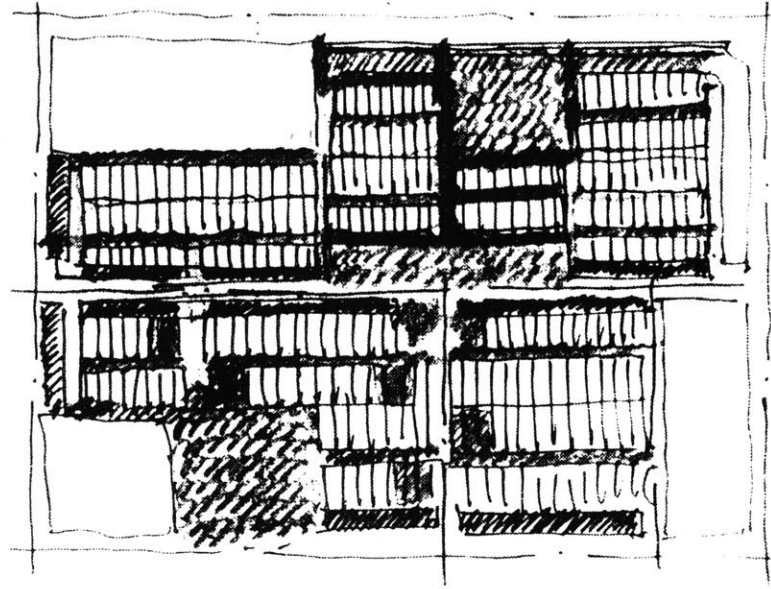
A 1.2m zone between the interior and the court defines the courtyard space. This zone can become part of the interior in the winter by glazing around the courtyard or part of the courtyard in the summer by leaving it open. Thus, the courtyard is both 4.2m X 4.8m during winter and 5.4m X 6.0m during the summer when it is necessary.

The utility court and the room below provide the necessary storage space. This will alleviate clutter in the main courtyard.

*Sketch studies of site layout*

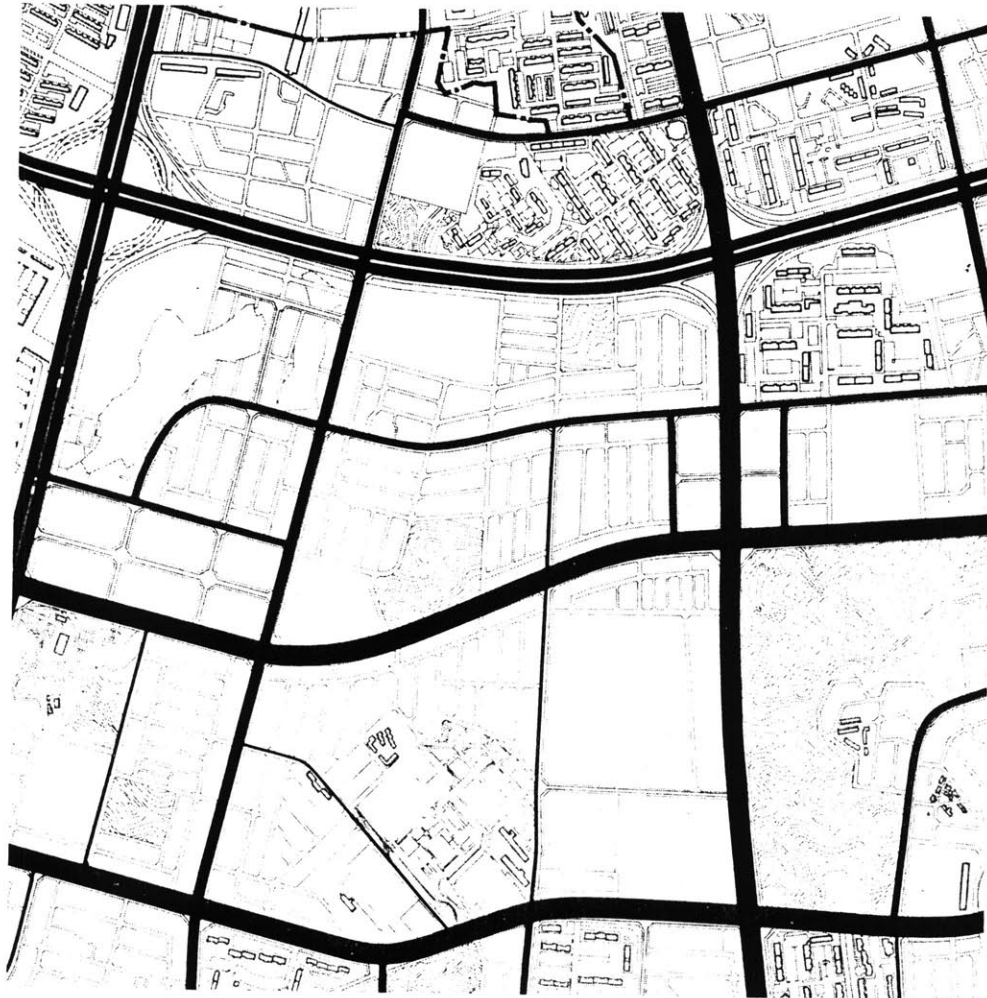
*Main access road run east-west  
parallel to pedestrian street.*

*Direction of pedestrian street  
determined by orientation of units  
to the south*



### **Chamsil**

*Existing urban fabric south of the Han River in Seoul. Area for low to mid-rise residential construction. Also the site for the 1988 Olympic Athletes' and Reporters' Village and related sports facilities*



### **B. NEIGHBORHOOD**

#### **Streets and Open Spaces**

The site is abstracted from a typical urban block of 500m X 500m. Characteristics of the block are a 50m boulevard to the north, a 30m road to the east and west, and a 25m road to the south. Commercial and institutional buildings define the periphery of the block. Small retail shops are found along an east-west access road through the site. Two primary schools and two parks are also included.

Streets and open spaces are organized in a hierarchical system. Roads around the block link one to the other and eventually leads to the center of the city. The east-west access road provide connection to other blocks. A secondary road perpendicular to it provides access to parking courts of each neighborhood. Parallel parking along this road accommodates the visitor.

A neighborhood is defined by rows of houses along a pedestrian street running east-west. This pedestrian priority street is restricted to service vehicles and temporary parking. The length of the neighborhood block is determined by the size of the parking court. Footprint of one ground unit accommodates four parking spaces. With a parking ratio of 1:1, each parking bay allows two clusters or four units. The larger the parking court the longer the pedestrian street. Typically, parking courts are no more than three bays.

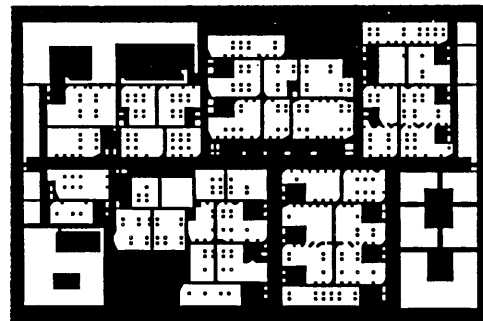
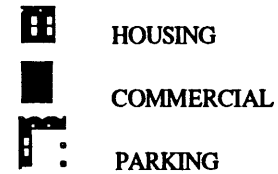
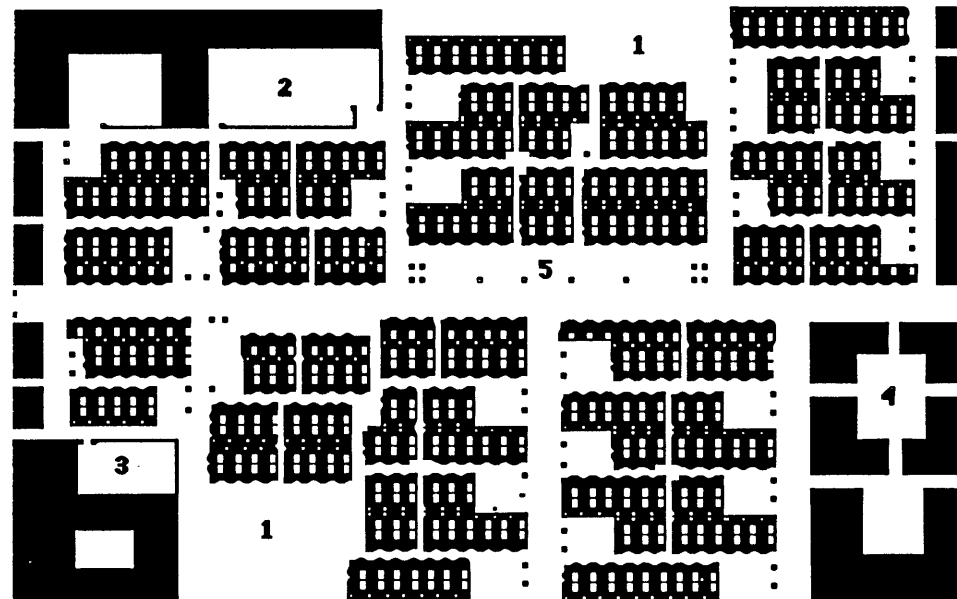


FIGURE - GROUND

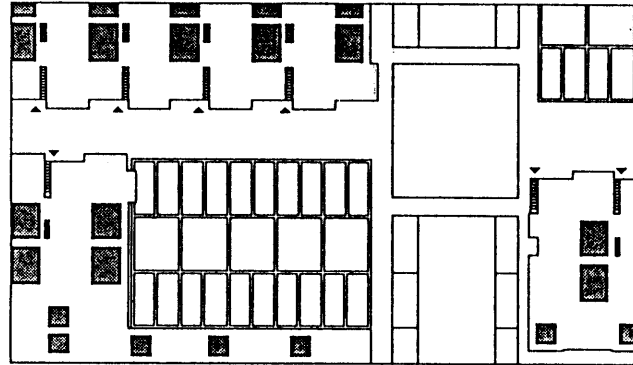
*Site Diagram showing hierarchical structure of built and open spaces.*



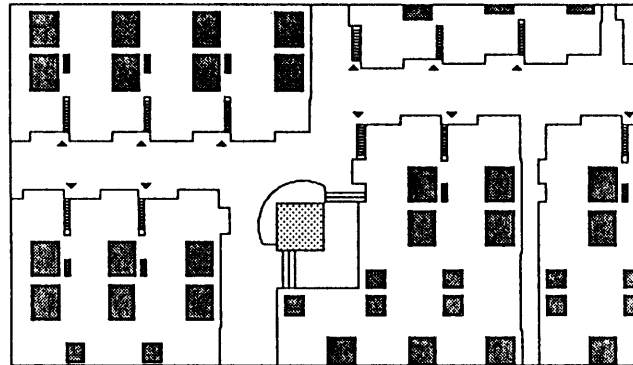
1. PARK
2. PRIMARY SCHOOL
3. HOSPITAL
4. SHOPPING CENTER
5. NEIGHBORHOOD CENTER



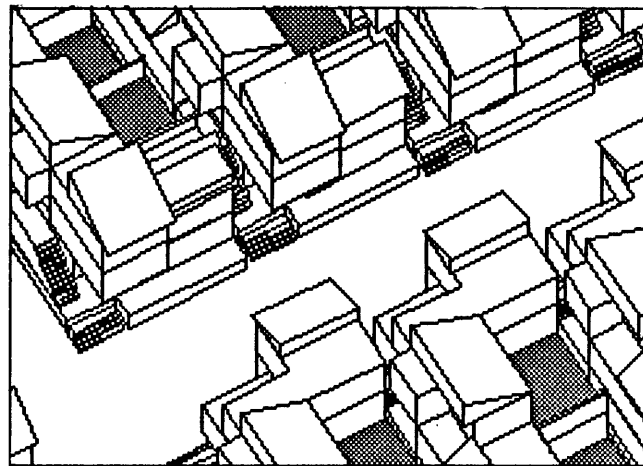
*Typical parking court*



*Typical pedestrian intersection*



*Cluster Axonometrics*



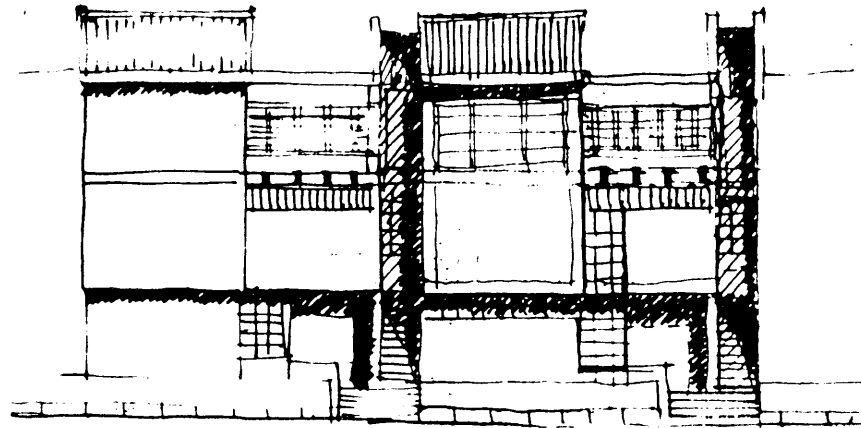
These pedestrian streets of 6.0m widths are occasionally intersected by a second pedestrian alley of 3.0m which allows a more flexible network of movement. The intersection becomes the neighborhood living room - a bosk of trees, tot-lots, drinking fountains, elderly pavilion.

