SUPPORT FOR COURT-YARD HOUSES   RIYAD,   SAUDI ARABIA

by

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B. Arch. Riyad University
1977

Submitted in Partial Fulfillment
of the requirements for the
Degree of
Master of Architecture in Advanced Studies
at the
Massachusetts Institute of Technology
February 1981

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Departmental Committee for Graduate Students

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Submitted to the Department of Architecture on October 21, 1980, in partial fulfillment of the requirments for the degree of Master of Architecture in Advanced Studies.

ABSTRACT

The objective of this report is to explore the application of the support concept in the Saudi Arabian context, as a result of the author's interest in the concept of user participation. To do so, the following steps were followed. First; an analysis and observations were made for both traditional and contemporary houses. Second, twenty-four patterns were developed to explain the possible relationship between various patterns in the Saudi culture, and in order to clarify the capacity of the courtyard house. Third, a support for courtyard house type was designed by using the S.A.R. methodology. This report deals only with design aspects on the level of the individual dwelling.

THESIS SUPERVISOR: N. John Habraken
TITLE: Professor of Architecture

Acknowledgement

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Contents

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Introduction

As a starting point for the concept of user par-
ticipation in the housing process, I explored the
application of the support concept in the Saudi
Arabian context. The support concept was de-
veloped by S.A.R. (Stichting Architecten
Research; -- an organization formed in the
Netherlands in 1964, to conduct architectural
research). The first question, then, is: How
can a concept which has been developed in a
western culture, be applied to a Saudi culture,
which is significantly different? The second
question is: What is a support, and is it really
needed? The author will try to answer these
questions briefly in the third section asking
the readers for patience in the interim.

In the following pages, entitled: "General Scope",
the author has tried to summarize the housing
situation in Riyad City. The first section is
devoted mainly to an observation of traditional
houses as well as an analysis, comparison, and
evaluation of contemporary and traditional
houses. In the second section, twenty-four
patterns were developed to clarify the potential

and capacity of the courtyard house, and to ex-
plain the different relationships between living
patterns in the Saudi culture. Those patterns
are a series of descriptions, assumptions, and
evaluations, followed by recommendations and
suggestions. The third section represents the
design of a support based on the analyses made
in the preceding sections. Only a support for
courtyard houses has been explored, in order to
concentrate on the organization and synthesis
of the living patterns.

It is the author's conviction that the concept
of support could also be developed for other
contextual applications and building forms,
such as walk-up apartments or detached houses.
However, these types have not been dealt with in
this report. Furthermore, this report deals
only with aspects related to the dwelling level;
with tissue context assumed to be developed in
detail later. Equally, problems of financing,
procedures of participation, legal aspects, and
many other related aspects which would become
essential for actual implementation, have been

relegated to be dealt with at that time.

Notwithstanding, as an architect, I am convinced
that the support concept is eminently suitable
and ultimately adaptable to the Saudi culture.
It is the attempt of this thesis to formulate a
beginning.

General Scope

RIYAD City is the capital of the Kingdom of
Saudi Arabia and the central region. Saudi Arabia
is located in the Arabian peninsula between the
Red Sea and the Persian Gulf. It has hot, dry
desert climate with two dominant seasons --
summer and winter. Its population, approxi-
mately 1 million -- including foreigners. Re-
cently Saudi Arabia has become a rapidly-
developing country with a strong economic power
because of its oil, which will be depleted in a
few decades; so the country is planning to de-
pend on other resources in the future by build-
ing its industrial strength. The government is
using the existing economic power to build all
the required facilities to serve this goal.
In Saudi Arabia, immigration from the rural areas
and nearby countries to the urban areas is
caused by the pull factor from the urban areas.
Thus, RIYAD City is passing through tremendous
growth which is causing changes in the physical
structure as well as the socio-economic struc-
ture and the result is acute shortage of housing,
community facilities, services and public
utilities. There are a number of problems. Some
of them include: lack of necessary data and in-
formation for the purpose of design, diffusion of
the traditional public spaces, the geometry of
the street, the scale, municipal regulation,
building codes, lack of infra-structure, unco-
ordinated administrative structure, increased
numbers of vehicles, and the excessively high
cost of land in and around the built-up areas and
the local roads. Speculation with land remained
unbuilt for a long period of time made it dif-
ficult for public housing to be built. Most of
the problems are due to the fact that the
developments are designed by foreign experts, who
lack the appropriate background in the Islamic-
urban culture. In order to ease the housing
problem, the government established the Mini-
stry of Housing and Public Works, the Ministry
of Municipal and Rural Affairs, and the Real
Estate Development Fund, which grants interest-
free and subsidizes long-term loans.
Housing problems in Saudi Arabia can, in general,
be divided into the following categories:
first, the lower-income group who need total or
partial subsidies from the governmental funds

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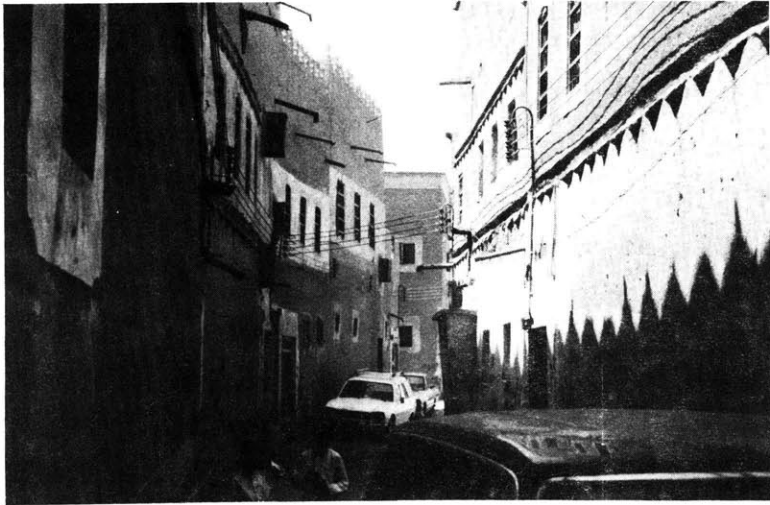
Traditional Type
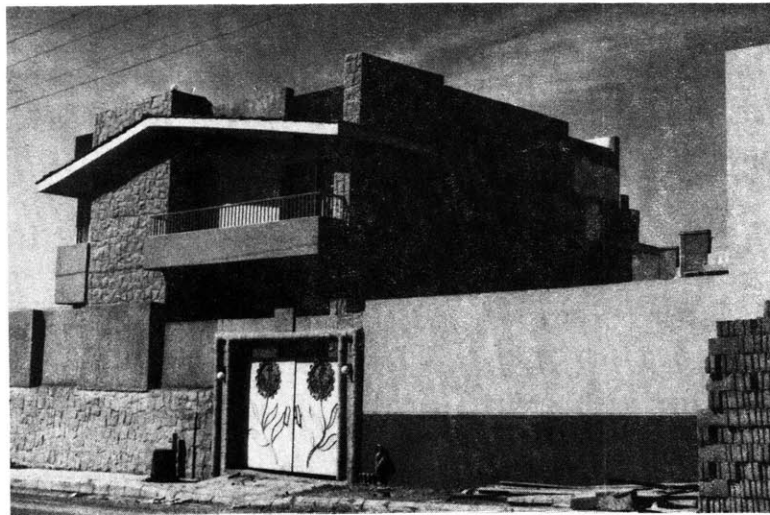
Contemporary Type

for land and construction. Second, the limited
income people who don't have access to a piece of
land and consequently, they don't benefit from
the real estate development fund. Third, people
who have a piece of land and need the government
assistance through the real estate development
fund. For the low-income people, the physical
nature of the shelter is secondary. High and
middle income people spend more money on housing.

The concept of housing in terms of produc-
tion could be divided into the following sectors:
First, houses built and owned by the residents
themselves which could be palaces or villas or
shacks. Second, houses built by developers for
renting or selling purposes, in which profit is
the main motivation, like walk-up apartment
buildings and villas. Third, houses built by the
government ministries or agencies.
Housing Typology could be classified to the fol-
lowing. First the traditional house. These
houses were built prior to 1945, and can be
found in the oldest part of the city. They con-
sist of rectangular dwelling units built around
the central courtyard and are one or two stories.

They are well-protected and isolated from the
street in which they have very few openings. All
the rooms of the house open towards the courtyard.
Generally, it is characterized by the heavy,
massive appearance and narrow shaded streets.
Second, houses built after 1945: These reflect
the present needs of their inhabitants. They are
constructed by using contemporary building
materials. The majority of these houses are
free-standing within a garden compound. Those
mentioned are the extreme two types. Other
types could be recognized, like row-houses and
walk-up apartment buildings.

Finally, in terms of participation houses in
Saudi Arabia could be classified into three
categories: Firstly, the traditional house
which was designed and built by the users
themselves, according to their own needs and
norms, by using local available materials, in
which they had full control over their built
environment and dwellings. Secondly, houses de-
signed by architects who have been hired by the
users, in which the architects try to accommodate
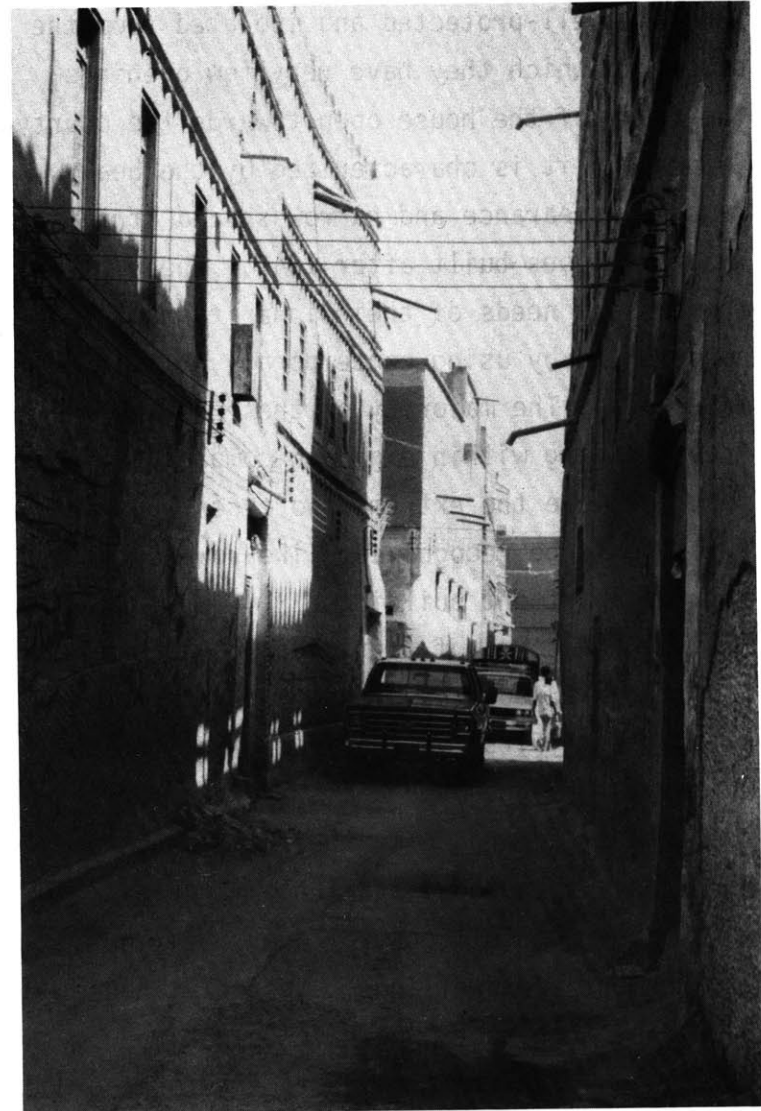the inhabitants' requirements and lifestyles

Walk-Up Apartment Building

Public Houses

within his own values and norms. In this category, the user has very limited control over his dwelling and no control over his surrounding built environment. Thirdly, the public houses built by the government in which the user has no control over his unit or his surrounding environment.

Traditional Type

Section 1:
Observation

Contents

Introduction

Most foreign architects did not understand and appreciate the suitability of the courtyard house. Some Saudi civil engineers and architects also failed to understand it, as the western house was developed as a "closed house". But the new type of house plan has not answered the religious-social demands, nor has it satisfactorily met climatic conditions. The once private, open-air courtyard has disappeared only to be replaced by a garden surrounding the house and enclosed by an eye-level wall. This garden is not private in the sense to which Saudi's have been accustomed; it is overlooked by neighbors who may prefer to sit on their first floor terrace in the afternoon. The simultaneous use of the garden and the neighbor's first floor terrace could lead to social tension between neighbors. In addition, the intense heat prohibits the garden from being used before late afternoon. Thus, for both social and climatic reasons, all activities must take place indoors.

Climatically, these houses are inferior to the traditional courtyard houses. Since they are detached houses, they have the maximum area exposed to direct solar radiation and they have large climatically unprotected windows, which invite overlooking and present security problems. In addition, the orientation is both inappropriate and incorrect. No effort has been made to provide natural ventilation like that in the courtyard houses, and because of the hot, dry air, the windows cannot be open during the day, forcing the inhabitants to rely on fans or air conditioners. Air conditioners are placed in front of the hall's main window, which reduces the natural daylight inside. In addition to their unattractive appearance, these air conditioners are not economical to run and maintain. Unfortunately, this type of house with its air conditioner has become a status symbol for rich people, while the traditional courtyard house is associated with the lower classes. Among the new houses, the streets are very wide; since they provide no shelter for the pedestrians, few people use them in the summer before the late afternoon. In contrast, the alleyways of the traditional areas are used by pedestrians throughout the day.

In Saudi Arabia, where the rate of physical expansion has been very high, land for residential use is being allocated to government employees according to their professions. Each professional group has its own building society and its own type of modern house. The practice of professional segregation has led to a weakening of social relationships in these new areas. Friendship between neighbors is based on rank and position, which is a complete reversal of the traditional society which existed for many centuries. Most of the inhabitants of owner-occupied courtyard houses have moved out to live in the detached houses. As a result, a large number of courtyard houses are now occupied by poor families and families who have migrated to Saudi Arabia or the houses are used as storage for commercial use. These changes have come about because of rising standards of living and the growth of the population.

Although traditional houses lack proper sanitary facilities and adequate protection against dust storms, they have come a long way to meet the religious-social criteria and climatic needs.

What is needed is not the replacement of tra-
ditional houses by western type houses, but an
understanding, analysis and appreciation of their
advantages over other types of houses. The prob-
lem would then be that of rationalizing, co-
ordinating and incorporating these character-
istics or their equivalents into the new houses.

The following are some of the differences
between traditional and western houses:
oThe participation of the users was common in the
creation of the traditional dwelling and com-
munity. The results were highly identifiable
dwellings which expressed the personality,
culture, occupation, social habits and available
resources of the local inhabitants. Today's
mass development reduces user participation to a
minimum and consequently causes a loss of
identity.
oIn the past, rooms had no specific names and
were used as required by the family. However,
today rooms are designated for specific uses in-
corporating the appropriate furniture, so that
rooms are no longer used to their full po-
tential.

∘The traditional dwellings have been small with respect to dimensions. Recently, dwellings have increased in size due to the reduction of private outdoor space, less efficient use of indoor space, and the motivation of social prestige. As a result the dwellings have become more expensive.

∘Health and sanitation procedures in the traditional houses were established and based on a balance between the resources available and that which people could provide for themselves. Today, everyone relies on the advantages provided by modern technology. On the other hand, the effects of government investment in utility systems and the disappearance of self-dependence among residents have not yet been adequately integrated.

∘In the traditional pattern there is a definite hierarchical order in the formation of the alleyways. Main alleyways enclose large blocks of houses which, in turn, are divided into smaller blocks by narrow alleyways that finally lead to closed alleyways. These closed alleyways provide more security for their inhabitants because they exclude nearly all strangers and passers-by. Nowadays, with the increase of social mobility in massive development, the cluster-scale social group and its cultural values are being forgotten. The relationship between man and his community becomes very limited, because upon leaving his dwelling he is transplanted into the town level without intermediate hierarchy of spaces.

∘The traditional houses were always served by pedestian systems, which consist of walkways on different levels of privacy and visual access. Today the movement system is mainly for the vehicle and is, therefore, unsafe for small children. It offers no opportunity for adult social activities and group gatherings.[1]

1 SHELTER AND SOCIETY, Edited by Paul Oliver Oriental Houses in Iraq by Subhi H. Al-Azzawi, 1969, p. 91-102.

Architecture of the Islamic World, Edited by George Michell. The House and Society, by Guy T. Petherbridge (1978), p. 193-208.

Social Aspects

Islamic urban and cultural organization is the physical manifestation of the equilibrium between social homogeneity and heterogeneity in a social system which requires both segregation of domestic life and participation in the economic and religious life of the community. Characteristically, the city compromises a system of public, semi-public, semi-private and private spaces, varying in degrees of accessibility and enclosure. The main public areas of the town are those of the central shopping area, lined with open shops and workshops, associated with major mosques, cafes, and caravanserais. This is the domain of men, with the emphasis on accessibility and unrestricted contact. Town and city quarters, perhaps, occupy just a single street and are usually formed by relatively small homogeneous communities, bound by common religious ethnics or occupational ties, (jewellers, tanners, weavers, relatives, etc.). They have a strong feeling of group solidarity with reciprocal duties and obligations. City quarters are an ancient and ubiquitous phenomenon in Islam.

The quarter is a knit group providing consciousness of social identity and security. There is always a balance maintained between this social self-sufficiency and isolation. The quarter participates in the communal and economic affairs of the city as a whole. Each quarter is not usually emphasized architecturally. It is physically linked with the neighboring buildings of the adjacent quarter. The residents of a quarter sometimes extend their contacts in all directions, particularly to include their back-to-back neighbors. However, closely the individual is associated with the life of his quarter, he also belongs to another unit: the family, the basic and irreducible unit of social life. The right and obligation of the family to live enclosed in its house has led to a clear separation between public and private life, which is, perhaps, the most significant social characteristic of Islamic culture. The Arabic name, Sakan, is used to denote the house and is related to the concept of peacefulness. The word for woman, Harim, is related to haram, sacred area, which also denotes the family living quarter. Although the outside world is dis-

couraged, access for the womenfolk is also limited. If suitably protected,.the women may observe public life under certain conditions. The separation of women is manifested physically in various forms of barriers through which women can see, but not be seen. The screended balcony allows the female occupants to view the outside world without being seen. In the interior of the houses screens may be built providing openings from which women can observe without being seen. The Islamic house, therefore, is an introverted house.

In Islam the man is permitted to have four wives, although this is rare these days. He has reciprocal legal obligations to provide his wives with separate apartments (who must in return have equal access to him and equal status among themselves). The same rule applies when one of the husband's relations is lodged in the same apartment with the wife. If they are not wealthy, the husband must provide a separate apartment according to his means, which must possess the necessary conveniences and must be isolated. In these cases, houses are made up of separate apartments. While they do not communicate directly with one another, they share the central courtyard and entrance. The women of Saudi Arabia these days have their own activities, but are still separated from the men. For example, the women have their own clubs and libraries; almost all women have an education. Some are involved in occupations such as teaching and nursing. The most popular recreational activity for women is their gathering together in parties, such as weddings. Finally, the influence of religion upon all aspects of life and upon the attitudes of the people is very strong and sets the accepted pattern of morality, respectfulness for older people and neighbors.[2]

2 Architecture of the Islamic World, Edited by George Michell. The House and Society, by Guy T. Petherbridge (1978), p. 193-208.
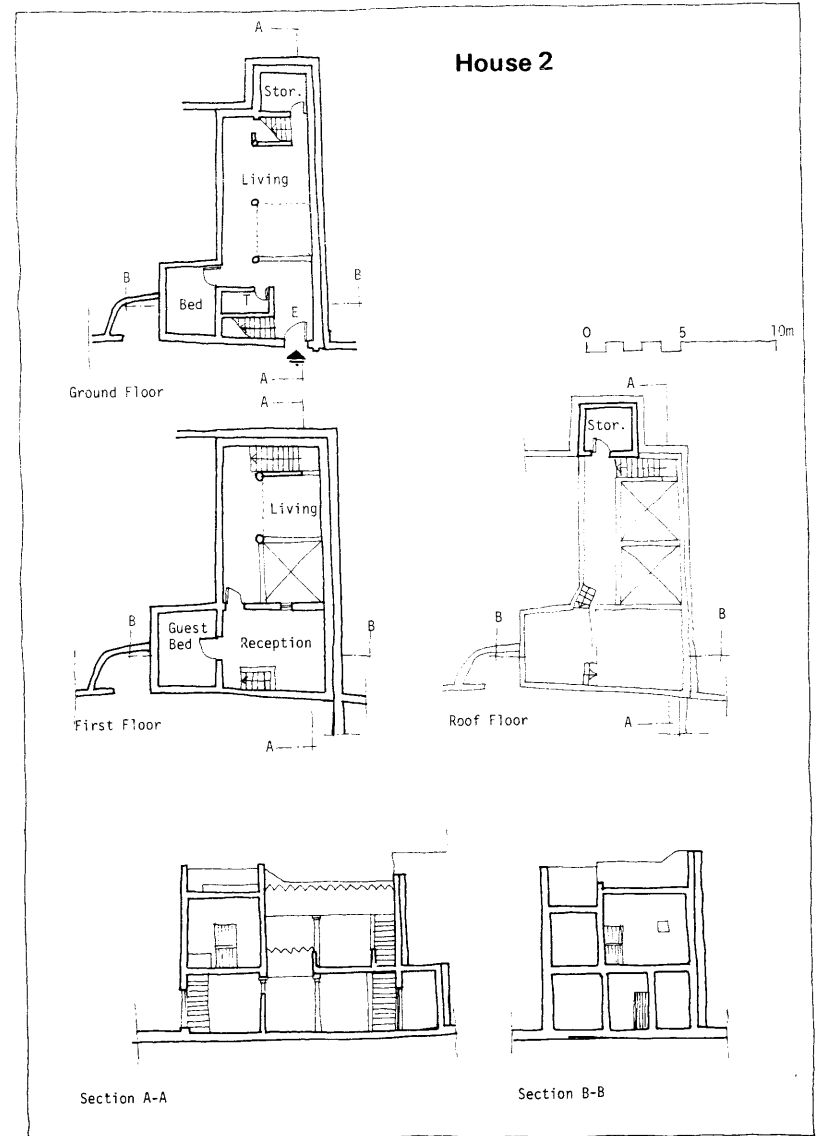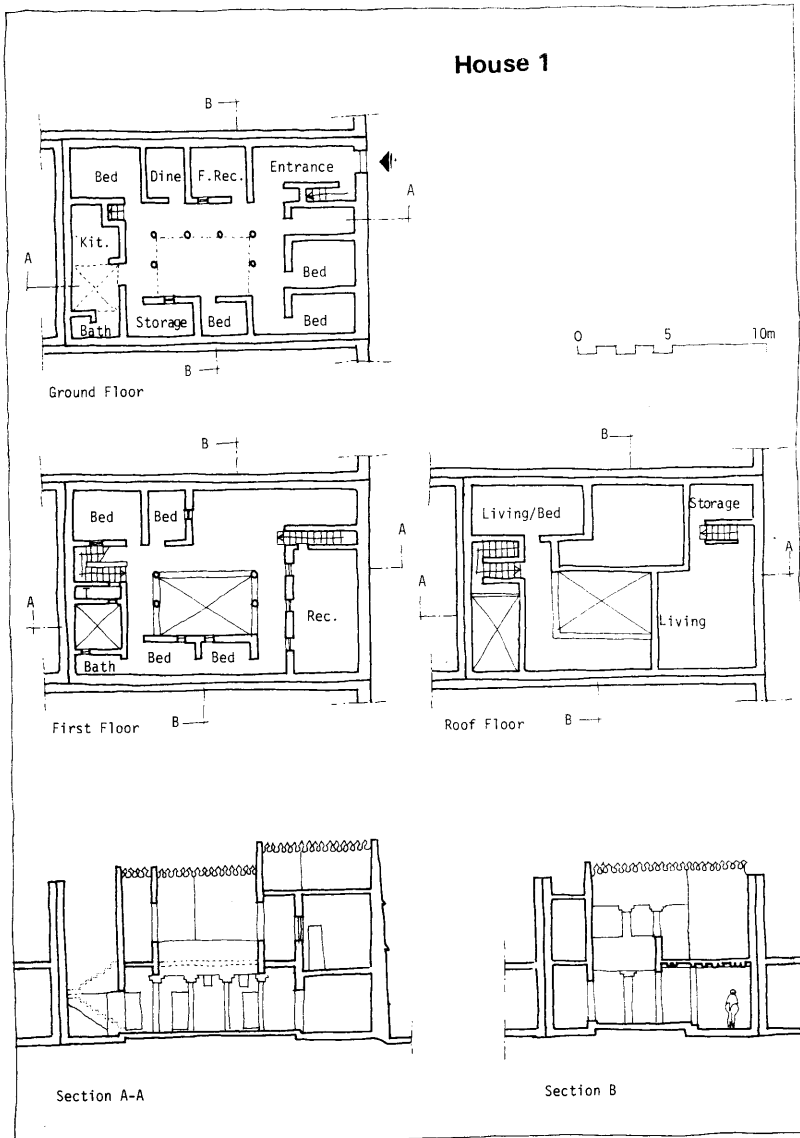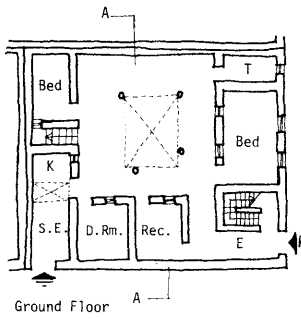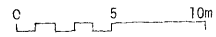
Growth
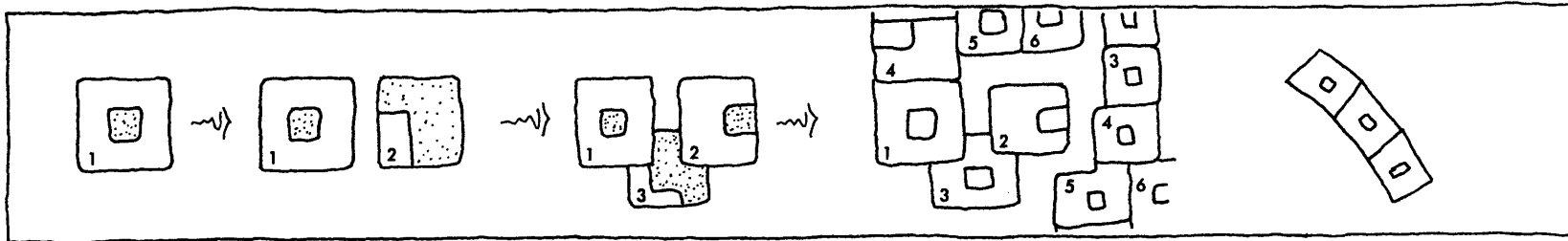
Historically speaking, the Arab house is never complete; as each extended family grows, so does the house. Thereby, the Arab house reflects the accumulated history of the growth and family structure of a number of generations, and the traditional social and economic structure is constantly transformed. As individual members of the family become economically independent, they reside as nuclear families in individual dwellings. These modern structures, however, still provide for future family growth in a form very similar to the indigenous courtyard house. Initially, one or two rooms at ground level are built to accommodate the nuclear family, but these are intentionally constructed in a way that will support future rooms above, as in the older houses. The courtyard perimeter defines the potential areas of the future extended family home. The house construction, in some cases, starts by building a boundary wall around the plot. The family head divides this plot into different sections to fulfill particular functions always keeping in mind future expansion. Religiously speaking nobody owns the land. Everyone needs a piece of the land - anywhere - he can own it by building a wall around it, but this ownership should not harm the others in any way. Family extension in dense urban areas could mean that an adjacent house may be taken over "if the neighbors agree" and an internal passage constructed to join them into a single unit. The lack of accurate measurement equipment and the feeling for the use of their spaces (particularly, with respect to activities and shade) formed, over time, very well-studied, designed spaces and curved streets.[2]
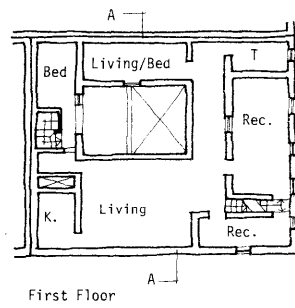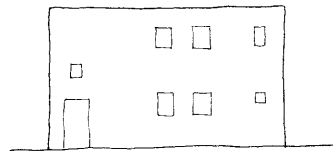
Traditional Houses

House 1

Ground Floor

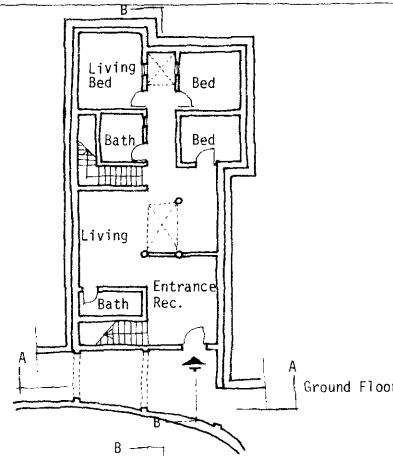Bed | Dine | F.Rec. | Entrance

Kit.

Bed

Bath | Storage | Bed | Bed

B

A

0   5   10m

First Floor

Bed | Bed | Bed

Bath | Bed | Bed | Rec.

Roof Floor

Living/Bed | Storage

Living

Section A-A

Section B

House 2

Ground Floor

Stor.

Living

Bed | E

A

0   5   10m

First Floor

Living

Guest Bed | Reception

Roof Floor

Stor.

Section A-A

Section B-B

House 3

House 4

0 — 5 — 10m

Bed

T

K

Bed

S.E. | D.Rm. | Rec.

E

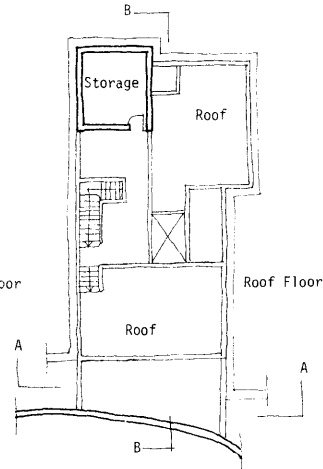Ground Floor

Bed

Living/Bed

T

Rec.

K.

Living

Rec.

First Floor

Section A-A

Elevation

Living Bed

Bed

Bath

Bed

Living

Entrance Rec.

