URBAN/RURAL DWELLING ENVIRONMENTS: KABUL, AFGHANISTAN

by

Bashir Ahmad Kazimee

B.S. in Architecture, Kabul University,
Afghanistan
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Signature of Author .....
Department of Architecture, May 6, 1977

Certified by .....
Horacio Caminos, Professor of Architecture, Thesis Supervisor

Accepted by .....
Chairman, Department Committee

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ABSTRACT

The study identifies and evaluates the existing dwelling/land situations in Kabul, Afghanistan. The work is based on surveys, evaluations and comparisons of three urban and two rural case studies/localities. The localities represent the range of residential developments of popular, private, and public sectors, from low to high income groups, in the context of urban and rural environments. The physical environment of each of the localities is analyzed/compared in terms of land utilization/layout efficiency and availability and the level of services for each dwelling/land situation. Based upon the case studies, an urban model is proposed. It serves as a tentative model for optimum efficiency of residential layouts. The study is intended to provide a tool/guideline for reference and information for those involved in present and future residential developments, especially for the low income sectors.

The material in this study is based upon field surveys carried out by the author during summer of 1976. The analysis is based on a methodology developed in the Urban Settlement Design Program, under the direction of Professor Horacio Caminos.

Thesis supervisor: Horacio Caminos, Professor of Architecture.

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Case Studies, Proposed Model

BASHIR A. KAZIMEE

Education/Research Program:
URBAN SETTLEMENT DESIGN IN DEVELOPING COUNTRIES
School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts
June 1977

Cover Photograph: View from Sher-Darwaza mountain,
city of Kabul, by Thomas J. Abercrombie.

CONTENTS

PREFACE

This research identifies and evaluates the existing dwelling/land situations in Kabul, Afghanistan. The work is based on surveys, evaluations and comparisons of three urban and two rural case studies/localities. The localities represent the range of residential developments of popular, private, and public sectors, from lowest to high incomes groups in the context of urban and rural environments.

The physical environment of each of the localities is described in terms of land utilization/layout efficiency, utilities and services. The localities are analyzed and studied at four levels: the locality itself, a segment of the locality, a selected block plan of the segment, and a typical dwelling unit. Availability and the level of services for each dwelling/land situation is analyzed and compared. Based upon the case studies an urban model is proposed. It serves as a tentative model for optimum efficiency of residential layouts. The material in this research is based on field surveys carried out by the author during the summer of 1976; complemented by maps and specific references mentioned in the bibliographic notes. The case study analysis is based on a methodology developed in the Urban Settlement Design program, M.I.T., under the direction of Professor Horacio Cominos.

The author is aware of the limitations and lack of information in all aspects of urban planning/studies, especially in regard to the accuracy of the data and statistical documents used in this study. However, the effort and the aim has been an attempt to sketch-out some of the critical issues concerned with the physical environments of residential developments, in its broader socio-economic and cultural context. The documentation was considered sufficiently accurate to provide a fair representation of the existing situation.

The study provides a tentative tool/guideline for reference and information for those involved in present and future residential developments, espicially for the low income sectors.

In carrying out this study the author wishes to acknowledge the support, guidance, and advice of professor Horacio Caminos, whose direction was invaluable in the representation of this work. I am also indebted to Reinhard Goethert for his assistance in all stages of this study, and to my classmates for providing a pleasant environment in which to speculate, and especially to Isabel, Alka, and Vidu for taking particular interest in various stages of this study.

I also wish to thank A.I.D., for the financial support that made these two years possible; and the A.I.D., advisors, William A. Parker and Harold Hudson, in Washington, D.C.

I am further indebted in Kabul to the Planning Office, of Kabul Municipality; the Planning Office of the Ministry of Planning; Central Authority for Town and City Planning; and particularly the Department of Architecture, Faculty of Engineering, for their support and intrerest in this study.

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Finally I am grateful to Professor Albert Szabo for his generous use of his photographs, and Branda Szabo Happy and Nazif for their many kind cosiderations.

INTRODUCTION

In contrast to the many developing countries experiencing the impact of massive and rapid urbanization, Afghanistan for the most part remains a rural society and rapid urbanization and technological change has been a rather recent process. The Republic of Afghanistan has a population of approximately 18 million. 85 percent of the population live and work in the rural areas, three percent lead some form of nomadic life, and only 12 percent live in the urban centers.

New opportunities in the major cities, and the inherent attraction of the city life gave rise to the phenomena of urbanization and the cities became a better alternative for rural migrants. On the other hand, lack of employment opportunities and education in the rural areas, population pressures, and scarcity of arable land, are the forces that push the village inhabitants from their rural environment.

Most of the migrants coming to the cities are from the lowest level of the economic hierarchy. They are extremely poor people and struggle constantly for shelter and security. In contradiction the resources are very limited in the cities, the available urban land is scarce, and the burden on the city governments is becoming more unmanageable. As a result, an urban crisis is created which affects all aspects of life; in particular the city is faced with a severe shortage in the supply of housing and other urban facilities.

Kabul, an important social, economic, and administrative center, is the capital and the largest city in Afghanistan. The impact of the urban crisis is particularly pronounced. The basic conventional approach of the government to these problems have proved unsatisfactory. New responsibilities and new outlooks must be assumed by government authorities and professionals. It is necessary to recognize and utilize the existing potentials/limits to ease the severe problems.

This study aims at the investigation of existing patterns/conditions through surveys, analysis, evaluation, and comparison of different settlements in an urban/rural contexts. The goal is to develop models and to suggest future policy guidelines in terms of land utilization.

The objectives of this study are to emphasize/evaluate the correlation between the efficiency of the settlements and their physical layouts; to recognize/define the limitation and potential of the existing patterns in terms of physical structures; to recognize different levels of various socio-economic groupings; and to suggest guidelines for more realistic and effective shaping of the physical environment.
The study concentrates on the city of Kabul as well as on rural dwelling/land systems as case studies. The localities chosen to survey and analyze cover a wide spectrum in both existing urban and rural dwelling environments, in order to provide a balanced overview.

The study consists of the following three sections:
1. Urban context: three case studies of the dwelling/land systems.
2. Rural context: two case studies of the dwelling/land systems.
3. Urban model suggesting tentative guidelines for residential layouts.

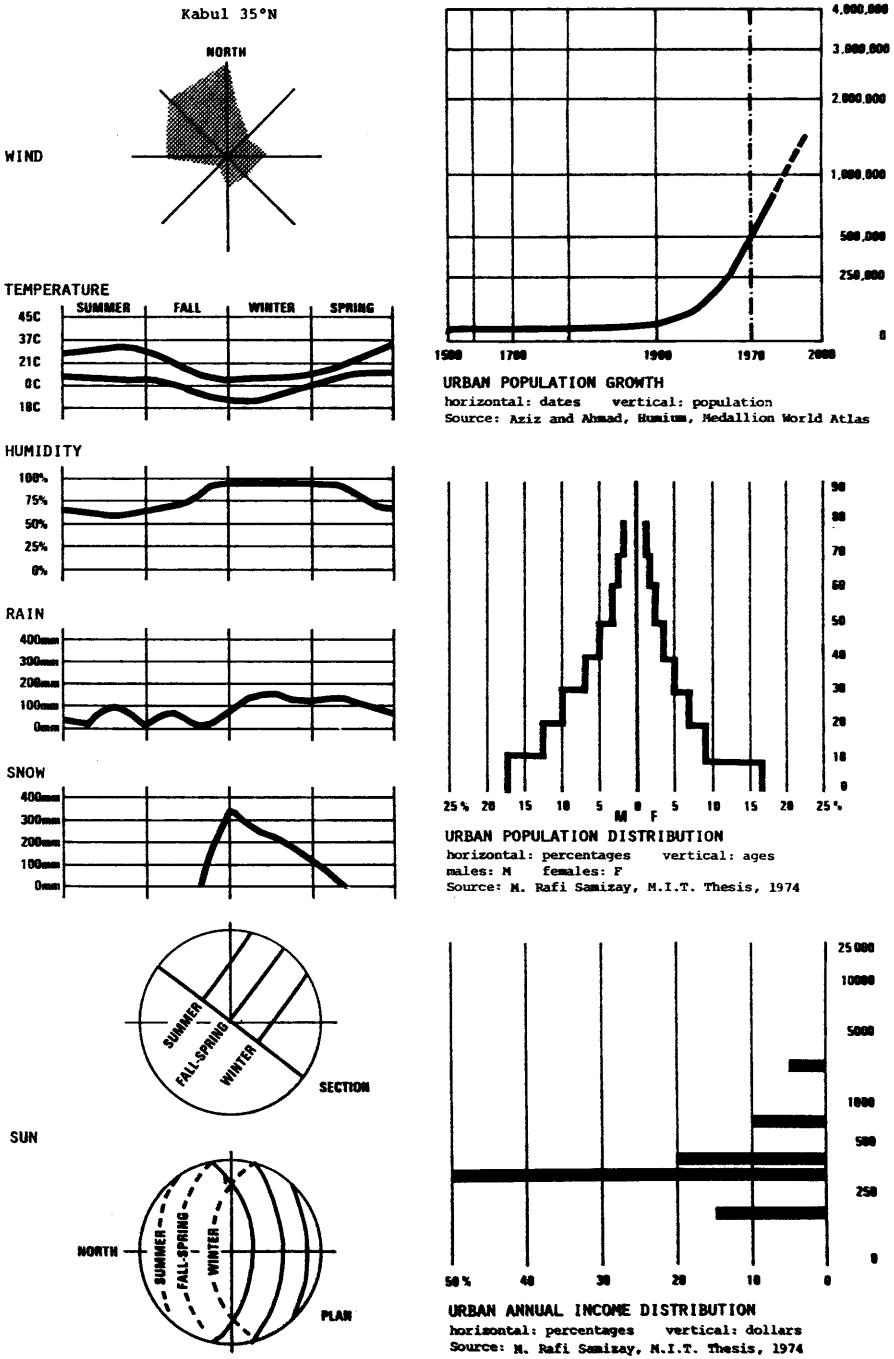
KABUL, AFGHANISTAN

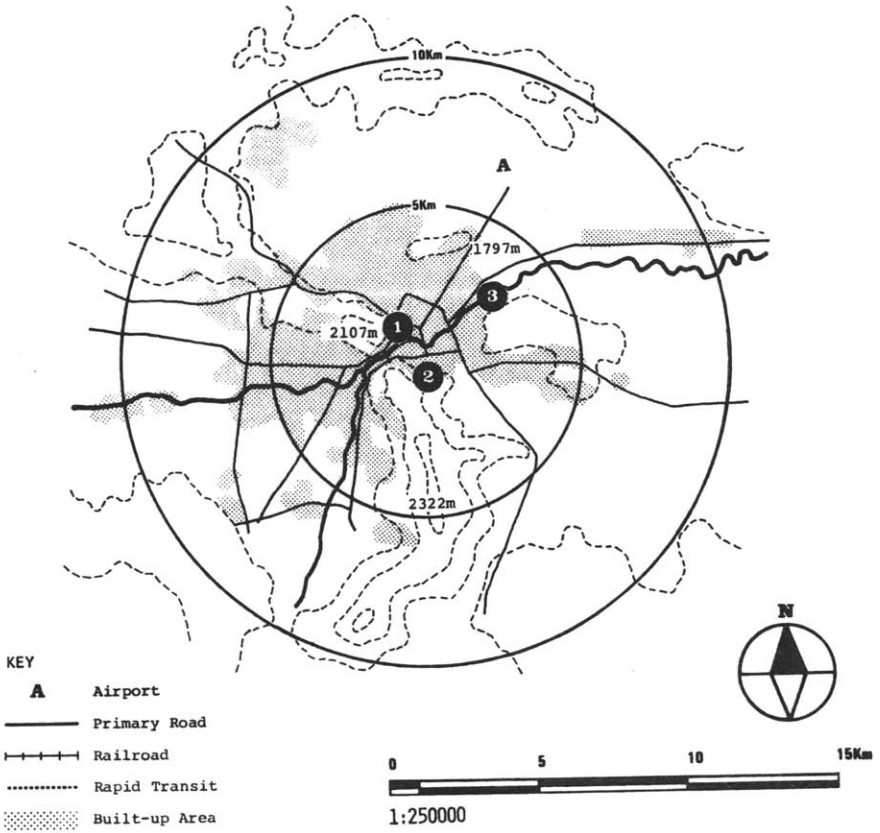
URBAN CONTEXT

1. PRIMARY INFORMATION: Kabul, the largest city and the capital of Afghanistan is the most important center of trade, business, and political and administrative activities in the country. It is located at latitude 34° 33' North and longtitude 69° 13' East. The urban development of Kabul is concentrated on the valley floor of the Kabul-River, and is at the height of approximately 1800 meters above sea level. The area extending a distance of about 25 km east to west and about 10 km north to south, is still considered the urban area of Kabul. The Kabul-River as well as the Asmaye mountain (2000m) to the north, and the Sher-Darwaza mountain (2332m) to the south of Kabul-River are the main physical characteristics of the city. The coldest month is January, when the mean temperature reaches 1.4°C. The summer is hot and dry, with a mean temprature of 25°C in the months of February, March, and April. The annual precipitation is low, approximately 329 mm, of which 50% may occur as snow. The prevalent wind in the winter is from the north, and in the summer from the south-west direction. The sun angle is 51° 29' in the winter and 60° 30' in the summer.

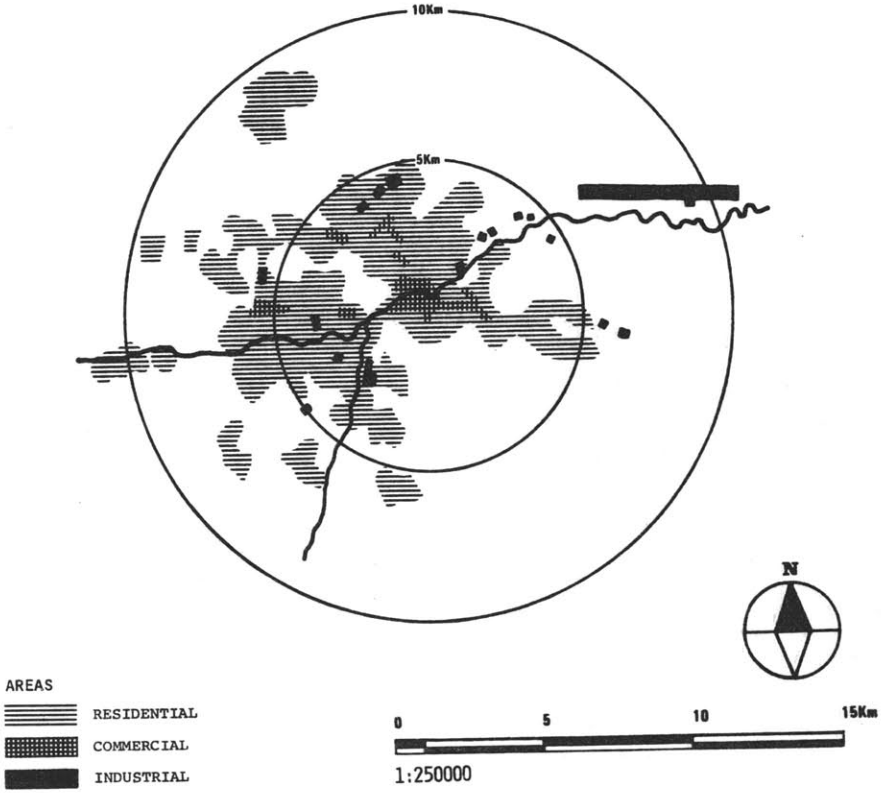
2. HISTORY: Contemporary historians believe that in prehistoric times the Kabul valley region was ruled by a number of independent tribes. In 150 A.D. Ptolemy identified Kabul for the first time in his writings as "Kabura" on the "Kophen River", the capital of "Kabolitae". In 657 A.D. Hsuen-Tsang, a Chinese pilgrim who came through Kabul, he described Kabul as an important commercial, and political, and religious center. From his observation can be assumed that Kabul was commercially and strategically an important city, especially because of its location on main route leading to India. In the Fifth Century a massive defensive wall was built on the Sher-Darwaza mountain extending eastwards to Bala-Hisar (the Citadel) and on the the Asmaye mountain to the village of Deh-Afghanan and the city's security system was further increased. At this time Kabul was an agricultural community and the religion of its inhabitants was Buddhism. Two hundred years later, Arabs conquered Kabul and the inhabitants accepted Islam as their new religion. In 1504 Babur Shah, the Mughul emperor, established Kabul as his capital. Babur was fond of Kabul and he constructed several buildings and planted beautiful gardens. In 1739A.D. Kabul suffered from the invasion of the Iranian king Nader Shah Afshar and some of the city's buildings and gardens were destroyed. Soon however, it was retaken by the Afghan king Ahmad Shah Durani, the founder of modern Afghanistan, and the capital was established in Kandahar. After his death in 1773, his son Timur Shah transferred the capital from Kandahar to Kabul, primarily because of its central location and less tribal conflicts. During this period Kabul grew in prosperity and in population as the capital of the kingdom. The size of Kabul in the Nineteenth Century remained very much the same and the physical structure possessed most elements of the traditional Afghan urban centers. Fortifications enclosed the city; the entrance was controlled through several gates; and many bazaars were the centers of city life.

3. ECONOMY: Kabul is considered the most important commercial and industrial center of Afghanistan. It is the crossroads of domestic as well as international travel. Approximately 66% of the industries and 69% of the labor force is located in Kabul. The main industrial products are textile, food, clothing, tanning, metalworks, auto-service, and building materials. According to a sample survey of 1970 by the Ministry of Planning, the annual percapita income for Kabul is estimated to U.S. $160 verses U.S. $100 for the country. Out of the total population 27% represents the working population sector and over one-half of the population is employed in administrative jobs. Approximately 35% of the population lies in the low income group which earns below $30





URBAN TOPOGRAPHY AND CIRCULATION



URBAN LAND USE PATTERN

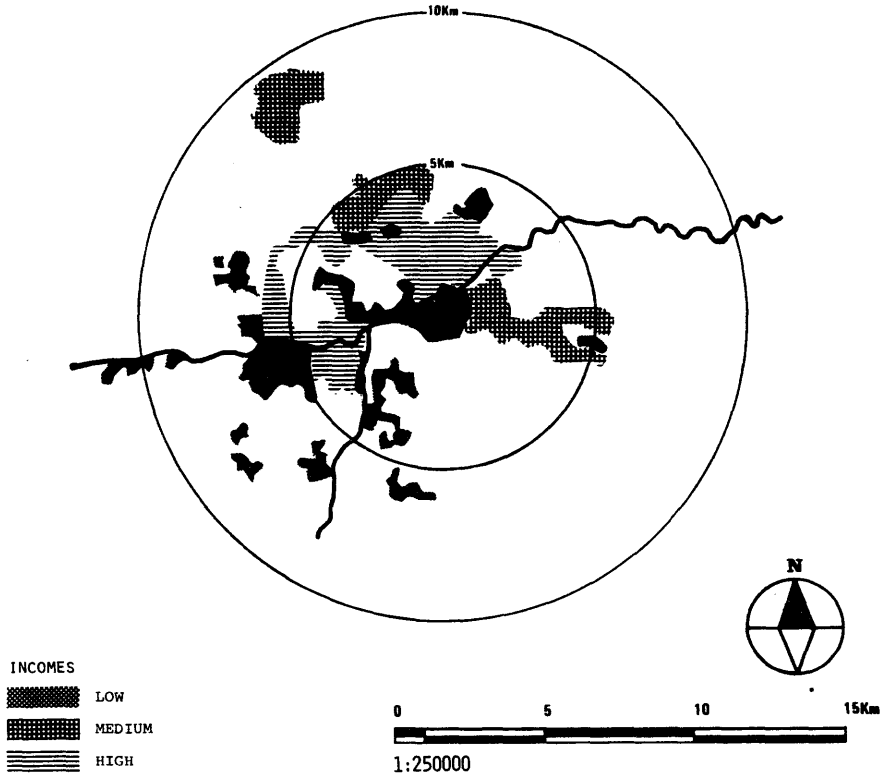
per month. 50% earns between $30 and $100 per month and only 14% earns more than $100 per month.

4. GOVERNMENT: In July, 1973, the monarchy was ended by President Mohamad Daoud and Afghanistan was declared a republican country. The new government repealed the constitution of 1964 which had a two-house parliamentary system and a judiciary independent of and co-equal with the legislative and executive branches. The new Republic of Afghanistan has its intention of creating a new democratic constitution.

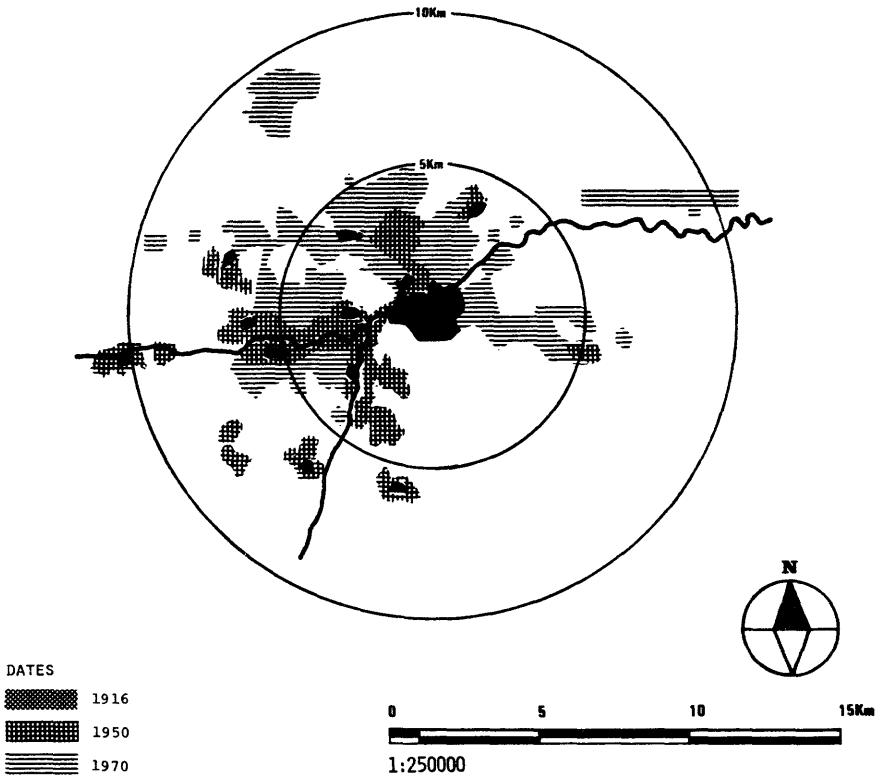
5. DEMOGRAPHY: Kabul represents 3.4% of the population of the entire country, and 35.8% of the total urban population of Afghanistan. According to a sample survey of 1970 (U.N.) the gross population of Kabul was estimated to be 520,000 people. The rate of natural increase of population is estimated between 2.0% and 2.5% per annum, and the rate of migration into the city is estimated between 2.75% and 4.0% per year. The gross residential area of the existing city is 4214 hectares. Out of the total inhabitants, 194,000 people live in the old urban areas, 180,000 people in the new urban areas and 145,600 people live in the rural areas. The number of houses in 1972 was estimated 43,000 with an average of 1.7 households per unit. The average family size is 7.1 persons.

6. URBAN GROWTH: It is estimated that Kabul in the 17th Century had a population of 10,000 people. In 1878 Kabul had 23,000 houses with a population of 70,000 people, and the area of the city was 180 hectares. Oscar Von Niemdermayer in 1916 reported the population of Kabul to be 65,000 inhabitants. The area of the city at this time was estimated to be about 400 hectares. Due to rapid growth Kabul expanded beyond its walls during this period, to include the villages of Deh-Afghanan across the river. In the Twenties, King Amanullah started building a new city on a site 15km south-west of the old city. This attempt at a new city was soon abandoned after his downfall in 1929. In 1936, the population of the city was 120,000 people, the area of the city at this time was estimated to be 500 hectares. During the Thirties, a large residential neighborhood was planned outside the boundaries of the old city for the first time. This development was patterned as a gridiron layout, typical of new western cities but not previously seen in Kabul. The idea of single-family detached houses on individual plots, contrasted with the densely attached houses of the old city. The new section was named Shari-Nau (new city). It was in this period that the last gate of the city (Lahori-Gate) was torn down.

In 1951 the population of the city further increased to 250,000 people within an area of 1500 hectares. This period saw a new surge



URBAN INCOME PATTERN



URBAN GROWTH PATTERN

of growth for the city. New roads were built office buildings and hotels began to appear. Migration from the other cities began and Kabul became the attraction center of employment. The first attempt at efficient municipal planning was initiated in 1962. A Soviet team of planners apparently under direct arrangement with the Municipality of Kabul, undertook a thorough investigation of the physical, human, social, and economic conditions of Kabul. In 1970 the population of Kabul reached about half a million and the residential area expanded to 2700 hectares. At this time more modern buildings such as hotels, offices, institutional and government buildings were built.

7. RECENT URBAN DEVELOPMENT: In 1966, realizing the importance of housing and urban development, the government authorized the Department of Housing and Town Planning to oversee the problems of the cities in Afghanistan. The purpose was to arrange master plans considering the future growth of all the cities in the country, with the consideration of housing as an important section of the development. New projects were developed in Kabul by this department to overcome the housing deficits. The projects developed in Kabul are as follows:

A. Khair Khana Maina residential project, located to the north-west of the city, was one of the largest projects planned for almost 20,000 people. This development was mainly intended for low and middle income people. About 500 houses and 9000 plots were sold to people.