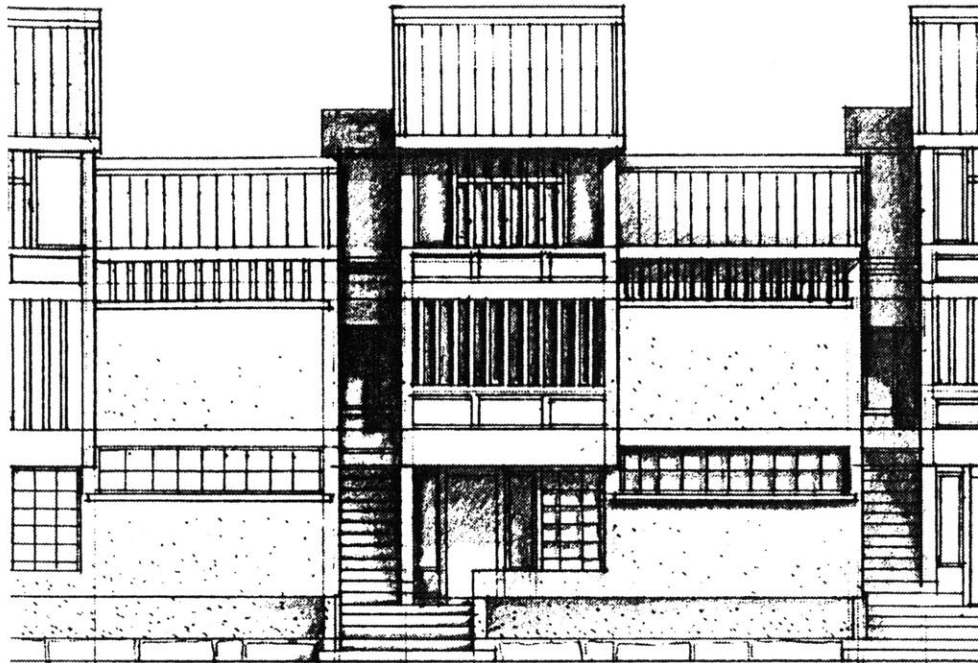
Parking courts occur where pedestrians and cars meet, accentuating the spatial experience as one moves along the road. Each court is identifiable with a neighborhood. One moves from room to room - one neighborhood to another.

Two large parks provide adequate open space for recreation. By intensifying the neighborhood fabric, it is possible to leave large areas un-built .



*Elevation studies*





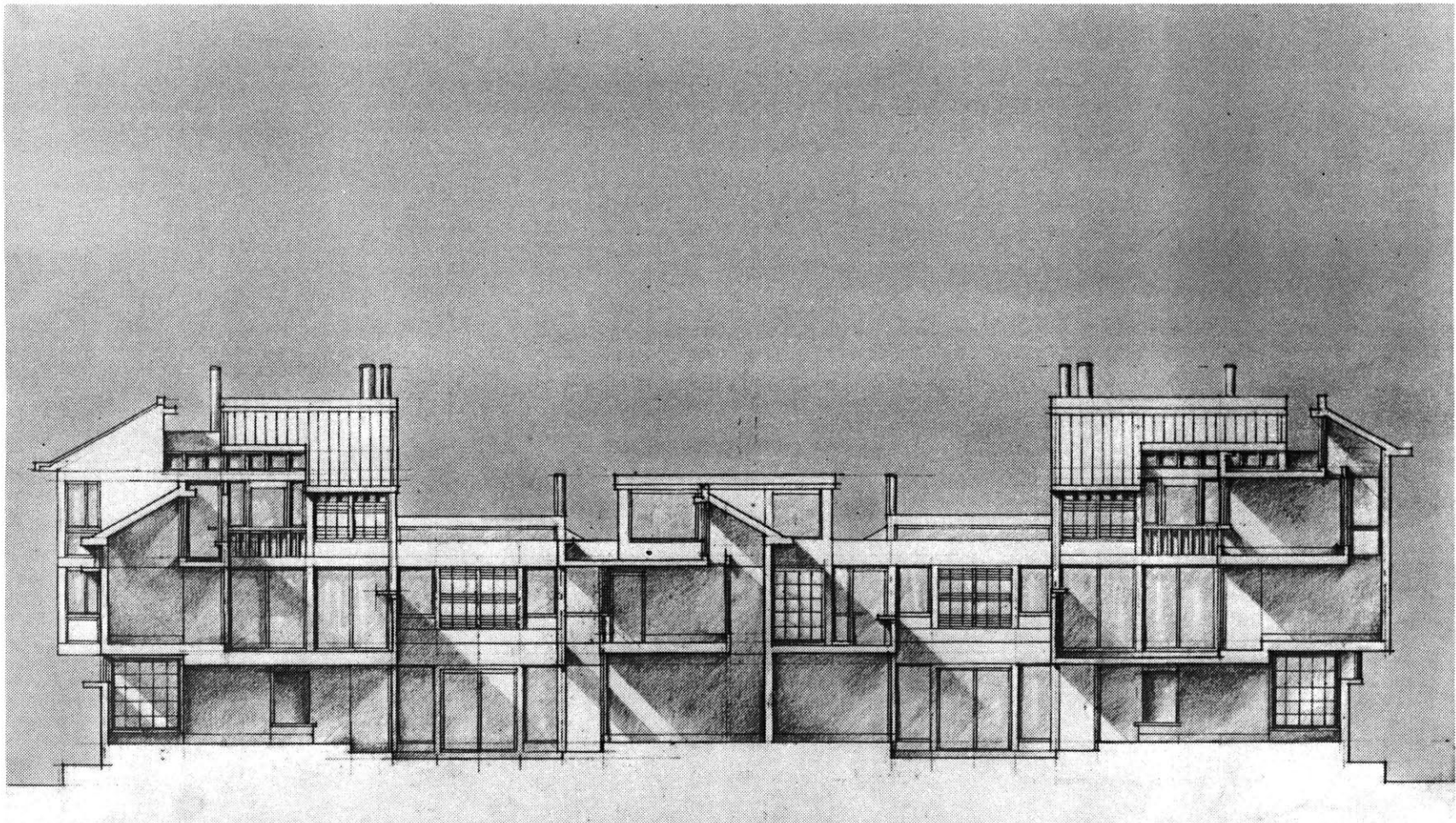
### Street Elevation

An architecture of walls and screens characterize the street scape. Houses sit on plinths which become places to sit or plant flowers. The ground level elevation is essentially a wall punctuated by openings which lead to individual entrances. Upper levels are more permeable and extend out to the street but with caution. It is not pleasant to have direct view of neighbors across the street. Windows are meaningless if it has no view. Openings facing the street are screens and translucent glazing to allow light but not view. Direct views are through corner and side windows.