Bath

Ground Floor

0 — 5 — 10m

Bed

Living

T

Reception

Reception

First Floor

Storage
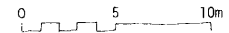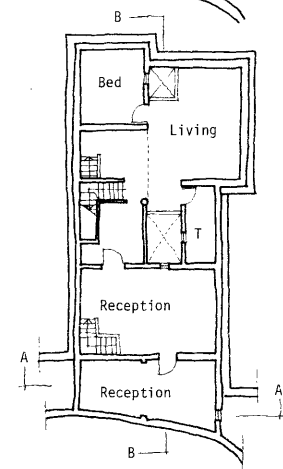
Roof

Roof

Roof Floor

Roof
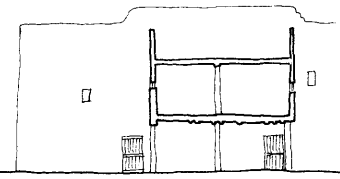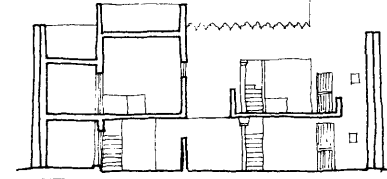
Section A-A

Section B

Contemporary Houses

E: Entrance
R: Reception
L: Living
D: Dining
K: Kitchen
B: Bedroom
Ba: Bathroom
T: Toilet
S: Storage
Tr: Terrace
Ro: Multiuse Room

Houe 1

0   5   10 m

House 3

House 2

House 4

First Floor

Ground Floor
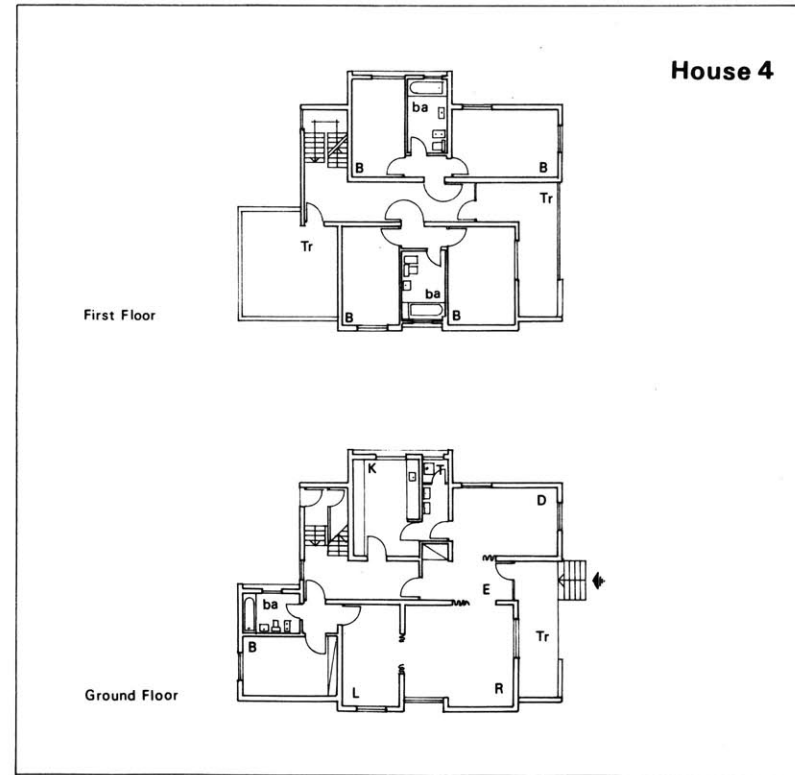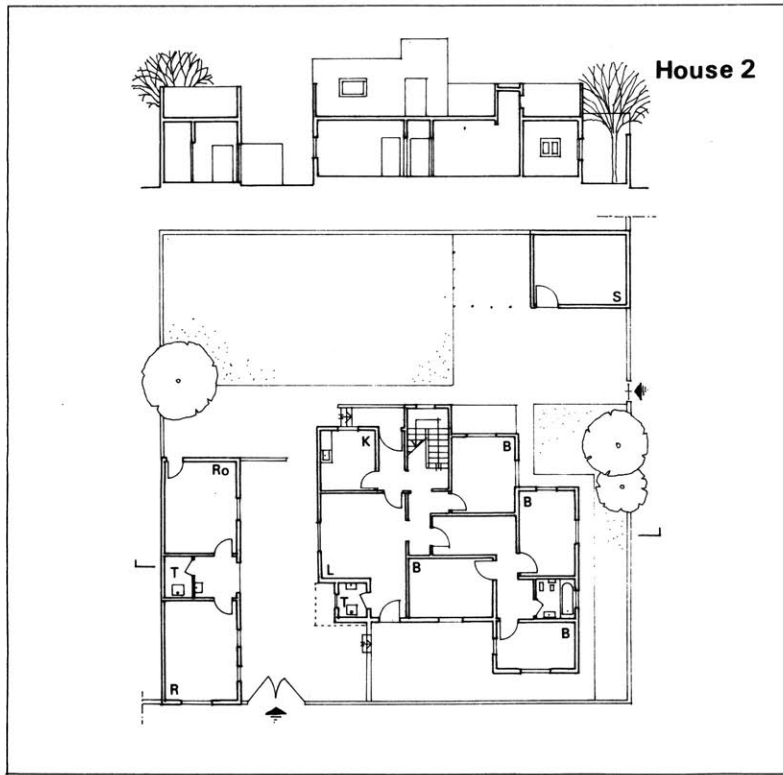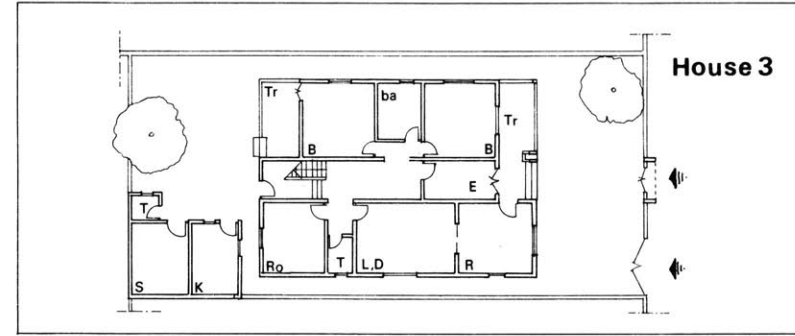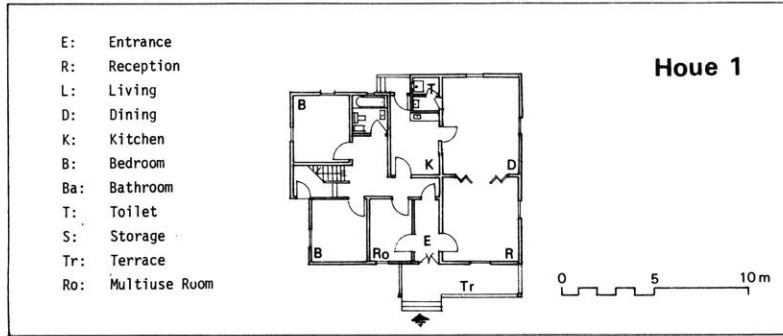
Public Houses

Dammam Project

Typical aparment plan.
[Four of these apartments
comprise a typical floor plan]

Site plan

Jeddah Project

Typical floor plan

Entrance

H3   H1   H2

The symbolic importance of the house's entrance is often emphasized by the construction of highly decorated doorways. A heavy entrance door is a common feature emphasizing the sharp line between the external public and internal private. The Islamic house usually has a single entrance, but a second entrance may be used exclusively by the womenfolk. The ent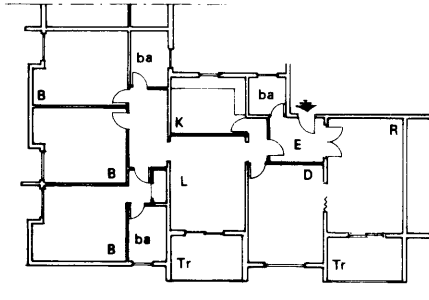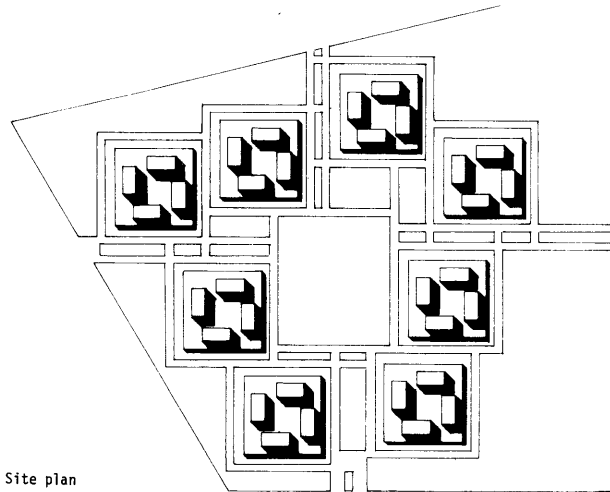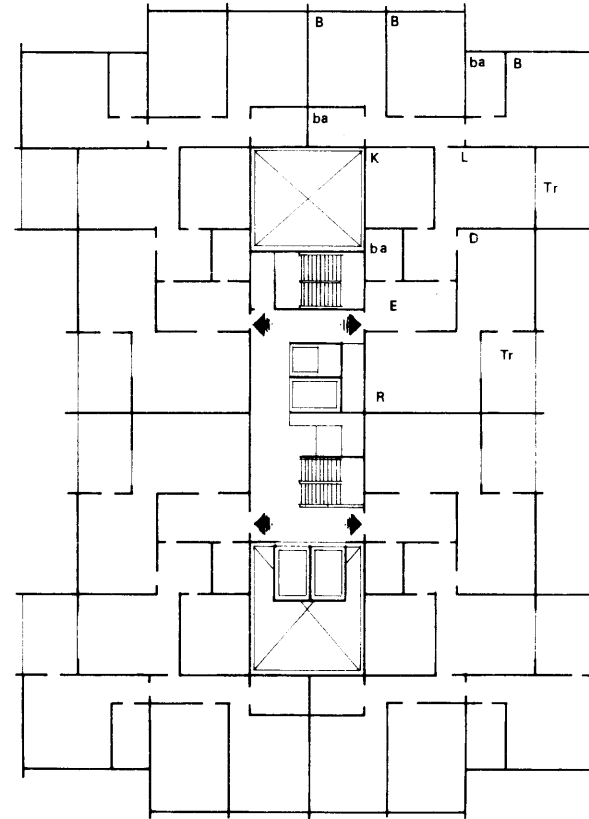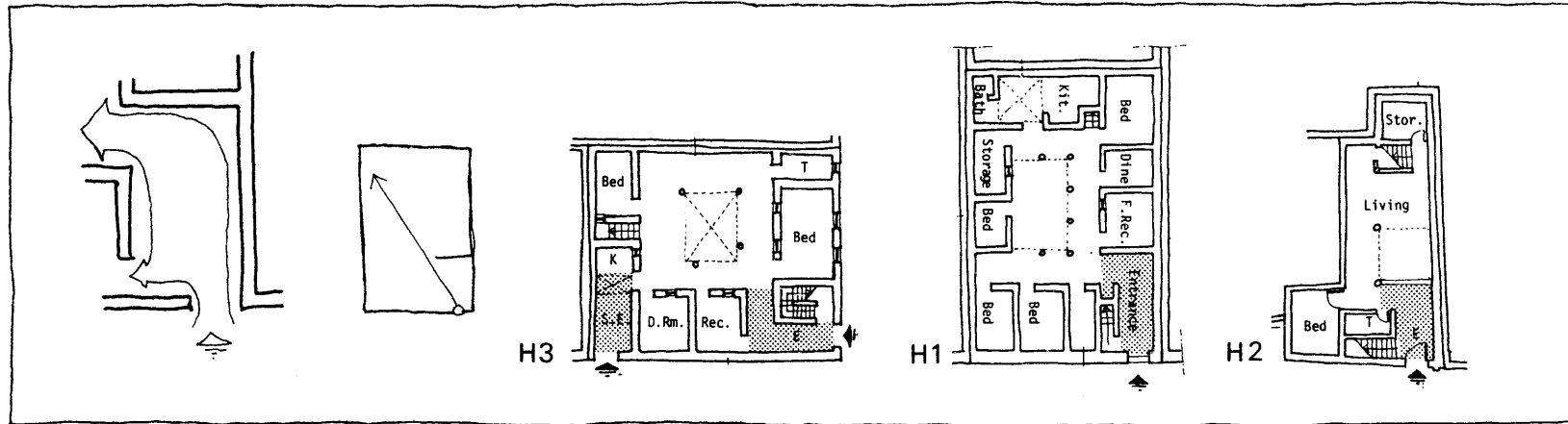rance door is designed to open onto a blank wall to obstruct all view of the inside and it does not give immediate access to the domestic quarters but leads to a vestibule. Sometimes the upper floors of houses communicate; there can be a bridge across the street for groups of neighboring women to meet without going outside. The entrance is usually located at the furthest point of the lot, which is the corner which provides maximum privacy. This position does not require building a wall to form the bent, but the rooms in front of the entrance are used to create the bent. The entrance is usually narrow and deep for acoustical purposes. The width of the entrance is most often equal to the width of one room. The length of the entrance is usually equal to a passageway plus a length of the staircase, a passageway plus a width of staircase plus w.c., or a passageway plus the width of the reception room.
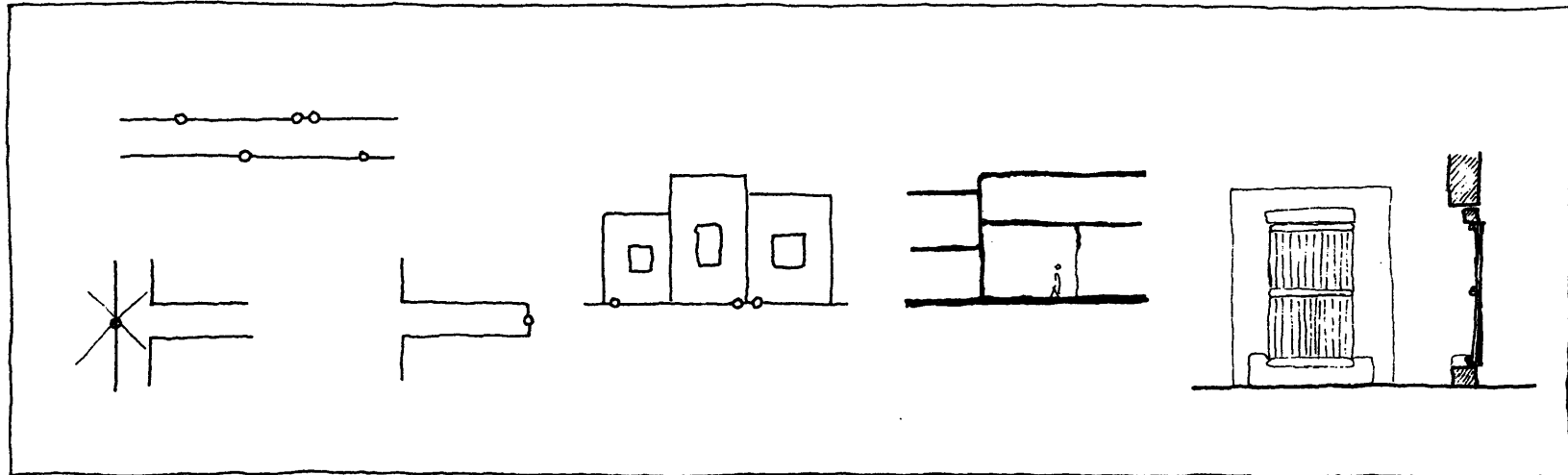
Generally, the following rules can be observed in the traditional houses:

oEntrances don't meet opposite from one another. They can be near to each other on the same wall.

oAn entrance visually could be seen if the street is a dead end street, but not at intersections.

oEntrances should always be in the house's corner, and it is possible to determine the beginning or the end of the lot from the location of the entrance.

oIt is recommended to locate the entrance beneath an overpass.

oHeight 180-200cm, width 120-140cm.

oDoors usually are one panel, made of wood and highly decorated with an overall pattern of incised floral and geometric designs. The incised pattern is often painted creating new textures and effects. A strong constrast is provided by the dark blues, blacks and greens of the design against a light background.

oThe house and the street are usually on the same level and there is one step of stone or mud between inside and outside.

oWindows and doors may be framed with mud plaster surrounds, applied and whitened with gypsum wash.

Reception
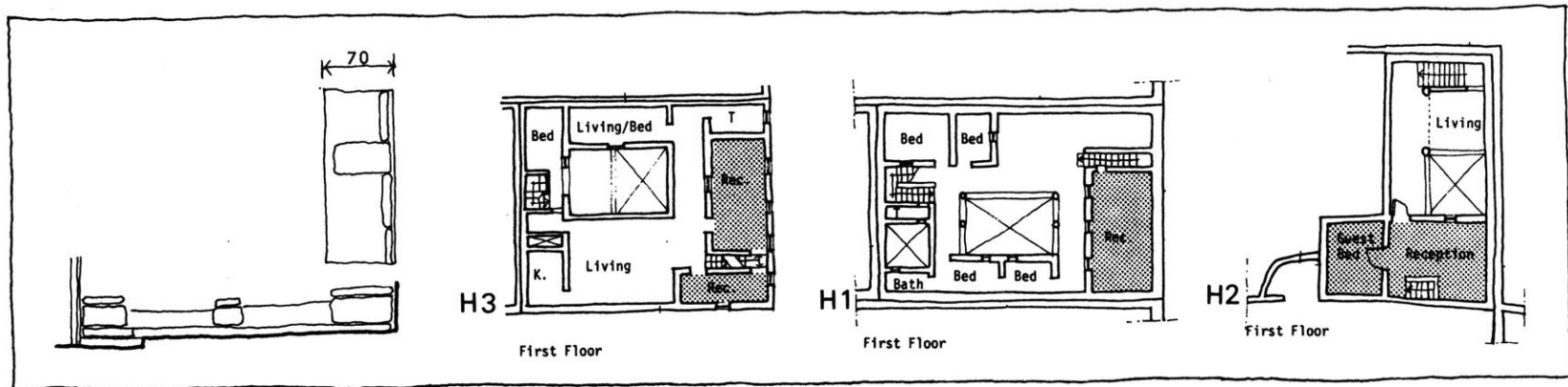
The men's reception room tends to be located adjacent and directly accessible to the entrance lobby. Every house should have at least one reception hall, and it has to be large enough to entertain visitors. In some houses, there may be no separate guest room, but the father or grandfather's room, often located near the entrance serves as the reception room. Sometimes it has a separate w.c. and stair which leads onto a roof terrace, where guests can sleep on a summer night. Some of them have a special place for making tea or coffee, usually situated in one of the corners and surrounded by cupboards structured into the walls. It is a symbol of the economic status of the family, and it is generally the most decorated room in the house. The guest room is used for recreation, relaxation and discussions.

According to the Islamic custom, guests have to be seated as one group, in an arrangement that allows each one to see and hear the others. The floor of the guest room is often divided into two levels, the one into which one enters and slips off one's shoes is lower than the level used for seating. In some cases there is a special hall near the reception entrance for exchanging dishes, particularly used for parties. The reception room is usually longated and parallel to the street.

Courtyard

The interior courtyard performs an important
function as a modifier for climate and privacy.
The importance of the courtyard and the relation-
ship between its area and height differ according
to the region and degree of affluence of its
builders. Despite these variations, the plan of
the courtyard is basically square or rectangular.
The courtyards of wealthy townhouses may contain
interior gardens. These are usually richly paved
with stone or tiles, and planted walkways raised
above ground level divide the planted areas.
When water is available, a fountain or pool is
constructed. Even poor houses may contain some
tree, plant or a modest tank.
The courtyard provides a safe playground for the
children, under the direct supervision of the
mother and provides a convenient space for living
activities for adults in the open air. The
courtyards are usually surrounded by paths for
circulation and one row of rooms. All the rooms
have direct access to the courtyard, except for
the male quarters.

H1

Bed | Dine | F.Rec. | Entrance

Kit.

Bath | Storage | Bed | Bed

Ground Floor

H3

Bed | T | Bed

K

S.E. | D.Rm. | Rec. | E

Ground Floor

H2

Stor.

Living

Bed | T | E

Ground Floor

H4

Living Bed | Bed

Bath | Bed

Living

Bath | Entrance Rec.

Roof

H 4 **H 2**

Open Living

H 1 **H 4**
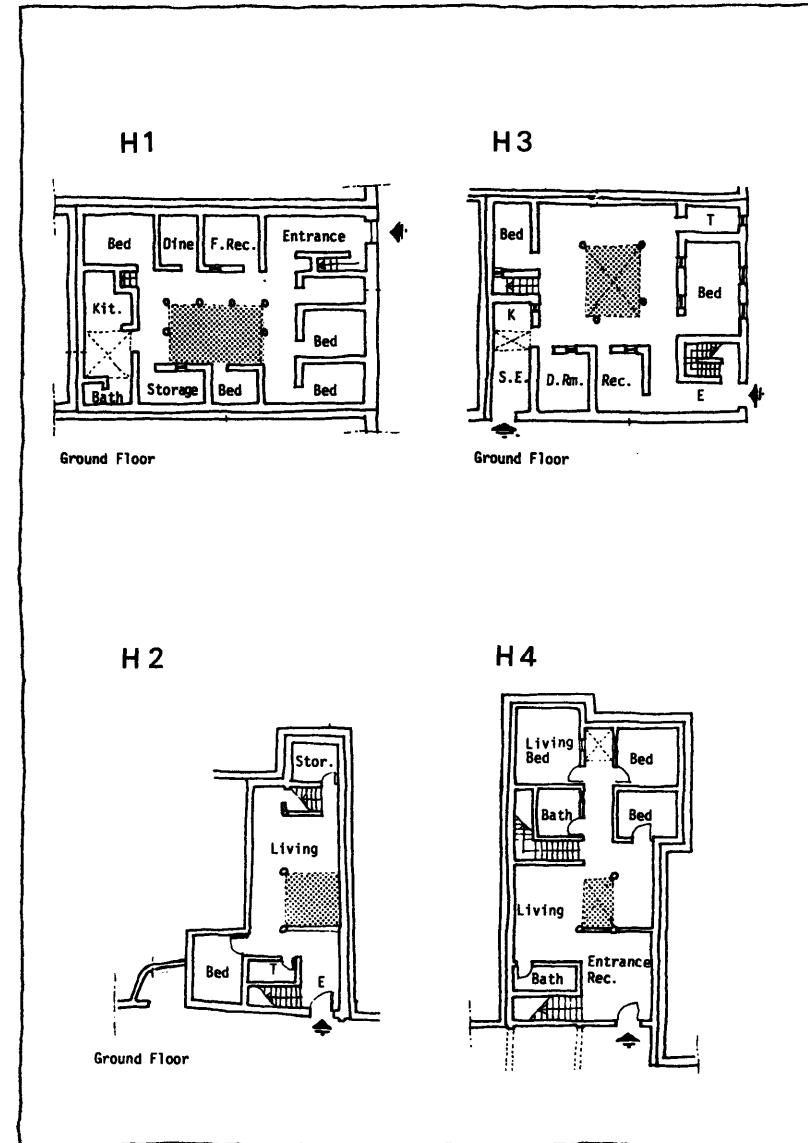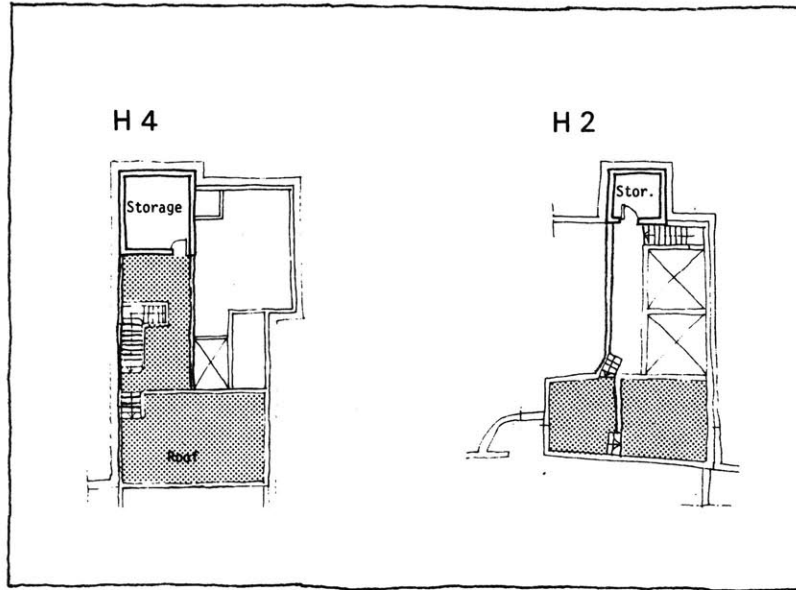
During the hot part of the year at night, the roof terrace is used as a sleeping area. The celebration of important family occasions, such as weddings, births, and annual religious feasts is usually centered on the courtyard and the roof. Often, the roof is divided into two or three different levels for the use of the men, women and guests, or parents, children and guests. There is a store-room on the roof for bedding. The roof is usually surrounded with high parapets.
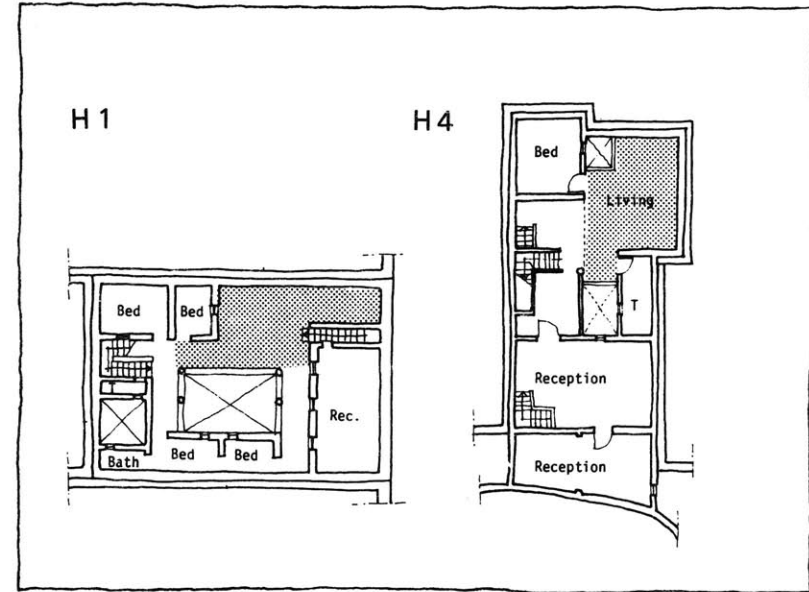
Usually on the ground or the first floor there is a covered open space used as an open livingroom during the year (except the winter). This room contains only essential and easily portable furniture. The favored Arab custom of sitting and eating on mats spread on the floor is still practiced.

Staircase

Usually, there are two staircases, one next to
the entrance for men, the other towards the back
of the house for the family. Staircases are most
often adjacent or on top of the kitchen, w.c. or
storage, allowing for the use of the space under
the stairs. Usually walls surround the stairs
and serve as handrails; in some cases, the first
few steps have a wall only on one side. If there
is a reception room on the second floor, the
staircase near the entrance leads directly to the
reception room or leads to the guest roof. Stair-
cases do not run from the ground floor directly to
the terrace roof; they lead from the ground to
the first floor and then change position. Per-
haps, this is done for visual and acoustical pur-
poses. The staircase was not just a way of get-
ting from one floor to another, the staircase
was a volume of living and air well, in which the
upper opening of it "which is longer than the
lower opening" leads directly to the courtyard.

Kitchen

Ground Floor
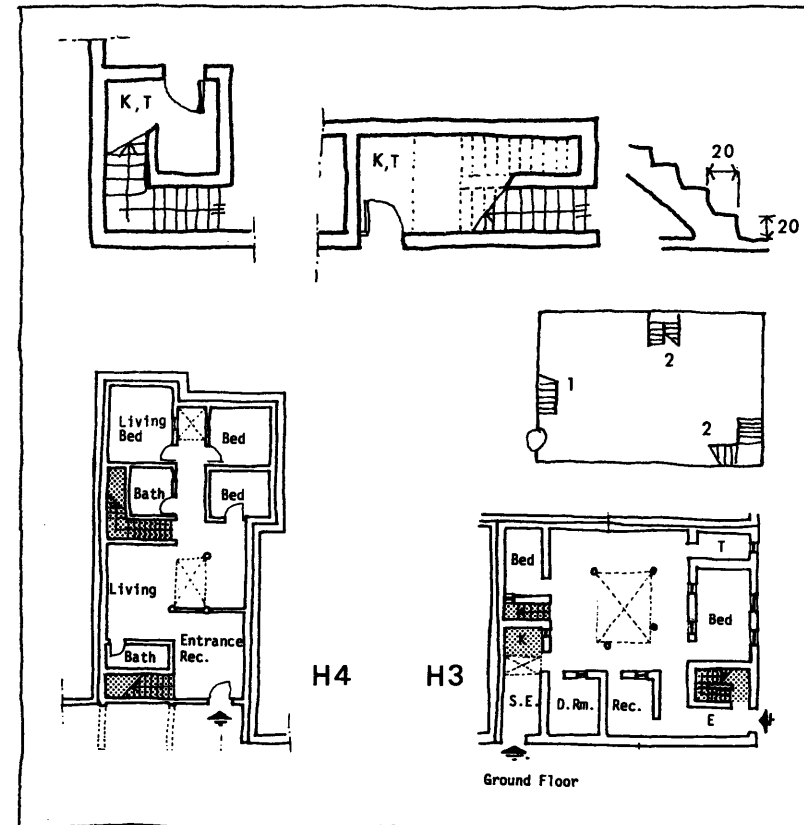
The kitchen is not equipped with modern cooking
equipment such as a stove or sink, but it has
some grooves in the wall for dishes. It is often
located in the corners. Frequently, there is a
storeroom at ground level for grain and other
foods.

Bathroom

Toilet
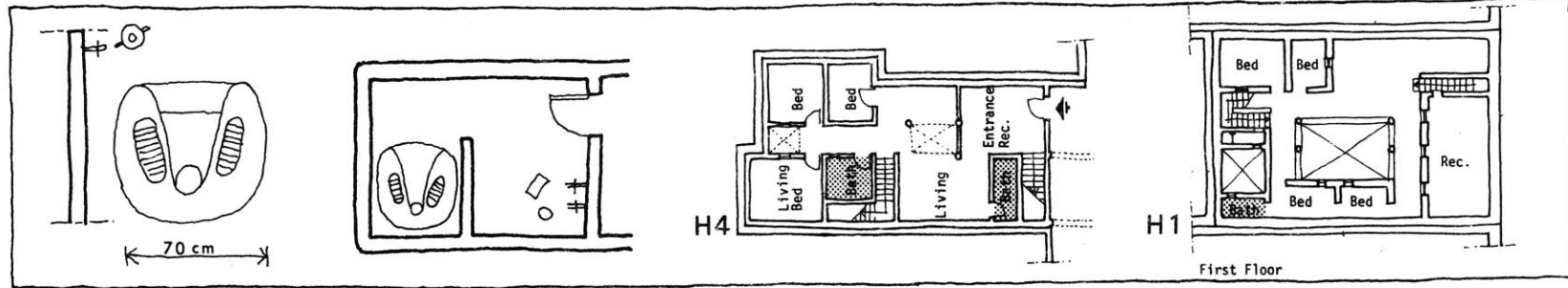
The bathroom in the traditional houses lack much, both in design and sanitary requirements. The type used is a raised open tank for keeping water on tap. In other Islamic countries the bathroom consists of two compartments, known as the first bath and the second bath. The first compartment is for changing clothes and a short rest after the bath. The second compartment consists of a small basin with two taps, one supplying cold water from a tank installed at the top of the house, the other supplying hot water from a heater fixed outside the bathroom. This kind of bath does not need much water, while in the modern bath the basin has to be filled and the body is washed from the same soapy water. Washing and cleaning clothes are usually done in the bathroom.

The position of toilets is influenced by religious injunctions relating to pollution and Sanctity of Mecca Orientation. The person who eases nature or makes water should not face or turn his back to Mecca. The toilets used in the traditional houses do not meet proper sanitary needs because of water shortages and lack of building materials. Religiously speaking, the human body should not touch the w.c. In some of the traditional houses septic tanks are used. Toilets are usually located in the corners. Usually the people use their hands for eating, and in these cases the wash basin should be located near the dining and reception rooms.