B. Sia Sang residential project, located in the south-east periphery of the city. It was originally planned for 1100 plots, but later it was expanded to about 4000 plots. The plots were sold and about 3000 houses are built.

C. Khoshal Khan residential project, located to the west side of the city on privately owned land, was developed by the government. This project is still under development.

D. Wazir Akber Khan residential project, located to the north near the city center, was developed mostly for high income people. There are about 400 plots and almost all of them now have houses. This area has the most modern houses in Kabul.

E. Nader Shah Maina residential project also called "Nicro Royan", located to the east of the city center, was built with prefabricated elements. It is the largest housing project planned and constructed by the government. Up to 1974 about 2500 apartments were built for about 10000 inhabitants.

KABUL, Afghanistan: (top) view showing the new center of the city.

(bottom) view showing the square (chowk) of Jada-e-Maiwand, located at the middle of the old city.

URBAN CONTEXT SOURCES

Topography and Circulation: *(approximate) Kabul Municipality Planning Office. (Cartographic Institute, Kabul, 1974).*

Land Use Pattern: *(approximate) IBID.*

Income Pattern: *(approximate)IBID, field survey B. Kazimee, students from Department of Architecture, Faculty of Engineering, Kabul University, 1976.*

Climate: *(accurate) R. Samizay, M.I.T. Thesis 1974.*

General Information: *R. SAMIZAY, M.I.T. Thesis 1974.*
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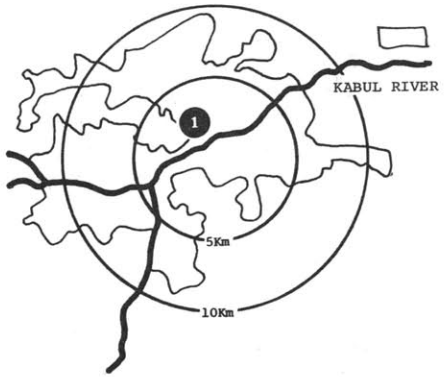
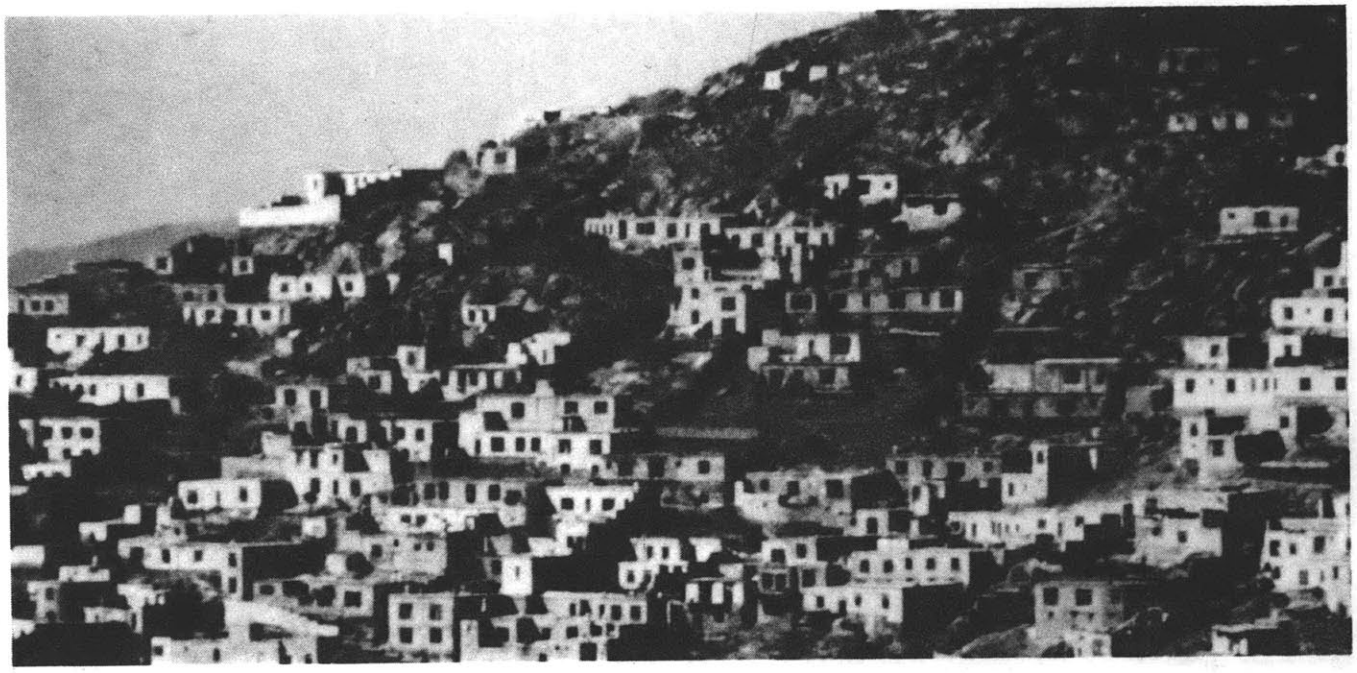
1 DEH-AFGHANAN, Kabul

POPULAR, LOW INCOME,
URBAN SQUATTER SETTLEMENT

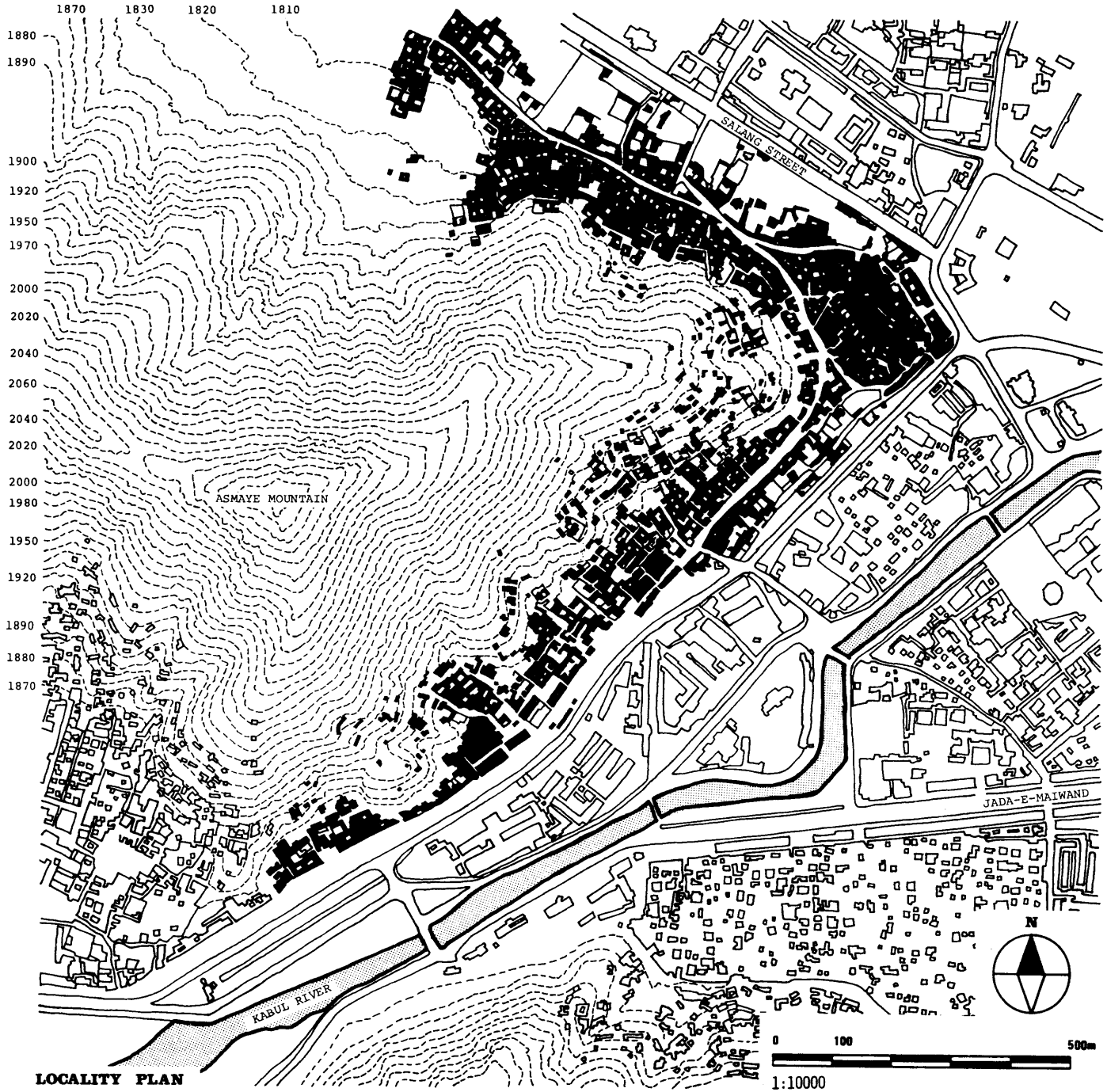


1. LOCATION: It is located on the east end of the Asmaye mountain, and to the north of the Kabul River which is adjacent to the city center. The locality grew from squatters after its first settlement and spread on both sides of Asmai Mountain, to the north towards Salang-Maina and to the south towards Deh-Mazang.



DEH-AFGHANAN, Kabul: (top) A view of the old squatter area on the side of the Asmaye mountain. The houses are in a bad physical shape and the locality is at the saturated stages of development.

(bottom) A view showing comparatively new squatters which follow the recent gradual expansion of the locality on the side of the same mountain.



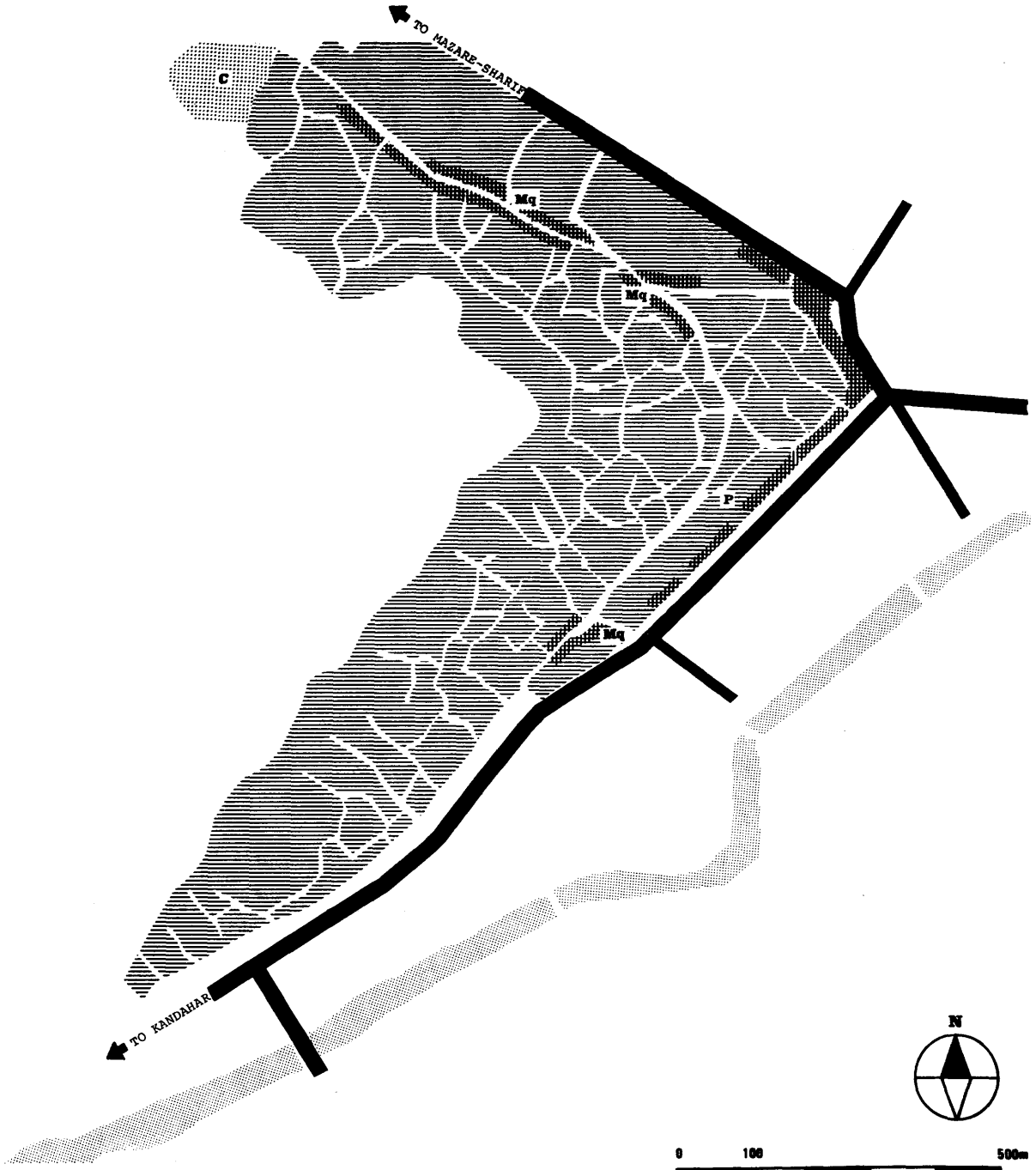
LOCALITY PLAN

2. ORIGINS: In 1916-1930 the existing Old-City of Kabul expanded to include the villages nearby. The first village within the boundaries of the city was Deh-Afganan. The farther growth of the locality was by squatters who were migrants from the other cities or from rural areas. They either directly settled in the area or they first settled in the other sections of the city before constructing their houses here. The houses and the land in this area do not have any legal title and the municipality recently banned the growth of such settlements in the city.

There are no sanitary services or water in this area. The water is carried either by the users or by water carriers (saque) from the foot of the hill where a public water pipeline is provided, or from the nearest possible springs on the mountain. The locality has electricity.

3. LAYOUT: The locality grew by accretion. The irregular type of layout is the result of this growth, the hilly site, and illegal ownership of the land. Lots are irregular in shape and of different sizes. The old houses in this area are of the usual traditional type built from adobe and mud. In the new houses they took the advantage of brick and stone. Because of its availability on the site, stone is used extensively. Houses on the lower part of the hill are two story apartment-like structures overlooking the circulation paths. As one goes higher the houses become detached and spread out.

Note: Elevations indicated in meters



LOCALITY LAND USE PATTERN

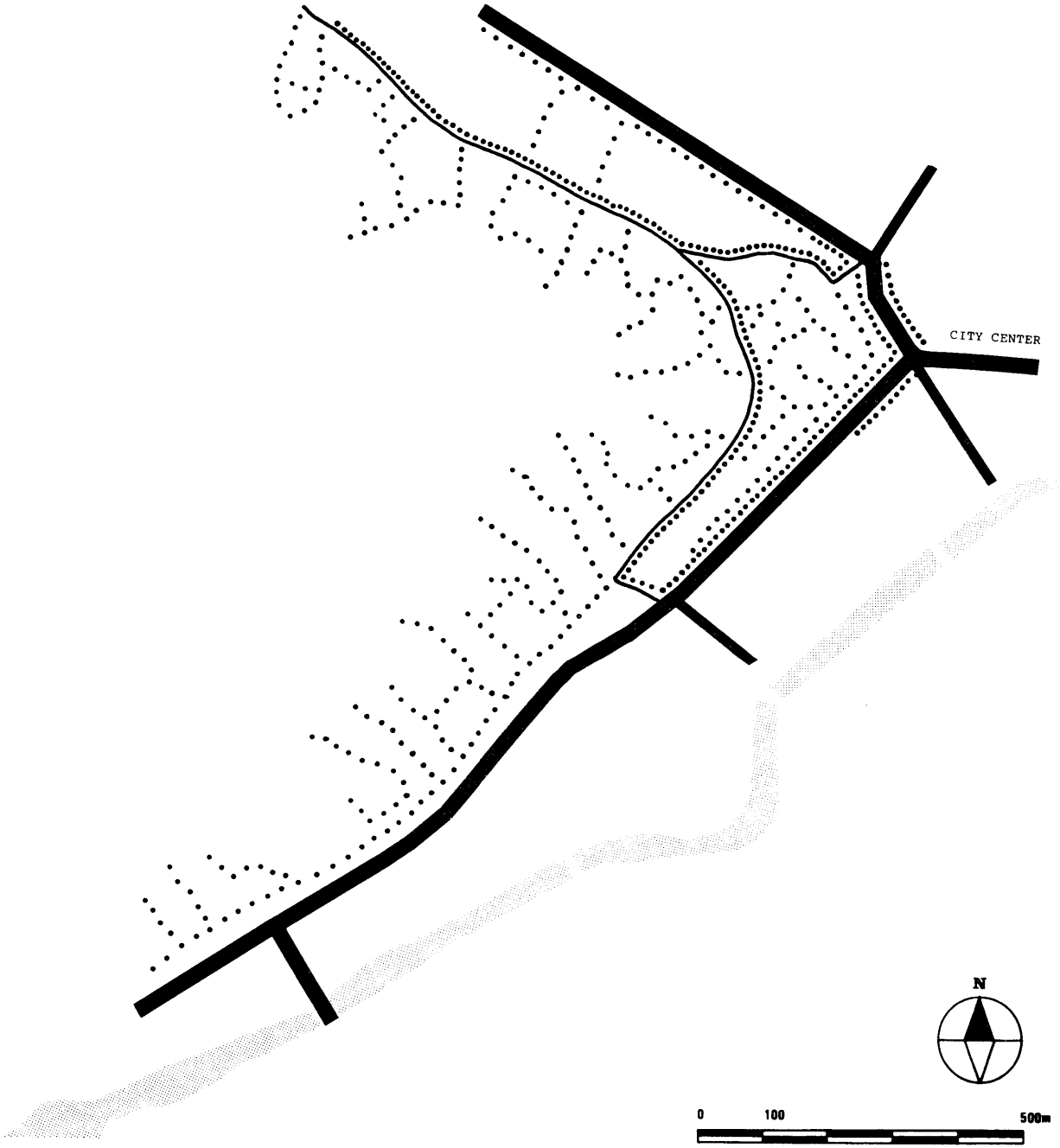
4. **LAND USE:** Commercial activities occur at the foot of the hill on the main street. Elsewhere the locality is almost exclusively residential. Some minor commercial facilities also are intermixed with the residential areas along the unpaved road in the middle of the site, which consist of small shops, small restaurants, and tea houses. There are three mosques in the locality. There are no schools in the site, but neighboring schools and employment centers are easily reached. There are no defined open spaces in the site. The surrounding areas on top of the hill as well as the open land in the site are the only open spaces that are undeveloped. No industry exists in the site.

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- **Pk** Parking
- **P** Police
- **F** Fire Department
- **S** School
- **Mq** Mosque
- **R** Recreation
- **L** Library
- **U** University
- **H** Health
- **PO** Post Office
- **SS** Social Services
- **M** Market
- **C** Cemetery
- Bus
- Rapid Transit



LOCALITY CIRCULATION PATTERN

5. CIRCULATION: An unpaved road provided at the middle of the site is the only vehicular street which connects the site to the main city streets. There is no other regular circulation pattern in the locality. Almost all the circulation is predominantly pedestrian. The pedestrian paths are heavily influenced by topography. Muddy walkways make the walking difficult during the winter.

6. POPULATION: According to the 1974 census the locality has an estimated population of about 30,000 people. The residential area of Deh-Afghanan is very densely occupied and the density of population sometime reaches 750 persons per hectare.

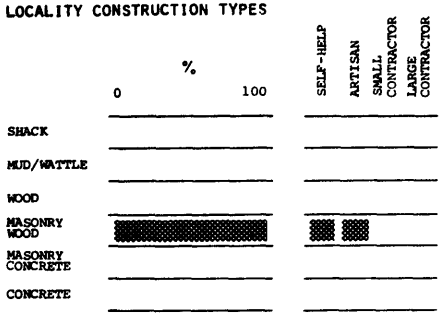
7. INCOME: Data is not available. The majority of the population falls within the low income group and are mostly manual laborers.

KEY

VEHICULAR

PEDESTRIAN

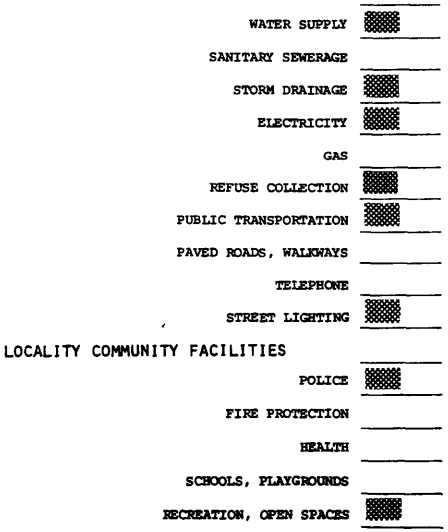
LOCALITY CONSTRUCTION TYPES



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

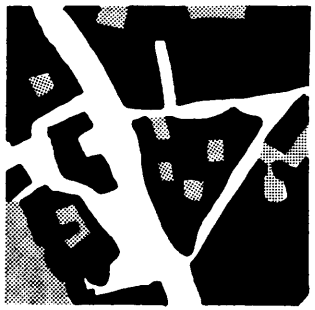
Quality of information: Approximate

LOCALITY SEGMENT PLAN

1:2500

LAND UTILIZATION DIAGRAMS

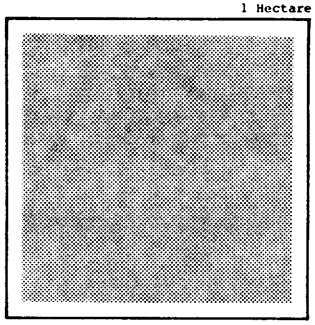
1 Hectare



PATTERNS

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

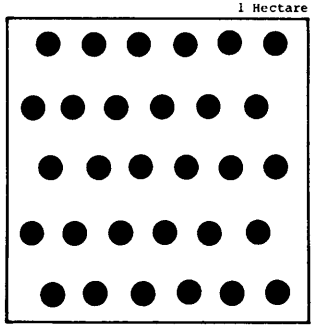
1 Hectare



PERCENTAGES

Streets/walkways	16%
Playgrounds	-
Cluster Courts	-
Dwellings/Lots	84%

1 Hectare



DENSITY Persons/Hectare 600

● 20 persons

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	25	0.6	42
DWELLING UNITS	47	0.6	78
PEOPLE	345	0.6	575

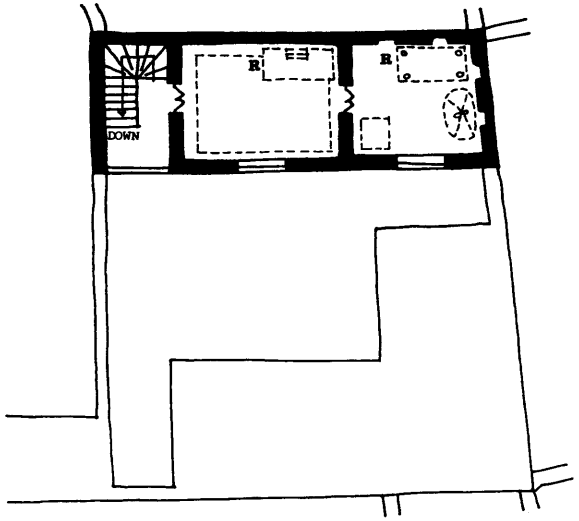
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.26	43
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	0.34	57
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	0.6	100

NETWORK EFFICIENCY

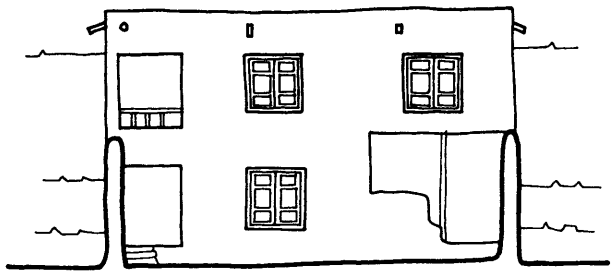
$$R = \frac{\text{network length (circulation)}}{\text{areas served (circulation, lots)}} = 327 \text{ m/Ha}$$

AVERAGE LOT AREA = 136 m^2

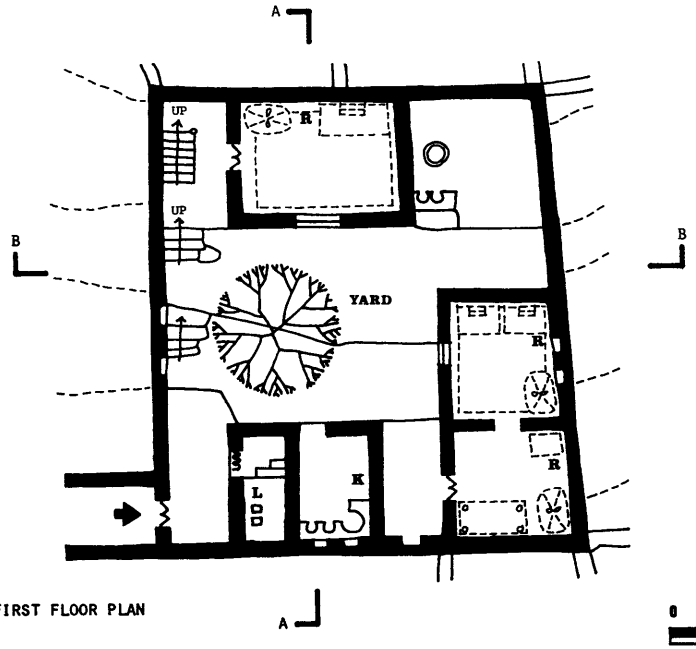
LOCALITY BLOCK PLAN



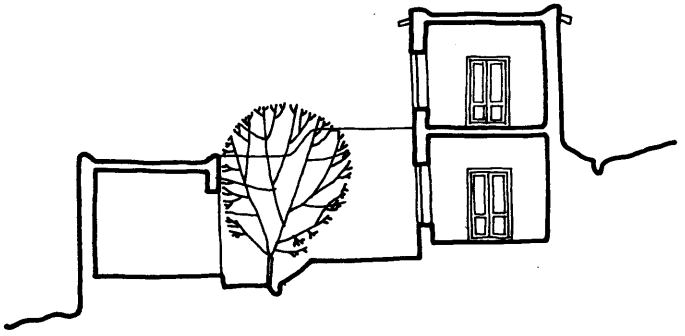
SECOND FLOOR PLAN



SECTION B-B

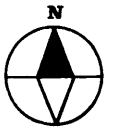


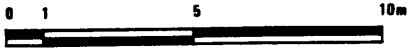
FIRST FLOOR PLAN



SECTION A-A

TYPICAL DWELLING





1:200

KEY

FR	Family Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Latrine
C	Closet
S	Storage
R	Room (multi-use)
GR	Guest Room

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	HOUSE
area (sq m):	81
tenure:	EXTRALEGAL OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	132
tenure:	EXTRALEGAL OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	ROW HOUSE
number of floors:	2
utilization:	MULTIPLE/FAMILIES
physical state:	FAIR
DWELLING DEVELOPMENT	
mode:	INCREMENTAL
developer:	POPULAR
builder:	SELF-HELP/ARTISAN
construction type:	MASONARY/WOOD
year of construction:	1965
MATERIALS	
foundation:	STONE
floors:	STONE/MUD
walls:	ADOBE
roof:	WOOD-TIMBER SUPPORTS
DWELLING FACILITIES	
wc:	-
shower:	-
kitchen:	2
rooms:	5
other:	LATRINE/CLOSETS

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	MAZARI-AHARIF
place of birth:	MAZARI-SHARIF
education level:	NONE
NUMBER OF USERS	
married:	4
single:	2
children:	6
total:	12
MIGRATION PATTERN	
number of moves:	3
rural - urban:	-
urban - urban:	1960, 1962, 1963
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	LOW
employment:	BARBER
distance to work:	2km
mode of travel:	BUS
COSTS	
dwelling unit:	N.A.
land - market value:	N.A.
DWELLING UNIT PAYMENTS	
financing:	SELF FINANCING
rent/mortgage:	-
% income for rent/mortgage:	-

DEH-AFGHANAN, Kabul: (left) A typical squatter house with courtyard for privacy. The land tenure is not legal and all of the dwellings are built without a license.

