

FORM AND TERRITORY

A Comparison Between Four Areas in Cairo

by

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In the design of the built environment, it is very important to understand and realize the importance of design decisions such as

- The form of the environment to be created.
- The percentage of the open and built areas.
- The different territories that this form of environment can hold.

This thesis is a study of the relation between form and territory in four different built environments in Cairo. This is achieved by the application of three methods of analysis (form analysis, quantification of form as analysed, territorial analysis) to the four areas. The areas chosen represent four different built environments in Cairo: a traditional environment, a public housing project, a formal development, and an informal development.

The outcome of the study emphasizes the form/territory relationship. The different forms of environment presented different territorial potentiality. The traditional environment has offered many territories with great territorial depth compared to the other three areas of analysis. It also suggests the possible territorial enrichments to the informal and public housing areas without changing the existing form.

Thesis Supervisor: John Habraken
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Head of the department of Architecture

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Introduction

The form of the built environment, the areas built and open, and the territories that this form can hold are important design decisions. They are inter-related dependent elements, often ignored in the design of environments. Concern is only with form regardless of its consequences, one of which is its territorial potentiality.

This study is only a study of form/territory as suggested by form. It describes four different built environments in Cairo, representing a traditional environment, a formal development, an informal development and a public housing project.

The main motivation for this study is my interest in the form of traditional environment and a belief that its physical form corresponds strongly with its territorial control offering rich territories. I wished also to study how the form/territory relationship in the traditional environment could be influential in the design of new environments.

In order to realize this objective, I chose the other three areas (informal, formal and public housing) for comparison. The analysis emphasized the form/territory relationship especially in Medieval Cairo, suggested possible territorial enrichments in the informal area and in the public housing project.

The study's purpose is to offer a quantitative and territorial comparison between the four areas as a possible model considered in the design process of new environments and the upgrading of existing ones.

It does not suggest any specific territorial model. It is only a step in the understanding of this complex relationship of form/territory and suggests further study of possible functional and

human requirements, and people's need to control their own surroundings.

The thesis study consists of three chapters. The first is a historical introduction of Old Cairo and a brief description of the other areas analyzed. The second is an explanation of the methods and their application. The third is the comparison and the conclusions.

CHAPTER 1

This chapter is divided into two parts. The first part introduces very briefly the history of the physical development of medieval Cairo from its evolution to its present form. Emphasis is on the elements of the traditional environment and its territorial elements. The second part introduces the four areas (medieval Cairo, Ain al Sira, Shoubra, and Imbabah) and the rationale for choosing them.

CHAPTER 2

This chapter is divided into two parts. The first part is an explanation of the three methods used. The methods are, an analysis of form, a quantitative analysis of form as analysed, and an analysis of territories based on the concept of territory introduced by Habraken. The second part is the application of the three methods to the four areas of analysis.

CHAPTER 3

This chapter is the comparison based on the quantitative data and the territorial potentiality between the 4 areas. Comparison is presented in the form of conclusions based on the quantitative analysis, conclusions based on the territorial analysis, and general conclusions that could be taken into consideration in the design of new environments and the upgrading of existing ones.

Chapter 1 BACKGROUND & SETTING

This chapter consists of two parts:

1. Historical introduction of Medieval Cairo
 2. Brief description of the four areas of analysis as they exist today: Medieval Cairo, Ain al Sira, Shoubra and Imbaba
-
1. Historical introduction of Medieval Cairo
 - Physical development of the city up till the 19th century
 - The quarter as a socio-economic-political unit
 - Elements of the built environments
 - Territorial elements in Old Cairo
 2. Brief description of the four areas of analysis as they exist today
 - Rationale for choosing each area
 - Brief description of each area
 - Available data for each area

PHYSICAL DEVELOPMENT ISLAMIC CITY

AL-FUSTAT (A.D. 642-750)

Babylon fell to the Arabs in A.D. 641.

Al-Fustat, the first Islamic settlement in Egypt was founded on the plain of Babylon by Amr ibn al-As. (see Fig.1)

"Al-Fustat" means simply "camps" which tells us the first need of the Arabs--a place to live and to pray, and their need for a strategic location close to the center of existing resources. First, the mosque of Amr was built in 641-642 A.D., then the areas around the mosque were divided into quarters, e.g., Quarter of Ahl al Raya and Quarter of Ahl el Zahir. Thus territorial arrangements representing different political organizations existed in the physical divisions of the city. The streets were irregular and very narrow. The buildings were very simple and homogenous, representing the simple and pure spirit of Islam. The mosque was also a very simple structure, similar to that of the houses. The House of Amr was inseparable from other houses.

The mosque was the main public building, serving a variety of functions. It was used as a council chamber, a judge's court, a place for gatherings and a lodge for strangers, in addition to being the House of God (Bayt Allah).

Fustat became an economic and administrative capital by A.D. 750 due to the mixing of Fustat and Babylon. This led to the physical expansion of the city and the appearance of luxurious buildings and markets filled with all desirable goods. (1)

The quarter as a physical social and political territorial entity existed in Al-Fustat.

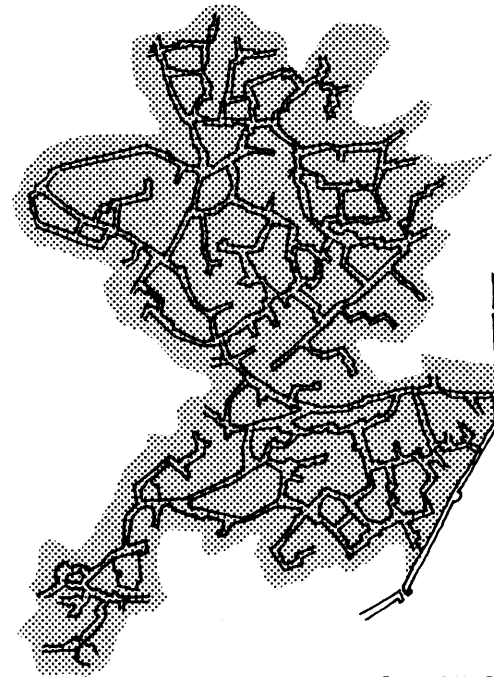


FIG.1 PLAN OF AL FUSTAT

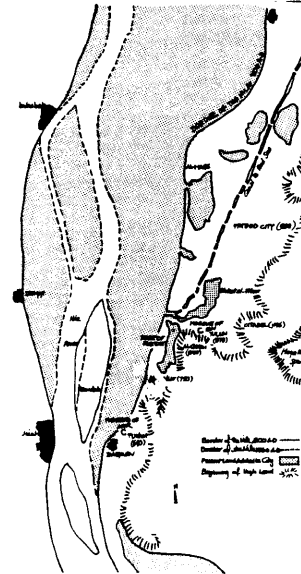


FIG 2.GENERAL LAYOUT

source, Cairo, 1001 years of the city victorious p.8

Abbasid City (A.D. 750 - 969)

CITY OF AL-ASKAR (780 - 868)

The political change also indicated a change in the capital. The new regime founded a new capital to represent it.

The Abbasid, after taking control, established Al-Askar, a new encampment northeast of Al-Fustat. The meaning of the name is "the army." (See Fig.2)

For a hundred years Al-Askar remained the seat of government. At first it was only a cantonment with officers' houses surrounding the palace and the mosque. Al-Askar was not accessible to ordinary people at first. But it was not easy to maintain segregation. Later markets were established in the quarters. (2)

The settlement was divided into quarters, similar in this respect to Al-Fustat, but its streets were more properly planned. The quarter as a physical, social and political territorial entity continued in Al-Askar.

The Tulunid City AL-QATAI (868-905)

Ibn Tulun founded a new quarter called Al-Qatai northeast of Al-Askr which became the capital of the tulunid state. It is different from both Fustat and Al-Askr in its size and splendor. It is a military port similar to Samarra in Mesopotamia where Ibn Tulun had grown up. The mosque and palace were built, and the surrounding areas were divided into quarters (Qatai) which gives an explanation for the name Al-Qatai (The Quarters).

These quarters were given to the different troops. So there were quarters for the Sudanis, for the Greeks, for the slaves, etc. The city had a mili-

tary character in this respect.

This was similar to Al-Fustat and Al-Askar where the quarters represented different military groups. The shopping markets were located around the Mosque of Ibn Tulun. New constructions were introduced in this period such as a race course, a large hospital, and aqueducts.

Street Pattern

A large commercial street ran from the palace, and two arteries parallel to that were cut by perpendicular streets. (3)

In 905 Al-Qatai was destroyed and Al-Askar returned to its role as the capital of Egypt until its fall to the Fatimids in A.D. 969.

The Fatimid City

AL-QAHIRA THE VICTORIOUS CITY (969-1169)

In A.D. 969 Jawhar paced out a small rectangular plan for a new military capital for the Fatimid state north of the existing Al-Askar and Al-Fustat.

It was built to be a princely city representing the saintly person of the Galipha (ruler).

Physical Description

The city is rectangular in shape, half a square mile in area surrounded with fortified walls in all four directions. The main spine named after the Galipha, Al Mu'izz Street ran from north to south, connecting Bab al Nasr with Bab Zuwayla.

The two big princely palaces, the east and the west palaces, were located at the center of the city along the main spine, one on each side. The spaces between the two palaces was used for gatherings on feast days. The big Kafour Park was connected to the west palace. There was another open space for guard parade. The Mosque of Al-Azhar was built to symbolize the Fatimid religious creed.

The city was divided into quarters for the different soldiers such as Burgwan, Emirs, Mahmoudia, Joudar, Barkyia, Akroads and El Roame quarters, again, having a military character.

Ibn Ducmaq says that the city was built as a place for the Galipha, his friends, and his army, and was proposed to be separated from the general public. (4)

Land Subdivisions

Total area of land = 350 acres
Total area of the two palaces = 70 acres

Area of the two large open spaces = 35 acres
Area of the Kafour Garden = 35 acres
Area of quarters for soldiers = 200 acres

We can conclude that the Fatimid city followed a theory in positioning its elements and its physical patterns to reflect its political order.

The medieval Muslim society was structured by a set of divisions:

- Separation of Muslims and non-Muslims
- Separation of Muslims themselves by different religious sects
- Separation of different ethnic tribal origins, though united in Islam
- Separation between military and civilian groups
- Religious and economic separation (5)

The quarters were a result of the political, social and religious groupings.

SOURCE, ABDEL-KADER,
"AL-KAHIRA AL-FATIMIA"

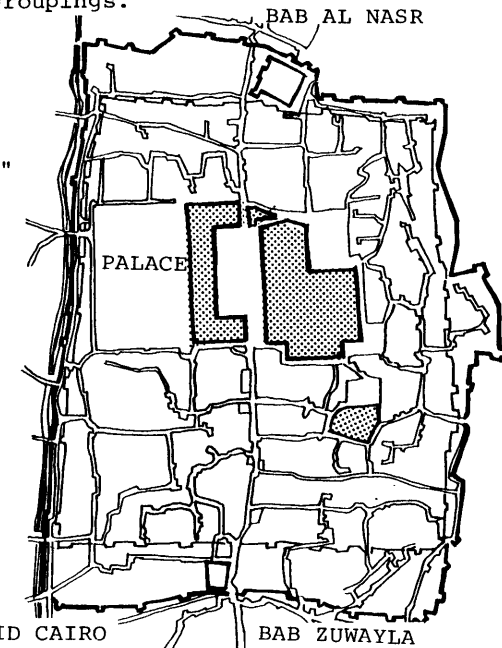


FIG.3 PLAN OF FATIMID CAIRO

AYYUBID AND MAMLUK CAIRO (1193 - 1517)

AYYUBID CAIRO:

Salah al Din al Ayyubi fortified Fustat, Al-Askar, Qatai and Al-Qahira with new walls, thus combining them physically. He built the Citadel, which was both a fortress and a royal residence.

Cairo remained during the Fatimid period a princely city, inaccessible to the ordinary people. Salah al Din opened Cairo to the people, who were flowing in due to a large fire that had destroyed Fustat. As a result Cairo grew and developed considerably in the Ayyubid period.

MAMLUK CAIRO:

Cairo continued to grow and develop during the Mamluks' period. Developments grew for the first time outside the fortified walls, as a result of internal and external security. Al-Husaynyah quarter was built north of the walls around Al-Zahir mosque. Also, new areas were built south and west of the walls.

Al-Maqrizi tells us that during the rule of Nasir ibn-Qalawun, the Qasbah had 12,000 shops, many new markets such as Suq Al Jammalin al Kabir, Suq Al-Kharratin, and Suq Al-Kutubiyin. (6)

Due to the receding of the Nile in the 13th century, new areas were exposed (Jajerate al Fil). It was mainly used as a sports area by the Mamluks, who were known for their love of sports.

The new suburb Buleq was established in A.D. 1313, and many houses, markets, mosques and baths were built there. This new area was connected with Cairo by a main street. (7)

During the Mamluk period many new buildings

were introduced, such as the wekelat, madrasa, sabil, and kuttab, hostels and khans (such as Khan al Khalili), and Maristan (hospitals). Also complex buildings, combining tomb, mosque, madrasa, and hospital such as the Hospital and Mausoleum of Qalawun and the mosque of Ibn Qalawun .

The Turkish Period (A.D. 1517-1850)

The Mamluk regime came to an end with the execution of Tuman Bey at Bab Zuwayla.

The major change during this time was that Cairo became one of thirty provincial capitals in the new Turkish empire. Resources began to flow from Cairo to a foreign capital rather than vice versa. Over forty crafts disappeared due to this transfer of material, masons, carpenters, etc. to Turkey. (8)

It is difficult to comprehend the life of the popular quarters of the city in this period. But strong solidarity was the rule within these quarters.

It is also important to note that this period, up until the 19th century, was a period of deterioration for Cairo.

The French Expedition (A.D. 1798-1801)

The French occupation introduced numerous changes such as the removal of the doors to each quarter and the destruction of many quarters.

Cairo at the time the French arrived was divided into 53 harat for administrative reasons.

The French combined them into eight large arrandissements, each known as a thumn (one eighth). These divisions have been retained in the present administrative organization of the city today, with a few modifications.

The French also had an impact on the street pattern. They regularized a number of important streets to allow the French army easy access and control over the city. The French also attempted

to clear Cairo and set regulations such as the lighting of the streets at night. As soon as the French withdrew streets were once again plunged into darkness.

The gates removed by the French have been rebuilt. It seems then, that the old ways reappeared at their departure (9)

Muhammed Ali (A.D. 1800-1848)

During the rule of Muhammed Ali, all the older gates to the quarters were replaced.

One of his few new constructions was his palace at Shoukre which has become today a very dense residential quarter. In 1845, Muhammed Ali developed a new plan for the city, providing a number of new streets and widening Al-Muski Street. The railway between Cairo and Alexandria was opened for traffic in 1858, leaving Cairo isolated no longer.

Modern Cairo

The city at the turn of the 20th century was divided into two distinct cities, the old eastern city, still mostly in its original form, and the western city, a modern colonial city. These two communities were isolated by strong physical and technological barriers. The eastern city remained preindustrial in technology, social structure and way of life. The quarters of the eastern city were still dependent on water peddlers, and were plunged into darkness at night. Transportation remained dependent on human and animal feet.

The history of the city after the second half of the 19th century is the history of the new western city, completely separated physically, and socially from the old city, which continued to deteriorate. (10)

THE QUARTER

Looking at the city as a whole, one does not realize at first glance any unity, due to the complexity of its buildings and spaces. One should not simply draw this conclusion without a real understanding of such a complex environment. Both the passage of time and the different ruling political powers have affected it physically and socially. But, looking at the medieval city, one may distinguish strong elements that shaped its physical form and reflected its social, political orders.

Some Definitions

THE QUARTER

It is very difficult to define the term's exact meaning. Jormand says in his Description abregee de la Ville, "The quarter in fact was a vaguely defined entity, depending on the one hand upon a particular cluster of streets, and on the other upon the organizational unity of the special segment of the society it represents." (11)

The word bears a number of meaningful definitions in different contexts.

"The quarter" can be defined in several ways.

Al-Darb is a dead end street (alley), with a number of smaller streets (atfat) branching off. The quarter here is defined by its darb.

Atfa is a short dead end alley branching from a darb.

Zuqaq is also a short dead end corridor that branches from a darb.

Khitat means "a section." It is a social concentration that designates quarters having specialized purposes, such as crafts groups. Khitat is a social definition, while Darb is more a physical definition. It is also used to designate non-Muslims' residential quarters. The word is synonymous with 'hara'.

Hara designates a street closed at one end, constituting an organized residential unit.

The quarter could also be defined as a Hayy.

Hayy means 'alive.' It designates a block of houses or a small section of the city.

We can conclude that the quarter is defined in many different terms. The darb, Al Khita, Al-hara, Al-Hayy. They all equally define the quarter, and all are very meaningful. But the definition is still incomplete because it lacks its social organization definition, that reflects its occupational, or ethnic or religious entity and unity.

The Quarter as a Socio-Economic Unit

The quarters established from the beginning of al-Fustat were always designated to a group of persons usually unified by ethnic or occupational characteristics, as well as by vicinal ties. Natural ties existed between them, constituting a homogenous group. These groups were segregated physically and socially from other sub-groups of the city.

But as the commercial life diversified, and as occupational grouping came to dominate more and more of the essential loyalties and identification of non-military classes, the harat adapted themselves to the

requirements of the craftsmen and tradesmen. The earliest harat showed a preoccupation with ethnic and tribal affiliation; the names of later harat sometimes revealed the dominant occupational or commercial functions of the area. This social organization gave medieval cities in the Islamic countries a common physical pattern. (12)

Many scholars have stressed the strong relationship between the physical organization and the social order. Lewis says that the guilds were so important that the guildsmen and their needs determined the form the city took. (13)

Although there was occupational segregation, income segregation such as that of modern Cairo was unknown.

The Quarter as an Administrative Unit

The organization of the quarter is expressed by its officials. The Shaykh of Al Hara, was an inhabitant of the hara, therefore his official power gained through local power and prestige, rather than by governmental appointment.

His duties consist of maintaining order and reporting disputes to the government authorities.

Another official is the Bawab (gate porter) who guards the gates of the hara and checks who comes in after sunset when the gates are closed.

We can realize that the Sheykh al Hara and the Bawab served as very powerful means of checking and administrative control for the government.

Andre Raymond estimates that in the 17th and 18th centuries there were 63 harat in the city. (14)

The quarter was an administrative unit and a very powerful means of governmental control.

The Quarter's Physical Form

Each quarter had its street (darb, sikka, or hara) which carries the same name as the collection of dwellings and shops on it. The hara was physically separated from the outside world, giving it a social and political unity.

There are enclosures of houses, more or less extended, guarded by gates which were closed at night, strengthening its physical unit. The gate, a heavy wooden door, separates the residential area from the commercial places outside.

DESCRIPTION OF SOME QUARTERS

Maghribis Quarter

The Maghribis quarters are one of the largest foreign divisions set apart by their nationality. They had three main quarters, one near al Azhar, one at the mosque of Ibn Tulun and the other west of Ezbakya. They lived in designated quarters, but not for defensive reasons. They were supported by the king's men and due to their religious and commercial interests they lived near mosques and the main markets, protected by their sheltered, compact neighborhoods. (15)

Coptic Quarters

Unlike Muslims, non-Muslims sought protection in their special quarters, and by living near the main palace.

The Copts had established a strong Coptic center in Misr al Atiqa on the foundation of the old Babylon fortress. There was also a large Coptic settlement north of Ezbakia on the former port of Al Maqs. (16)

Jewish Quarter

The main Jewish quarter beside the old Fatimid Palace remained the same up to 1956. They sought protection from the palace, as had the Copts. The money exchange markets and gold markets were located within their quarter.

Their quarters were described as very large and populous, like a small city within a city. The main street was very narrow (narrower than the normal streets) and the houses had shabby exteriors as protection from the Muslim rulers. The interiors were fine and well furnished. (17)

Quarters were complete communities, and that discouraged social interaction between the different groups. But the passage of time and the opening of the city through the efforts of both the French expedition and Muhammed Ali led to more physical interaction. The physical system has changed, but the social system continues to allow only limited types of communication, social orders being more resistant to change.

But as life and demands are changing, social change is being called for more and more.

ELEMENTS OF THE ENVIRONMENT

INSTITUTIONAL, COMMERCIAL AND RECREATIONAL BUILDINGS

Institutional, commercial and recreational buildings were used by all, regardless of ethnic or tribal group.

These buildings were places for social interaction between people from the different quarters, who met to carry out commercial or religious activities, or just to socialize. Mosques, coffee-shops, market places and public baths were places for these collective activities.

Open squares such as those in western medieval cities were unknown. The open spaces were used mainly as market places. Open areas as known today were introduced only in the 19th century when people started to celebrate feasts beside the ponds and the river banks. (18)

RELIGIOUS BUILDINGS

Mosques

Religion plays a major part in Muslim social and political life and has influenced the form of the cities. "God is intangible and the temple was a means of making the intangible tangible." (19)

The mosque is the center of life in Muslim communities, and besides providing a place for prayers serves other functions such as education, and sheltering travellers and the poor.

Location of the Mosque: Mosques were mainly located at crossroads in the center of the city. Attached to it the Khalifa built his palace and around it grew the market areas. As the city grew, mosques

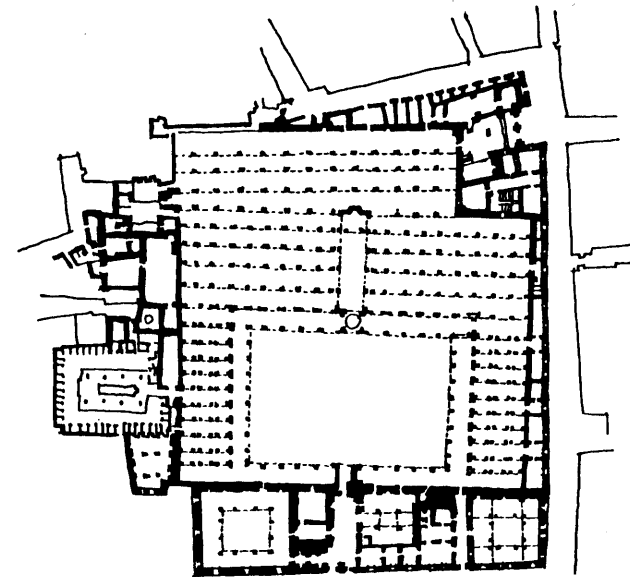
were built within the residential quarters. Mosques needed to be within comfortable walking distance; this could have been due to climate.

Special Design of the Classic Mosques: A classic mosque features four iwans (porticos) and a sahn (courtyard).

The Sahn: an open courtyard in the middle of which stands a fountain for ablutions.

Iwans: praying places surrounding the sahn, one of which faces Mecca.

Minaret: an important element, the most prominent element of the mosque, seen from all quarters of the city. Bernard Lewis described the minaret as ". . . a finger pointed skyward from every quarter of the city, soaring above the crowded alleys and markets, it is the signal and warning to the faithful." (20)



SOURCE, ABDEL-KADER,

FIG. 5 MOSQUE OF AL AZHAR

"AL_KAHIRA AL-FATIMIA"

Sabil and Al Kuttab:

the sabil is for the distribution of waqf water, combined with a koran school (kuttab) which developed in the late Ottoman period. The sabil and al kuttab became separate buildings in the late 19th century. Today they no longer are built; public water fountains are now used.

Khamikahs (cloisters);

Those who sought permanent detachment could find peace in zawayes, ribats and khanigahs where a spiritual brotherhood took the place of the natural family; some came to adopt an eremitic existence (21)

Madrassas (schools):

Mosques in the beginning served educational purposes. Madrassas later became separable buildings and developed to the present form of modern schools.

Cemetaries

When the Fatimid city of Cairo was planned, cemetaries were located outside the walls. As the city grew, cemetaries grew beyond the walls, mixing with the living fabric. It is said that by 1800 the cemetaries occupied almost 1/4 of the entire area of Cairo. (22)

GOVERNMENTAL AND ADMINISTRATIVE OFFICES

These offices were located in the Citadel. But the administrative buildings dealing with commerce were located near the main market area on the Qasabah. The official weights and measures administration still exists within the Qasabah.

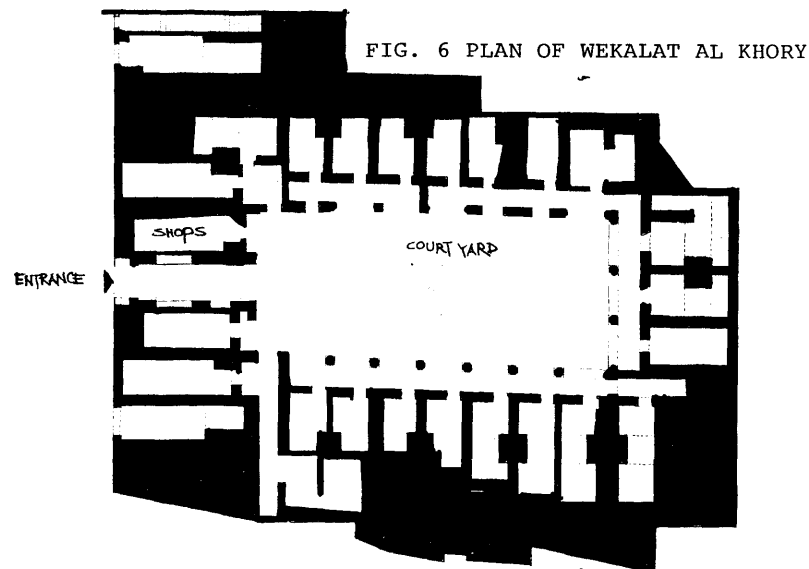
COMMERCIAL BUILDINGS AND AREASQasabah and the Market Areas (Al Aswak)

The Qasabah is the main spine of the area running from Bab al Futah north to Bab Zuwayla south, along which the markets were located. It constitutes what is known in modern planning as a linear commercial area. The market area is divided into separate specialized markets which occupy one or more streets.

Homes, work shops and shops were combined, either in the same structure or within the same quarter. This mix made income segregation impossible because everyone depended upon one another.

Wekalat and Inns

These were large buildings for travelling merchants where they could stay, store their goods, and eventually sell them, while the ground floor provided a place for beasts of burden.



RECREATIONAL PUBLIC BUILDINGS

Baths: These were public places where people went to bath and socialize; there were separate baths for women and for men. For the most part, the design is similar to the Roman baths: three halls, cold, warm and hot. These spaces were heated by an under-floor heating system of pipes.

Coffeeshops : Small coffee shops were located along the Qasabah and the market areas where people (men only) could sit and talk, and are still widely used. A quarter may have had a small coffee shop of its own.

SOURCE, EL-ZOGHBY,
"REVITALIZATION OF FATIMID CAIRO"

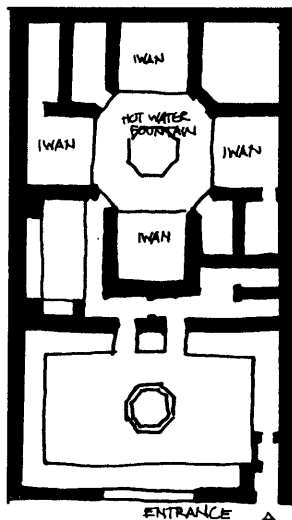


FIG. 7 PLAN OF A PUBLIC BATH

RESIDENTIAL BUILDINGS

THE HOUSE

The design of houses followed a certain prototype. This prototype (the courtyard house) allowed contact with the open space, achieved by the use of the sahn (court). The sahn is in the middle of the house, surrounded by the living spaces.

In the middle of the sahn is a water fountain which helps to cool the air.

So by means of the sahn and the fountain, nature (water) and space (sky) are brought into the house. (23))

Large houses were divided into quarters for the men and quarters for the women. Women's quarters are on the first floor, while men's quarters and reception halls were on the ground floor.

The Qa'a

The reception hall (al Qa'a) is in the center of the house with iwans leading off it; it is covered by a ceiling with openings that allow hot air to escape. In the middle of the Qa'a is a water fountain. The Qa'a is similar to a sahn, but covered.

The Malkaf

The malkaf is a shaft rising above the rest of the house, with its opening placed on the northern end of the qaia. Air escapes from the Qa'a through the low dome, and is replaced by fresh air coming through the malkaf, creating a draught that helps to cool the house.

The Mashrabiya

A wooden screen on the windows which, while

creating privacy, also helps to hinder direct sunlight into the interior. One of the most basic and attractive architectural elements of the house facades.

Thermal comfort was achieved through closed windowless facades, the court, the thick stone walls, and the malkaf.

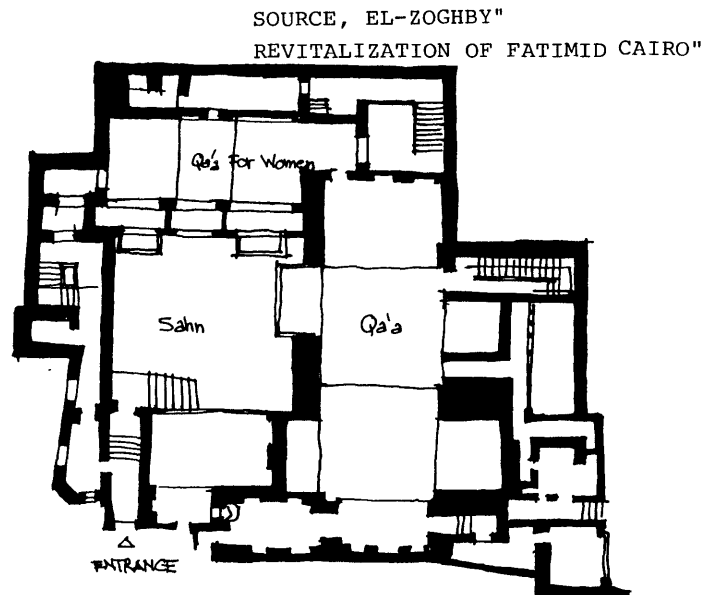


FIG 8 PLAN OF A COURTYARD HOUSE

STREET PATTERN

Jarmand noted that ". . .the interior arrangement of the city has hardly any resemblance to European cities; not only are its streets and public squares extremely irregular, but the city is almost entirely composed, with the exception of a few long avenues, of extremely short, broken, zig-zag streets with innumerable dead ends. . . The result is the difficulty of knowing the interior of Cairo as a whole." (24)

Street Pattern and the Modes of Transportation

The modes of transportation that existed prior to the 20th century did not require broad straight streets. Walking and donkeys were the normal means of internal circulation.

Street Pattern and the Climate

The long summer months, with the bright sun and the lack of natural shade, necessitated the need for artificial shade.

The street pattern helped solve this problem by its narrowness, and its irregular form. Buildings also provided shade, due to their closeness and their projecting elements such as mashrubayah and the projection of the first floor over the ground floor. These projecting elements shaded the building itself, as well as the ground below. Thus, these narrow streets show a highly functional adaptation to climatic requirements (25)

Elements of 'Territory Control' in Medieval CairoPhysical Elements

- .Fortified Walls Surrounding City
- .Gates
 - City Gates
 - Quarters Gates
 - Entrance Doors to Buildings

.Street Form

- Dead End Streets
- Winding Streets
- Dark Entrances to Streets
- Complexity of Relationship Between Streets

Social Elements:

- .Strong Social Relationships Between Inhabitants

PHYSICAL ELEMENTSFORTIFIED WALLS

Cairo, like all ancient and medieval cities was surrounded with fortified walls. These walls served both for defense, and to control people and goods entering and leaving the city.

The city as a territory was strongly identified by this physical boundary.

GATES

City Gates: Entrance to the city was through main gates located on the major arteries of the city, connecting it north, south, east and west. Bab al Nasr, Bab al Futuh and Bab Zywala are three remaining gates from the original eight main gates of the city. Gates were always guarded, and were closed at night.

Gates to Quarters: All residential quarters had gates on their main street (hara, darb). As mentioned in Chapter -1- they were closed at night and guarded by a porter who controlled accessibility to the quarter. They served security and defense purposes during internal or external disturbances. Today, these gates, even when still extant are used no longer due to changes in social, political and economic life-styles and needs.

Entrances to Buildings: If the building is an old traditional court-house, the entrance is a heavy wooden door, and this entrance leads to the interior of the house (the court) through a bent entrance corridor that isolates the interior from the outside visually even if the door is open, thus preserving privacy.

Today's apartment buildings have metal doors, locked

at night, and sometimes taken care of by a porter, but this is confined to middle- and high-income buildings. But in low-income areas, the residents of the building share the duties of the porter.

STREET FORM

Dead End Streets: Dead-end narrow streets discourage pedestrians. But continuous streets encourage through traffic.

Winding Streets: Irregular street forms with several axes give no indication where they will lead, and therefore discourage people from entering. Winding streets also served for protection, as mentioned in Chapter 1.

Dark Entrances: Some entrances are through dark passages under buildings such that even if the gate were open, one would not enter unless familiar with the path.