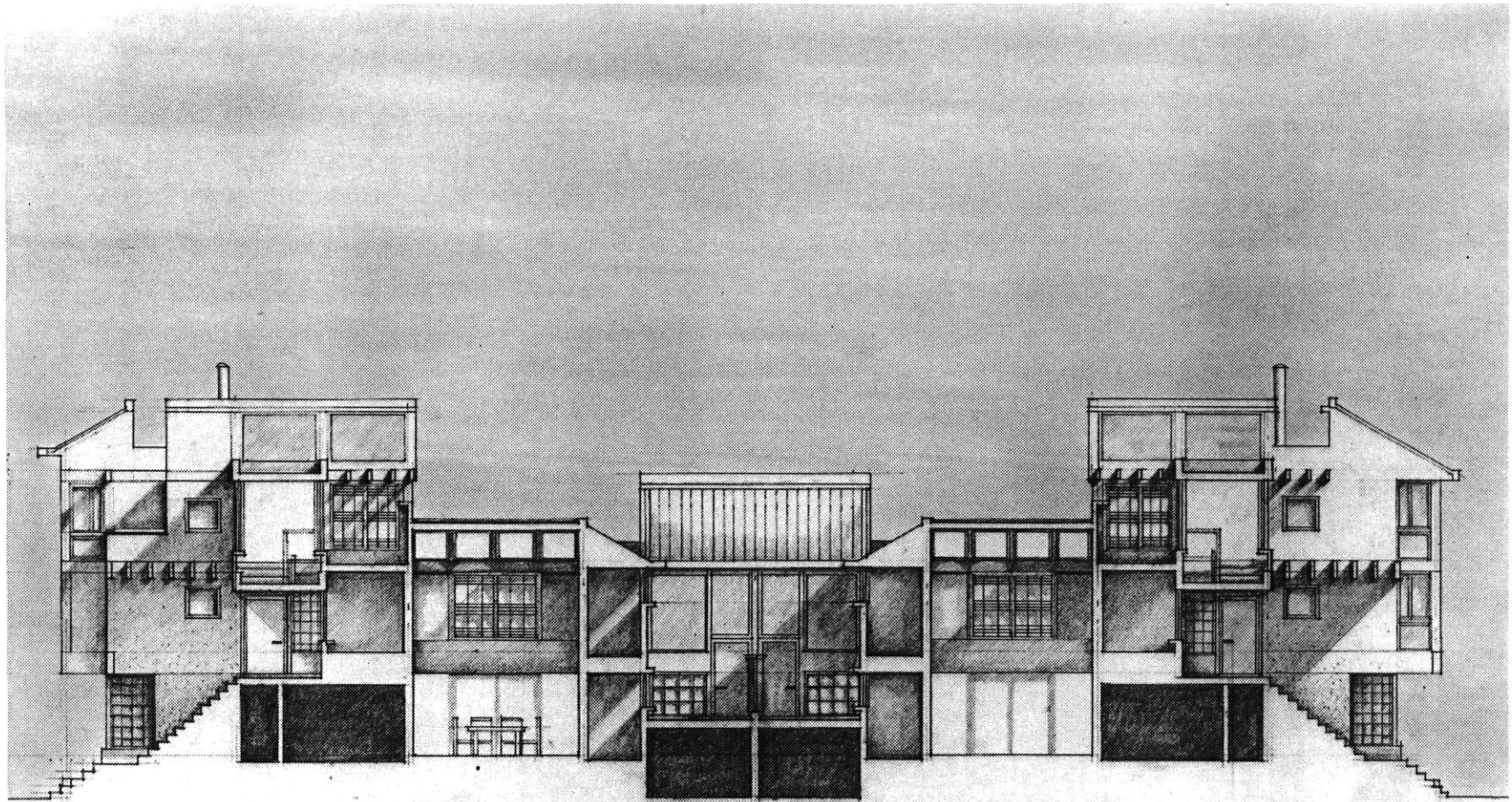


# **DRAWINGS**

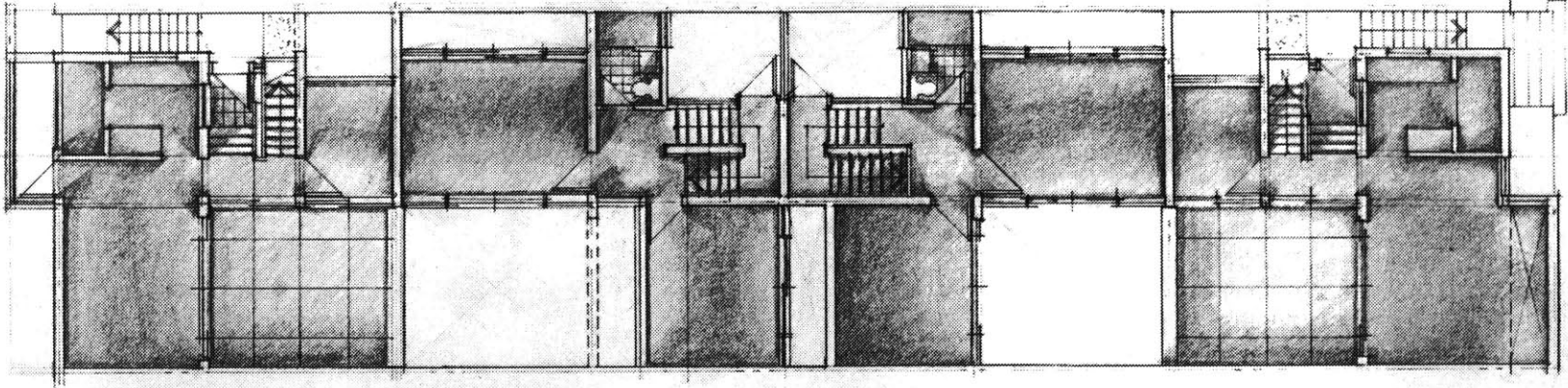




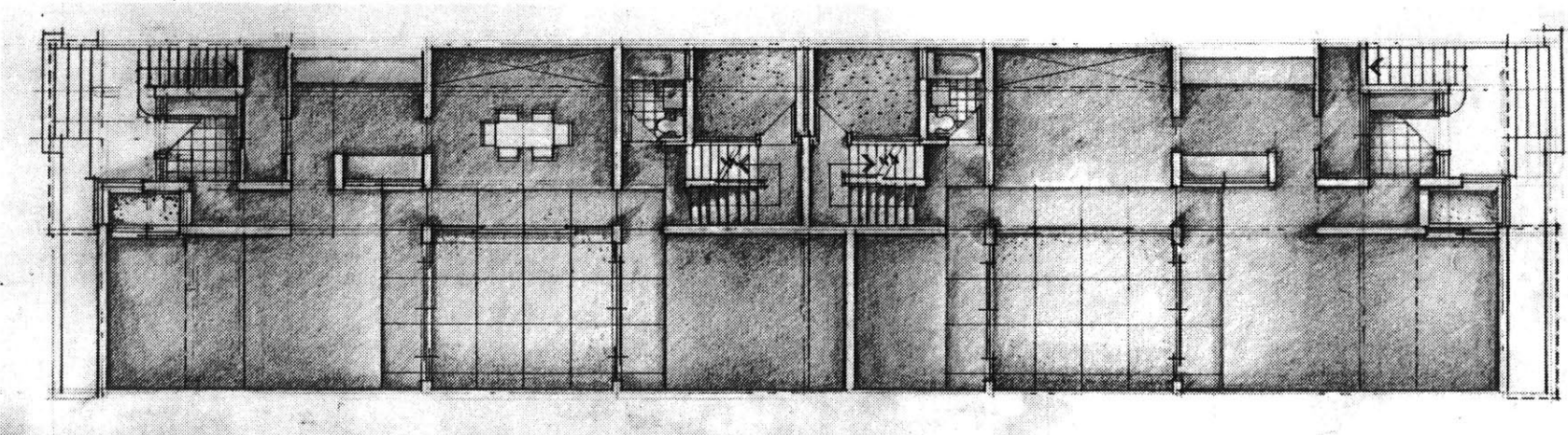
LONGITUDINAL SECTION THROUGH MAIN COURTYARDS



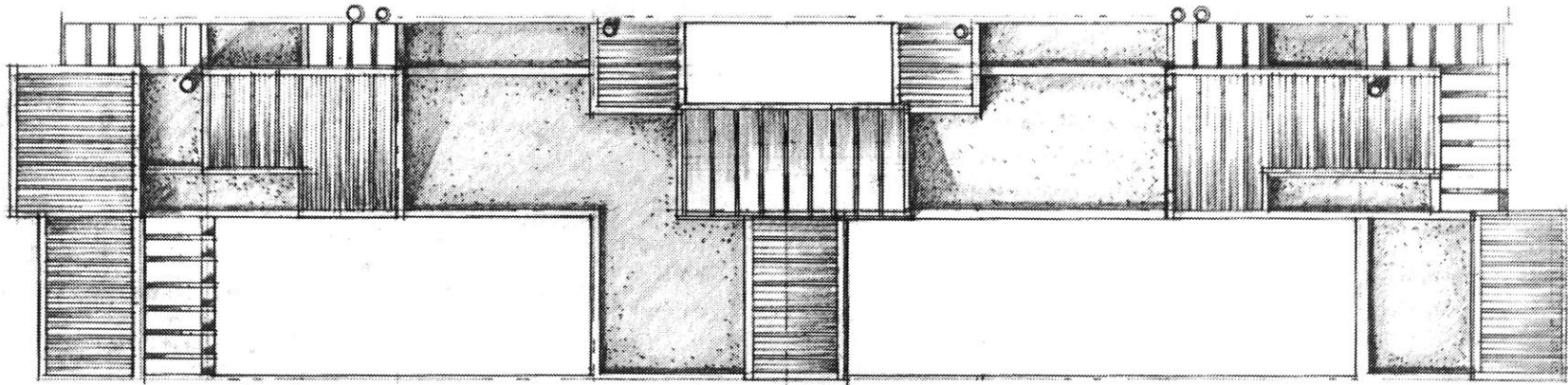
LONGITUDINAL SECTION THROUGH 1.2M ZONE



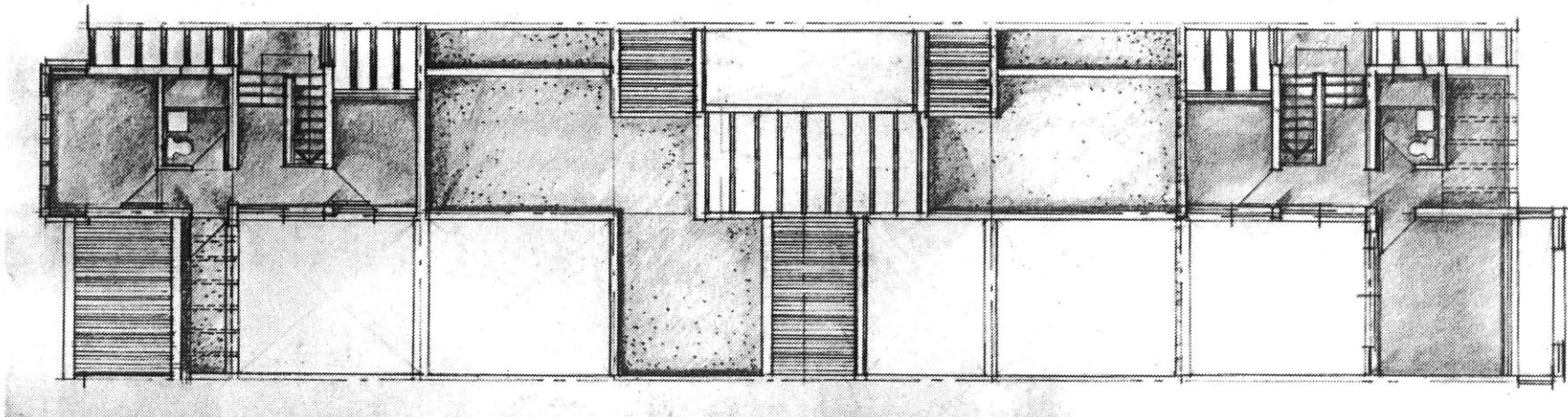
SECOND FLOOR PLAN



GROUND FLOOR PLAN

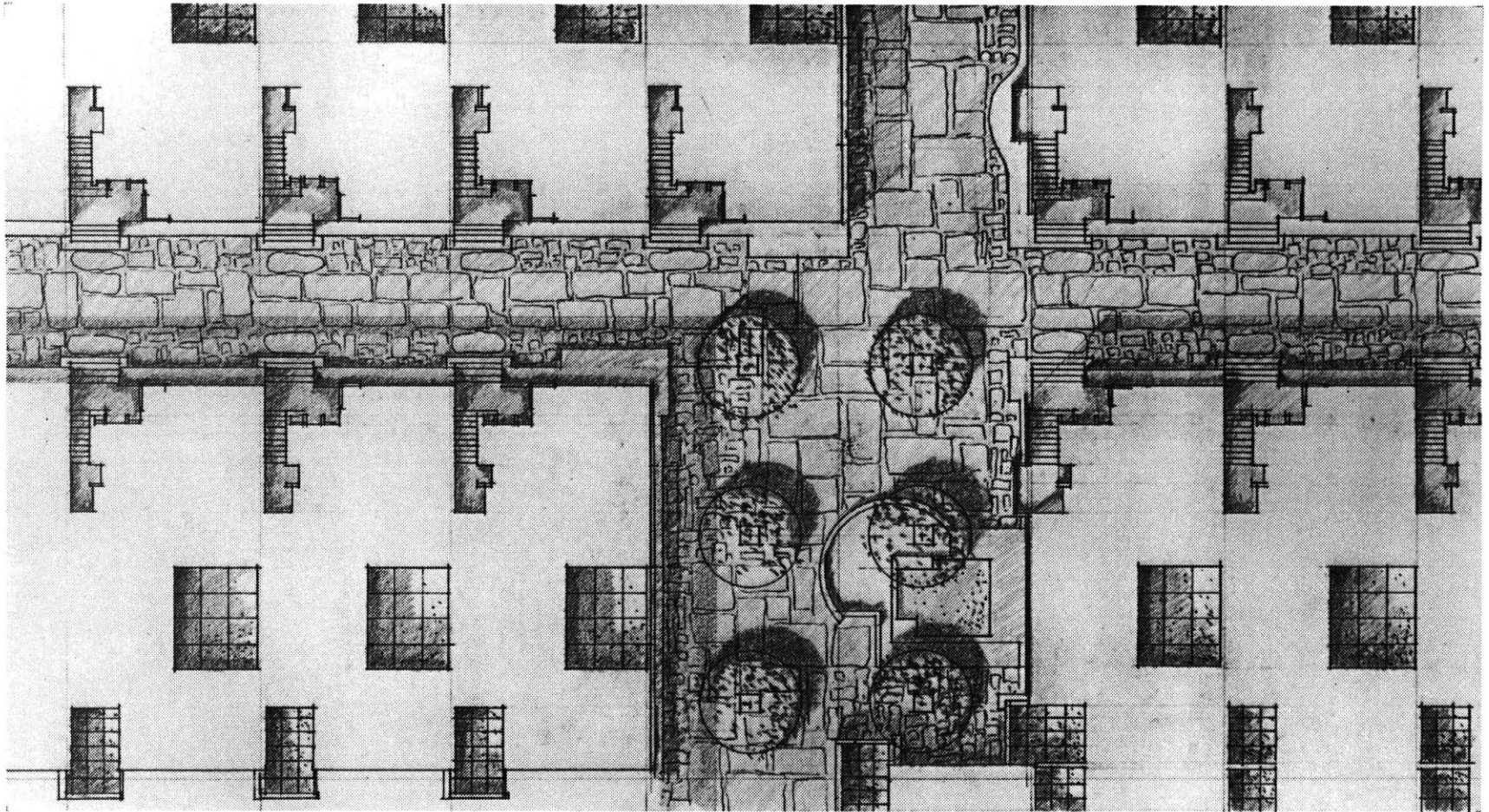


ROOF PLAN

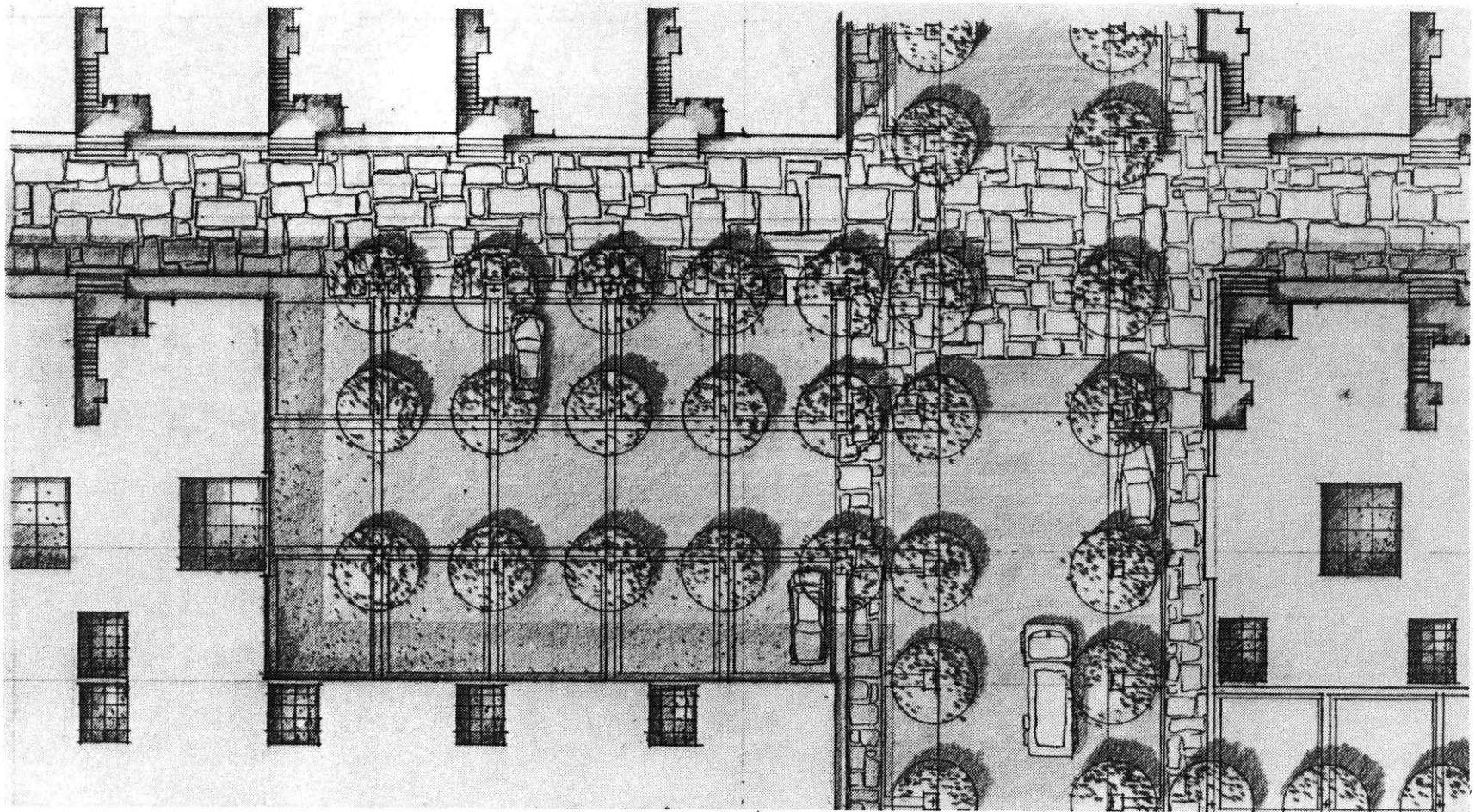


THIRD FLOOR PLAN

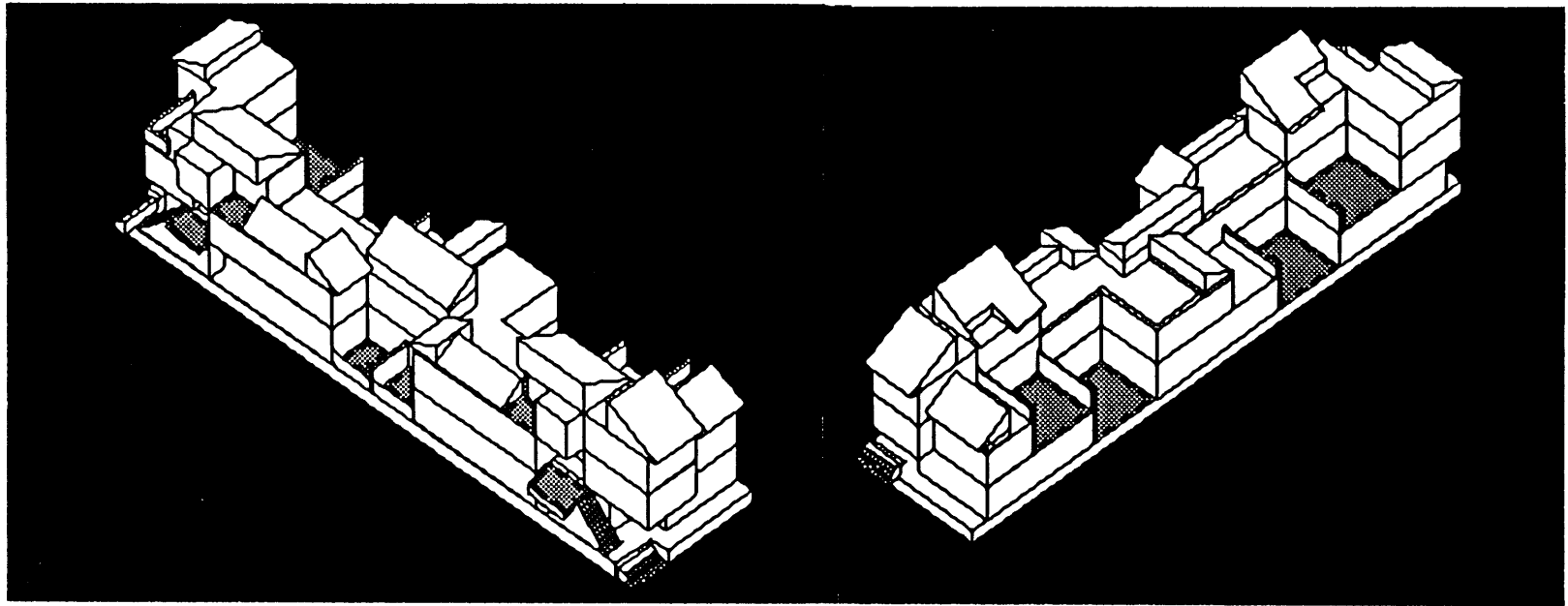