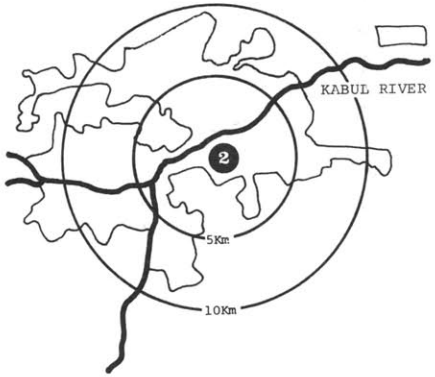
(right) Recent squatters on the steeper slopes of the Asmaye mountain being consolidated. Access to the dwellings is often by undeveloped walkways. The dwellings are built with permanent materials and are structurally sound.

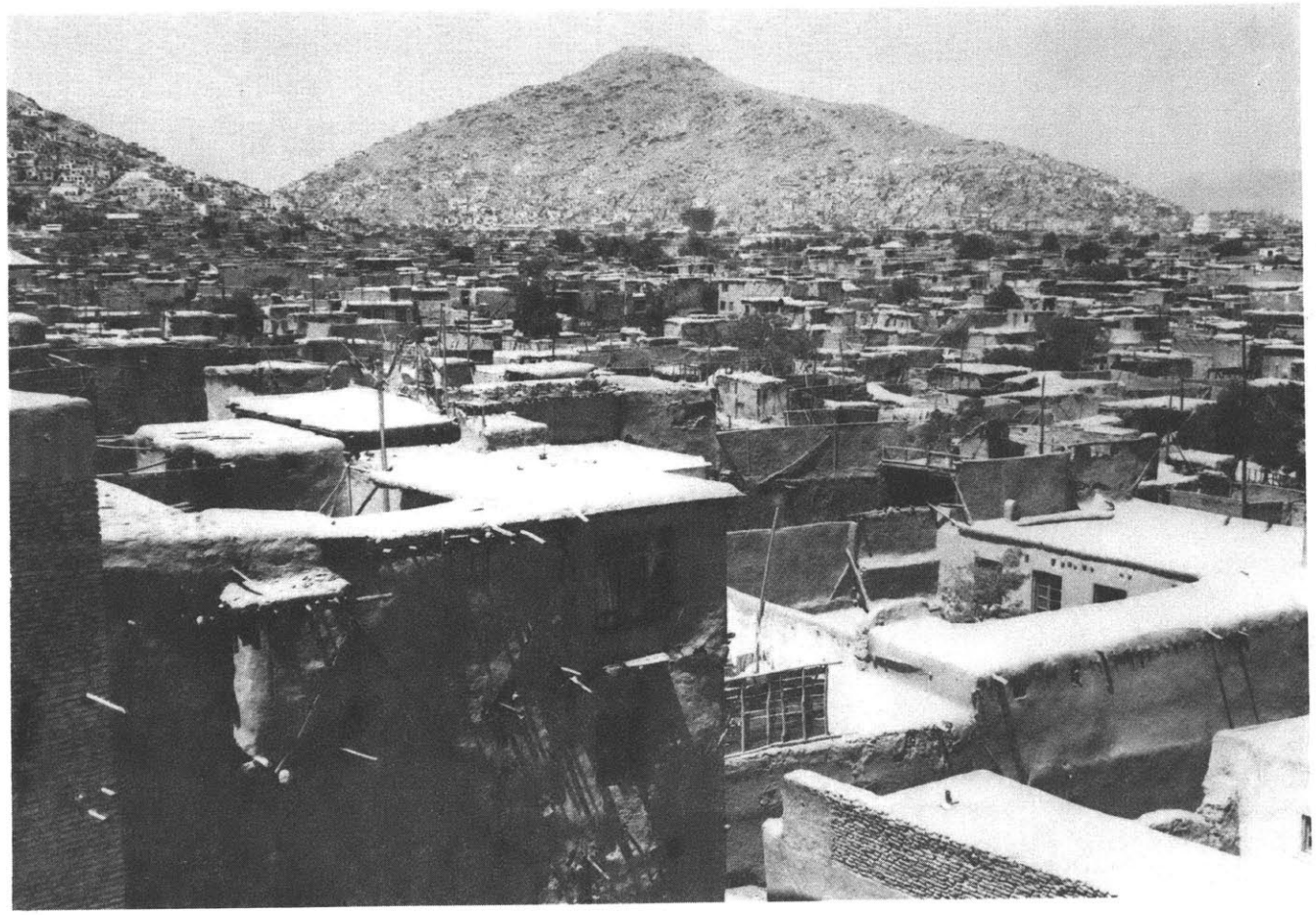
LOCALITY SOURCES

Plan:	*(accurate) Kabul Municipality, Planning Office. (Cartographic Institute, Kabul, 1969).*
Land Use Pattern:	*(approximate) IBID, field survey, B. Kazimee, students from Department of Architecture,, Faculty of Engineering, Kabul University, 1976.*
Circulation Pattern:	*(approximate) IBID.*
Segment plan:	*(accurate) IBID.*
Block Plan:	*(approximate) IBID.*
Typical Dwelling:	*(accurate) Field survey B. Kazimee, students from Department of Architecture, Faculty of Engineering, Kabul University, 1976.*
Physical Data:	*(accurate) IBID.*
Socio-Economic Data:	*(accurate) IBID.*
Photographs:	*B. Kazimee, Albert Szabo, 1976.*

2 OLD CITY
Kabul

PRIVATE, LOW INCOME,
URBAN TRADITIONAL SETTLEMENT





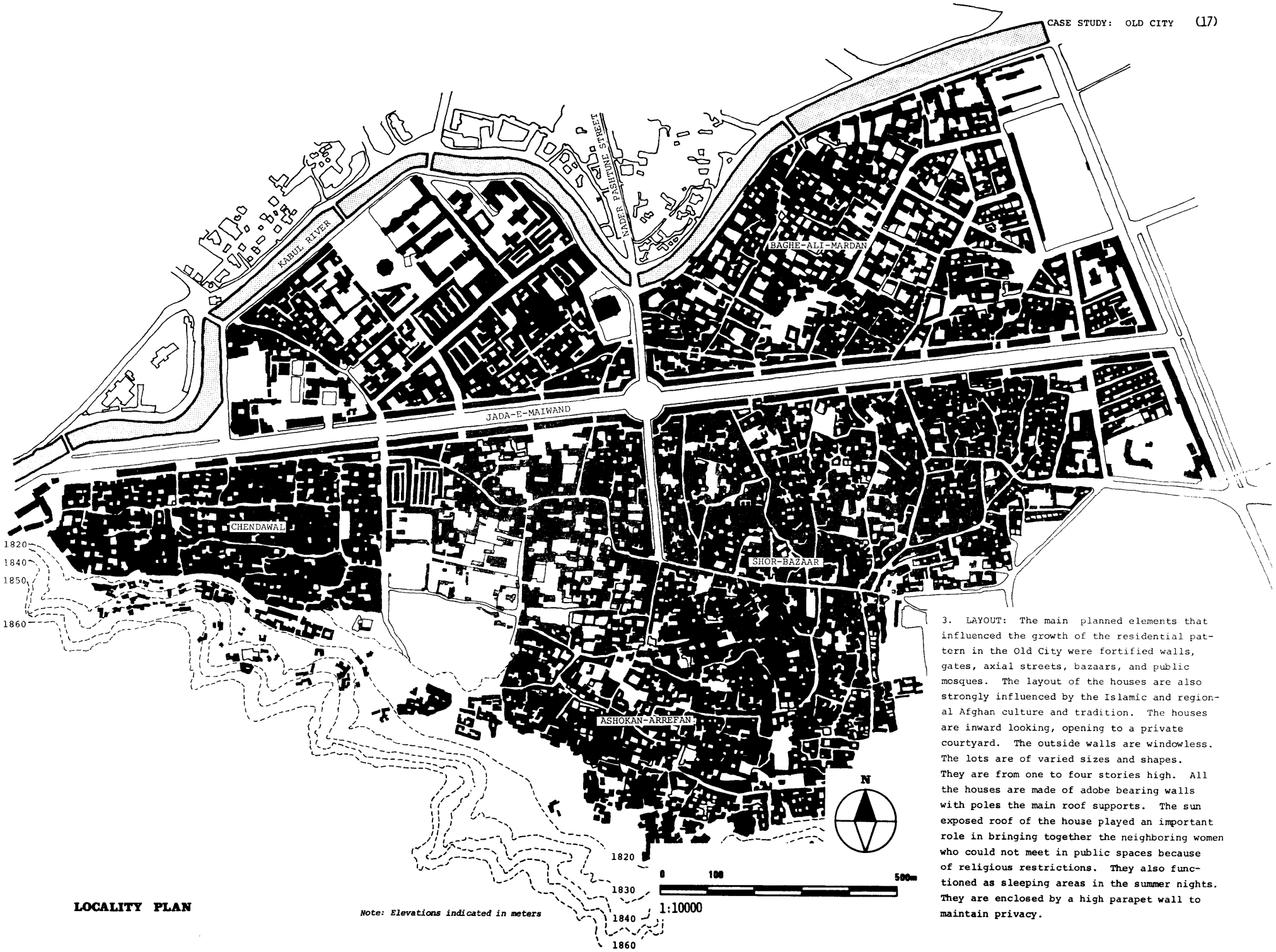
1. LOCATION: The Old City is located to the south of Kabul River and to the north of the Sher -Darwaza mountain. It is considered the center of the city. It was planned historically for reasons of defense, and is a good example of a traditional urban settlement. The locality is composed of several other sections: Shor-Bazaar, Chendawol, Ashokan-Arrifan, and Baghi-Alimardan.

2. ORIGINS: It is estimated that during the Seventeenth Century the city of Kabul, which is the existing Old City, was nothing but a village town of about 10,000 inhabitants. In 1878 the Old City was still enclosed by a wall; prominent bazaars at this time were Char Cheta Bazaar, Shor Bazaar, and the Chendawol Bazaar which still exist. The size of the Old City in the Nineteenth Century remained very much the same as today. The boundaries at that time were defined by the Sher-Darwaza mountain to the south and Kabul River to the north; and starting from the Bala-Hissar (citadel) to the east, a wall ran north towards the river completing the city's defense system. Entrances to the city were controlled through seven gates.
The first piped water supply in the Old City was constructed between 1910-1920, in addition it had an underground storm sewer system which was only available in few other areas of the rest of the city.

6. POPULATION: The total population in this area is approximately 107,000 people, and the density in some areas reaches 1000 persons per hectare. There are 7,531 houses with 17,247 families. The average occupancy is 16 persons per house.

7. INCOME: Data is not available. Although a quarter of the wealthy families lived here at one time, today it has mostly turned into tenements for the low income group.

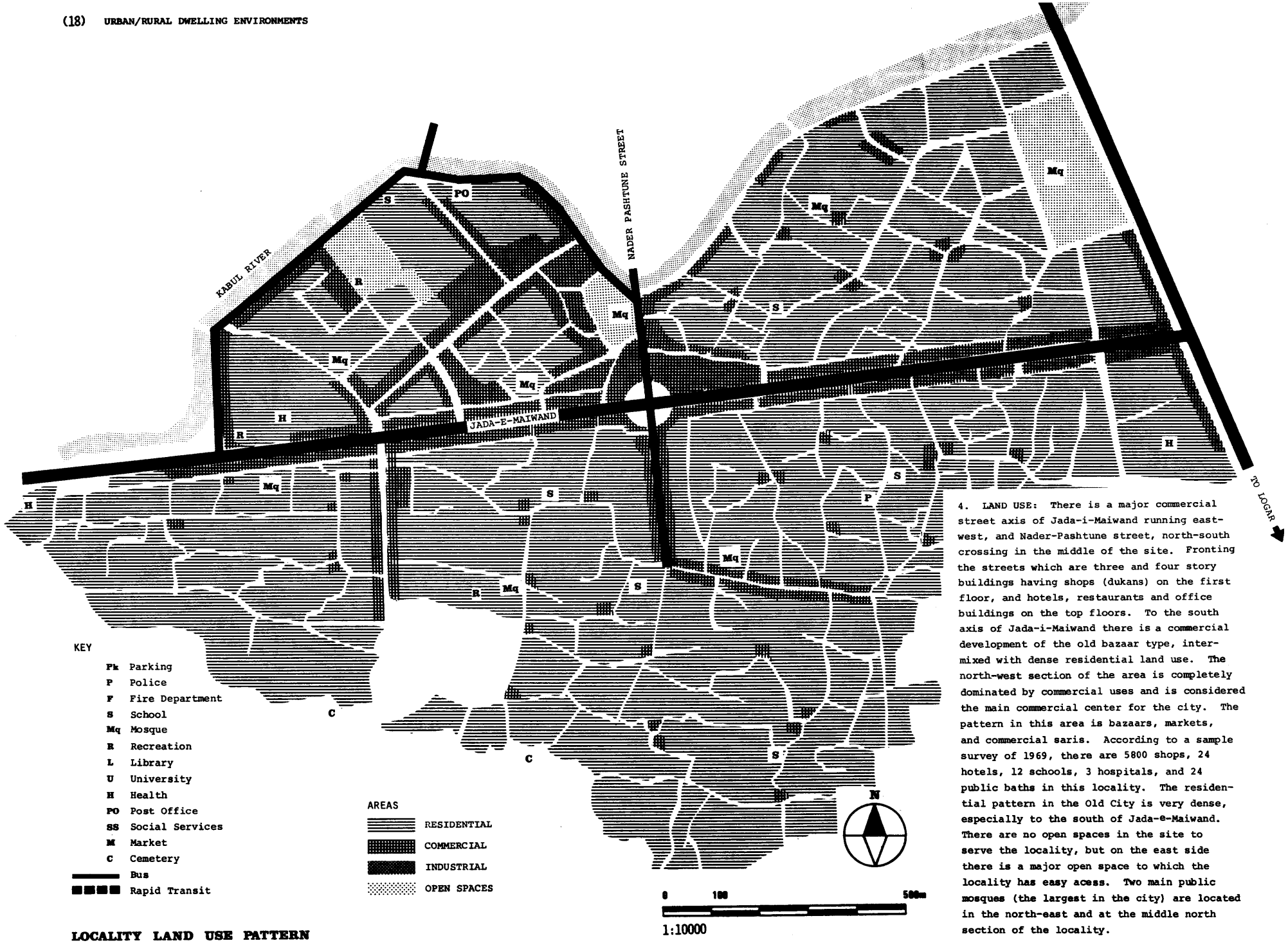
OLD CITY, Kabul: Panorama showing the west section of the locality. The locality is at the saturated stage of development and is considered a slum area.



LOCALITY PLAN

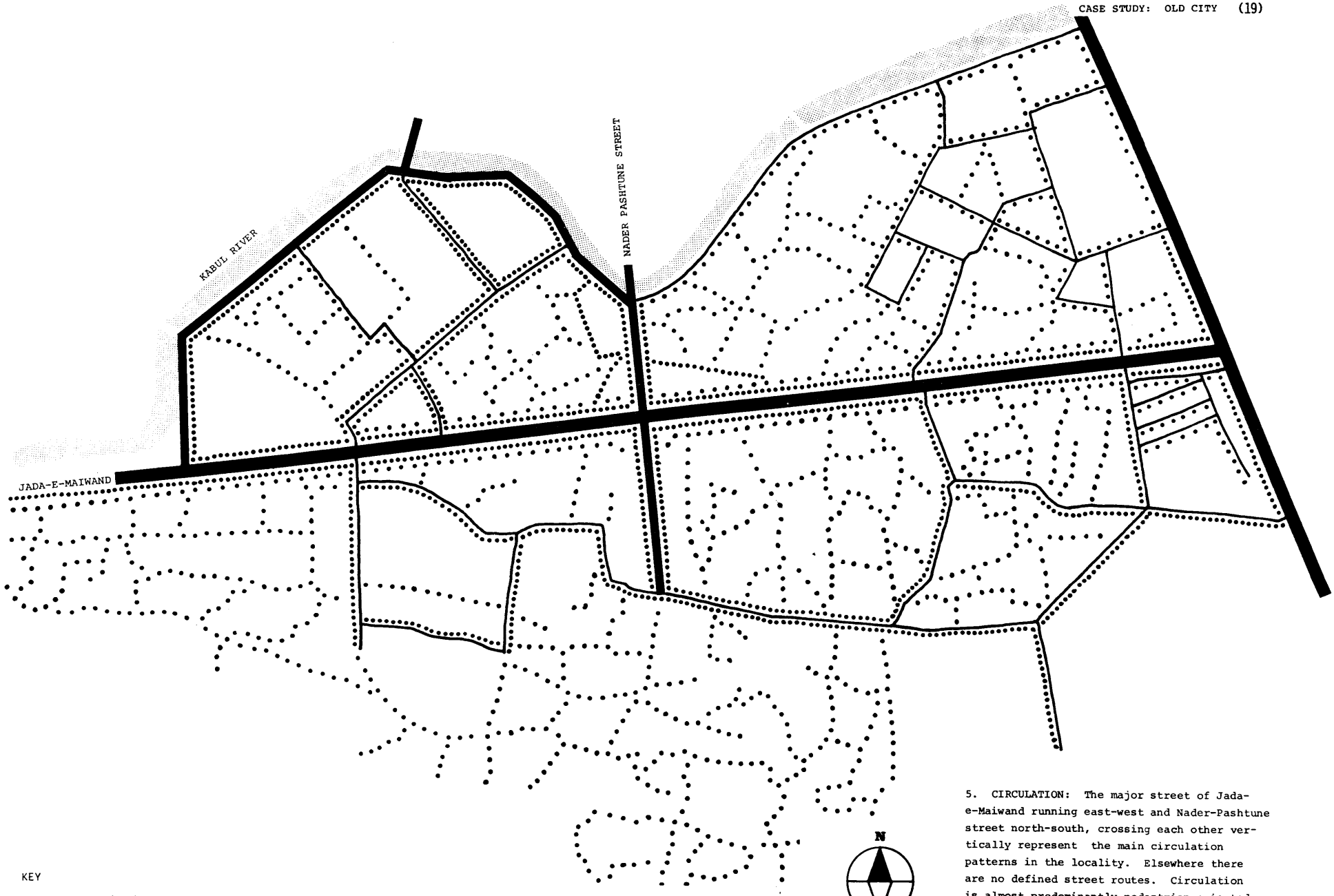
Note: Elevations indicated in meters

3. LAYOUT: The main planned elements that influenced the growth of the residential pattern in the Old City were fortified walls, gates, axial streets, bazaars, and public mosques. The layout of the houses are also strongly influenced by the Islamic and regional Afghan culture and tradition. The houses are inward looking, opening to a private courtyard. The outside walls are windowless. The lots are of varied sizes and shapes. They are from one to four stories high. All the houses are made of adobe bearing walls with poles the main roof supports. The sun exposed roof of the house played an important role in bringing together the neighboring women who could not meet in public spaces because of religious restrictions. They also functioned as sleeping areas in the summer nights. They are enclosed by a high parapet wall to maintain privacy.



LOCALITY LAND USE PATTERN

4. LAND USE: There is a major commercial street axis of Jada-i-Maiwand running east-west, and Nader-Pashtune street, north-south crossing in the middle of the site. Fronting the streets which are three and four story buildings having shops (dukans) on the first floor, and hotels, restaurants and office buildings on the top floors. To the south axis of Jada-i-Maiwand there is a commercial development of the old bazaar type, inter-mixed with dense residential land use. The north-west section of the area is completely dominated by commercial uses and is considered the main commercial center for the city. The pattern in this area is bazaars, markets, and commercial saris. According to a sample survey of 1969, there are 5800 shops, 24 hotels, 12 schools, 3 hospitals, and 24 public baths in this locality. The residential pattern in the Old City is very dense, especially to the south of Jada-e-Maiwand. There are no open spaces in the site to serve the locality, but on the east side there is a major open space to which the locality has easy acess. Two main public mosques (the largest in the city) are located in the north-east and at the middle north section of the locality.



KEY

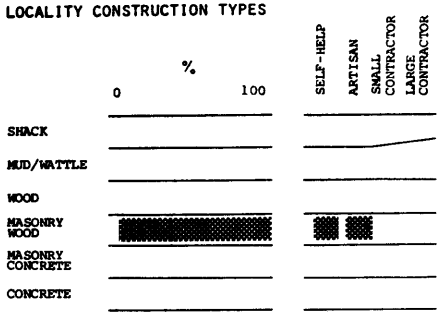
VEHICULAR

PEDESTRIAN

LOCALITY CIRCULATION PATTERN

5. CIRCULATION: The major street of Jada-e-Maiwand running east-west and Nader-Pashtune street north-south, crossing each other vertically represent the main circulation patterns in the locality. Elsewhere there are no defined street routes. Circulation is almost predominantly pedestrian oriented. Streets are too narrow and irregular for vehicles. Except for the main streets that are paved almost all the other circulation routes are dirt and make walking difficult in the winter.