Multi Use Space
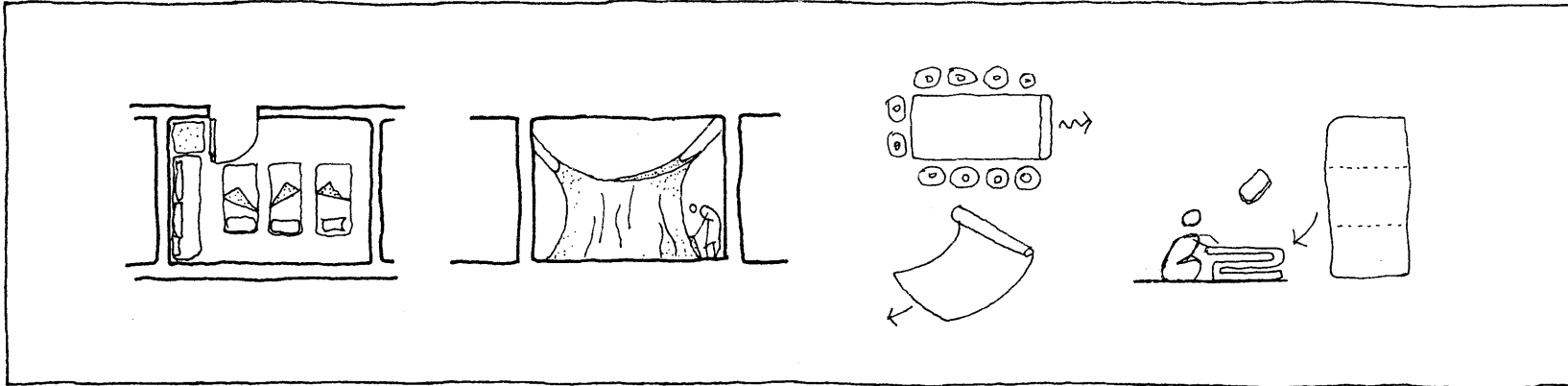
While rooms in eastern countries are usually allotted to specific activities, the religious divisions in the Arabic house are those of social accessibility, both public and private. Most interior spaces are functionally non-specific; rooms can be used interchangeably for eating, sleeping, recreation, and domestic tasks. This flexible use of living space is relfected in the absence of cumbersome furniture like tables and chairs. Chests are commonly used. The people sleep, sit and eat on the floor, on carpets, rugs, mats, and cushions; these can be rolled up and stored away when not in use. Storage cupboards or open niches are built into the walls and are often decorated with a characterized feature.

Interiors are also characterized by changing druinal and seasonal patterns of use, an example being the use of the roof terrace at night and the court at the evening. Development of these can be explained by: The life requirements of the past were very simple, an example being that since there were no professional schools of architecture, no drawing tables were needed. Religious reasons such as the facts that eating at tables and using silver dishes are not recommended, since it is considered selfishness and showing-off, or because the air is cooler near the ground surface.

IN GENERAL, THE FOLLOWING RULES OR AGREEMENTS
CAN BE RECOGNIZED.

Openings

External openings on the outer facades are few and
located mainly on the upper floors. The only
ground floor window openings are the guest room
windows, next to the entrance. Sometimes there
is a simple wooden box structure which serves as
a chimney and is located immediately above the
entrance for defensive purposes. Windows are
usually rectangular with two solid wood panels.
Sometimes lattice wooden slates are used in-
stead, and curved wooden panels at sill linted
levels. Sometimes windows have steel bars for
security. Windows are usually surrounded with
whitened gypsum wash. Usually windows are
located on an external wall surface without set
back. There are small triangular openings for
ventilation near the ceiling. The width varies
from 40-90cm. Height is 150cm on the upper
floors and 15cm for ventilation openings. Dis-
tances between openings should be more than 2
triangular perforations.
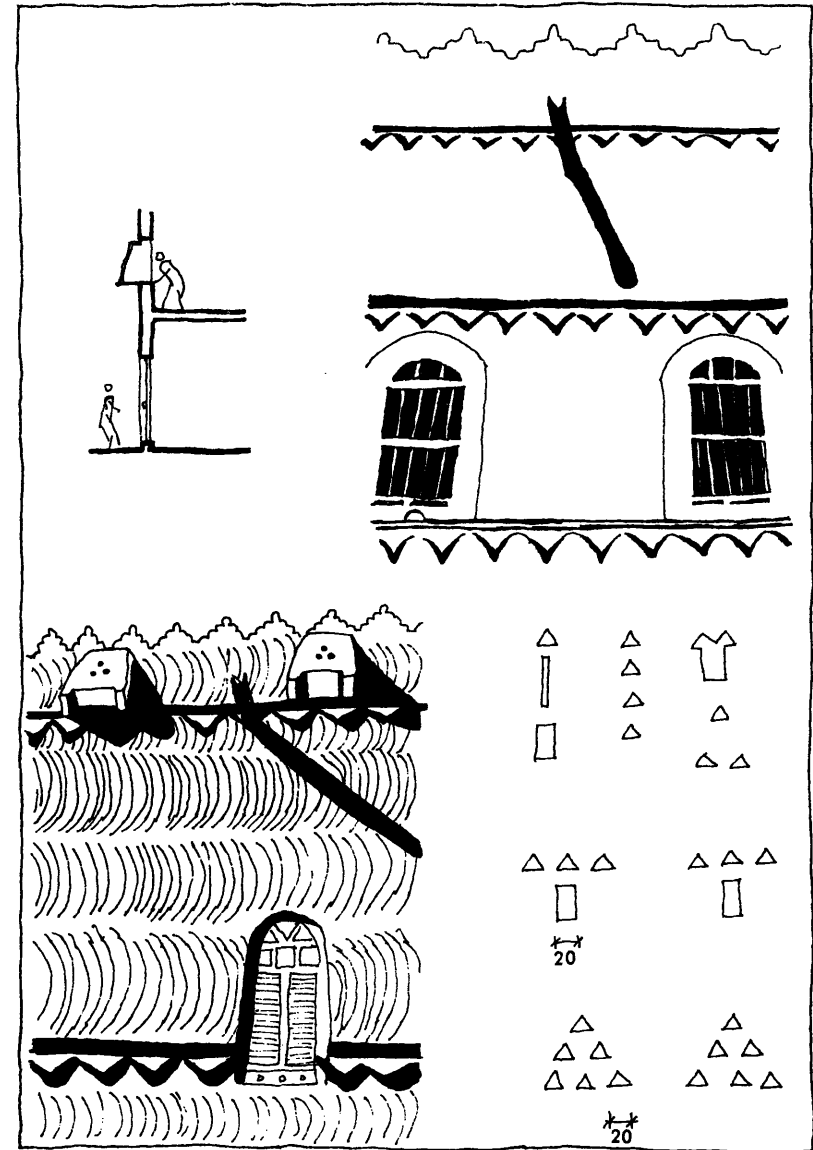
Walls

The width of the walls is 30-50cm at the ground
level and 15cm at the parapets. The external
appearance is, therefore, heavy and has massive
volume, characterized by a continuous compact and
solid appearance. It is constructed of layers of
mud brick over which a final coating of mud
rendering is applied. The surface texture of the
mud plaster captures and modifies light in a
manner which tends to deemphasize the heavy
appearance. The color is golden-yellow, a "mud
color". The texture is rough, curved, horizontal
and repetitious. In some cases, the wall's
foundation is made of stone and the height of the
stone foundation is no more than 1m. The para-
pets of some of these walls are decorated bands
of triangular perforations. Floor levels are
usually emphasized by a decorated band of tri-
angular patterns. Height of the wall varies from
3 to 10 meters.
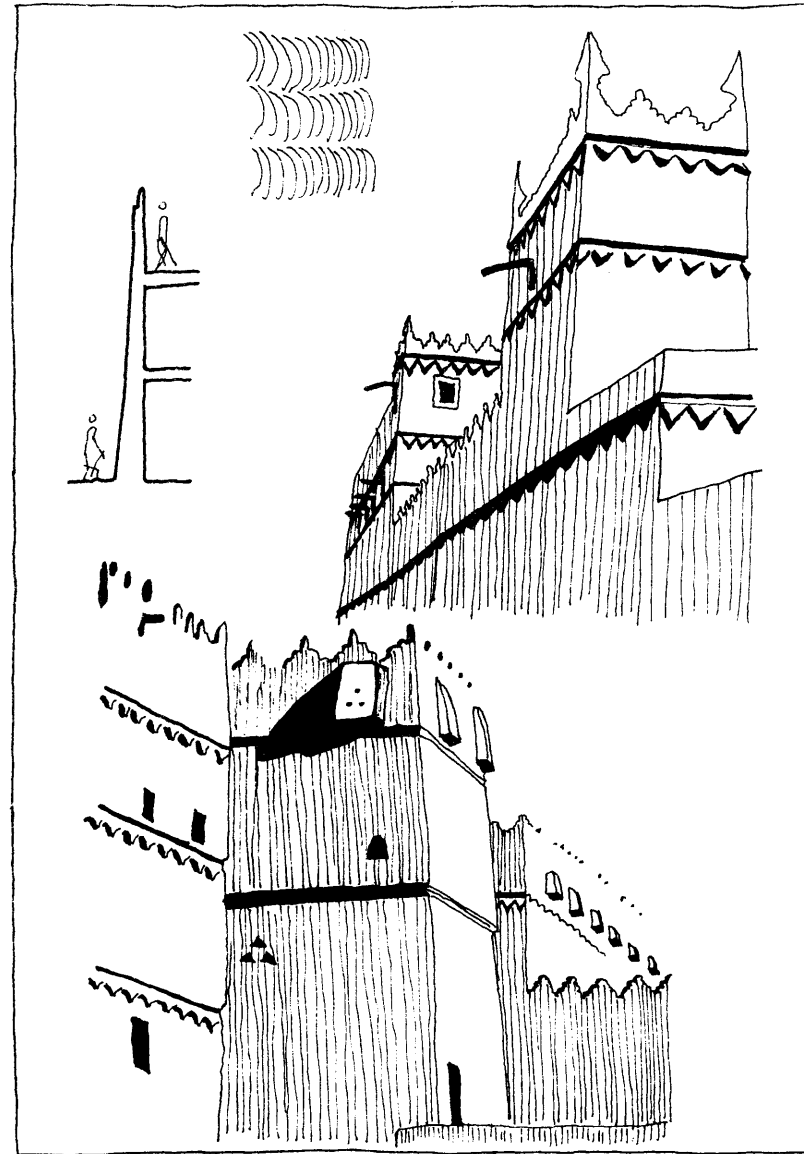
Decorations

Usually houses have bands of triangular patterns and triangular projections all around the house. Usually these decorations exist in the upper floors. Floor levels are usually emphasized by these decorations, but not necessarily on the same level as the ceiling. Plants that are used are usually palm trees, and they exist in the courtyard and not in the streets.

Shade

Walls should be high and the streets should be narrow so it will have a trench appearance in which the maximum shade is achieved. Because of the strong sunlight, the difference between the shaded and unshaded areas is very obvious in terms of glare, visual appearance and color, shaded areas are more active. The triangular perforations refine the sharp line between the wall surface and the sky. It also refines the sharp line between the shaded and unshaded areas. The shaded areas vary because of the different heights of the buildings, parapets and overpasses.
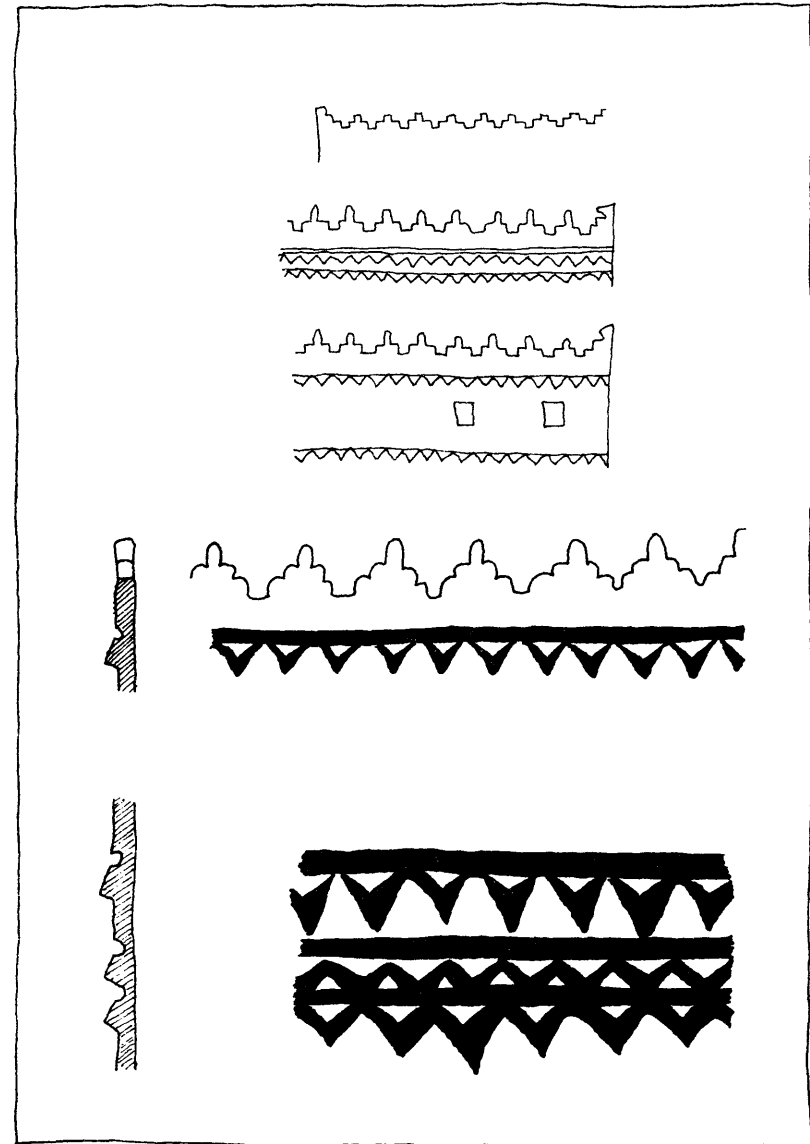
Water Spouts

Water spouts are used as a decorative and
functional element. Rain water collects in the
recessed horizontal groove and then drops clear
of the wall to the street and not the court. Its
cross section is <u>V</u> or <u>U</u> shaped and it is made
of wood in one or two or three pieces. It could
exist on any floor and not necessarily the roof
terrace. It is the only element on the
elevation which shows the different levels of the
house. It does not exist over a door or
window; it can be adjacent to them. It exists
in the overpass even though it drops the water
to the middle of the street. Because of the
sun's sharp angle, it creates strong shade on a
clear background.
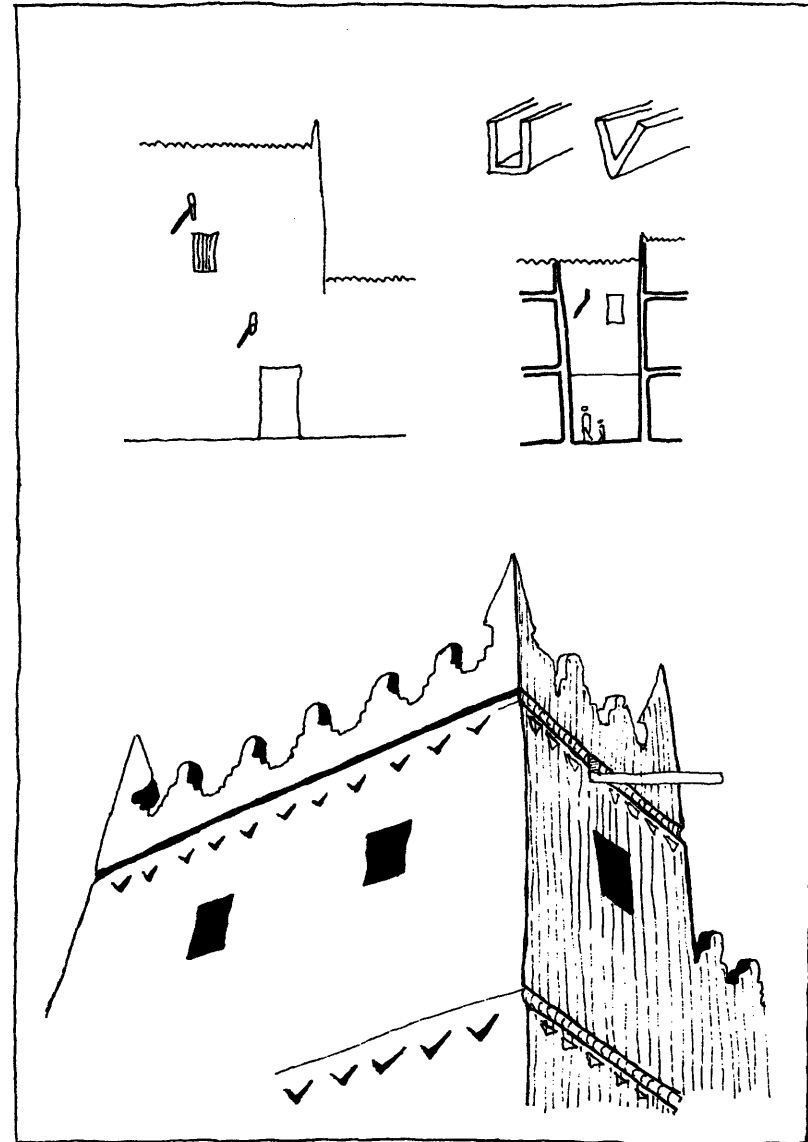
Circulation
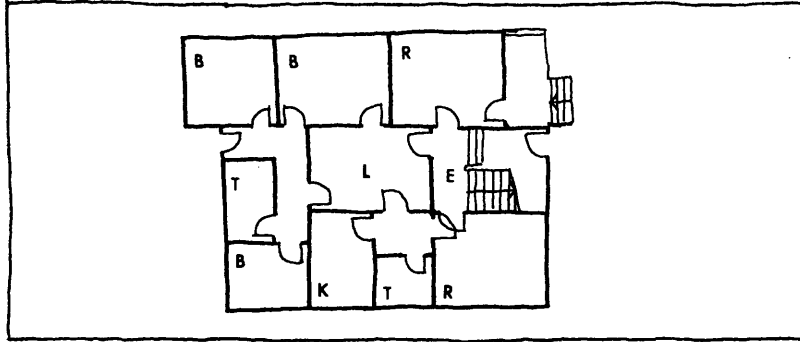
There is a traditional need to entertain male or female guests and at the same time bar the sexes. This has given rise to additional complexities of design particular to Islamic domestic architecture, which, therefore, must accommodate very defined and characterized spaces for circulation. The new houses are designed in a way that most of the spaces in the house can work as circulation and usable spaces, and as a result, the house has a large number of doors, for example; the house shown has sixteen doors, while the area is $140m^2$. The rooms can be used as dining, reception, guest bedroom or living space by opening and closing different doors.
The diagrams show the relationship between spaces in the traditional and the new type.

E: entrance hall
R: reception
L: living
C: courtyard
T: toilet
B: bedroom
K: kitchen
BT: bathroom
RO: multi-use room
LO: lobby
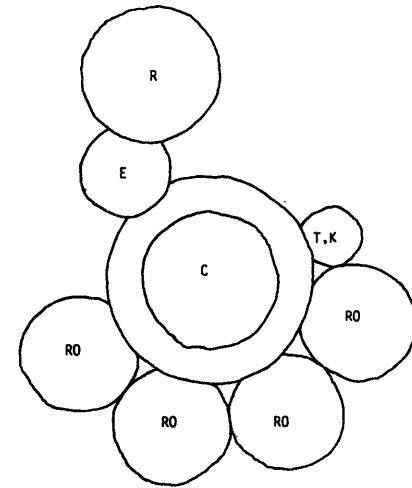
THE TRADITIONAL TYPE
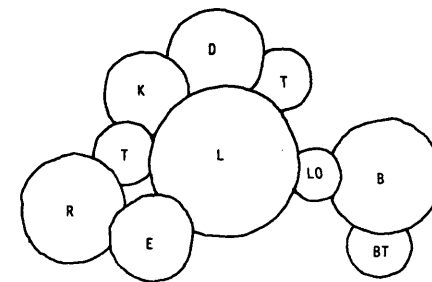
THE NEW TYPE

Movement

The diagram shows the inhabitants' movements in-
side of the house.

°The horizontal line means the inhabitant is
within the space.
°The vertical line means the inhabitant is
passing through the space.
°The slanted line means the inhabitant is
between the spaces in which the line is located.
As the lines indicating movement in the outside
zone increases in height, so does the level of
importance.

――――――	Household movement	
··············	Son's movement	this indicates
― ― ― ― ―	Mother's movement	action happens
― · ― · ― · ―	Daughter's movement	often
――――――	Household movement	
················	Son's movement	this indicates
+ + + + + + +	Mother's movement	action happens
― · + · ― · + · ―	Daughter's movement	occasionally

● Breakfast
▲ Lunch
■ Dinner

Levels Of Privacy

The diagrams show the different levels of
privacy and the circulation between spaces in:

a) Traditional houses.

b) The new houses.

c) The relationship which most users try to
achieve as possible.

In traditional houses and new houses, users
achieve the separation in circulation by; for
example: having parties at different times,
an example being the male guest at noontime
and the female guest in the evening, or vice-
versa. Using the roof terrace for females and
using the ground floor for males, or vice-versa,
like weddings. If a relative or male visitor is
moving from one space to another he usually
notifies the others. Curtains also may be used
for a limited time as required.
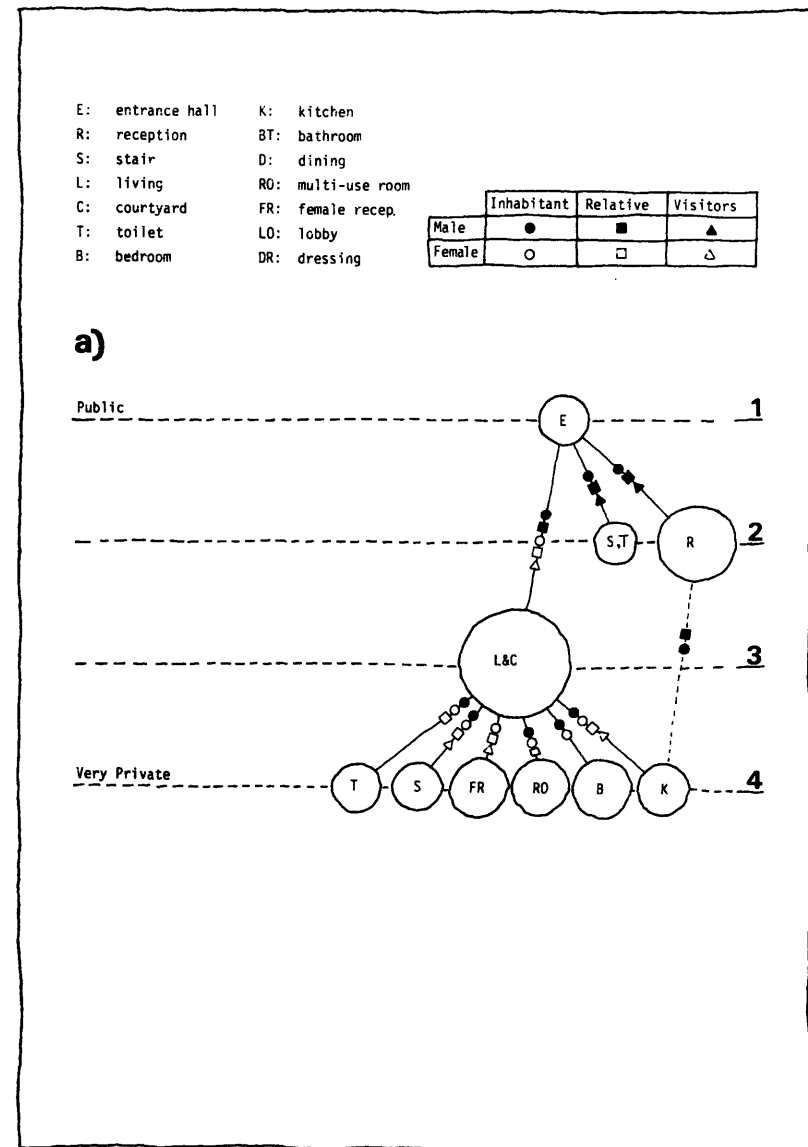
E:	entrance hall	K:	kitchen
R:	reception	BT:	bathroom
S:	stair	D:	dining
L:	living	RO:	multi-use room
C:	courtyard	FR:	female recep.
T:	toilet	LO:	lobby
B:	bedroom	DR:	dressing

	Inhabitant	Relative	Visitors
Male	●	■	▲
Female	○	□	△

a)

E: entrance hall   K: kitchen
R: reception   BT: bathroom
S: stair   D: dining
L: living   RO: multi-use room
C: courtyard   FR: female recep.
T: toilet   LO: lobby
B: bedroom   DR: dressing

	Inhabitant	Relative	Visitors
Male	●	■	▲
Female	○	▢	△

b)

Public 1

.... T ..... R 2

.... L ...... D 3

.... LO .... K 4

Very Private .. Boy's B — Girl's B — BT — Parent's B 5

c)

Public 1

.... S .... R 2

.. FR .... L .... D ..... T 3

.... T ..... D ...... K 4

.. Boy's B — Girl's B — Parent's B 5

Very Private .. BT — DR — BT 6
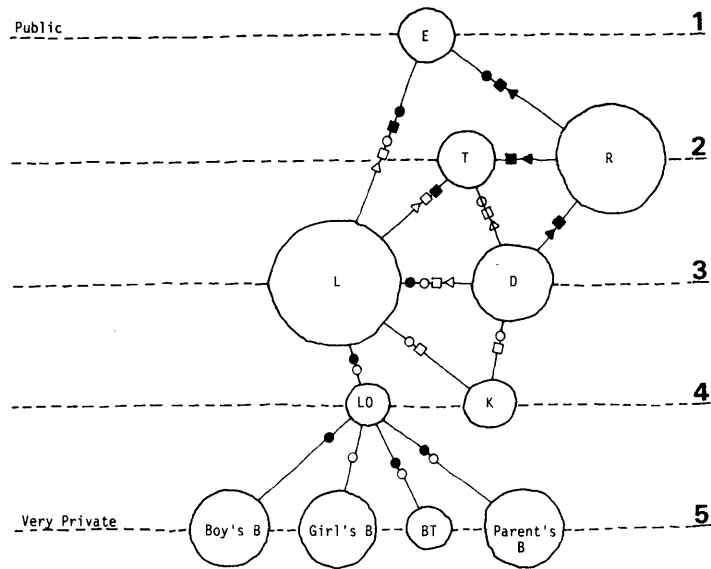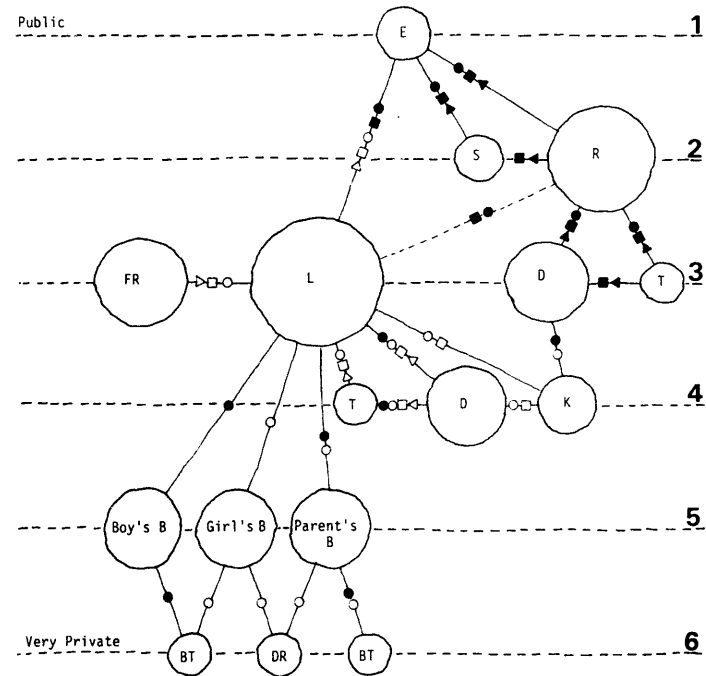
Areas

This page shows a comparison between the new and traditional houses with respect to the dimension of the spaces.

By comparing the two diagrams of the houses:

The Traditional House:
The rooms are always longated. The rooms have almost the same area although the function is different. The services all have the same area (toilet, kitchen, storage).

The New Houses:
All the areas are increased. The area depends on the function of the space. The spaces are almost squares. The area of the entrance is reduced. The number of the toilets is increased.

Climate

INTRODUCTION

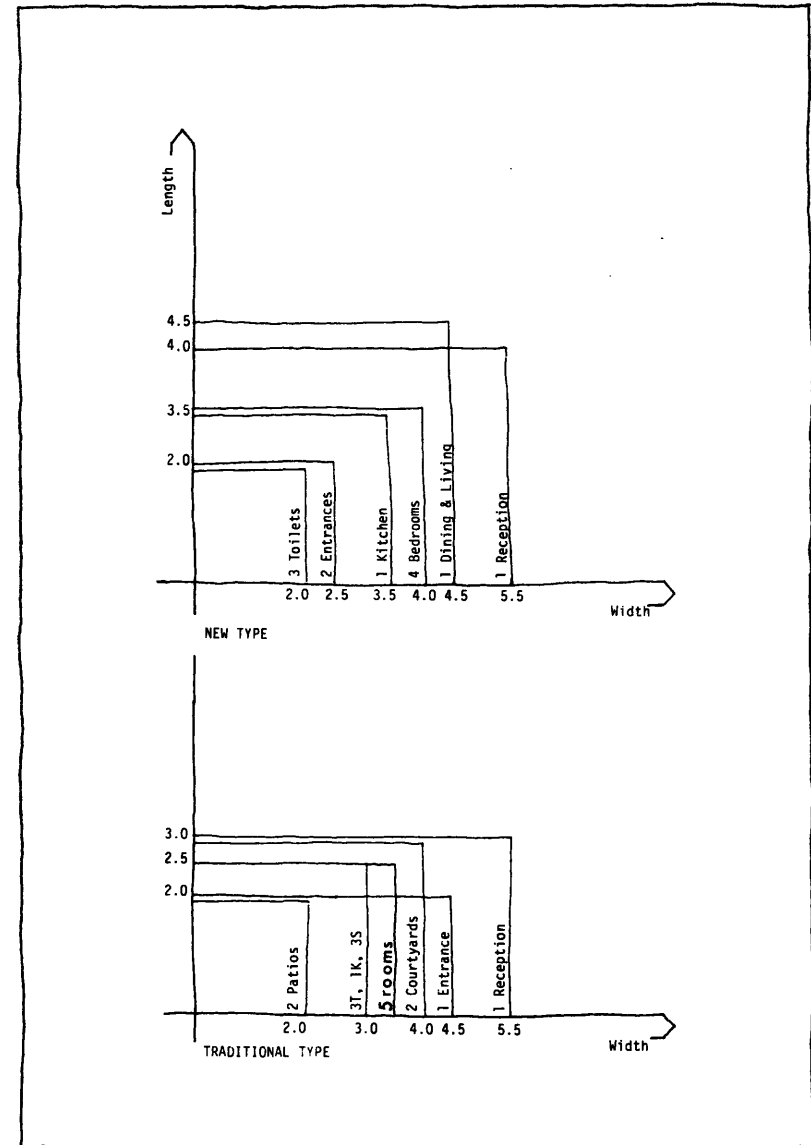In both the hot dry and the hot humid areas of the Islamic world, the users controlled the environment by the creation of domestic microclimates of which the courtyard house is the most common example. Thus, the courtyard has become the owner's private piece of sky offering him comfort, security, privacy, and protecting him from burning, glares, and sandstorms. The width of the street has great effect on the air movement inside the house, "narrow or wide street". The question arises whether the traditional building solutions are still the most appropriate models today and whether the concepts can be applied to new design problems. Although many studies were made on the desert climate regarding building materials, insulations, etc., the following explains the vernacular solutions which have evolved over centuries, due to continuous contact with a harsh climate.