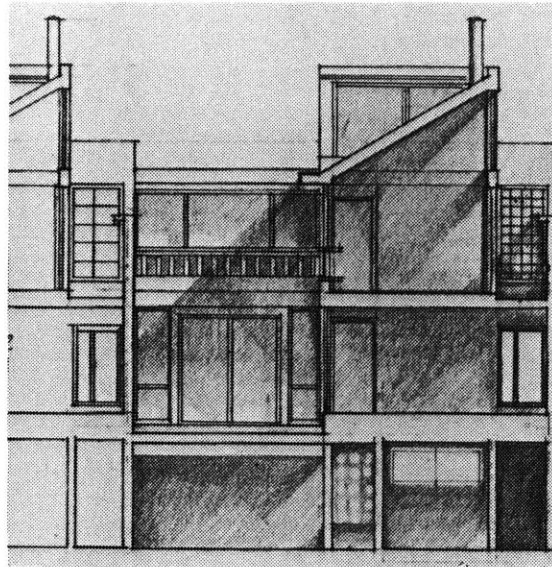
PEDESTRIAN STREET CROSSING



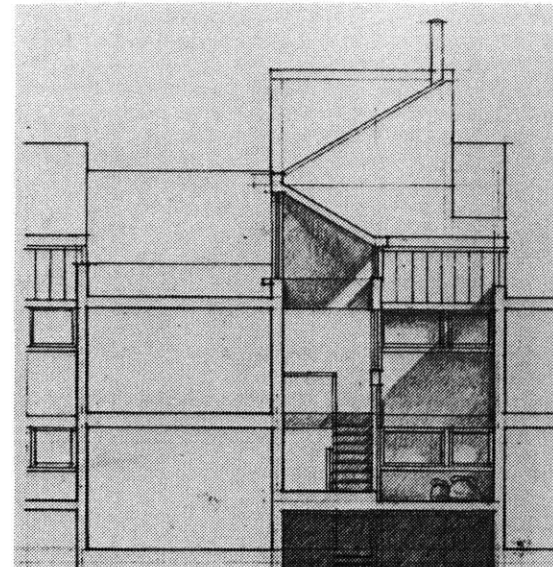
PARKING COURT



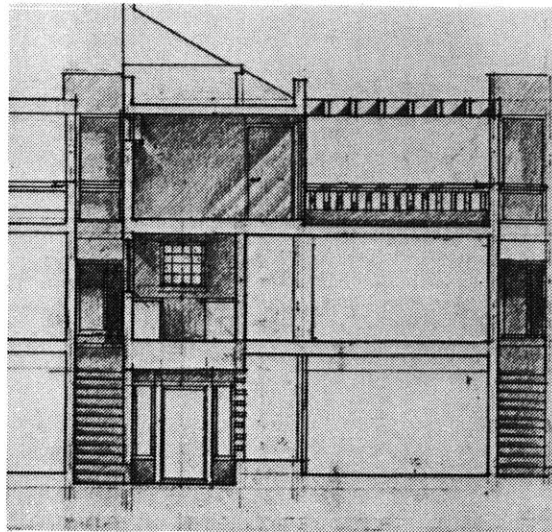
CLUSTER AXONOMETRIC



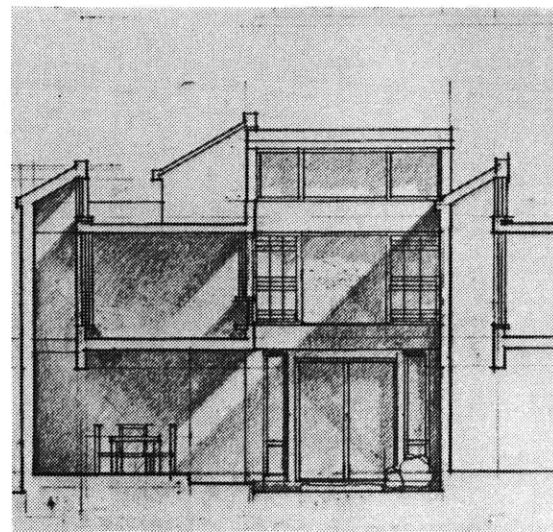
SECTION THROUGH UPPER UNIT COURT



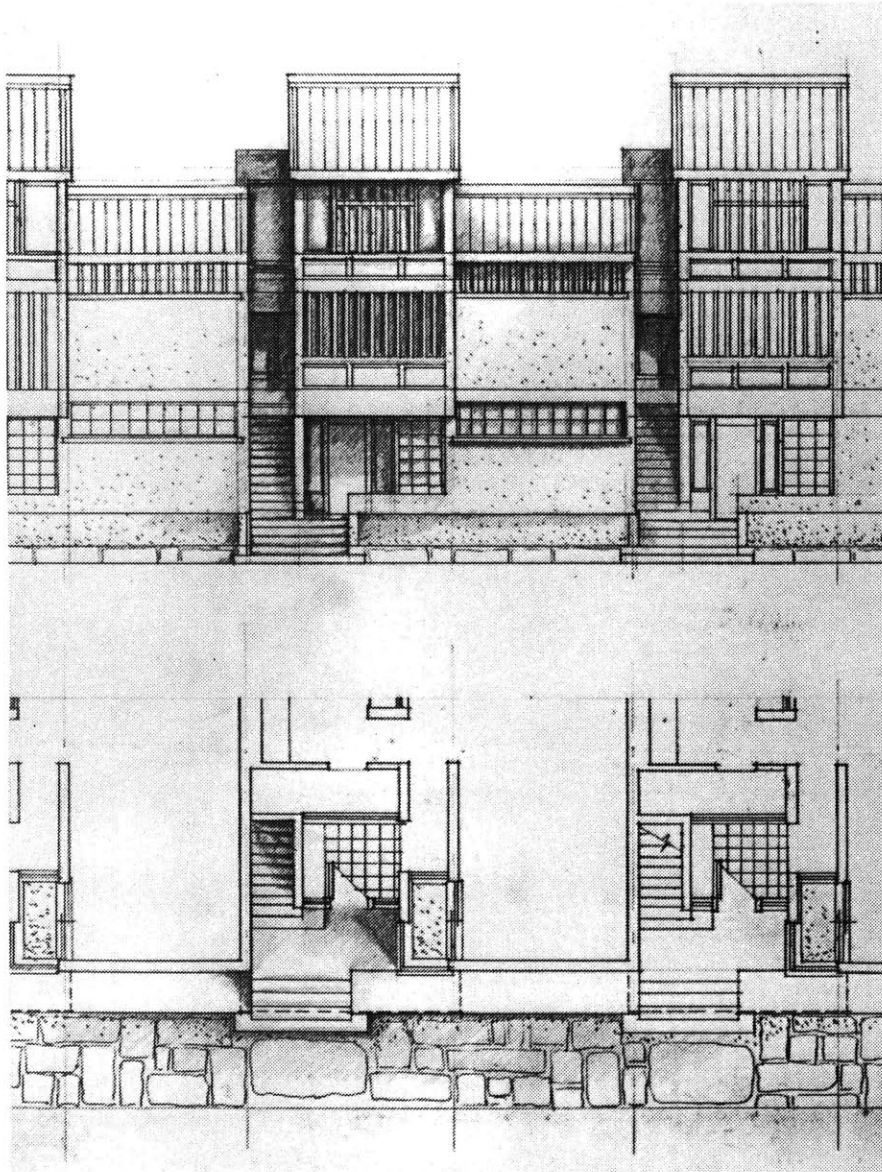
SECTION THROUGH UTILITY COURT



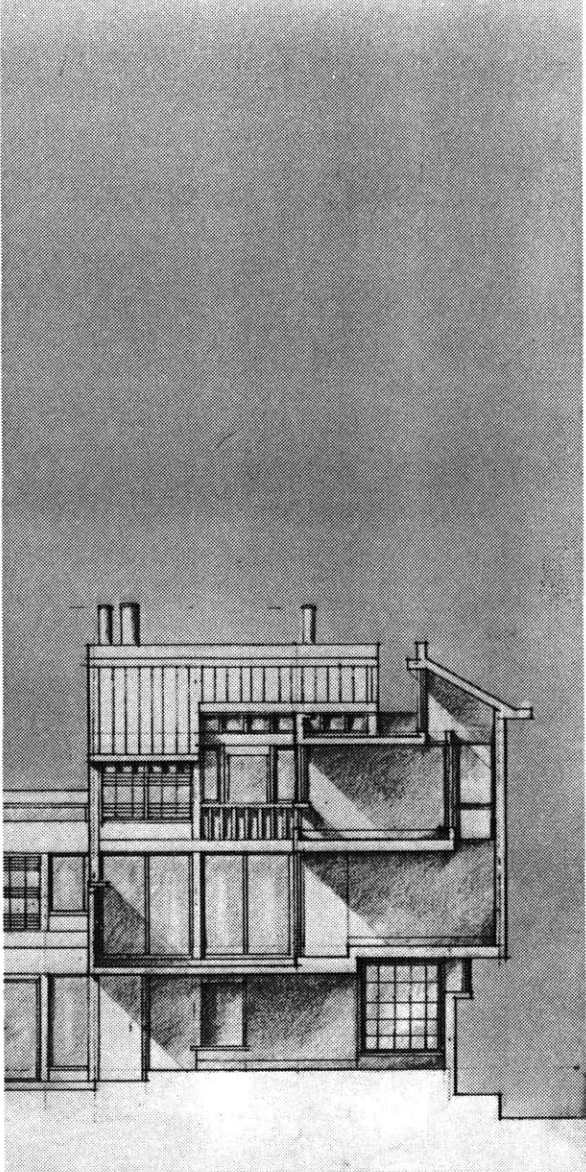
SECTION THROUGH ENTRY COURT

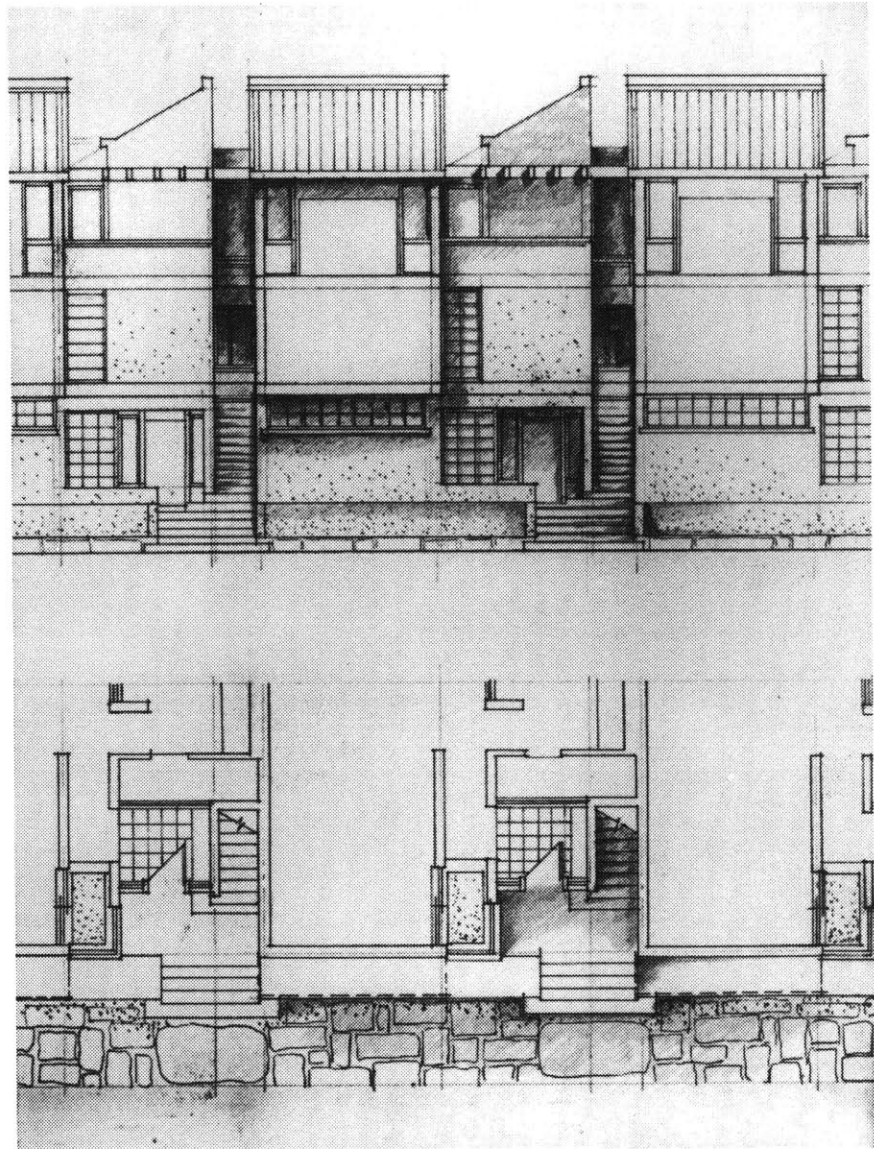
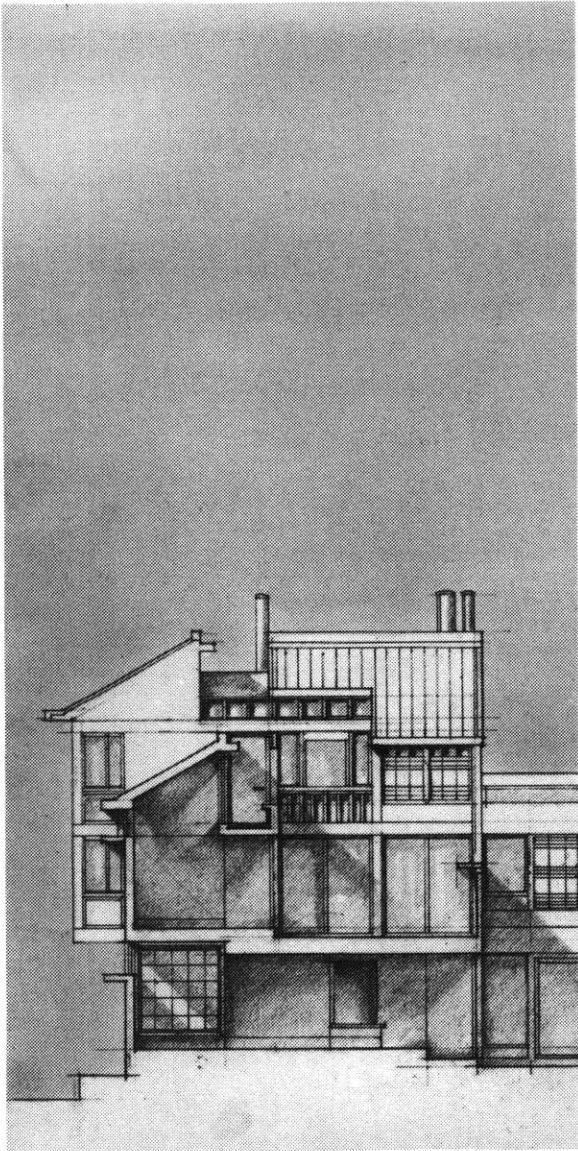


SECTION THROUGH GROUND UNIT COURT