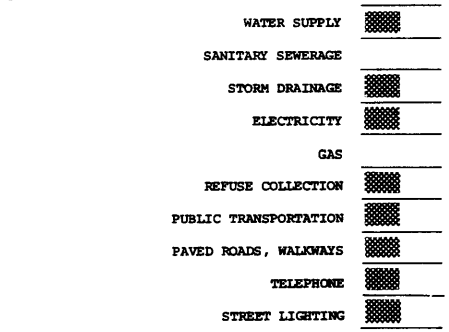
LOCALITY CONSTRUCTION TYPES



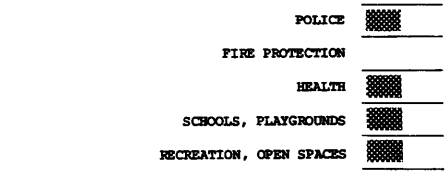
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



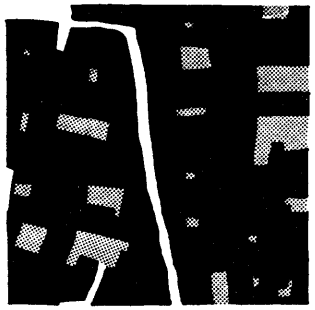
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

LOCALITY SEGMENT PLAN

LAND UTILIZATION DIAGRAMS

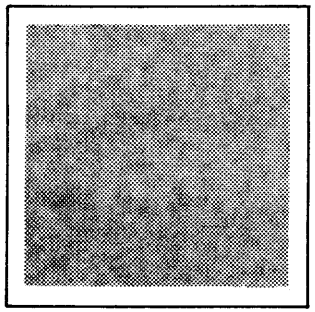
1 Hectare



PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

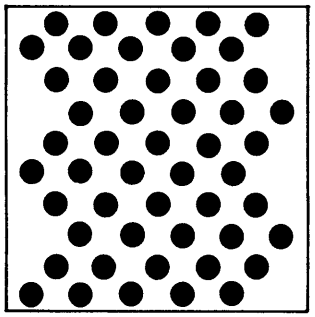
1 Hectare



PERCENTAGES

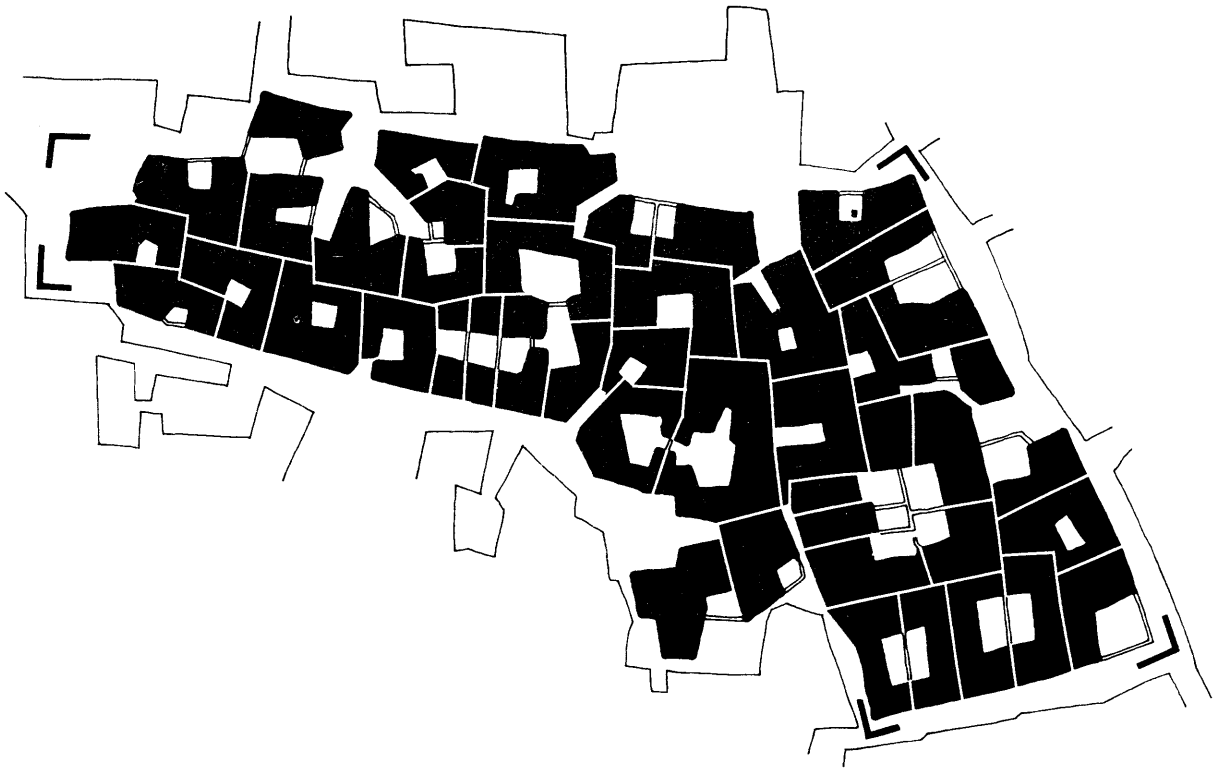
Streets/walkways	21%
Playgrounds	-
Cluster Courts	-
Dwellings/Lots	79%

1 Hectare



DENSITY Persons/Hectare 1000

● 20 Persons



LOCALITY BLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	46	0.7	66
DWELLING UNITS	106	0.7	151
PEOPLE	736	0.7	1051

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.16	23
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	0.54	77
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	0.7	100

NETWORK EFFICIENCY

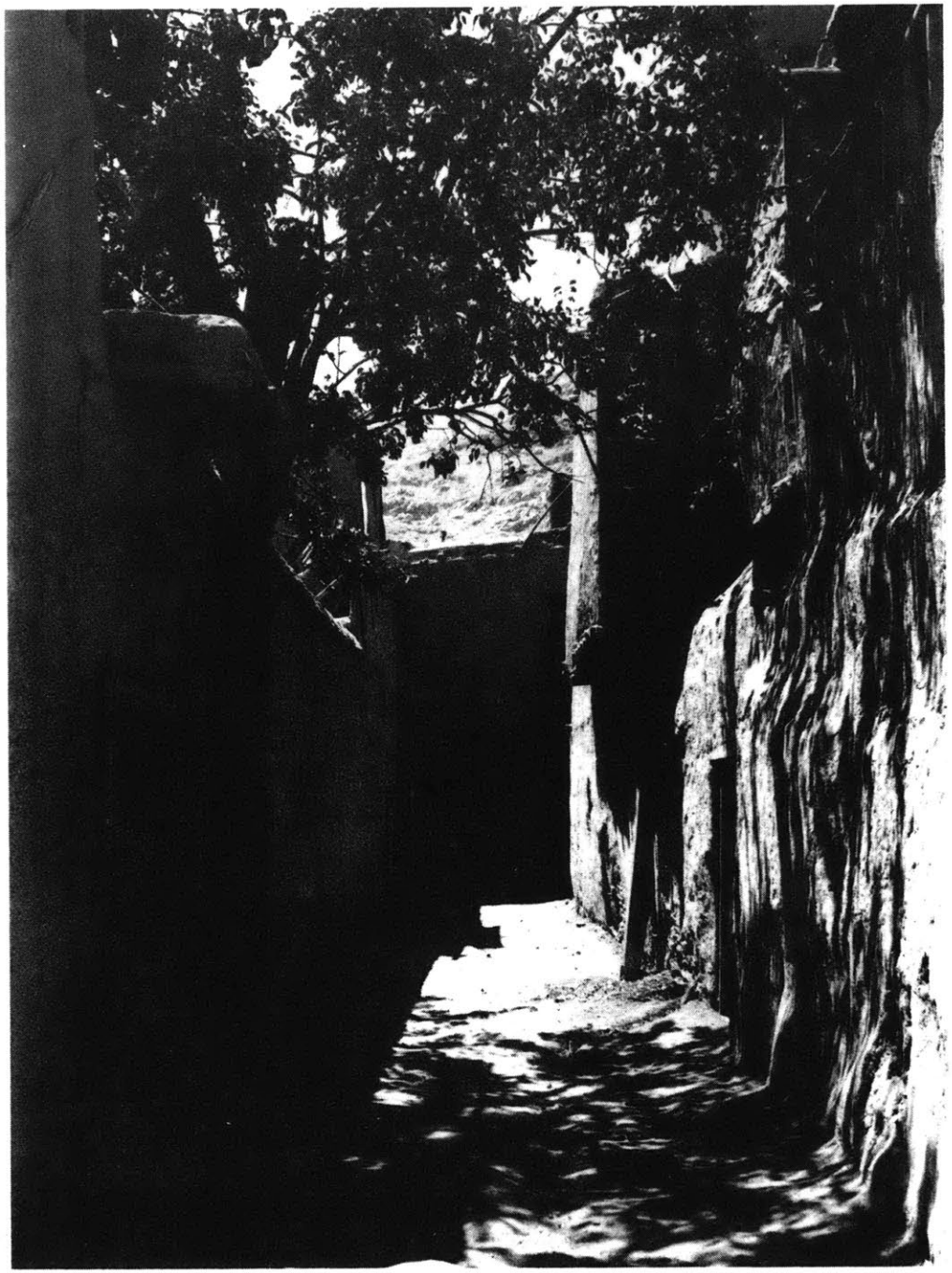
$$R = \frac{\text{network length (circulation)}}{\text{areas served (circulation, lots)}} = 279 \text{ m/Ha}$$

AVERAGE LOT AREA = 117 m^2

N

0 10 50m

1:1000

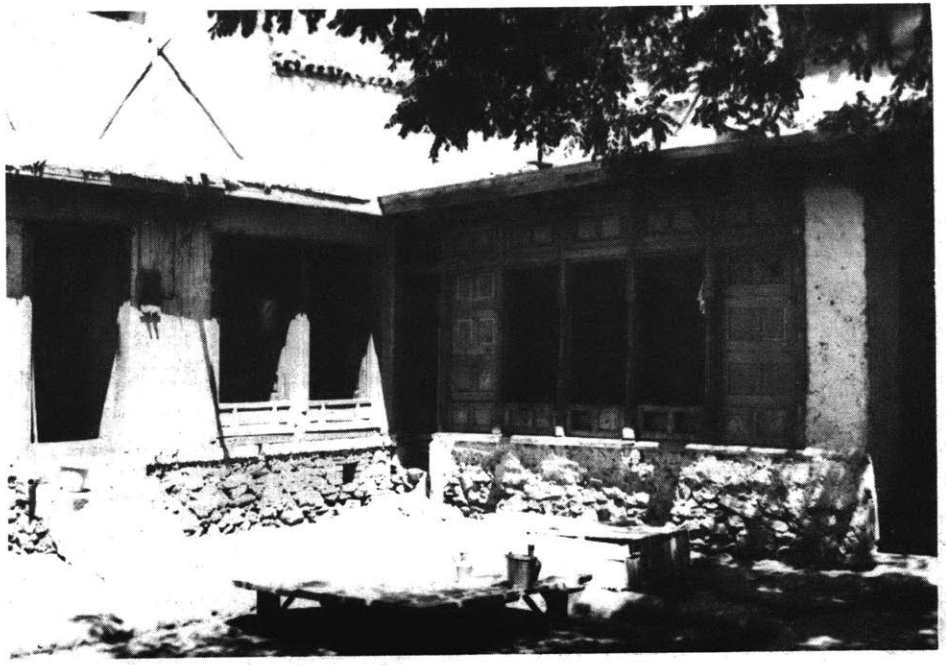


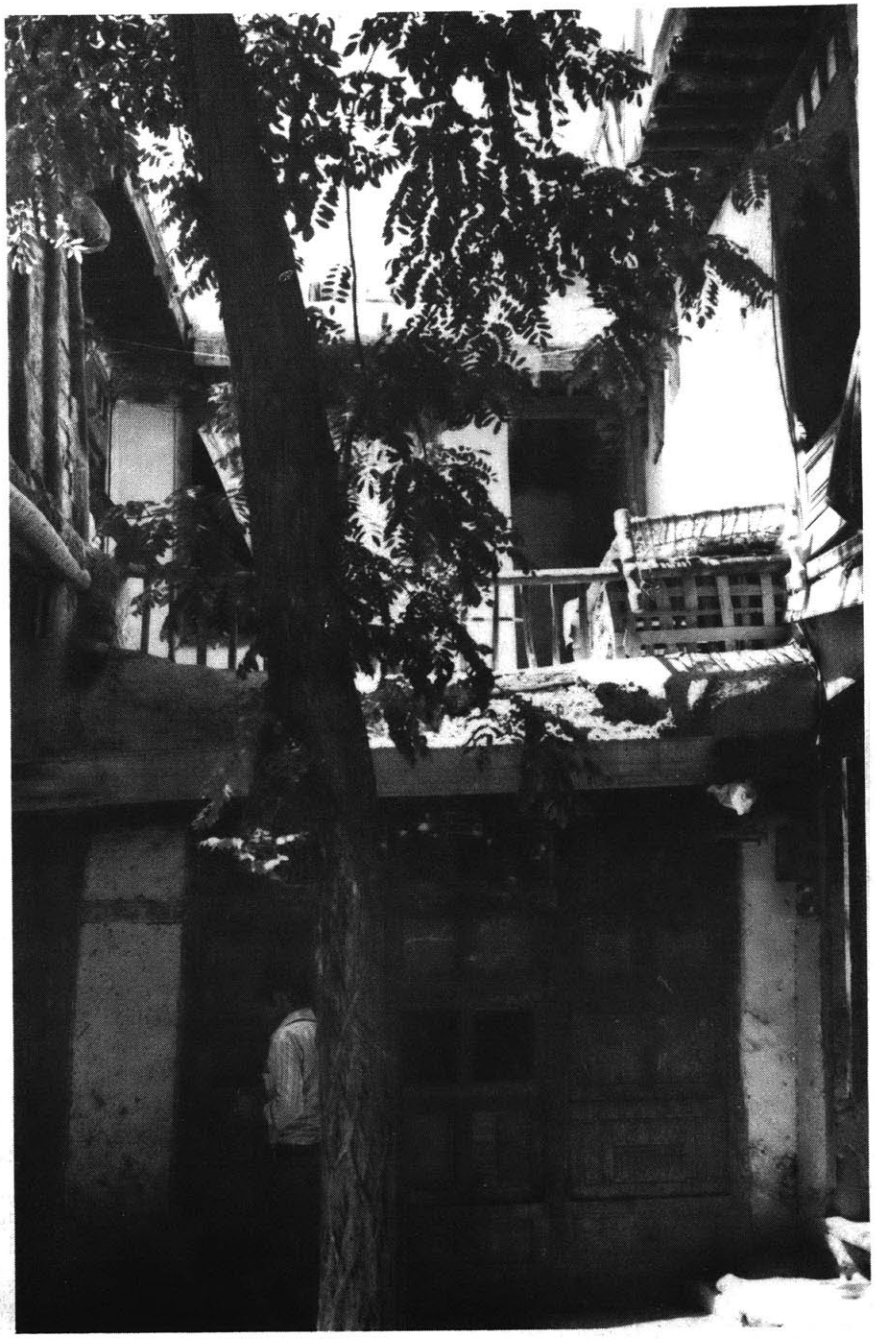
OLD CITY, Kabul: View showing a narrow pedestrian walkway. The streets and walkways are not paved. Muddy streets make walking difficult during the winter.

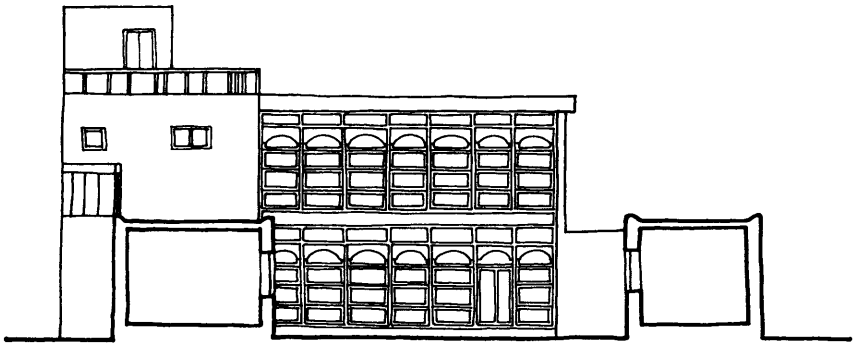
Opposite Page
OLD CITY, Kabul: (left top) a view looking into the courtyard of house. Notice the water storage container on the left and the small garden in the center.

(left bottom) A view looking from the courtyard of a traditional house to its interior facade. The rooms are built around the courtyard and all the windows open to the courtyard.

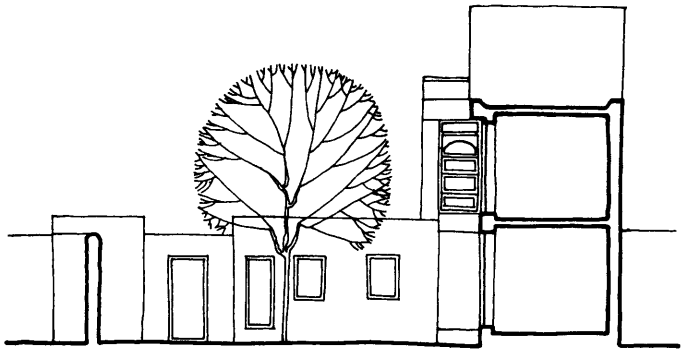
(right) A view looking to the west section from the courtyard of the house. Large trees are usually found in the courtyard of the houses.



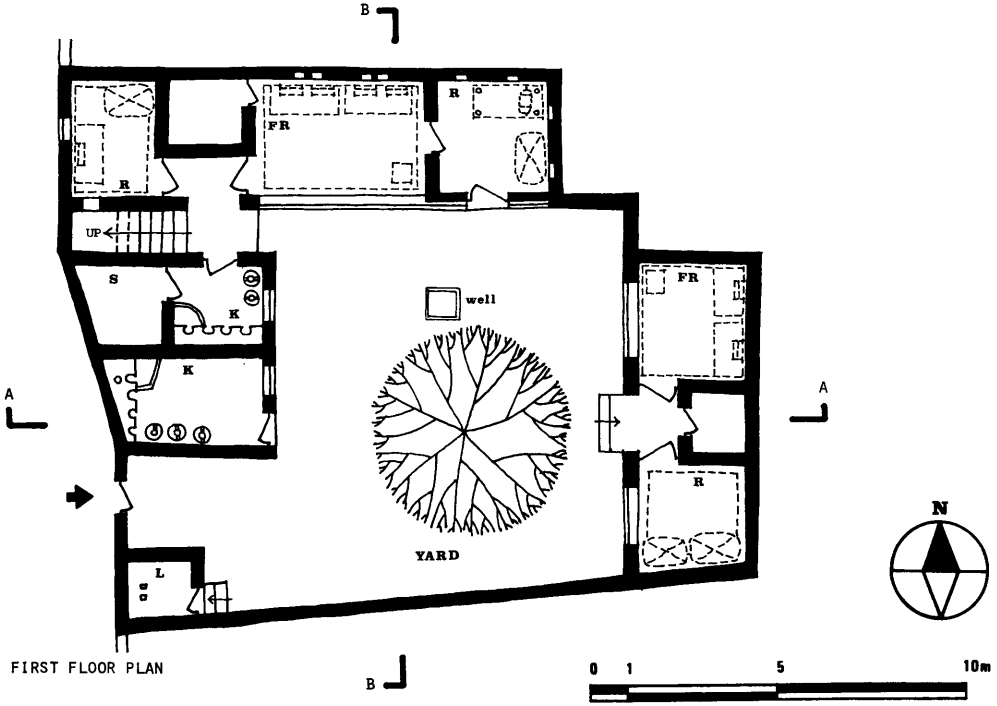




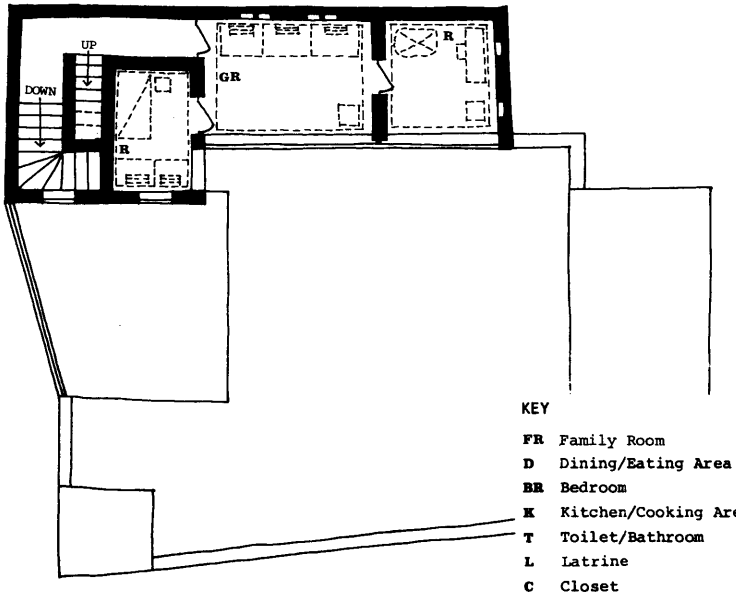
SECTION A-A



SECTION B-B



FIRST FLOOR PLAN



SECOND FLOOR PLAN

KEY

FR	Family Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Latrine
C	Closet
S	Storage
R	Room (multi-use)
GR	Guest Room

TYPICAL DWELLING

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	HOUSE
area (sq m):	114
tenure:	LEGAL OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	224
tenure:	LEGAL OWNERSHIP
DWELLING	
location:	CIRY CENTER
type:	ROW HOUSE
number of floors:	2
utilization:	MULTIPLE/FAMILIES
physical state:	BAD
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PRIVATE
builder:	ARTISAN
construction type:	ADOBE-MUD
year of construction:	1910
MATERIALS	
foundation:	STONE
floors:	STONE WITH BRICK FINISHING
walls:	ADOBE
roof:	WOOD- TIMBER SUPPORTS
DWELLING FACILITIES	
wc:	-
shower:	-
kitchen:	2
rooms:	8
other:	LATRINE/CLOSETS

LOCALITY SOURCES

Plan:	*(accurate) Kabul Municipality, Planning Office. (Cartographic Institute, Kabul, 1969).*
Land Use Pattern:	*(approximate) IBID, field survey, B. Kazimee, students from Department of Architecture, Faculty of Engineering, Kabul University, 1976.*
'culation Pattern:	*(approximate) IBID.*
Segment Plan:	*(accurate) IBID.*
Block Plan:	*(approximate) IBID.*
Typical Dwelling:	*(accurate) Field survey, B. Kazimee, students from Department of Architecture, Faculty of Engineering, Kabul University, 1976.*
Physical Data:	*(accurate) IBID.*
io-Economic Data:	*(accurate) IBID.*
Photographs:	*B. Kazimee, 1976.*

SOCIO-ECONOMIC DATA
(related to user)

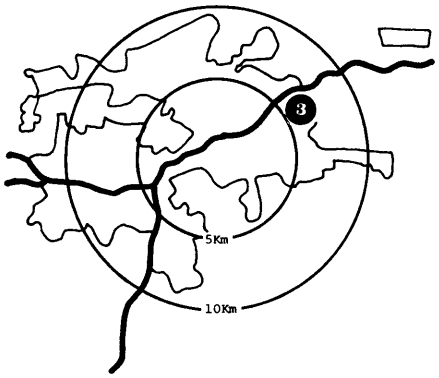
GENERAL: SOCIAL	
user's ethnic origin:	KABUL
place of birth:	KABUL
education level:	PRIMARY SCHOOL
NUMBER OF USERS	
married:	6
single:	5
children:	10
total:	21
MIGRATION PATTERN	
number of moves:	1
rural - urban:	-
urban - urban:	-
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	LOW
employment:	GOVERNMENT EMPLOYEE
distance to work:	3km
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	-
land - market value:	-
DWELLING UNIT PAYMENTS	
financing:	SELF FINANCED
rent/mortgage:	-
% income for rent/mortgage:	-

OLD CITY, Kabul: (top) Interior view of a traditional house. The view looks from the courtyard towards the north two story facade of the house.

(bottom) All houses are built of adobe and mud, mixed with wood for framing and stability. The high parapet wall on the roof provides privacy and the roof of the houses functions as sleeping areas in the hot summer nights.