Complexity of Relationship Between Streets: Dead end streets lead to several other dead end streets, such that one's way might easily be lost in this complex of intersecting dead end streets, especially in the areas that had very little conservation effort.

SOCIAL CONTROL

Due to the strong social interaction between inhabitants of each street, and its limited access, any stranger passing through would be noticed and questioned. This is no longer the case today due to the change in the structure of these streets and the introduction of new functions.

We can conclude that control over territories was achieved through the physical elements of control such as gates, street form, and social control. but today due to the disappearance of many elements of control these territories no longer exist and what still exists has lost its depth.

Four Areas of Analysis

The areas chosen represent different forms of the built environment today. Three of four are new built environments that represent housing trends which will continue in the future. The fourth one is the old part of Cairo, dating to A.D. 969.

The areas are:

(Traditional environment)	Old Cairo
(Formal popular environment)	Shoubra
(Informal environment)	Imbaba
(Public housing environment)	Ain Al-Sira

Rationale for choosing the traditional environment of Old Cairo: It is my belief that the traditional environment of Old Cairo, with its richness of form and territory is a very interesting example for analysis. This analysis not only will help to understand existing traditional environments, but could perhaps have great impact on design for new environments. This could be achieved by implementing some relevant and applicable territorial levels which existed in the past in new designs, thus adding richness to our new environments which lack territorial depth.

Rationale for choosing the public housing project:

The government has built several large housing projects following completely foreign housing trends --scattered apartment blocks on a large area of land. This housing type not only wastes land, but also is unsuited to the climate and Egyptian social needs.

It represents an environment where inhabitants have had no impact on planning beforehand, nor after the construction. It is very obvious that

these environments lack territorial depth, but adding new territories is possible by allowing people to control some space and define it as theirs.

Rationale for choosing the formal development:

This area represents an area planned by the government, provided with complete utilities and facilities. It is a car-designed environment. Lots are built following building codes and regulations. This area represents most of the middle-income housing, and follows a western planning pattern (gridiron). I believe that in areas where there is no separation between car paths and pedestrian, lack in territorial depth is an inescapable result.

Rationale for choosing the informal area: Informal development on agricultural land is the result of the housing shortage and the inability of the government to provide housing for low-income people. People themselves divide the land, plot the streets, divide the lots, and build their own houses without any land ownership permits or building permits.

It is a good example of environments built by the people with their limited resources, trying to fill their needs. Informal housing makes up almost 50% of the housing being built in Egypt today.

CAIRO TODAY:

Cairo today is divided into the western city, the eastern city and the northern city. It is also divided according to Factor 1 (life styles) into 13 subcities. (see Fig 9) (26)

Medieval Cairo belongs to the eastern city, Community X. Imbabah belongs to the western city, Community VI. Shoubra belongs to the northern city, Community II. Ain Al Sur is below on the south edge of eastern city. Following is a brief description of each area.

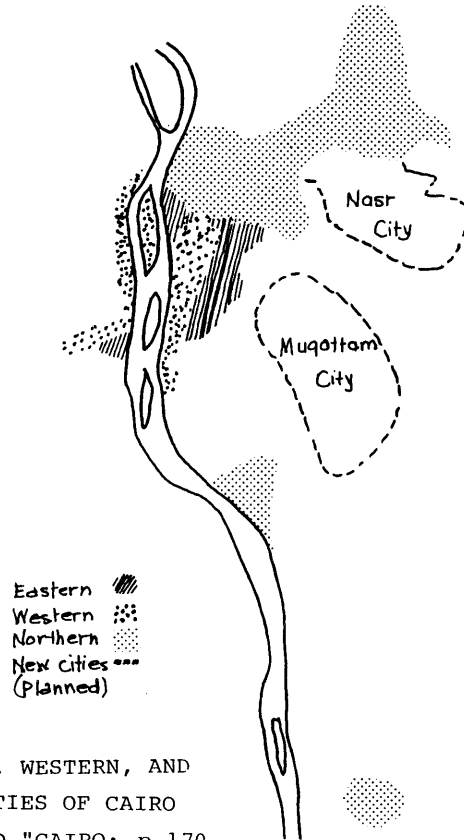


FIG 9 THE EASTERN, WESTERN, AND
NORTHERN CITIES OF CAIRO
SOURCE, ABU-LUGHOD, "CAIRO: p.170

Medieval Cairo (Community X)

Community X corresponds to a large extent to the Fatimid, Ayyubid and early Mamluk times. (27) (See Fig.) The main Qasabah still bears its first name of Al-Muizz lidin Allah. Along it still exist many markets and workshops. It starts from the north at Bab al- Futah; heading south it is intersected twice, first by Al-Muski Street, which was started by Muhammad Ali and completed by Ismail. The second is Al Azha Street, a very wide traffic street. After these two main crossings the street continues its medieval path until intersected again by Taht al Rabb Street, which is very narrow, and continues, to reach the Citadel square, into which it converges, along with several other main streets. (28)

The area deteriorated at the end of the 19th century as the rich families who once lived there moved to better areas. Their houses were left behind to be subdivided into densely packed tenements. Today the district is poor, a slum even by Egyptian standards. It is traditional, but also urban, and a vital complex of work, residence, sales and consumption. Industry and commerce are preindustrial, small-scale pattern. (29) The municipality of Cairo has enacted an "architectural control ordinance" to conserve and restore the historic character of the district. The district is deteriorating, and unless it finds enough support, one cannot anticipate any improvement.

The area chosen for analysis belongs to Qism al Gamalia, and is located in the center of old Cairo on Al Muizz Street, partly on the former grounds of the Western Fatimid Palace. This areas is considered

one of the best preserved in the district. The historical monuments in it are well-conserved and many new conservation efforts are going on. Crumbling old buildings are rebuilt as new apartment buildings.

Ain Al Sira Public Housing Project

Since the revolution of 1952, construction of public housing has become an important governmental policy. The Ministry of Housing and Awkaf have been greatly involved in construction of several housing projects for low and middle income groups. One public housing project was built before 1952, Workers' City in Imbahbah, 1000 dwelling units of which were rented, and later sold to their occupants. Ain Al Sira is a very ambitious scheme. It was built in 1957 in the Kharab (30) just below the old aqueducts. Close-by another public housing project was built at the same time (Zaynhum). The surrounding area serves as a squatters' area, a municipal rubbish dump and most recently, as a site for archaeological excavations. The project is located on "Magraa Al Euoon" highway which connects with the main highway of Salah Salem.

Shoubra: Community II

In 1808 Muhammed Ali, the ruler of Egypt, built a palace for himself in Shoubra, several miles north of the city near the banks of the Nile. The palace was connected with the city by a main avenue. Fifty years later, the area became an upper class district of expensive houses built in the fields of Shoubra. This avenue today still carries its former name "Shoubra Street," serving a highly populated district.

The original site is Jazerate Al Fil, a fertile, cultivated island, exposed by the Nile's recession in 1312.

Shoubra, a Subcity of the New North: Shoubra is north of Cairo's major railroad station (Bab al Hadid) . The area is defined by Abu-alFaraj Street to the east, and by the railraod to the Delta. The area derives its name from its major transportation axis, "Shoubra Street." North of Shoubra are the main industrial areas of Shoubra Al Khaymah and Shoubra al Bald. (31)

The density of Shoubra increased very rapidly as the area was transformed, due to the following factors, from a rural to an urban area:

1. By the end of the 19th century, important families had abandoned the medieval city for this new section, leaving behind their houses to be subdivided and converted to densely packed tenements.
2. The provision of two tramlines--one from Bab al Hadid railroad station in 1903 due north along Sharia Shoubra, and then to Sahil Rod Al Faraj. The second, an extension of the first, was completed in 1907, reaching the outlying village of Shoubra al Khaymah. (32)

The area chosen for analysis was previously owned by a Belgian company, and divided into large plots for sale. The building type is mostly western-style apartment buildings, following building codes and regulations.

Imbabah: Community VI

Long before the Arab conquest by Amr, stretching from north to south on the western bank of the Nile, lay the small villages of Imbabah. (33) (See map)

The area was completely rural until the 20th century when a number of changing elements occurred, among which the following two were the most influential.

1. The extension of Abu al Ala Bridge, thus connecting the eastern and western banks. (34)
2. The establishment of large industrial areas to the north. Two large housing projects were constructed, one for those who worked here, called The Worker's City. The second is Al Tahrir City.

In the fifties a large informal settlement spread over the agricultural land west of these housing projects, and continued to grow very rapidly until the present. This informal development, in spite of governmental policy, continues to grow, eating up more and more agricultural land.

The area of analysis is called Al Monyra, a subsection of Imbabah.

MEDIEVAL CAIRO

SITE: Dates to Fatimid Cairo 969
 DEVELOPMENT: Old, traditional, private development

USER: Income: Wide range (low income)
Family Size: 5:6 persons
Employment: Almost 60% are self-employed and 40% are either under-employed or unemployed
Location of Work: City center
Transportation Mode: walking
Education: The majority of heads of family are illiterate, all children go to school

DWELLING: Type: 2:5 story apartment buildings, or traditional court houses
Area of Dwelling: Varies
Facilities: 2:3 rooms, kitchen, bath and electricity are added by owner
Construction: Traditional: mud-brick bearing walls; new: reinforced concrete structures with mud brick and red brick walls
Height: Varies depending on type of construction

INFRASTRUCTURE: Utilities: Dwelling units along main streets connected to essential utilities such as water supply, sewage disposal, electricity and street lighting
Services: Schools, health services, collection and public transportation provided, but very poorly

DENSITY: 1401 people/hectare (35)

AIN AL SIRA

SITE: A former garbage dump
 DEVELOPMENT: Low-income, public housing project built by the government

USER: Income: Low income
Family size: 5:6 persons
Employment: 40:60% government employees, the rest self-employed
Location of Work: City center
Transportation Mode: Public transportation or walking
Education: Majority literate

DWELLING: Type: 5 story walk-up apts.
Area: 40:80 m²
Facilities: 1:3 rooms, kitchen, bath, and small balcony
Construction: Reinforced concrete frame with brick walls
Height: 5 stories

INFRASTRUCTURE: Utilities: Water, sewage, paved streets, electricity and street lighting provided
Services: Schools, health services, social services, refuse collection, and public transportation provided

DENSITY: 1428 persons/hectare (36)

SHOUBRA (37)

SITE: Agricultural land
 DEVELOPMENT: Formal, private, middle-income established development
 USER: Income: Middle Income
Family size: 5:6 persons
Employment: Almost all are government employees
Location of Work: 85% city center, 15% inner ring
Transportation Mode: Public transportation or walking
Education: Illiterate: 24%; literate: 39%
 DWELLING: Type: apartment buildings
Area: varies depending on size of apartment
Facilities: 3:4 rooms, kitchen bath, and balconies
Construction: Reinforced concrete skeleton frame with brick walls
Height: Four stories: 29%; five: 31%; six: 14%; less than four 26%, depending mainly on street width.
Height: 1½ street width
 INFRASTRUCTURE Utilities: Water, sewage, paved streets, electricity and street lighting are provided
Services: Schools, health services, social services, refuse collection, and public transportation provided
 DENSITY: 1132 people/hectare

IMBABA: AL MONYRA

SITE: Agricultural land
 DEVELOPMENT: Informal, private, popular established development
 USER: Income: Low income
Family size: 5:6 persons
Employment: majority are government employees and self-employed. Some are under- or unemployed
Location of Work: City center and inner ring
Transportation Mode: Public transportation and walking
Education: 40% illiterate; 60% literate
 DWELLING: Type: rows of apartment buildings
Area of Dwelling: 2:3 rooms, kitchen bath, ventilation well and electricity added by owner
Construction: Brick bearing walls, reinforced concrete structures with brick walls
Height: Average height 3 stories; expected to reach 5 stories due to increase in housing demand
 INFRASTRUCTURE: Utilities: Essential utilities such as water supply, sewage, electricity and street lighting provided
Services: Services such as schools, health services, social services, refuse collection and public transportation are poorly provided
 DENSITY: 1716 people/hectare (38)

Chapter 2 METHODS & APPLICATION

This chapter is divided into two parts. The first part is the explanation of the methods used for the analysis. The second is the application of the methods to the 4 areas.

PART 1

EXPLANATION OF THE METHODS OF ANALYSIS:

Three methods of analysis are used. The first is an analysis of the form of the built environment. The second is the quantification of form as analyzed. The third is the territorial analysis based on the concept of territory introduced by Habraken. This concept is a manuscript of his book "The Transformation of the site" theory of change in the man-made environment.

The three methods are applied in the order mentioned below, which is:

- 1 - Analysis of form
- 2 - Quantification of form as analyzed
- 3 - Analysis of territory

PART 2

APPLICATION OF THE METHODS TO THE FOUR AREAS:

The three methods are applied to;

- 1- MEDIEVAL CAIRO
- 2- AIN AL SIRA
- 3- SHOUBRA
- 4- IMABABAH

1 - THE ANALYSIS OF FORM

Introduction

In any environment we can recognize built and open elements.

Built elements are all that is built in the environment. It is all the lots that are either residential or any other function (commercial, institutional, etc. buildings). Built elements are not totally built, a part of them are open for lighting, ventilating, and circulation purposes. That is in the form of light wells, courtyards, and staircases.

Open elements are all that is open in the environment. It is all streets, alleys, and open areas (squares, gardens, or just open land).

Built and open elements have different forms in which they are recognized in the environment. These forms are the outcome of social, economical, historical and climatic needs that result in distinguishable environments not only all over the world but also in one city.

Objective of Form Analysis

The objective of the form analysis is to identify the different built environments in terms of their open and built elements.

Method of Form Analysis

The form analysis is based upon the available maps for the different areas and on personal site visits to the areas. The analysis is strictly an analysis of form, irrespective of any functional meaning.

Description of Form Analysis

The built environment is recognized as:

- O open, all that is open area
- B built, all that is built area

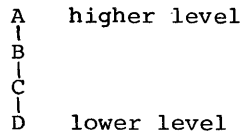
O is recognized in the form of
 streets (linear spaces)
 open space concentric spaces in the form
 of squares, open green areas
 or just land

B is recognized as lots which consist of
 b the covered built area
 o the open are (courtyards, lightwells, etc.)

Street Levels

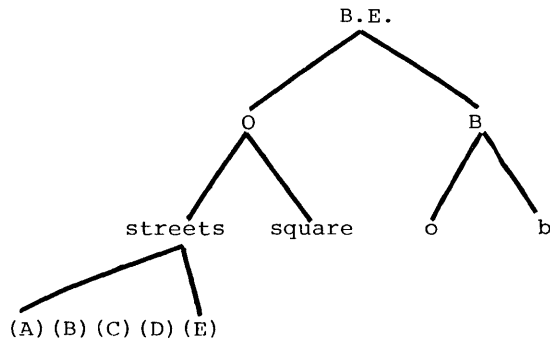
Streets have different hierarchical levels depending upon their dimensions and flow of traffic that is either car or pedestrian.

Thus streets are labeled according to their level as (A, B, C, etc.)



Only in medieval Cairo are streets leveled (besides their dimension and flow of traffic) by their physical form.

So we can diagram the form of the environment in this following diagram:



where:

B.E. is built environment
 B is all the built area in B.E.
 O is all the open are in B.E.
 b is all the built area in B
 o is all the built area in B
 (A), (B), (C), (D), etc. are the different
 street levels in O

List of illustrations provided for each area:

- 1 - Fig. 1 showing the open area (streets, open spaces) in the whole area.
- Fig. 2 showing the built area (all the lots) in the whole area.
- Fig. 3 showing the area chosen for analysis.
- Fig. 4 showing the different street levels in the whole area.
- Fig. 5 showing the different street levels in area chosen for analysis.
- Fig. 6 showing a diagram of the form of the built environment.

2 - Quantification of Form as Analyzed

Introduction

The use of land differs from one environment to another depending on the area built (lots) and the area open (streets, open space) in each.

The higher the percentage of built area in an environment, the higher the livable space and thus the higher the density it can achieve. In low income housing in Egypt today, with the very limited available resources and the high cost of land, it becomes an economic constraint to obtain high livable space.

The 4 areas of analysis represent 4 different forms of environment with different land use (built and open).

Objective of Quantification of Form Analysis

The objective of the quantification of form is to calculate the built and open elements in each built environment to allow comparable analysis between them.

Method of Analysis

This analysis is based on the form analysis. It is a quantification of the form analyzed in Fig. 6 for each area.

In order to be able to carry such an analysis, a segment of the environment is chosen.

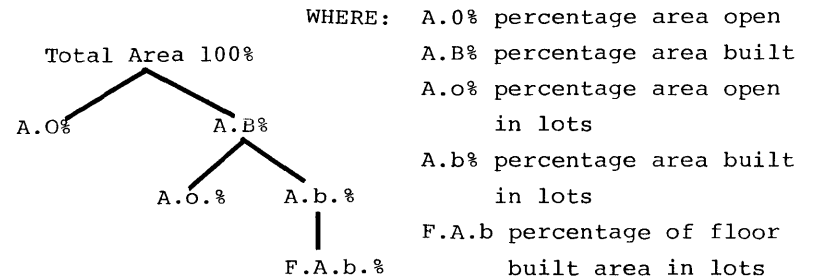
The choice of the different segments in each environment follows certain general rules:

- 1 - They are identified by main streets except for the area of Shoubre (the street patterns did not allow that on this level).
- 2 - The area of land is approximately the same.

- 3 - In the case of medieval Cairo and Ain al Sire two segments were analyzed.
- 4 - The areas chosen represent the structure of the environment in which they exist.

The calculations provided for each area are:

- 1 - Total area of segment chosen
- 2 - Area open (streets and open space)
 - 2.1 - Total area of streets, total length of streets
 - 2.2 - Total area of squares
- 3 - Area built (all the existing lots or buildings). Note: In Medieval Cairo, Imbabah and Shoubre the built area is divided into lots, in Ain al Sire there are no lots.
 - 3.1 - Area open in lots (staircase, lightwells, courtyards).
 - 3.2 - Area built in lots.
 - 3.3 - Floor area built = area built in lots x average number of stairs.
 - 3.4 - Average block area, block length and depth.
 - 3.5 - Average lot area, lot frontage and depth.
- 4 - Circulation efficiency = street length/area served = m/hectare



3 - Method of Territorial Analysis

Introduction

Ever since his early existence, man has identified space as his territory and as he developed he has extended his control over the outside world. It is man's natural drive to extend his control and identify areas as being his own. This natural drive should be encouraged, allowing man to interact with his surroundings, thus creating better man/environment relationships that will help to solve many of today's housing problems, such as feelings of alienation, insecurity and fear.

It is through the design of the elements of the built environment that such relationships may be achieved.

Objective of The Territorial Analysis

The objective of the territorial analysis is to identify the different possible territories in each area. The method is based on the concept of territories introduced by Habraken. This part will introduce the concept to the reader and also the definition of the terminology used. The main reference of this analysis is the manuscript of Habraken's book "Transformation of the Site", The General Theory of Change in the Man Made Environment.

Definition of Territories:

-A territory is a space or an arrangement of connected spaces, under control of one power.

Fig. 1-a.

-A power is any person or group of persons acting as one, who can transfer the site.

-A territory is also defined by its boundaries where the exercise of territorial power ends, as

revealed by the selective movement of elements as indicated by the elements of enclosure. Fig 1-b
-A territory can have relationships with another territory if they share a common boundary that is crossed. Fig. 1-c.

-A territory is always included in another territory.
-The relation between territories is in a vertical order in which each territory includes other territories and is inclosed itself in a larger territory Fig. 1-d.

How Can We Define Territories?

We can define territories by the existence of control. We can also read territories by elements such as gates, fences, and name plates, etc.

The form of the environment also suggests territories. Streets, open spaces, and buildings all hold different territories. "One building may hold different territories. One territory may hold different buildings." (39)

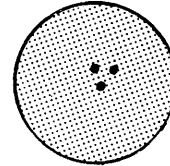


FIG 1a

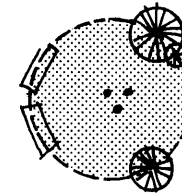


FIG 1b

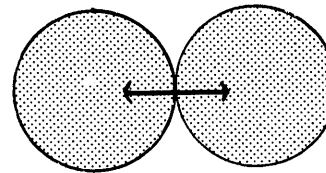


FIG 1c

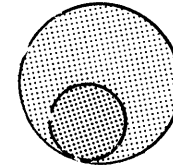


FIG 1d

Model Used for Territorial Analysis

The territorial relationships can be modeled by a graphic model as shown in Fig. 1.

"Each territory is divided into a public and a private space."

"The private space in each territory may be further divided into public and private spaces again and again, creating deeper and deeper territories."

"This graphic model is no more than a simple form for illustrating this concept."

"It is not a map of any particular sites, it is a diagram of the different territories we may find in any site."

"It has no dimensional scale. The only scale is the different territorial depths, with the lowest depth upwards and the deepest downwards."

"All through this continuous subdivision of territories, the first territory remains undiminished in size."

"If we move from one territory to another, each time crossing a boundary, we still remain in a public territory whether we move up or down in the graphic model."

"The principle of inclusion only works if there is a part of each territory that is not part of any included deeper territory. That part of any included deeper territory has some space that must be shared by all that inhabit it (e.g., a garden in a residential lot shared by all inhabitants). Thus, it is the public space in each territory that makes inclusion work. Private space is the space under our control, all that is not under

our control is considered the outside world, which could be defined as public."

How Can We Diagram Territories by the Graphic Model?

To illustrate that, it is useful to diagram a small residential area. See Fig. 2.

The whole area is the first territory 0.

This territory is divided into a public and a private space.

01 is the public space in territory 0. It is all the streets that give access to the different lots.

02 is the private space in territory 0. It is all the lots that are located on 01.

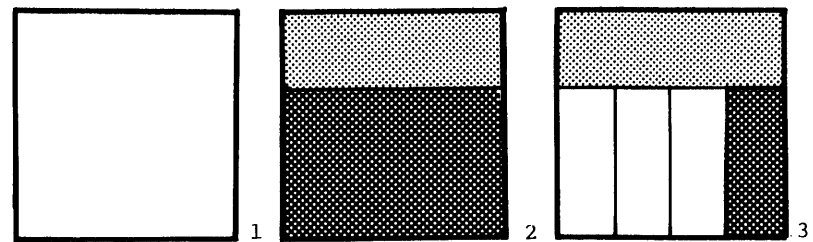
02 is divided into the different lots.

Each lot is territory in itself that is divided into 02-1 a public space and 02-2 a private space.

02-1 is the garden shared by all the inhabitants of the lot. It is the public space in territory 02.

02-2 is the different apartments in territory 02. Each apartment is a territory that is divided into public space (living areas and kitchen and bath) and a private space (the different rooms that are occupied by the different individuals of the household).

FIG 2 SEQUENCES



NOTE

Territories are not fixed, they change with the change in our social and economic needs. A large house that was once occupied by one family is today divided into many small territories occupied by different families.

Based on the form analysis a model representing the different territories that each environment can hold is suggested.

The Different Territorial Models for Each Area

-The territorial model of medieval Cairo does not represent the existing territories. It assumes the territories that once existed in this form of environment.

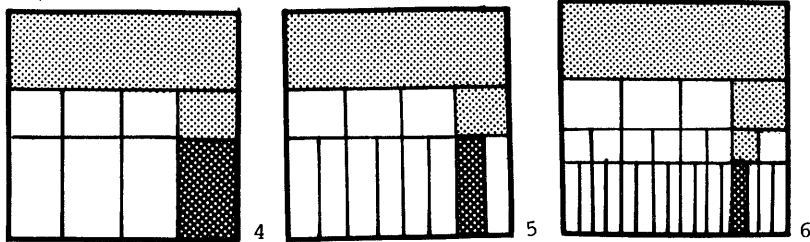
-The territorial model of Shoubre represents the existing territories that this form of environment holds.

-Two territorial models are provided for Ain Al Sira, the first is a representation of the existing territories, the second suggests the only possible territorial enrichment with its present form.

-Two territorial models are also provided for Imbabah, the first is suggested as a territorial model if the government will take the responsibility for providing sewage, electricity and water supply and maintain all streets in the area.

The second represents a territorial mode where the people themselves have control of the alleys that give access to their dwellings. The second model is closer to reality, because the alleys are mainly pieces of land provided by the owners of the land and they built their own sewage system.

The alleys are under the control of the inhabitants.



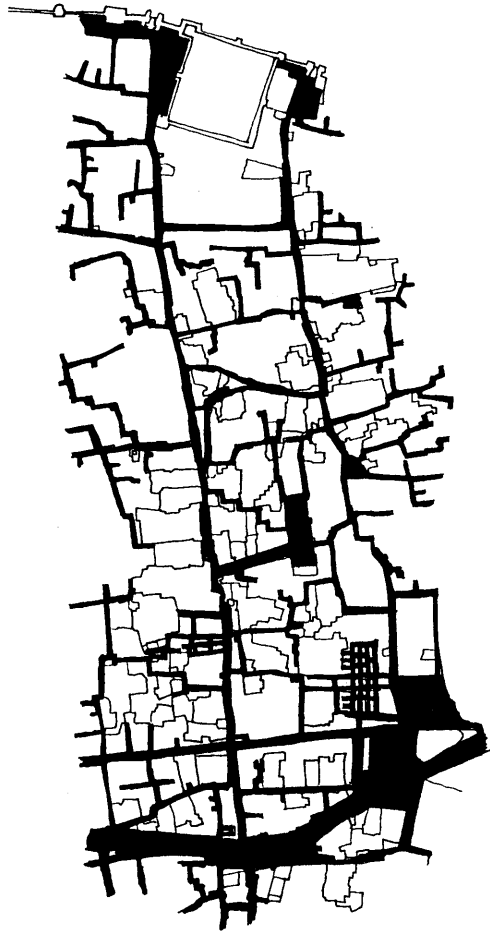


FIG 1 : AREA OPEN IN THE WHOLE AREA

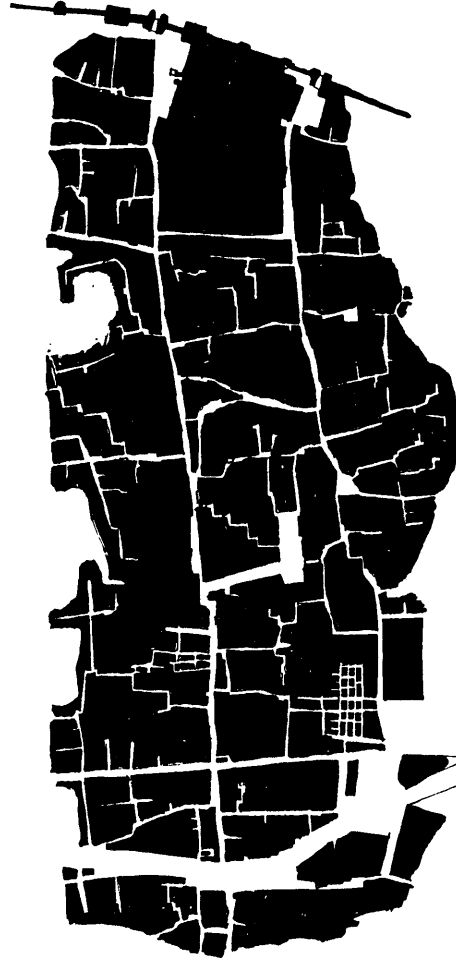


FIG 2 : AREA BUILT IN THE WHOLE AREA

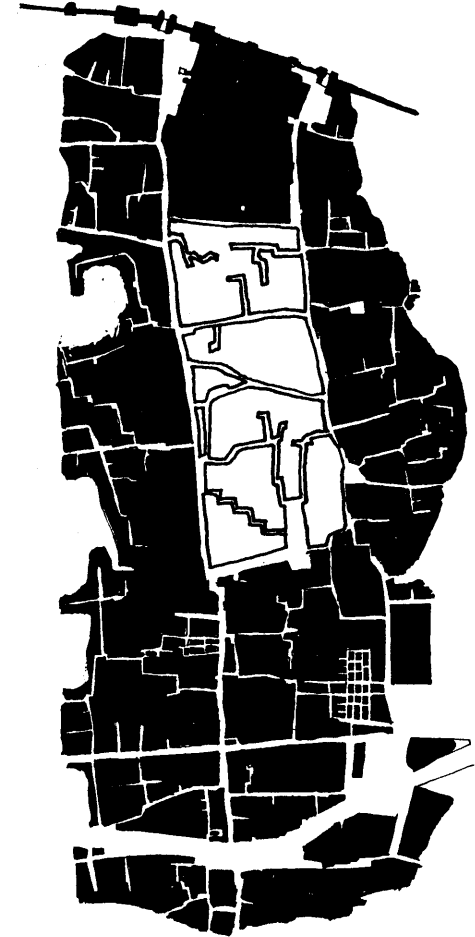


FIG 3 : AREA CHOSEN FOR ANALYSIS

PART 2 APPLICATION OF THE METHODS TO:

MEDIEVAL CAIRO

1- FORM ANALYSIS

STREETS

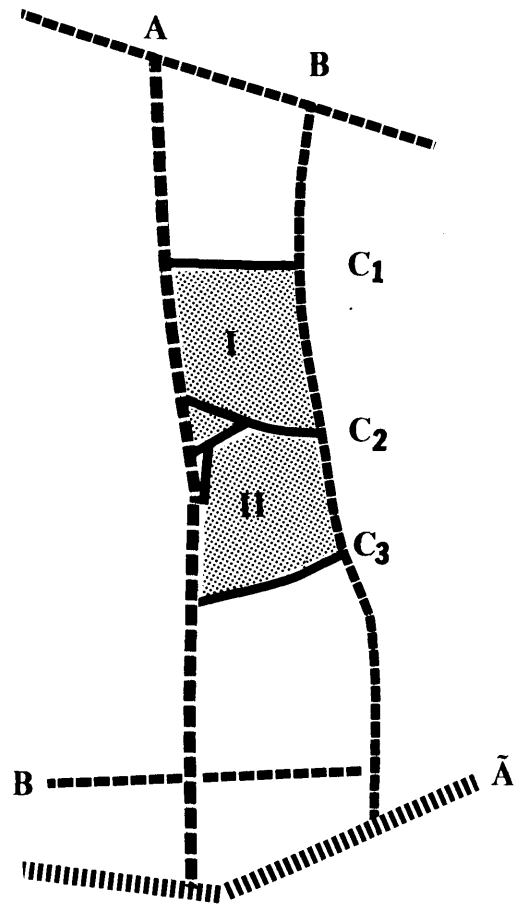


FIG 4 : STREET LEVELS IN THE WHOLE AREA

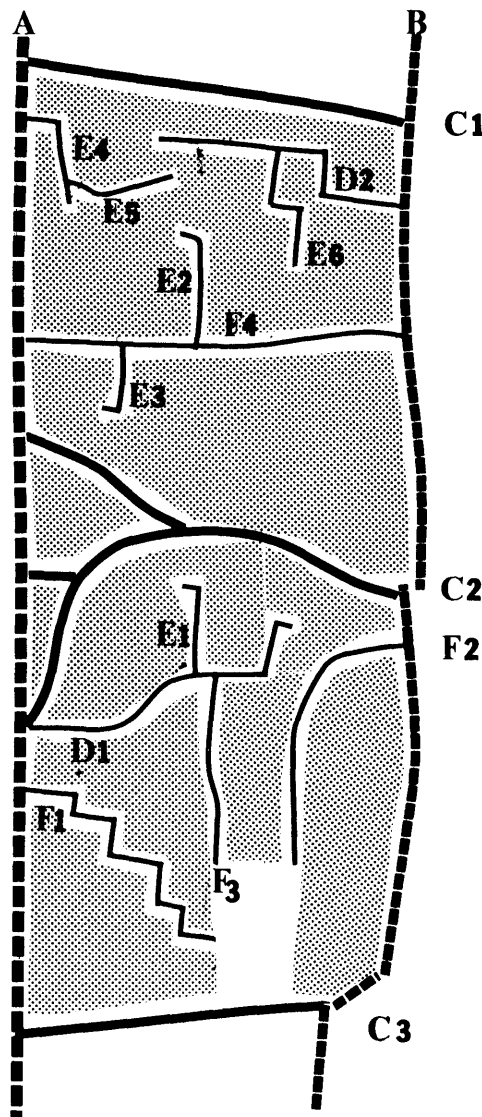


FIG 5 : STREET LEVELS IN THE AREA OF ANALYSIS

THE FORM OF THE BUILT ENVIRONMENT:

- 1.0 OPEN AREA
 - 1.1 STREETS
 - 1.2 SQUARES
- 2.0 BUILT AREA:(all lots)
 - 2.1 BUILT AREA IN LOTS
 - 2.2 OPEN AREA IN LOTS

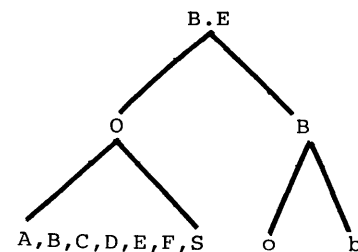


FIG 6 THE FORM OF THE BUILT ENVIRONMENT

where:

- B.E BUILT ENVIRONMENT
- O OPEN AREA (STREETS AND SQUARE)
- B BUILT AREA (LOTS)
- o AREA OPEN IN LOTS
- b AREA BUILT IN LOTS
- A,B,C,D,E,F STREET LEVELS
- S OPEN SPACE

STREETS

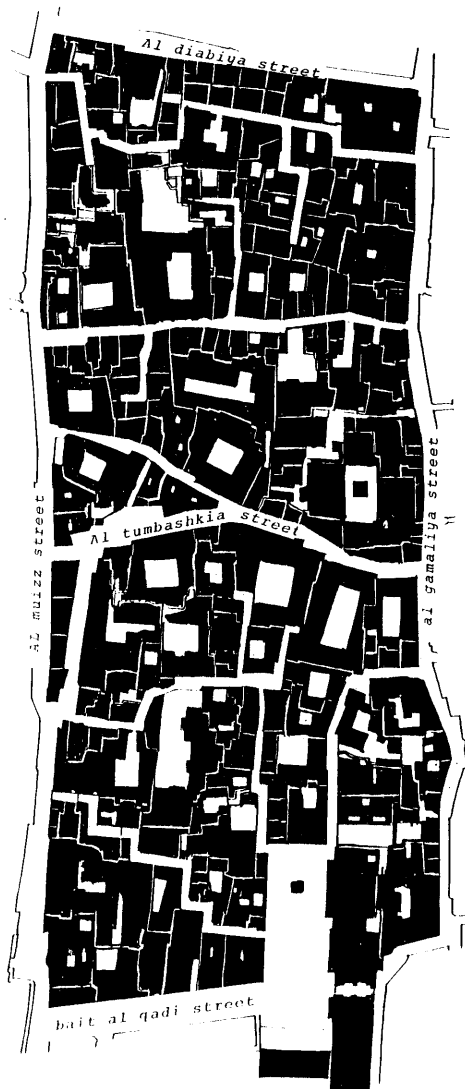


FIG 7 THE AREAS OF ANALYSIS I AND II

1.1 STREETS:

1.1.1 STREETS SURROUNDING AREA I & II

1.1.2 STREETS WITHIN AREA I & II

1.1.1 STREETS SURROUNDING AREA I & II

In the two areas of analysis we distinguish three different streets surrounding them.