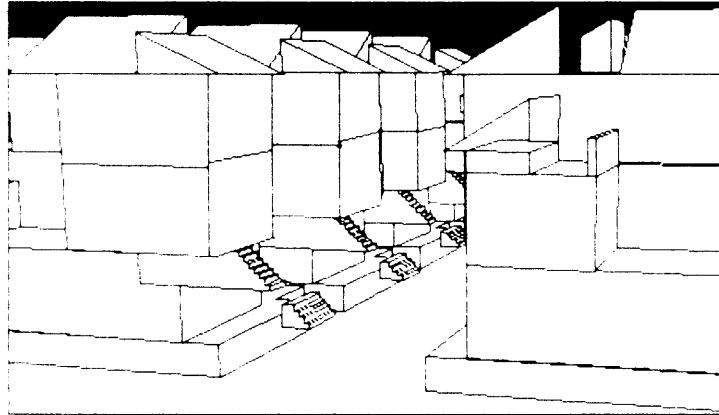


SOUTH STREET ELEVATION

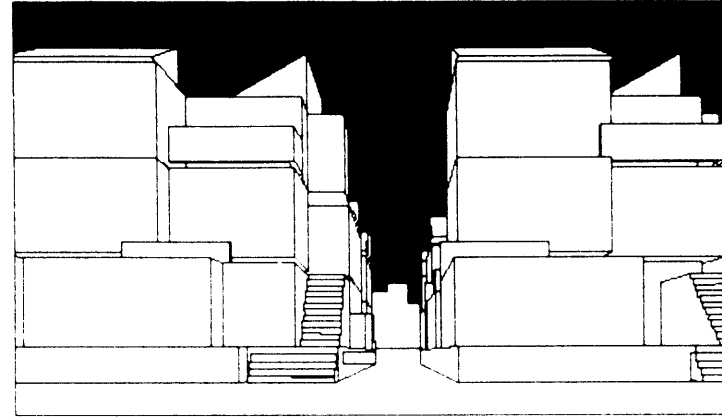




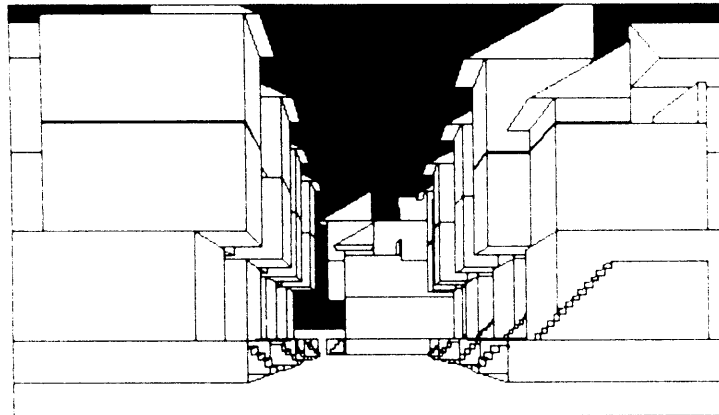
NORTH STREET ELEVATION



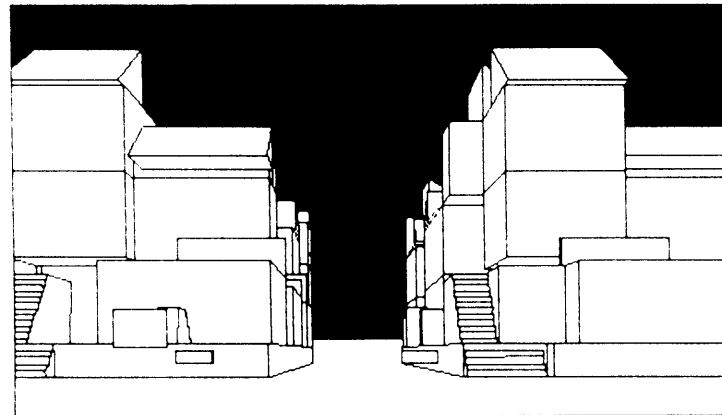
VIEW FROM UPPER FLOOR



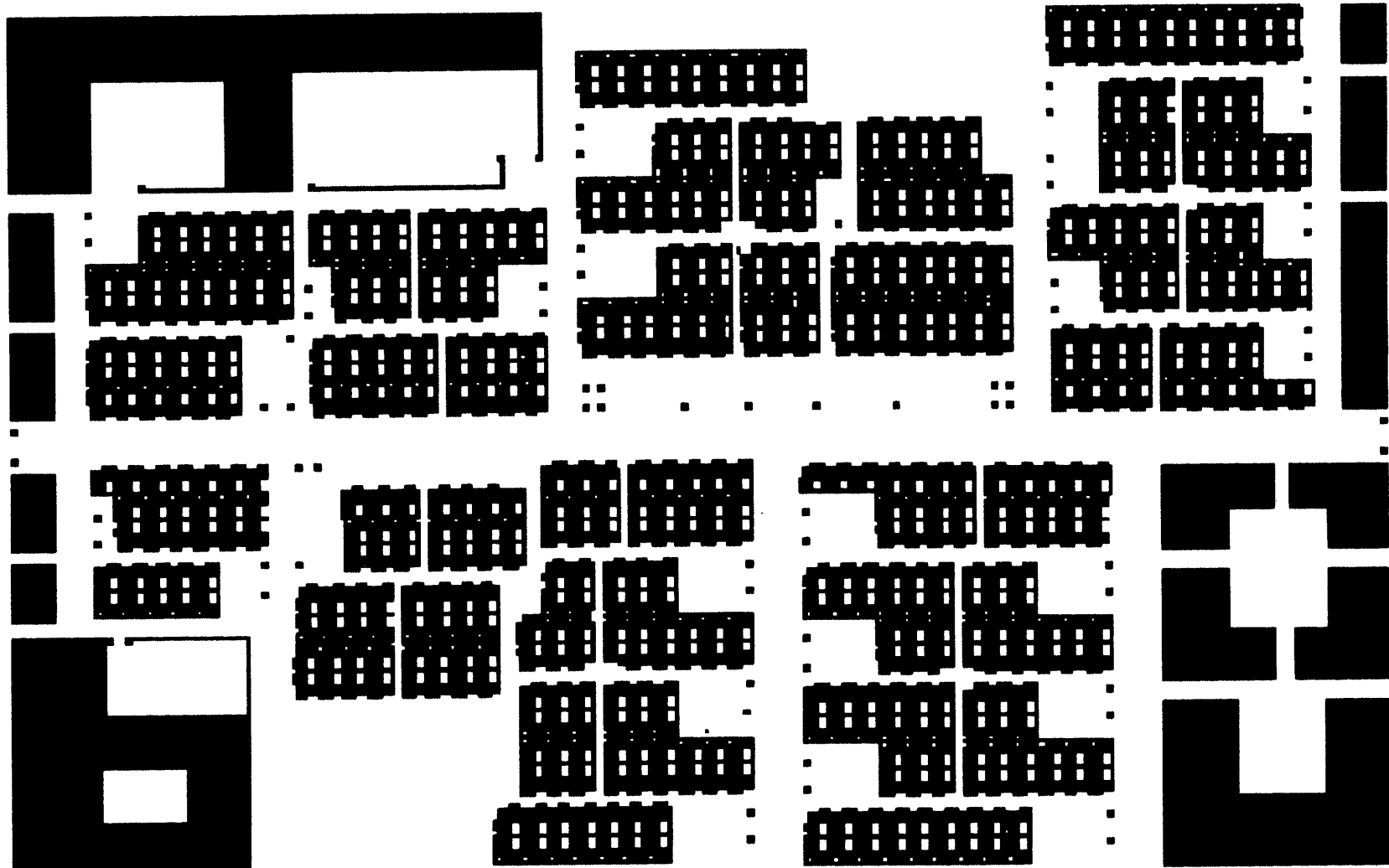
ALLEY - "GOL-MOK"



PEDESTRIAN STREET



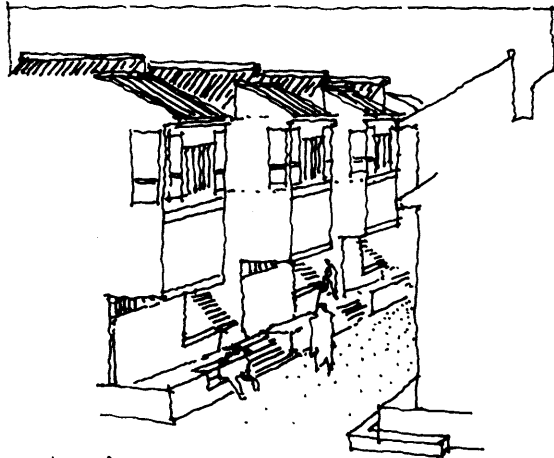
THROUGH STREET



0 9 18 36 72 m

SITE PLAN





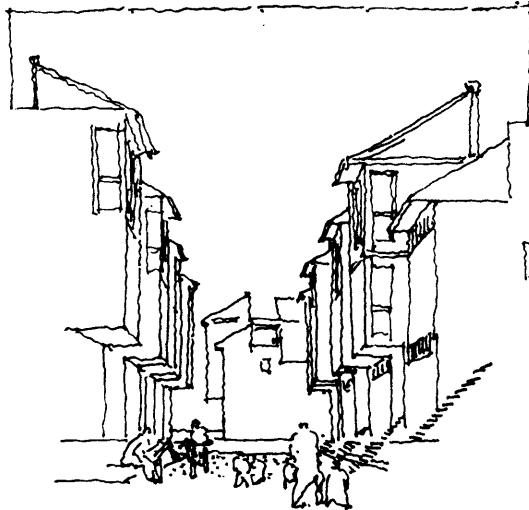
View from upper floor.



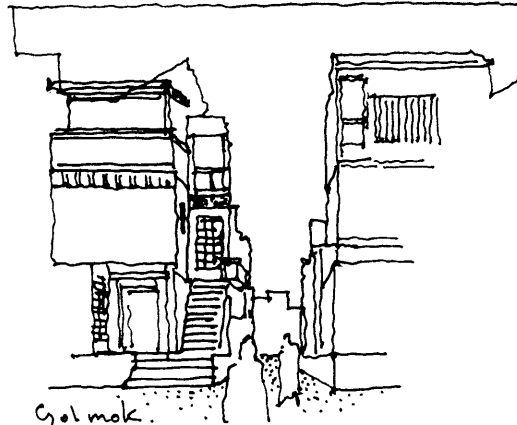
South E1.