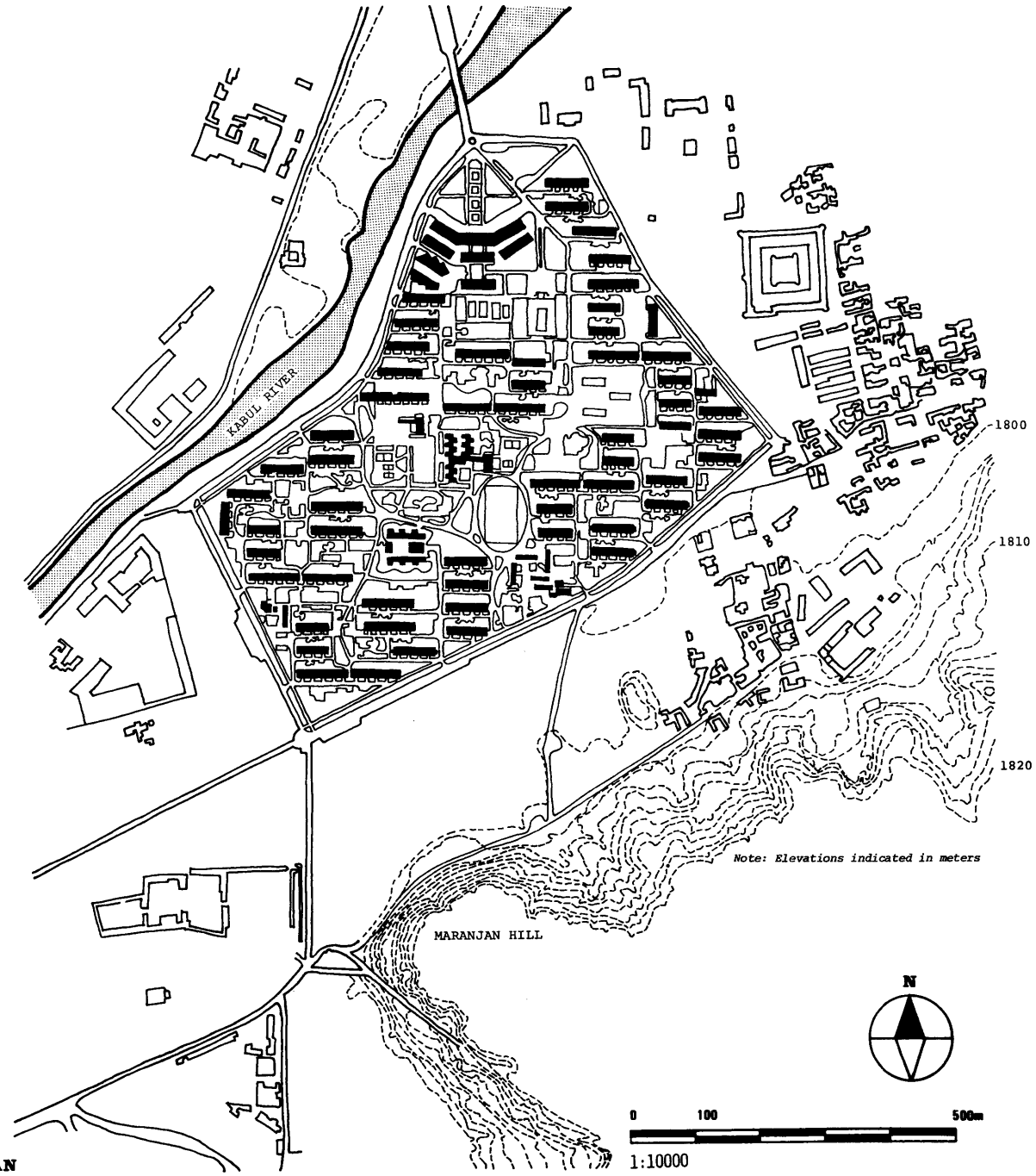
3 NADER SHAH MAINA, Kabul

PUBLIC, HIGH/MIDDLE INCOME,
WALK-UP APARTMENTS,
URBAN PROJECT

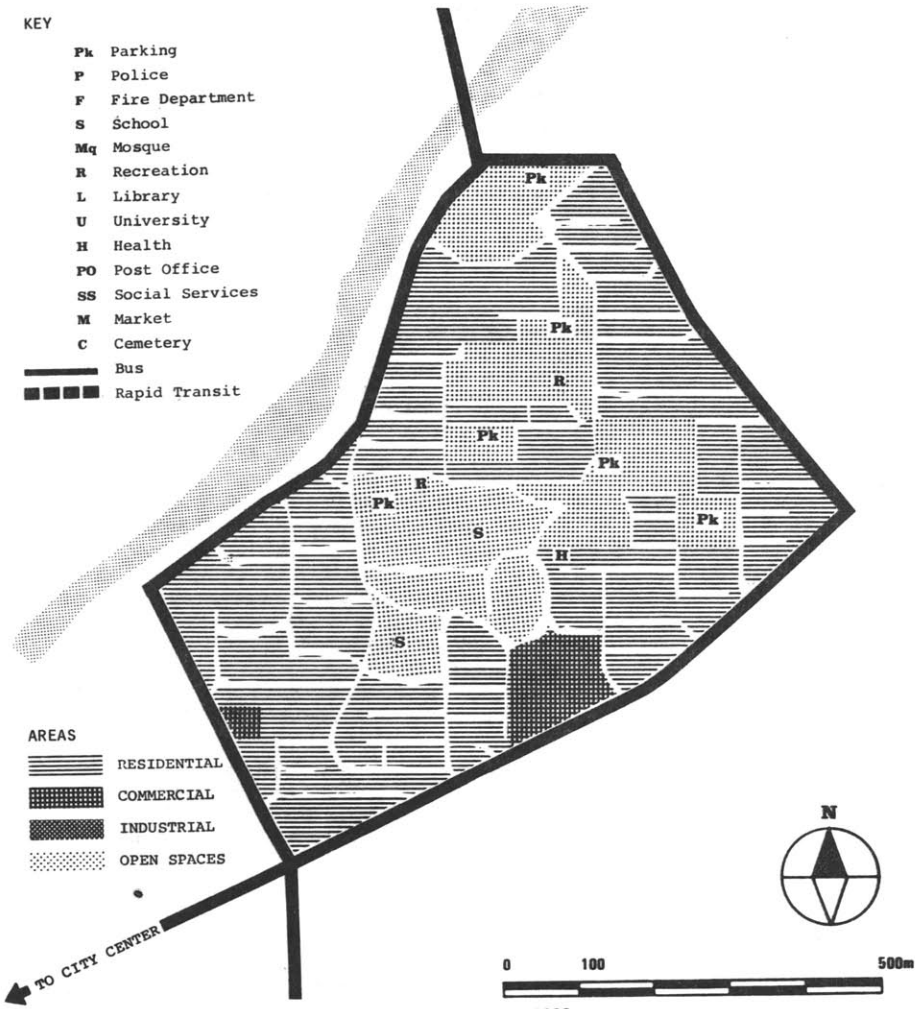


1. LOCATION: It is located to the south of the Kabul River and to the east of the Old City, within a radius of approximately 5km from the city center. The new development of Nader Shah Maina comprises a complex of four to five story walk-up apartment buildings, constructed of prefabricated elements. The project is done by the Central Authority of Town and City Planning, with the assistance of the Soviet Union.

2. ORIGINS: A prefabricating factory was started in Kabul and began to produce apartment elements in 1960. Up to 1970 the factory had built about 2000 apartments. At that time most of these apartments were not occupied because of the small size and high cost. Therefore it was suggested for the project ways and means for attracting tenants by subsidizing certain costs and the rent. By March 1974 about 500 additional flats had been completed

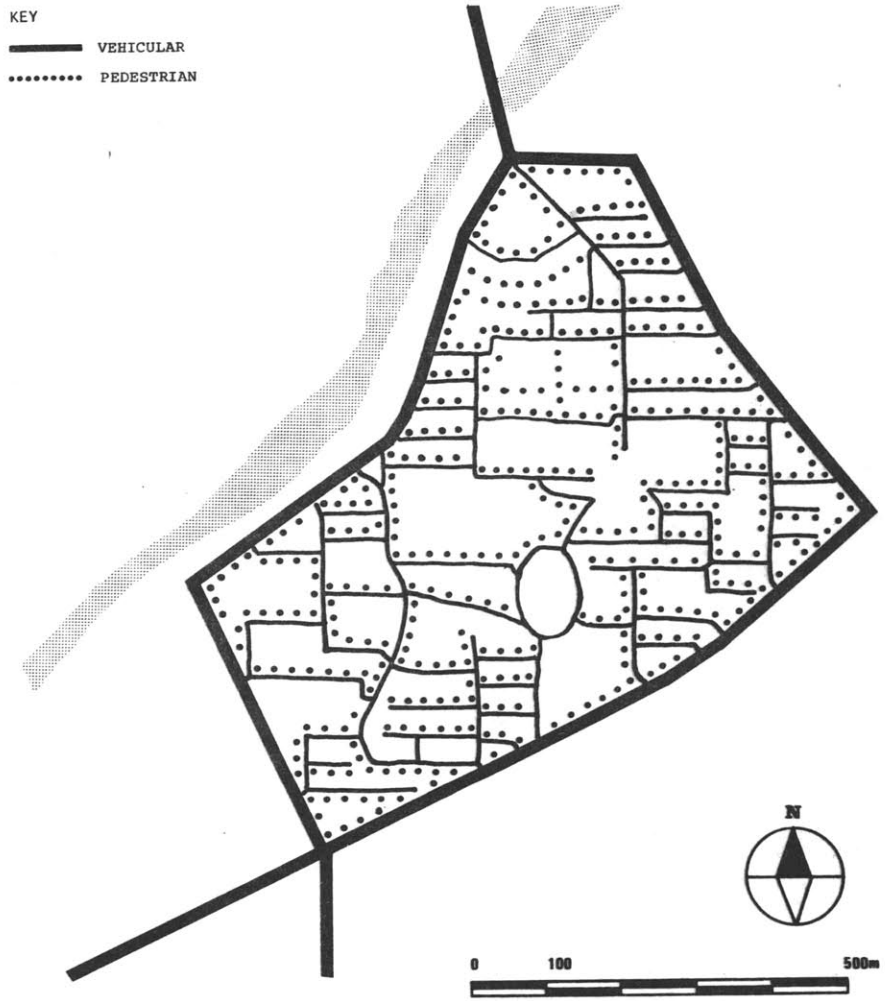


LOCALITY PLAN



1:10000

LOCALITY LAND USE PATTERN



1:10000

LOCALITY CIRCULATION PATTERN

and sold to the government employees, on low instalments payments of 25 years.

Nade Shah Maina apartment complex has a water system planned and built as an integral part of the development. Hot water is also supplied to the apartments two days a week from a central boiler. Residents pay for the water as part of their monthly charge. The locality is the only major residential development in Kabul which is provided with the conventional underground piped sewage collection and sewage treatment facilities.

3. LAYOUT: Unlike the other settlements in the city, individual lots or private patios do not exist. The residential blocks are composed of walk-up apartments facing north and south, and planned in a parallel pattern to each other in the site. The units are owned through a condominium arrangement (the only case in the city).

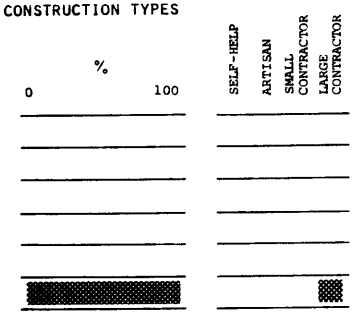
4. LAND USE: The development of Nader Shah Maina consists of 60 residential apartment blocks, with 2500 flats and a total of 141,000 sqm of floor area. There is one school, one kindergarten, 3 cafes, one swimming pool, and three shopping centers. There is no control over the use of open spaces which creates a problem of upkeep by the city. Some of the buildings are also used for the government offices.

5. CIRCULATION: Access for cars are provided to every block. Pedestrian circulation serves the interior of the block. A public bus line going around the locality connects to the city center. All the streets and walkways are paved.

6. POPULATION: The population of the locality is about 10,000 people, out of which 1000 people are office workers. The density of population is low and is approximately 100 persons per hectare. The average family size is 5 persons.

7. INCOME: The occupants fall within the high and middle income groups. Although there is no available statistical data, the average family income can be estimated and is over 100 dollars per month.

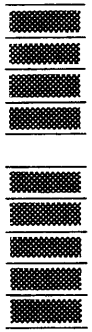
LOCALITY CONSTRUCTION TYPES



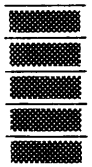
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



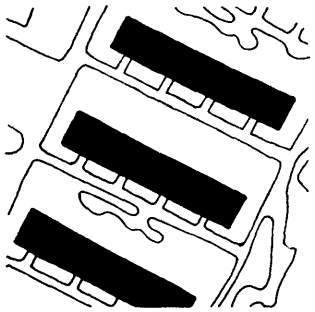
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

LOCALITY SEGMENT PLAN

LAND UTILIZATION DIAGRAMS

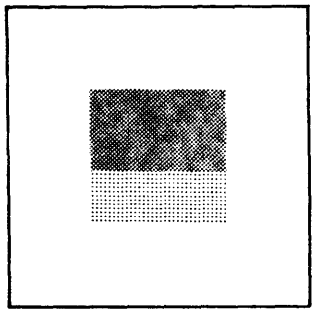
1 Hectare



PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

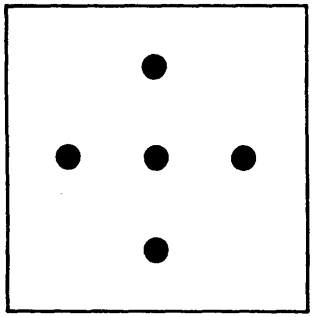
1 Hectare



PERCENTAGES

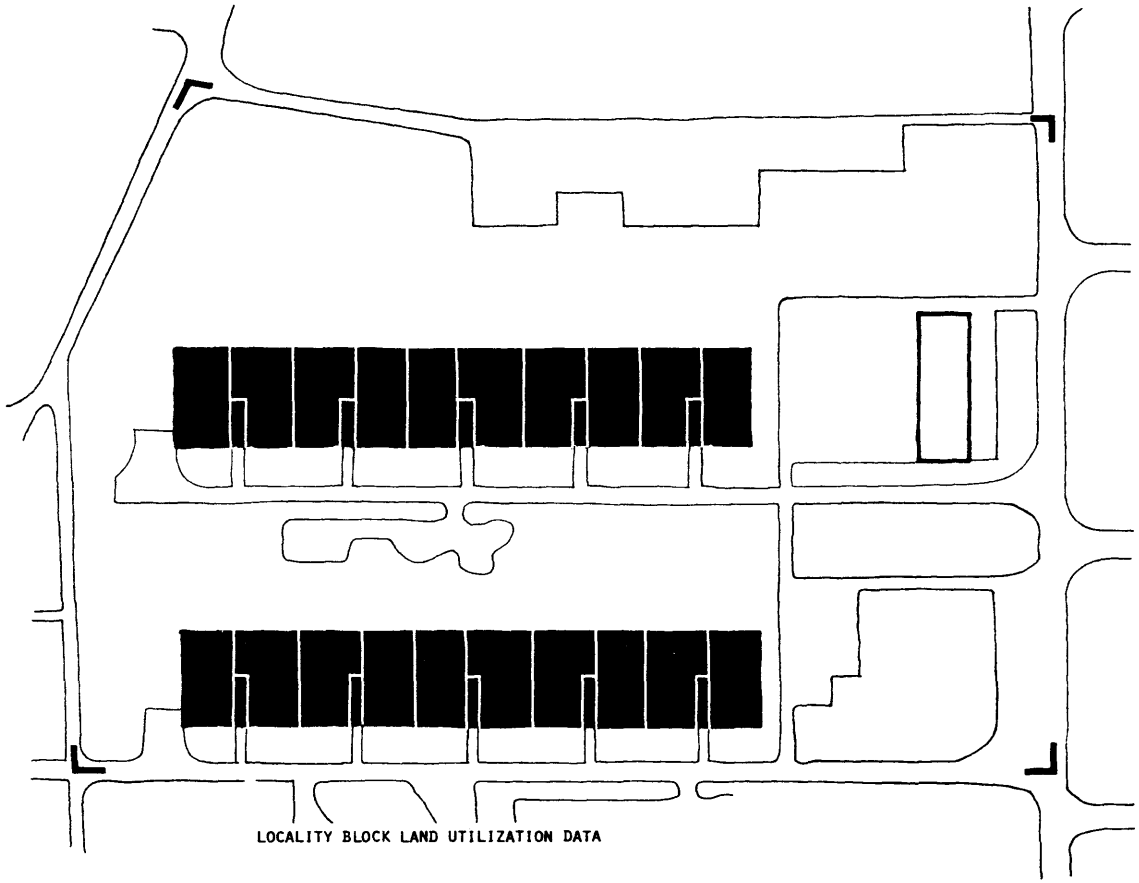
Streets/Walkways, Playgrounds	87%
Cluster Courts	-
Dwellings/Lots	13%

1 Hectare



DENSITY Persons/Hectare 100

● 20 Persons



LOCALITY BLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	2	1.23	1.63
DWELLING UNITS	80	1.23	65.00
PEOPLE	400	1.23	325.00

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	1.01	82
SEMI-PUBLIC (open spaces, schools, community centers)		
PRIVATE (dwellings, shops, factories, lots)	0.22	18
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	1.23	100

NETWORK EFFICIENCY

$R = \frac{\text{network length (circulation)}}{\text{areas served (circulation, lots)}} = 169$ m/Ha

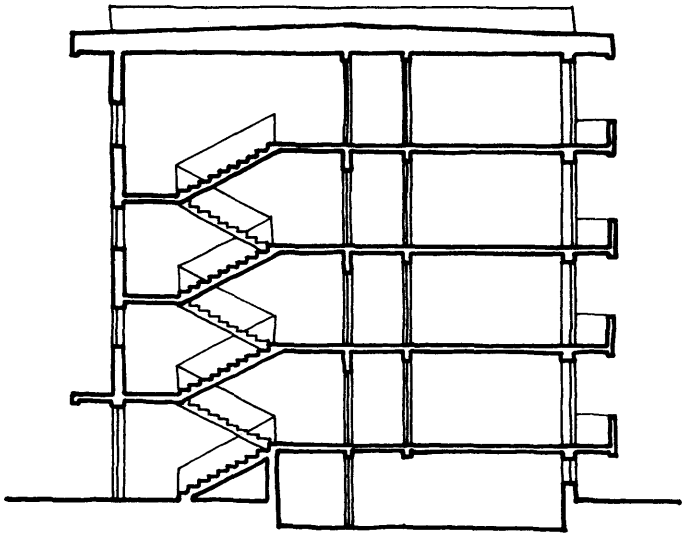
AVERAGE LOT AREA = 1120 m^2

N

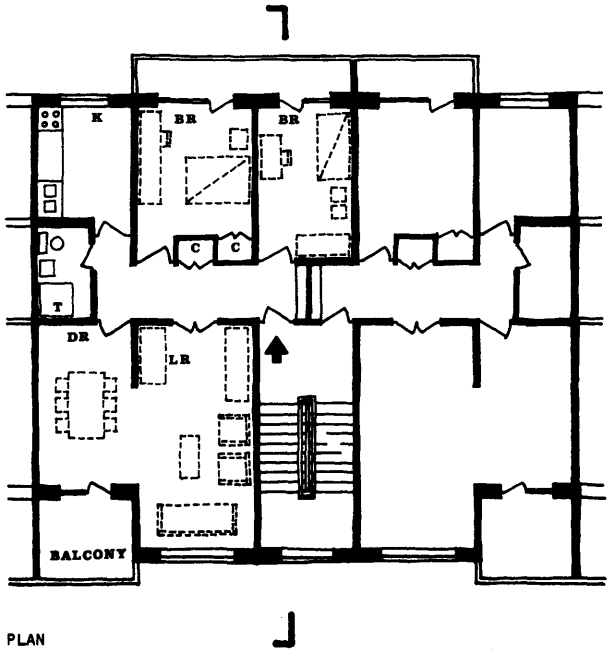
0 10 50m

1:1000

ELEVATION

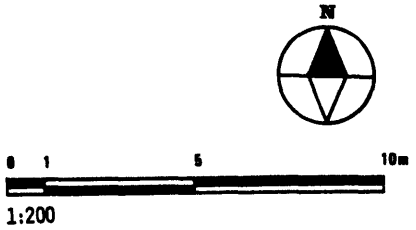


SECTION



PLAN

TYPICAL DWELLING



KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Latrine
- C Closet
- S Storage
- R Room (multi-use)
- GR Guest Room

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	APARTMENT
area (sq m):	90
tenure:	LEGAL OWNERSHIP
LAND/LOT	
utilization:	PUBLIC
area (sq m):	-
tenure:	PRIVATE CONDOMINIUM
DWELLING	
location:	INNER RING OF CITY
type:	WALK-UP APARTMENT
number of floors:	4
utilization:	MULTIPLE/FAMILIES
physical state:	GOOD
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PUBLIC
builder:	LARGE CONTRACTOR
construction type:	PREFABRICATED CONCRETE
year of construction:	1970 - 1974
MATERIALS	
foundation:	CONCRETE
floors:	CONCRETE
walls:	CONCRETE
roof:	CONCRETE
DWELLING FACILITIES	
wc:	1
shower:	1
kitchen:	1
rooms:	4
other:	CLOSET/BALCONY

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	ANDKHOI
place of birth:	ANDKHOI
education level:	UNIVERSITY
NUMBER OF USERS	
married:	2
single:	2
children:	4
total:	8
MIGRATION PATTERN	
number of moves:	10
rural - urban:	-
urban - urban:	1953
urban - rural:	-
why came to urban area:	EDUCATION
GENERAL: ECONOMIC	
user's income group:	HIGH
employment:	DEPT. OF DEMOGRAPHY
distance to work:	0.5km
mode of travel:	WALKING
COSTS	
dwelling unit:	$ 7,000
land - market value:	-
DWELLING UNIT PAYMENTS	
financing:	PUBLIC FINANCED
rent/mortgage:	-
% income for rent/mortgage:	-

NADER-SHAH-MAINA, Kabul: (left) view looking towards a prefabricated residential block with walk-up apartments. The units are owned through a condominium arrangement.

(right) A view looking to several apartment blocks. Vast, undefined open spaces surround the blocks. There is no control over the open spaces and all must be maintained by the city. The low cast concrete fence surrounds a kindergarten. Concrete posts prevent circulation for cars.

LOCALITY SOURCES

Plan:	*(accurate) Kabul Municipality, Planning Office, 1976.*
Land Use Pattern :	*(accurate) IBID.*
Circulation Pattern:	*(accurate) IBID.*
Segment Plan:	*(accurate) IBID.*
Block Plan:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID, B. Kazimee, students from Department of Architecture, Faculty of Engineering, Kabul University, 1976.*
Physical Data:	*(accurate) IBID.*
Socio-Economic Data:	*(accurate) IBID.*
Photographs:	*B. Kazimee, 1976.*

RURAL CONTEXT
Afghanistan

In Afghanistan approximately 85% of the population lives and works in the rural areas, and an additional 3% are nomads or semi-nomads in tentative settlements. The rest, 12%, live in urban areas. These are the centers for commercial, industrial, and administrative activities. The important trade centers for rural areas are in towns. The agricultural goods, produced in smaller villages, are sold in the towns, which then are transported to the larger population centers.

There are approximately 14,200 villages in Afghanistan. The villages accommodate different population sizes, from 100 persons and sometimes to 6000 people. Eighty percent of the village population are farmers. The remainder are engaged as religious teachers, shepherds, carpenters, masons, barbers, and etc. About 80% of the agricultural product is wheat, cotton, fruits, nuts, karakol pelts, and mutton. According to a sample survey in 1971 by the Ministry of Planning, 11% of the rural population is composed of large landholders, 51% of the population lives on the small owner-operated farms. The remaining 35% are landless farm-laborers, renters, and share-croppers.

The physical shape and form of the village strongly depends on the topography, climate, and material available, and the development of the village is the response to the need for water and security. For example, villages in Nuristan (North and West Afghanistan), on the high mountain slopes, are built around agricultural land. The houses are made of wood and stone which gives it a distinctive Nuristani character and unity. In comparison, in the flat lands of West Afghanistan such as Kandahar, the villages are surrounded by the agricultural land. Here the houses are built generally from mud and brick, which permits a most sophisticated type of vault and dome. Variations and combinations of the two systems are obviously also found.

The village organization is based upon "Rishsafid", "Khan", "Malik", and "Arbab". The "Rishsafids" are from a village or from several villages, who are respected elderly people, and the community listen to their advice and recommendations. The "Khan" and "Arbab" are the rich landlords who are the masters of the village and "qala". The "Malik" is the representative of the village to the central government in the larger towns, and is responsible for tax collection and other legal processes. Whenever there is an important matter or problem in the village, the Rishsafids will preside at a meeting called "jirgah", which is often held in the mosque, "mehman-khana" (guest-room), or in open communal gardens. Traditionally jirgah is an important part of the villagers' social life.

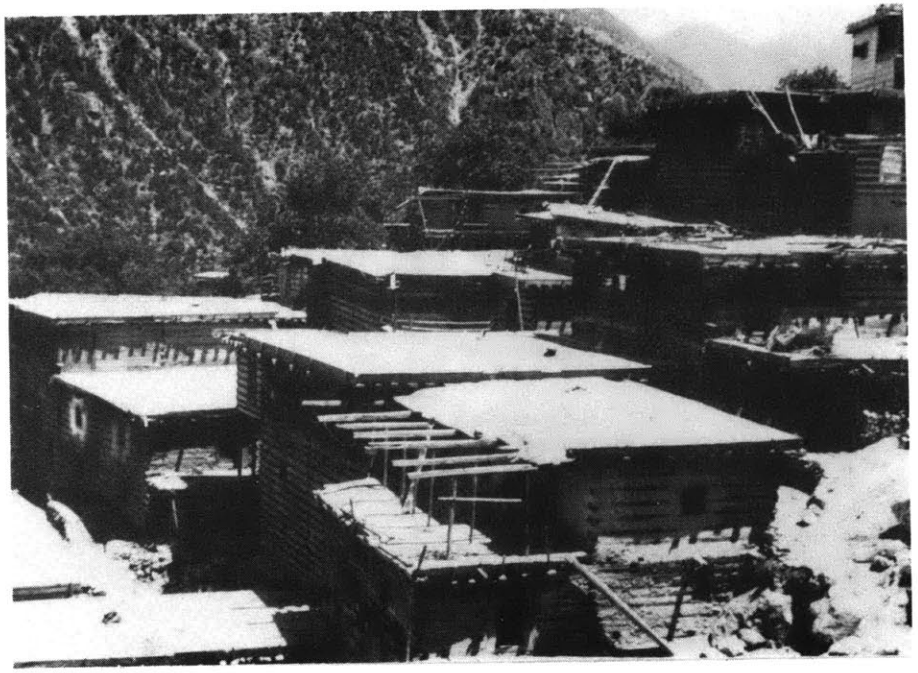
The village has a mosque which serves many functions aside from its religious purposes. It is a meeting place for the villagers, a place for the travellers to stay, and a seasonal school for the children of the village.

Water is provided in the villages by being carried to the houses several times a day by the women or the girls of the family from the the nearest stream or "karize", which is called "gudar". The gudar also functions as a place for courtship. Private wells are also dug inside the houses in some cases.

Sewage is disposed by means of pit-latrines located inside the household compound. The location is such that the composted waste may be removed by the farmers from the outside and then used as fertilizer.

The villages are generally not served by electricity unless they are located near a large town or a city. Usually kerosene lamps are used at night for lighting.

Small shops called "dukan", are located in the villages, which provide the primary daily supplies. Domestic goods are mostly purchased in the nearest town or the city.