NATURE OF THE CLIMATE

Hot-dry climate is characterized by very hot, dry air and dry ground. Day-time air temperatures may range between 27° and 49°C, but at night it may fall as much as 22°C. Humidity is continuously moderate to low. There is little or no cloud-cover to reduce the high solar radiation. The clear skies do, however, permit a considerable amount of heat to be re-radiated to outer space at night. Local winds often carry dust and sand.

COURTYARD

Interior courtyards serve both as light-wells, in a building type that restricts exterior window area, and as air-wells into which the temperatures drop considerably during the night, due to irradiation into outer space. This drop amounts to approximately 10-25°C during the summer months. In this way cool air deposits in the courtyard and flows into the rooms surrounding it, cooling the furniture and the structural elements, walls, roofs, and floors, which work as a store of coolness till quite a later hour of the day. The sun's rays do not heat the courtyard until later in the day. When the sun does reach the interior court and the heated air rises, convection currents set up an air-flow that ventilates the house and keeps it cool. This particular

Night   Noon   After Noon
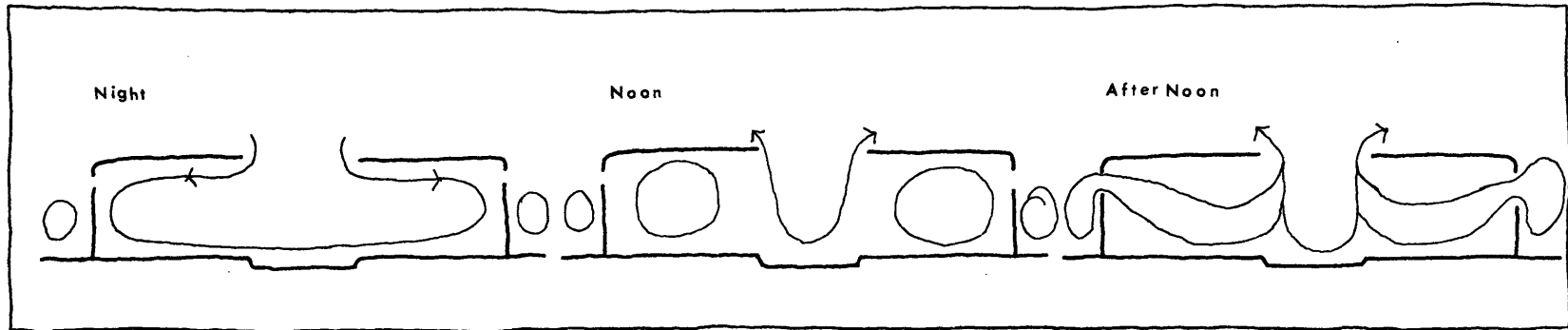
increase in air movement may also relate to the relationship between indoor and outdoor temperatures within the house. The building temperature is raised due to the fact that the walls are beginning to radiate warmth. The air within the building in this case is relatively warmer than the outside air and has a lower density or pressure. Air always moves from high to low pressure. There are many traditional houses in Elmedina in which the users have more than one courtyard of different sizes to circulate the air in order to cool the rooms and to maintain a satisfactory temperature.

STREETS

The complex Islamic street pattern as it may appear has an important planned control over the microclimate. As streets vary from 2-4 meters (secondary), or 4-10 meters (primary), or 12-20 meters (main) and the houses extend 8-10 meters high, the effect of the street is mostly like a trench in which the maximum shade is achieved. The wide streets usually take a north-south direction at right angles to the path of the sun which thus keeps them in the shade most of the day.

The side narrow streets (running east-west) contain many bends, with changes and overhanging buildings, which are also designed to achieve maximum shade. The only spaces which are open enough to receive sunshine for greater lengths of time are the points of the intersection and the courtyards within the houses. The open spaces at
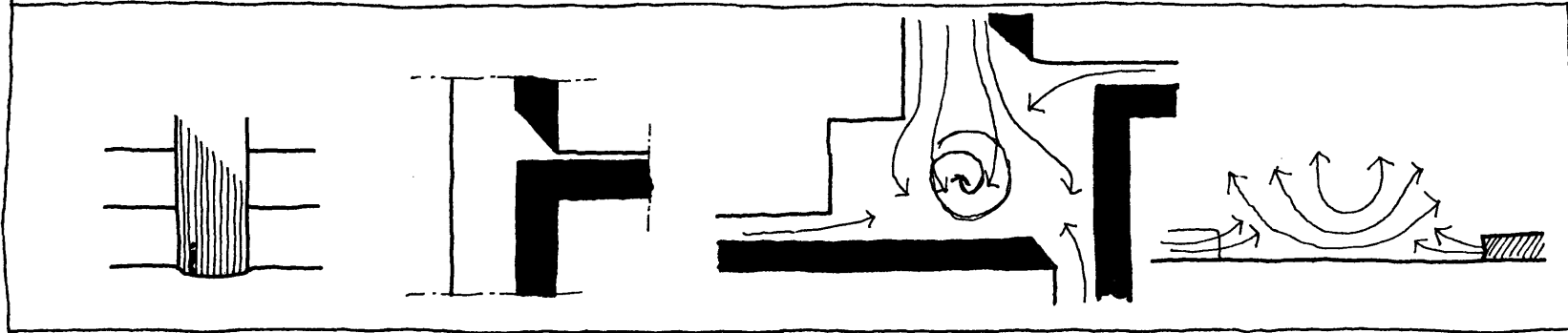
the intersection not only provide a focal point, or visual highlight, and community space, but also serve the microclimate functions. In the middle of the day these areas, receiving intense solar radiation, heat up to a greater extent than the shaded side streets. The hot air of the open intersection is, of course, less dense than the cooler air of the street. A convection system is automatically set up with cool denser air drawn down the side streets to replace the hot light air which rises. The side streets are, therefore, ventilated by this convection system. The main street or wide streets usually take prevailing wind direction, which draws air down its length and thus ventilates the heavily used spaces. The wind through the main streets tends to create low pressure areas in the wide open intersections of smaller streets on the side. This action induces air movement in the air up the streets to the intersection. This combined with the convection system created by temperature differences, creates a definite satisfactory air movement and ventilation system in the streets and courtyards.

OPENINGS

The Islamic house is an introverted form conceived from the inside outwards. The emphasis is the decoration of interior elements, such as the courtyard facade, while the street facade is usually plain. External house walls are built to a height that insures that the domestic interior cannot be overlooked. Openings in the ground floor are small, grilled and above the

line of vision of passers-by. The windows of
upper stories are generally larger and may pro-
ject considerably; though admitting light and
air, they usually do not overlook neighboring
courtyards or terraces. The optimum inlet/outlet
opening area relationship requires many tests
with varying sized openings under a number of
wind conditions. Tests in Cairo showed that the
relationship is 1:1.7, and in any case, the size
of the air outlets must be greater than the air
inlets. In the central part of Saudi Arabia,
wind catchers and mashrabias were not used, prob-
ably because of the lack of materials. In other
parts of the Islamic world they were used ex-
tensively. It is recommended that they be used
in that region.[3]

3 Unpublished paper Climatic Study of Traditional
   Buildings, Cairo, Egypt. Development Workshop
   F. Afshar, A. Cain, J. Norton, 1973.

   Design with Climate, Victor Olgyay, Princeton
   University Press, 1963.

   Manual of Tropical Housing and Building,Part 1
   Climatic Design by Koenigsberger, Ingensoll,
   Mayhew, Szokolay,.Longman 1973.

Section 2:
Patterns

Contents

Clarification

Pattern language is a design tool in which the
design process traces the functional require-
ments of human needs and activities and then
provides the kinds of forms which mean
solution for problems under certain context. It
is one of the most systematic and developed
approaches to environmental design. It is a
series of explicit statements about physical
relationships of objects in the environment.
It's fundamental assumption is that the environ-
ment can be analyzed as a series of elements.
These elements are recurrent and consistent
diagrams of physical relationships. These
relationships are universal within the stated
contexts, and these contextual universals are
transferable and applicable to a wide range of
situations in many combinations.
The pattern language is, therefore, one funda-
mental important value, in which one can
specify the process which will lead directly to
solve architectural conflicts, i.e., the method
based on the big-one value and not the little
many-values.

It is extremely important here to note that the
patterns in this section are used as a method of
communication. It is used only to clarify the
potential and capacity of the courtyard house;
it is used to explain the possible relation-
ships between the element in the Saudi culture.
These patterns are based on my own value system
in which the problems that I have defined might
not be an important issue to the users. There
might be more important problems which the users
themselves could only recognize. These patterns
are based on assumptions and facts which are
subject to change, since the Saudi culture is
passing through tremendous change, which will be
discussed briefly in the third section.
I may have viewed the problems through angles
completely different than the inhabitants' own
angle. I think users have the right to define
the beauty and conveniences in their own way.
Finally, the following patterns are not stated
in the pattern language format, i.e., context,
problem, solutions. They are presented as series
of descriptions, assumptions and evaluations
followed by recommendations and suggestions.

Setbacks
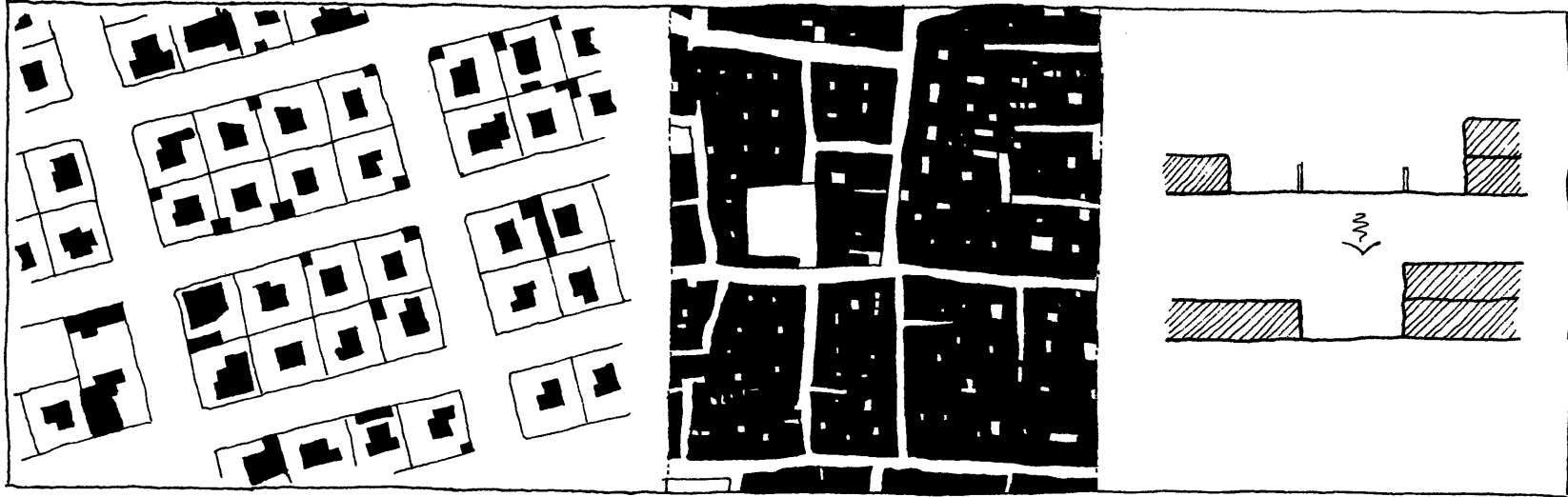
Because of municipal regulations, the new houses in Saudi Arabia have set-backs from the street and surrounding buildings. This rule was passed to ensure that buildings would not crowd each other, and thus cut off lighting and ventilation. Because of the climatic and social reasons mentioned in the first section; these setbacks have no redeeming value and have destroyed the value of the open spaces between the buildings. These leftover spaces are never used; they are used only as a further extension. These open spaces have no shape. We can see the buildings as figures and the open spaces as ground. The traditional open space had a distinct and definite shape; like the courtyards and the squares -- they look like a room. The leftover spaces of today cut the buildings from the street, and destroy it. In short, the traditional spaces are positive spaces and the new leftover spaces are negative spaces. Since it is possible to guarantee plenty of air and light in the courtyard houses, it is suggested here to avoid setbacks.

Street Gallery
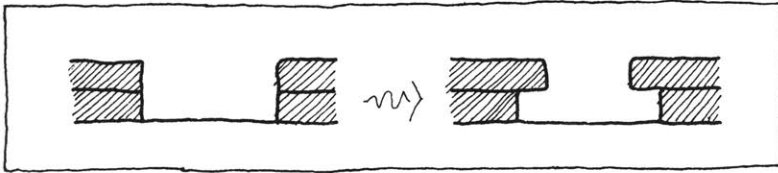
Nowadays, the streets are so unattractive, they serve as an inducement for people to remain inside their homes. People do most of their traveling by car; they drive directly up to the house, usually allowing for no other social interaction. People park inside of the house or just outside of the house, leaving the street abandoned. Since cars have taken over the streets, most of the ambulatory moving which people do, is indoors. The traditional street provided the dwellers with usable public spaces directly outside of their houses. The streets are the most desirable place for the children to play. Shaded spaces are always used and active. It is suggested, therefore, in order to recreate social interaction as best possible, streets should be considered an outside "room", and that there be an increased sense of enclosure on the street. It is further recommended that sheltered walks and arcades be created.
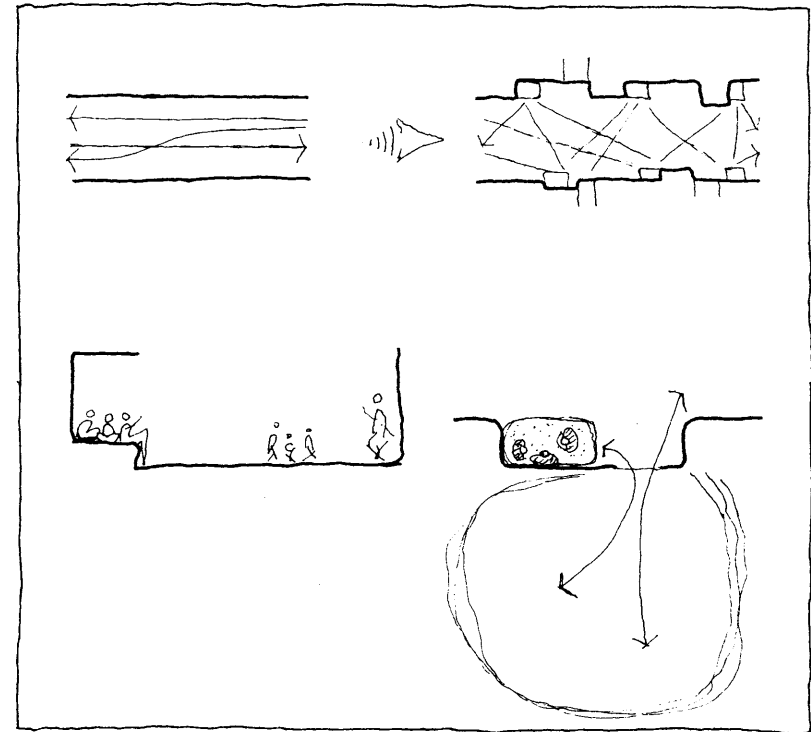
Edges

If the street's edges do not provide active spaces or spots, the street becomes a place to walk through, not a place in which to stop and spend time. For lively spaces, it is suggested that edges be created with seats, benches, etc.

Street Seats ‹Dakah›

Traditionally, in most Islamic regions, people sit in the street during the late afternoon. They watch the activities of the street, but they do not become involved in their neighbor's privacy. They do not want to be seen; this is especially true for older people. They sit legitimately and talk with others. In order to respect their neighbor's privacy, they do not choose to sit "exposed" in the middle of the street; they usually sit in a cleft, partly enclosed, partly open and shaded space. They watch their children running, playing, and making noise. They take a position naturally higher than the action and large enough for one group of friends or neighbors. They want these places to be very close to the family life and also enjoy the conveniences of it, like getting tea or coffee whenever they wish. It is suggested, therefore, that spaces be provided where people can make "street" seats (outside the front entrance, if they wish). It is also recommended that these spaces be partly enclosed and shaded in such a way that although these spaces are in public domain, they are private.

Shops
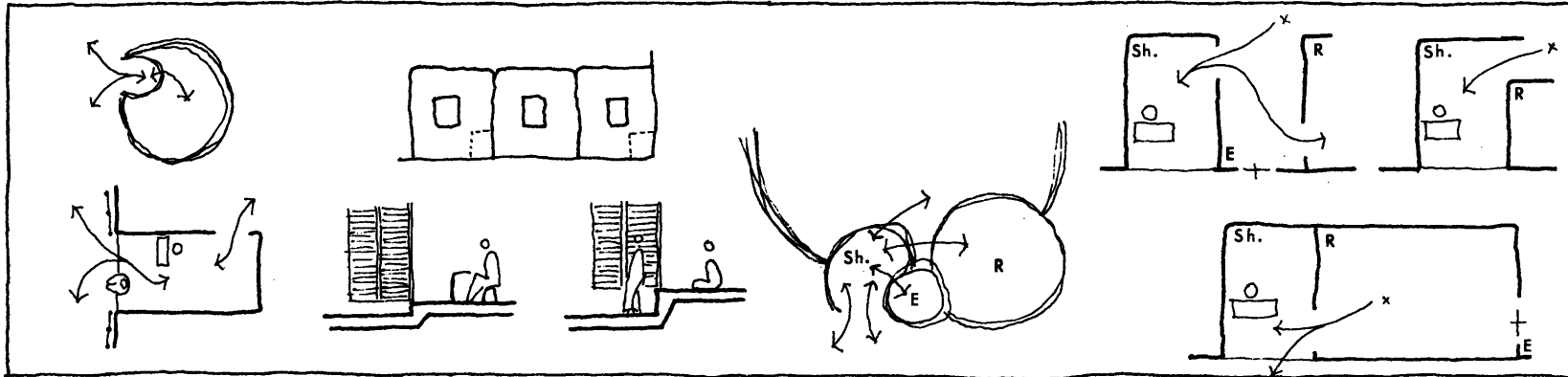
Traditionally, all the shops were located in the center of town and around the mosques. Nowadays, however, shops are everywhere (possibly due to modern life daily necessity, city expansion and the economy). People build shops to work in them, especially older and retired people, or they rent them or hire someone to work in them. Traditionally, shops were small and individually owned; they provided friendly services by the owner(s); they were a place to meet others, sit, talk and spend time. They were like a reception space in which the owners welcomed customers. Shops were completely open to the street, so people felt free to drop by or sit outside. These shops were one or two steps high; some- times they extended to the street enabling people to pass through and hear and see what was inside.

Nowadays, however, shops are large and often controlled by absentee owners. Services are not provided on the more "personable" level. It is, therefore, suggested that small, com- pletely open spaces be provided to be used as shops by the dwellers. It is also recommended that these shops be adjacent to the entrance, reception or circulation zone inside the house and positioned in a way that male inhabitants can keep their eyes on it from the inside, if they wish.

Internal Street

Relationship   Movement
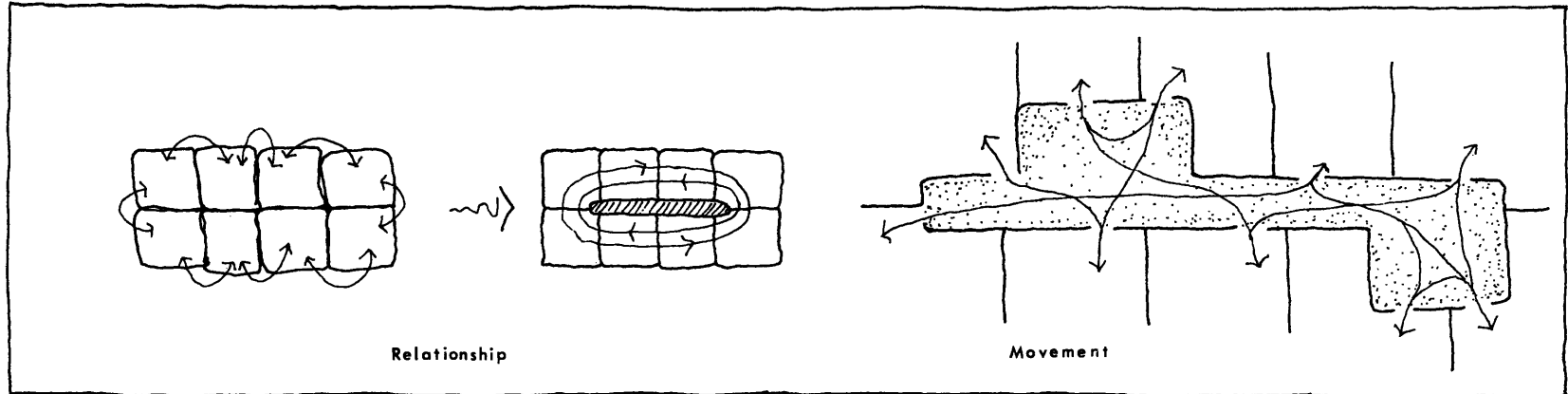
Dogmatically, all community neighbors should have the feeling of solidarity, reciprocal duties, respectfulness and obligations towards each other. Each unit should extend its contacts in all directions up to the seventh neighbor. Nowadays, however, this phenomena does not exist in most new communities. The reason for this is that the women and children do not have the opportunity to move freely and interact with the neighbors. Women have to "veil" and pass through wide streets in order to visit neighbors. Streets are also considered dangerous for children to play. Traditionally, there were small, narrow and closed streets. Occasionally, they were con- nected to the main street through gates. These streets served as an external room for the children to play.

It is, therefore, suggested that a space be provided in which the users, if they agree, can make into an internal street. This street can be for groups of relatives, friends, or just neighbors, a street where children can play safely, a street where women can move about freely as men do in the main streets and without need of veiling, a street which works as a light and air-well for a small community. It is also recommended that the street be narrow and partially roofed to provide shade.

Parking

Small parking lots set aside for groups of residents will not be used by them; they may be used by visitors. The reason for this is that the people prefer to park as close as possible to their houses. They park over sidewalks and adjacent to the external walls; looking for areas of shade and a distance which is minimal for walking to their houses. Some try to make shelters for their cars in the street (although this is against municipal regulations); others try to park and shelter their cars in their gardens. Garden parking spaces, however, are not commonly used, especially if they are not sheltered, since it is not convenient for people who have to make many trips daily. In Tabuk Armor City in Saudi Arabia, there is one, two-car parking space which serves two houses. There are also two entrances to each house: one leads directly to the kitchen, the other to the main entrance. The dwellers use the kitchen entrance as the main entrance simply because it is much closer to the parking garage. Relatives and female visitors also use the kitchen entrance as the main entrance, since it is the one which the


Tabuk
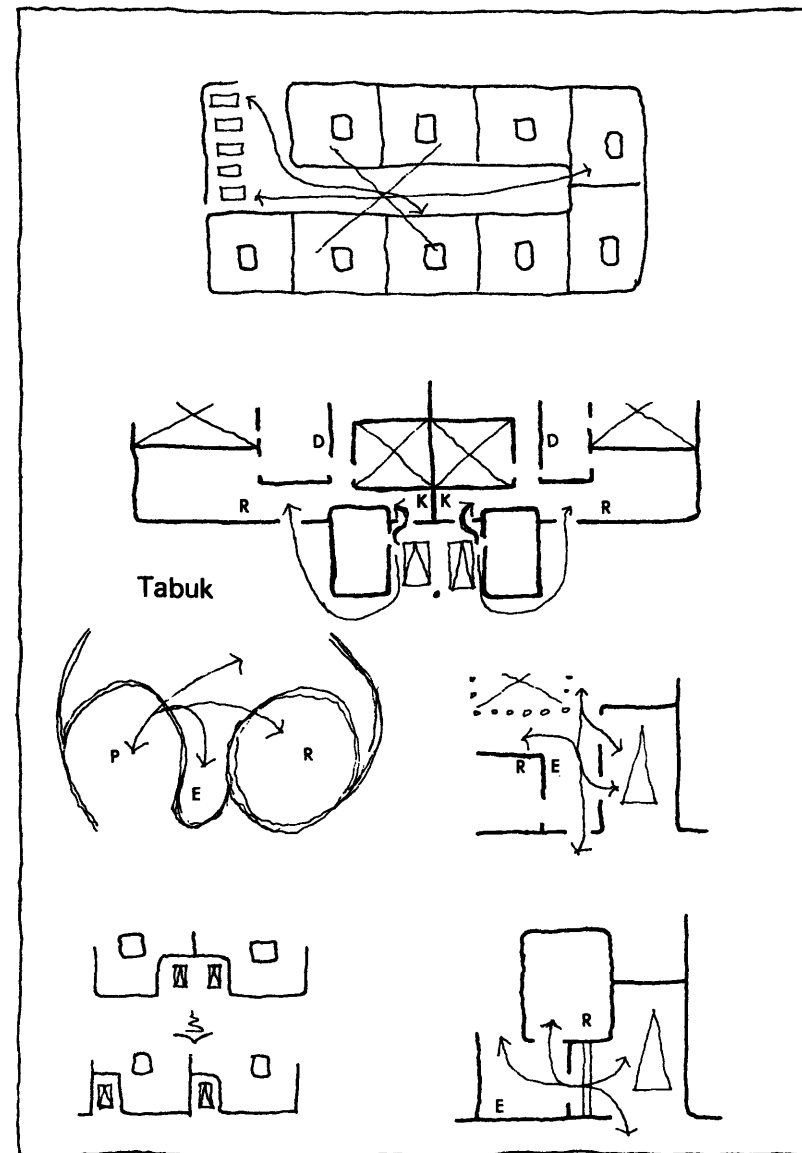
family uses. The parking space situation has
caused tension between the two families having
to share them. Almost all residents have com-
plained about these situations. During large
celebrations, some families use the garage as a
space where men can help in the preparation of
tea or coffee, or even for cooking; others might
use it temporarily as a reception space for just
one day.

It is, therefore, suggested that spaces be pro-
vided for use as a parking garage, if the users
wish to have one. It is also suggested that the
parking garage be close to the entrance door, or
could even have direct access to the entrance
hall or the circulation zone, if the users' wish.
It is also recommended that parking garages be
separated and each unit have its own space, but
if two or more relatives would like to have
their parking together, they are free to do so.

Entrance

Traditionally, entrances were visually hidden
for social reasons. Each entrance was isolated.
In some cases, there were groups of entrances
for relatives; these were large uncovered
entrance halls which were shared. These en-
trance halls were connected to the street through
a gate. Nowadays, building entrances are also
hidden since they are located inside the gar-
dens. Main entrances of houses, on the other
hand, are very visible on the street. They are
usually decorated and sheltered. The people
identify their doors by using different textures,
colors and forms emphasizing the line between
the external public and internal private.
In courtyard houses, the position of the main
entrance influences the layout of the circula-
tion zone. It controls movement to and from the
house. The drawings show some of the possible
relationships between the entrances and the
circulation zones. People in Saudi Arabia want
their entrances to be private domain. This do-
main can be established if the front door is
set back, and there is a transition space be-
tween the door and the street.
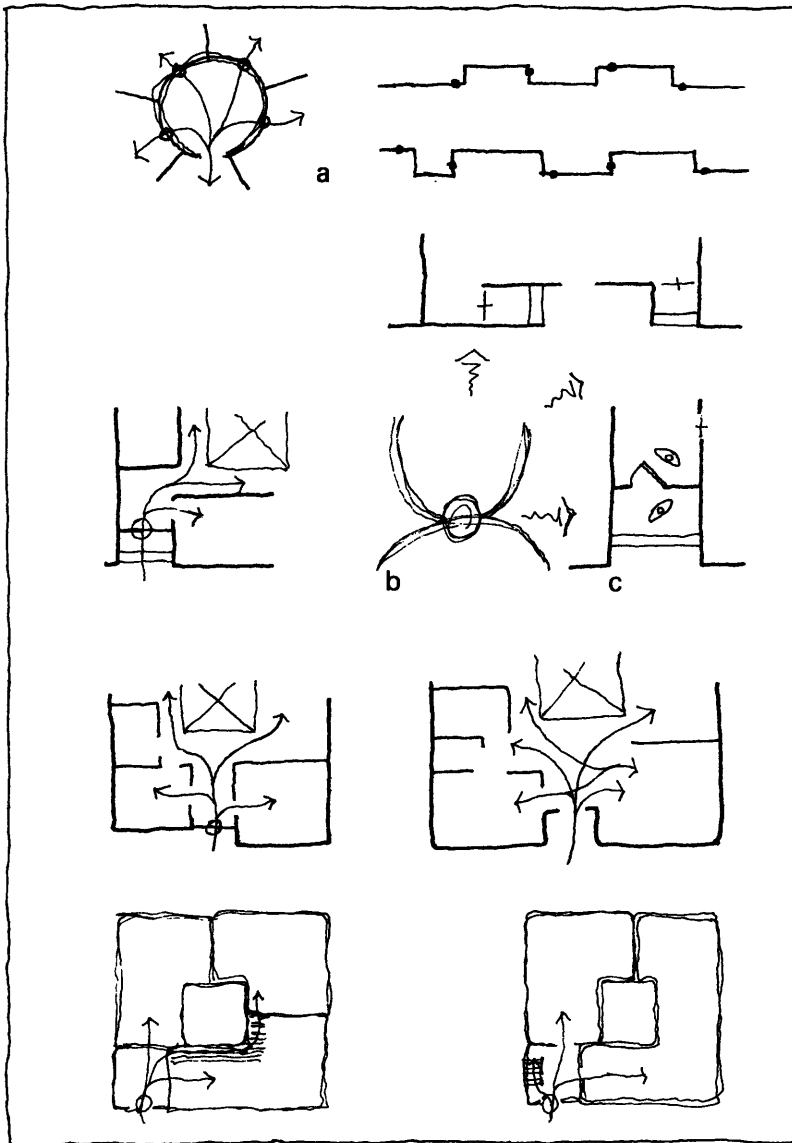
It is suggested, therefore, that entrance grouping be avoided as much as possible; and that each entrance is somehow hidden from the others in which the building line protrudes beyond the entrance. In this case visitors, especially women, will not be viewed by others while they are waiting. It is also suggested that spaces be provided where groups of houses for relatives can form one entrance hall in which females can move without being seen by the public.«a»

It is further recommended that a transition space be provided between the front door and the street. The transition space may be emphasized by a change of level, a change of direction, or a change of light by covering it. It is a space where people can get shade and lose the street behavior.«b»

It is also recommended that the entrance room inside the house provide privacy, so that a person standing on the door front cannot see the family quarter; and the door may be positioned in such a way that if the female answers the door, she can have plenty of room behind the door without being seen.«c»