- 1- (A) A main street, which is the main spine of the whole area of Old Cairo.
- 2- (B) A main street also, but less in importance than (A). It runs parallel to (A).
- 3- (C) A secondary street that is perpendicular on both (A) & (B).

NAMES OF (A), (B), AND (C) STREETS:

OA AL MUIZZ LIDIN ALLAH STREET

OB AL GAMALIYA STREET

OB1 BAIT AL MAL STREET

OB2 HABS AL RAHMA STREET

OB3 AL GAMALIYA STREET

OC1 AL DIABIYA STREET

OC2 AL TUMBAKSIYA STREET

OC3 BAIT AL QADI STREET

The street might have different names at different parts. The reason for that could be, that the name corresponds to different activities that are carried on along it or the name is the name of the ruler who established it.

THESE STREETS (A), (B), (C) DEFINE THE BOUNDARIES OF AREA (I) AND (II).

Area I is defined by C1, C2, A & B.

Area II is defined by C2, C3, A & B.

DIFFERENT STREET LEVEL:

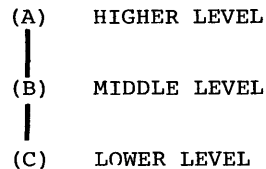
The difference in the street naming is due to a difference in the street's level. The level is based on both dimension and level of traffic flow which is the result of activity.

(A) is according to this specification is at a higher level than both (B) AND (C).

(B) is at a lower level than (A) and at a higher level than (C).

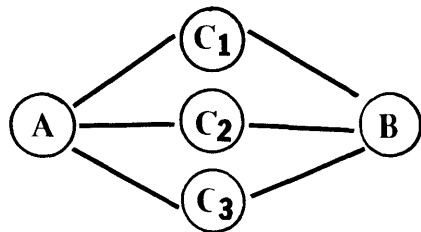
(C) is at a lower level than both (A) and (B).

This vertical hierarachy in street levels could be simply diagramed



THE RELATIONSHIPS BETWEEN THE DIFFERENT STREET LEVELS

- (A ----C1 ----B)
- (A----C2a----B)
- (A ----C2b----C2a----B)
- (A ----C2c----C2a----B)
- (A ----C3 ----B)



1-1-2STREETS WITHIN AREA I AND II

Within area (I) and (II) we can distinguish three additional kinds of streets. They are different in their form .

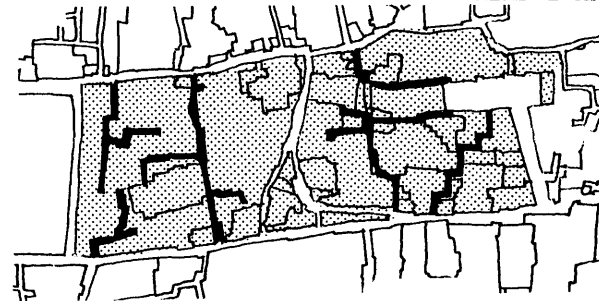
These three different forms of streets have specific names, which are HARA, ATFA, AND ZUKAK.

It is important to define these streets according to both their form and their name.

FUNCTION:

The main function of these streets is to reach the different residential quarters withwn area I and II. It is also important to note that small scale industr-ies and workshops exist along some of these streets and some are strictly residential.

FIG 8 THE STREETS WITHIN AREAS I AND II

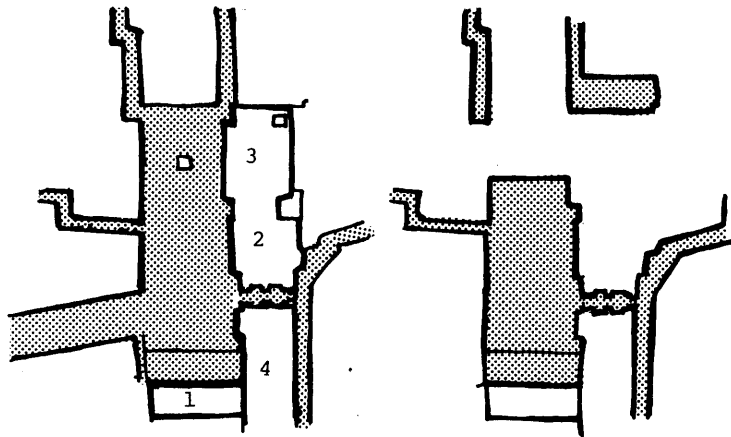


DIFFERENT STREET FORMS:

From (fig-8) we can observe three different street forms within area 1, 11 Their form as well as their dimension are the main differentiating elements.

1.2 SQUARES:

BAIT AL QADI SQUARE (S)



FORM OF SQUARE IN 1981

FORM OF SQUARE IN 1800

i In area (II) we observe one main and single square
 This square is called (the square of the judge) which
 is Maidan Bait al Qadi. The square is a public space,
 surrounded with 4 public buildings which are;
 1- Bait al Qadi(house of the judge)
 2- Fire station
 3- Police station
 4- Administrative building for official weights
 and in the middle of the square are public toilets

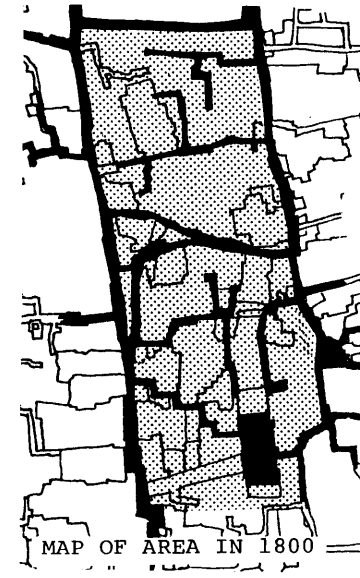
SQUARE FORM IN 1800 & 1981:

The form of the square has changed from it's form
 in 1800.

It has expand 30m to the north, thus connecting with
 with both atfat al Qaffasin and harat Qirmiz. This
 relationship between the square and both these streets
 did not exist in 1800.



MAP OF AREA IN 1981

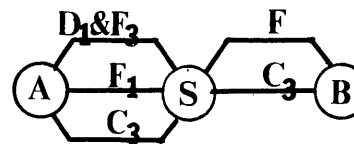


MAP OF AREA IN 1800

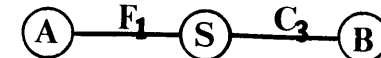
Atfat al qaffasin was a dead end street which had a
 small space used as a garden. This space is occupied
 with an apartment building today.

Harat al Qirmiz was also a dead end street till it was
 connected to the square.

The square also was connected to the main street of the
 the area Al Muizz lidin Allah street through a new
 modern street called Bait ai Qadi street.



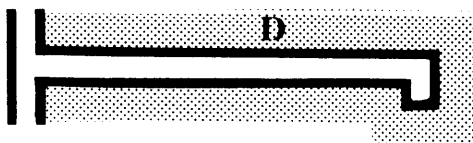
FORM RELATIONSHIP IN 1981



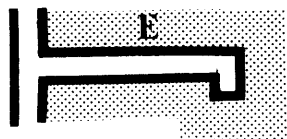
FORM RELATIONSHIP IN 1800

DIFFERENT STREET FORMS:

- 1- (F) A continuous street open at both ends.
Length varies between 120m and 165m.



- 2- (D) A long street open at one end and a dead end at the other end.
Length varies between 75m and 165m.



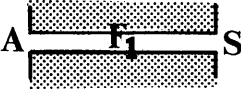

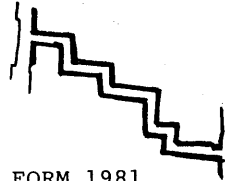
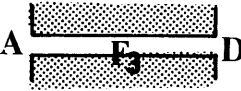
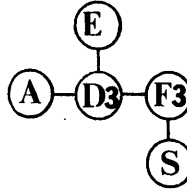
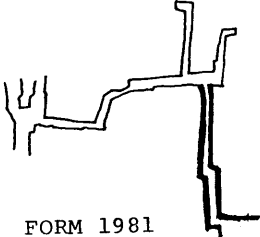
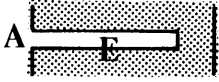
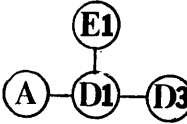
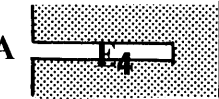

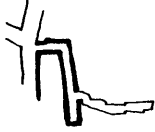
- 3- (E) A short street open at one end and a dead end at the other end.
Length is less than 75m.

- * A HARA COULD BE: A long continuous street (F).
A long dead end street (D).
A short dead end street (E).
- * A DARB COULD BE ONLY: A long dead end street (D).
- * A ATFA COULD BE: A long continuous street (F).
A short dead end street (E).
- * A ZUQAQ COULD ONLY BE: A short dead end street (E).

NAMES OF STREETS WITHIN AREA I AND II

HARET BAIT AL QADI	(F1)
HARET QIRMIZ	(F3)
HARET AL DARB AL ASFAR	(F4)
HARET A: TAWAKI	(E4)
ATRET AL QAFFASIN	(F2)
ATFET QIRMIZ	(E1)
ATFET AL DARB AL ASFAR	(E2)
ATFET AL TAWAKI	(E5)
ATFET AL RASHIDI	(E6)
DARB QIRMIZ	(D1)
DARB AL RASHIDI	(D2)
ZUKAK AL RASHIDI	(E3)

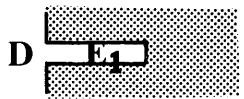
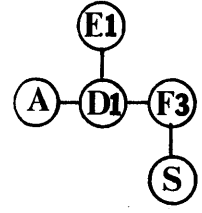
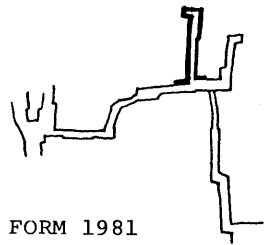

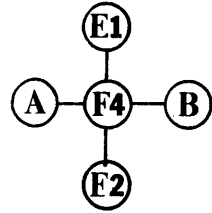
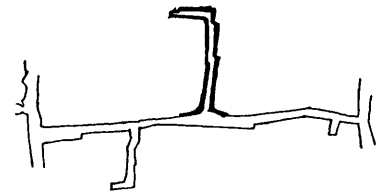



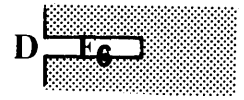
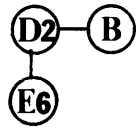
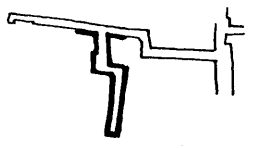
FORM ANALYSIS OF STREETS WITHIN AREAS I AND II

NAME OF STREET		DIMENSIONS			STREET FORM (STARTING & ENDING POINTS)	RELATIONSHIP WITH OTHER OPEN SPACES	STREET FORM FROM MAP
		L	W	A			
HARAT BAIT AL QADI	FI	120	4	480			 FORM 1981
HARAT QIRMIZ	D2	85	3.5	297			 FORM 1981
							
HARAT AL TAWAKI	E4	60	3.5	210			 FORM 1981

FORM ANALYSIS OF STREETS WITHIN AREAS I AND II

NAME OF STREET		DIMENSIONS			STREET FORM (STARTING & ENDING POINTS)	RELATIONSHIP WITH OTHER OPEN SPACES	STREET FORM FROM MAP
		L	W	A			
HARAT AL DARB AL ASFAR	F3	165	4	660			
A'FFAT AL QAFFASIN	F2	115	4	460			

FORM ANALYSIS OF STREETS WITHIN AREAS I AND II

NAME OF STREET		DIMENSIONS			STREET FORM (STARTING & ENDING POINTS)	RELATIONSHIP WITH OTHER OPEN SPACES	STREET FORM FROM MAP
		L	W	A			
ATFAT QIRMIZ	EI	45	3.5	157			 FORM 1981
ATFAT AL DARB AL ASFAR	E2	60	3.5	210			 FORM 1981
ATFAT AL TAWAKI	E5	50	3.5	175			 FORM 1981
ATFAT AL RASHIDI	E6	60	3.5	210			 FORM 1981

FORM ANALYSIS OF STREETS WITHIN AREAS I AND II

NAME OF STREET		DIMENSIONS			STREET FORM (STARTING & ENDING POINTS)	RELATIONSHIP WITH OTHER OPEN SPACES	STREET FORM FROM MAP
		L	W	A			
DARB QIRMIZ	DI	140	4	560			<p>FORM 1981</p>
DARB AL RASHIDI		120	4	480			<p>FORM 1981</p>
ZUKAK AL DARB AL ASFAR	E3	45	3.5	157.5			<p>FORM 1981</p>
		1056		4057			

BUILT AREA IN (I) AND (II):

We can distinguish different kinds of buildings in area (I) and (II).

*INSTITUTIONAL, RELIGIOUS, AND EDUCATIONAL BUILDINGS.

MOSQUES
SABIL AND KUTTAB
MADRASA
MOUSOLEUMS
KHANIQAHS
ADMINISTRATIVE

*COMMERCIAL BUILDINGS

WEKALAT
KHANS

*RECREATIONAL

PUBLIC BATHS
COFFEE SHOPS

*RESIDENTIAL BUILDINGS

HOUSES (COURTYARD)
(APARTMENT BUILDING)
PALACES

Buildings are classified as Historical and Non-Historical.
For each historical building the historical period to which
it belongs is given.

BUILT AREA IN AREA (I)HISTORICAL RESIDENTIAL BUILDINGS IN AREA I

- 1- House darb qirmiz No 12 (before 1800) OTTMAN PERIOD
- 2- Bait al Qadi al Islam (before 1800) OTTMAN PERIOD
- 3- Qa,a Muhibb al Din (1545) OTTMAN PERIOD
- 4- Palace of Bashtak (1334-1339) MAMLUK PERIOD
- 5- Maqad Mamay al saifi (1496) MAMLUK PERIOD

NON-HISTORICAL INSTITUTIONAL BUILDINGS IN AREA I

- 1- Police station
- 2- Bait al mal (tresseurey)
- 3- Offices for official weights
- 4- Public toilets

HISTORICAL INSTITUTIONAL BUILDINGS IN AREA I

- 1- Mosque and Madrassa of Tartar al Hyaziyya (1348-1360)
MAMLUK PERIOD
- 2- Mosque al Gamaliya, Madrassa of Jamal al Din (1408)
MAMLUK PERIOD
- 3- Mosque and Madrassa Mithcal
- 4- Wekalat Bazara (end of the 17th century) OTTMAN PERIOD
- 5- Wekalat al Nagadi (1616-18) OTTMAN PERIOD
- 6- Wekalat al Abbas Agha (1694) OTTMAN PERIOD "only
portico exists "
- 7- Wekalt al Awand (before 1800) OTTMAN PERIOD
- 8- Wekalat al Julshaniyyia (before 1800) OTTMAN PERIOD
- 9- Mousoleum of shaikh Sinan (1598) OTTMAN PERIOD
- 10- Sabil - Kuttab and House of Abd al Rahman Katkhoda (1744)
OTTMAN PERIOD



FIG 9 BUILT AREA IN AREA I



FIG 10
COMMERCIAL AND INSTITUTIONAL BUILDINGS IN AREA(I)
[Dark cross-hatched box] HISTORICAL BUILDINGS
[Stippled box] NONE HISTORICAL BUILDINGS



FIG 11
RESIDENTIAL BUILDINGS IN AREA(I)
[Dark cross-hatched box] HISTORICAL BUILDINGS
[Stippled box] NONE HISTORICAL BUILDINGS

BUILT AREA IN AREA (II)HISTORICAL RESIDENTIAL BUILDINGS IN AREA II

- 1- Bait al-Sihiani (1648-1796) Ottoman period.
- 2- House of Mustafa Jafar (1713) Ottoman period.

NON-HISTORICAL INSTITUTIONAL BUILDING IN AREA II

- 1- Cinema (no longer used as a cinema, it is used as a workshop.
- 2- Coffe shop

HISTORICAL INSTITUTIONAL BUILDINGS IN AREA II

- 1- Ruins of an old Wekala (not listed in the historical list of all islamic monuments.
- 2- Wekalat sharia al Sinanin (19th century)
- 3- Mosque of al Aqmar (1125) FATIMID PERIOD PERIOD
- 4- Hammam al Jamaliya (before 1739)
- 5- Khaniqah Said al Suada (1173- 1174) AYYOBID PERIOD
- 6- Sabil and Kuttab Qites Bey and Wekalat at-Tina (1630) OTTMAN PERIOD.



FIG 12 BUILT AREA IN AREA II



FIG 13
COMMERCIAL AND INSTITUTIONAL BUILDINGS IN AREA II





 HISTORICAL BUILDINGS
 NONE HISTORICAL BUILDINGS



FIG 14
RESIDENTIAL BUILDINGS IN AREA II

 HISTORICAL BUILDINGS
 NONE HISTORICAL BUILDINGS

MEDIEVAL CAIRO

AREA OF STREETS SURROUNDING AREA I AND II

STREET	L	W	AREA
A Al Muizz St.	465/2	9	2092.5
B Al Jamaliya St.	425/2	7	1487.5
C1 Al Diabiya St.	170/2	7	510
C2 Al Tumushkia St.	350	6	2100
C3 Bart al Kady St.	140/2	14	980
TOTAL	950		6700

AREA OF STREETS WITHIN AREA I AND II

STREET	L	W	AREA
F1 Haret Bait al qadi	120	4	480
F2 Atfet al qaffasin	115	4	40
F3 Haret qirmiz	85	3.5	297.5
F4 Haret al Darb al Asfar	165	4	660
E1 Atfet qirmiz	45	3.5	157.5
E2 Atfet al Darb al Asfar	60	3.5	210
E3 Zuqaq al Darb al Asfar	45	3.5	157.5
E4 Haret al Tawaki	60	3.5	210
E5 Atfet al Tawaki	50	3.5	175
E6 Atfet al Rashidi	60	3.5	210
D1 Al Darb al Asfar	140	4	560
D2 Darb al Rashidi	120	4	480
TOTAL	1056		4057.5

TOTAL AREA OF STREETS IN AREA 10757.5

AREAS OF LOTS SERVED BY THE DIFFERENT STREETS

STREET	A	A.B	A.O	F.A.B	L.F	LOT
Tumbashkia C2	12125.5	1644.5	10481	30245	552	25
Bait Al Qadi C3	4930	672.5	4257.5	1277	269	13
Dabiya C1	32125	599.37	2613.12	7839.37	152	10
Al Muizz A	5250	662.5	4587.5	13752.	266	18
Al Jamalia B	8005	1230.25	6774.75	20324.25	252	19
Harat and Atfat al Tawaki E4 E5	1887.5	146.87	1740.62	5150.6	163	10
Darb al Rashidi D2	3062	315.62	2496.87	7490.625	198	13
Atfat al Rashid E6	1400	171.25	1228.75	3258.75	87	8
Harat al Darb al Asfar F4	7975	1751.55	6264.45	18793.3	295	26
al Darb al Asfar E3	662.5	33.125	629.37	1888.125	80	7
Atfat al Darb al Asfar E2	1125	193.75	930.75	2482.25	113	9
Atfat al Qaffasir F2	2625	717.5	1907.5	5722.5	145	7
Bait al Qadi E1	2118.5	262.5	2512.5	7537.5	191	11
Darb Qirmiz D1	5977.65	1438.67	4538.8	13616.47	212.5	16
Harat Qirmiz F2	834	65.92	768.08	2304.24	51	6
Atfat Qirmiz E1	668.75	93.44	575.28	1725.84	36.87	4
TOTAL	61858	9997	51861	155583	3064	202

2- QUANTIFICATION OF FORM AS ANALYSED

WHERE:




W width
 L length
 A area
 A.B area built in lot:
 A.O area open in lot
 F.A.B floor area built
 F.L lot frontage on street

CALCULATIONS:

Total Area	= 75315.50 m ²
Area Open	= 13457.5 m ²
Streets	= 10757.5 m ²
Square	= 2700 m ²
Area Built (Lots)	= 61858 m ²
Area Built in Lots	= 51861 m ²
Area Open in Lots (Courts and Staircase)	= 9997 m ²
Floor Area Built (where 3 stories is av. height of buildings)	= 51861 x 3 = 155583 m ²
Average Area of Lot	= 306 m ²
Length of Street	= 2015 m
Street Efficiency	= 267 m/hectare



FIG 15

-  LOTS ON A, B, C1, C2, C3, and S
-  LOTS ON F1, F2, D1, F4, F3, D2, E4
-  LOTS ON E1, E2, E3, E5, E6

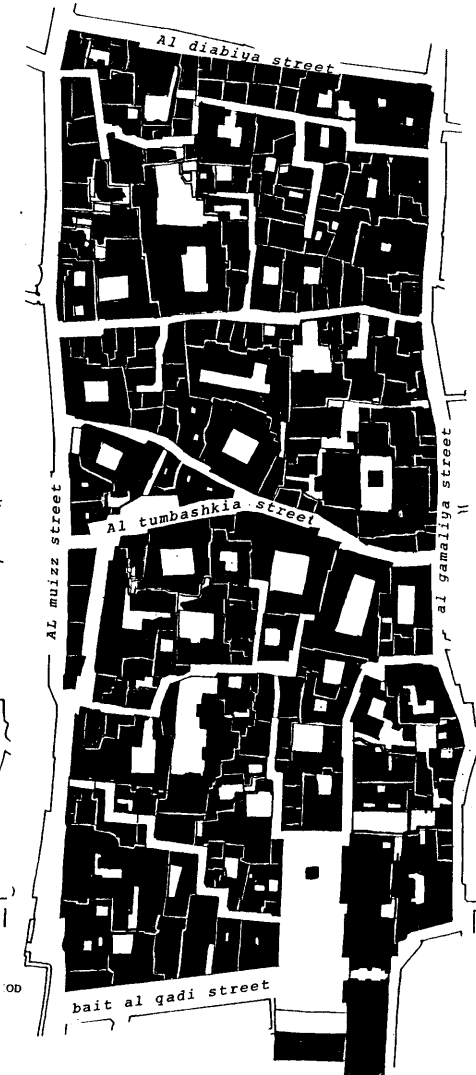
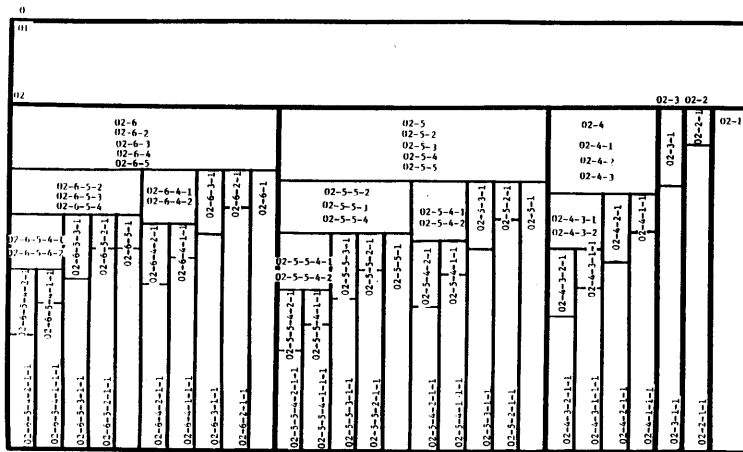


FIG 16 AREA BUILT AND AREA OPEN IN MEDIEVAL CAIRO

3- TERRITORIAL ANALYSIS



POTENTIAL TERRITORIES IN MEDIEVAL CAIRO

0 is the whole territory

this territory is divided into

01 is all A,B,C streets and square S.

it is the public space in territory 0.

02 is all the built lots and the E,D,F streets

it is the private space in territory 0

this private space is divided into

02-1 is any institutional, commercial and recreational building located on 01

02-2 courtyard house

this territory is divided into

02-2-1 is the courtyard

02-2-1-1 are the different apartments

02-3 apartment building

this territory is divided into

02-3-1 is the staircase

02-3-1-1 are the different apartments

02-4 a short dead end street E1

this territory could be divided into

02-4-1 courtyard house

02-4-1-1 is a staircase

02-4-1-1-1 are the different apartments

02-4-2 apartment building

02-4-2-1 is the staircase

02-4-2-1-1 are the different apartments

02-4-3 a short dead end street E2

this territory could be divided into

02-4-3-1 courtyard house

02-4-3-1-1 courtyard

02-4-3-1-1-1 apartments

02-4-3-2 apartment building

02-4-3-2-1 staircase

02-4-3-2-1-1 apartments

02-5 a long dead end street D1

this territory could be divided into

02-5-1 institutional...etc., building

02-5-2 courtyard house

02-5-2-1 court

02-5-2-1-1 apartments

02-5-3 apartment building

02-5-3-1 staircase

02-5-3-1-1 apartments

02-5-4 a short dead end street E2

this territory could be divided into

02-5-4-1 courtyard house

02-5-4-1-1 court

02-5-4-1-1-1 apartments

02-5-4-2 apartment building

02-5-4-2-1 staircase

0a-5-4-2-1-1 apartments

02-5-5 a long dead end street D2

TERRITORIAL DEPTH IN MEDIEVAL CAIRO:

0--01

02---02-1

02-2---02-2-1

02-2-1-1

02-3---02-3-1

02-3-1-1

02-4---02-4-1---02-4-1-1

02-4-1-1-1

02-4-2---02-4-2-1

02-4-2-1-1

02-4-3---02-4-3-1---02-4-3-1-1

02-4-3-1-1-1

02-4-3-2---02-4-3-2-1

02-4-3-2-1-1

02-5---02-5-1

02-5-2---02-5-2-1

02-5-2-1-1

02-5-3---02-5-3-1

02-5-3-1-1

02-5-4---02-5-4-1---02-5-4-1-1

02-5-4-1-1-1

02-5-4-2---02-5-4-2-1

02-5-4-2-1-1

02-5-5---02-5-5-1

02-5-5-2---02-5-5-2-1

02-5-5-2-1-1

02-5-5-3---02-5-5-3-1

02-5-5-3-1-1

02-5-5-4---02-5-5-4-1---02-5-5-4-1-1

02-5-5-4-1-1-1

02-5-5-4-2---02-5-5-4-2-1

02-5-5-4-2-1-1

02-6---02-6-1

02-6-2---02-6-2-1

02-6-2-1-1

02-6-3---02-6-3-1

02-6-3-1-1

02-6-4---02-6-4-1---02-6-4-1-1

02-6-4-1-1-1

02-6-4-2---02-6-4-2-1

02-6-4-2-1-1

02-6-5---02-6-5-1

02-6-5-2---02-6-5-2-1

02-6-5-2-1-1

02-6-5-3---02-6-5-3-1

02-6-5-3-1-1

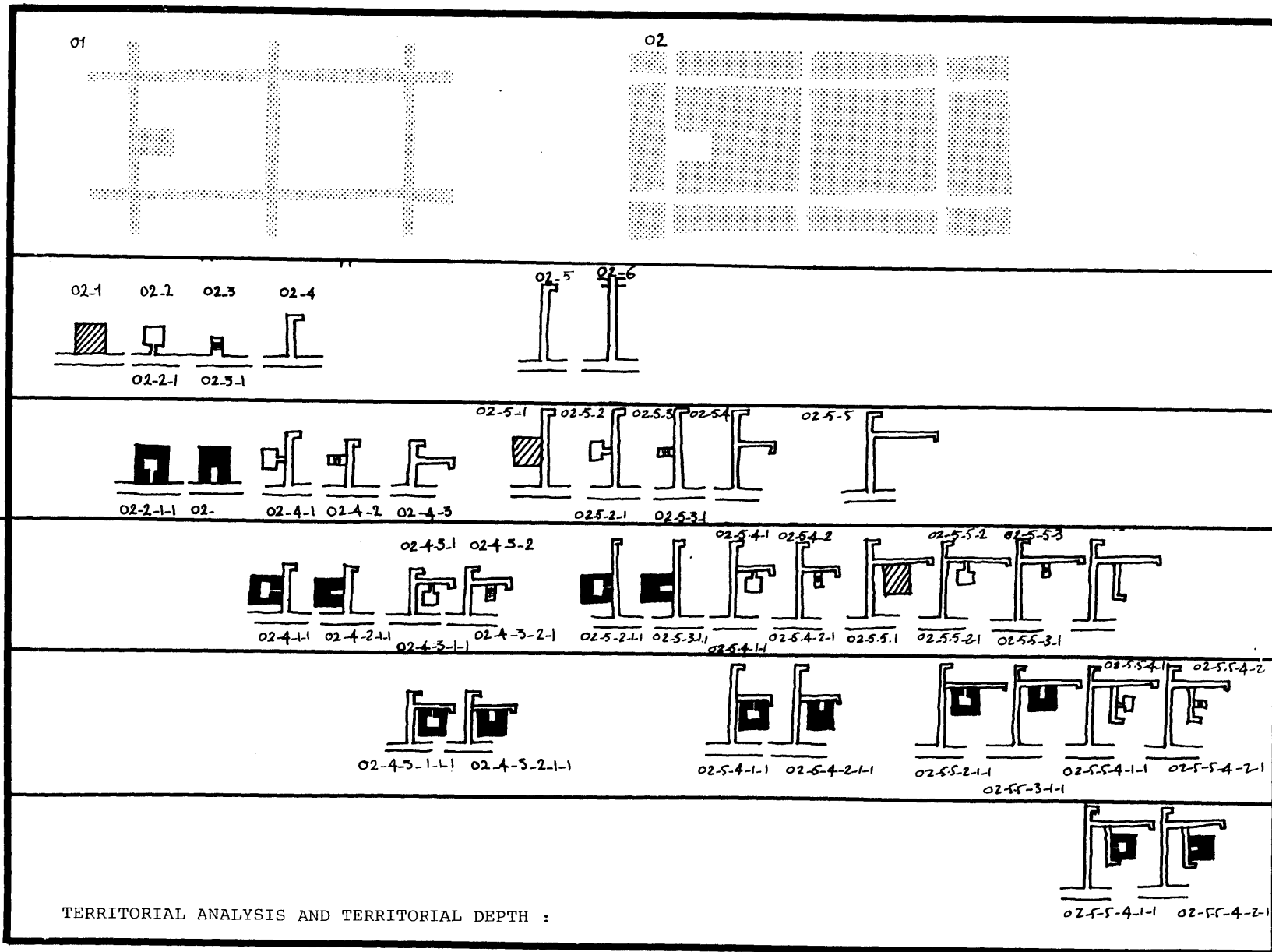
02-6-5-4---02-6-5-4-1---02-6-5-4-1-1

02-6-5-4-1-1-1

02-6-5-4-2---02-6-5-4-2-1

02-6-5-4-2-1-1

0



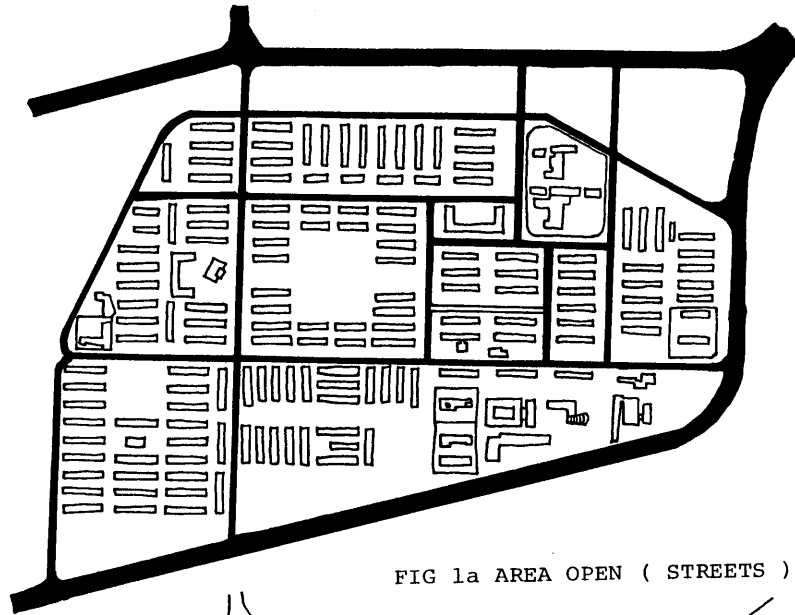


FIG 1a AREA OPEN (STREETS)