VILLAGE, Nuristan: (top) A view looking towards a section of the village built on the steep slope side. All the houses are made out of wooden timbers with stone infill. The roof of the dwellings are flat and used as a terrace by the other dwellings.

VILLAGE, Kabul: (bottom) A view looking towards a village located on a flat site in the middle of farmland. The low mud wall defines the ownership of the land.

DWELLING

The settlement in rural areas are villages composed of an extended family, or qalas which are the basic home of Pashtune tribes. There are no isolated individual dwellings. The village and qala is the source of power and prestige, for the families or a particular tribe.

The house is representative of family tradition, culture, and social life styles. A house is simply rooms surrounding an open courtyard. All rooms are looking inward. The walls of the courtyard are generally high and windowless on the outside.

All the rooms in a house are usually furnished with rugs and carpets. The mattresses are used to define the sitting areas in a room. Traditionally, special mattresses are used for sleeping; they are rolled up in the day time, and stored, and laid out during the night.

The courtyard is the family private space and has a unique atmosphere: the feeling of privacy, security, and protection.

The kitchens are furnished with "ujaqe" for cooking and a "tandure", for making bread (see opposite drawings). The common type of fuel used in the kitchen is wood, hay or cowdung. In summer an outdoor kitchen is mostly used.

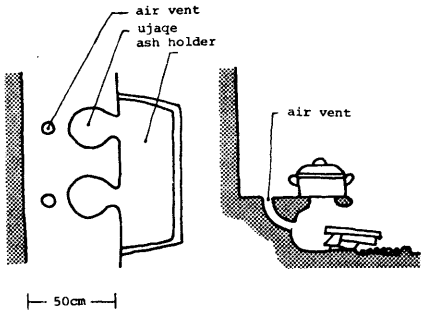
To accommodate the visitors, each house has a guest-room which is commonly located near the entrance of the house and called "mehman-khana". The mehman-khana varies according to the financial status of the families. In many wealthier families the mehman-khana is a separate structure adjacent to the house. This type of mehman-khana also functions as a social gathering place.

RURAL CONTEXT SOURCES

Cooking and Heating Systems: *(accurate)*

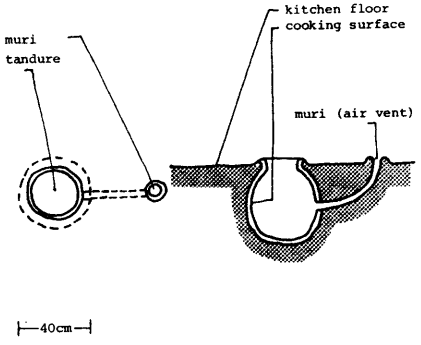
Cooking and Heating Systems: *B. Kazimee, 1976*
Structure Types: *B. Kazimee, Albert Szabo, 1976*
Photographs: *B. Kazimee, 1976*
General Information: *B. Kazimee, M.I.T. 1976*
Louis Dupree, Afghanistan, New-Jersey, 1973.
R. Samizay, and S. Hallet, Research magazine, M.I.T. 1972.
Survey of Progress, Ministry of Planning, Kabul, 1972.

DWELLING
COOKING SYSTEMS



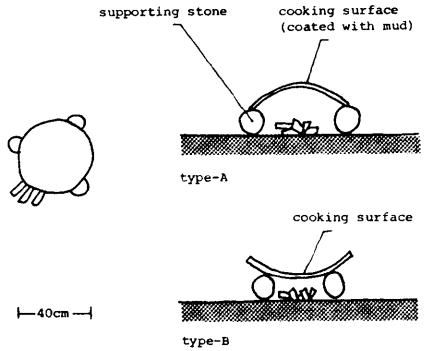
PLAN SECTION

1. Ujaqe: a "stove" for cooking. Is made out of mud located along a wall of the kitchen. It is shaped so that it can support a cooking utensil. The ujaqe is about 50cm in width and about 30cm above the floor and runs the length of the wall. Several ujaqes are made side by side, and the front of the ujaqe is shaped as a container to hold ashes. On the back of each ujaqe there is an air vent which allows adjustment of the fire.



PLAN SECTION

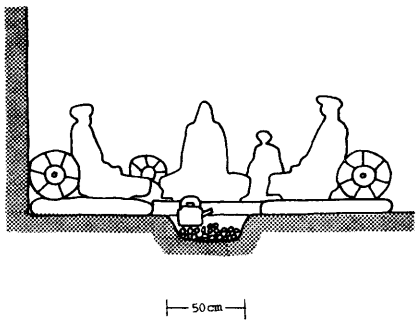
2. Tandure: an "oven" for making bread. The most common type is a ceramic, conical shaped unit, which is buried in the floor of the kitchen. Ventilation for the fire comes through a small hole called "muri" Wood, hay, or cowdung is used to heat the inner surfaces until the bread is baked.



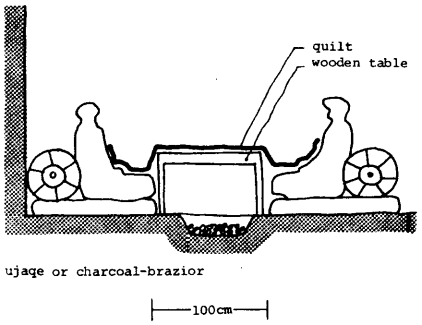
PLAN SECTION

3. Tawa: a portable, curved, circular iron plate, placed on top of three pieces of stone or brick. Fuel is burned underneath the tawa, on top of which the bread is to be baked. In order to distribute the heat evenly on the cooking surface and to avoid burning the bread the tawa is coated with a thin layer of a special kind of mud.

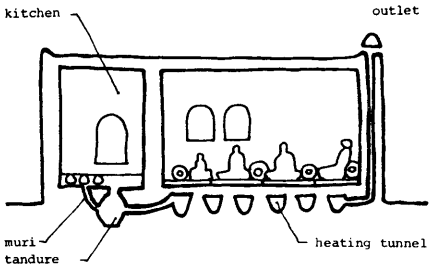
DWELLING
HEATING SYSTEMS



1. "heating ujaqe" and "manqal". These are used in the areas where the winter is not very cold. An "ujaqe" is dug 15cm in the floor in a corner of family room. Glowing embers or the fire leftover from the kitchen is used as fuel. The whole family sits around the ujaqe on mattresses laid on the sides. In some areas a "manqal", (charcoal brazier), which is a portable fire container is also used.



2. Sandali. This is a low wooden table over an "ujaqe" or a "manqal" on which a quilt or blanket is spread over it, and on part of the floor around it. The family then sitsaround the sandali, covering their legs, arms, and as much of their body as possible under the quilt or the blanket, and under the sandali. The top of the sandali is used for eating.



3. Tawakhana: This is an elaborate heating system under the floor, used in many areas with very cold winters. A tandure located in the kitchen may serve as the heating source. The heat is exhausted from the tandure circulated through heating tunnels constructed under the floor. When the warm air reaches the end of the heating tunnels, it escapes through an outlet located on the opposite wall. Heating tunnels are made of stone trenches covered with flat stones. The stones hold the heat, and keep the floor warm.

STRUCTURE TYPE

As the result of the many ethnic groups, different customs, and social relations of the people in the valleys and plains of the rural areas of Afghanistan, the forms of the indigenous architecture have developed differently.

Each form of the building is the response to the particular geographic and socio-economic conditions. All structures represent and embody the spirit of culture, tradition, and social life styles.

A study of the seven types of building forms/ elements is shown in its sequence of construction. They are catagorized as portable and permanent structures, as follows:

I. PORTABLE STRUCTURES. The "Jat tent" and the "yurt" are the portable shelters for the semi-nomads; the yurt in North Afghanistan and the Jat tent in South and West Afghanistan (a special tribe). The people who use these are herdsman or seasonal farm laborers, and move collectively with the seasons. Sometimes they are farmers who move with their families to their farms at harvest time and then live in portable tents or yurts.

1. JAT TENT: A portable, cloth-covered structure. The normal type of tent cloth is goats hair. There are bamboo poles inside the tent which provide vertical support, and the tent is secured to the ground with wooden pegs. A low mud wall is built around the perimeter of the tent to protect it from the outside wind and dust. These shelters are usually for summer use by settlements. However, if the living condition is suitable for the next season, the settlement may decide to stay. At this stage the form of the shelter immediately changes: the side-walls of the tent are built higher, and more mud structures are added, such as a makeshift kitchen, a latrine, a place for animals, and etc. Experience shows that villages developed in this form parallel those of squatter settlements, which are also a transition from tentative to permanent settlements.

2. YURT: a round, hemispherical, wooden, portable structure. Sections of wooden lattices are jointed together to form a cylinder about 1.5m. A number of wooden poles about 10cm in diameter are driven into the ground on the perimeter of the wooden lattices for stability. A series of long poles of smaller diameter are tied together with leather strings to the lattice cylinder. At the peak they are curved to fit into a slotted, hollow wooden disc. The lattice frame is covered with reed matting as insulation, and a number of colorful, woven bands, wound around it. Felt is used over the top of the roof. The peak of the yurt is left open for ventilation and lighting.

II. PERMANENT STRUCTURES. The vault, dome, and wooden framework are common in the areas in which people have permanent residences, as in villages, qalas, towns, and cities. Wooden timber roofing is common in East and South Afghanistan (Nuristan and Paktia), where wood is available locally. Vault and dome roofing evolved in the areas where timber or other similar roofing materials are in short supply, as in North and West Afghanistan (Kandahar, Herat, and Mazare-Sharif). The walls with the vaulted system are layered earth courses, mud brick, or brick.

1. DOME: The walls are built to the springing point of the dome. Construction of the dome then begins on each corner on pendentives. The bricks are laid one on top of the other with straw and mud for mortar Such that the brick courses lean toward the corners and no framework is needed. When the pendentives are completed to the point where they intersect eachother on the side walls the space between the pendentives are filled with the same procedure, until they form a continuous course from which the dome can be completed. Sundried mud brick (23cm x 11cm x 5cm), is common in this area. The walls are often up to one meter thick to support the heavy load from the weight of the dome.

2. VAULT (Zarbi): Construction is similar to the dome up to the completion of the pendentives. Then the space between the pendentives are filled on only the end walls to form a continuous course for the vault. In all cases of construction the brick courses lean towards the end walls, so that the vault does not collapse nor require formwork.

3. VAULT (Khancha-Poosh): This is common roofing type in Kandahar (South-West Afghanistan). The side walls are built to the springing point of the vault. The end wall is built higher, so that an inverted catenary form may be traced on it. An arched-rib is then built of brick and the vault is then constructed on it, with the brick jointed on the sides with gypsum mortar. The mason positions the brick which is then held by an apprentice until the next brick is placed. Additional arched-ribs are constructed after the completion of several courses of vault. For buttressing and insulation purposes the roof is filled with earth within extended side walls. The flat roof is then also used for sleeping in the summer nights.

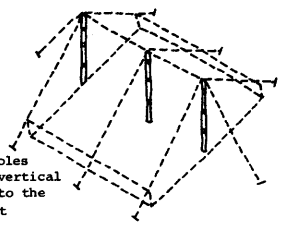
4. VAULT AND BEAM: (see also type 3), wooden beams are positioned about a meter apart on the side walls. A vault spans between each beam, and then the roof is filled with mortar to form a flat surface. This type of roof is also found in Kandahar.

5. TIMBER ROOFING AND WALLS: This is common in Nuristan (East Afghanistan). Wooden timbers with square cross sections (20cm x 20cm), and stone infill are used to construct the walls: one layer wood and one layer stone bonded with mud. In the corners the timbers are jointed by wooden pegs. Timbers are placed on top for the roof about 50cm apart. Boards are used to cover the space between the beams. The top of the boards is filled with straw and mud. Decorated, carved boards are used on the sides of the roof to contain the earth.

NOTE: The rural context refers to most of the settlements; obviously there are many variations considering the rich diverse culture, types of organization, and physical settings.

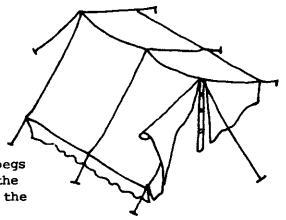
PORTABLE

JAT TENT



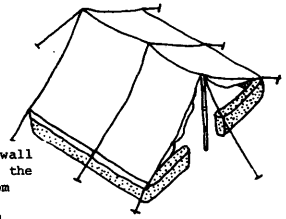
bamboo poles provide vertical support to the wool tent

1



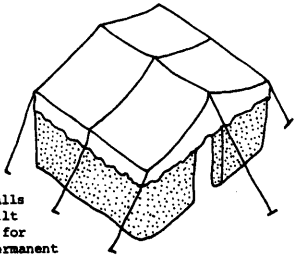
wooden pegs secure the tent to the ground

2



low mud wall protects the tent from outside wind and dust

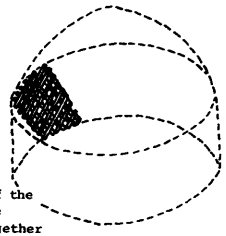
3



side walls are built higher for more permanent shelter

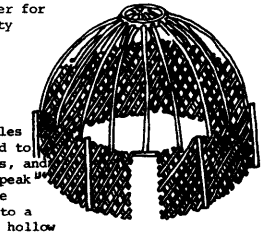
4

YURT

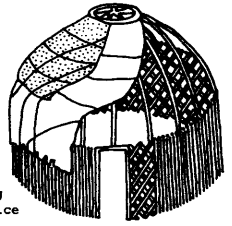


sections of the lattice are jointed together

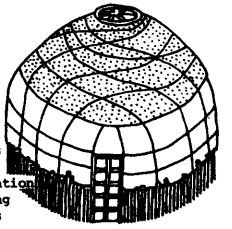
wooden poles are driven into the ground on the perimeter for stability



long poles are tied to lattices, and at the peak they are curved to a slotted hollow wooden disc



reed matting covers lattice frame as insulation

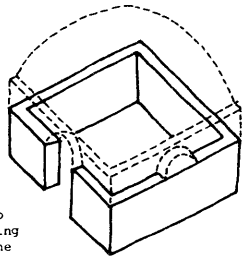


the peak is left open for ventilation and lighting

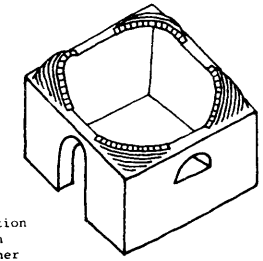
felt covers roof, tied with ropes

PERMANENT

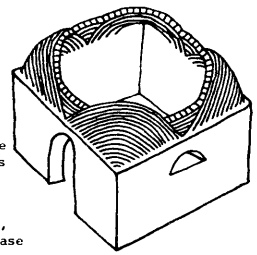
DOME



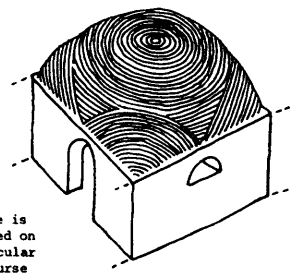
walls are built up to the springing point of the dome



construction begins on each corner

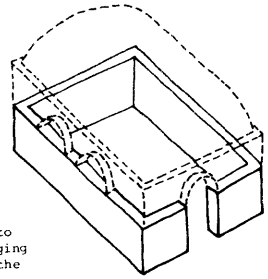


the spaces between the pendentives are filled until they form a continuous, circular base course

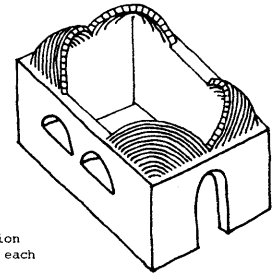


the dome is completed on the circular base course

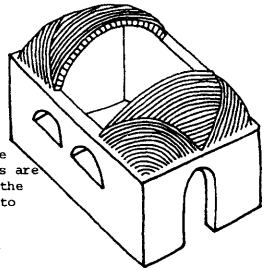
VAULT (zarbi)



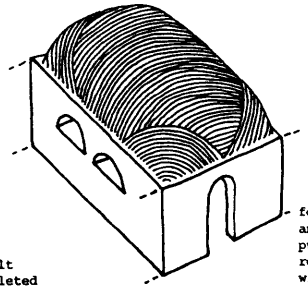
walls are built up to the springing point of the vault



construction begins on each corner

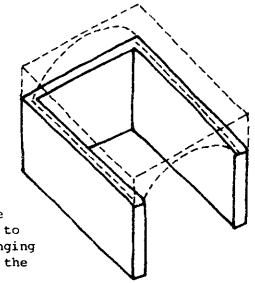


the spaces between the pendentives are filled on the end walls to form a continuous course for the vault

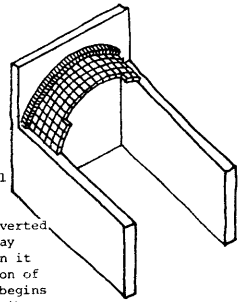


the vault is completed

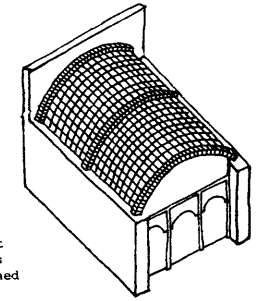
VAULT (khancha-poosh)



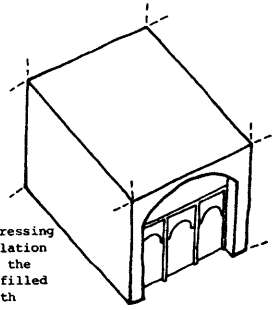
walls are built up to the springing point of the vault



an end wall is built higher, so that an inverted catenary may be built on it construction of the vault begins on arched-rib

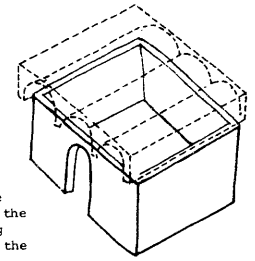


The vault continues with arched ribes as required

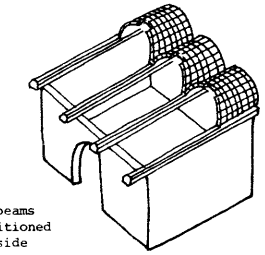


for buttressing and insulation purposes the roof is filled with earth

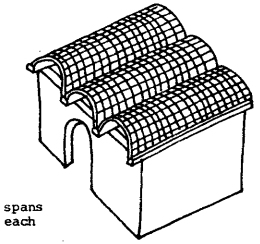
VAULT & BEAM



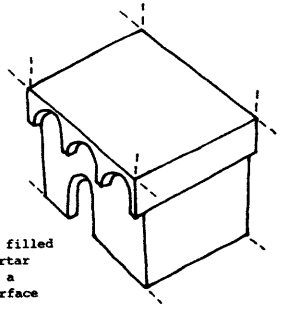
walls are built to the springing point of the vault



wooden beams are positioned on the side walls

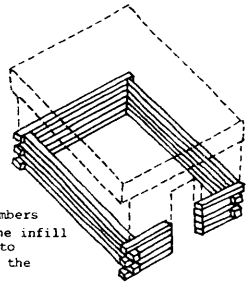


a vault spans between each beam

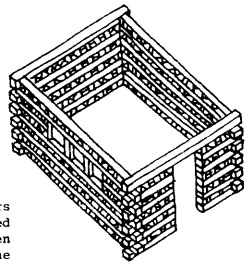


roof is filled with mortar to form a flat surface

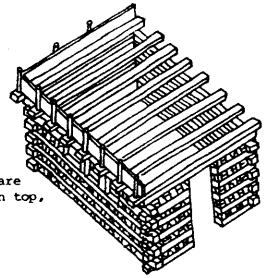
TIMBER ROOFING



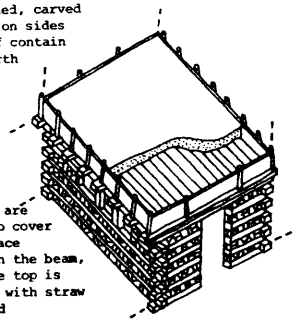
wooden timbers with stone infill are used to construct the walls



the timbers are jointed with wooden pegs in the corners



timbers are placed on top, for roof



decorated, carved boards on sides of roof contain the earth

boards are used to cover the space between the beam, and the top is filled with straw and mud

1 VILLAGE CASE STUDY, Kandahar

RURAL TRADITIONAL SETTLEMENT

1.KANDAHAR URBAN AREA:

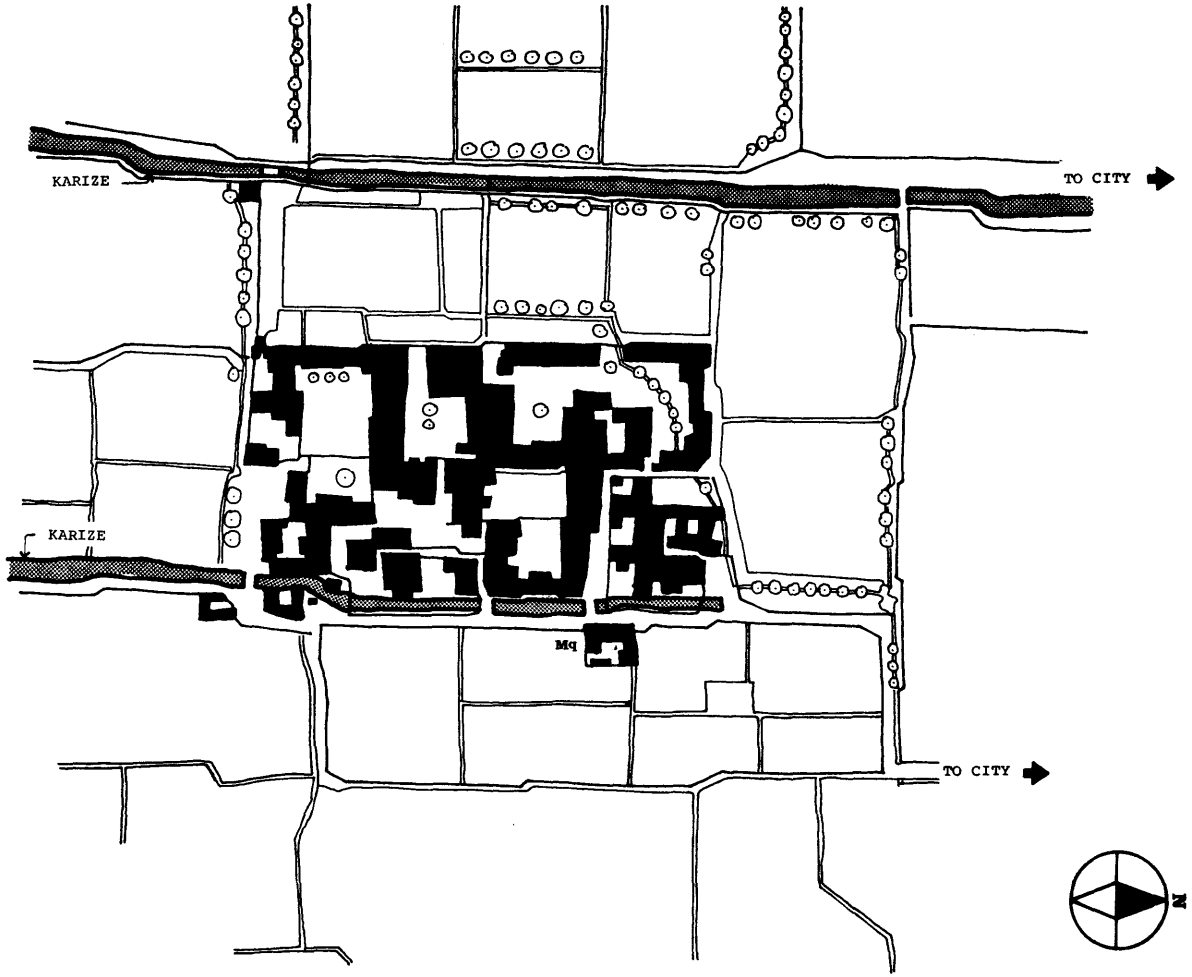
Kandahar, the birth place of modern Afghanistan was built in 1761, by the great king Ahmad Shah Durrani. Today it is the second largest city in Afghanistan, about 515km west of Kabul. It is located in the west flat region of Afghanistan at 64 and 68 degrees east longitude,and 29 and 43 degrees north latitude, and is approximately 600m above sea level. The population of the city is 130,800 people, with a density of 56.4 persons per hectare. The total area of the city is approximately 45,100 Sq.km. Climate is dry and very hot in the summer with its mean temprature reaching 42°C in the month of July. The amount of rainfall will not exceed 200mm in a year. It does not snow in Kandahar.

2. LOCATION AND ORIGINS:

The village surveyed is located approximately 3km to the south of the city of Kandahar and was built 300 years ago. It is constructed in the middle of farm land which is the property of the village. The village belongs to one extended family and is composed of 54 dwelling units with a population of 350 persons who are mainly landlords and farmers. According to a sample survey the income of the families ranges from 250 to 6000 dollars per family per year. The main sources of income for the families are both working in the city as government employees or having their own business, and meanwhile maintaining their farms and gardens as a second source of income. The farmers in the village do not own any land, they are simply farm-laborers and share-croppers. The farmers are given a separate house, which is still the property of the farm owner. They are usually located on the peripheries of the village.