Windows
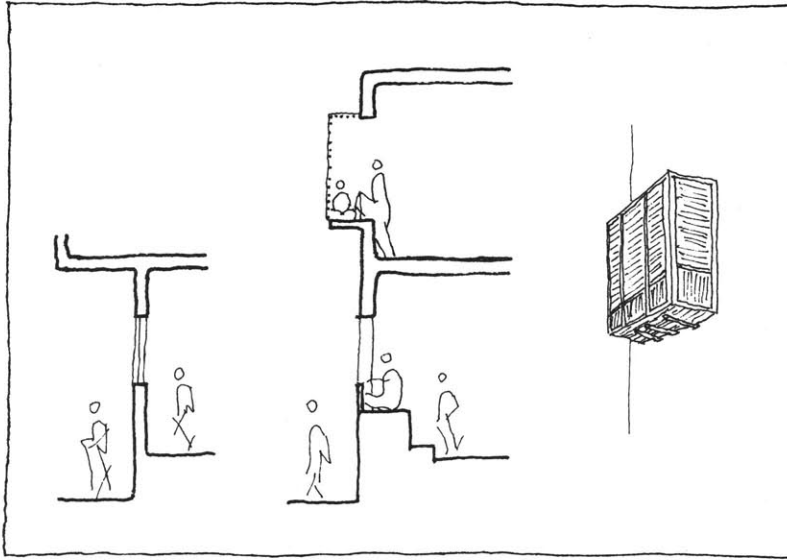
Large protected windows known as "Mashrabias", were used extensively in most Islamic regions. They filtered the light and people could see through them without being seen. They made the street look visually alive. Females were traditionally allowed to watch the street from upper floors, as long as they were not visible. According to Islamic customs, men do not look or view upper floors; it is considered impolite. Second and third floor windows allow the people to view down the street. Ground floor windows are so close to the street they do not allow a view onto the street. The ground floor windows are protected by steel bars or are always closed for privacy or security reasons. It is suggested that large openings be provided in the upper floors; so people, if they wish, can build large windows with wide sills in which they can lean and sit. It is also recommended that ground floor openings be high enough to provide privacy.
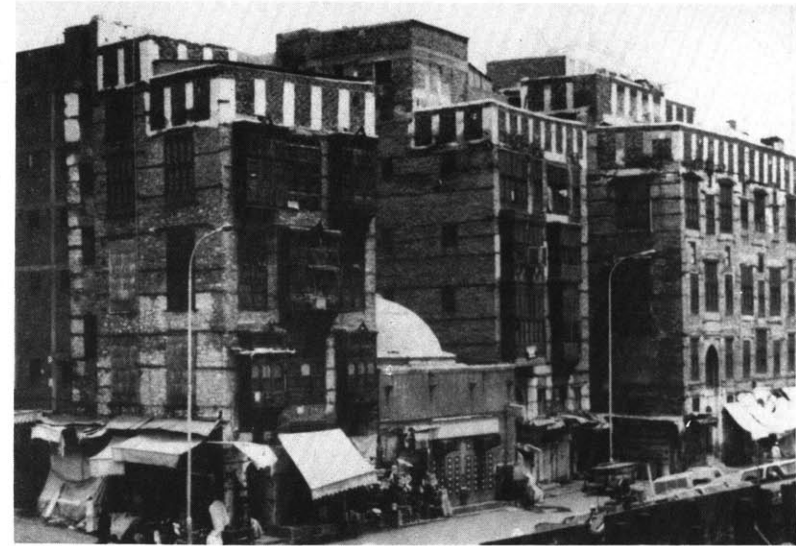
Court Yard

a) There is a need for space to sit privately,
to drink, to eat, and to talk together; there is
a need for an out-door room where people can be-
have as they do in indoor rooms, and particularly,
there should be an outdoor room which allows
people to appreciate the beauty of the sky while
they engage in these activities. This space
gains added dimensions when it is well enclosed
and is surrounded with rooms, galleries, bal-
conies, and sitting walls, thus allowing all the
family members to take advantage of this very
well defined concentric space.

b) It is recommended that the courtyard have
doors on at least two opposite sides, which
would allow for added traffic, activities, and
functions, so that it becomes a meeting point
for these activities. The added doors provide
for access, overflow and circulation. The
existence of doors in one side would inhibit
dwellers from using the courtyard for different
activities, and from passing through it. If
these doors were not positioned in the corners of
the courtyard, the people might store things in
those corners.
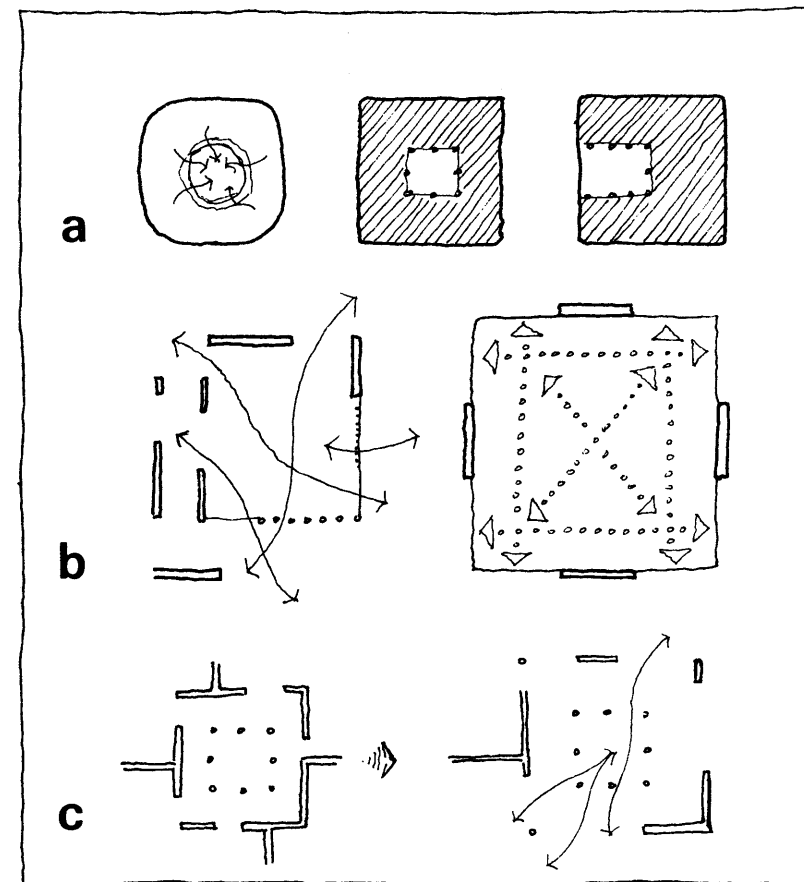
c) It is recommended that the courtyard be
placed in a position which can be viewed by
other smaller spaces, so people can look into it,
as well as a position which allows people to see
beyond it.

Galleries

a) The courtyard, it is suggested, should not
be completely disconnected from the house nor
should it be surrounded totally by rooms and
walls. A transition space might be needed be-
tween the covered rooms and the open courtyard.
The transition space is partly roofed and,
therefore less exposed to the sky (especially
the north side). Possibly, a space could exist
which is continuous with both the inside and
the courtyard: a "margin". This would make
the courtyard seem more like a part of the
house, and consequently the dwellers might
drift naturally into it.

b) In existing houses most galleries and
balconies are not used for the purposes for
which they were designed. Usually this is be-
cause they are overlooked by neighbors or
passing pedestrians. As a result, they are
often used as a storage area or they are covered
and built up to join the house as a room. The
balconies which are inside the house and face
toward the courtyard are private and ought to
be used. Galleries or arcades on the ground
floors could support balconies in the upper
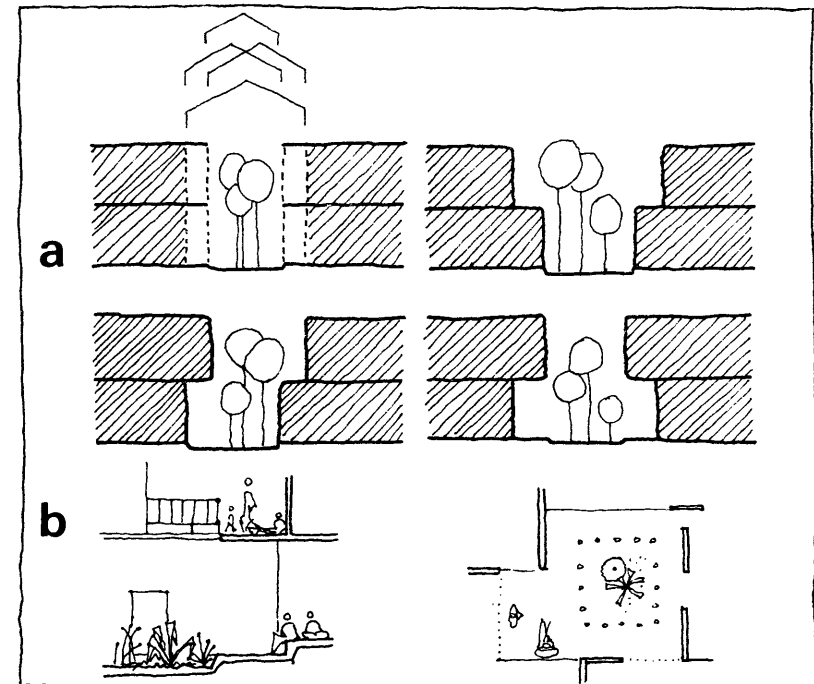
stories, thus allowing the people to spend much
time in touch with the courtyard - doing work,
eating, or sitting with children. In short, most
human situations would be enriched by enhancing
the qualities of this space. It is recommended
that the space be large enough for 2 or 3 people
to be able to sit in small groups, since the
Arabic custom of sitting on the floor and
stretching one's legs is still very prevalent.

Openings

a) When people, particularly women, are at home for any length of time, they might enjoy looking out into the street or the courtyard to refresh themselves. They might also be drawn to the court windows since they are shaded and well-ventilated. This would be a natural place to sit, watch others, read, talk, etc. Therefore, it is suggested that the house provide low sill windows or half open walls between rooms or facing the courtyard.

b) Tents, canvas, and awnings are often used in the Middle East. They have a unique beauty: they are soft and weather the sun, light and wind extremely well; they are translucent and allow breezes to cool through them; they are inexpensive and easy to roll up and pull down by means of ropes and wires; and they give colors to the courtyard and a warm glow to the interior rooms. Two types are recognized: First, awnings to provide shade from the sun over windows, sidewalks, etc. Second, tend-like roofs on courtyards which can filter the sunlight and make the outdoors like a room.
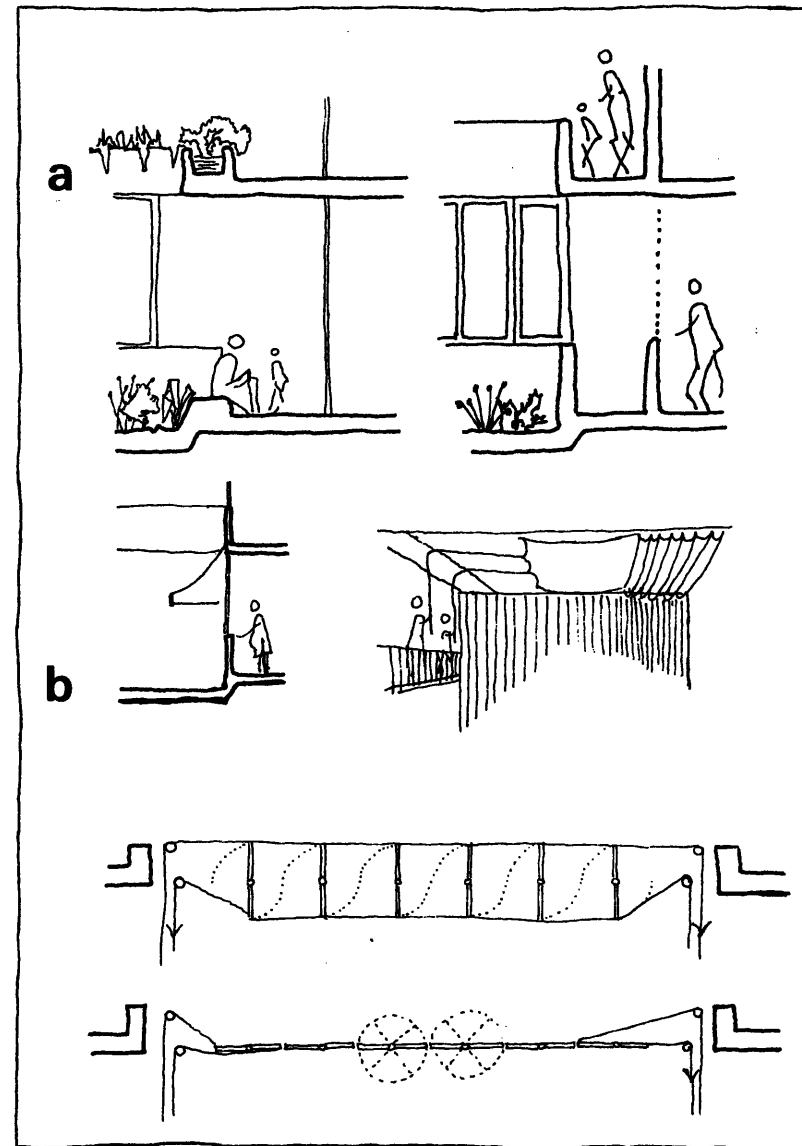
Cover
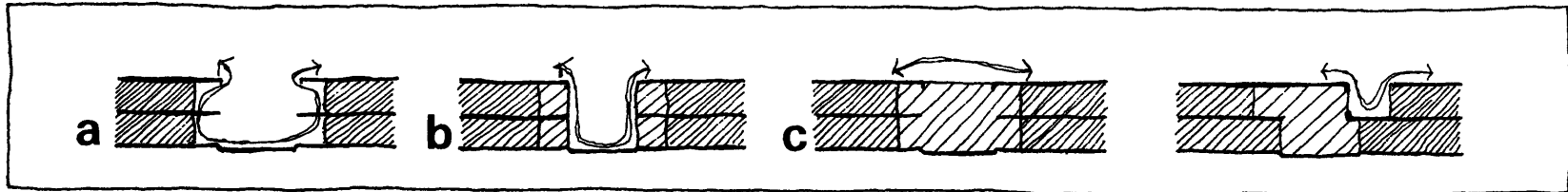
In a desert climate, houses need a courtyard
opening in the summer with good protection
against direct sunlight and dust. Houses must
also have good protection during the winter. To
deal with this problem, three types of covering
are recognized.

a) Each room is protected and isolated by it-
self. In this case, the dwellers have to go
through different temperatures and conditions
when they move inside the house. Naturally this
is unacceptable, especially if the rooms are
air-conditioned.

b) The rooms and circulation zones around the
courtyard are protected. In this case, the
dwellers may move freely inside the house, but
they may not enjoy the courtyard. The courtyard
may lose its beauty.

c) The opening of the courtyard is protected
with semi-movable and semi-translucent covers.

With such covers, the whole house, including
the courtyard, becomes a sealable space; with
climate control included throughout the house.
During the summer, the courtyard cover can be
opened during the late afternoon and at night,
causing the breeze to blow through the house
cooling the rooms and furniture. In the noon-
time, the courtyard covers are closed, pro-
tecting the house aginst sun rays and dust.
During the winter the courtyard cover can be
closed at night and opened during the day. In
this case, windows which open into the courtyard
may not need glass or moving frames. For visual
privacy, curtains may do fine.

In new houses, fountains are located in the gar-
den and exposed to the sun rays and dust. But
in courtyard houses, small fountains may
humidify the air and may be viewed by the sur-
rouding rooms.

Communality & Privacy

Human society is based on the extended family, which includes at least three generations of parents, children, grandparents, uncles, aunts, cousins all living together in a single or multiple household. Nowadays, some members of the family become involved in education and/or work, so that the nuclear family consists of the father, mother, and children. These families are based on blood ties. The people in the house live together as a group and through this arrangement can often find the comfort they need during difficulties. Therefore, the setting for a large family must provide a physical balance of privacy and communality. Each couple and each person needs a private space or "territory"; this includes the children, who might have a separate room. The most vital common areas are the living, eating and reception rooms, as well as the courtyard and in some cases the kitchen. It would appear, then, that there should be a large family room at the heart of the house, in which everyone would tend to meet. This could be a separate wing of the house or the entire first floor of a multi-story house.
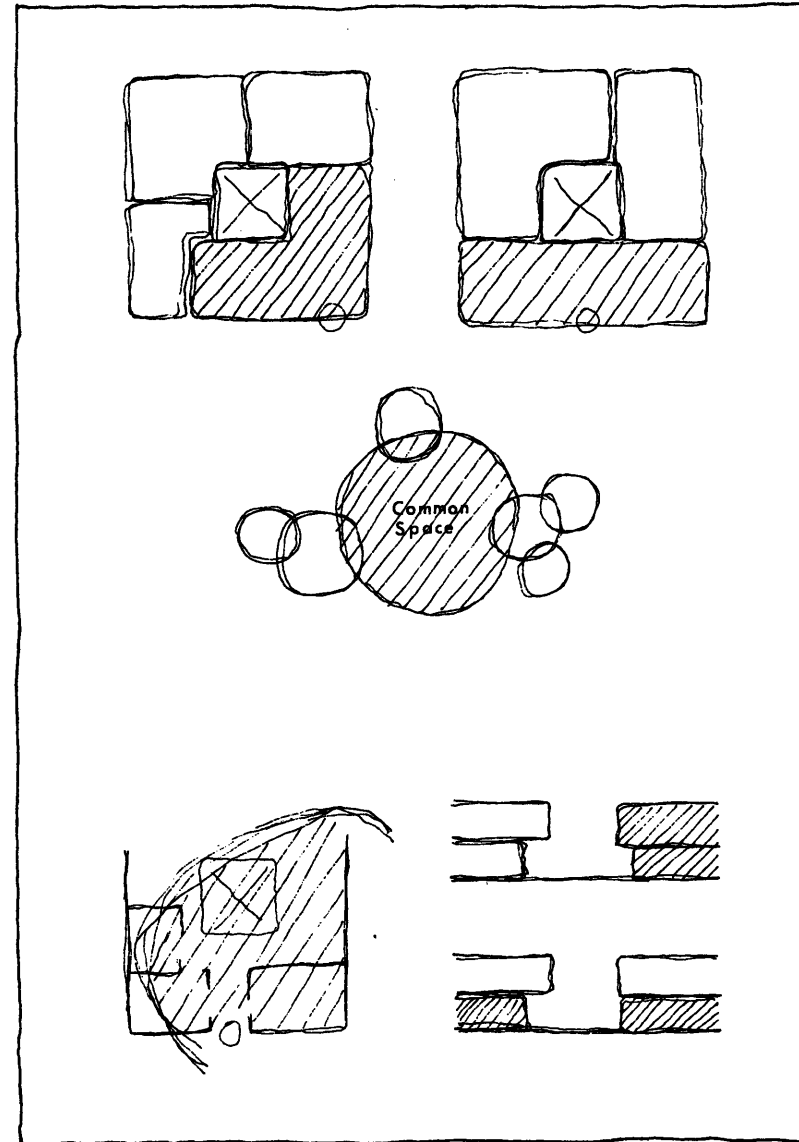
When formal friends or distant relatives are in-
vited in, they are limited to the well-furnished,
most visible part of the house, the reception
room. Close relatives or close female friends
may be made to feel at home in the family room.
A few relatives and female friends will be
allowed into the kitchen and other work spaces
or, perhaps, the bedrooms. Whatever the relation-
ships with the guests, the family always main-
tains a sense of privacy and pride. This
phenomenon is very evident in the case of par-
ties. Even though the house is full of people,
some will never get beyond the reception room.
Others will go so far as helping out in the
kitchen. Each person, however, has a very ac-
curate sense of the appropriate level of privacy
to which he is entitled and knows exactly how far
into the house he may penetrate. Thus, the
spaces create a sequence of "privateness" and
"publicness". See page 38.

Common   Private
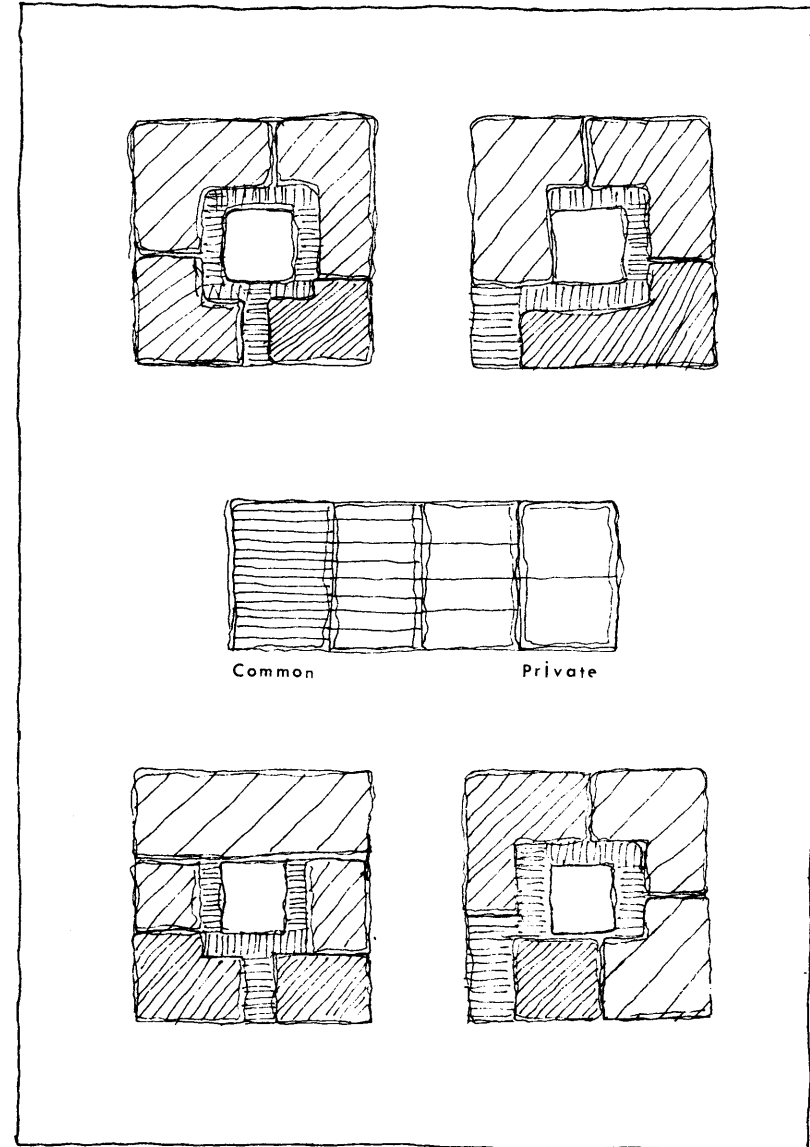
Intermediate Space
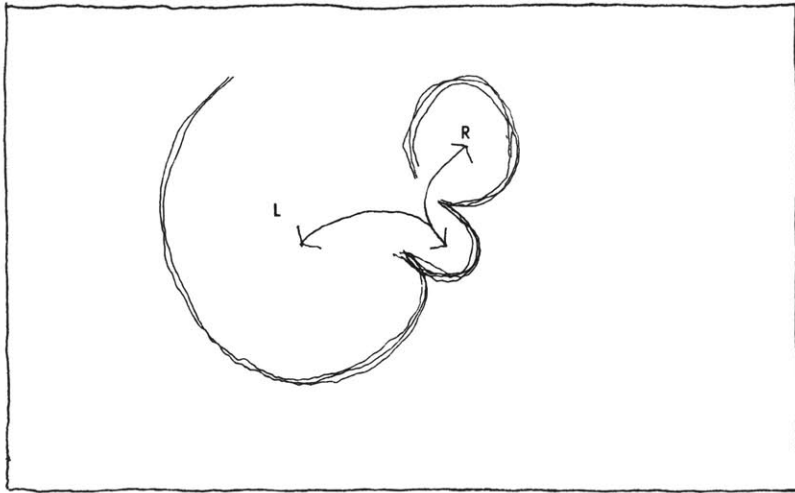

Veiling, in general, is very common in Saudi Arabia, but it varies from one family to another. Most families are strict about it. In the Saudi custom, the man is allowed to see his aunt, but not her daughters "cousins". The woman is allowed to see her uncle, but not his sons "cousins". Now, if there are male visitors in the reception room and one of these men wishes to meet his aunt, he has to penetrate to the family quarter; because the aunt is not allowed in the reception room. This will force the daughters to stay in their bedrooms. The husband also is not allowed to see his sister-in-law. So, if there is a female party, and his sister-in-law is helping his wife, "her sister", he has to stay in his bedroom or leave the house. In fact, there are many other examples which require a double circulation system or double living rooms inside the family quarter. Therefore, it is suggested that an intermediate space be located between the reception and living areas. This space can be an extension of the living room and connected to it; but somehow isolated by a screen, curtain or partition. It can be used as an informal reception or formal living room.
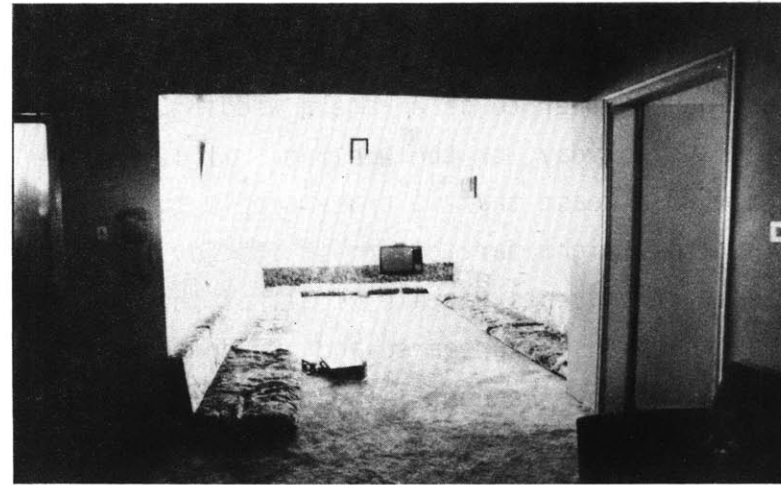
Events

One of the most active social events in Saudi Arabia is having a party, gathering together and eating together to celebrate a wedding, a religious holiday, or the weekend. It is the nature of a feast that it draws people together so that they might participate in its joys. At the feast, the guests partake of all of the good things which are prepared and presented with great care by the host. In this atmosphere of friendship and gratitude, people share and become closer. The feasts bind people together. Feasts can be for males, females, or both separated as well as mixed (for close relatives). Usually people try to form a continuous, sizable space in the house by opening doors and storing or moving things that might be in the way. It is suggested that one continuous space be formed by joining the reception, and living, or dining room and the courtyard. Ideally, one would avoid solid walls between them.
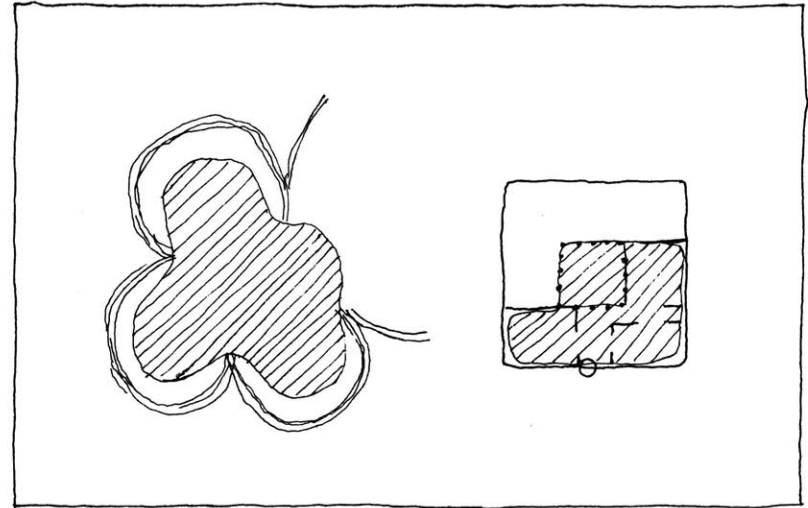
Loop

Circulation in the existing houses is based on a
series of passageways and lobbies. To move from
one point to another, people have to pass in and
out through halls. The movement between rooms
is as important as the rooms themselves and its
arrangement effects social interaction. A common
criticism of the courtyard houses is that they
are boring and repetitive, because they consist
mainly of the corridors and rooms distributed
around the court. In fact, one might improve
this situation by establishing a loop which
passes through all of the major rooms, establish-
ing a more generous feeling within the space.
With the loop it would always be possible to
come and go in two different directions; and one
could always walk around. Not only would it tie
the rooms together, but if it passed through the
common room, it would be a better connector than
a simple passageway. The loop could also work
as a chain for leveling the rooms in terms of
privacy, and it would establish the common rooms
as a space for movement and gathering.
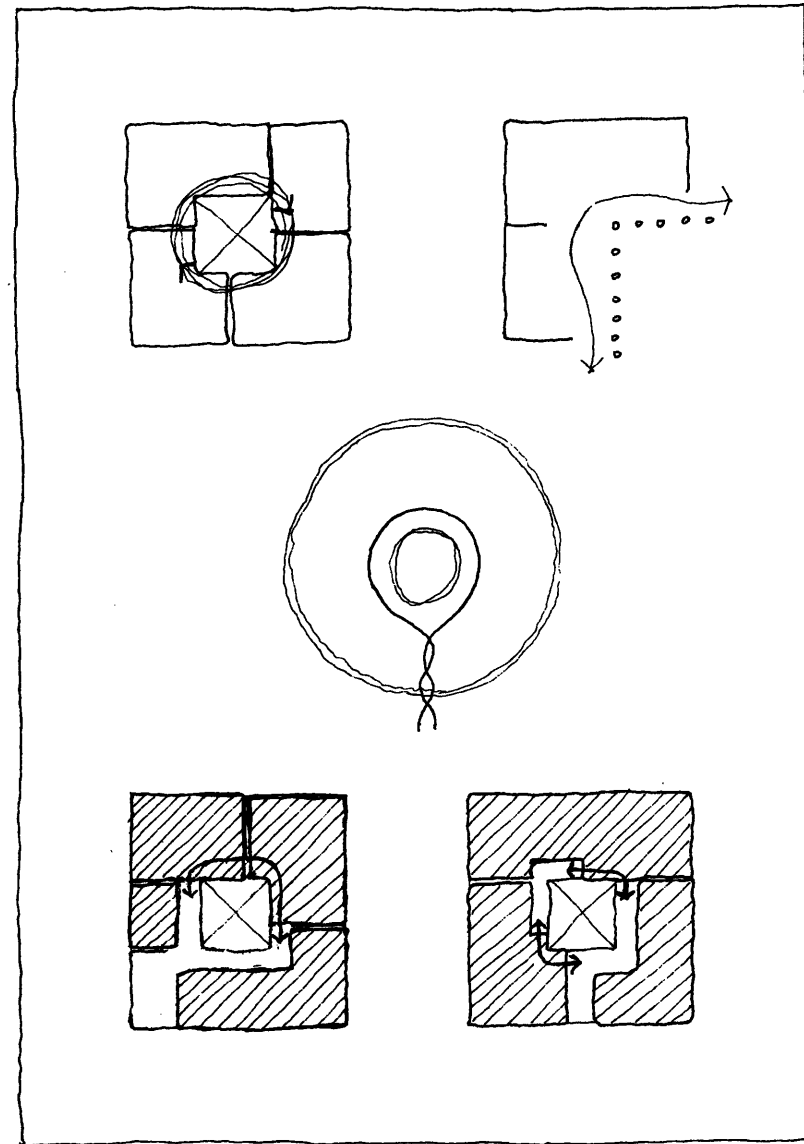
Passageways

Lobbies and passageways in existing houses are
blank, solid walls without windows or shelves.
However, the corridor has the potential of being
a place for activities, like a room. It is
recommended that the corridors not be long and
repetitive and that an emphasis be placed on
making them a "living" space.