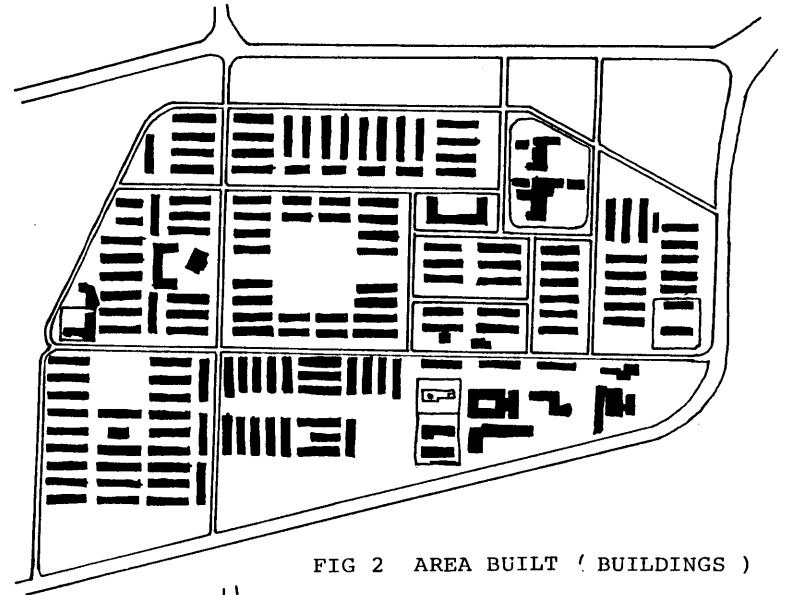


FIG 2 AREA BUILT (BUILDINGS)

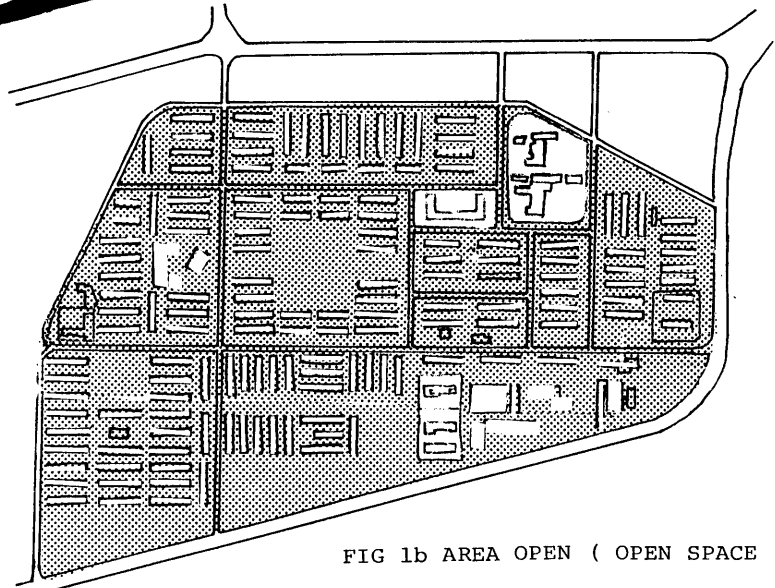


FIG 1b AREA OPEN (OPEN SPACE)

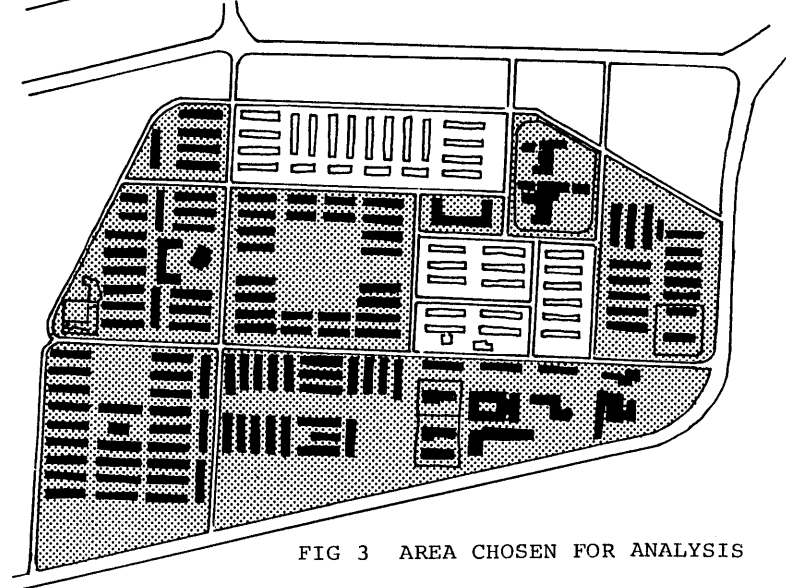


FIG 3 AREA CHOSEN FOR ANALYSIS

PART 2 APPLICATION OF THE METHODS TO:

AIN AL SIRRA

1- FORM ANALYSIS

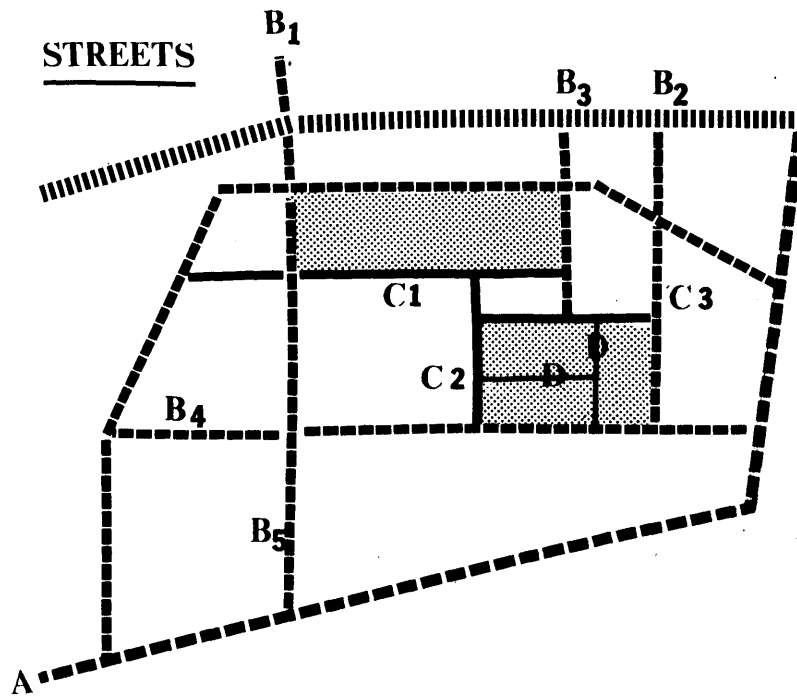


FIG 4 : STREET LEVELS IN THE WHOLE AREA

FORM OF THE BUILT ENVIRONMENT:

- 1- 1- OPEN AREA
 - 1-1 STREETS
 - 1-2 OPEN SPACE
- 2- BUILT AREA (ALL BUILDINGS)
 - 2-1 OPEN AREA IN BUILDING
 - 2-2 BUILT AREA IN BUILDING

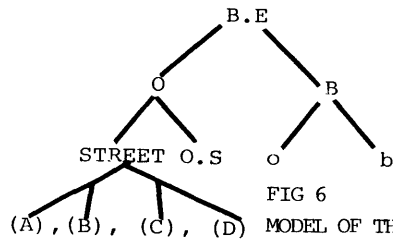


FIG 6

MODEL OF THE FORM OF THE BUILT ENVIRONMENT

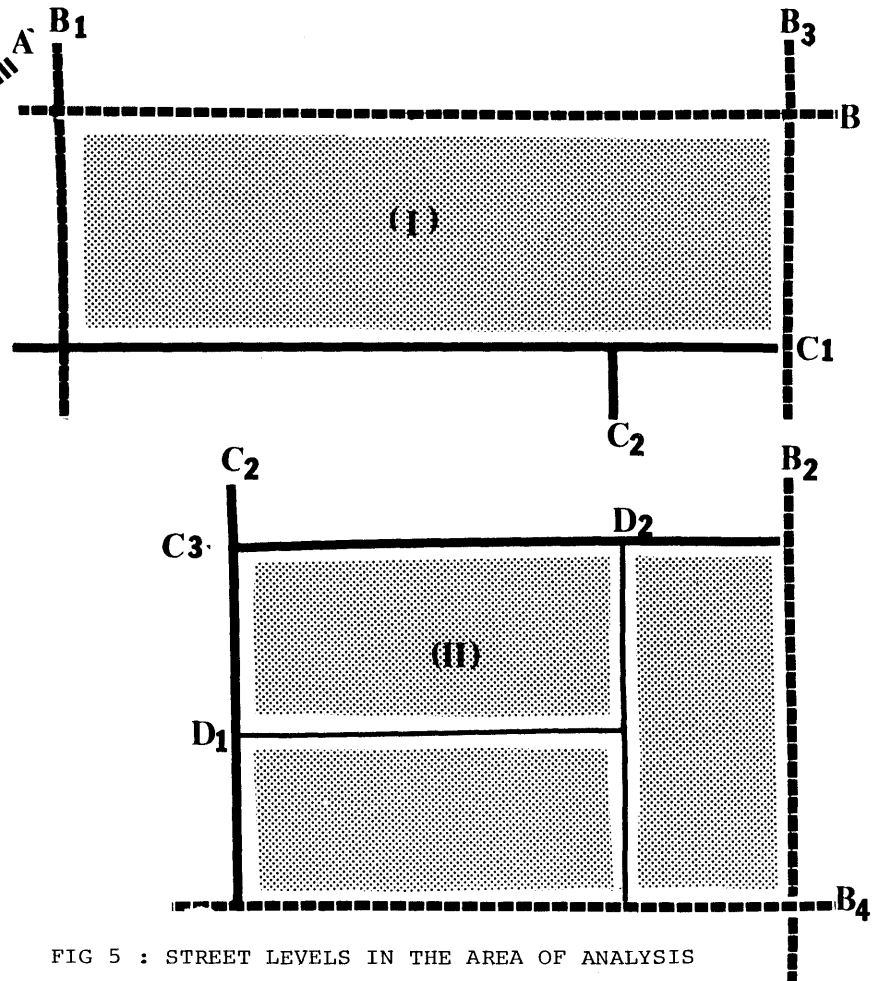


FIG 5 : STREET LEVELS IN THE AREA OF ANALYSIS

where: B.E BUILT ENVIRONMENT

O OPEN AREA (STREETS&OPEN SPACE)

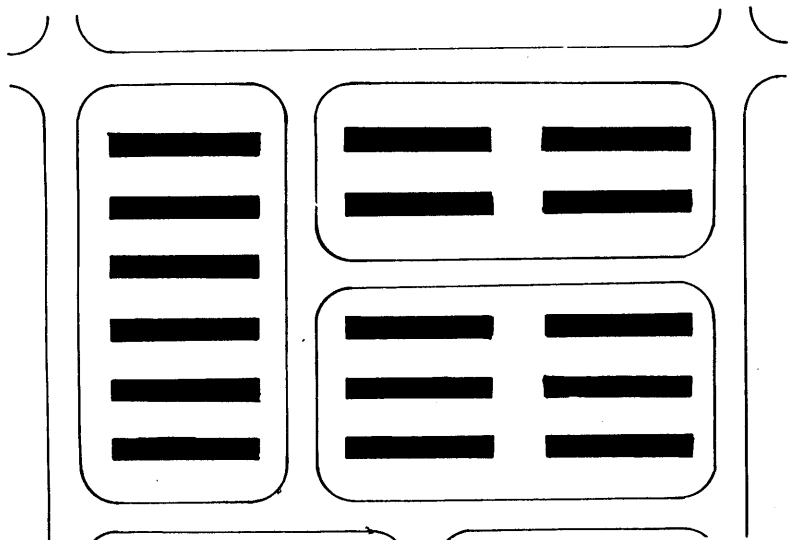
O.S OPEN SPACE

B AREA BUILT (BUILDINGS)

o AREA OPEN IN BUILDING

b AREA BUILT IN BUILDING

(A), (B), (C), (D) STREET LEVELS



1- OPEN AREA
1-1 STREETS

FIG 7 AREA II OF ANALYSIS

In the area of Ain al Sira we distinguish 5 different street levels.

- 1- (A') main ring road (Salah Salem road)
- 2- (A) main road
- 3- (B) main streets in the area
- 4- (C) secondary streets in the area
- 5- (D) small circulation streets in area I

DIFFERENT STREET LEVELS:

The difference in the street level is based on the dimension of the streets and the level of traffic flow.

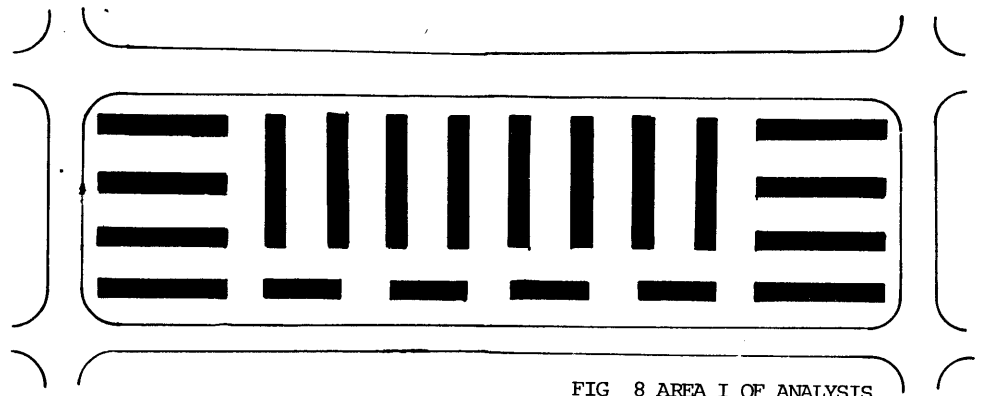
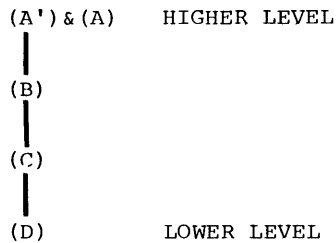


FIG 8 AREA I OF ANALYSIS

1-2 OPEN SPACES

In the area of AMn al Sira we distinguish two forms of open spaces

1-2-1 CONCENTRIC SPACES

these open spaces are intended to serve as green areas, where the inhabitants of the area can spend their times of leisure they are completely bareless of trees and are considered large areas of wasted land.

1-2-2 AREAS SURROUNDING THE APARTMENT BUILDINGS

these spaces are circulation paths used by the inhabitants to reach their buildings.

2- BUILT AREA (BUILDINGS)

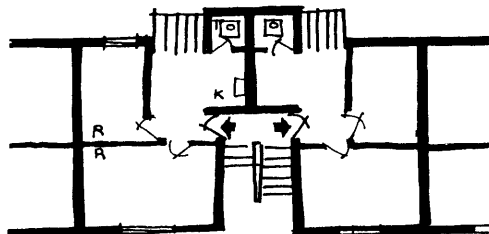
The built area is in the form of the identical apartment buildings built by the government. These buildings are 5 story walk-ups, each floor has two apartments. The building has no open area in the form of light wells. All rooms are ventilated and lighted from openings on the external facades. The only open area in the building is the staircase that leads to the different apartments.

2-1 OPEN AREA IN BUILDING

open area in the building is in the form of staircases

2-2 BUILT AREA IN BUILDING

built area in the building is in the form of the different apartments reached by the staircase.



R different rooms
K kitchen
T bath
B balcony

FIG 9 TYPE OF DWELLING IN THE AREA OF ANALYSIS

Source, Interm report working papers(housing)1977, TAP, p.50

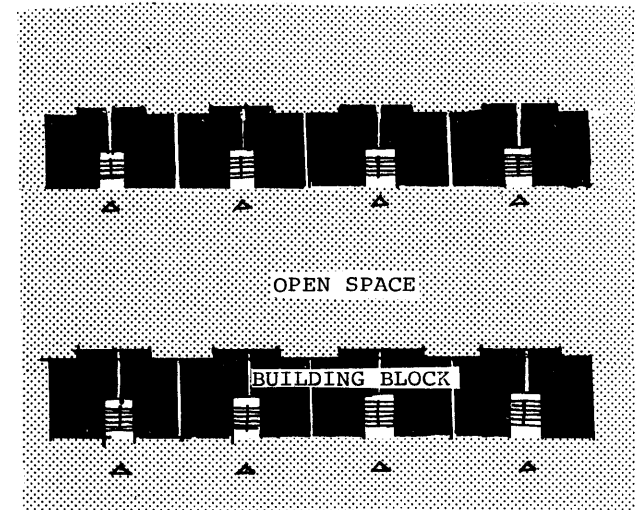
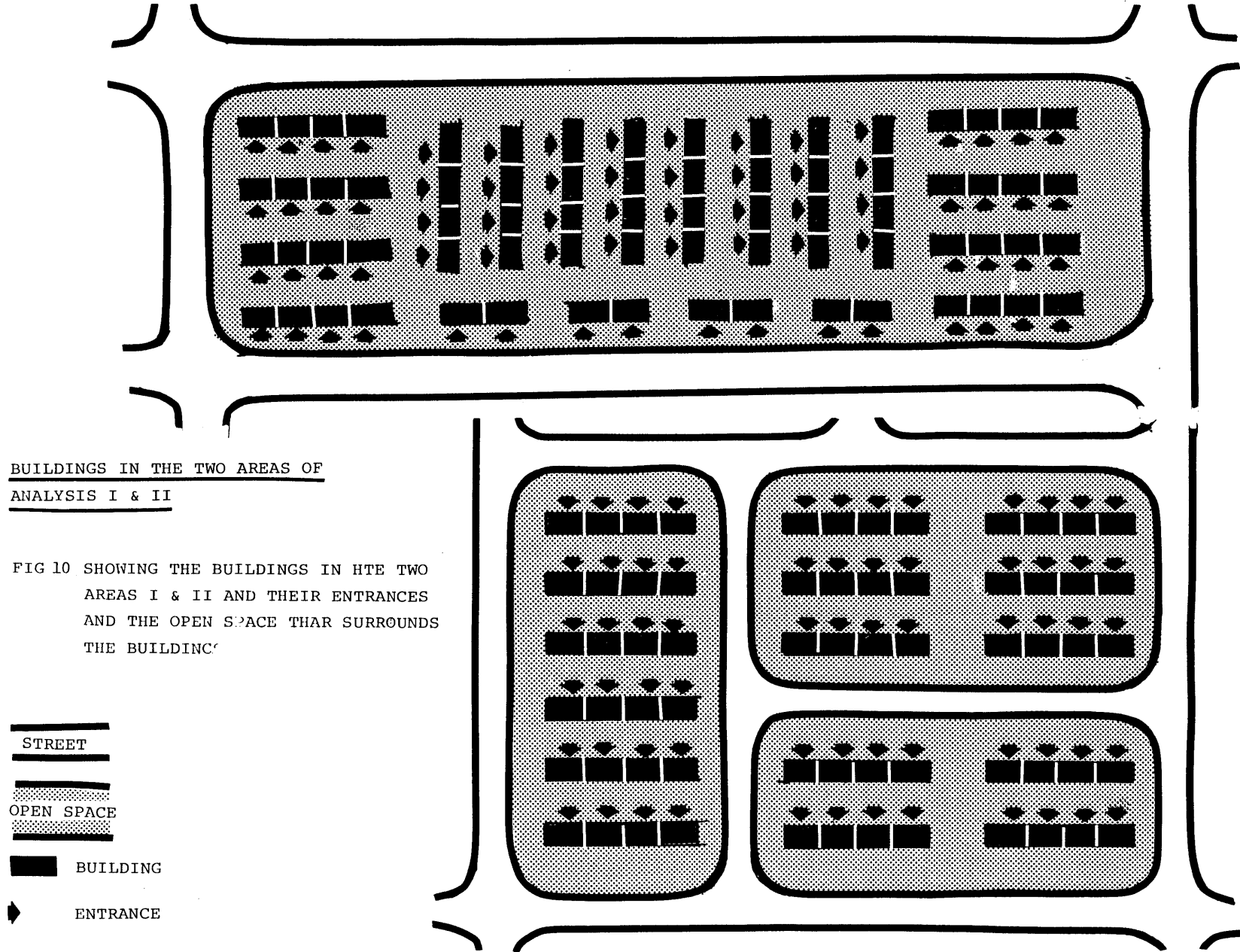


FIG 10 TYPICAL BUILDING BLOCK



BUILDINGS IN THE TWO AREAS OF ANALYSIS I & II

FIG 10 SHOWING THE BUILDINGS IN HTE TWO AREAS I & II AND THEIR ENTRANCES AND THE OPEN SPACE THAR SURROUNDS THE BUILDINC'

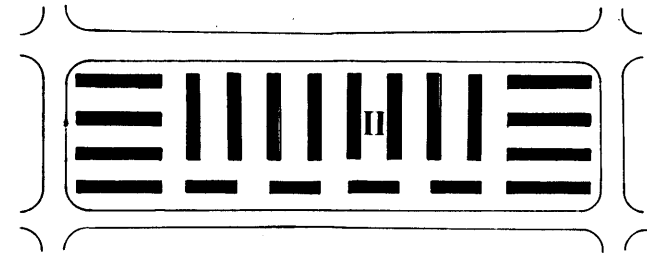
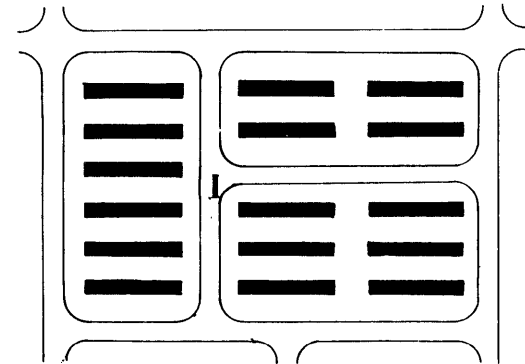
- STREET
- OPEN SPACE
- BUILDING
- ENTRANCE

AIN AL SIRA**2- QUANTIFICATION OF FORM AS ANALYSED**Area I

Total Area	=	32160 m ²
Area Open	=	26016.00 m ²
Area of Street	=	6510
Area of Open Space	=	19506 m ²
Area Built Upon	=	6144
Area Open Within Buildings	=	576 m ² (staircase)
Area Built Within Buildings	=	5568 m ²
Floor Area Built	=	5568 x 5 (no. of floors) = 27840 m ²
Street Length	=	1016 m

Area II

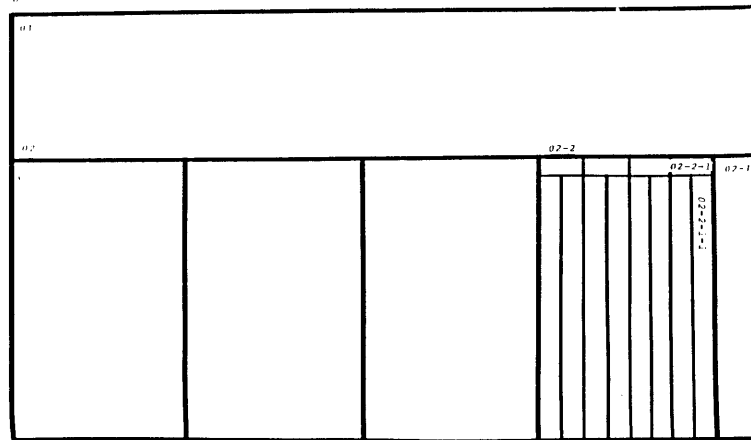
Total Area	=	33000 m ²
Area Open	=	25896 m ²
Area of Streets	=	5824 m ²
Area of Open Space	=	20072 m ²
Area Built Upon	=	7104
Area Open Within Buildings	=	640 m ² (entrance)
Area Built Within Buildings	=	6464 m ²
Floor Area Built	=	6464 x 5 (no of floors) = 32323.2m ²
Street Length	=	330 + 100 = 430 m

Area I & II

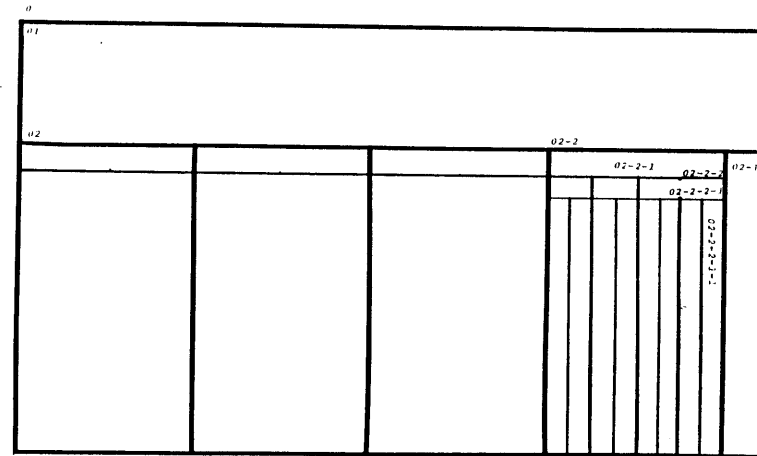
Total Area	=	65160.0 m ²
Area Open	=	51912.0 m ²
Area of Streets	=	12334 m ²
Area of Open Space	=	39578.0 m ²
Area Built Upon	=	13248 m ²
Area Open Within Buildings	=	1216 m ²
Area Built Within Buildings	=	12032 m ²
Floor Area Built	=	60160.0 m ²
Street Length	=	1446.0 m
Circulation Efficiency	=	610 m/hectare

Circulation Efficiency is taken from "THE HOUSING AND CONSTRUCTION INDUSTRY IN EGYPT internal report working papers 1977"

3- TERRITORIAL ANALYSIS

EXISTING TERRITORIES IN AIN AL SIRA:

- 0 is the whole territory
 - this territory is divided into
 - 01 is all the streets and the open areas surrounding the buildings
 - 02 is all the built area in territory 0 (built-it is the private space and is divided into
 - 02-2 residential buildings
 - 02-2 is divided into
 - 02-2-1 is the staircase that leads to the different apartments
 - this is a public space in territory 02-1
 - 02-2-1-1 are the different apartments reached from the staircase
 - each apartment is a private space in territory 02-1
 - 02-1 is any institutional, commercial, and recreational building in territory 02
 - this is a public territory

POTENTIAL TERRITORIES IN AIN AL SIRA:

- 01 is all the streets and open areas except the space between the buildings (see Fig.)
- 02 is the public space in territory 0
 - 02 is all the built area in territory 0 and the space in front of the buildings
 - it is the private space in territory 0
 - this private space is divided into
 - 02-2 is the group of apartment buildings and the space in front of them
 - 02-2 is divided into
 - 02-2-1 is the front space shared by the inhabitants of the group of buildings
 - this space is public space in territory 02-2
 - 02-2-2 is the apartment building
 - this territory is divided into
 - 02-2-2-1 is the staircase that leads to the different

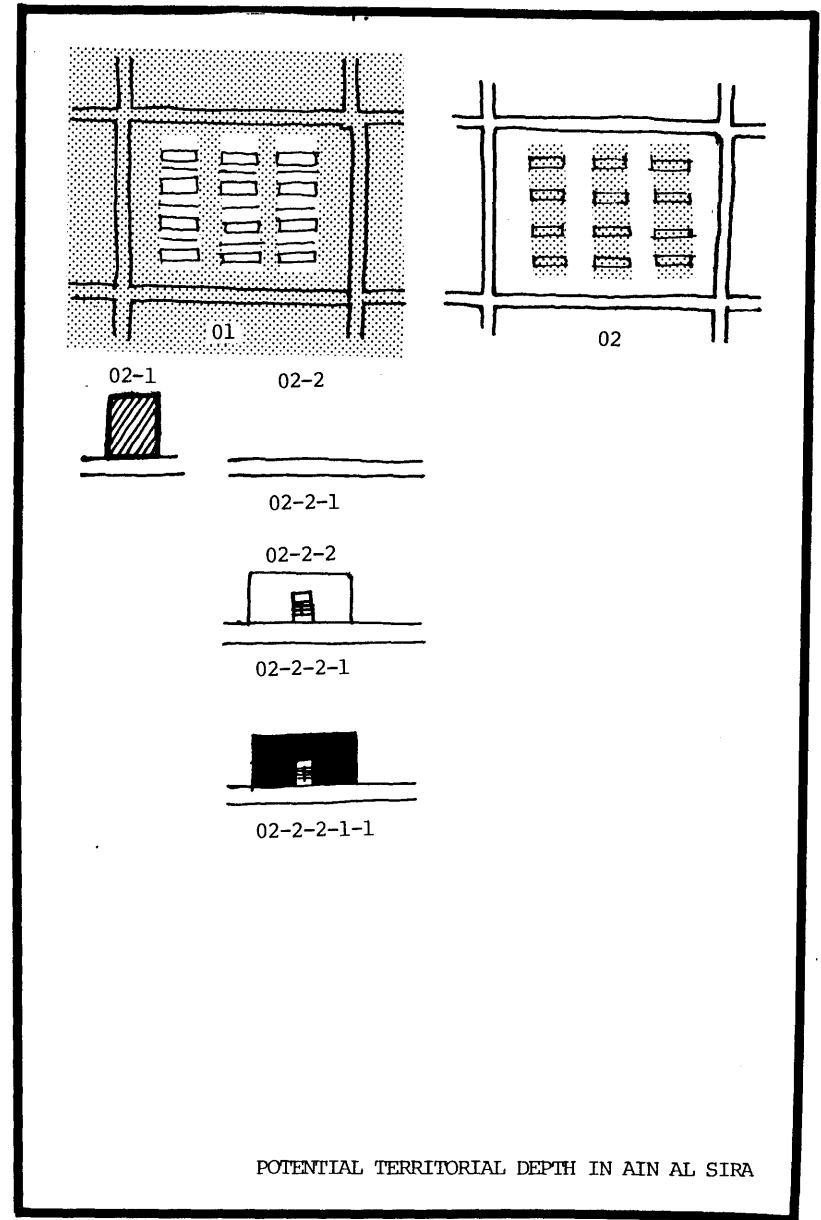
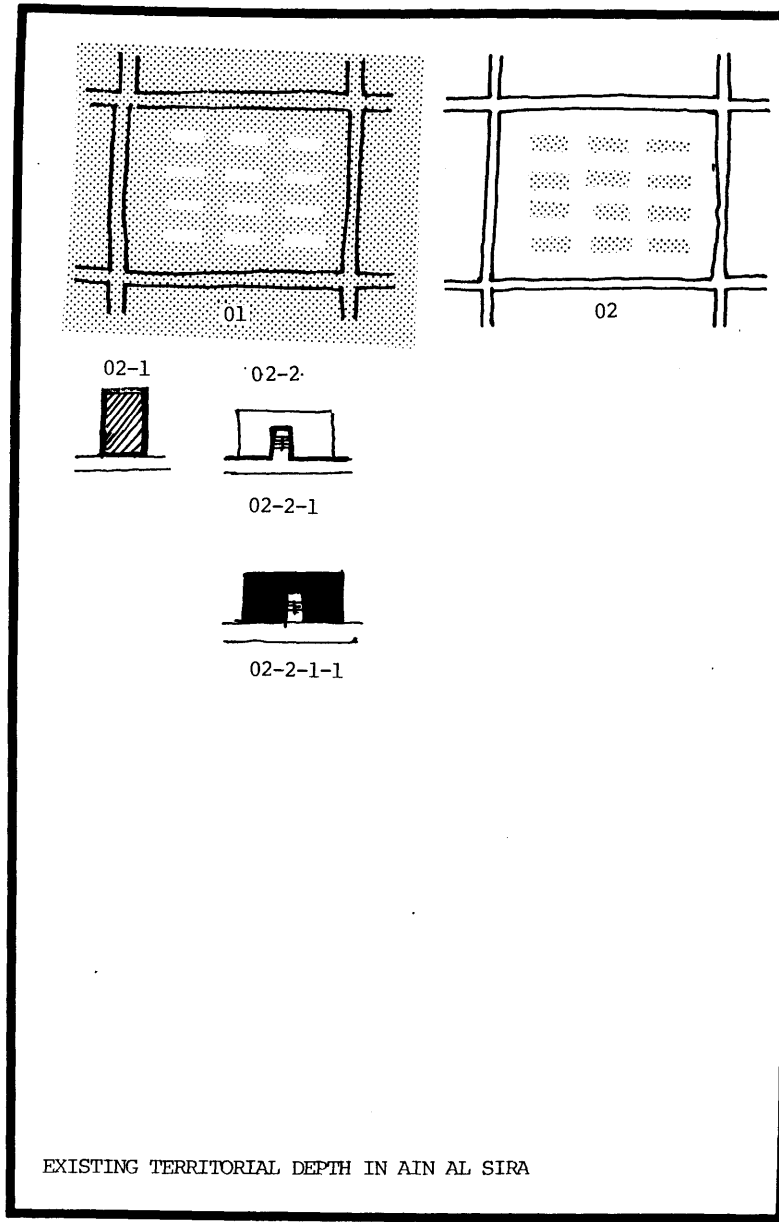
apartments it is the public
 space in 02-1-1
 02-2-2-1-1 are the different apartments
 reached by the staircase
 each apartment is a private
 space in territory 02-1-1
 02-1 is any institutional, commercial, and
 recreational building in territory 02