Pedestrian alley  
"gol-mok"



Pedestrian Street.



Gol mok.



Parking Court.

## Concluding Remarks

The measure of the quality of our living environment should be based on the individual person. Family composition and characteristics vary, as do personal desires. A diversification of dwelling types is necessary to satisfy the needs of a more pluralistic society. The construction of monotonous blocks of high-rise apartment buildings is understandable considering the intense housing shortage faced by many urban centers. Density is an important part of the housing equation which should not be disregarded. It is problematic when social, economic, and political forces begin to control dwelling types.

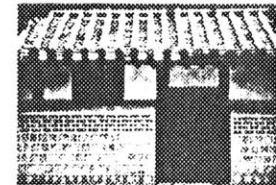
This proposal is not suggesting that all new housing should be a courtyard type but to suggest an alternative, an alternative which provides the essential qualities of house - privacy, light, and garden - while maintaining intimacy in

the street life within an urban fabric. The target density did not seek to compete with high-rise apartments. Roughly, the maximum density of low-rise housing with surface parking ratio of 1:1 is 76 units per hectare. However, there are significant trade-offs as it was discussed earlier. The resulting density is a balance between the need to provide direct connection to the ground and maintaining access to south light. Higher densities are possible by expanding on to the roof areas if a general consensus about light change over time.

This alternative in combination with occasional high-rise towers could provide the necessary density requirements. The taller buildings would provide a diverse mixture of house types, accentuating an otherwise monotonous physical fabric. Its

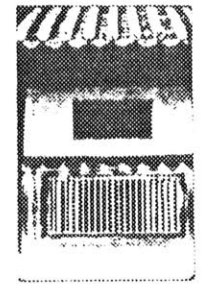
presence should not interfere with the low-rise group in terms of access to south light by locating them adjacent to large open areas or around the periphery of the block.

The real measure of the success or failure of this scheme cannot be concluded within the scope of this thesis. An exploration of actual solar access was limited to three-dimensional and sectional studies. The next step would be to build an intermediate or full scale model of a cluster in a specific urban context.





# **BIBLIOGRAPHY**





## Bibliography

Abdulac, S. and A. Boire  
*Maison à Patio* . Report. 1982.

Bastlund, Knud.  
*José Luis Sert*. Verlag Für  
Architecture, Zurich, 1967.

Blazer, Werner.  
*Atrium* . WEPF + Co. A.G. Verlag,  
Basel 1985.

Blazer, Werner.  
*Courtyard Houses of China* .  
Birkhauger, Verlag, Basel, Boston.  
1979

Boyd, Robin.  
*New Directions in Japanese  
Architecture* . George Braziller, Inc.  
New York. 1968.

Chang, Yih-Ping.  
*Concentric Cores: Towards an  
Architectural Typology of Chinese  
Compound Houses*. S.M.Arch  
Thesis, MIT 1976.

Fawcett, Chris.  
*The New Japanese House* . Harper  
and Row. New York. 1980.

Harbraken, John N.  
*Thematic Design : Class Notes* . By Lu  
Liu and Jamel Akbar. 1982.

Hoffmann, Hubert.  
*Row Houses and Cluster Houses : An  
International Survey* . Frederick A.  
Praeger, N.Y. 1967.

Kim, Edward H.  
*Korea Beyond the Hills* . Kodansha  
International ,LTD. Tokyo. 1980

Kim, Nina  
*Forms for Change: An Architecture of  
Meaning*. M.Arch Thesis, MIT 1987.

Kirchenmann, Jorg C. and Muschalek,  
Christian.  
*Residential Districts* . Whitney Lib.  
of Design. N.Y. 1980.

Lynch, Kevin.  
*Site Planning* . MIT Press,  
Cambridge. 1982.

Polyzoids, Sherwood. Tice.  
*Courtyard Housing in Los Angeles* .  
Univ. of California Press, Berkeley.  
1982.

Schoenauer, Norbert.  
*The Oriental Urban House* . Garland  
STM. Press. N.Y. 1981.

Scandinavian Institute of Asian Studies  
*The House in East And Southeast  
Asia*. Curzon Press, London. 1982.

International Architectural Competition  
Booklet:  
*1988 Seoul Olympics Athletes' and  
Reporters' Village*. Seoul  
Metropolitan Government. 1984.

Ga - Wae Dong Research Report  
Seoul National University, 1986  
Lee, Kwang-Ro

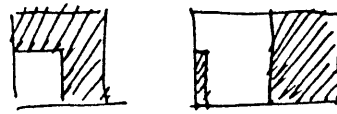


① Count as single level  
1 family

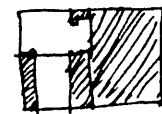
UNIT



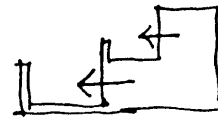
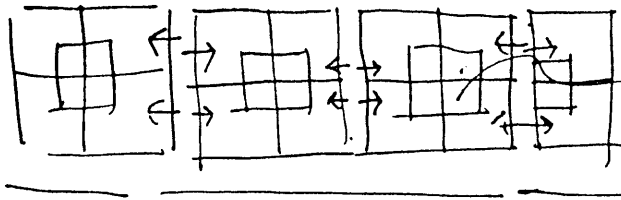
② House on 2 levels  
1 family



③ Multi family  
house  
or double count.

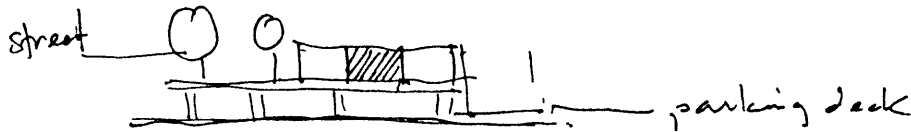


AGGREGATE



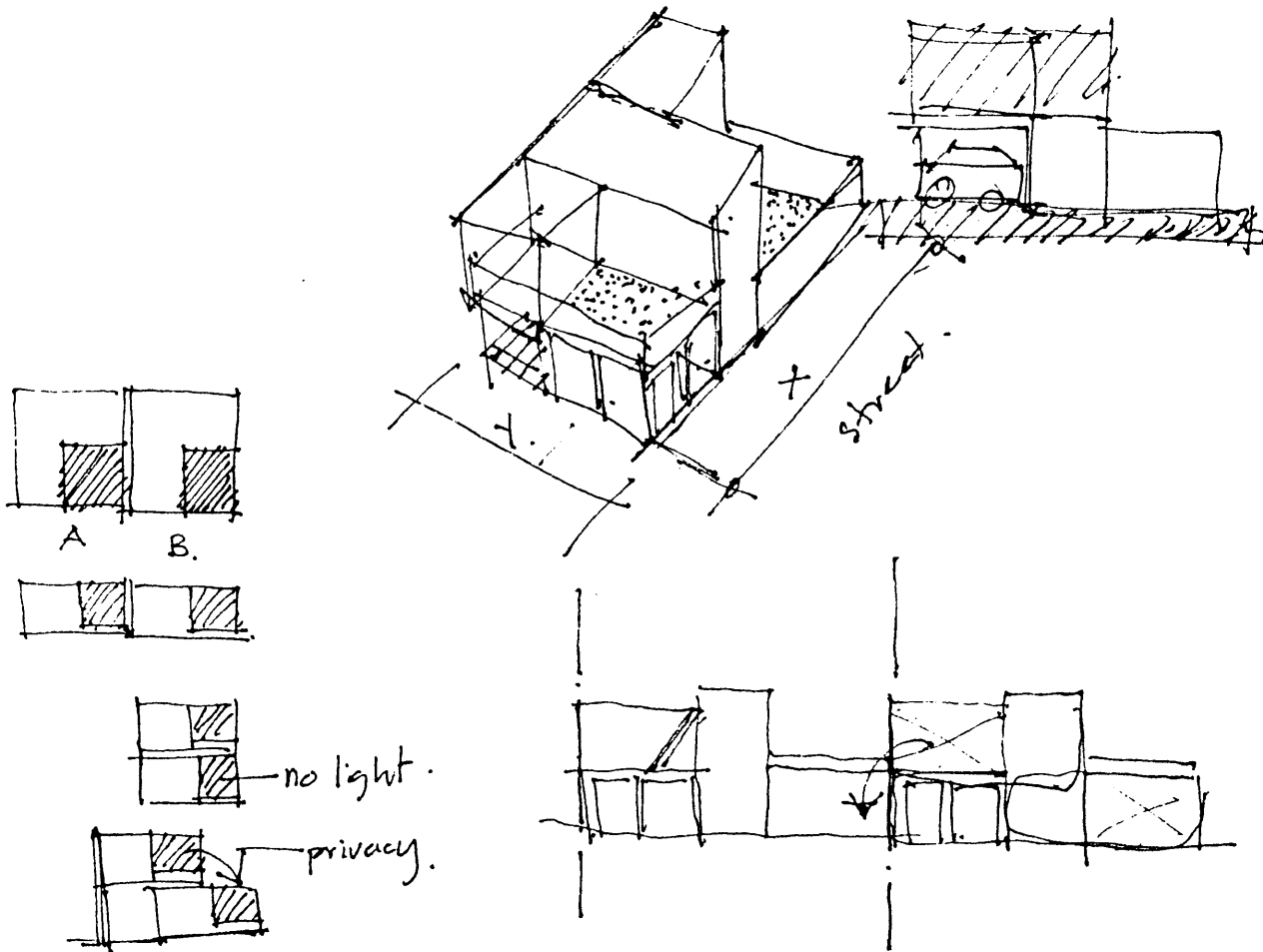
what about problem of noise?  
an introverted privacy-  
scheme.

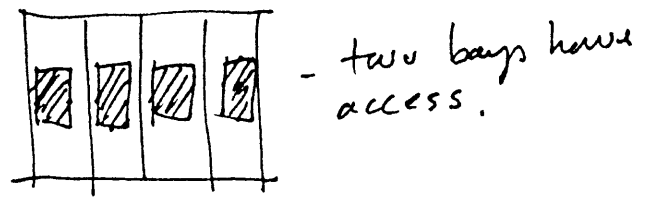
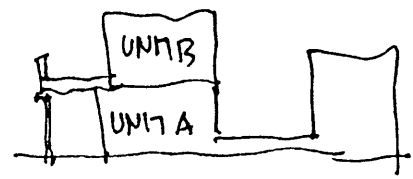
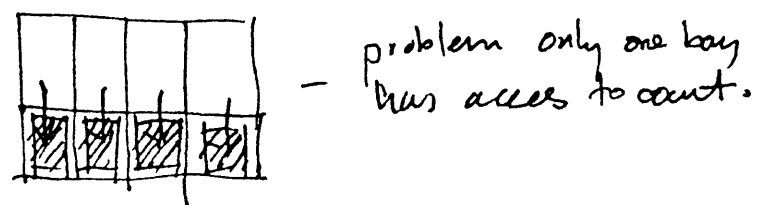
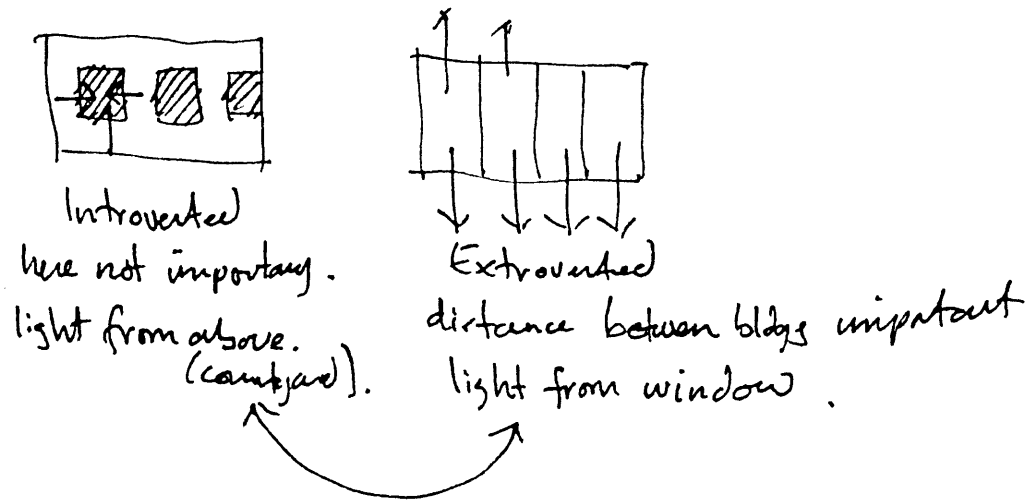
2 level house not preferred in Korea.



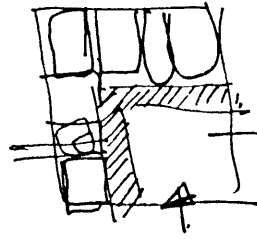
- So - challenge then is to develop a multi storey / multifamily courtyard house
- Each unit should be on one level.
- perhaps top level could have higher.





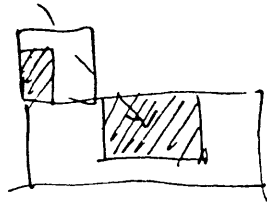
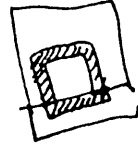
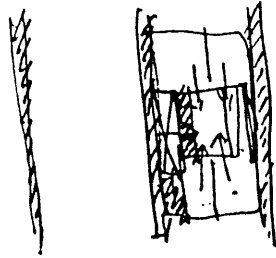


A = Court house  
B = Tenare House.