It is recommended that the corridors or passages
be generously lit and shaded and dark zones
avoided.

It is also suggested that doors and windows
line the sides of the passages. The openings
from the rooms to the corridors might establish
a flow between the rooms and the passable ways.
This would allow for a more informal style of
communication.

Ideally, the passages would have chairs or seats,
thus inviting people to spend time there and the
passages would provide views to the court and
upper or lower stories.
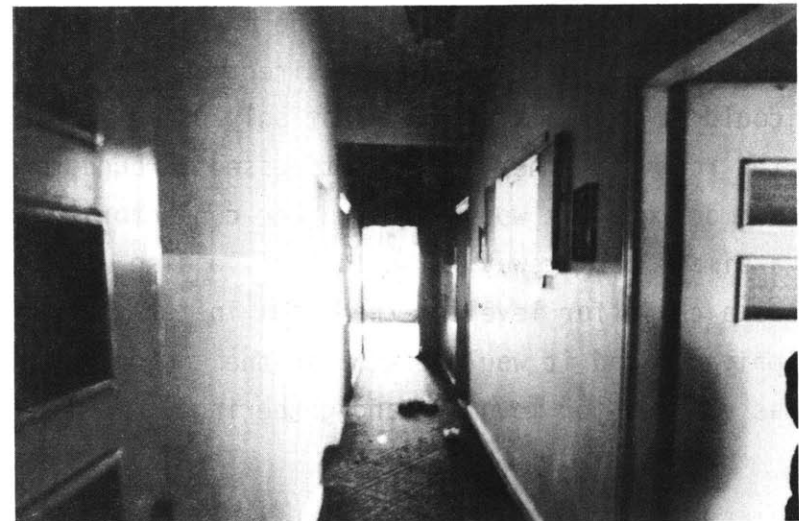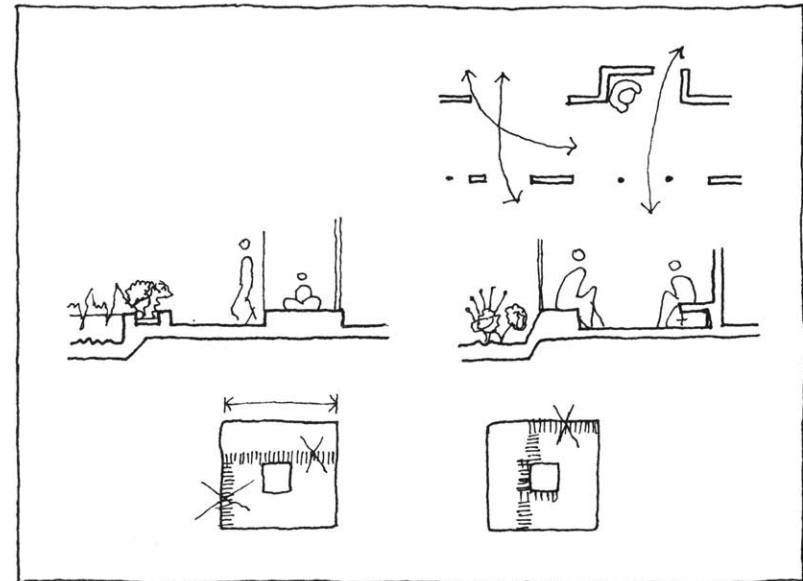
Living

Traditionally, the living room represented a source of security and love. Nowadays, each family member has his own room and engages in his own interests, very often in the privacy of his own room. The various members of the family go in and out at different times. As a result, the family members do not share the communality of the living room. The new houses support this change through the use of the stairs or passageways which lead directly to the bedrooms. The living room is one completely open space, so that one member of the family might disturb others when watching television or practicing his own interests. A recommendation for this situation would be a bent living room or smaller spaces connected to the larger room. This should be located in the heart of the house where many familial activities can take place at the same time. This space would also facilitate the visiting of female relatives or friends by allowing them room to sit separately in groups "boys, girls, men, women, children, adults".
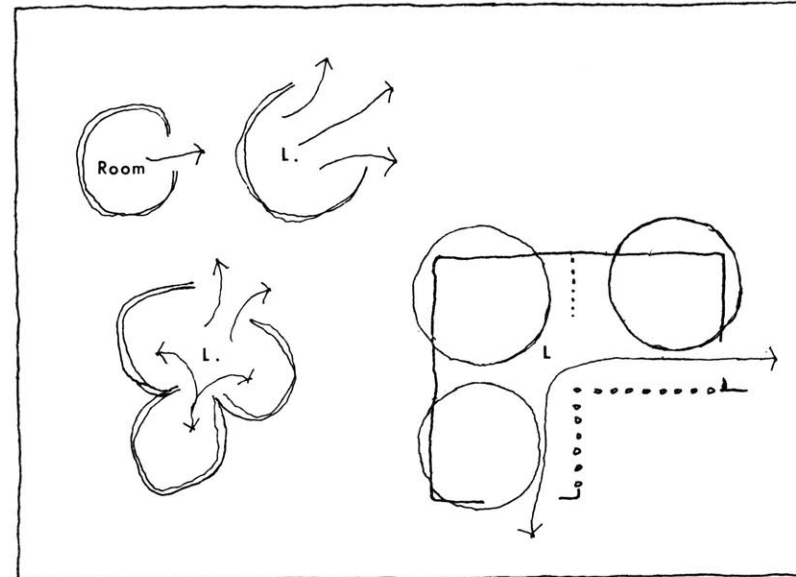
Sleeping

Sleeping is a critical issue, very related to the family lifestyle and structure. People sleep at different times in the night and in the afternoon. People might have one cluster: parents and children, 2 rooms; parents, girls, and boys, 3 rooms. There might even be another separate cluster for the grandparents, or married son, or relatives. The simultaneous need for privacy and contact/being close in Saudi culture leads to the design of the lobby concept sleeping cluster, in which the lobby is never used and the rooms are arranged in an "introverted" manner.

In Islam, a strict segregation of the sexes is required in the sleeping areas, even if there is only one room; the females sleep on one side and the males on the other side.

If the family has children, the whole house will have the character of a children's room. Since the children desire to be near the adults, it is recommended that the order of the bedrooms be: master bedroom, children's bedroom, living space. In this case, the lobby could be a playing area for the children, and the master bedroom will be more private. It is also recommended that the
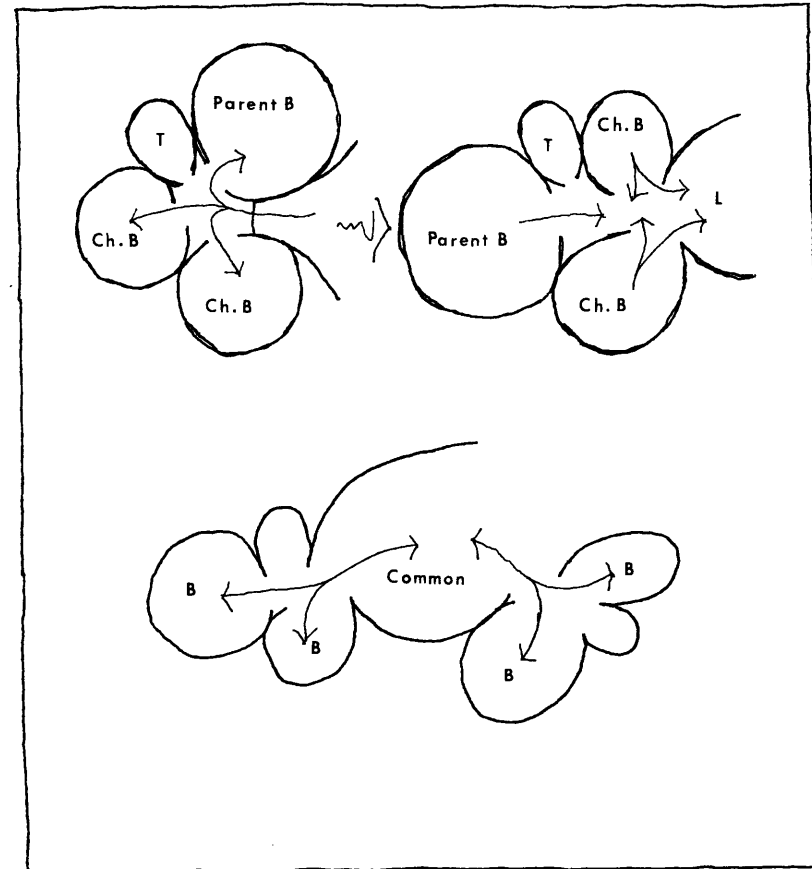
clusters be positioned close to each other, yet somehow separated by communal space in which privacy and contact can be maintained. Dressing rooms are fashionable these days and are located between the bathroom and the bedroom.

Staircase

Traditionally, the staircase was not just a way
to move from one level to another, like those of
existing buildings in which the stairs are en-
closed in stair wells. The staircase was a
volume which provided a special place to sit;
its first few steps were free and wide. It was a
place to see others and be seen. Nowadays, the
stairs connect lobbies or corridors, while in
courtyard houses they connect the courtyard
with the upper gallery, even though they may be
located in corners. The stairs might be treated
as a room or a living space if it were located
within a communal space. The need for double
circulation in Saudi Arabia, led the people in
some houses to have two staircases; each one
positioned in a different quarter; while it is
possible to have one staircase, if it were
located properly between these two quarters.
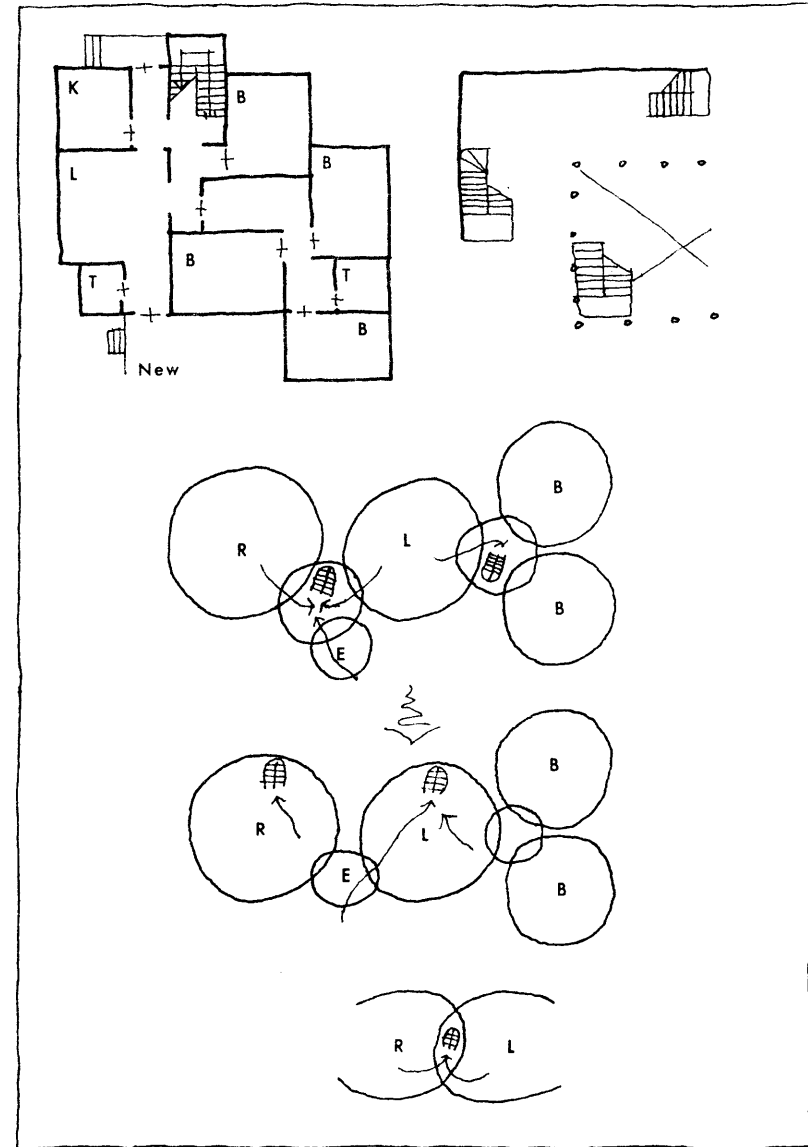
Kitchen

a) Traditionally, when there were no servants and the women took care of the cooking, the kitchen was a simple room located close to the family life. As a result of wealth, servants took over the function of cooking, particularly, in the palaces and homes of the wealthy. Consequently, the kitchen was separated from the family quarters and sometimes the kitchen was separated from the building itself. Also, it was preferred to avoid any sight or smell of food when the architects designed previously. The kitchen was located in the leftover spaces of the house and usually opened to the corridor or lobby only. Thus, integration between living area and kitchen depended upon the family's wealth. This separation put the women in a very difficult position. In the Saudi culture, both cooking and eating are enjoyable and pleasant. Women who spend much time in the kitchen dream of a large kitchen since it can be a place for gathering and gossiping with close friends and relatives, who usually help with the cooking. The women want to prepare the food, but at the same time they want to be close to and in
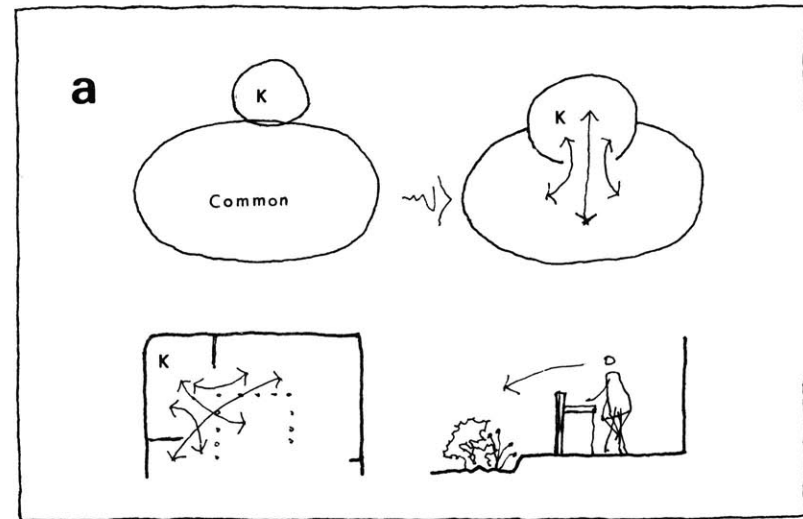
touch with the family. It is recommended that
the kitchen be made larger, and that it be lo-
cated near the common spaces, with openings
which would allow the women to see the family
life and the courtyard, if possibe.
b) Traditionally, the kitchen had open
shelves so that everything was displayed. They
were one item deep, so that things did not need
to be moved when getting something. These
shelves were also used in the reception rooms to
display glasses, dishes, etc. In some cases,
they were covered by curtains. These shelves
could be used in the kitchen in windows that
look toward the courtyard so that they would
filter the light.
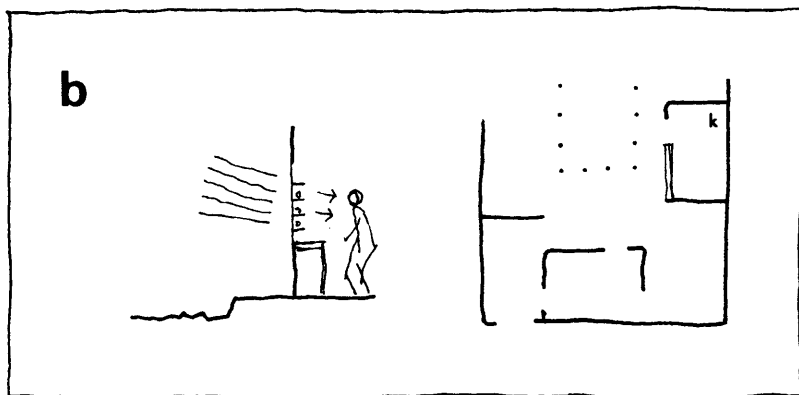
Storage

A bulk storage space is important these days
since wealth has enabled people to buy many
things, which they do not necessarily need or
use often. The Saudi culture is a self-
sufficient one; "the people cook, wash, etc. at
home"; this requires the existence of much
equipment in the house. If adequate storage is
not provided, then another space - such as a
balcony - will become a storage area. It is
suggested that two storage spaces be considered.
One would be for long term storage, and it
could be located anywhere in the house, while
the other could be for the everyday items and
could be located close to the living and kitchen
sections. Most new houses do not provide ade-
quate closets in bedrooms, kitchens, and living
spaces, so people are storing their things,
mats, cushions, etc.", under beds, behind doors,
and in corners. It is, therefore, suggested
that each room should have at least one closet.

Bathroom

The bathroom and toilet are usually used as one
unit in Saudi Arabia, and there is always a basin
beside or outside of the toilet for washing be-
fore and after having food.

The members of the family should be able to
pass from bedrooms to bathrooms without being
seen and without passing through the reception or
living sections.

Family members or relatives should be able to
use the bathroom directly from the living room
without seeing the bedrooms.

Visitors should be able to use the bathroom with-
out passing through private rooms or living sec-
tions. Therefore:

a) If there is just one bathroom in the house,
it is recommended that it be located between the
reception and living sections, so that visitors
will not see the house.

b) If one bathroom and one toilet is provided,
then the bathroom should be located between the
bed and living sections, and the toilet between
the reception and living sections.

c) If more than two bathrooms or toilets are
provided, then one bathroom should be in the bed
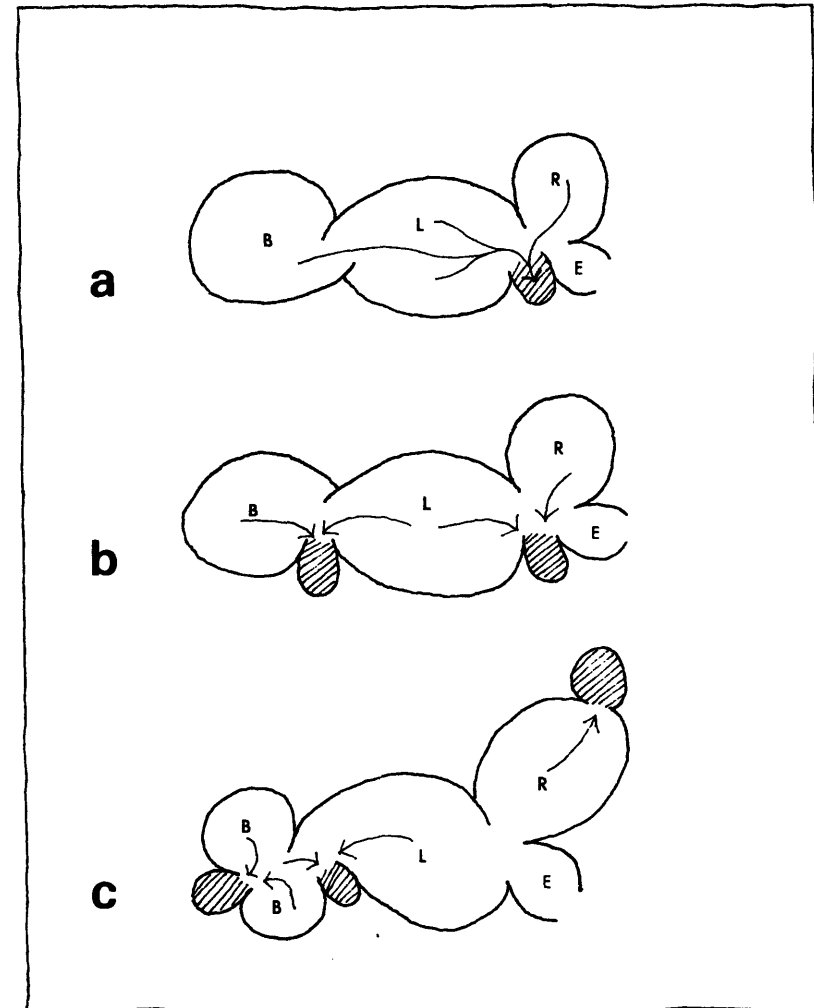
cluster, the second in the reception quarter, and
the third between the living and bed cluster.
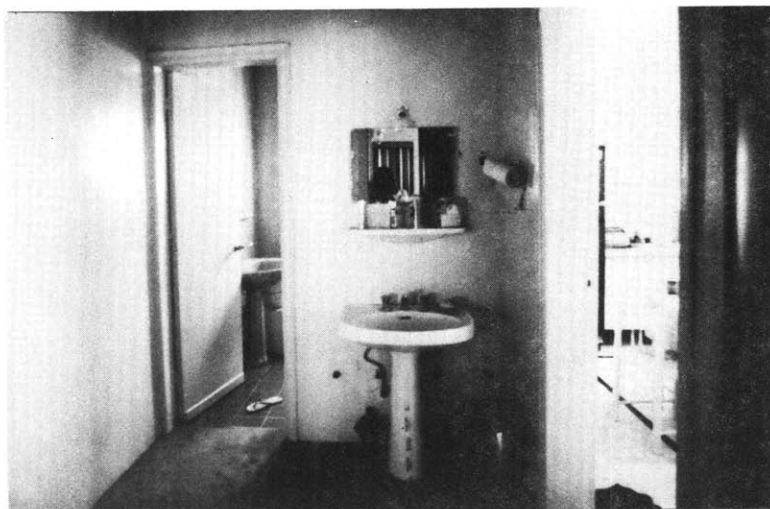
Washing Basin

Reception
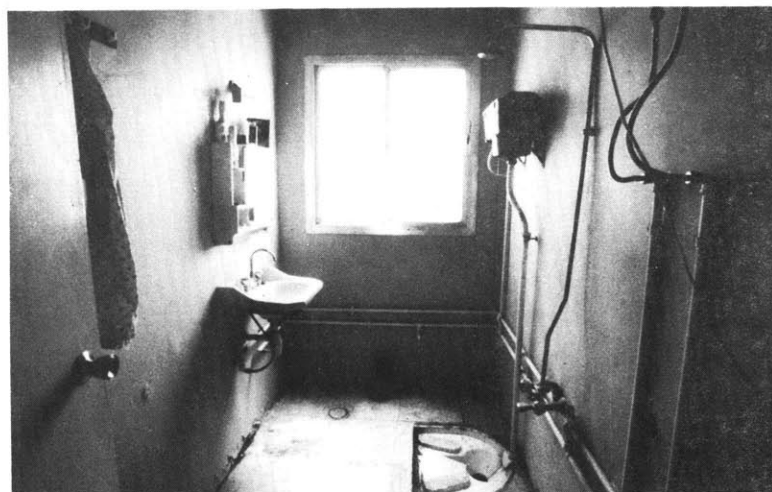
Toilet

Mats, Cushions, etc. Stored in Corners

Section 3:
A Support

Contents

Introduction

Recently, in Saudi Arabia, the government established the Ministry of Housing and Public Works. This Ministry is mainly building high-rise housing projects in various parts of the country. Each project consists of approximately 2000 units. These new projects have not yet been inhabited; one of the reasons behind this is the indecision as to who will inhabit them. 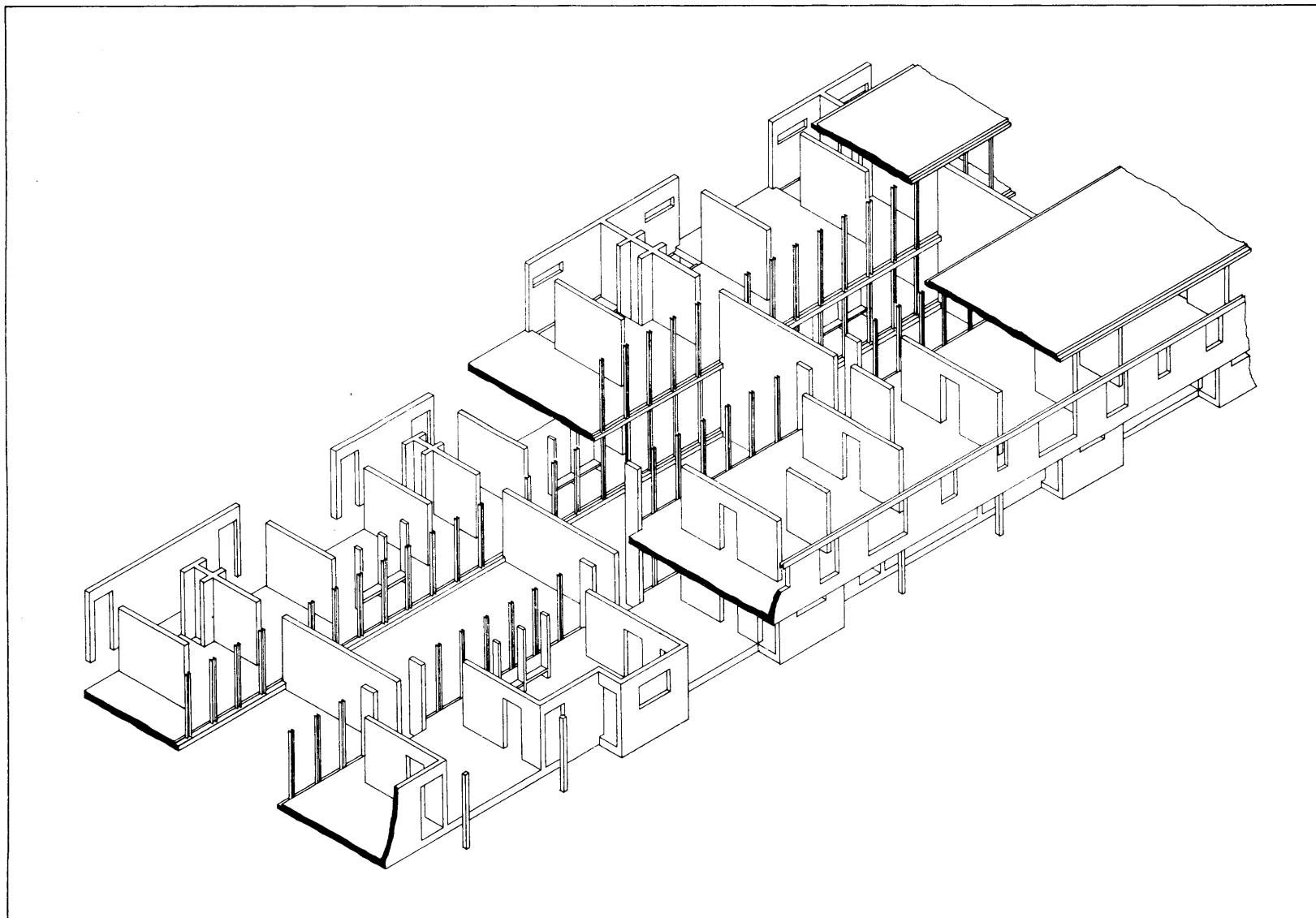The design process used in this mass housing is based on the floor plan or the unit plan. Once the unit is designed, it is repeated to create the larger building. The basic floor plan is always a compromise, the result of endless negotiations between the Ministry of Housing and foreign companies. In fact, all design effort is directed toward a solution to justify continuous repetition of the floor plan. Meanwhile, in order to ensure that these projects would not fail, highly industrailized housing systems were implemented, the area of the units was increased, the spaces between buildings were landscaped, etc. These highly standardized efforts resulted in a production of a large, monotonous and uniform buildings. At the same time, there are doubts about the economic benefits for these projects. They do not seem competitive with traditional building methods. The Ministry of Housing, however, has currently put a stop to the production of these high-rise buildings and is, instead, planning to build "detached"-type houses in the future. Currently, the most successful houses are ones which are built by the users themselves, or are subsidized through the Real Estate Development Fund. Most architects tend to think of these houses as "disastrous", simply because they are architecturally unacceptable due to their unusual forms, colors, and building materials. The users, however, like this type of house, since they are tailored to fit their user's needs and requirements, thus giving them a sense of full control over their dwellings. As these houses were specifically designed to meet the needs of individuals with different backgrounds and values, they exhibit considerable diversity in floor plan, elevation, etc. However, these tailor-made houses, make it expensive and difficult to accommodate future changes.

The missing element in public housing is the role of the individual dweller who is no longer a participant in the housing process. Indeed, the very principle of mass housing as a technical and organizational concept is that the user has no role in the decision-making process. In the traditional building environment, users were active participants with full control over their dwellings; they participated in shaping their surrounding environment. In fact, a balance between the individual and the communal forces can be found in many different forms. In mass housing, however, this force does not exist.
In Riyad City, prior to the establishment of the Ministry of Housing, the Ministry of Finance during the sixties implemented a housing project in the Al-Malaz community. Concurrently, the Ministry of Defense implemented a housing project in the Al-Matar Street Community. The houses, in each of these two projects were owned by the dwellers.
During the course of their stay, users have changed the layout within the dwelling units; some have enlarged their bedrooms, while others added bathrooms, etc. In most houses, the floor area was increased by adding new construction. Furthermore, the function in some houses was changed from residential to commerical. Some users converted their house or some part of it into stores, shops, offices, etc. Therefore, now, fifteen years later, the original floor plans have all changed, buildings shapes have changed, elevations have changed; they are barely recognizable from the original structure.

Why have these changes taken place? There are many contributing factors which have brought about these changes, some of which include the following:
THE NEED FOR IDENTIFICATION: People want to recognize themselves and to be recognized. This need determines the choice of clothing, cars, furniture, etc. It also plays a role in the choice of housing. They improve their houses and spend money generously to determine their place in society. Homes have always been used as a means of self-expression, and homeowners have felt the need to personalize their environ-

ment. Old wooden windows are replaced by
"modern" wide glass windows; curtains are
changed often to be replaced by new ones; fac-
ades are painted in different colors; pink,
yellow, green, etc. Different textures and
materials are used to form fascinating facades;
pitched roofs are added in desert climates;
large reception rooms are added to express
hospitality. There are, indeed, numerous ex-
amples like these which can be pointed out
easily.

CHANGES IN LIFE STYLE: The life-style in Saudi
Arabia is passing through tremendous change.
This change is caused by contact with other
cultures through travelling, through watching
television and through education which intro-
duces new ideas about society. Although the
Saudies share the same culture, each family has
its own life style. For instance, veiling varies
among families; some are very strict about it,
others are not. The majority are proud of the
Saudi customs, while some are taking on more
western attitudes. Even poor people are being

affected by the surrounding environment. Changes
in the structure of the society have a strong
influence on life-styles. The styles of ten years
ago are not today's styles. Increased affluence
has placed a higher demand on the provision of
services in a house. From the first two sections
of this report and by reviewing the history of
housing we can notice easily the effects of life-
style change. Futhermore, it is almost
impossible for any architect to really understand
the family life-style or predict how it will
change in the near future. The Saudi life-style
will naturally change, but the author feels it
will not be similar to the western life style as
most foreign architects predict.

NEW TECHNOLOGICAL POSSIBILITIES: New techno-
logies allow change in the utilization of avail-
able spaces. It is no longer necessary to have
one air-conditioned room as the center of all
activities; each member can sit individually
and comfortably in his or her room. Television
may require a second living room or a television
room. The life span of some components in the

house are shorter than that of the basic construction. Windows which are no longer attractive have to be replaced; air-conditioning units which are no longer useful have to be replaced by a central air-conditiong system. In Saudi Arabia, the traditional houses did not have many fragile or vulnerable parts. The contemporary houses, on the contrary, have many fragile and changeable parts. These fragile parts do not last for the life span of the building. They may even need to be replaced before the end of their useful life, for instance, bathroom/sanitary and kitchen facilities.