EXISTING TERRITORIES IN AIN AL SIRA:

0-----01
 02-----02-1
 02-2-----02-2-1
 02-2-1-1

POTENTIAL TERRITORIES IN AIN AL SIRA:

0-----01
 01-----02-1
 02-2-----02-2-1
 02-2-2-----02-2-2-1
 02-2-2-1-1



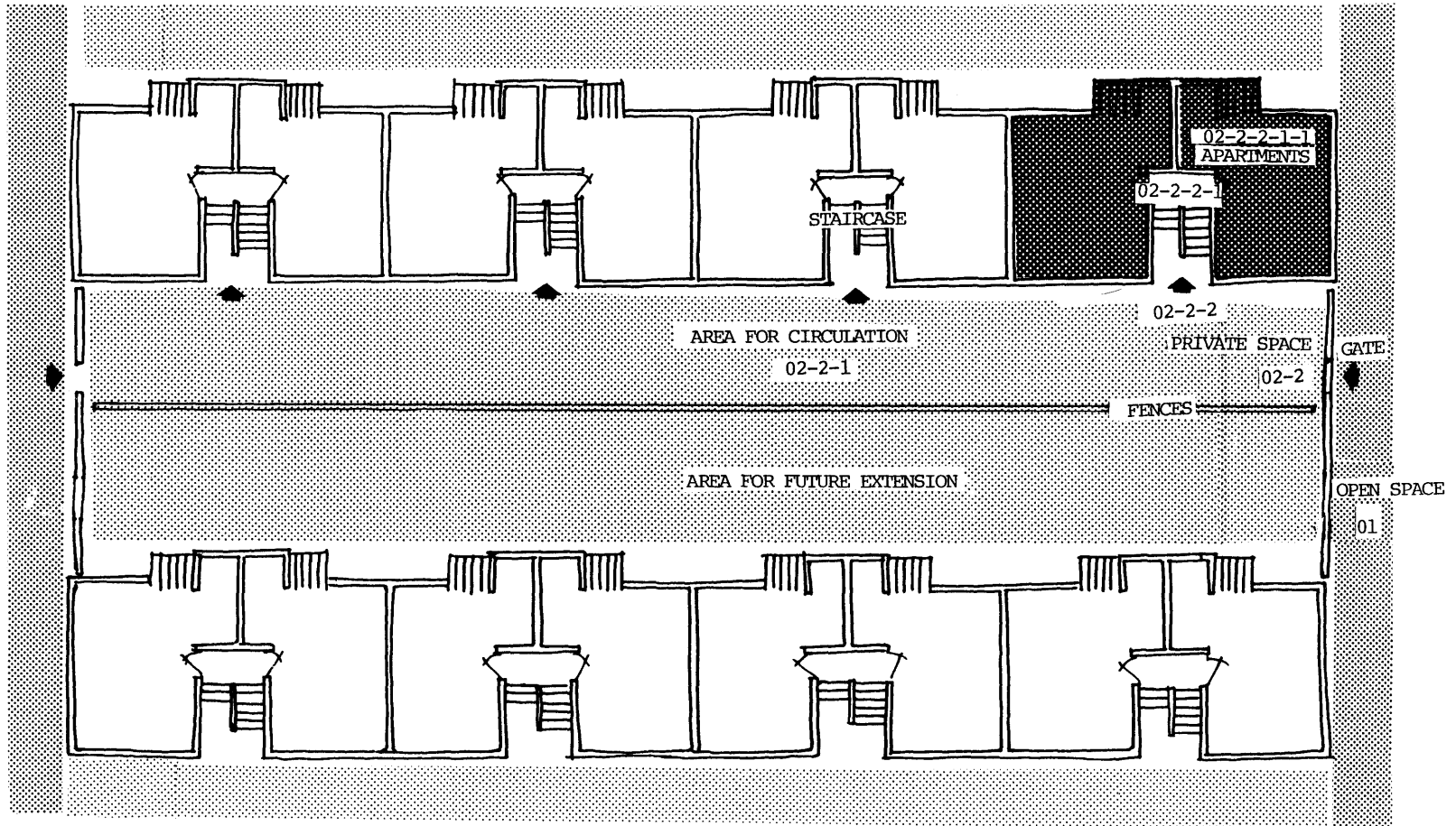


FIG 11 PLAN SHOWING THE POSSIBLE TERRITORIAL ENRICHMENT THROUGH THE ADDITION OF SIMPLE ELEMENTS SUCH AS FENCES AND GATES THAT ARE CONTROLLED BY THE INHABITANTS OF THE GROUP OF BUILDINGS.

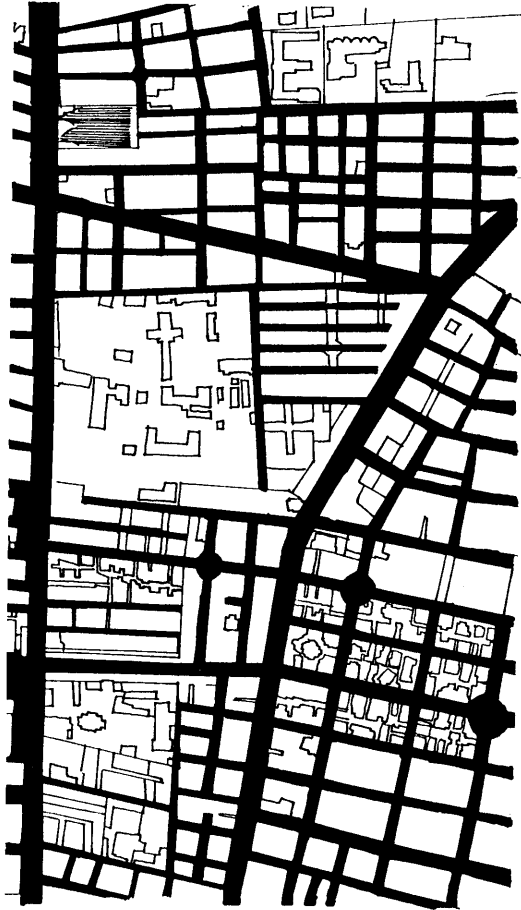


FIG 1 : AREA OPEN IN THE WHOLE AREA

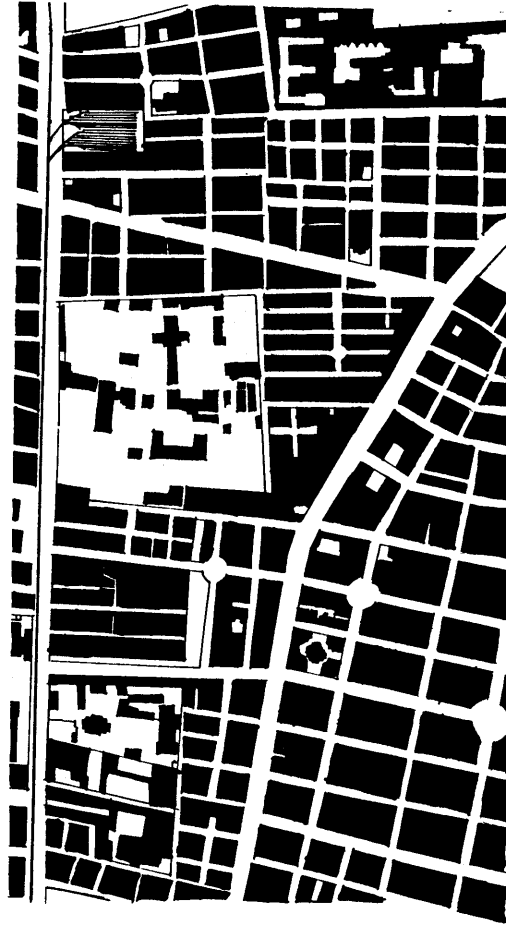


FIG 2 : AREA BUILT IN THE WHOLE AREA

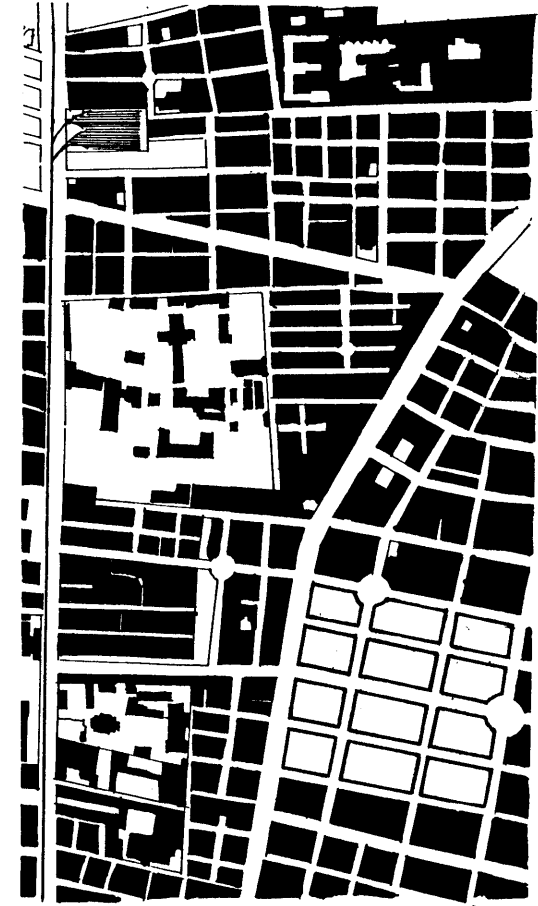


FIG 3 : AREA CHOSEN FOR ANALYSIS

PART 2 APPLICATION OF THE METHODS TO:

SHOUBRA

1- FORM ANALYSIS

STREETS

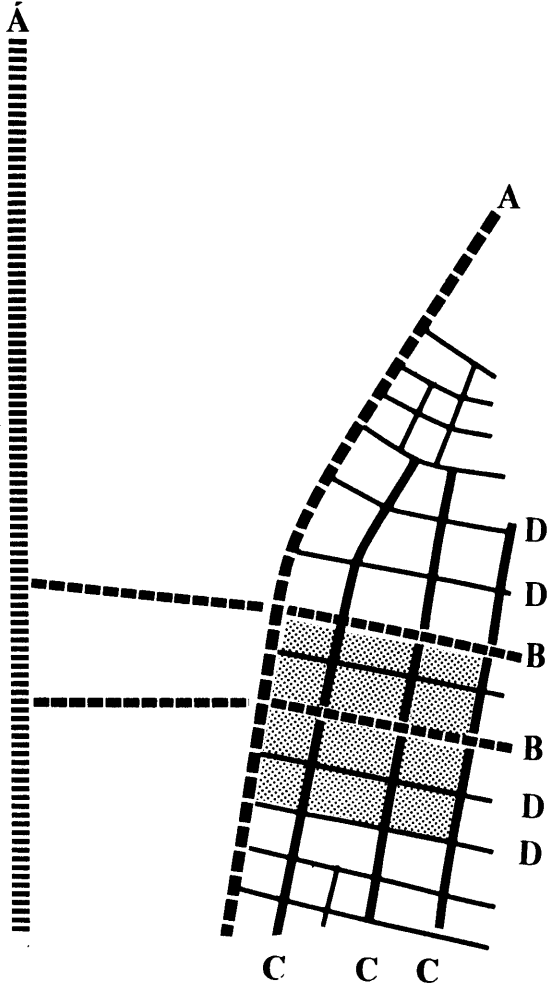


FIG 4 : STREET LEVELS IN THE WHOLE AREA

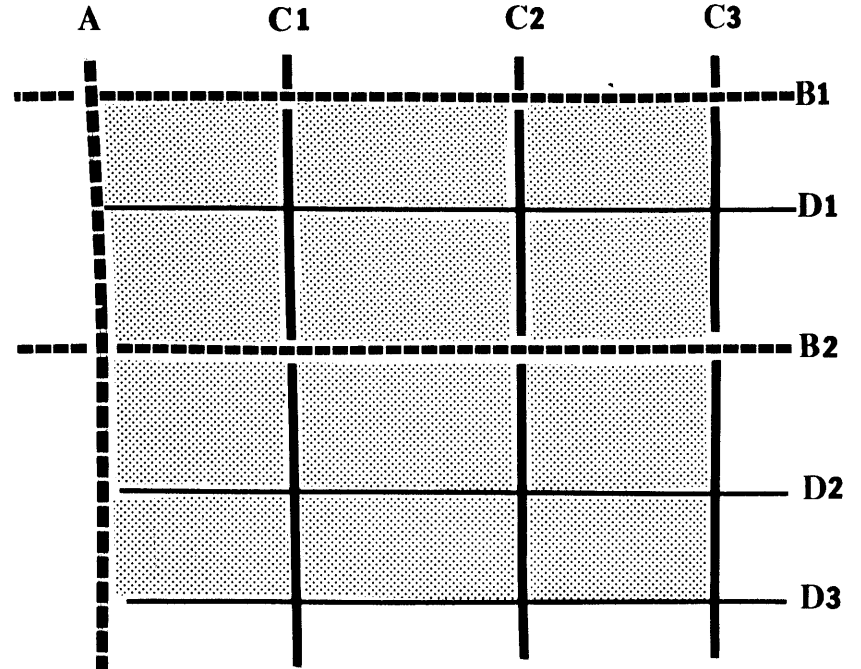


FIG 5 : STREET LEVELS IN THE AREA OF ANALYSIS

FORM OF THE BUILT ENVIRONMENT

- 1- OPEN AREA
 - 1-1 STREETS
- 2- BUILT AREA: (ALL LOTS)
 - 2-1 BUILT AREA IN LOTS
 - 2-2 OPEN AREA IN LOTS

WHERE: B.E BUILT ENVIRONMENT
 B BUILT AREA (LOTS)
 O OPEN AREA
 b BUILT AREA IN LOTS
 o OPEN AREA IN LOTS
 A,B,C,D STREET LEVELS

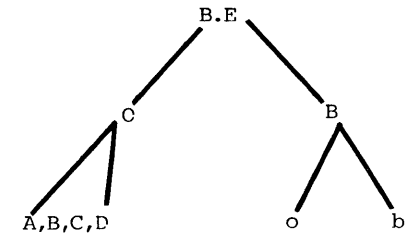
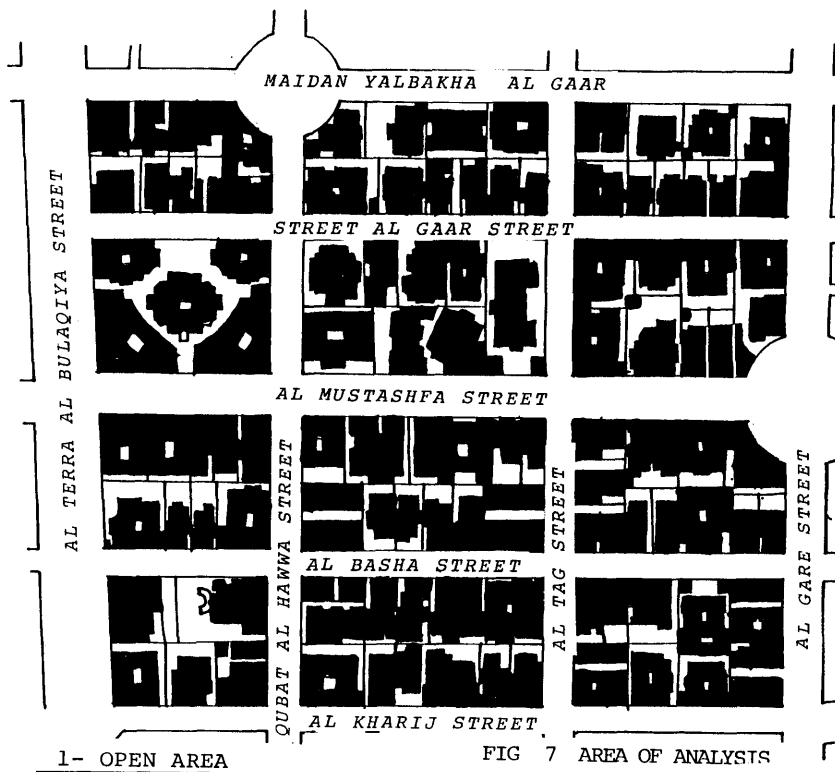


FIG 6 MODEL OF THE FORM OF THE BUILT ENVIRONMENT



1-1 STREETS

In the area of analysis we distinguish 5 different streets

- 1- (A) A main street, which is the main street of the area of Shoubra.
- 2- (A) A main street, on which the area analysed is located on. It is less important than (A')
- 3- (B) Secondary streets, that connect with both (A') and (A).
- 4- (C) Circulation streets that lead to the different lots in the area. They run perpendicular on (A).
- 5- (D) Circulation streets that lead to the different lots in the area. They are short streets and run parrallel to (A)

NAMES OF THE DIFFERENT STREETS AND THEIR LEVEL

The difference in the street level is based on both dimension and level of traffic flow which is the of the existing activity.

shoubra street	A1
AL TERRA AL BULQIA STREET	A2
AL MUSTASHFA STREET	B1
MAIDAN YALBUKHA STREET	B2
QUBAT AL HAWWA STREET	C1
AL TAG STREET	C2
AL GARE STREET	C3
AL GEUOSH STREET	D1
AL BASHA STREET	D2
AL KHREG STREET	D3

All these streets are designed for the use of cars
The narrowest street is 10m. Thereare no parking spaces nor open green areas.

(A), (B), (C) and (D) streets define the different building blocks as shown in fig

DIFFERENT STREET LEVELS:

(A) HIGHER LEVEL

(B) MIDDLE LEVEL

(C) & (D) LOWER LEVEL

2- BUILT AREA (ALL LOTS)

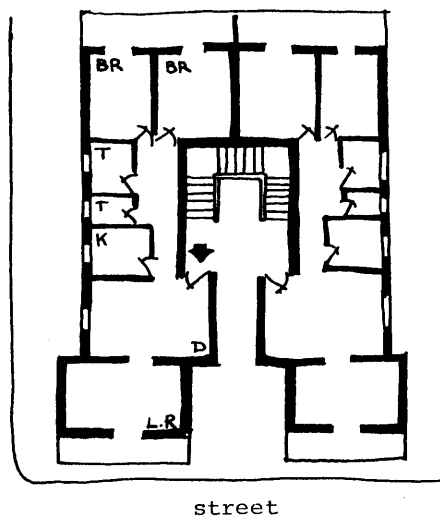
The built area is divided into blocks, which are then divided into the different building lots. In these lots, buildings are built according to the building codes and regulations. Their average height is 5 stories. The building type is detached apartment buildings.

2-1 OPEN AREA IN LOTS

open area in the lots are in these following forms,
 staircases
 lightwells, set backs
 front and back gardens

2-2 BUILT AREA IN LOTS

built area in the lots is the form of the different apartments reached by the staircase.



L.R living room
 D dining room
 B.R bed room
 T bath
 K kitchen

FIG 8 TYPE OF DWELLING IN THE AREA OF ANALYSIS

Source; Interm Report working papers 1977, TAP, pp.42.

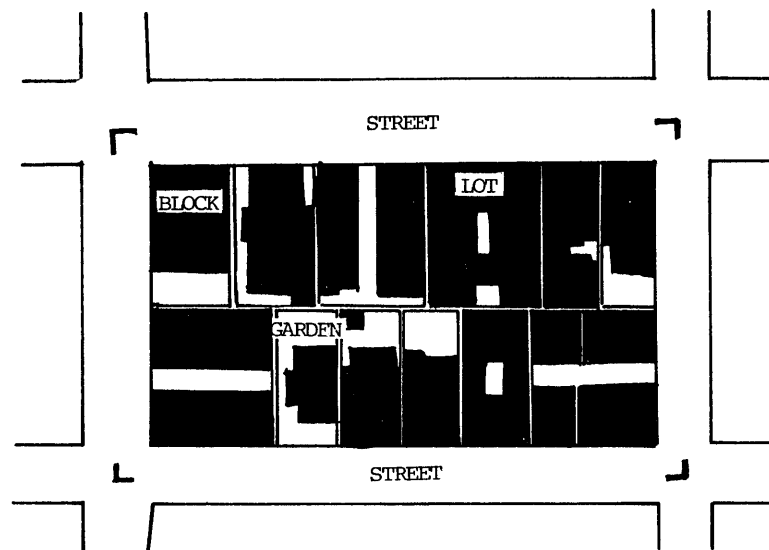


FIG 9 TYPICAL BLOCK

BLOCKS AND LOTS IN THE
AREA OF ANALYSIS

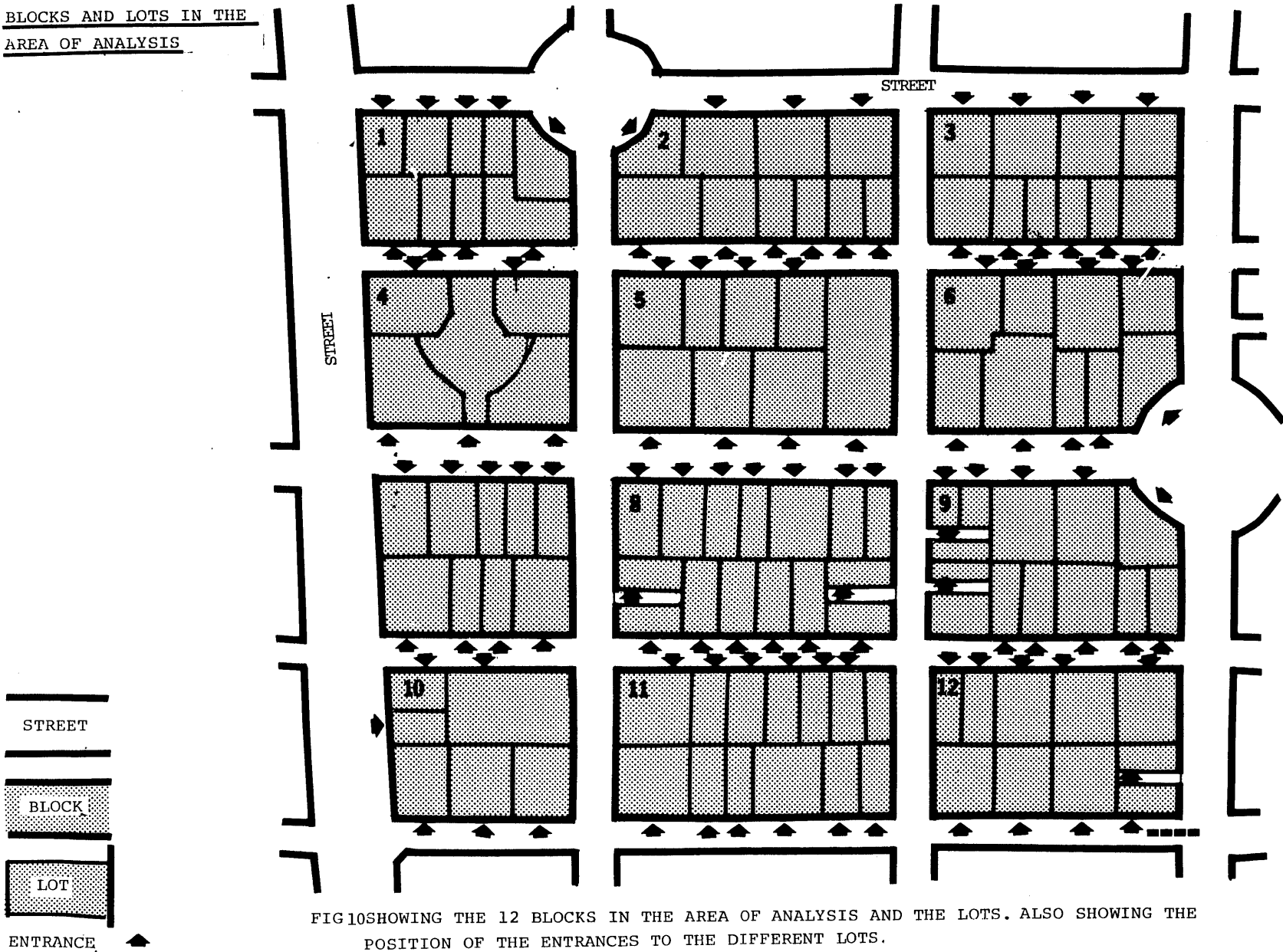


FIG 10 SHOWING THE 12 BLOCKS IN THE AREA OF ANALYSIS AND THE LOTS. ALSO SHOWING THE POSITION OF THE ENTRANCES TO THE DIFFERENT LOTS.

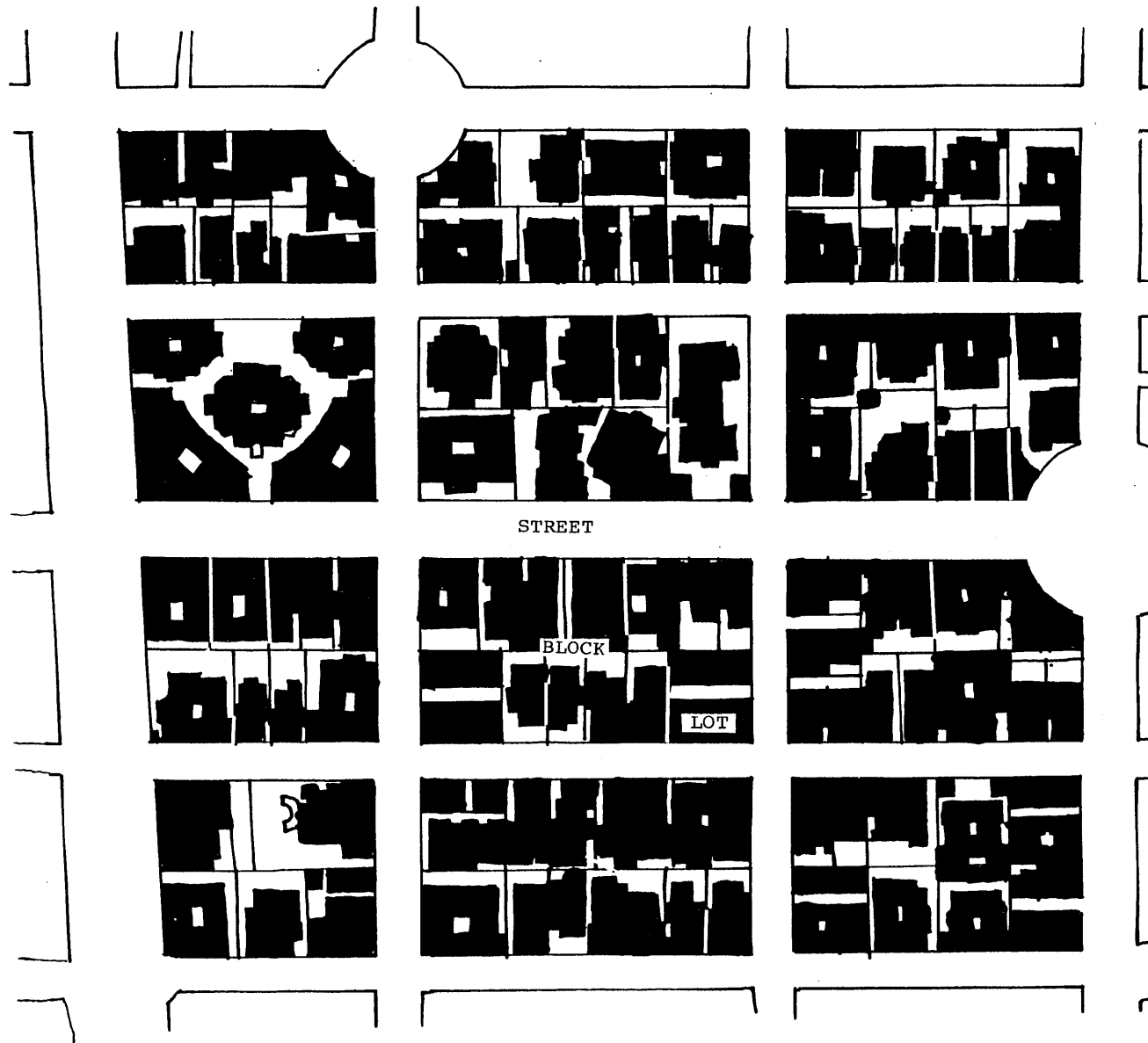


FIG 11 SHOWING THE BUILT AREA (LOTS) AREA BUILT IN LOTS- OPEN AREA IN LOTS

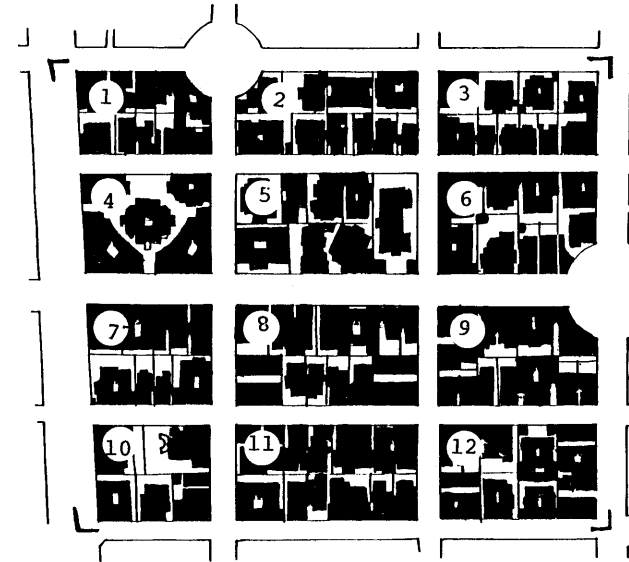
SHOUBRA**2- QUANTIFICATION OF FORM AS ANALYSED****AREAS OF STREETS**

STREET	L	W	A
A	239	24/2	2868
C1	239	12	2868
C2	239	10	2390
C3	239	16/2	1912
B1	281	12/2	1686
D1	281	10	2810
B2	281	10	2810
D2	281	10	2810
D3	281	10/5	1405
TOTAL	1560		21559

A= AREA
A.B= AREA BUILT
A.O= AREA OPEN
F A.B= FLOOR AREA BUILT
W= WIDTH
L= LENGTH
No L= NUMBER OF LOTS
IN BLOCKS
ST= STREET
B= BLOCK

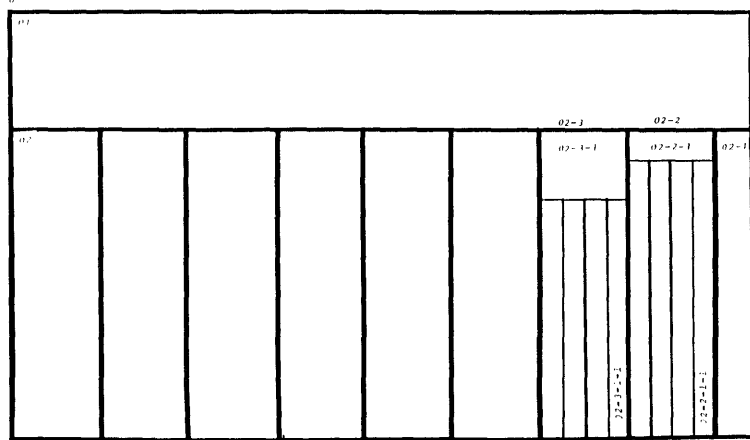
AREA OF BLOCKS AND LOTS

B	W	L	A	A.B	A.O	F.A.B	No L
1	43	68	2924	1900.6	1023.4	9503	10
2	43	91	3913	2543.4	1369.55	12717	10
3	43	80	3443	2236	1205.05	11180	10
4	49	68	3332	2165.8	1166.2	10829	5
5	49	91	4459	2892.5	1560.65	1560.65	9
6	49	80	3920	2535.0	1372	12675	9
7	50	68	3400	2210	1190	11050	9
8	50	91	4550	2957.5	1592.5	14787.5	15
9	50	80	4000	2600	1400	13000	13
10	50	68	3400	2210	1190	11050	6
11	50	91	4550	2957.5	1592.5	14787.5	13
12	50	80	4000	2600	1400	13000	12
12			45888	29827.5	16060.8	149136	121

**CALCULATIONS:**

Total Area = 67447 m²
Area Built (lots) = 45888 m²
Area Open (streets) = 21559 m²
Area Built in Lots = 29827.2 m²
Area Open in Lots (set backs, light wells, stairs) = 16060.8 m²
Floor Area Built (area built x 5 stories) = 29827.2 x 5 = 149136 m²
Av. Block Area = 3824.0 m²
Av. Lot Area = 34761 m²
Av. No. of Lots in Block = 10:11
Av. Block Depth = ≈ 48
Av. Block Length = ≈ 80
Av. Lot Depth = 24 m
Av. Lot Length = 14.48 m
Length of Streets = 1560 m
Circulation Efficiency = 231 m/hectare

3- TERRITORIAL ANALYSIS



reached from the staircase;
 each apartment is a private
 space in territory 02-2

02-3 an apartment building that has a garden
 territory 02-1 is divided into
 02-3-1 is the garden and the staircase
 that leads to the different
 apartments
 this is a public space in terri-
 tory 02-3

02-3-1-1 are the different apartments
 reached from the staircase
 each apartment is a private
 space in territory 02-3

EXISTING TERRITORIES IN SHOUBRA

0 is the whole territory
 this territory 0 is divided into

01 is all the streets in territory 0
 it is the public space in territory 0

02 is all the built lots in territory 0
 it is the private space in territory 0
 this private space is divided into

02-1 is any institutional, commercial and
 recreational building
 this is a public territory and there-
 fore not further divided.