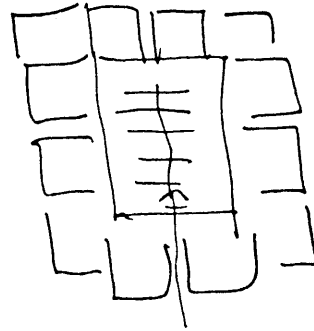
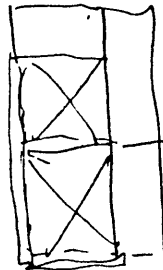


what is courtyard going to be used for?

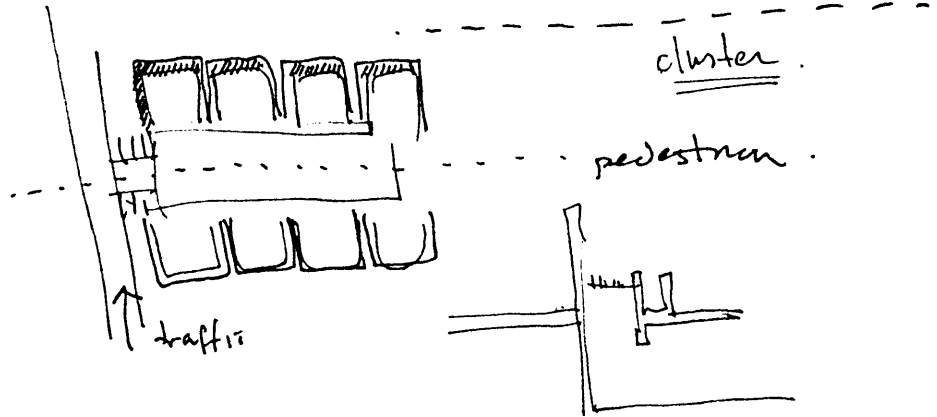
- what is minimum size for courtyard?
- ① Light catcher.
  - ② Must be large enough for small child to play.
  - ③ All rooms depend on it for light + air + view.



2



1. Unit
2. Cluster
3. Neighborhood
- 4.



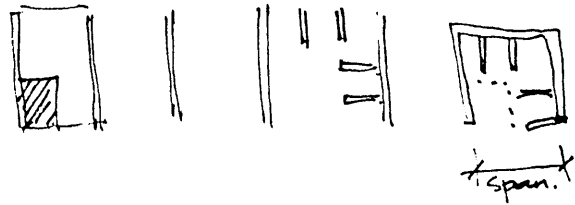
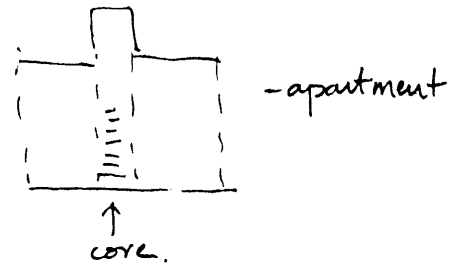
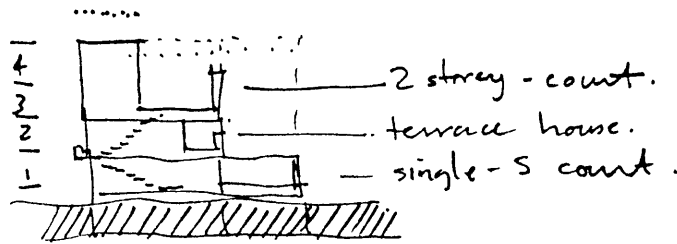
\* What are important aspects of contemporary court house?

- Issues:
- o Single or double storey? one-storey preferred.
  - o Outdoor space used for:
    - ① Light
    - ② garden
    - ③ play space
    - ④ Expansion of internal space.
    - ⑤ center of circulation.

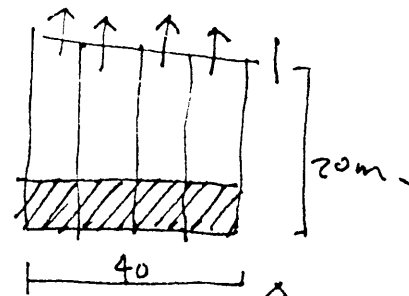
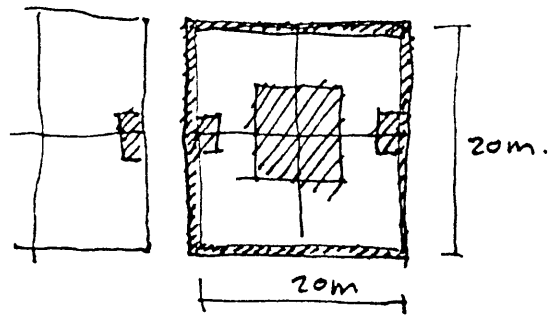
o Tasks is to: <sup>Transform</sup> Retain qualities of traditional courtyard while meeting new density demands.

Process:

- ① Explore several schemes

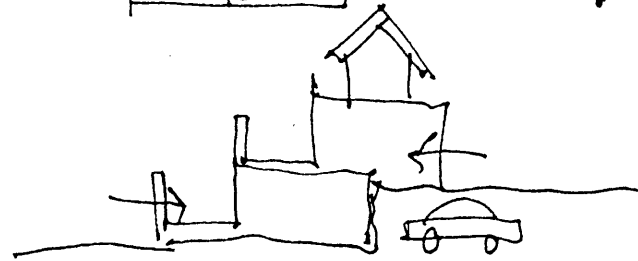
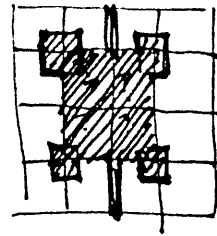


- o Issues:
- ground access
  - parking



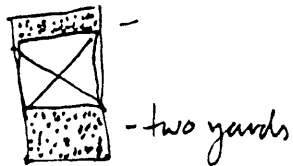
o Clarify territory adjacent to garden wall.

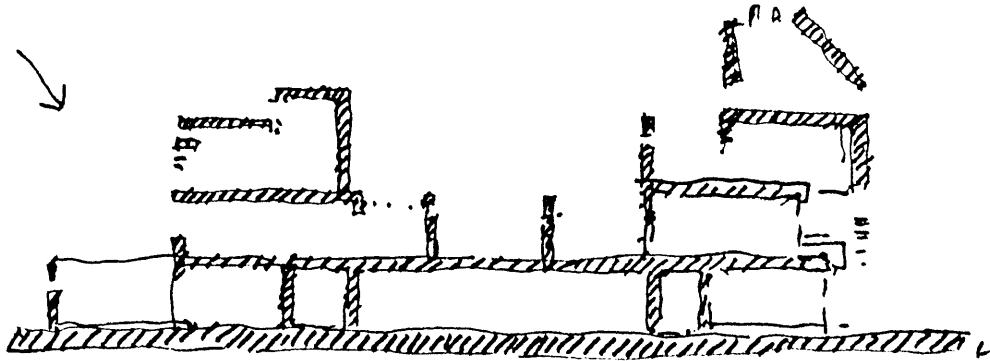
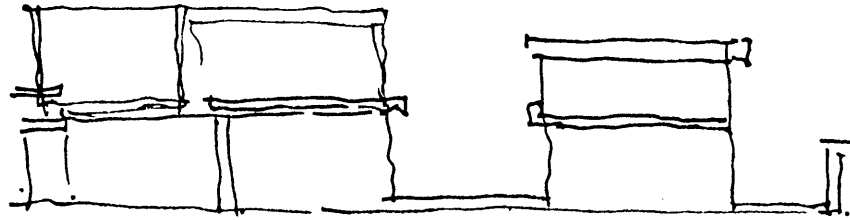
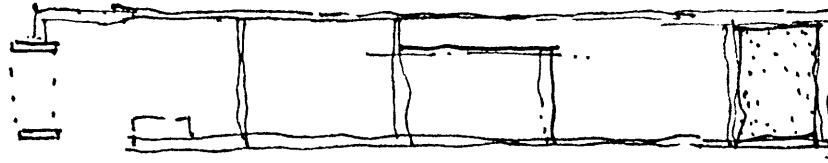
o Ventilation



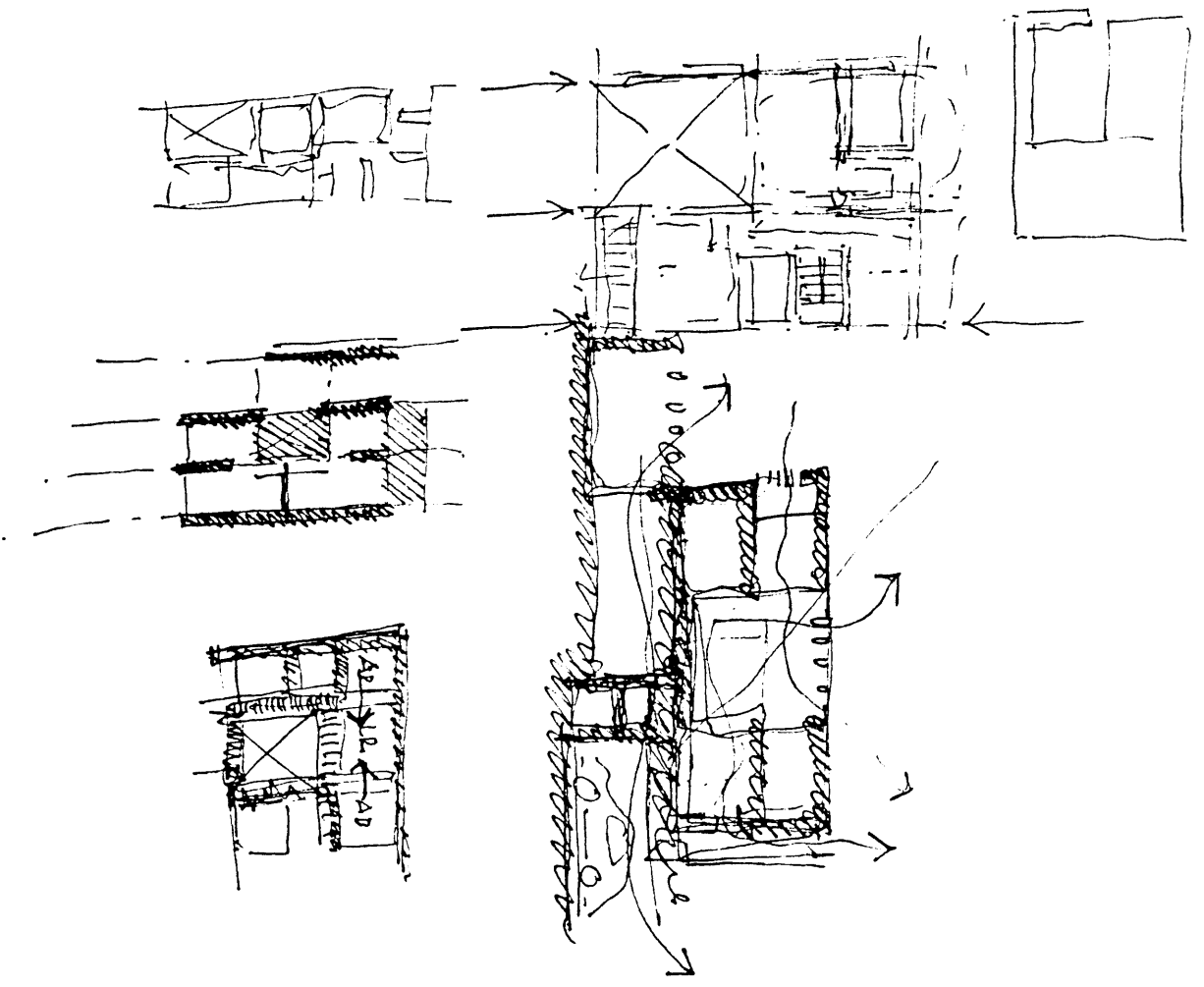
o Advantages of courtyard house is to be able to pack them closer together into clusters.

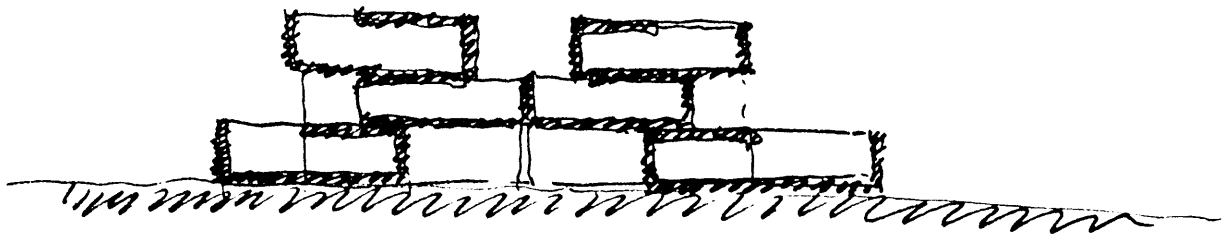
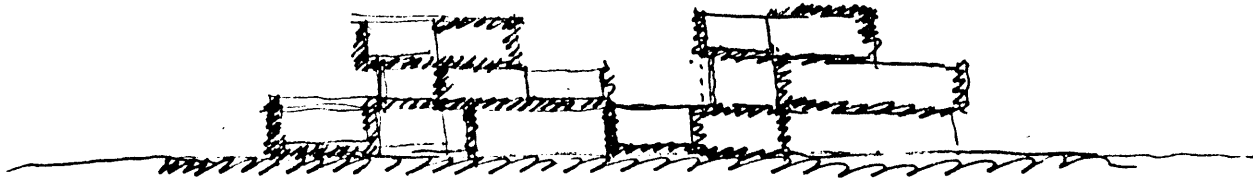
o Zero-lot-line zoning.