THE CHANGING FAMILY: The family has different stages of development. The daughter gets married and leaves her home; the son who grows up, attends college and gets married, leaves the home or brings his wife to join the family as a new member; a new baby is born; others move out; and so on. The above-mentioned reflects not only changes in room number, but also involves a series of different relationships and ways of living together. These changes influence the number of rooms in the house and also affect the type of equipment and the number and location of appliances within the home.

USER'S REALIZATION: The user, who is usually not an architect, in some cases cannot explain his exact needs to the designer. He cannot easily communicate with the designer through drawn floor plans. He might even be convinced by the designer, who usually tries to adapt his architectural concept in the user's home, to build things which he, the user, may not need. It is not until much later, after the house has been completed and the user has resided for sometime in the dwelling, that he realizes his real needs and requirements, simply because the house is now "real" and three-dimensional to him.

The previous descriptions clarify the need for a method which allows users to participate; a method which can accommodate different changes and requirements. Meanwhile, the basic principle of the support concept is that of user participation or user control. Furthermore, the support

concept allows changes and can accommodate different requirements and needs. The support concept provides an opportunity for individual action and adaptation. The basic idea of the support concept, is that the dwelling -- whatever its shape or size -- is always the result of two spheres of responsibility and decision-making. Part of the structure is within the realm of the dweller who can change and adapt it as he wishes. The other part, however, belongs to a larger infra-structure about which one individual cannot decide alone. These two areas of decision-making can always be recognized. The support concept is one in which the dwelling is not a product that can be designed and produced like any other commodity, but is a result of a process in which the user can make a decision within a larger framework of communal services and infrastructure. A support, in fact, is any building intended to contain a number of dwelling units, which can individually be adapted to the ever changing needs and desires of the users over the course of time. Therefore, in the support concept, the final floor plan will not be predetermined. Indeed, the support is designed in such a way as to provide potential for varying the floor plan over time. The support, then, by definition is a building that contains everything for which not one single occupant is responsible, i.e., everything in the sphere of communal responsibility. The things that the individual dweller will be responsible for is called detachable units. Therefore, a dwelling will be created when an individual builds a detachable unit into the support. Also, the concept of support and detachable unit are defined in terms of who makes the decisions.

It is important to note that the point of view taken in the support concept is not a technical one, but one of human need. People want to be responsible for their material environment; people want to identify with it. An environment may be very beautiful and comfortable, but if it is not adaptable, it cannot be home. To dwell is to take action. Beauty and comfort can not give identification; only action can give that. A dwelling is the result of people fulfilling the

needs to dwell. Thus, the decision about where
the support ends and the detachable unit begins
is not made on technical grounds. In designing a
support in this report, the decision about what
constitutes a support and what constitutes a de-
tachable unit is based on the specifics of Saudi
cultural and temporal settings; on the amount of
change of residential behavior and the use of
the dwelling over time, and on other social
criteria. For example, in designing a support
for courtyard houses we must determine, firstly:
"Is the courtyard location part of the support
and the dweller have not control over it?"
Secondly, "Is the dweller allowed to locate the
courtyard anywhere he wishes?" and third, "Is the
dweller allowed to choose and locate the court-
yard within a limited zone?" These are some of
the questions which must be dealt with in the
design of a support.

The support is not a structure which offers large
areas of floor space with as few obstructions as
possible. The support is not a dwelling. The
support is a building in which other people, who
are not designers, will be able to recognize
specific possibilities to live by, through the
means of detachable units. Therefore, a support
should not be neutral, since neutral things are
hard to identify with. A support should give
real form, real spaces; spaces that are not rooms
(yet), but, nevertheless, tempt the imagination,
suggesting more possibilities for living than the
occupant could have thought of before seeing
them. The support should offer places, dark or
sunny, small or roomy, that could just be places
to sit, to eat, to sleep -- places that suggest
possibilities for kitchens, bedrooms and living
areas in unending variations and combinations.
Therefore, there may be more construction in the
support, but this does not mean that there will
be less potential for variety than in a more
open support. In other words, in designing a
support, the objective is to find a solution that
allows for all the desired variations while using
as few detachable units as possible.

It is extremely important to note here that this
support is designed according to the analysis

and observations made, as mentioned previously
in the first and second sections of this report.
For example, the pattern of avoiding setbacks is
considered although it may not be the case. The
users may prefer having front yards or the
municipal regulation may not allow it. Then,
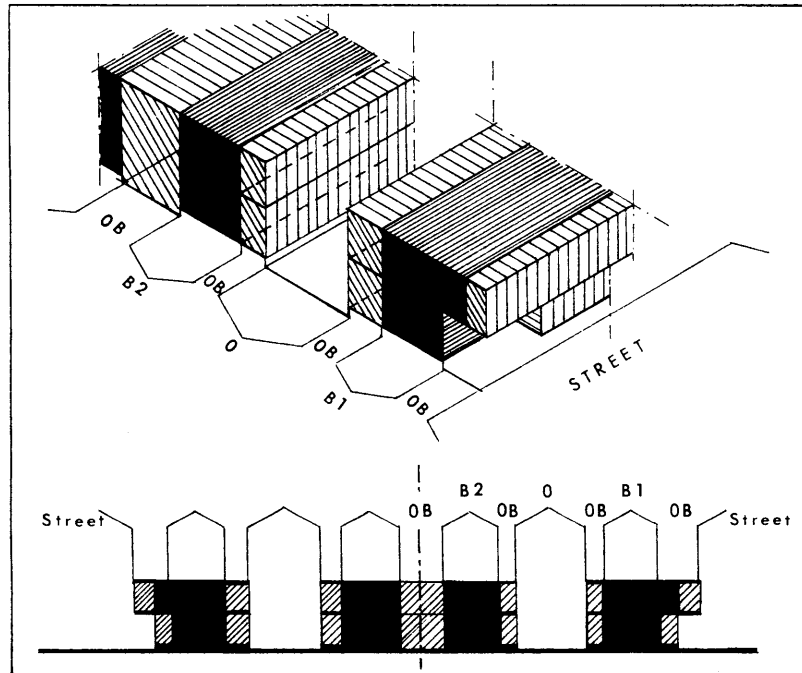naturally, other supports have to be designed.

Finally, this report intends to present
only the conceptual interpretation of the
support by offering an example of its possible
design. Obviously, other designs are possible,
even desirable. The emphasis is on a general
philosophy, an approach, implemented by a clear
method of steps and procedures, and only test-
able in real use. It does not elaborate techni-
cal detail beyond fundamental assumptions about
certain structural and spatial construction
considerations. It is an adaptation of the SAR
methodology, and thus assumes its principles to
be both implicitly and explicitly contained in
the solution.[4]

4 Habraken, N.J., et al., Variations: The
   Systematic Design of Supports, MIT Laboratory
   of Architecture and Planning, 1976.

Concept

This support consists simply of two linear,
parallel built zones. The first built zone, "B1"
is adjacent to the street. Meanwhile, a linear
open space "0" lies between the two built zones
"B1 and B2", in which the courtyards will be
located and formed by connecting the two built
zones by using floor plates. Between the built
zones and open spaces, there is always open-built
margins "OB" which can be built or open. The
support system is developed by using a zone mar-
gin system in which two alpha zones measure
330 cm in the ground floor. On the upper floor,
one alpha zone measures 330 cm within B2, and
two alpha zones measures 180 and 210 cm within
B1 zone. All the margins measure 180 cm except
the ones that are adjacent to the street in the
ground and upper floor which measures 150 cm.
The margins which will result from locating the
courtyard within 0 zone "delta" will measure
120 cm "alpha, delta margin", while the spaces
between the courtyards and the support wall will
measure 210, 330, 450 or 570 cm "vertical alpha
zones".
One of the major characteristics is the location

This support in the ground floor provides open spaces towards the street allowing the dwellers to use it as shops or garages while the upper floor facade is more solid.

Within this support almost all rooms can be formed by placing walls in the margins between the support elements in which the connection between detachable units are avoided as much as possible. Furthermore, different sector groups with different sizes can be formed quite simply by adding support components. It is also possible to change the dimension of units with relatively little cost and effort. Also, the various possible locations of the courtyard for each sector groups will result in unlimited possibilities of basic variants.

Finally, it is suggested that a vacant unit be provided on the upper floor (either within the B1 or B2 zone) which can be used as a roof terrace or as a future extension, or both, allowing the dwellers to plan it in the future by using a minimum set of detachable units to create spaces with adequate privacy in which it will have its own ducts.
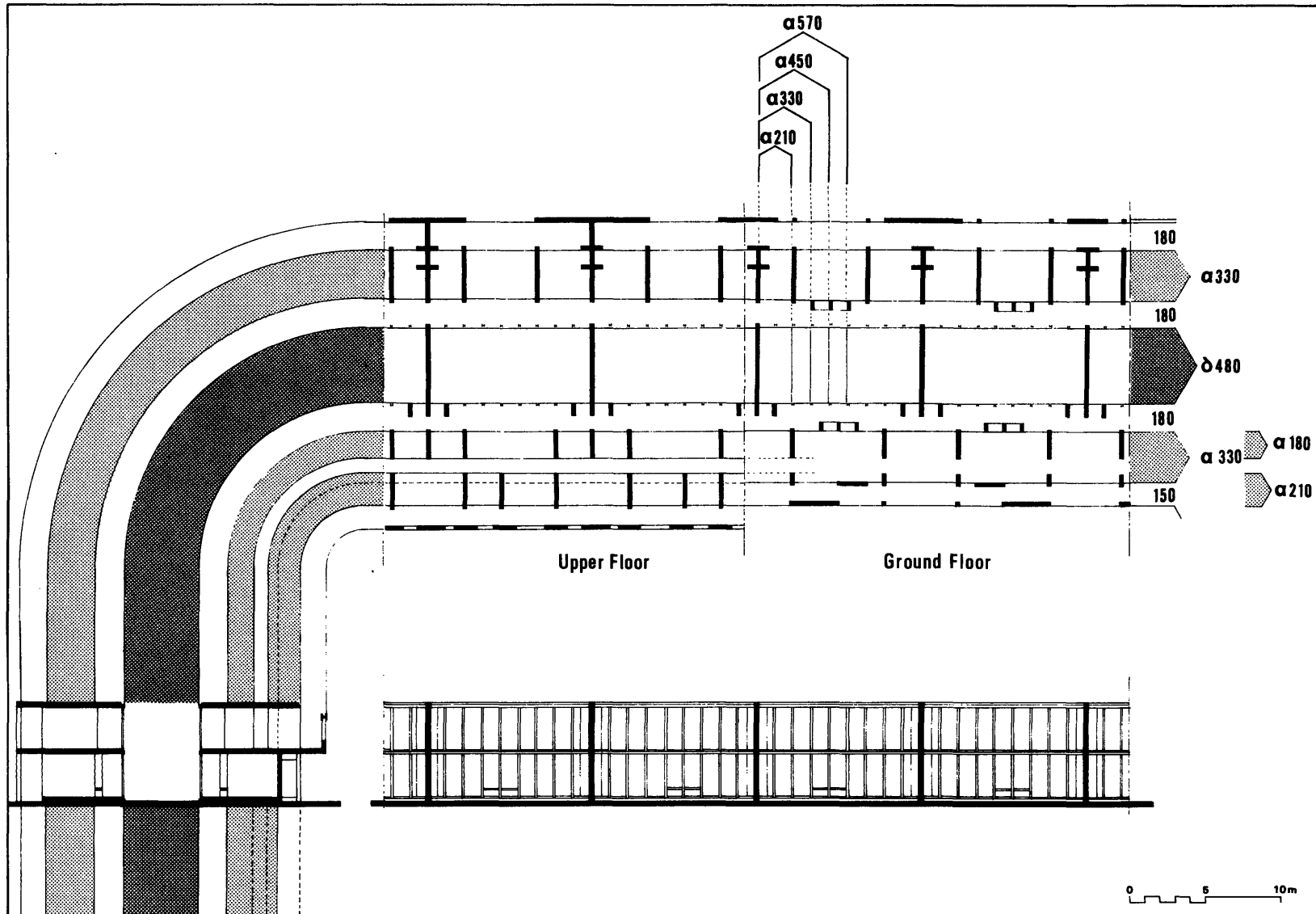
of the ducts in the corners, which will allow the residents to use the ones that they choose. Therefore, the dwelling units that can be designed in the support will generally have their bathrooms and kitchen in the corners within B2 zone. Meanwhile, within B1, kitchens and bathrooms will be located in alpha zones and alpha/delta margins. Also, general purpose and special purpose spaces will be located in alpha zones.

Support system

a570
a450
a330
a210

180
a330
180
ò480
180
a330   a180
150   a210

Upper Floor   Ground Floor
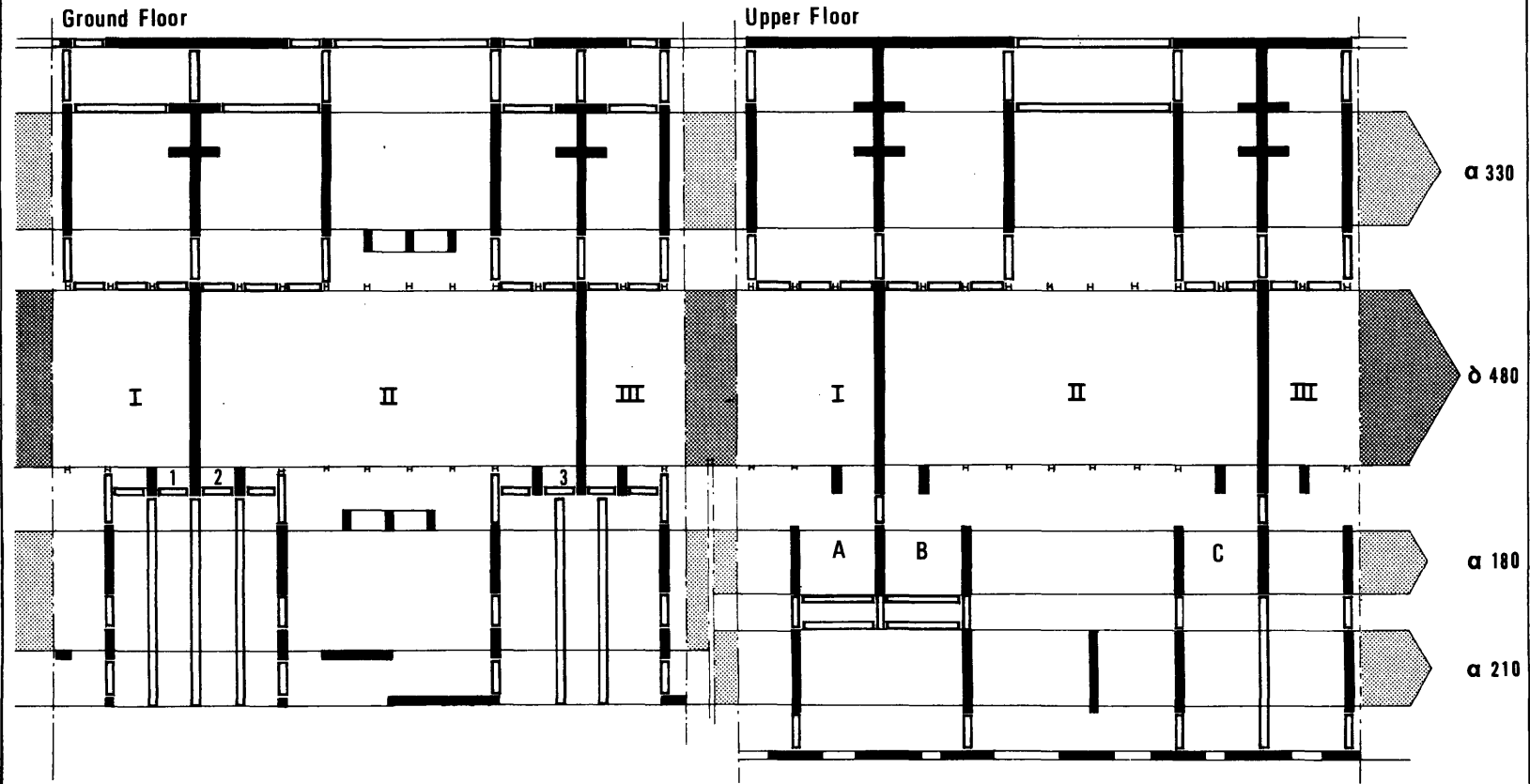
0   5   10m
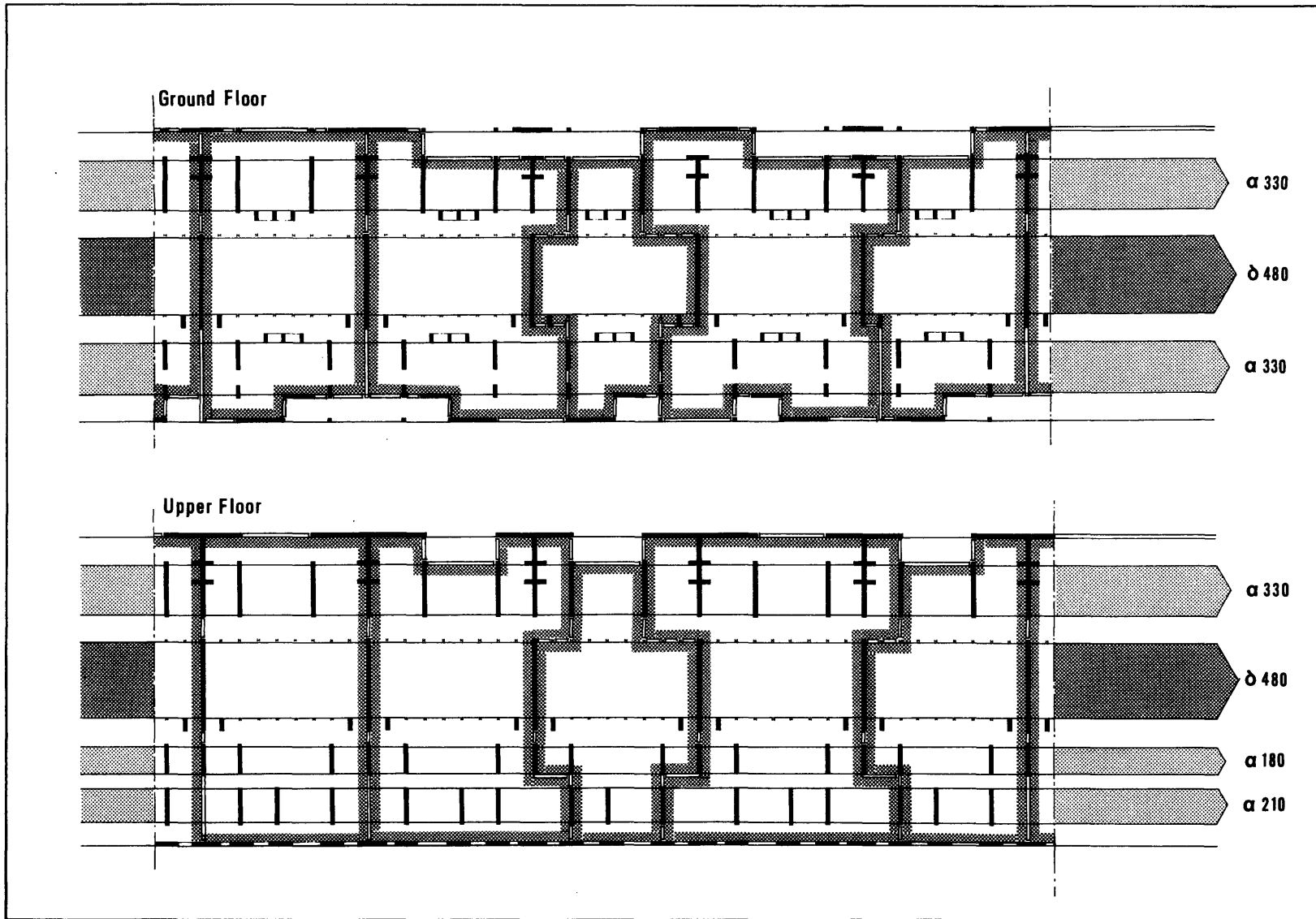
Sector groups

Step One:

In this step the location of the party walls will be decided. This drawing illustrates all the possible locations for the party walls in the ground and upper floors. Different size dwellings can be formed by adding sectors in the ground and upper floors or enlarging the size of the sectors in the B1 zone of the ground floor. The area of the smallest sector groups in the ground floor is approximately 95 m², while the largest sector groups is 250 m², including the courtyard.

In the ground floors, duct 1 always belongs to unit I and ducts 2 and 3 belong to unit II, etc. In the upper floors, sector A always belongs to unit I and sectors B and C to unit II, etc.

Ground Floor

Upper Floor

α 330

ð 480

α 180

α 210

Ground Floor


α 330

ò 480

α 330

Upper Floor

α 330

ò 480

α 180

α 210

Internal street

Step Two:

In this step the decision about the internal street will be made. The OB margin between B2 and B2 can accommodate a street, patio and rooms. The dwellers have to decide whether or not they want a street, and its shape and size. The street can be connected to the main street or isolated. The street will also be partially covered and narrow. This page illustrates the different section types which can accommodate a street, patio and house.

The next page illustrates some of the possible street layouts formed by different sector groups.

180
30
180

OB   OB   OB   OB   OB

Ground Floor

a 330

ò 480

a 330

Internal St.

a 330

ò 480

a 330
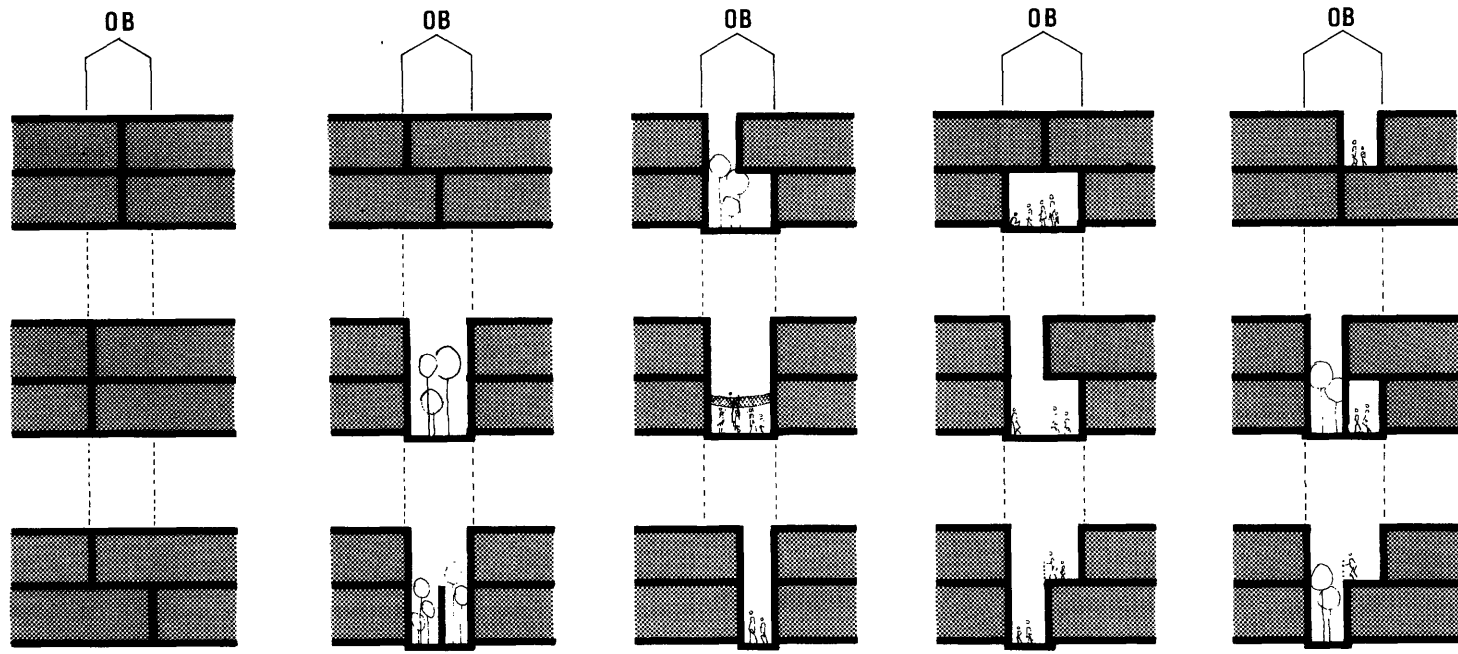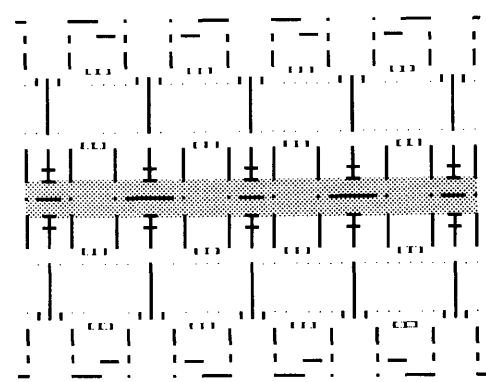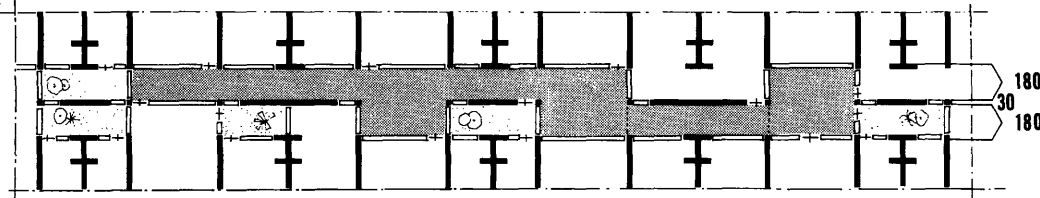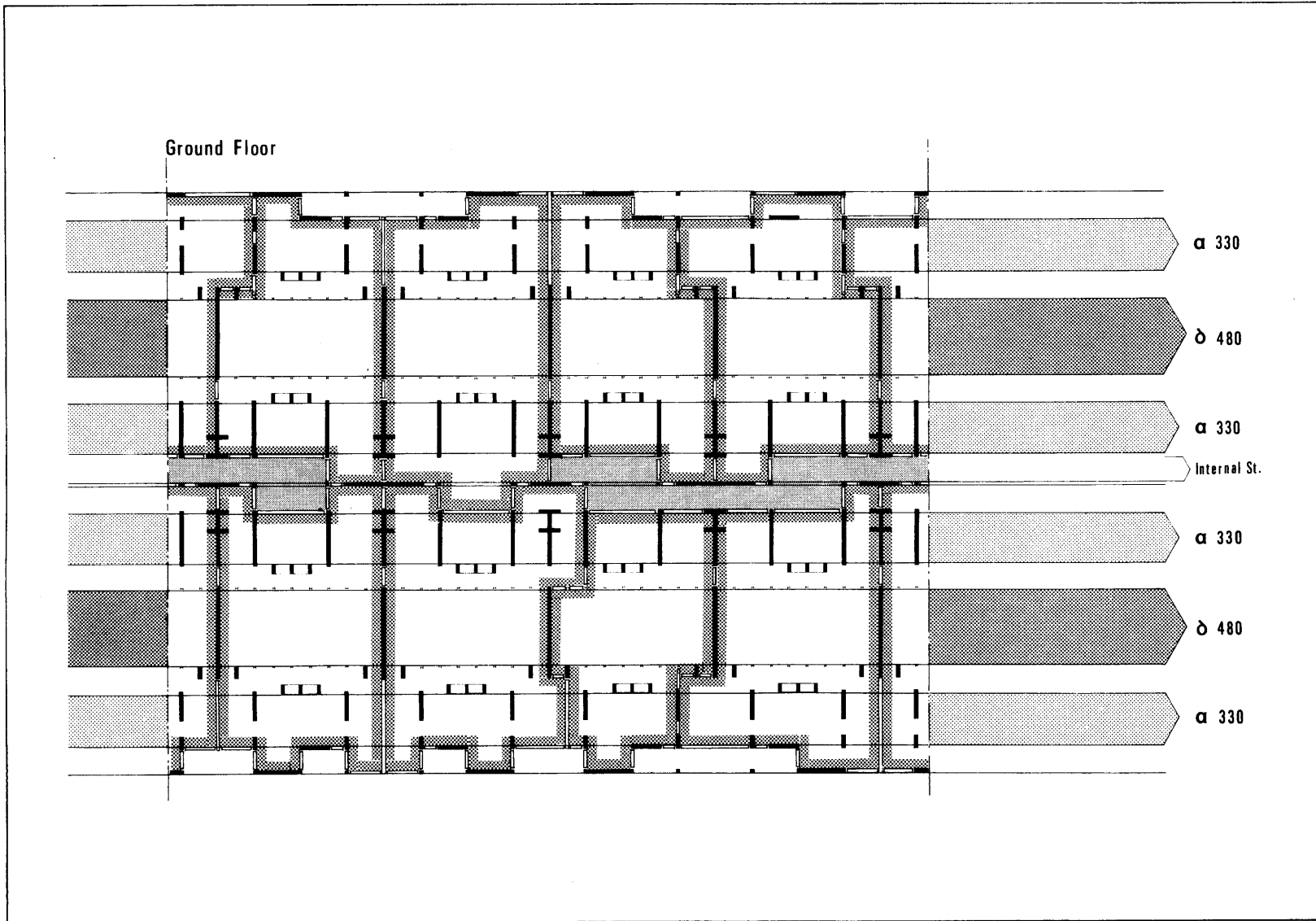
Section types

Step Three:

In this step each family will decide upon the
location and size of the courtyards in the
upper and ground floors by connecting the two
built zones by floor plates.
On the next page, the first three columns on the
left illustrate the basic section types. From
each basic section type, five or more variants
can be developed by shifting or changing the
location of the openings. The column on the
right illustrates some of the section variants
of the side courtyard openings.