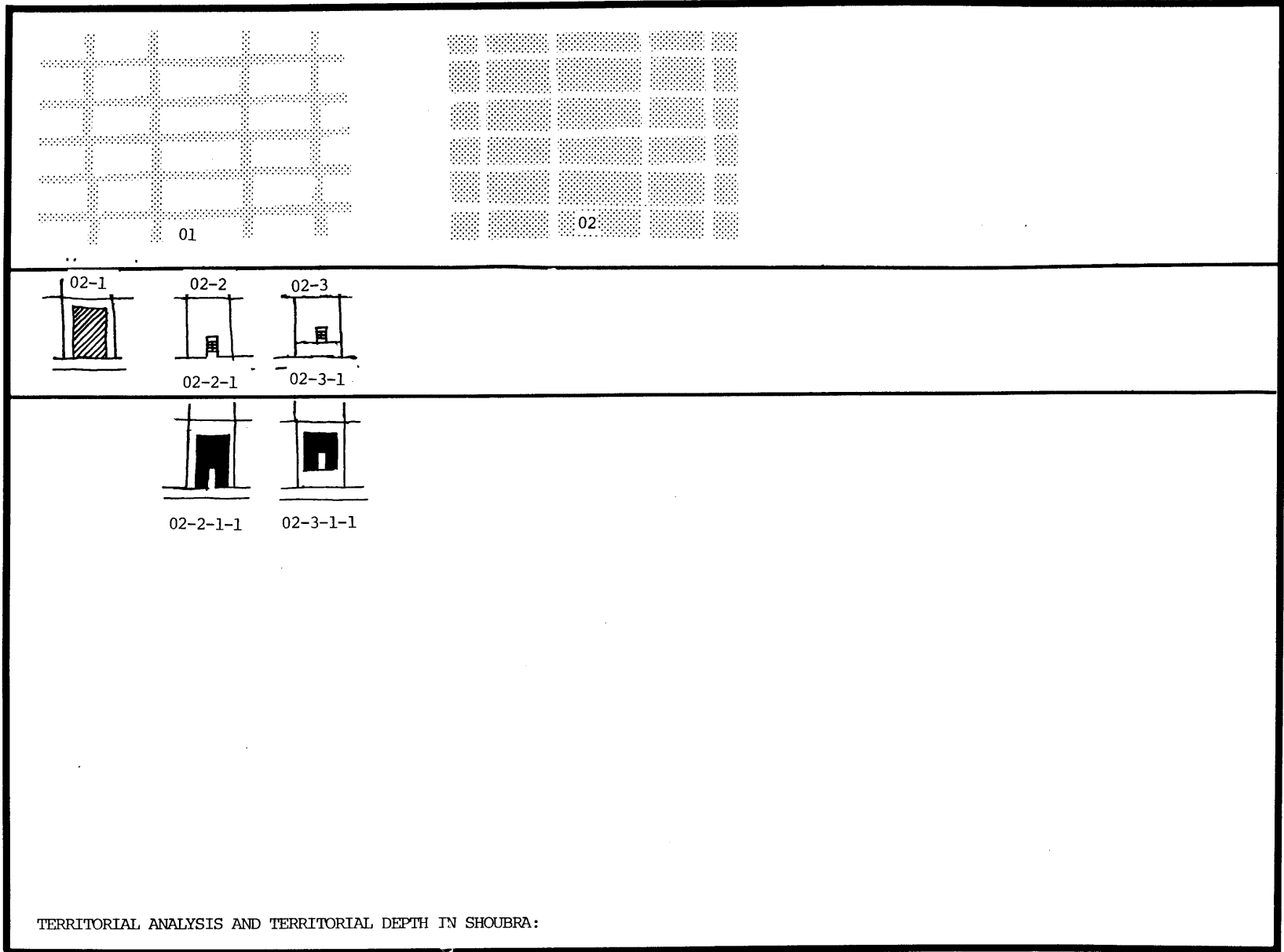
02-2 an apartment building that has no
 garden territory. 02-2 is divided into

02-2-1 is the staircase that leads to
 the different apartments
 this is a public space in terri-
 tory 02-2

02-2-1-1 are the different apartments

TERRITORIAL DEPTH IN SHOUBRA:

0-----01
 02-----02-1
 02-2-----02-2-1
 02-2-1-1
 02-3-----02-3-1
 02-3-1-1



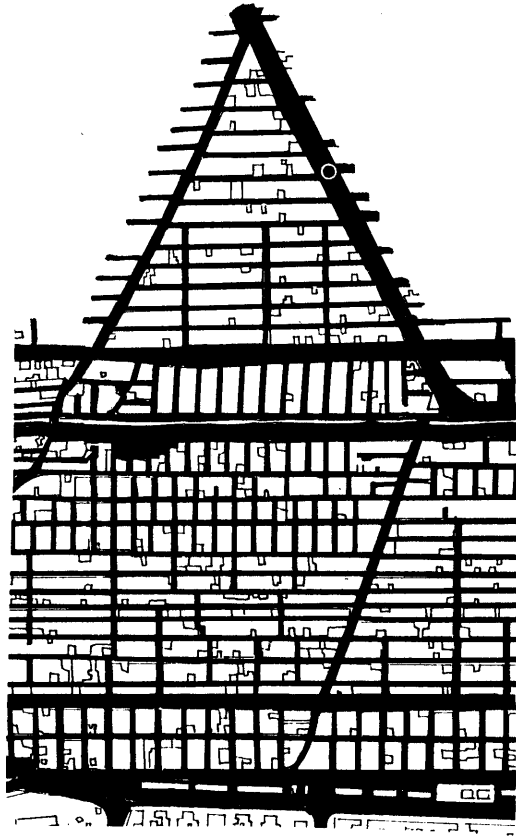


FIG 1 : AREA OPEN IN THE WHOLE AREA

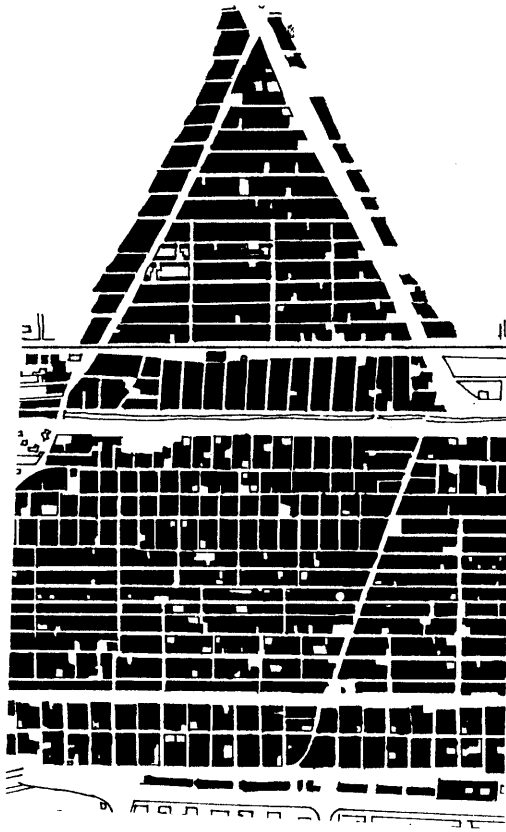


FIG 2 : AREA BUILT IN THE WHOLE AREA

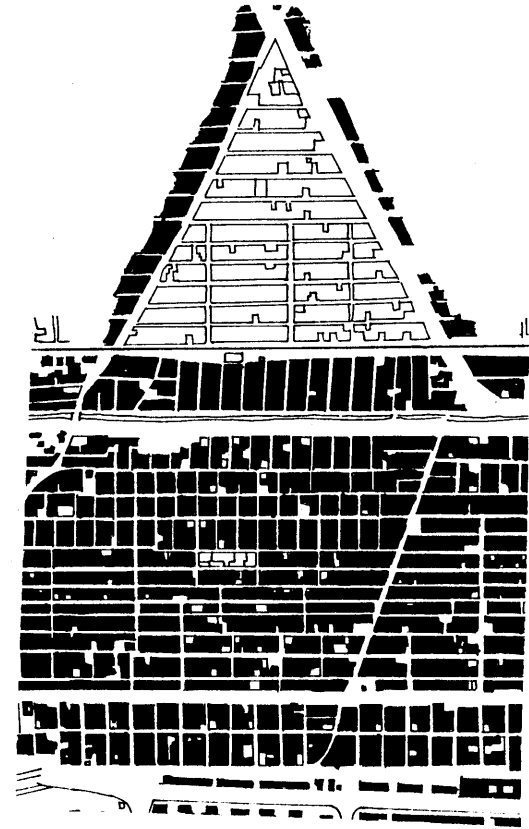


FIG 3 : AREA CHOSEN FOR ANALYSIS

PART 2 APPLICATION OF THE METHODS TO:

IMBABAH

1- FORM ANALYSIS

STREETS

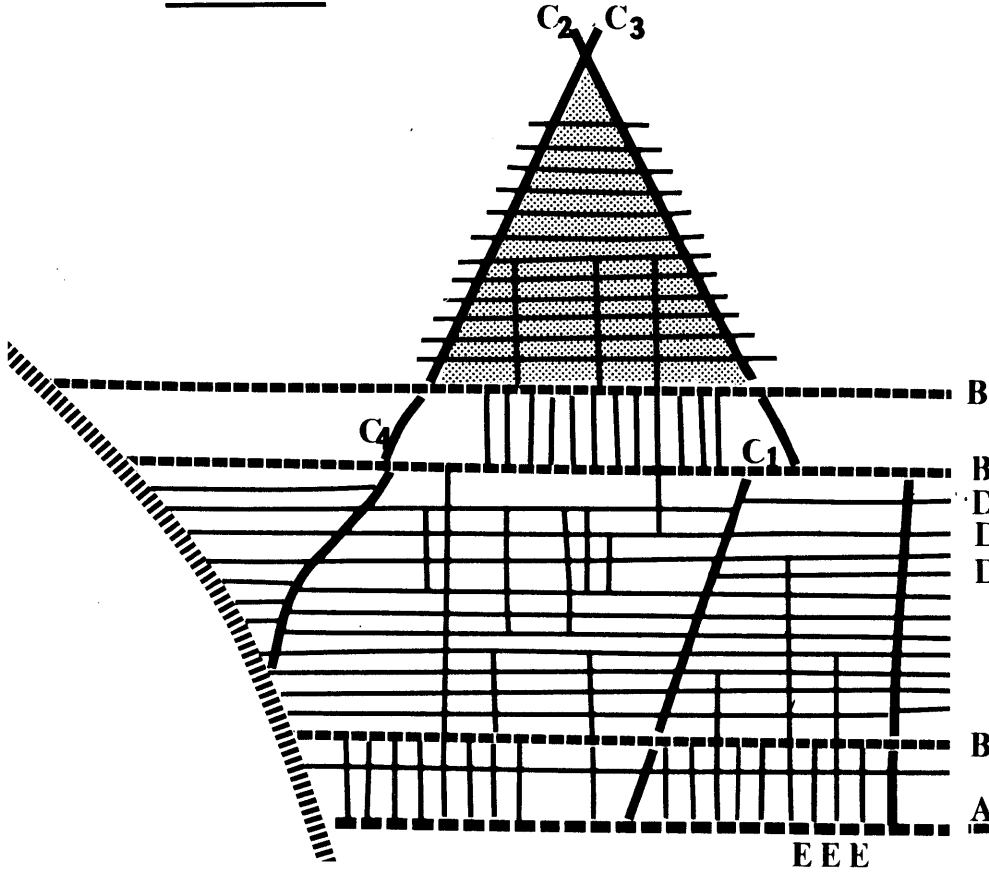


FIG 4 : STREET LEVELS IN THE WHOLE AREA

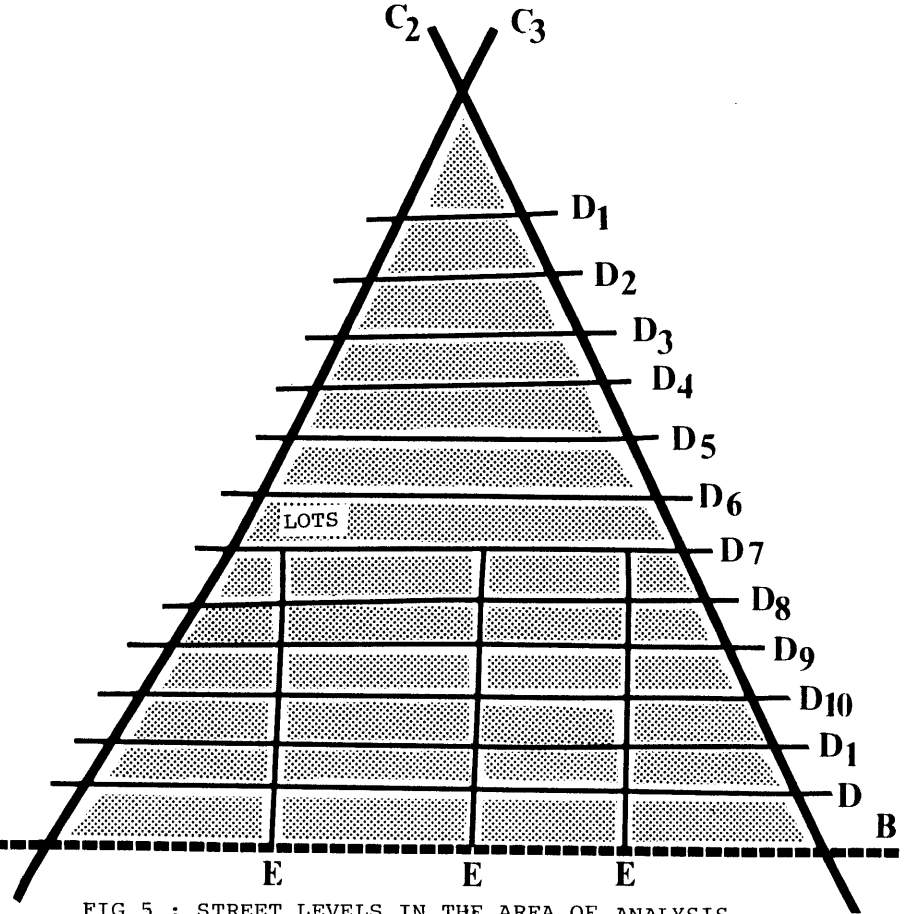
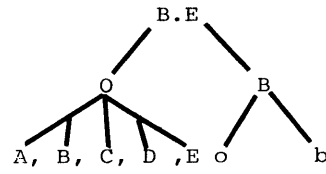


FIG 5 : STREET LEVELS IN THE AREA OF ANALYSIS

THE FORM OF THE BUILT ENVIRONMENT:

- 1- OPEN AREA
 - 1-1 STREETS
- 2- BUILT AREA: (ALL LOTS)
 - 2-1 AREA BUILT IN LOTS
 - 2-2 AREA OPEN IN LOTS

where:



- B.E BUILT ENVIRONMENT
- O AREA OPEN (STREETS)
- B AREA BUILT (LOTS)
- o AREA OPEN IN LOTS
- b AREA BUILT IN LOTS
- A,B,C,D,E STREET LEVELS

FIG 6 MODEL OF THE FORM OF THE BUILT ENVIRONMENT

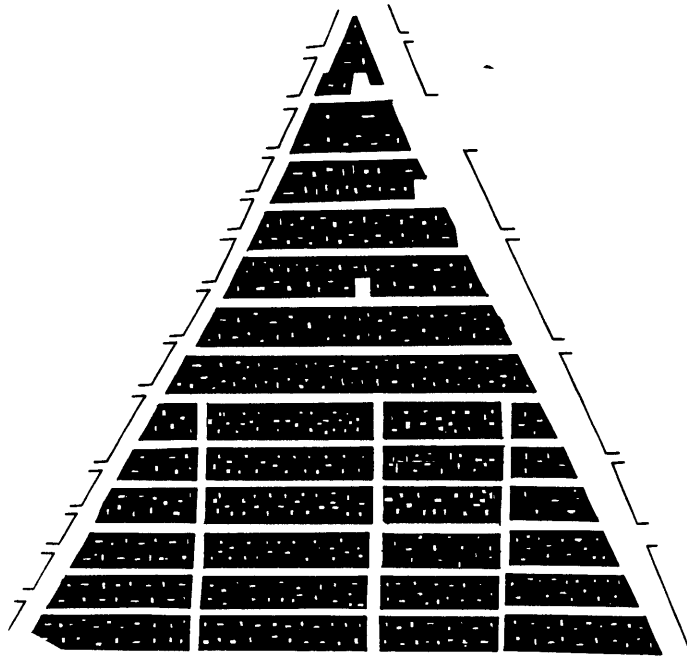


FIG 7 THE AREA OF ANALYSIS

1- OPEN AREA

1-1 STREETS

In the area of analysis we distinguish 5 different streets

- 1- (A") A main street, which is called the al Matad street. And on which runs the rail road of Imbaba.
- 2- (A) A main street, It is the main street of the area
- 3- (B) Are main streets, less in importance than (A), (B).
- 4- (C) Secondary streets that lead to the different parts of the area, they connect between the (B) streets and (A).
- 5- Are the different alleys that lead to the different lots, they run parallel to (A) and (B).
- 6- Are short circulation streets that connect between the alleys and the main streets; they run perpendicular to on (A) and (B).

NAMES OF THE DIFFERENT STREETS AND THEIR LEVEL IN THE AREA CHOSEN FOR ANALYSIS:

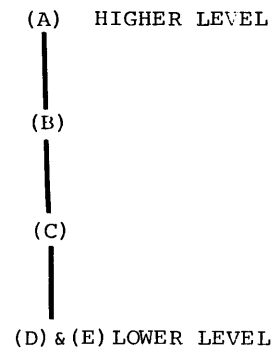
The area of analysis is surrounded by three main streets (B), (C2) and (C3). And within the area are (D) and (E) streets.

The difference in street level is based on both dimension and the level of traffic that reflects the activity that is carried on along the street.

- (A) AL nadi al Reyadi street
- (B1) Abd al menaim street
- (B2) Al boohy street
- (B3) AL sikka al Hadid street
- (C3) Massraf al Nahawda street
- (D1) Mohammad al Shathly street
- (D12) Lamey Imaraa street

(A), (B), and (C) streets allow the use of the car, but (D) and (E) streets don't allow that due to the narrowness of the streets.

(A), (B), (C), (D), (E) streets define the different blocks, as shown in fig 5

DIFFERENT STREET LEVELS:

2- BUILT AREA (ALL LOTS)

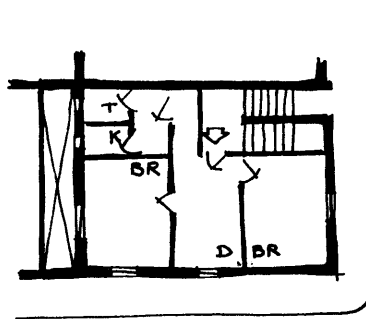
The land is mainly agricultural land that was divided in to building lots and sold. The buildings are built without building permitt. They do not follow the building codes and regulations, nor do the streets. The average height is 3 storys, but is expected to reach up till 5 storys due to the high housing demand.

2-1 OPEN AREA IN LOTS

open area in lots is in the form of staircases and small light wells.

2-2 BUILT AREA IN LOTS

built area in lots is the different apartments.



WHERE:

- LR LIVING ROOM
- D DINING
- BR BED ROOM
- T BATH
- K KITCHEN

FIG 8 TYPE OF DEWLLING IN THE AREA OF ANALYSIS



FIG 9 TYPICAL BLOCK

BLOCKS AND LOTS IN THE AREA OF ANALYSIS

FIG 10 SHOWING THE 31 BLOCKS IN THE ANALYSIS AND THE LOTS.

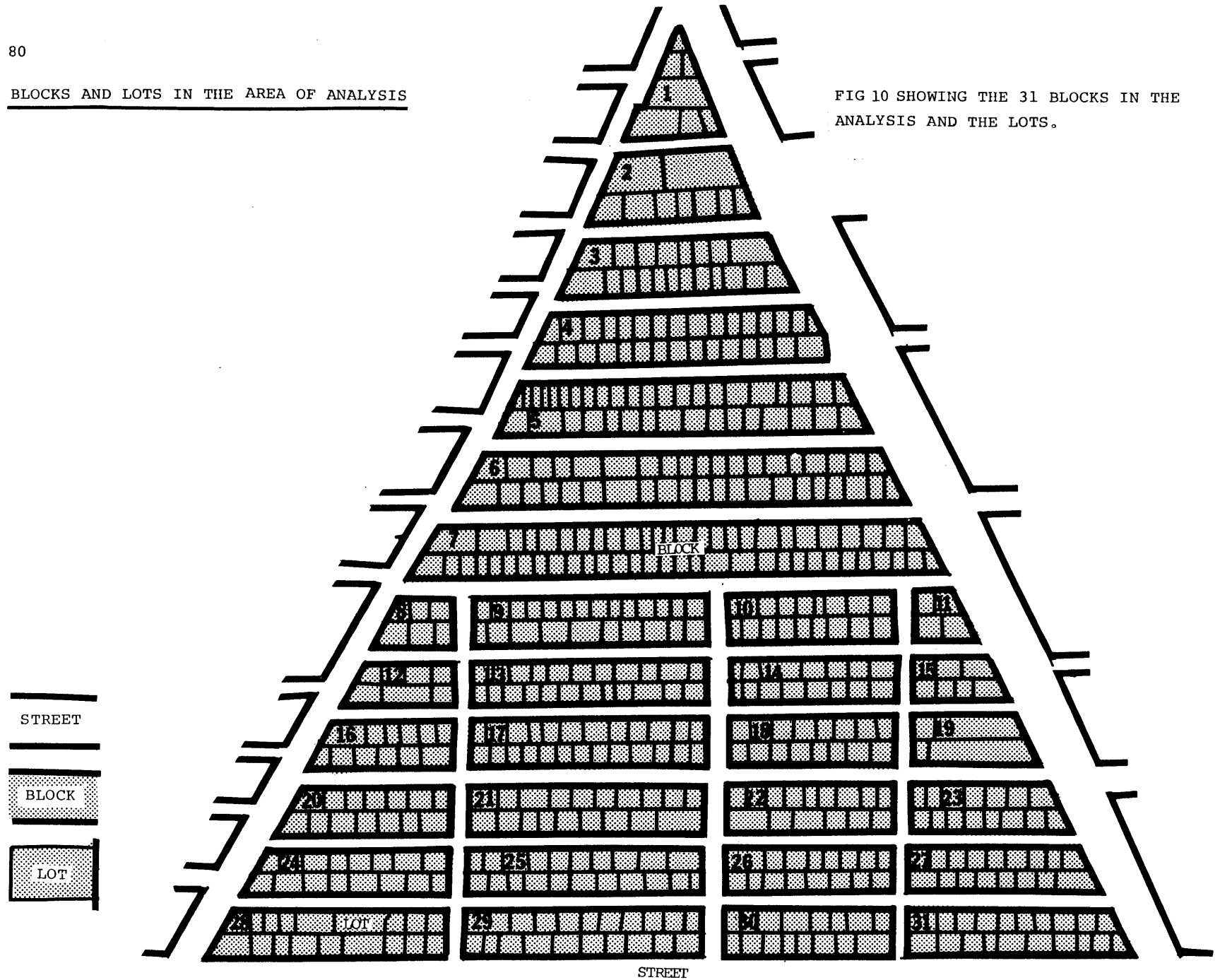
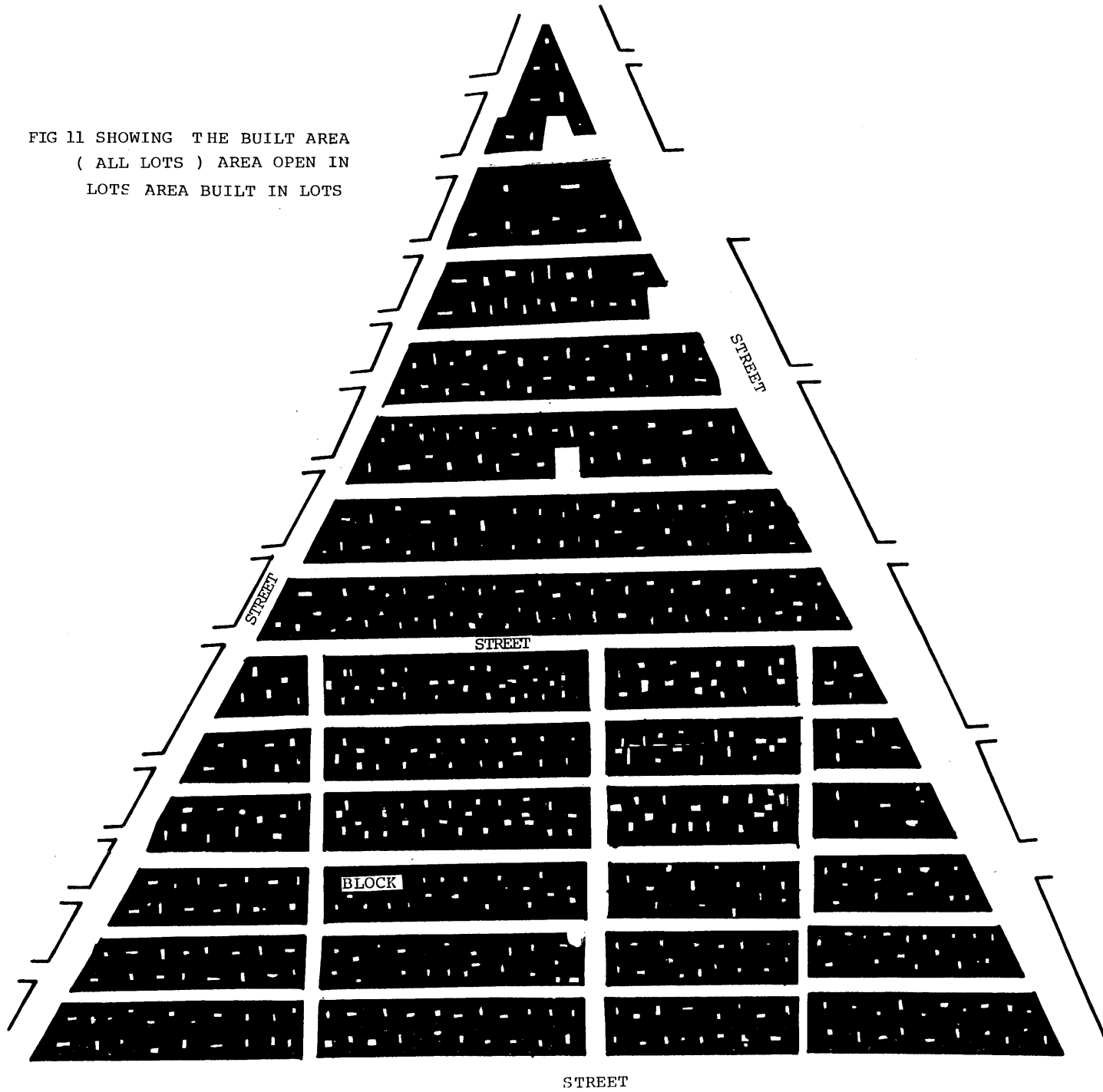


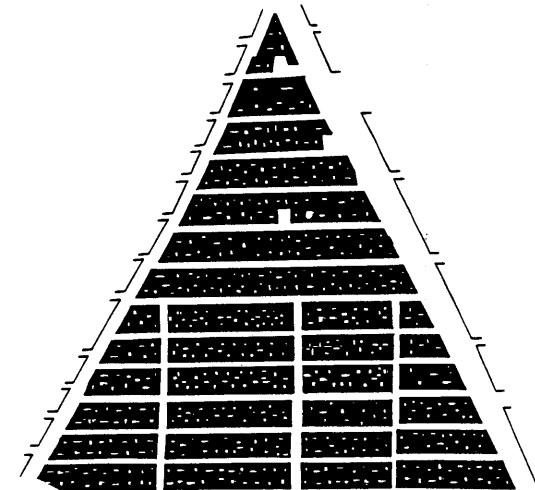
FIG 11 SHOWING THE BUILT AREA
(ALL LOTS) AREA OPEN IN
LOTS AREA BUILT IN LOTS



IMBABAH 2- QUANTIFICATION OF FORM AS ANALYSED

AREA OF STREET:

STREET	L	W	AREA
B	385	80/2	1925
C2	425	10/2	2125
C3	430	10/2	2150
D1	45	4	180
D2	70	4	280
D3	95	4	380
D4	122	4	488
D5	155	4	620
D6	185	4	740
D7	215	4	860
D8	240	4	960
D9	265	4	1060
D10	290	4	1160
D11	315	4	1260
D12	340	4	1360
T	360	4	1440
TOTAL	3287		16868



CALCULATION

Total Area	= 68787.00 m ²
Total Area Built (lots)	= 51919 m ²
Total Area Open (streets)	= 16868 m ²
Area Open in Lots	= 10383.8 m ²
Area Built in Lots	= 41535.2 m ²
Floor Area Built (Area built in lots x no. of stories)	= 41535.2 x 3 = 124605 m ²
Average Block Area	= $\frac{51919}{31}$ = 1674.8 m ²
Average Lot Area	= $\frac{51919}{573}$ = 90.61 m ²
Average No. of lots in block	18:19
Average Block Depth	= 21.35 m
Average Block Length	= 78.41 m
Average Lot Depth	= 10.68 m
Average Block Length	8:9 m
Length of Street	= 3287 m
Circulation Efficiency	= 477.85 m/hectare

WHERE:

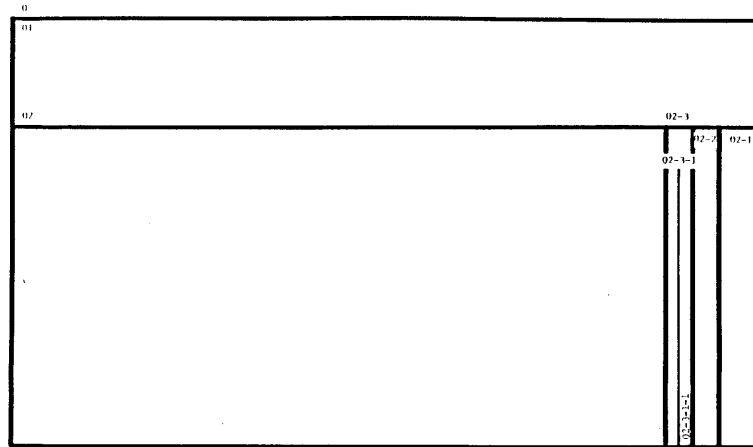
W WIDTH
 L LENGTH
 A AREA
 A.B AREA BUILT IN BLOCK
 A.O AREA OPEN IN BLOCK
 B BLOCK

AREA OF BLOCKS AND LOTS IN THE AREA OF ANALYSIS:

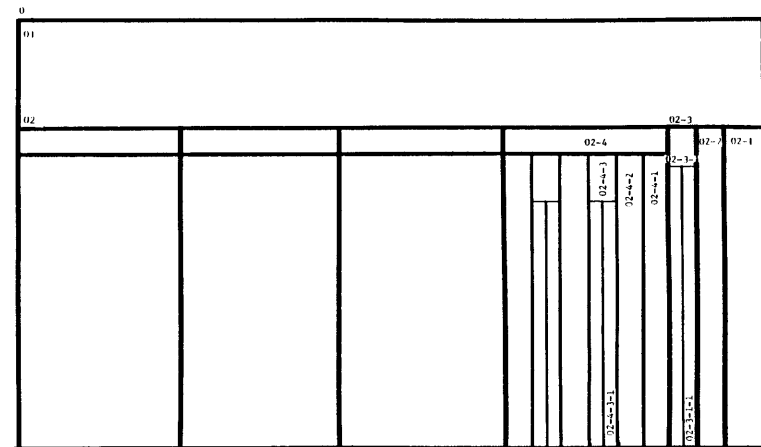
B	W	L	A	A.O	A.B	F.A.B	LOTS
1	45	42/2	945	567	189	2268	6
2	29	56	2956	2364.8	591.2	7094.4	9
3	24	93	1992	1593.6	398.40	4780.8	19
4	22	113	2486	1988.8	497.2	5966	31
5	23	138	3174	3539.2	634.8	7617.6	38
6	22	168	3696	2956.8	739.2	8870.4	41
7	21	200	4400	3520	880	10560	57
8	21	28	588	470	117.6	1411.2	6
9	21	93	1953	15624	390.6	4687.2	22
10	21	67	1407	1185.6	281.4	3376.8	18
11	21	21	441	352.8	88.2	1058.4	4
12	18	42	756	604.8	151.2	1814.4	8
13	18	93	1674	1339.2	334.8	4017.6	23
14	18	67	1206	964.8	241.2	2894.4	16
15	18	33	594	475.2	118.80	1425.6	7
16	21	54	1134	907.2	226.8	2721.6	12

B	W	L	A	A.B	A.O	F.A.B	LOTS
17	21	94	1974	1579.2	394.8	4737.6	25
18	21	66	1386	1108.8	277.2	3326.4	16
19	21	45	945	750	189	2268	4
20	20	64	1280	1024	256	3072	14
21	20	93	1860	1488	372	4464	20
22	20	67	1340	1072	268	3216	15
23	20	58	1160	928	232	2784	15
24	19	77	1463	1170.4	292.60	3511.2	16
25	19	94	1786	357.2	1428.8	4286.4	21
26	19	67	1273	254.6	1018.4	3055.2	16
27	19	70	1330	266.0	1044	3192	17
28	20	90	1800	360	1440	5320	20
29	20	95	1900	380	1520	4560	21
30	20	67	1340	268	1072	3216	16
31	20	84	1680	336	1344	4032	20
31			51919	10383.8	41535.2	124605	573

3- TERRITORIAL ANALYSIS

FIRST TERRITORIAL MODEL IN IMBABAH

- 0 is the whole territory
 this territory is divided into
- 01 is all the streets in territory 0
 it is the public space in territory 0
- 02 is all the built area (lots) in territory 0
 it is the private space in territory 0
 This private space is divided into
- 02-1 is any institutional, commercial, and recreational building
 this is a public territory and therefore not further divided
- 02-2 is a single family house
- 02-3 is a multi-family house
 this territory is divided into
- 02-3-1 is the staircase that leads to the different apartments
 this is a public space in 02-3
- 02-2-3-1-1 are the different apartments reached from the staircase

SECOND TERRITORIAL MODEL IN IMBABAH

- 0 is the whole territory
 this territory is divided into
- 01 is all the streets in territory 0 except for D streets. includes all the E streets and D7
 it is the public space in territory 0
- 02 is all the built area in territory 0 (lots)
 it is the private space in territory 0
 this private space is divided into
- 02-1 is any institutional, commercial, and recreational building in territory 02
 this is a public territory and therefore not further divided.
- 02-2 a single family house
- 02-3 a multi-family house
 this territory is divided into
- 02-3-1 is the staircase that leads to the different apartments
 this is a public space in territory 02-3

02-3-1-1 are the different apartments
 reached from the staircase
 each apartment is a private
 space in territory 02-3

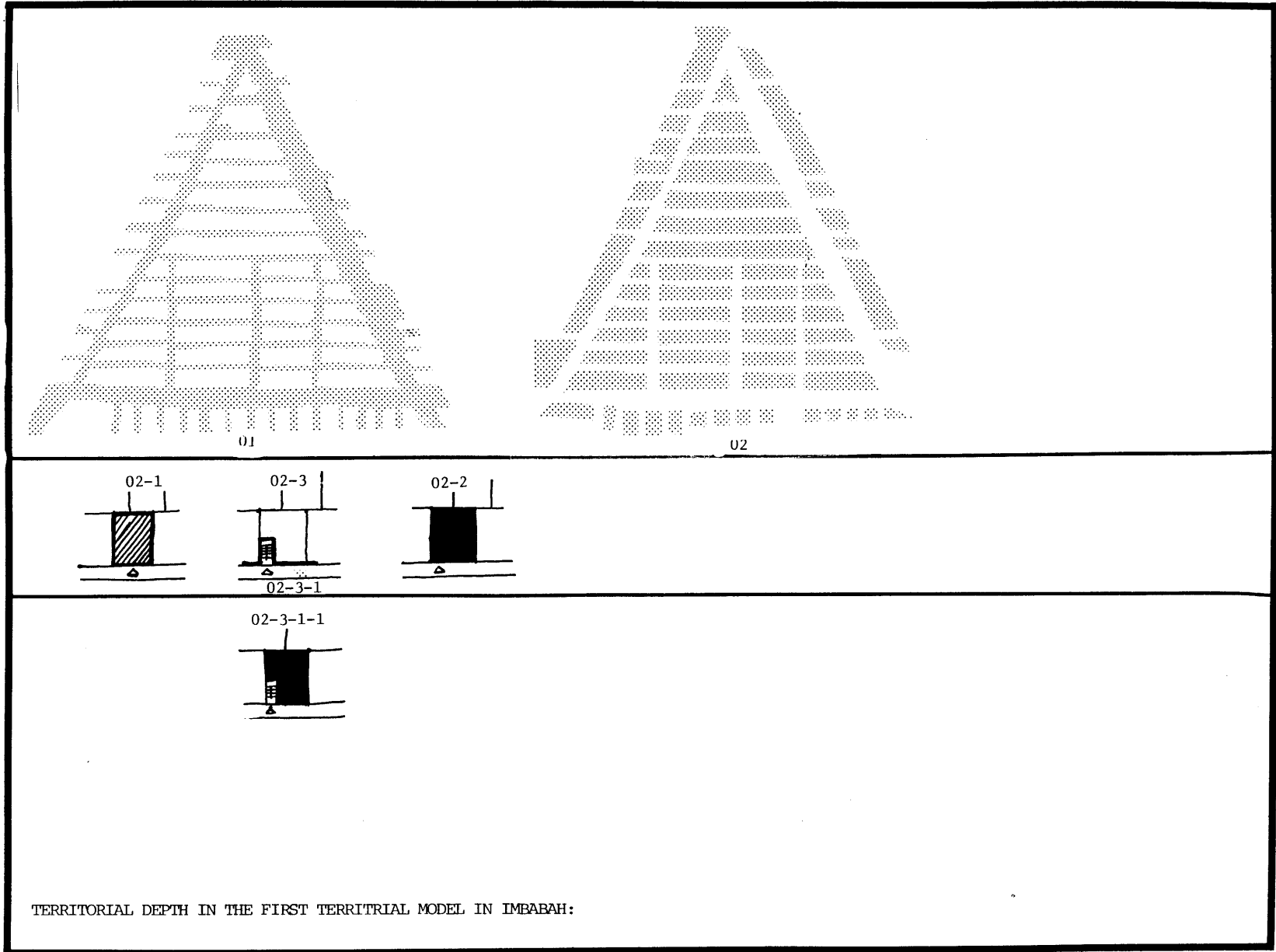
02-4 Is any D street except for D7
 this territory is divided into
 02-4-1 is any institutional,...etc.
 02-4-2 is a single family house
 02-4-3 is a multi-family house
 this territory is divided into
 02-4-3-1 is the staircase
 02-4-3-1-1 are the different
 apartments

FIRST TERRITORIAL MODEL IN IMBABAH

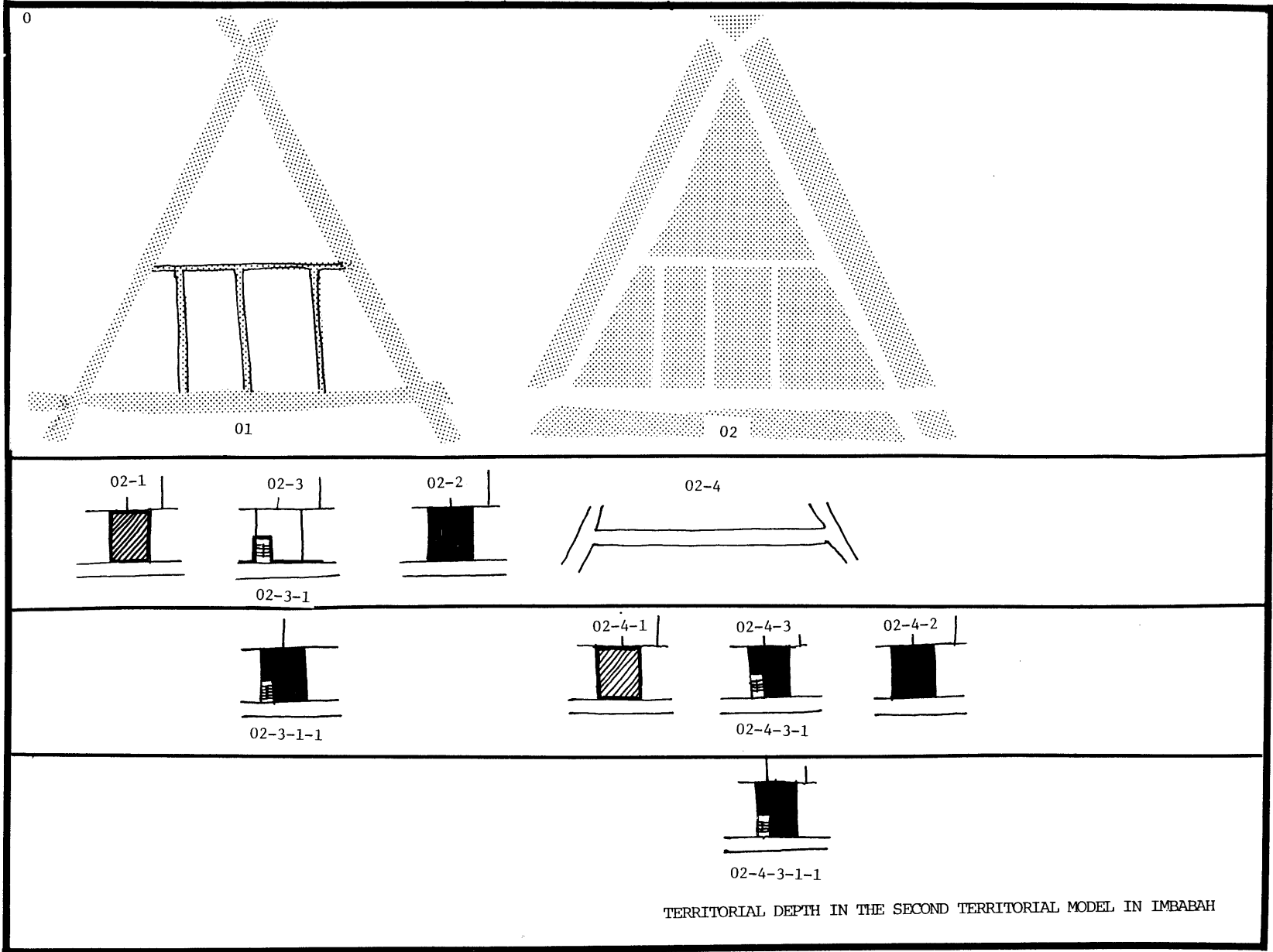
0-----01
 02-----02-1
 02-2
 02-3-----02-3-1
 02-3-1-1

SECOND TERRITORIAL MODEL IN IMBABAH

0-----01
 02-----02-1
 02-2
 02-3-----02-3-1
 02-3-1-1
 02-4-----02-4-1
 02-4-2
 02-4-3-----02-4-3-1
 02-4-3-1-1



TERRITORIAL DEPTH IN THE FIRST TERRITRIAL MODEL IN IMBABAH:



Chapter 3

COMPARISON & CONCLUSIONS

This chapter is the comparison between the 4 areas analyzed in Chapter 2.

Comparison is presented in the forms of the following conclusions

- 1 - Conclusions based on the quantitation of form analysis for each area
- 2 - Conclusion based on the territorial analysis for each area
- 3 - General conclusions

CONCLUSIONS BASED ON THE QUANTIFICATION ANALYSIS:MEDIEVAL CAIRO

- High percentage of built-area (lots) 83%, and a very low percentage of open area (streets and square) 17%.
- Percentage of open area in lot is 20% of lot area and 12% of total land area. The form of the open area in lot is a court, which is shared usable space.
- Percentage of floor area built is 210% which is high although height is only 3 stories. It is the highest floor built area with a 3 story height.
- Average lot area is 360m². Average lot area on main streets is 461m² (A,B,C streets) and average lot area on secondary streets is 289m² (F,D,E streets).
- Lot frontage:lot depth
1:2
- Circulation efficiency is high, 296 m/hectare.
- Density is high 1428 persons/hectare.

AIN AL SIRA

- High percentage of open area (streets and open space) 80% and a very low area built (buildings) 20%.
- No open space because there are no lots. Only 2% of the 20% is used as staircase to the different apartments. No light wells. All rooms are lighted and ventilated on facades.
- Percentage of floor area built is 90%, which is very low although height is 5 stories.
- No lots.
- Circulation efficiency is 610 m/hectare.
- Density is high, 1401 persons/hectare.

SHOUBRA

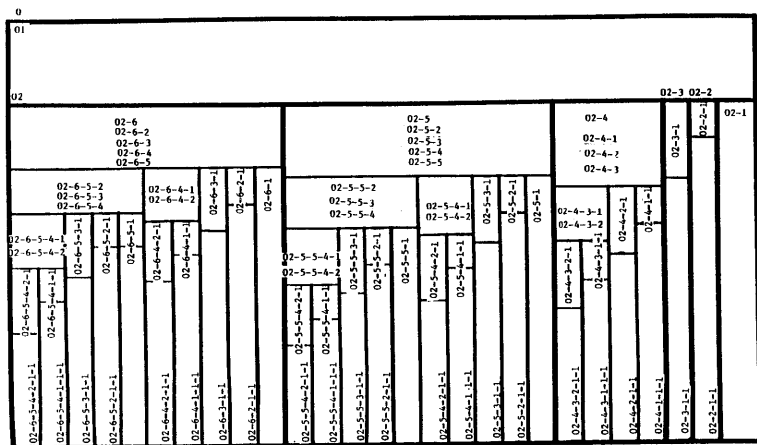
- High percentage of open area (streets) 33% and area built (lots) 67%.
- As a result of laws and building regulations 65% of lot area or 44% of total area is built. The open area of lot is in the form of internal ventilating wells, set backs and gardens. The form of space is not usable except for the gardens.
- Percentage of floor area built is 218% which is high and was achieved as a result of building height (5 stories).
- Average lot area is 347.64m².
- Lot frontage:lot depth
1:1.46
- Circulation efficiency is 330 meters/hectare.
- Density is 1132 persons/hectare.

IMBABA

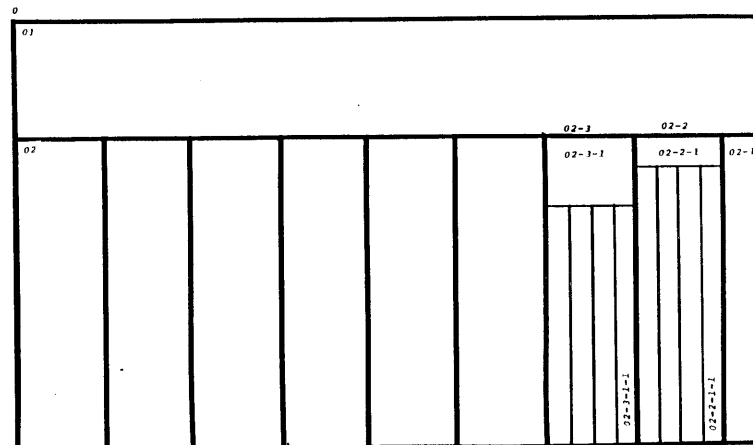
- Reasonable open area (streets) is 25% and area built (lots) is 75%.
- Percentage of built area in lots is 80% of lot area and is 60% of total land area. The area open in the lot is used in the form of light wells and stair cases.
- Percentage of floor area built is 180% with a height of 3 stories. It is expected to reach 5 stories thus offering a very high floor area built 300%.
- Average lot area is 90:100m².
- Lot frontage:lot depth
1:1.19
- Circulation efficiency is very low 470m/hectare.
- Density is very high 1716 persons/hectare.

TERRITORIAL COMPARISON BETWEEN THE FOUR AREAS

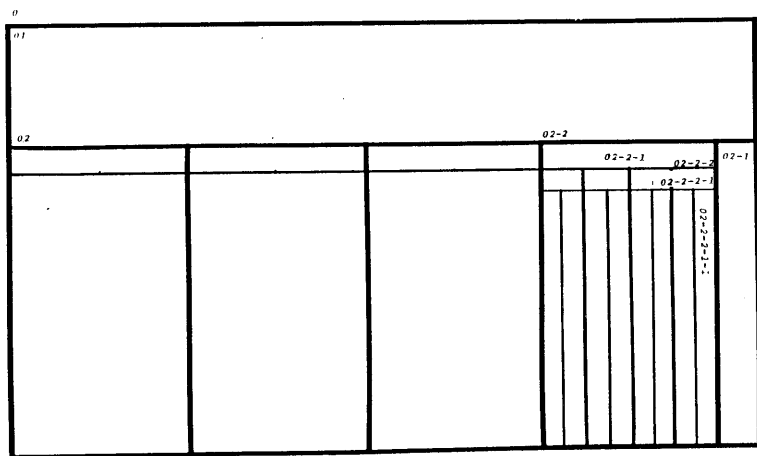
POTENTIAL TERRITORIES IN MEDIEVAL CAIRO



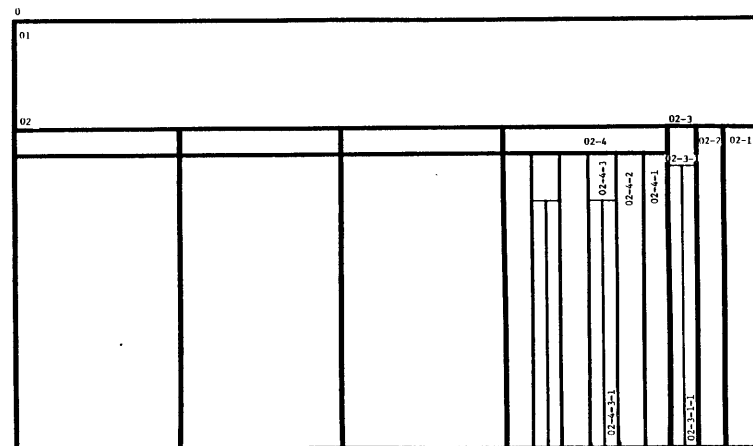
EXISTING TERRITORIES IN SHOUBRA



POTENTIAL TERRITORIES IN AIN AL SIRA



TERRITORIAL MODEL 2 IN IMBABAH



CONCLUSIONS BASED ON THE TERRITORIAL ANALYSIS:MEDIEVAL CAIRO

- The territorial organization of Old Cairo is rich in its territorial depths.
- It is assumed that in the past the form of this environment corresponded with its territorial control. Territories are closely related to the hierarchy of the street pattern and the different positioning of the built elements. Buildings and streets are positioned at different levels thus creating at each level a new territory with a different territorial depth.
- These territories as suggested by the form no longer exist, the model is a representation of the possible territories that this form of environment can hold. Many of these territories have disappeared as the result of the change in social and economical needs.
- The graphic model is a step in the process of understanding this complex environment. It suggests further analysis in order to be able to determine those territories that could be implemented in the design of new environments that reflect our cultural, social and economical needs.
- The study demonstrates that we can only understand form if the territorial organization is also understood.
- The rich form and the rich territorial organization are the result of relatively few elements that are placed in different relations. It emphasizes the importance of form/position relation, not only the elements.

AIN AL SIRA

- The existing territorial organizations in Ain al Sira lack territorial depth.
- One of the reasons for this lack in territorial depth is the high percentage of open area (80%) that is not used or controlled by anyone, even the government that owns it.
- High percentage of open area does not always result in environments that lack territorial depth. It is the result of one centralized control over a large area of land. The area is owned by the government that is unable to maintain it due to its very limited resources.
- The only possible way to enrich territorial depth in the existing form of this environment is to give the land between the buildings to the people allowing for each building a front space for a private passage to the entrances of the different apartment blocks and a back space that will allow the extensions on the ground floor that is already hopping regardless of government constraints (see Fig 12).
- The model that represents this territorial enrichment is not any recommendation. It only suggest territorial enrichment in this form of environment with simple elements (gates, fences) and indicates new guidelines to the design to future public housing projects with less waste in land.

CONCLUSIONS BASED ON THE TERRITORIAL ANALYSIS:

SHOUBRA

- The existing territorial organization of Shoubra lacks territorial depth.
- One of the main reasons for the lack in territorial depth is the street pattern that is all on one territorial level. There is no hierarchy in streets and they are all accessible to all cars and pedestrians.
- As a result of the one territorial depth of streets, buildings are positioned also on one territorial level.
- Although there are different forms of open space in the built area, such as gardens, set backs, light wells, only the garden defines a territory. The garden is separated from the streets by fences and gates (physical elements).
- The potential territories in Shoubra are limited and the graphic model only represents the existing territories.
- With the existing form of this environment it is not possible to suggest any territorial enrichment. Territorial enrichment is only possible by changing the structure and function of the street pattern, which is not an objective of this study.

IMBABAH

CONCLUSIONS BASED ON THE TERRITORIAL ANALYSIS

- The territorial organization of Imbabah has more territorial depth than both Ain Al Sira and Shoubra.
- This form of environment suggests two territorial models. The first as shown in Fig. suggests that the government is responsible for all streets in the area including the alleys that lead to the different lots. It provides the area with water, sewage and maintenance. The second as shown in Fig. suggests that the inhabitants of this area are responsible for the alleys and have full control over them.
- The second model is closer to reality, because the streets are mainly pieces of agricultural land given up by the landowners to make a street. They provided their own sewer system.
- The social life in the alleys is very similar to the social life in the harat and streets of old Cairo. The street is an extension of the living fabric.
- The (E) streets, which are small streets that connect between the different alleys, are creating a horizontal relationship between the alleys. These streets do not define any territory, as they are not controlled by anyone. They are strictly circulation streets, and their elimination would not effect the territorial depth in this area.

GENERAL CONCLUSIONS

-The form of the built environment of medieval Cairo offers many and deep territories.

-The informal area of Imbaba has more territorial depth than both Ain al Sira and Shoubra.

-The territorial organization of Ain al Sira could be enriched by creating a new territorial depth.

-Shoubra with its existing form does not offer any territorial enrichment.

-It is important to separate between car streets and pedestrian paths. This will not only add territorial depth but will result in a better use of space.

-Territorial richness and depth are not only the result of high percentages of built area, but are also the outcome of the different relations between the different elements of the built environment.

-Although the territorial richness of the traditional environment is an aspect of importance, it is only one aspect of improvement. Better understanding of it could improve new developments.

-Lack of territories is the result of many factors. Here we have only dealt with territory defined by physical form. From the analysis we can conclude that it is the result of high open area (in the case of Ain al Sira), the result of form (in Shoubra), and the lack of control (in Imbaba).

-Finally this study is a contribution to the understanding of the traditional environment in Cairo. This area is receiving poor conservational and reservational effort and very little effort is devoted to the understanding of its physical structure and its form, which is the real essence of conservation. If structure and form is understood, then change is possible without disturbing the structure of this traditional environment.

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9. Abu-Lughod, op. cit., pp. 83-84.
10. Ibid., pp. 98-99.
11. Staffa, op. cit., pp. 265-267
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36. Ibid.
37. Ibid.
38. Density is obtained from Mohammed al Soufi's thesis on Imbahbah.

Appendix

This appendix includes the calculations for medieval Cairo. It calculates the different lot areas for each street separately. It is assumed that the height of the buildings is 3 storeys high.

THE FOLLOWING CALCULATIONS ARE GIVEN FOR EACH STREET:

length of street
width of street
area of street
area of each lot
area built in each lot
area open in each lot
floor area built= area built in each lot x 3
length of lot frontage on street
total area of lots
total area built in all lots
total area open in all lots
total floor area built in all lots
total number of lots on street
total length of lot frontage on street

area calculated are for lots 1951 for all streets.

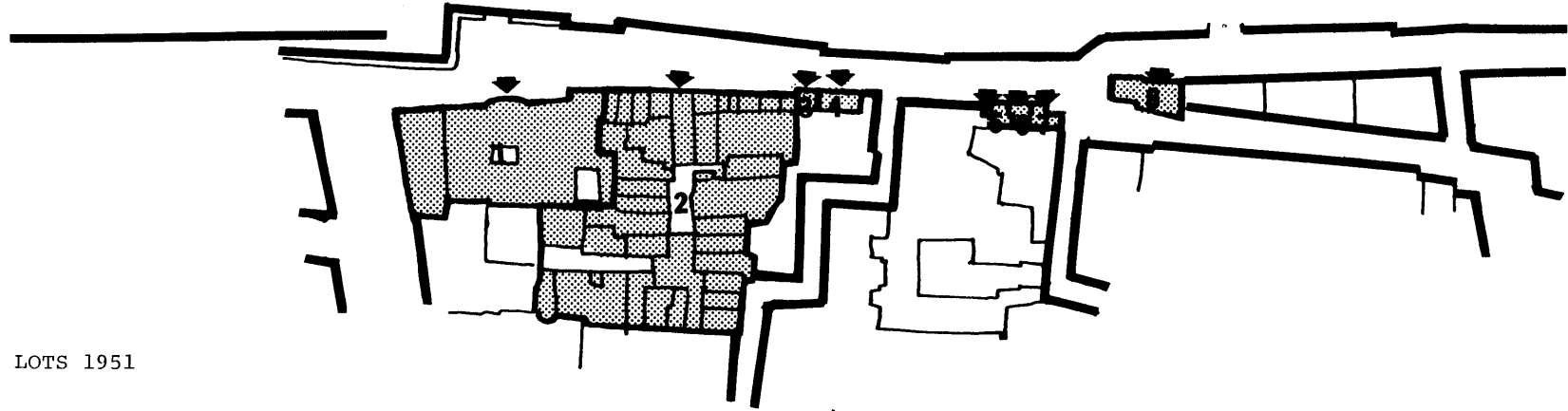
Area between() are areas of courts.

Area not between () are areas of staircases and lightwells.

SYMBOLS:

A AREA OF LOT SERVED BY THE STREET
A.B AREA BUILT IN LOT
F.A.B FLOOR AREA BUILT
A.O AREA OPEN IN LOT
L.F LOT FRONTAGE ON STREET

AL MUIZZ STREET A:



LOTS 1951

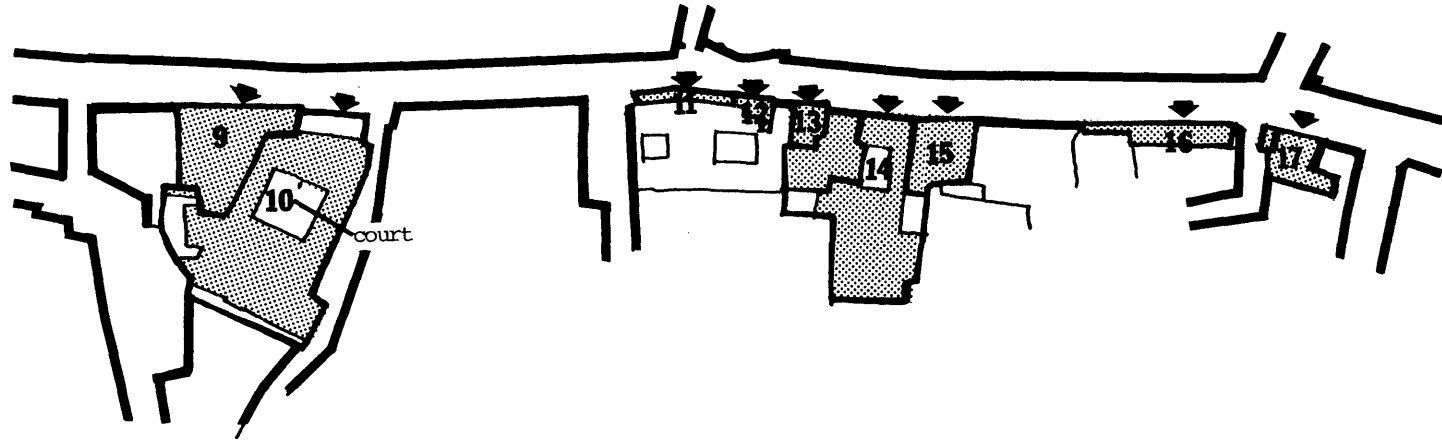
length of street = 465 m.

width of street = 9 m.

Area of street = 2092.5 m²

AREA OF LOTS SERVED BY THE STREET:

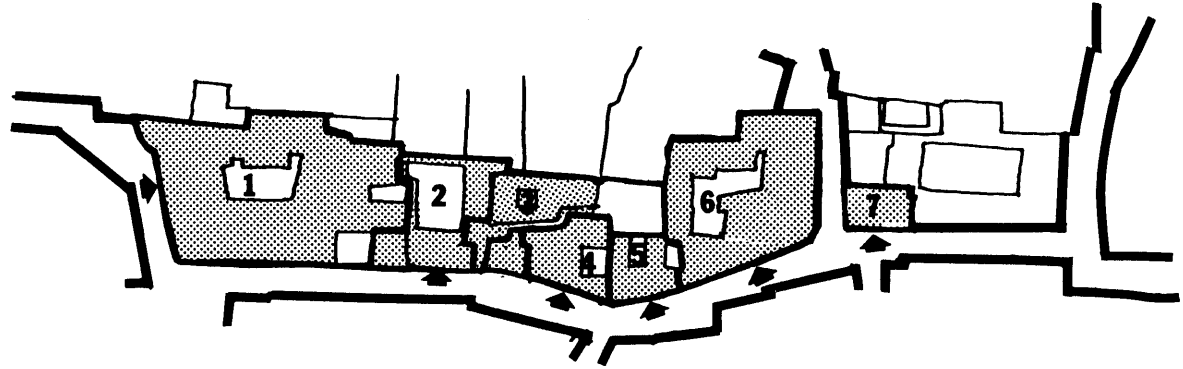
LOT	A	A.O	A.B	F.A.B	L.F
1	825	(200)	625	1875	45
2	1800	(200)	1600	4800	35
3	25	1.25	23.75	71.25	4
4	50	2.5	47.5	142.5	8
5	25	1.25	23.75	71.25	5
6	25	1.25	23.75	71.25	5
7	25	1.25	23.75	71.25	5
8	100	5	95	285	15
9	300	15	285	855	23



LOT	A	A.O	A.B	F.A.B	L.F
10	850	(100)	750	2250	20
11	50	2.5	47.5	142.5	20
12	35	1.25	23.75	71.25	6
13	50	2.5	57.5	142.5	6
14	175	8.75	166.25	498.75	6
15	525	(100)	425	1275	10
16	175	8.75	166.25	498.75	12
17	100	5	95	285	30
18	125	6.25	118.75	356.25	11
18	5250	662.5	4587.5	13752.5	266

AL GAMALIYA STREET:

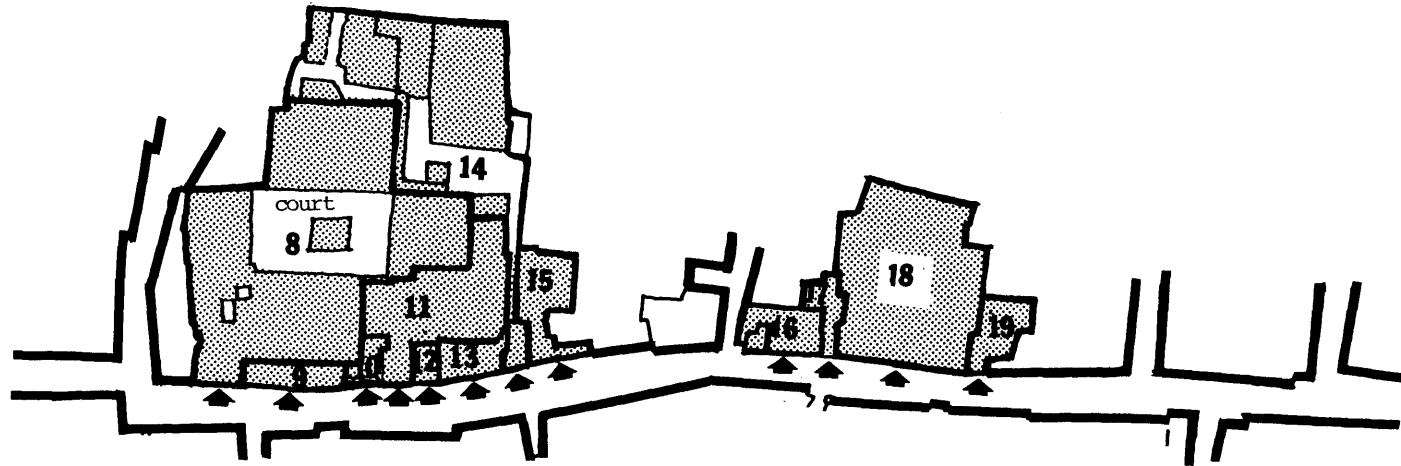
LOTS 1951



length of street=425 m.
width of street = 7 m.
Area of street = 1487 m².