3. UTILITIES AND SERVICES:

There are two main unpaved pedestrian paths which provide access to the village. They are located on the east and west boundaries of the village, and run parallel to each



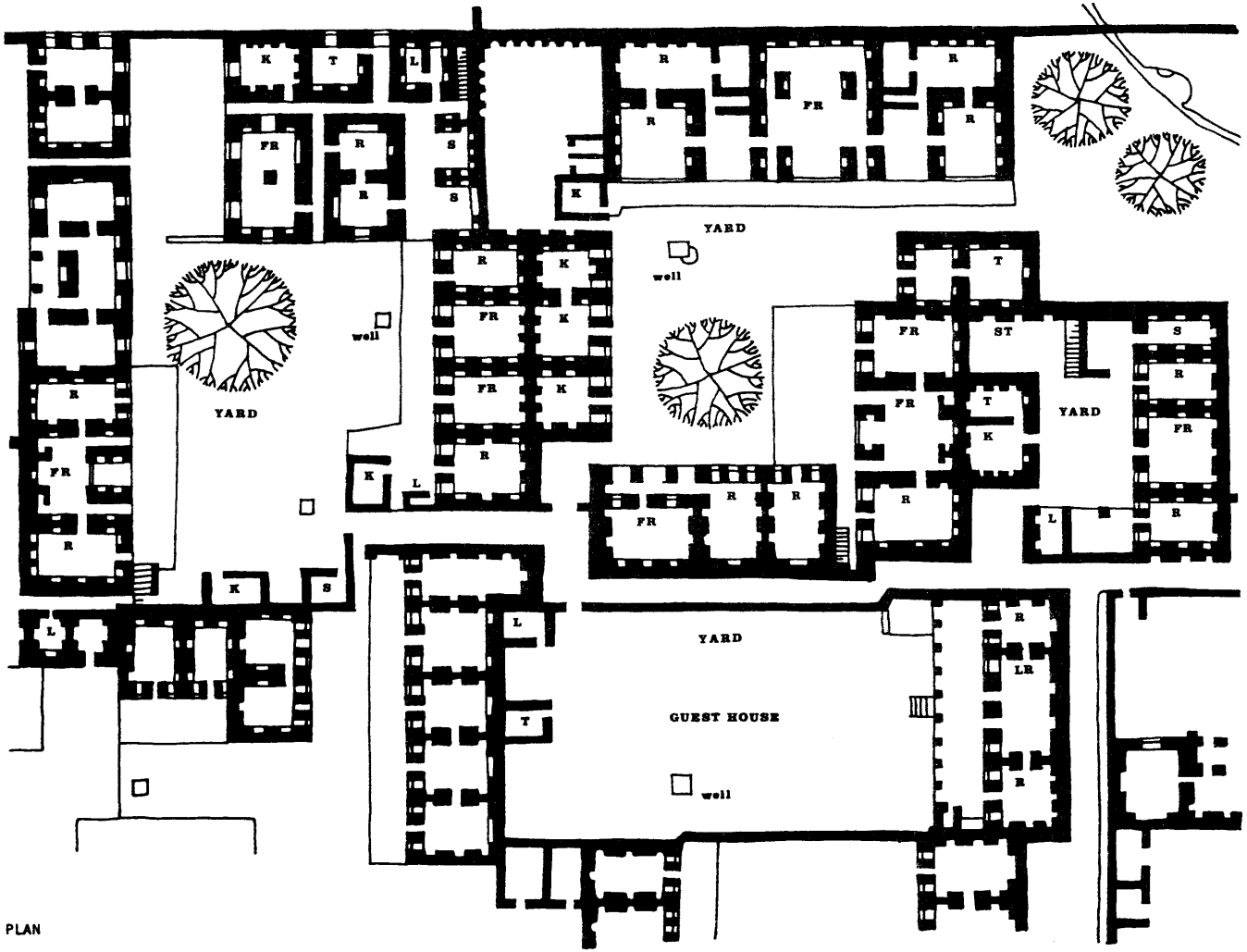
LOCALITY PLAN

LOCALITY SOURCES

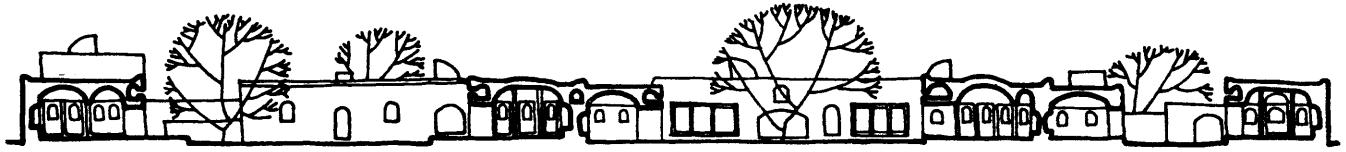
Plan:	*(approximate) Field survey B. Kazimee, 1971, 1976.*
Segment Plan:	*(approximate) IBID.*
Land Tenure:	*(accurate) IBID.*
Social Structure:	*(accurate) IBID.*
Space Utilization:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID.*
Photographs:	*B. Kazimee, 1976.*

0 50 100 150m

1:2500



PLAN



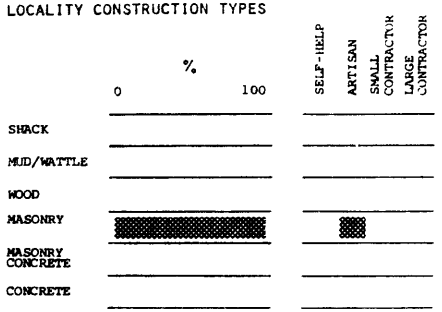
SECTION

0 5 15 25m

1:500

LOCALITY SEGMENT PLAN

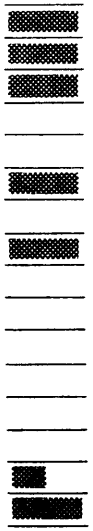
LOCALITY CONSTRUCTION TYPES



The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



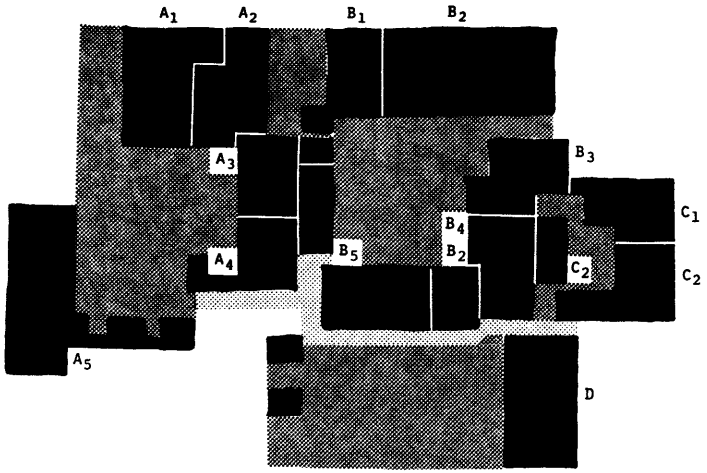
LOCALITY COMMUNITY FACILITIES

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

KEY

FR	Family Room
LR	Living Room
GR	Guest Room
R	Room
K	Kitchen
B	Bathroom
L	Latrine
ST	Stable
S	Storage
Mq	Mosque



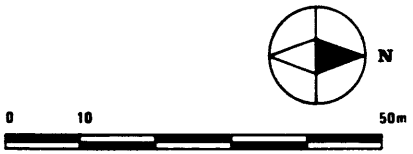
PATTERN

Public:

Semi-Public:

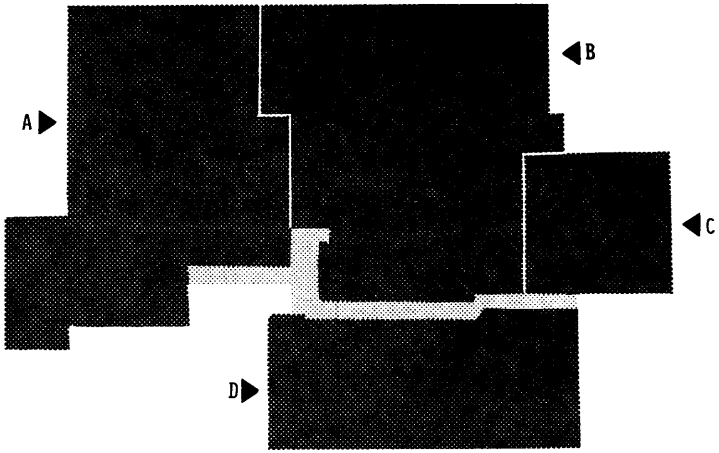
Semi-Private:

Private:

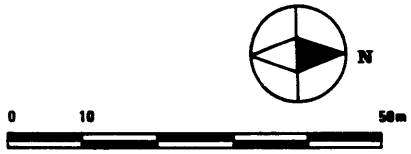


1:1000

LAND TENURE



(A) Five families, composed of relatives and brothers
(B) Five families, composed of brothers and relatives
(C) Two families, composed of brothers
(D) Guest house



1:1000

SOCIAL STRUCTURE

other. They also provide access to the other villages which are located to the south of the city.

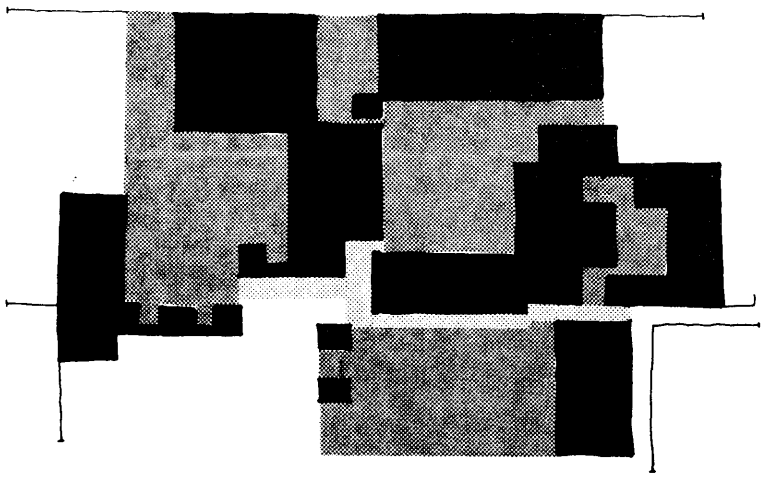
Water is provided by two streams (karize) originated from a nearby natural spring, and they are located along the main pedestrian paths on two sides of the village. In some cases the dwelling have their own water well dug inside the courtyard of the house. Water for irrigation purposes comes through a separate system of ditches. The village is not served by electricity.

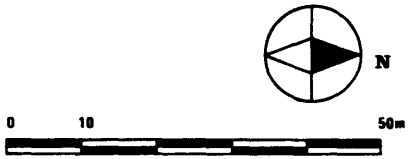
4. LAND TENURE:

The villagers own about 14.2 hectares of land including the residential area. The ownership and the distribution of the land is the response to the traditional and social characteristics of the families. The wealth and belongings of the family pass to the children after the death of the father who is the leader of the family. However the residential area and the houses are of condominium character and type of ownership. In each house there are several families of relatives or brothers living together. Each owns a certain section of the house, while sharing the courtyard and some other facilities.

5. SOCIAL STRUCTURE:

The father is the leader of the family, and remains in the position during his life time. After his death the leadership passes to the older or brighter son of the family. The decision is either made by the father through his will or he is elected. Each brother has his own family, while sharing the common entertainment, and leisure time particularly when they function as a single economic unit. However, This policy often changes when the families get large, and wish to live by themselves. The result will be the subdivision and the distribution of the land which is often done after a few generations. In this particular village studied both kinds of family structure can be seen.





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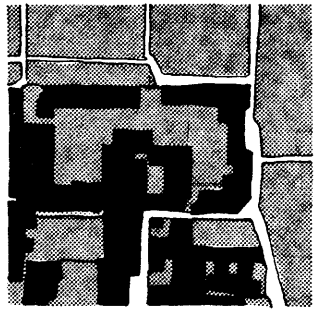
SPACE UTILIZATION

LAND UTILIZATION DIAGRAMS

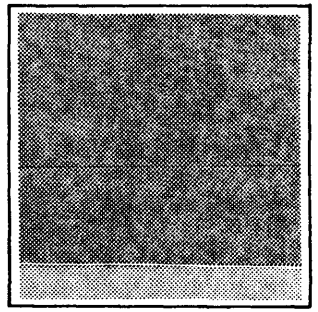
1 Hectare



PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

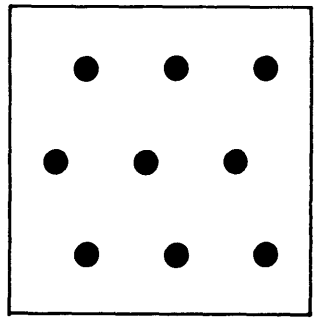
1 Hectare



PERCENTAGES

Streets/Walkways	7%
Playgrounds	-
Cluster Courts	10%
Dwellings/Lots	83%

1 Hectare



DENSITY Persons/Hectare 180

20 Persons

6. LAND USE:

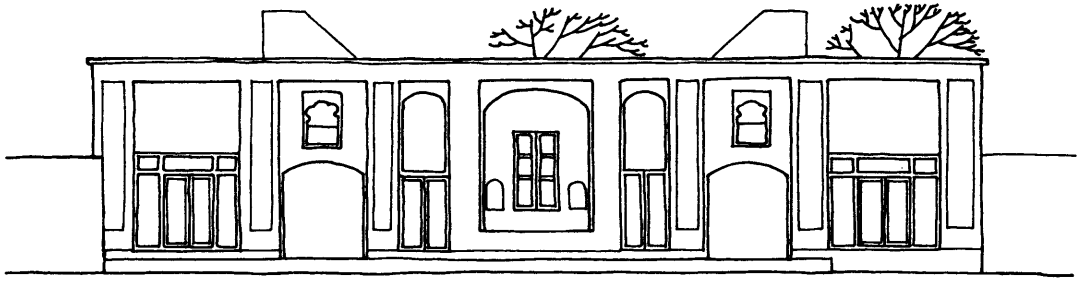
The pattern of settlement is almost completely residential, and follows the traditional style of housing, with courtyard and of comparatively low density. A mosque and a small shop is located in the middle east side of the locality. In order to accommodate visitors a common guest house is located at the center of the residential area. The village community has access to the surrounding gardens, for their common leisure time, entertainment, and social gathering.

There are no schools in the village, but they use the school in the city which is the easiest to reach.

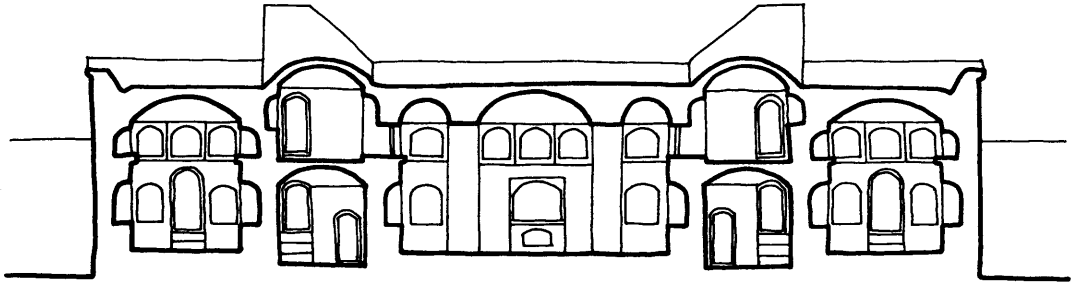
LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	4	0.4	10
DWELLING UNITS	12	0.4	30
PEOPLE	60	0.4	150

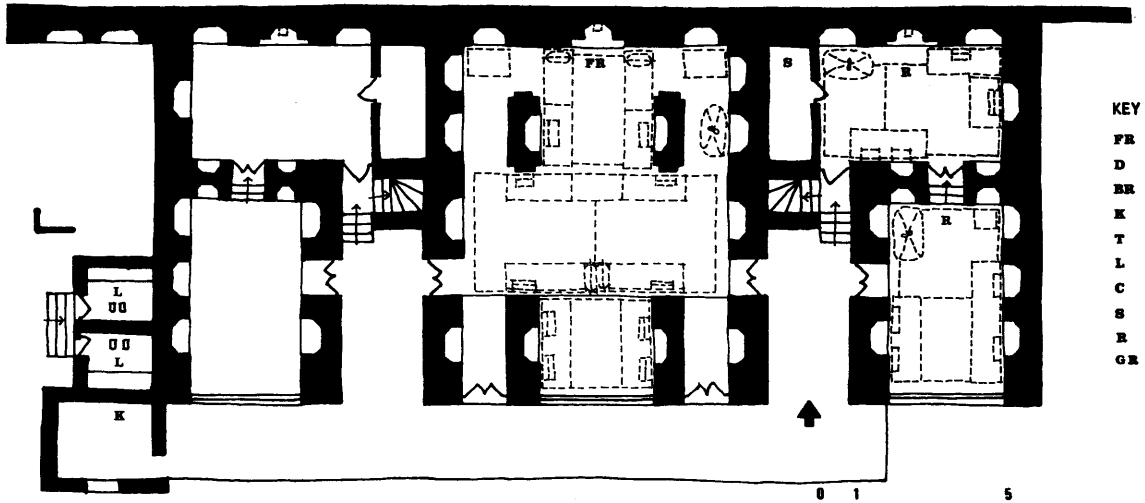
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.03	7
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	0.33	83
SEMI-PRIVATE (cluster courts)	0.04	10
TOTAL	0.4	100



ELEVATION



SECTION



PLAN

TYPICAL DWELLING

KEY

FR	Family Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Latrine
C	Closet
S	Storage
R	Room (multi-use)
GR	Guest Room

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	HOUSE
area (sq m):	259
tenure:	LEGAL OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	513
tenure:	PRIVATE CONDOMINIUM
DWELLING	
location:	(SOUTH OF RURAL VILLAGE KANDAHAR CITY)
type:	EXTENDED FAMILY
number of floors:	1
utilization:	MULTIPLE/FAMILIES
physical state:	FAIR
DWELLING DEVELOPMENT	
mode:	INCREMENTAL
developer:	PRIVATE
builder:	ARTISAN
construction type:	MASONARY
year of construction:	1800
MATERIALS	
foundation:	STONE
floors:	BRICK
walls:	BRICK WITH PLASTER
roof:	BRICK VAULTS
DWELLING FACILITIES	
wc:	-
shower:	-
kitchen:	4
rooms:	7
other:	LATRINE/BATHROOM/CLOSETS

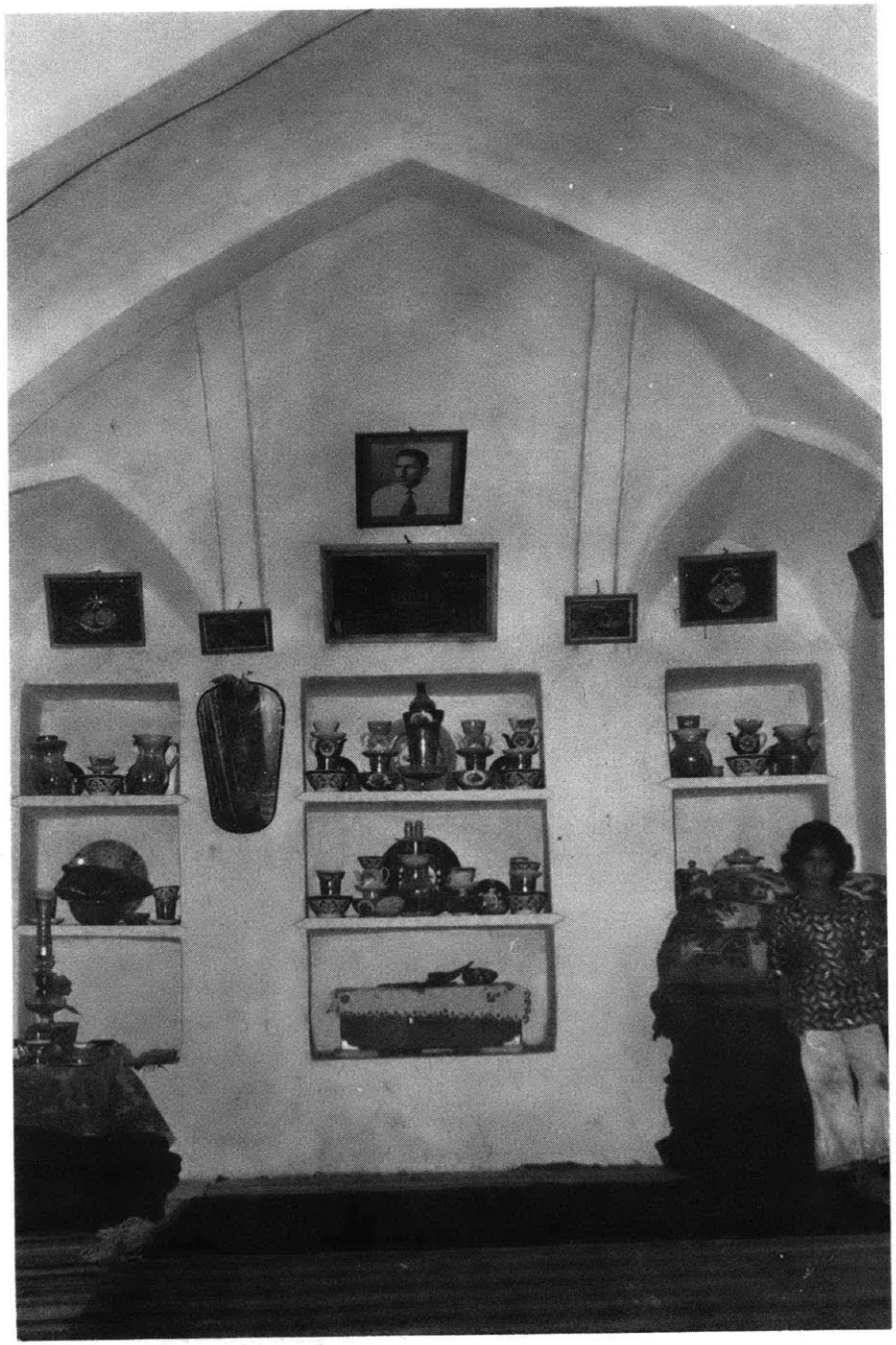
SOCIO-ECONOMIC DATA
(related to user)

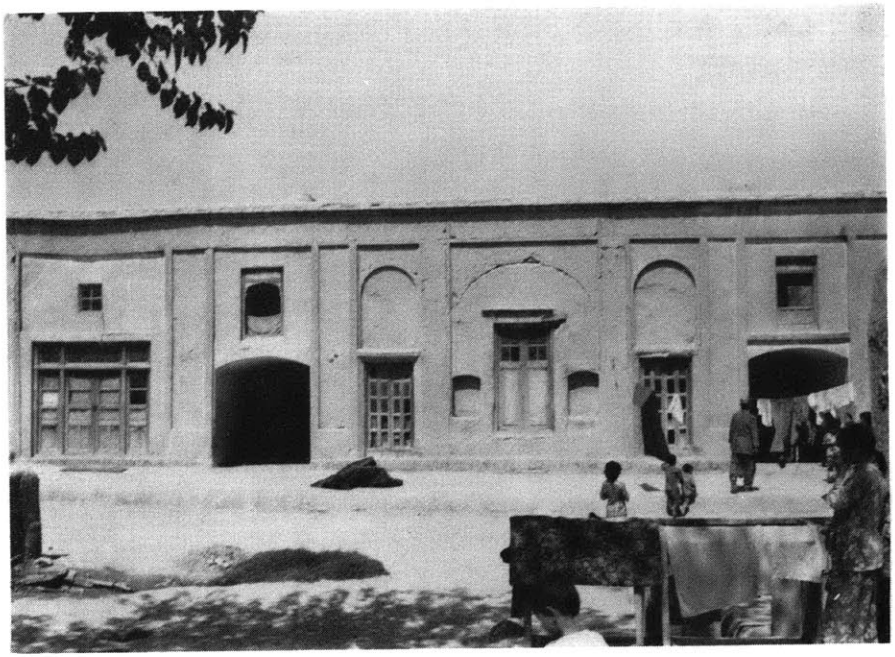
GENERAL: SOCIAL	
user's ethnic origin:	KANDAHAR
place of birth:	KANDAHAR
education level:	UNIVERSITY (MILITARY)
NUMBER OF USERS	
married:	6
single:	4
children:	8
total:	18
MIGRATION PATTERN	
number of moves:	-
rural - urban:	-
urban - urban:	-
urban - rural:	-
why came to urban area:	-
GENERAL: ECONOMIC	
user's income group:	HIGH
employment:	MILITARY OFFICER
distance to work:	10km
mode of travel:	CAR
DWELLING UNIT PAYMENTS	
financing:	SELF FINANCING
rent/mortgage:	-
% income for rent/mortgage:	-

Opposite Page
VILLAGE, Kandahar: (left) An interior view of a furnished room. Look at the neat arrangement of valued articles. The beds are rolled-up during the day and used as cushions.

(right top) View from the courtyard looking towards the west section of the house.

(right bottom) View from the courtyard looking toward the east section of the house. Large trees are usually found inside the courtyard for shading.