2:2

3:4

2:3

3:6

2:4

4:4

2:5

4:5

3:3
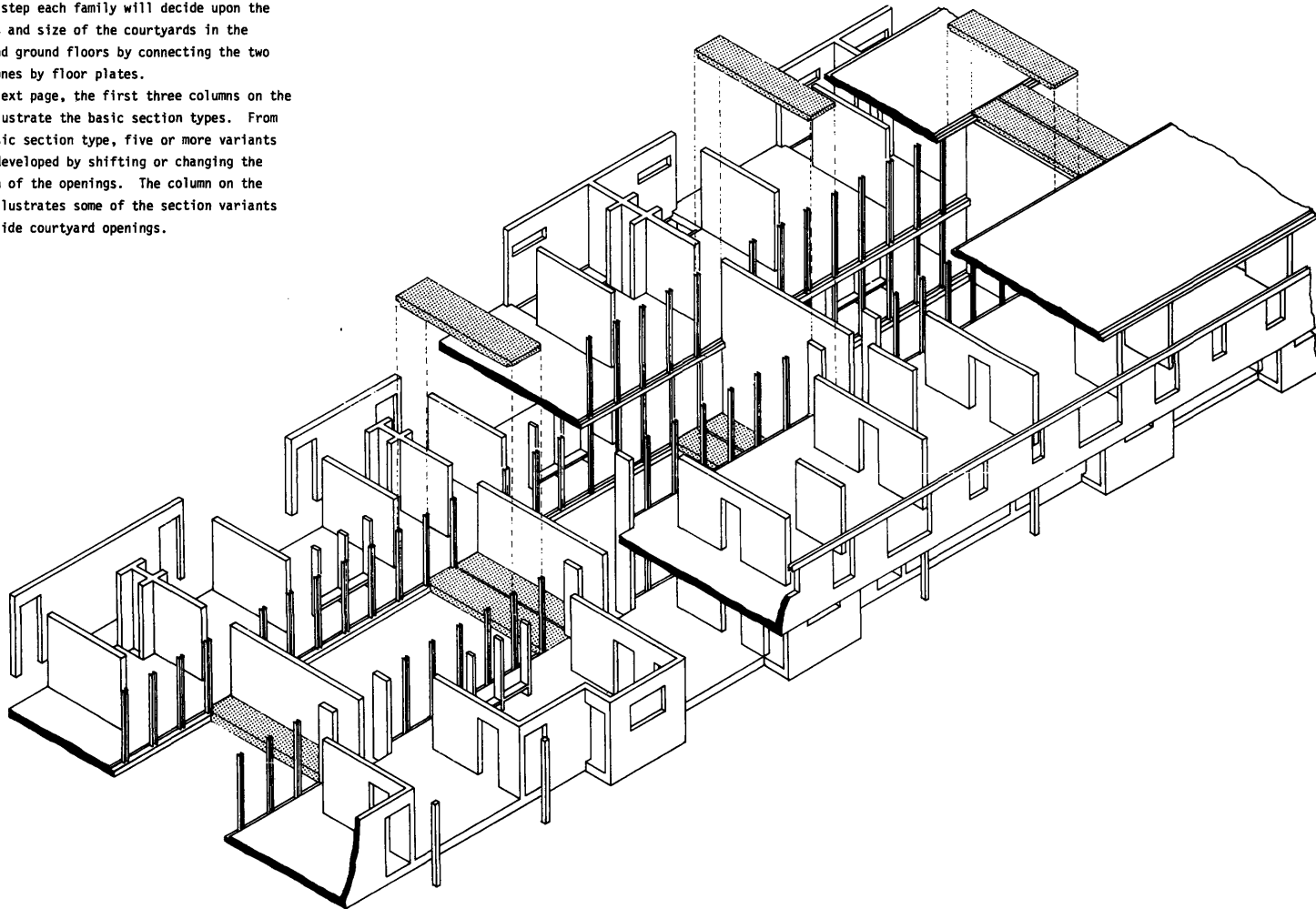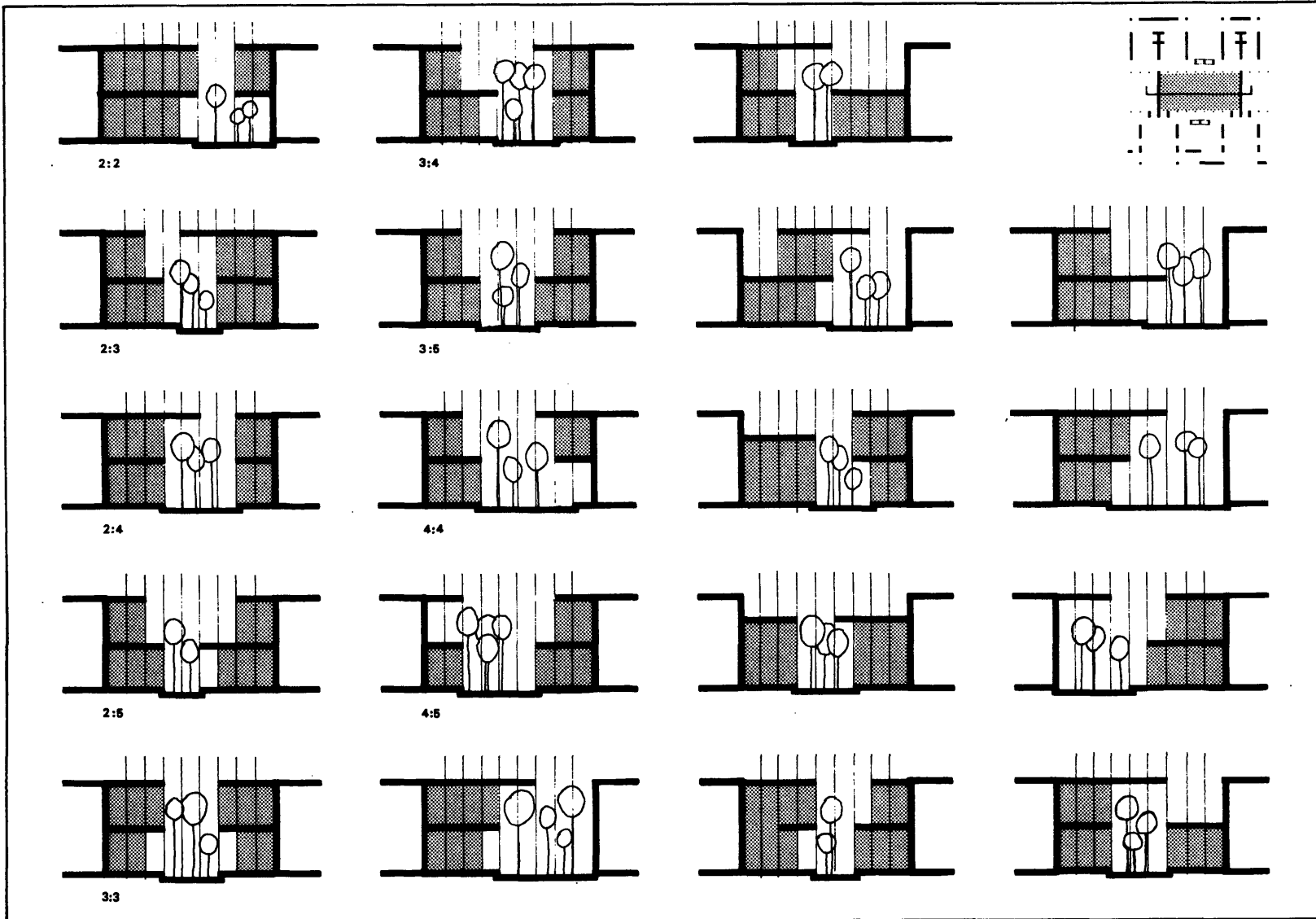
Location of Spaces

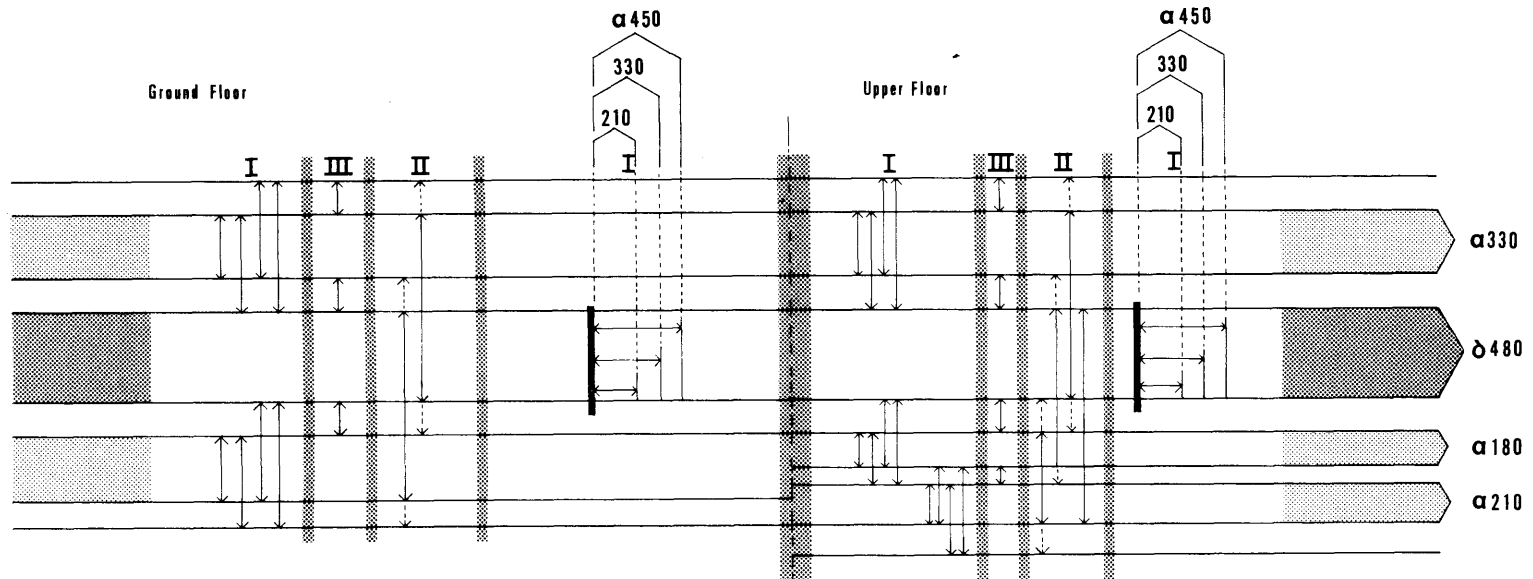|	Layout	Size	
Service Space	+	+	
Special Purpose Space	−	+	(max & min)
General Purpose Space	−	−	

	I	II	III
Service Space	●		●
Special Purpose	●		
General Purpose	●	●	

Service Space: K1, b, T, St, G
Special Purpose: K2, E, Sh, R, FL, D, B, Sd
General Purpose: L

E	Entrance	B1	One Person Bedroom
Sh1	Small Shop	B2	Two Person Bedroom
Sh2	Larger Shop	B3	Master Bedroom
G1	Small Garage	b	Bathroom
G2	Garage	T	Toilet
R1	Reception	K1	Kitchen for Cooking Only
R2	Large Reception	K2	Large Kitchen
FL	Formal Living	Sd	Study
L	Living	P	Playroom
D	Dining	St	Storage
B	Bedroom	Pa	Patio

Ground Floor

Upper Floor

I   III   II   I

α450
330
210

α330

δ480

α180

α210

Zoning Analysis

Ground Floor

α 330

150

Support Elements   Walls   Toilets   St. Seat   G1   G2

αδ 180

Sh1, Sh2
K1, K2
B1, B2

α 330

150

αδ 180

B3
R1, R2
L

α 330

150

Upper Floor   Ground Floor

Upper Floor   Ground Floor   Ground Floor   Upper Floor

Internal Street

180

α 330

αò 180

Supprt Elements   Walls   Bathrooms   Patio   Balcony

L
K1,K2
B1,B2,B3
FL

180

α 330

αò 180

Upper Floor

Bathrooms

αδ 180

L
K1,K2

α 180

90

L

α 210

150

Support Elements   Walls   Balconies

αδ 180

B1,B2,B3

α 180

90

B1,B2,B3

α 210

150

Upper Floor

aò180

a 180

90

a 210

150

B1, B2 ,B3

Support Elements   Walls

aò180

a 180

FL

90

FL

a 210

150

Ground & Upper Floors

Staircase

a210 a330 a450

Support Elements

Walls

K1 K1,K2 K2

B1 B1,B2 B1,B2,B3

FL FL, R FL R

180

δ 480

180

180

δ 480

180

Alpha Delta Margins «Ground & Upper Floors»

aδ 150   aδ 150

a
180
δ
180
a

a
180
δ

Support Elements   Walls   Columns

a
180
δ

a   150   δ

a   150   δ

a
180
δ

Walls

Support
Elements

Sector analysis

E3	Sh1/B1
G2	K2/R1
G1/E1	E1/R1
E2/Sh1	R2 or L

180

α 330

150

Ground Floor

← 450 →

180

α 330

150

R2	B1/R1
R1/E2	L
E1/B3	
B2/E1	

α 330

150

Ground Floor

← 570 →

α 330

150

B3
B1/B1
B2/E
L or D or FL

Internal St.

Internal St.

180

α330

Ground Floor

450

b/St
b/b
K1/b
K2, B1

St

St

Internal St.

180

α330

180

210

Ground or Upper Floor

Ground or Upper Floor

K2
D/K1
E/K1, B1/B2
B1/b, L or D

Internal St.

180

α330

180

330

B4
B1/B
B2
LorDorFL

α330

180

180

450

Upper Floor

K1 T/Sd
b   B1

180

α180

90

210

Upper Floor

B3/Sd   LorDorFL
B1/L

180

α180

90

570

Upper Floor

B3
B2 L(ext.)
B1 L•rSd•rD

90
α210
150

|60| 180 |90|
←——330——→

Upper Floor

B1
Sd
L(ext.)

90
α210
150

|60| 90 |60|
←—210—→

Upper Floor   Upper Floor

B4   L•rD•rFL
B3   •rP
B1/Sd

90
α210
150

|60| 90| 210 |60|60|
←——— 480 ———→

Ground & Upper Floors

α210

α210

α330

α330

α450

α450

B1/T
B1/St
B2
K1/Sd
LorD

B3
B1/B1
B1/K1
D/K1
LorDorR

B2/K2
B3/B1
K2/LorD
R2
FLorLorD

⟩δ480

⟩δ480

⟩δ480

Detachable units

Basic variations
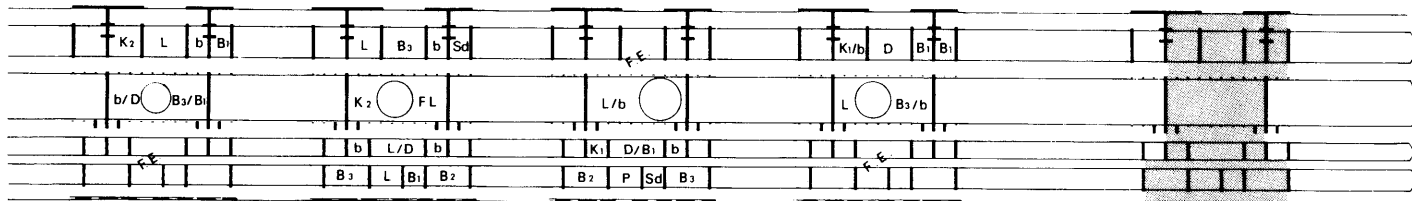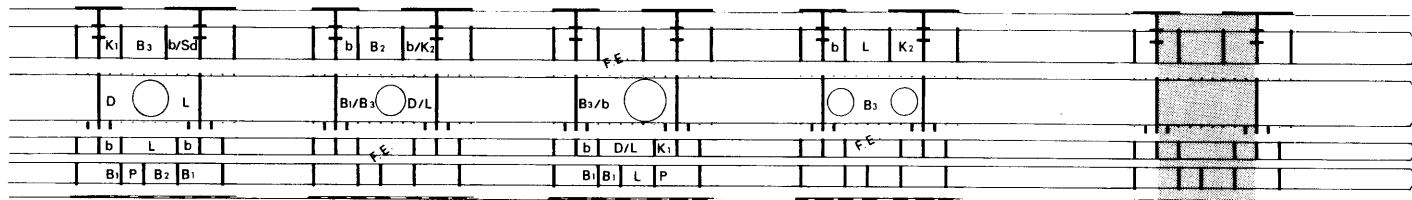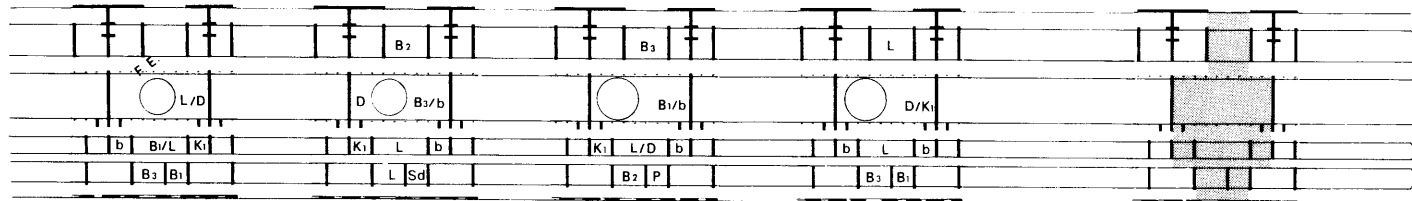
Ground Floor

Courtyard

Row 1:
B₃ | B₁/B₁ | L | L

K₁/D b/L | b/B₂ K₁/L | K/D | K₂ D/B₁

E/R₁ | E/R₁ | E/FL | E/R₁

Row 2:
b D K₂ | b B₃ L | B₁ B₂ b | B₁ B₃ K₁/b

B₁/B₃ L | B₁/B₁ L/K₁ | L/K₁ | L

Sh R₂ E | E R₂ D | Sh E/R₁ D | B₁ R₁/D E

Row 3:
b/b B₃ B₁ B₁ | L B₂ B₁ b | B₂ E/L K₂ b | L E/B₂ B₁ b

L L/K₁ | D/K₁ FL | B₁/b L/D | K₁/D

G₂/E R₂ D | E/Sh R₂ G₂ | G₂ E/R₁ Sh | R₂ E/D G₁

Upper Floor

F.E. : Future extension «roof terrace»

Sub-variations „Ground Floor„

B

α 210

α 180

ò 480

α 330

α 330

ò 480

α 180

α 210

A

A

B

Sd   D

L   K₁   L

L   B₁   D   L   B₁   K₁   D

B₂   B₂   B₁   B₁   B₁   B₁   Sd   B₃

B₁

K₁   Sd   L

B₂   B₃   Sd   B₃   L   B₃

B₃   K₁   L

K₁   B₃   Sd   K₂   L   B₃

D   L «Diwan» ground floor   K₂   L & D   B₂   D

B₁   L   L   K₁   L   K₁

L

B₂   B₃   B₁   B₁   B₁   Sd   B₃   B₃   L   B₁   B₁

F.E.

F.E.

F.E.

F.E.

110
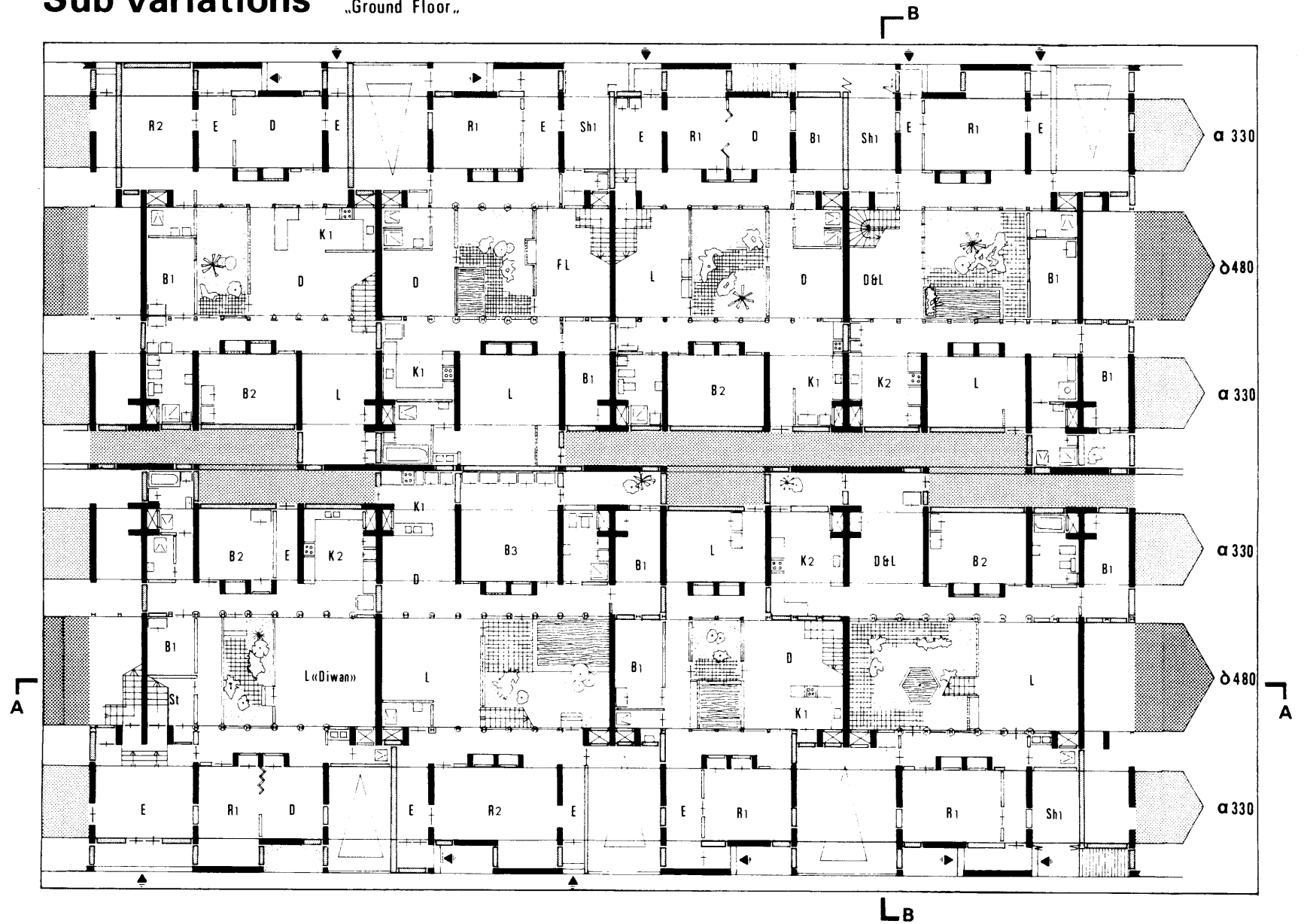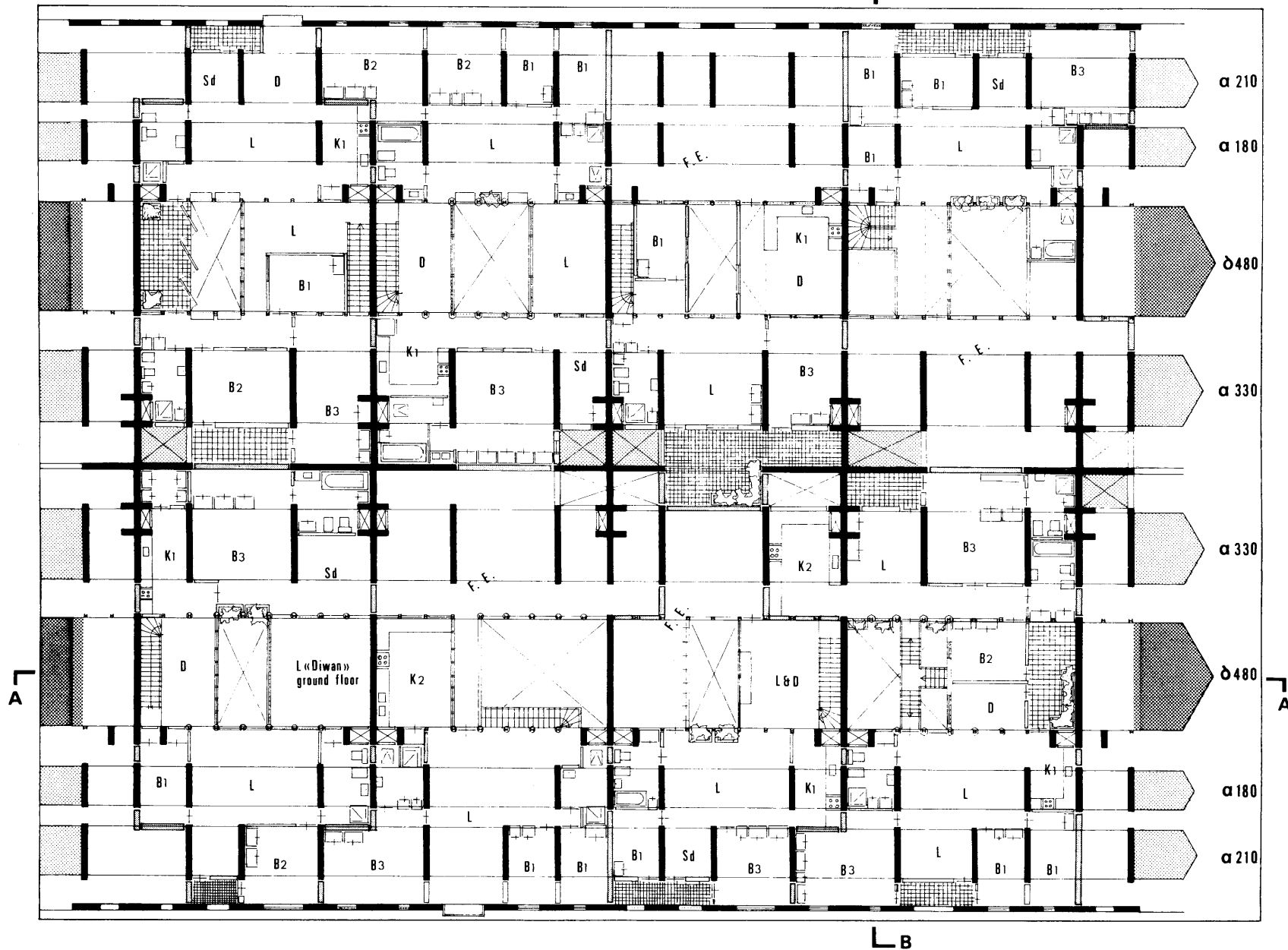
A.A

B.B

Concluding Remarks

In the third section of this report, a design for a support was illustrated, with no specific information given about formulating the design problem.

In the following I will try to summarize briefly the steps that were followed, i.e., an adaptation of the S.A.R. methodology as a means of formulating a design problem.

The S.A.R. methodology introduced the concept of a design "system", in which the building can be regarded as a system of components, ordered according to certain rules--a system, i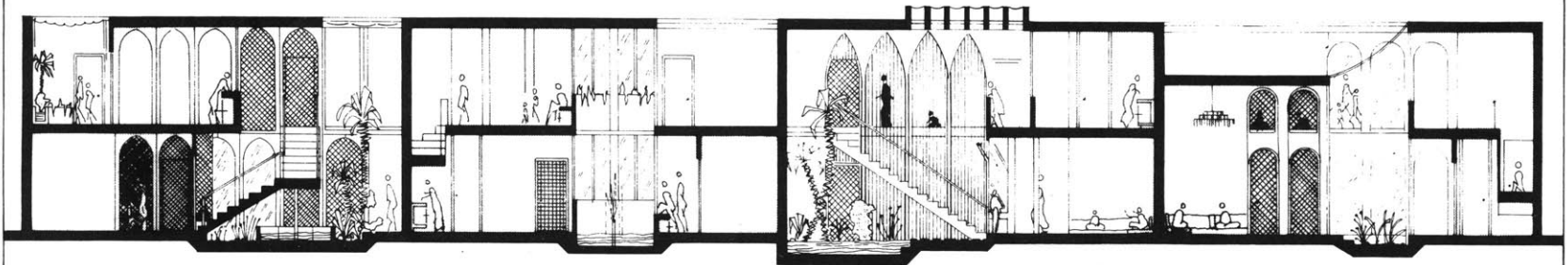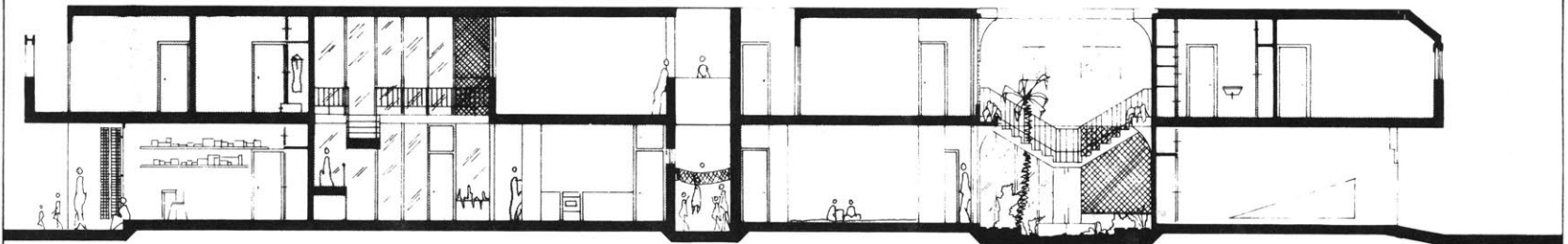n which the spaces are the system's components, and where the relationship between those spaces conforms to certain rules.

A system, in general, is a set of clearly defined elements, plus a description of the relationship between them. In this case, the elements are spaces, identified by their dimensions, functions, etc. while the relationships between the elements are their relative positions. Thus in order to describe a space system for a "well-designed dwelling" in Saudi Arabia, I had to formulate a set of standards, or, in other words, determine what are the standards which lead to the formulation of a "well-designed dwelling" in Riadh City? What is the definition of the term of a "well-designed dwelling"? To determine this, the elements were defined by their dimension, type, number and function. For example, charts were developed for, say, special purpose spaces and service spaces on the basis of formal analysis. These charts also aided in clarifying that some spaces of a certain size are suitable for a number of functions and conversely that spaces of a different size may be suitable for a single function. Different relationships between the elements were also determined, i.e., on the basis of the functions, standards were formulated about the position of spaces relative to each other. For example, should the reception room and the toilet be close to each other? And how far apart can they be? How close should the entrance be to the living area? Should the reception have a view of the courtyard or not, etc.

Similarly, standards were formulated between the

various elements and the environment. For example, is the position of the courtyard in the middle, or is it adjoining the street facade, or should it be in the back of the house? Should the position of the reception be internal or adjoining the street; to name but two of many such relationships. Note that most of these relationships are mentioned in the first two sections of this report. The most important thing to remember is that the elements always have to be placed in an environment. For example, a room is the environment in which the furniture is an element; the sector group is an environment in which the individual sectors are elements and so forth. To determine the relative position of the elements, "environments" were adopted, such as zone distribution, sector, sector group, 10/20 tarten grid, etc. In order to design a support, certain operations and evaluations were made on zoning, sectors, sector groups, basic variations and sub-variations.

Finally, since this is an academic report, there are obviously, no real participants. Thus, the decisions were made by myself on behalf of the participants and as a result the support reflects to some extent my own value judgements.

The readers--especially non-Saudies--may not fully appreciate--for instance--the sub-variations, but if that should be the case, it is recommended that the capacity of the support may be tested by re-designing the sub-variations according to the patterns shown in this report, thus providing clear evidence that the proposed support indeed is capable of accommodating change and growth.

Appendix

A SUPPORT is that part of a habitable structure over which the resident has no individual control.

DETACHABLE UNITS are movable components over which the resident has individual control.

A ZONE DISTRIBUTION is a system of zones and margins, the relative positions of which follow certain conventions.

AN ALPHA ZONE is an internal area, intended for private use, and is adjacent to an external wall or the courtyard.

A BETA ZONE is an internal area, intended for private use, and is not adjacent to an external wall.

A GAMMA ZONE can be internal or external but is intended for public use.

A DELTA ZONE is an internal open space intended for private use.

A MARGIN is an area between two zones with the characteristics of both of these zones and taking its name from them.

A GENERAL PURPOSE SPACE is a space that allows a combination of activities that cannot always be determined in advance.

A SPECIAL PURPOSE SPACE is a space intended for occupancy over a considerable length of time the minimum and maximum sizes of which can be determined on the basis of its function.

SERVICE SPACES are meant for short term occupancy and are utilitarian in character, the size and layout of them can be determined on the basis of an analysis of their functions.

POSITION 1 -- A space which overlaps a zone and ends in the adjoining margins.

POSITION 2 -- A space which overlaps more than one zone and ends in a margin.

POSITION 3 -- A space which begins and ends in
the same margin.

A SECTOR is a part of a zone and its adjoining
margin that can be planned freely.

A SECTOR GROUP is a combination of connected
sectors.

A BASIC VARIATION indicates the position, in a
specific sector group, of a certain group of
functions, which together form a dwelling
program.

A SUB-VARIATION of a basic variation is a com-
pleted layout in which the positions of the
functions are the same as in the basic variation.

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