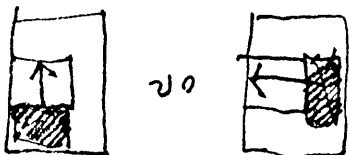


o Hierarchy of courts: unit  $\xrightarrow{\text{cluster}}$  neighbour  $\rightarrow$  district.





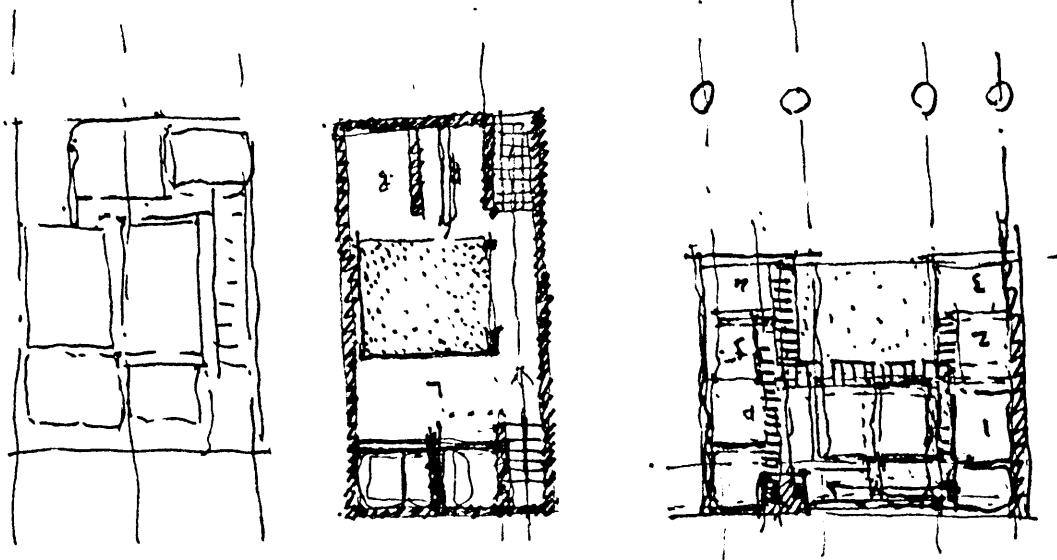


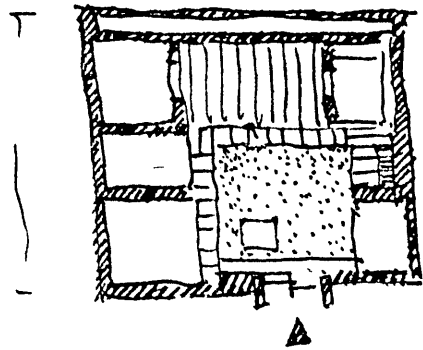
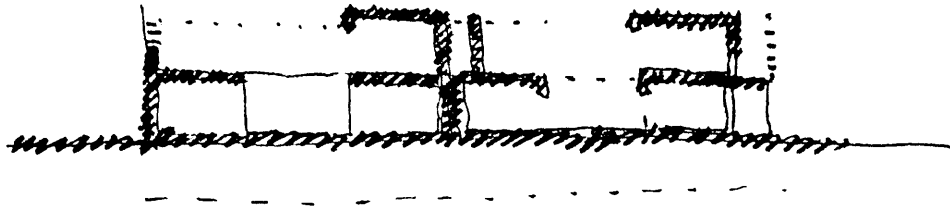


What is view to from main room?  
 Is it wall or is it another room.

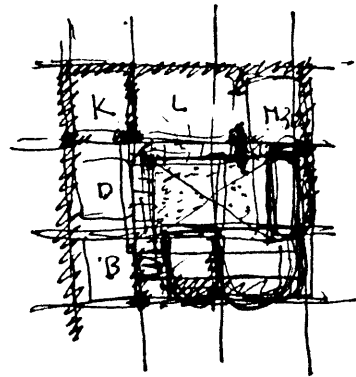
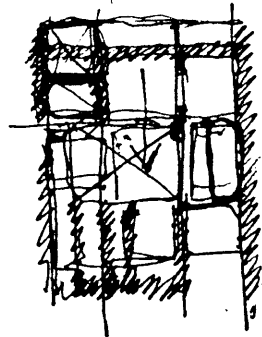
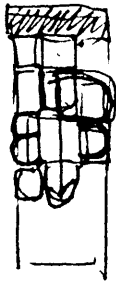
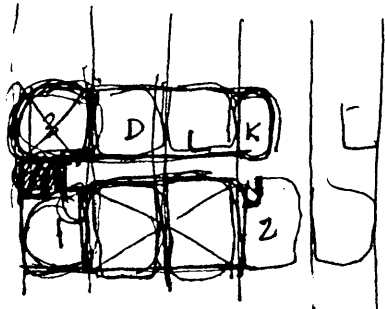
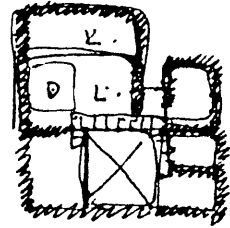
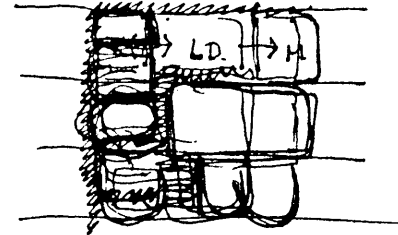
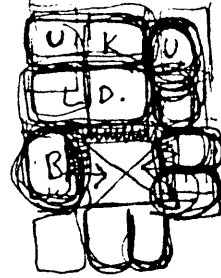
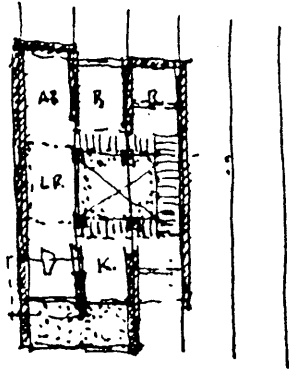


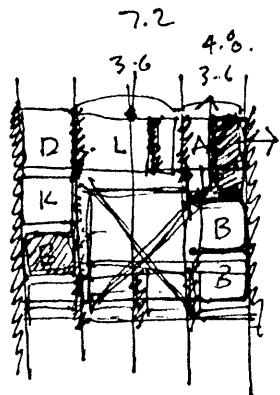
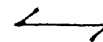
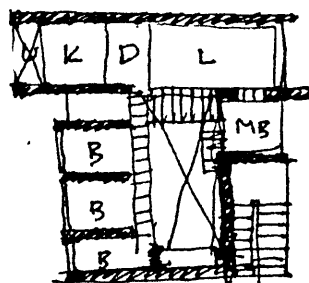
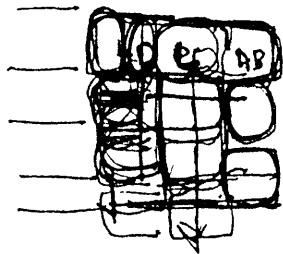
All views to courtyard.  
 Room has only one relationship.



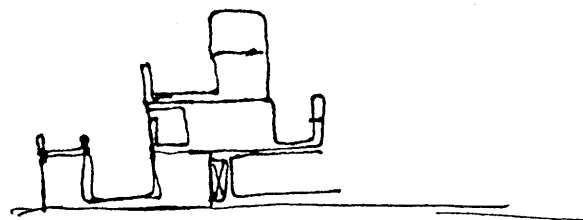
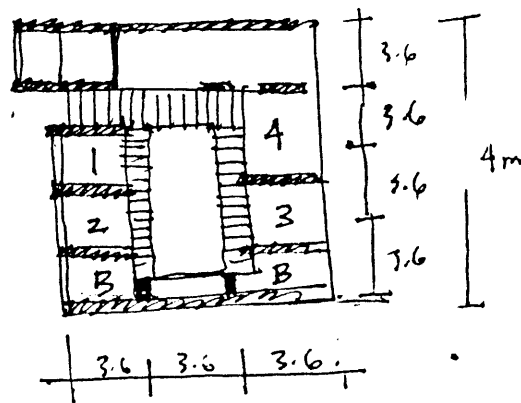


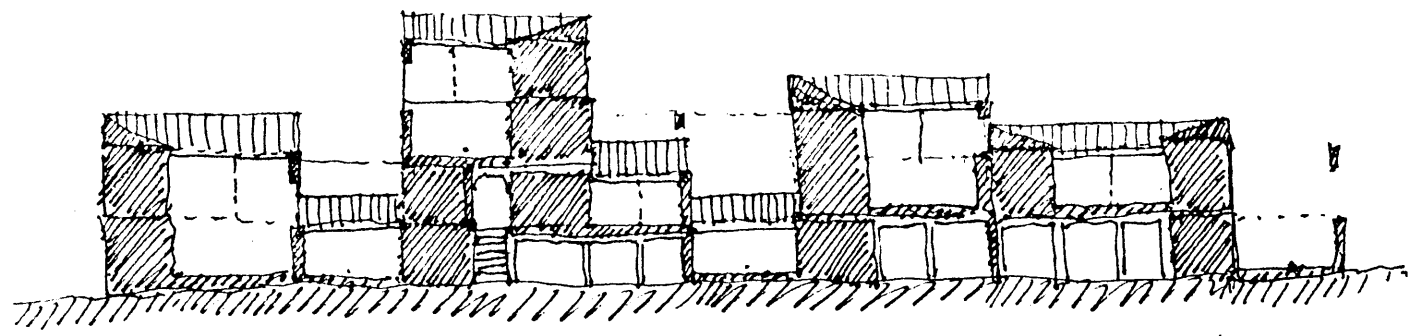
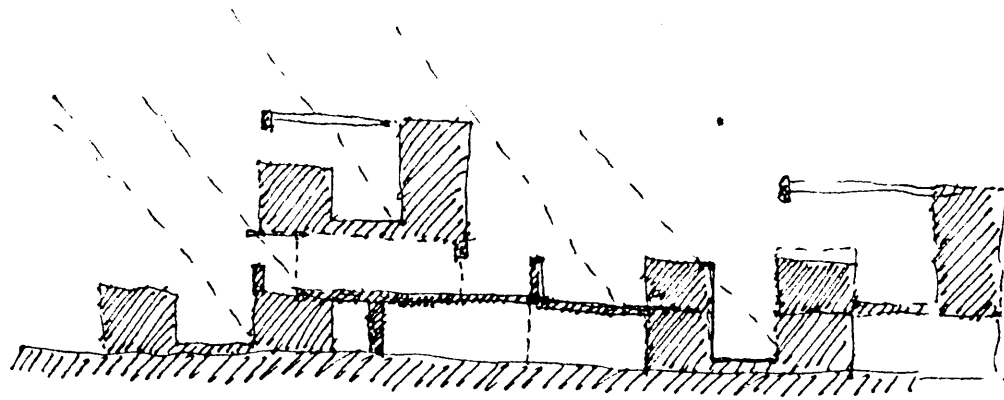
Entry - from courtyard or Rear?





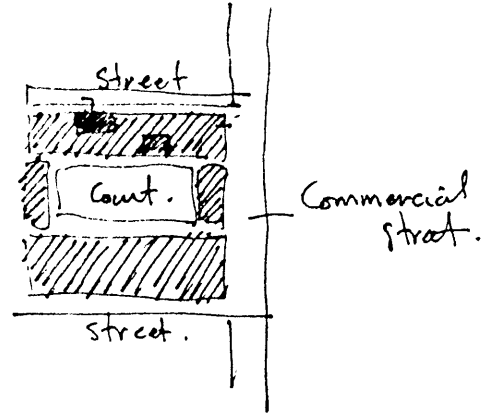
An Baug  
muss relate  
to drawing



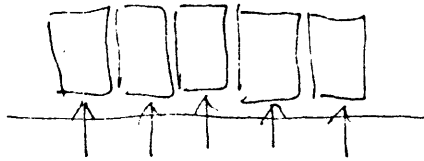
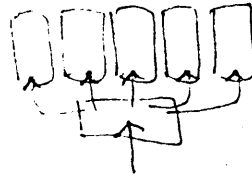


E-W SECTION.

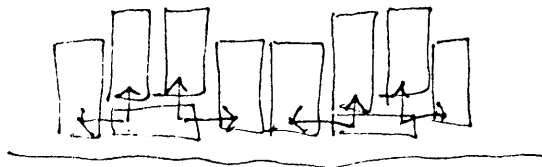
# Aggregator/Cluster



Entry:

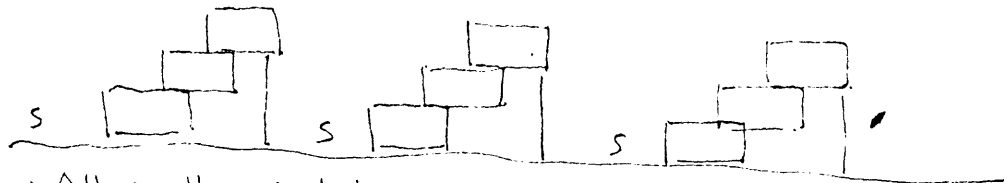


an.

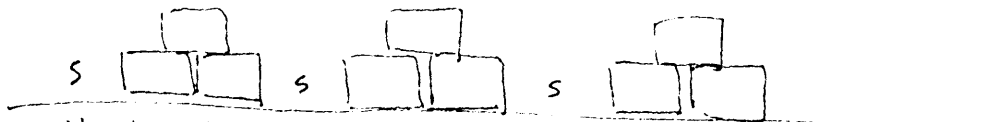


For Tuesday

- Slide sketches of interesting court housing
- References.



- All south orientation
- But streets have front yard and backyard orientation.



- North + South orientations but street is symmetrical.