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	1200	(50)	1150	3450	65
2	275	(100)	175	525	18
3	300	(100)	200	600	3
4	225	(25)	200	700	8
5	250	(100)	150	450	15
6	750	(100)	650	1950	13
7	100	5	95	285	25
8	1500	(375)	1125	3375	12
9	100	5	95	285	10



LOT	A.	A.O	A.B	F.A.B	L.F
10	50	2.5	47.5	142.5	18
11	650	32.5	617.5	1852.5	6
12	30	1.5	28.5	85.5	5
13	75	3.75	71.25	213.75	12
14	1025	(200)	825	2475	5
15	250	12.5	237.5	712.5	12
16	150	7.5	142.5	427.5	16
17	75	3.75	71.25	213.75	2
18	875	(100)	775	2325	4
19	125	6.25	118.75	356.25	3
19	8005	1230.25	6774.75	20324.25	252

AL TUMBAKSHIYA STREET C₂ :

length of street = 350 m.

width of street = 6 m.

area of street = 2100 m².

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	75	3.75	71.25	213.75	8
2	150	7.5	142.5	427.5	25
3	175	8.75	166.25	498.75	22
4	50	2.5	57.5	142.5	7
5	125	6.25	118.75	356.25	13
6	1500	(225)	1275	2825	8
7	1050	(125)	925	2775	30
8	400	(50)	350	1050	15
9	125	6.25	118.75	356.25	10
10	175	8.75	142.5	498.75	12
11	750	(100)	650	1950	30
12	150	7.5	142.5	427.5	7
13	375	18.75	356.25	1068.75	60
14	25	1.25	23.75	71.25	6
15	225	11.25	213.75	641.25	30
16	175	8.75	166.25	498.75	30
17	200	10	190	570	18
18	125	6.25	118.75	356.25	15
19	1300	(175)	1125	3375	60
20	175	8.75	166.25	498.75	15
21	1050	(200)	850	2250	25
22	75	3.75	71.25	213.75	12
23	1500	(225)	1275	3825	50
24	1350	(250)	1100	3300	27
25	850	(175)	675	2025	17
25	12125.	1644.5	10481	30245	552

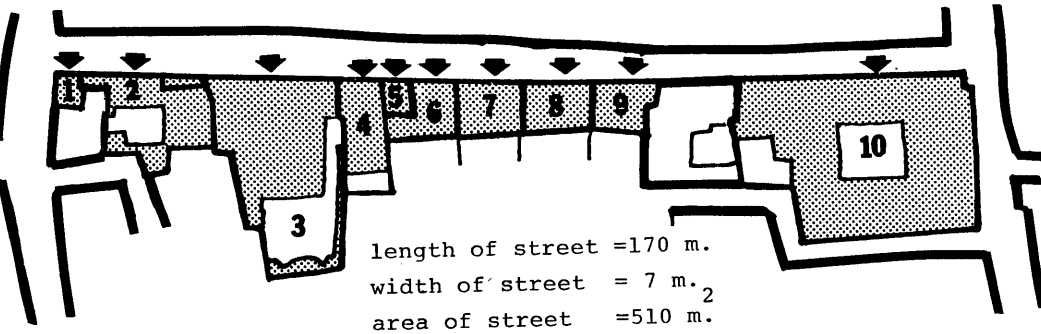


LOTS 1951

AL DIABIYA STREET:

AREA OF LOTS SERVED BY THE STREET:

	A	A.O	A.B	F.A.B	L.F
1	375	(75)	300	900	5
2	325	(50)	275	825	23
3	725	(300)	425	1275	26
4	150	(50)	100	300	7
5	37.5	1.875	35.625	106.875	6
6	100	5	95	285	8
7	125	6.25	118.75	356.25	11
8	125	6.25	118.75	356.25	12
9	100	5	95	285	12
10	1150	(100)	1050	3150	42
10	2875	599.375	2613.125	7839.375	152



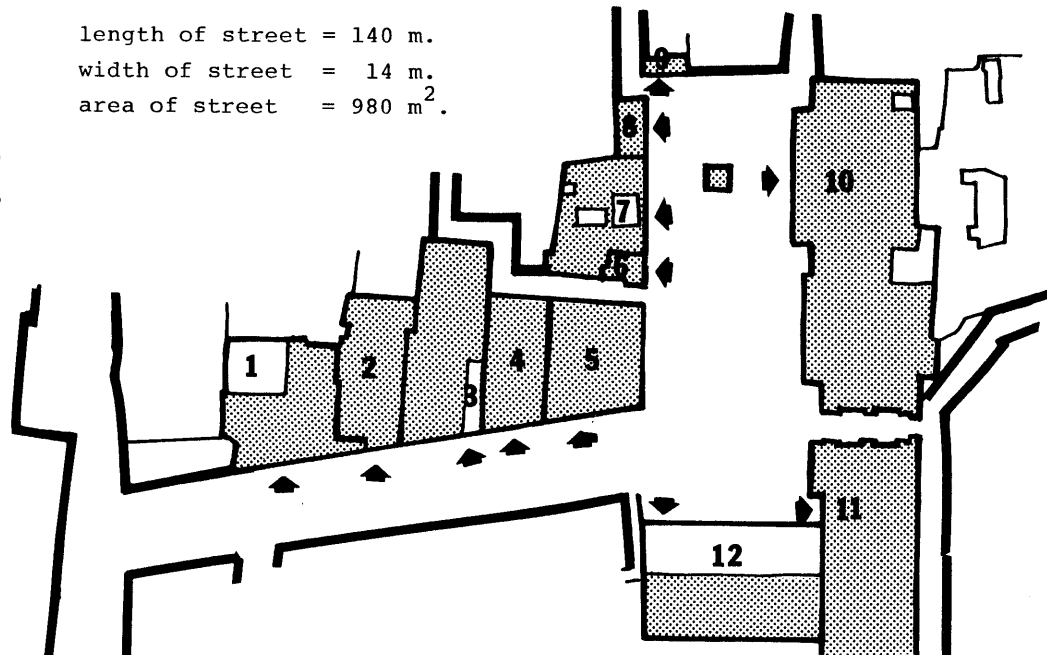
LOTS 1951

BAIT AL QADI STREET:

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	500	(100)	400	1200	24
2	350	17.5	332.5	997.5	6
3	550	(50)	500	1500	15
4	250	(25)	225	675	11
5	400	(25)	375	1125	34
6	175	(25)	150	450	6
7	175	(25)	150	450	17
8	50	2.5	47.5	142.5	10
9	25	1.25	23.75	71.25	8
10	1250	(100)	1150	3450	60
11	680	(100)	580	1740	15
12	500	(200)	300	900	32
13	25	1.25	23.75	71.25	20
13	4930	672.5	4257.5	12772.5	269

length of street = 140 m.
width of street = 14 m.
area of street = 980 m.²



LOTS 1951

HARET BAIT AL QADI F₁:

length of street = 120 m.
width of street = 4 m.
area of street = 480m².

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	225	(50)	175	525	25
2	75	3.75	71.25	213.75	10
3	625	31.25	593.75	1781.25	6
4	425	(50)	375	1125	5.5
5	250	12.5	237.5	712.5	28
6	375	(75)	300	900	31
7	50	2.5	47.50	142.5	12
8	150	7.5	142.5	427.5	21
9	250	12.5	237.5	712.5	33
10	100	5	95	285	14
11	250	12.5	237.5	712.5	5.5
11	2118.5	262.5	2512.5	7537.5	191



ATFET AL QAFFASIN F₂:

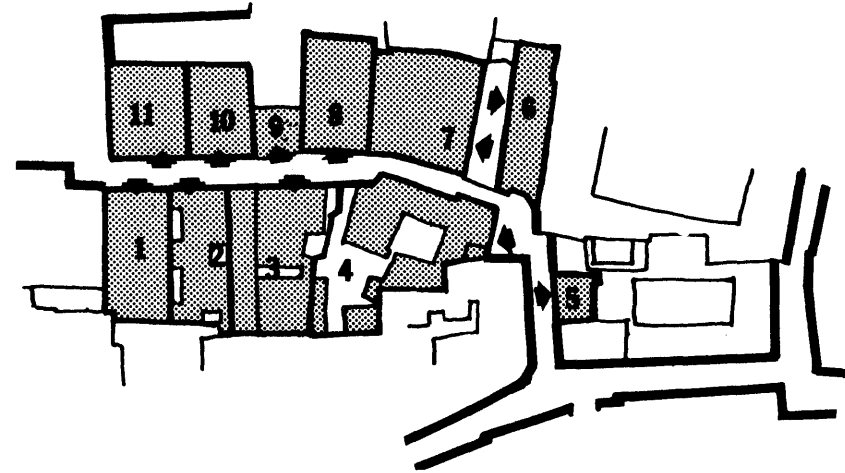
length of street = 115 m.

width of street = 4 m.

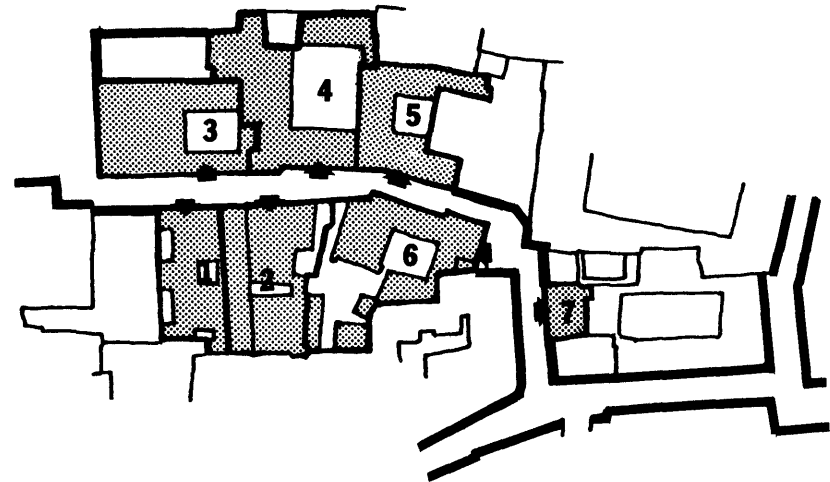
area of street = 460 m².

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	375	(50)	325	975	15
2	150	7.5	142.5	427.5	16
3	450	(100)	350	1050	27
4	550	(175)	375	1125	20
5	400	(175)	225	675	18
6	600	(200)	400	1200	39
7	100	(10)	90	270	11
7	2625	717.5	1907.5	5722.5	146



LOTS 1981



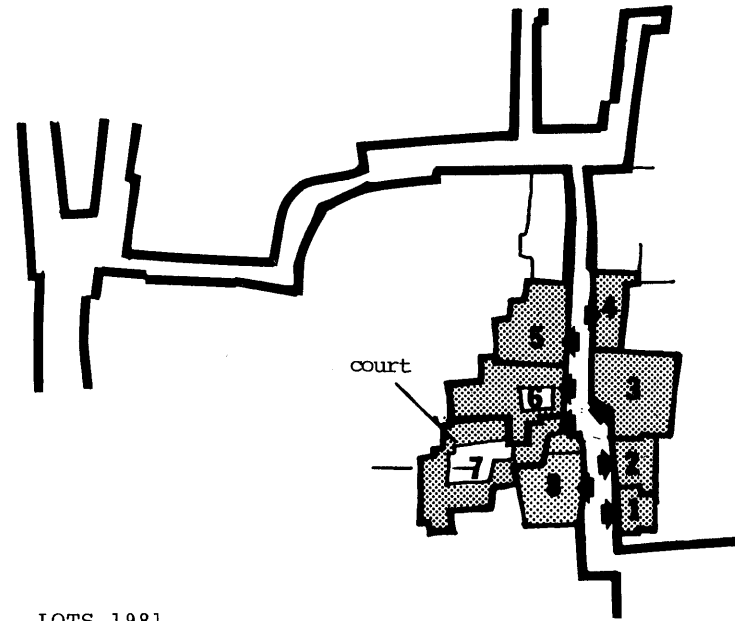
LOTS 1951

HARET QIRMIZ F₃:

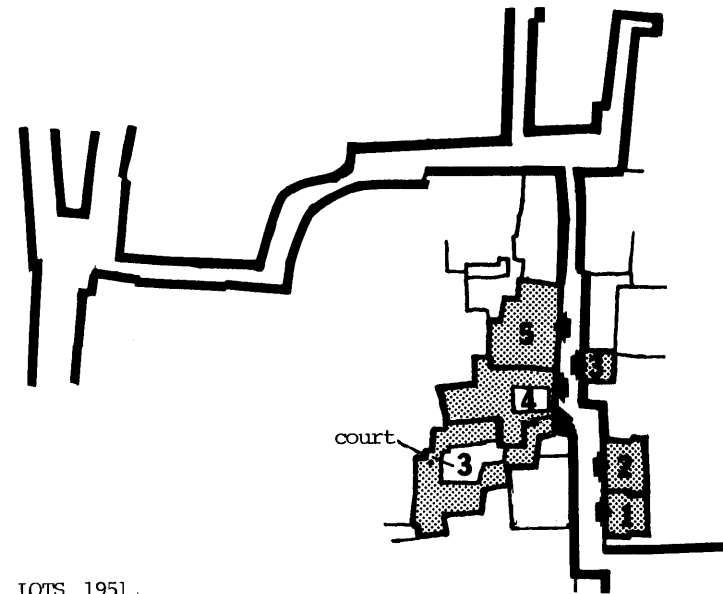
length of street = 85 m.
width of street = 3.5 m.
area of street = 297.5 m.²

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	74.97	3.75	71.22	213.66	8.3
2	86.4	4.32	82.08	246.24	9.6
3	156	(32)	124	372	3
4	286	14.30	271	815.1	8
5	192	9.60	182.4	547.2	16.11
6	39	1.95	37.65	111.15	6
6	834	65.92	768.08	2304.24	51



LOTS 1981



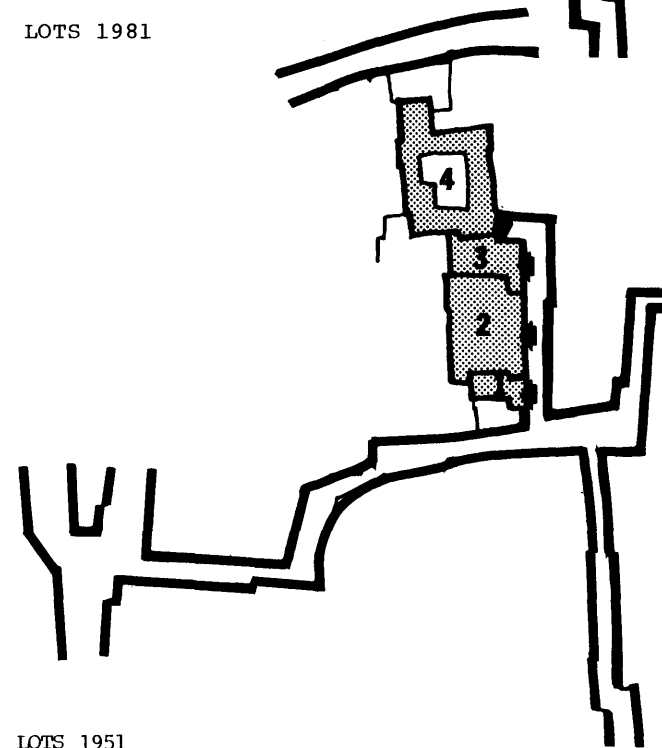
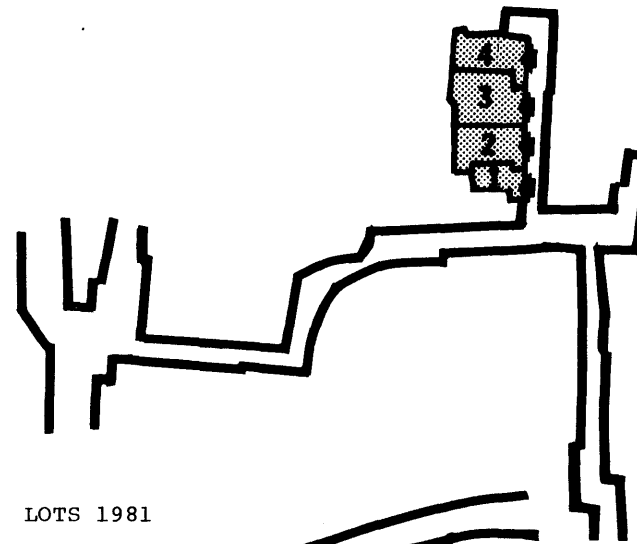
LOTS 1951

ATFET QIRMIZ: E1

length of street = 45 m.
width of street = 3.5 m.
area of street = 157.5 m².

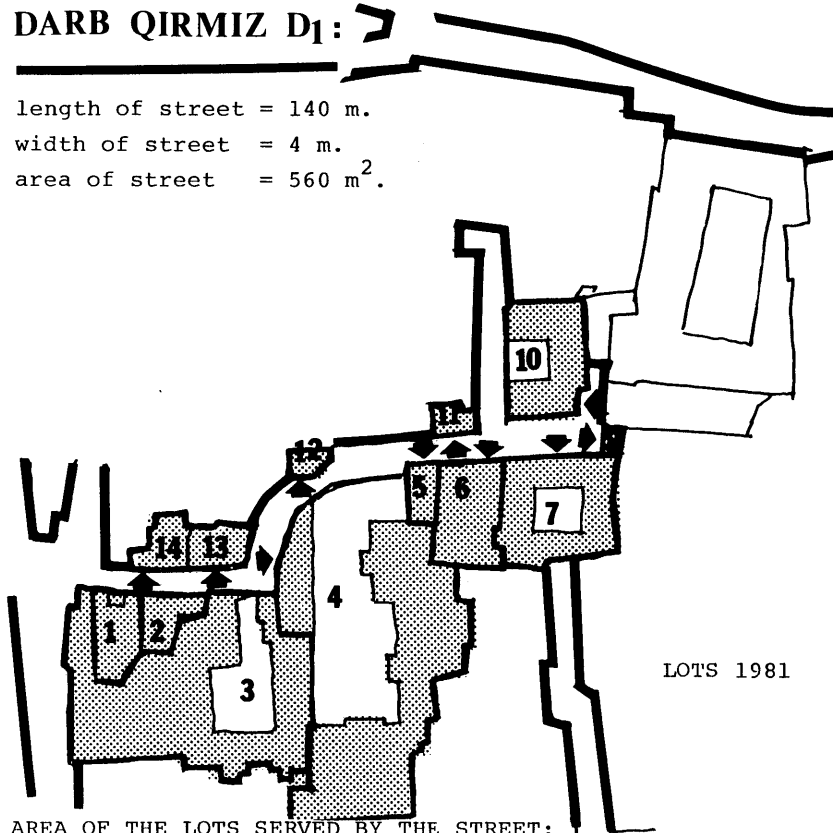
AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A,B	F.A.B	L.F
1	56.23	2.81	53.4	160.26	6
2	225	11.25	213.75	641.25	13.88
3	87.5	4.38	83.13	249.38	13.24
4	300	75	225	675	3.62
4	668.75	93.44	575.28	1725.84	36.87

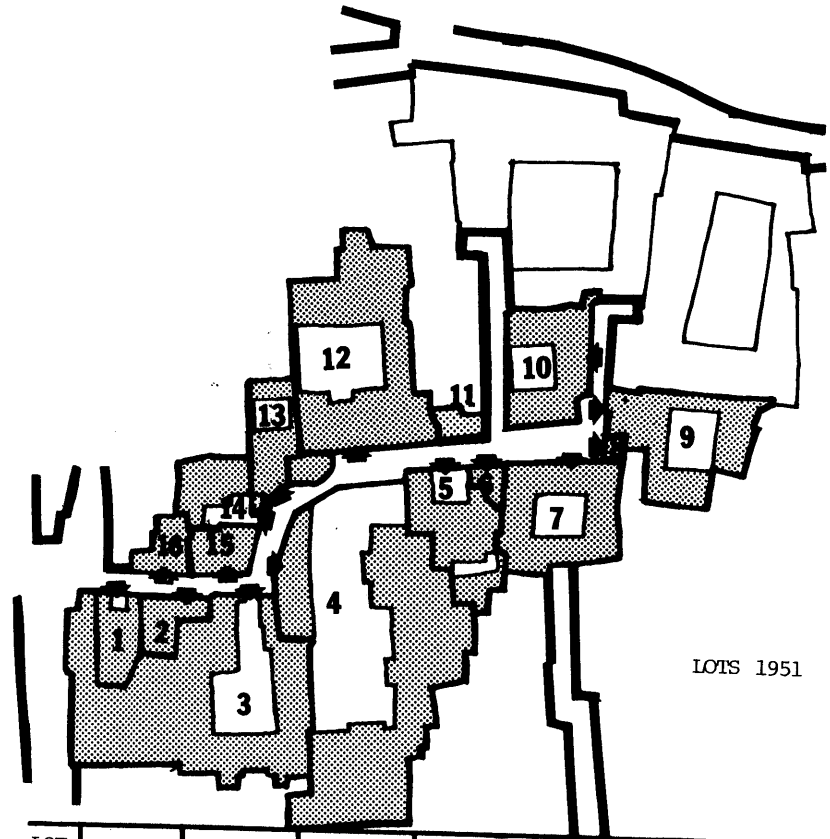


DARB QIRMIZ D₁:

length of street = 140 m.
 width of street = 4 m.
 area of street = 560 m².



LOTS 1981



LOTS 1951

AREA OF THE LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	125	(13)	112	336	8
2	87.5	4.375	83.125	249.375	7.5
3	1150	225	925	2775	12
4	1625	(628)	1000	3000	37.5
5	375	(42)	333	999	11.37
6	19.5	0.975	18.525	55.575	4.87
7	400	(100)	300	900	17
8	25	1.25	23.75	71.25	5

LOT	A	A.O	A.B	F.A.B	L.F
9	450	(88)	362	1086	7.70
10	330	(64)	266	798	22
11	56.5	2.825	53.675	161.025	9.43
12	726	(192)	534	1602	19
13	207	(35)	172	516	16.67
14	196	(35)	161	483	4
15	117	5.85	111.15	333.45	19.5
16	88	4.4	83.6	250.8	11.05
16	5977.65	1438.675	4538.825	13616.475	212.59

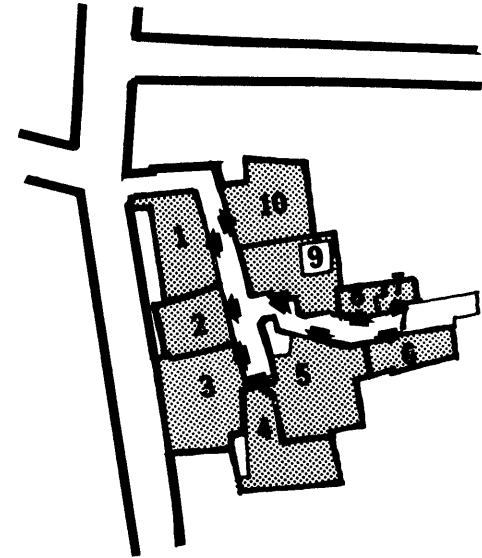
HARET & ATFET AL TAWAKI E₄ & E₅:

length of street = 60 m.
 width of street = 3.5 m.
 area of street = 210 m².

length of street = 50 m.
 width of street = 3.5 m.
 area of street = 175 m².

AREA OF LOTS SERVED BY THE STREET:

	A	. A.O	A.B	F.A.B	L.F
1	200	10	190	570	30
2	175	8.75	166.25	427.5	12
3	275	13.75	261.25	783.75	8
4	225	(50)	175	525	21
5	300	15	285	855	20
6	112.5	5.625	106.875	320.625	16
7	75	3.75	71.25	213.75	8
8	75	3.75	71.25	213.75	8
9	225	(25)	200	600	27
10	225	11.25	213.75	641.25	13
10	1887.5	146.875	1740.625	5150.625	163



LOTS 1951

LOTS 1981

ATFET & ZUQAQ AL DARB AL ASFAR E₂ & E₃:

length of street = 60 m.
width of street = 3.5 m.
area of street = 210 m².

length of street = 45 m.
width of street = 3.5 m.
area of street = 157.5 m²

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	125	6.25	118.25	354.75	15
2	250	12.5	237.5	712.5	25
3	150	7.5	142.5	427.5	30
4	100	(75)	25	75	3
5	75	(25)	50	150	7
6	75	(50)	25	75	7
7	50	2.5	75.5	142.5	7
8	200	10	190	270	5
9	100	5	95	275	14
9	1125	193.75	930.75	2482.25	113

LOTS 1981

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	100	5	95	285	18
2	100	5	95	285	12
3	125	6.25	118.75	356.25	11
4	37.5	1.875	35.625	106.875	2
5	75	3.75	71.25	213.75	19
6	100	5	95	285	18
7	125	6.25	118.75	357.25	10
7	662.5	33.125	629.375	1885.125	80

LOTS 1951



HARET AL DARB AL ASFAR F₄:

length of street =165 m.

width of street = 4 m.

area of street =660 m².

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L.F
1	400	(75)	325	975	16
2	775	(175)	600	1800	26
3	2375	(800)	1575	4725	32
4	375	(75)	300	900	13
5	100	5	95	285	8
6	100	5	95	285	7
7	350	(75)	275	825	7
8	175	8.75	166.25	498.75	6
9	175	8.75	166.25	498.75	9
10	200	10	190	570	17
11	150	7.5	142.5	427.5	20
12	425	(100)	325	975	3
13	75	3.75	71.25	213.75	18
14	425	21.25	403.75	1211.25	5
15	75	3.75	71.25	213.75	6
16	150	7.5	142.5	427.5	7
17	725	(275)	450	1350	15
18	150	(25)	125	375	13
19	100	(25)	75	225	8
20	100	5	95	285	5
21	75	3.75	71.25	213.75	6
22	150	7.5	142.5	427.5	17
23	150	7.5	142.5	427.5	7
24	75	3.75	71.25	213.75	10
25	100	5	95	285	7
26	56	2.8	53.2	159.7	7
26	7975	1751.55	6264.45	18793.35	295



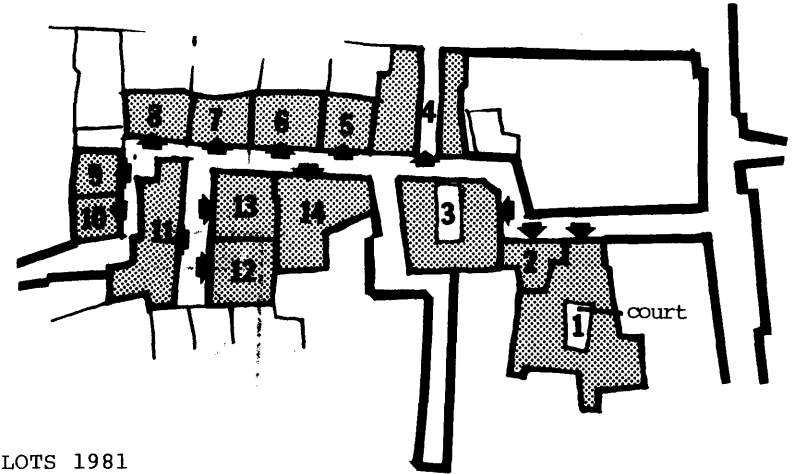
DARB AL RASHIDI D₂:

length of street = 120 m.

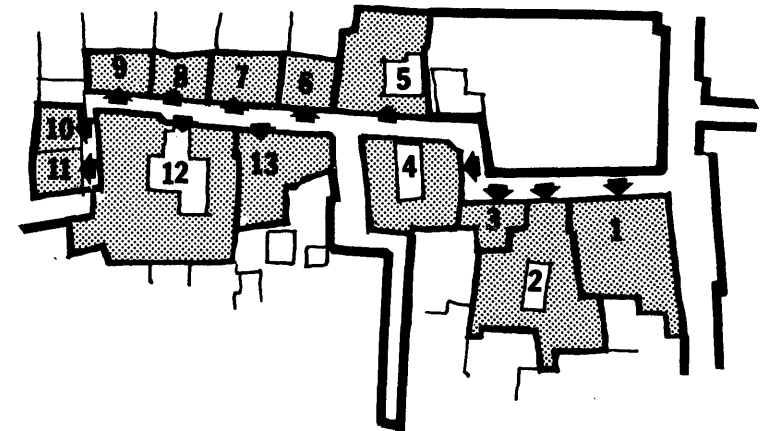
width of street = 4 m.

area of street = 480 m².**AREA OF LOTS SERVED BY THE STREET:**

LOT	A	A.O	.A.B	F.A.B	L.F
1	400	20	380	1140	19
2	450	(50)	400	1200	7
3	87.5	4.375	83.125	249.375	12
4	300	(50)	250	750	29
5	100	(50)	50	150	18
6	100	5	95	285	10
7	125	6.25	118.75	356.25	13
8	100	5	95	285	11
9	75	3.75	71.25	213.75	12
10	100	5	95	285	8
11	75	3.75	71.25	213.75	8
12	650	(100)	550	1650	27
13	250	12.5	237.5	712.5	24
13	3062	315.625	2496.875	7490.625	198



LOTS 1981



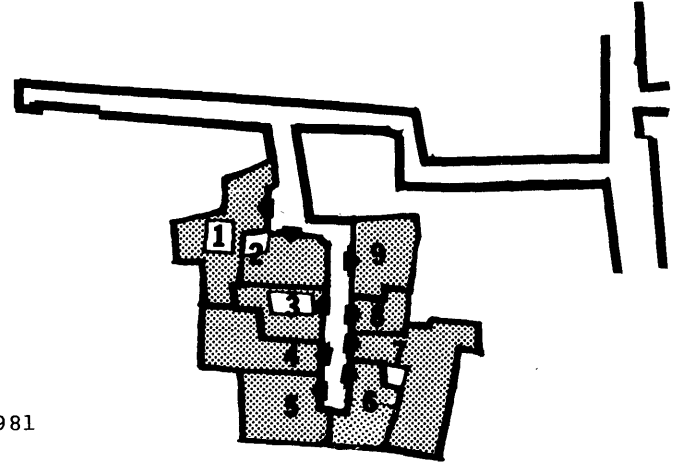
LOTS 1951

ATFET AL RASHIDI E₆:

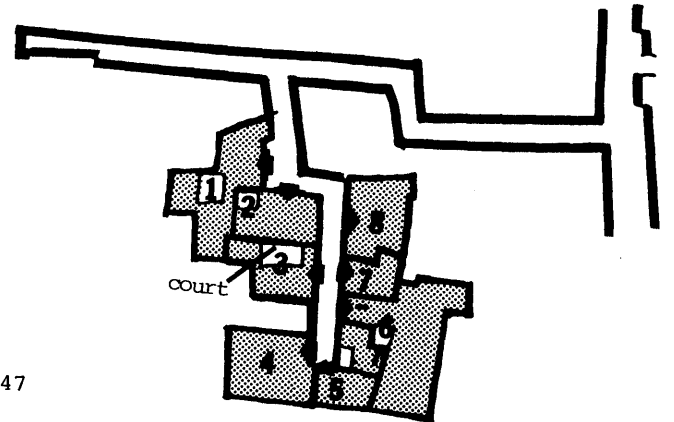
length of street = 60 m.
 width of street = 3.5 m.
 area of street = 210 m².

AREA OF LOTS SERVED BY THE STREET:

LOT	A	A.O	A.B	F.A.B	L
1	250	25	225	675	15
2	137.5	25	112.5	337.5	22
3	125	50	75	225	9
4	200	10	190	570	6
5	162.5	25	137.5	412.5	12
6	300	25	275	825	5
7	75	3.75	71.25	213.75	7
8	150	7.5	142.5	427.5	1.4
8	1400	171.25	1228.75	3686.25	90



LOTS 1981



LOTS 1947

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