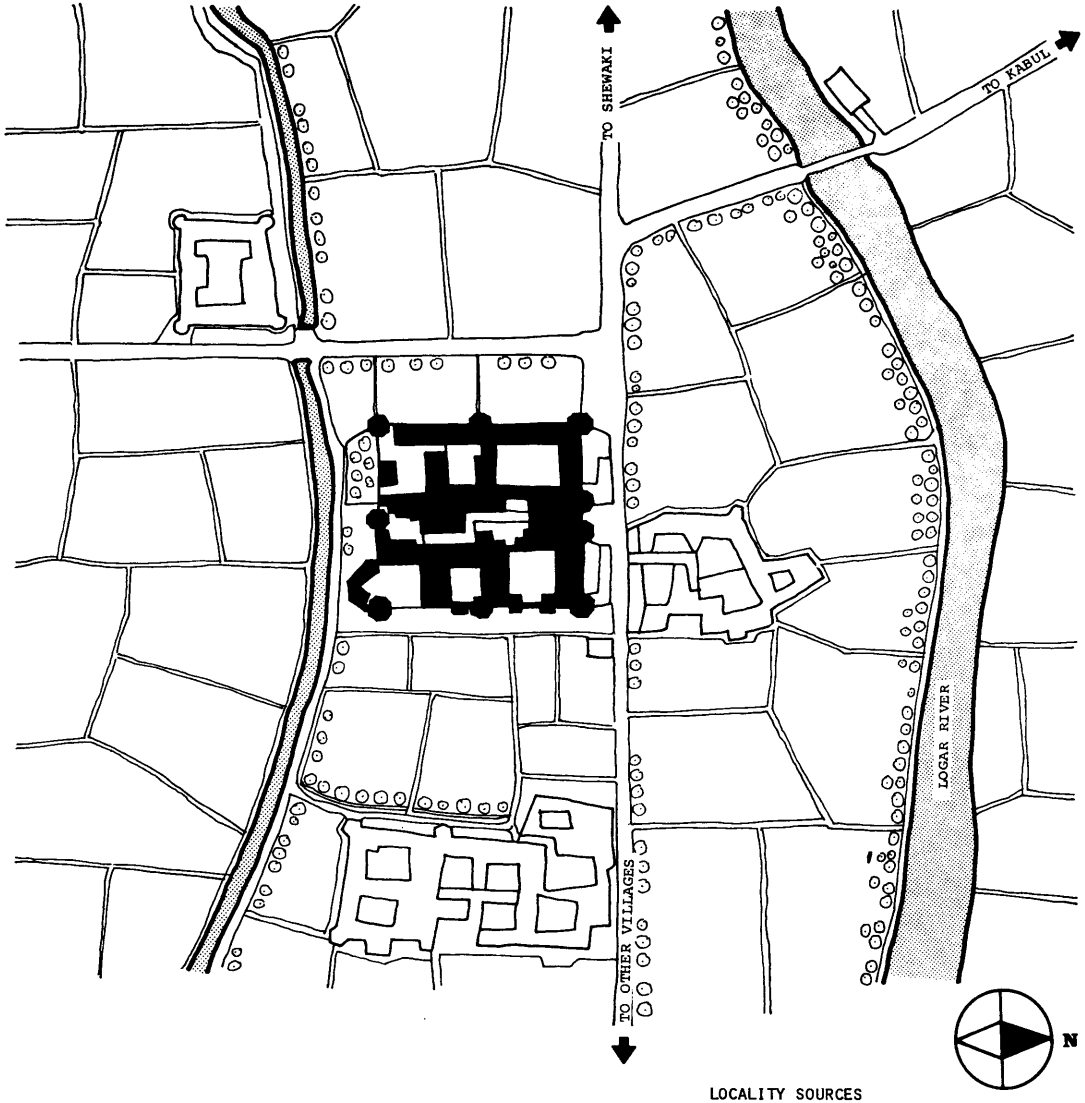
2 QALA CASE STUDY, Kabul

RURAL TRADITIONAL SETTLEMENT

1. LOCATION AND ORIGINS: It is located in Shewaki, approximately 10km to the south-east of the city of Kabul. The locality of Shewaki, which is mainly self-sufficient farmland, also remains one of the more important agricultural sectors for the city of Kabul. The origin of this qala goes back to about 60 years, built by a rich land lord in the middle of his farmland. Today the whole residential unit is dominated by the extended family of the former landlord. It is composed of 18 dwelling units of varied family sizes and with a population of about 96 persons. Most of the members of the qala work on the farmlands which they own, where in some landless families they work on the fields as tenant farmers. According to a sample survey, the productive source of income of the families is the piece of land which they own. The produce is mostly consumed directly by the families, and the little remaining is brought to the city for exchange for the needed products.

The qala consists of four massive outside walls built of mud and about seven meters high, forming a square base of 70 meters by 70 meters. It has nine towers on the sides and corners. Two of the towers are located at the entrance. The only entrance of the qala with its large door has its special characteristics and form. The guest room is located above the entrance and has elaborately carved windows out of wood which opens to the outside with a view to the farmlands, which give it a very rich and unique quality. The fortified towers at one time functioned for defense, they are now used for storing of grains and other farm products.

2. UTILITY AND SERVICES: The Logar River together with the other smaller streams provides water for irrigation for the farmland of several qalas and villages in this area. The major circulation route passes in front of the entrance of the qala. The route leads to other villages, and also connects the qala to the provincial center



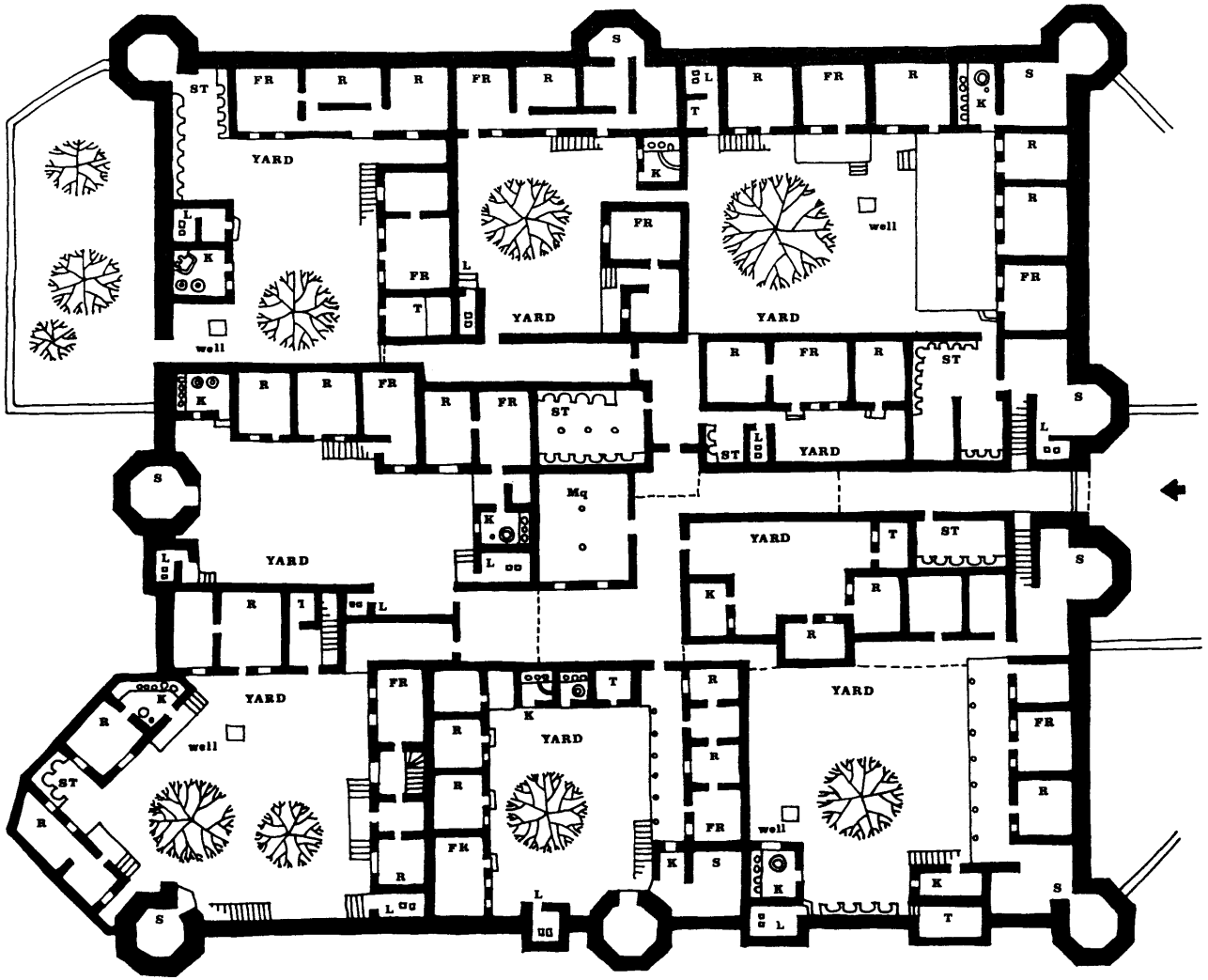
LOCALITY PLAN

LOCALITY SOURCES

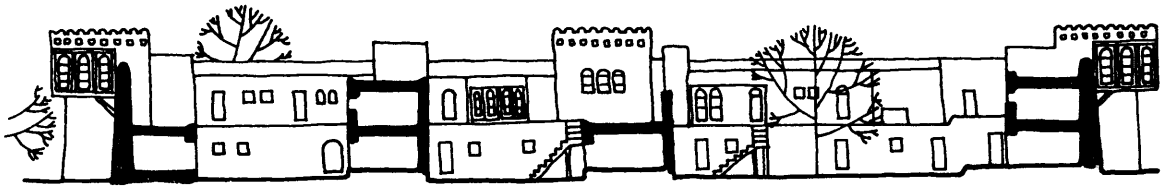
Plan:	*(approximate) Field survey B. Kazimee, 1971, 1976.*
Segment Plan:	*(approximate) IBID.*
Land Tenure:	*(accurate) IBID.*
Social Structure:	*(accurate) IBID.*
Space Utilization:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID.*
Photographs:	*B. Kazimee, 1976.*

0 50 100 150m

1:2500



PLAN



SECTION

LOCALITY SEGMENT PLAN

0 5 15 25 m

1:500

LOCALITY CONSTRUCTION TYPES

	% 0 — 100	SELF-HELP	ARTISAN	SMALL CONTRACTOR	LARGE CONTRACTOR
SHACK					
MUD/WATTLE					
WOOD					
MASONRY WOOD	■		■		
MASONRY CONCRETE					
CONCRETE					

The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES

WATER SUPPLY	■
SEWAGE DISPOSAL	■
STORM DRAINAGE	■
ELECTRICITY	
GAS	
REFUSE DISPOSAL	■
PUBLIC TRANSPORTATION	
PAVED ROADS, WALKWAYS	
TELEPHONE	
STREET LIGHTING	

LOCALITY COMMUNITY FACILITIES

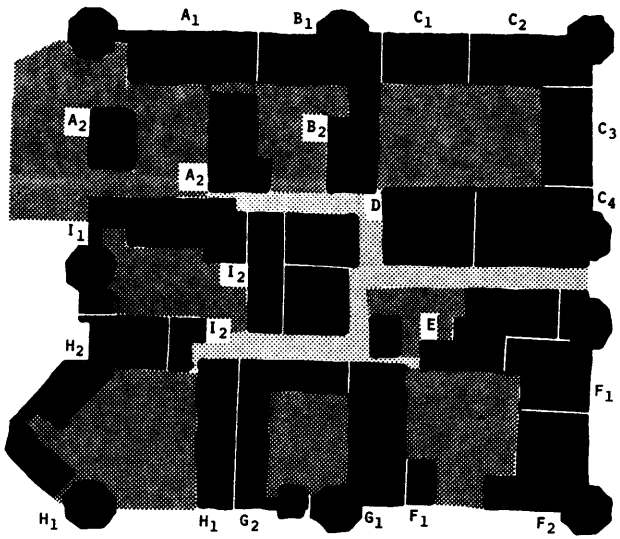
POLICE	
FIRE PROTECTION	
HEALTH	■
SCHOOLS, PLAYGROUNDS	■
RECREATION, OPEN SPACES	■

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

KEY

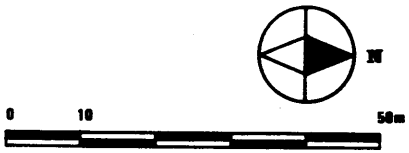
FR	Family Room
LR	Living Room
GR	Guest Room
R	Room (multi-use)
K	Kitchen
T	Bathroom
L	Latrine
ST	Stable
S	Storage
Mq	Mosque



(A) Two families, composed of relatives
(B) Two families, composed of brothers
(C) Four families, composed of relatives and brothers
(D) One family
(E) One family
(F) Two families, composed of brothers
(G) Two families, composed of relatives
(H) Two families, composed of brothers
(I) Two families, composed of relatives

PATTERN

Public:
Semi-Public:
Semi-Private:
Private:



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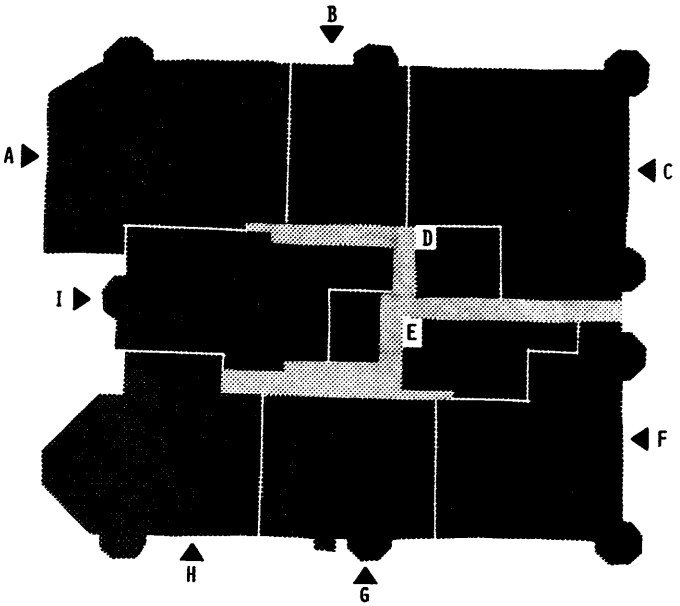
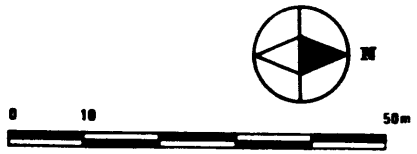
LAND TENURE





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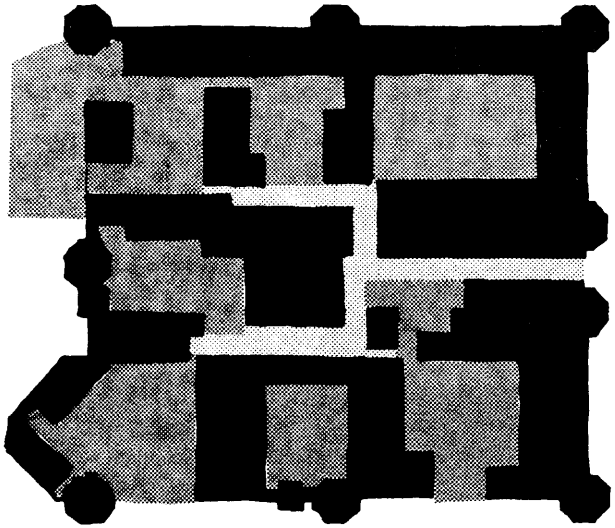
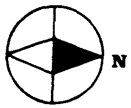
SOCIAL STRUCTURE

of Shewaki. None of the streets or walkways are paved. Water is provided by a stream located behind the south wall of the qala, while some of the dwellings have their own well dug inside the courtyards of their houses. This area is not served by electricity. There are no public water or sewer services, the houses all have pit-latrines, mostly located on the outside walls to allow access for cleaning.

3. LAND TENURE: There was no statistical data available. However the characteristic of the land ownership is of the common traditional type: The wealth and belongings of the families pass to their children. The families have expanded steadily but the farmland, has remained constant. Even in the residential area of the qala crowding is evident and the environment has become unhealthy because the means of sanitary disposal is inadequate for the higher densities. Each time the land is subdivided into smaller pieces, and it becomes more difficult for the families to support themselves. The chances of working in Kabul are also small because of the distance. Only in severe cases families are forced to emigrate to the city.

4. SOCIAL STRUCTURE: The families are socially a single unit and can be considered a neighborhood. Each house is shared by several brothers or they are distant cousins. Each night per custom they discuss the daily events and problems after praying in the mosque. But the community in the qala itself is not socially organized as in the large villages; however, there are traditional social bonds between several qalas in one area particularly during social events as weddings, riligious holidays, and etc.





0 10 50m

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SPACE UTILIZATION

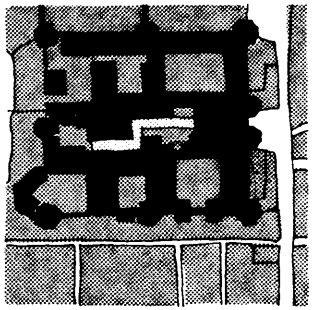
5. LAND USE: The form of the houses in the qala still follows the traditional style of rooms arround a courtyard. Most of the family activity rooms are located in the second and third floors, while the first floor is used for storage areas, stables, and etc. At night the animals are kept in the stables which are located near the entrances of each house. A small mosque is located in the middle of the qala for praying. The mehman-khana on the second floor above the entrance gate serves as a guest-room for the qala. Particularly in this area there are no schools or other public facilities, but they are located in the provincial center of Shewaki, which is within an hours walking distance.

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	9	0.46	20
DWELLING UNITS	18	0.46	39
PEOPLE	96	0.46	210

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.03	5
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	0.408	88
SEMI-PRIVATE (cluster courts)	0.022	7
TOTAL	0.46	100

LAND UTILIZATION DIAGRAMS



PATTERN

Public: streets/walkways

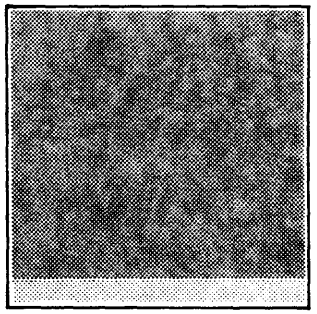
Semi-Public: playgrounds

Semi-Private: cluster courts

Private: lots

dwellings

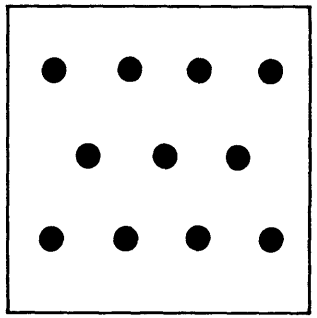
1 Hectare



PERCENTAGES

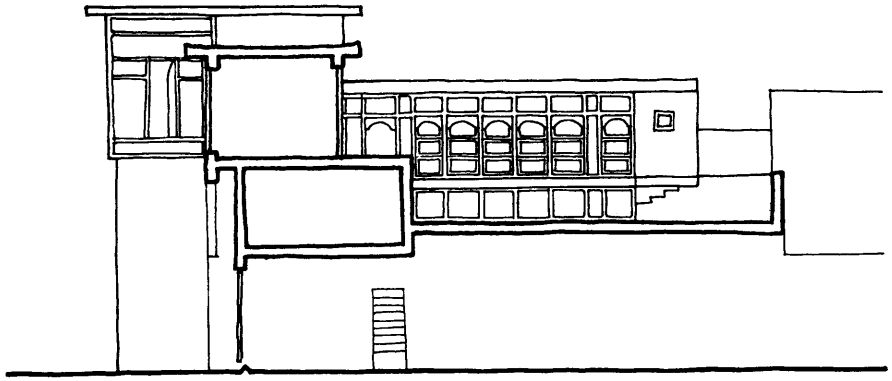
Streets/Walkways 5%
Playgrounds -
Cluster Courts 7%
Dwellings/Lots 88%

1 Hectare



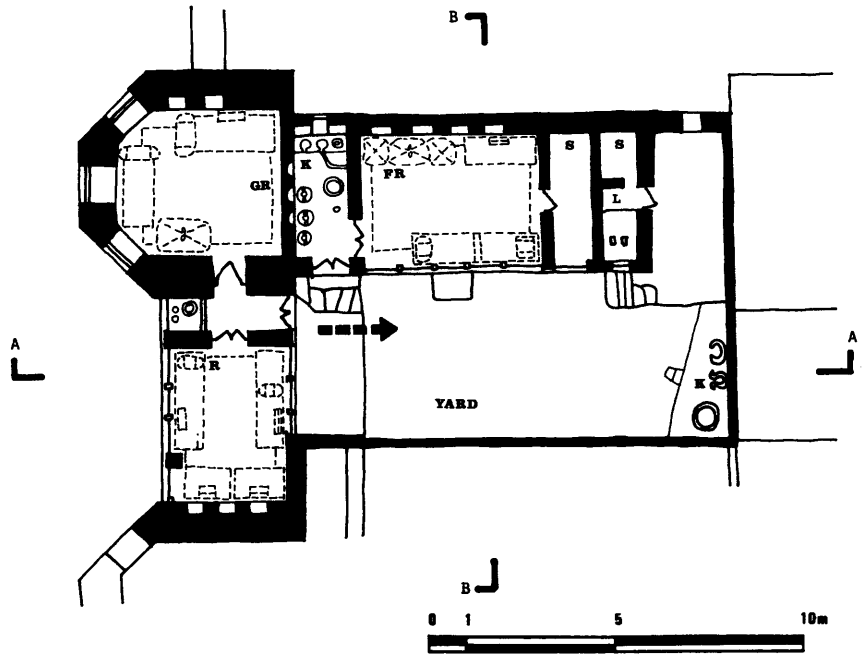
DENSITY Persons/Hectare 227

20 Persons



SECTION A-A

SECTION B-B



PLAN

1:200

TYPICAL DWELLING

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	SHEWAKI
place of birth:	SHEWAKI
education level:	NONE
NUMBER OF USERS	
married:	4
single:	2
children:	4
total:	10
MIGRATION PATTERN	
number of moves:	-
rural - urban:	-
urban - urban:	-
urban - rural:	-
why came to urban area:	-
GENERAL: ECONOMIC	
user's income group:	LOW
employment:	PEASANT
distance to work:	200m
mode of travel:	WALKING
COSTS	
dwelling unit:	-
land - market value:	-
DWELLING UNIT PAYMENTS	
financing:	PRIVATE
rent/mortgage:	-
% income for rent/mortgage:	-

KEY

- **FR** Family Room
- **D** Dining/Eating Area
- **BR** Bedroom
- **K** Kitchen/Cooking Area
- **T** Toilet/Bathroom
- **L** Latrine
- **C** Closet
- **S** Storage
- **R** Room (multi-use)
- **GR** Guest Room

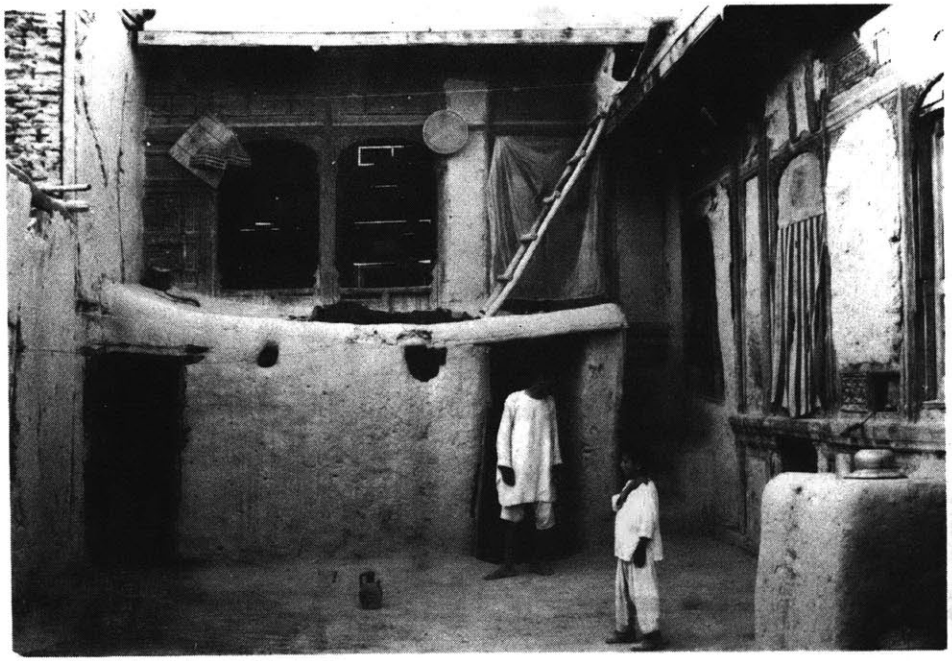
PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	HOUSE
area (sq m):	90
tenure:	LEGAL OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	149
tenure:	PRIVATE CONDOMINIUM
DWELLING	(SOUTH-EAST
location:	SHEWAKI OF KABUL)
type:	EXTENDED FAMILY
number of floors:	2
utilization:	MULTIPLE/FAMILIES
physical state:	BAD
DWELLING DEVELOPMENT	
mode:	INCREMENTAL
developer:	PRIVATE
builder:	ARTISAN
construction type:	MUD-WATTLE
year of construction:	1910
MATERIALS	
foundation:	STONE
floors:	MUD
walls:	MUD, ADOBE
roof:	WOOD POLES SUPPORTS
DWELLING FACILITIES	
wc:	-
shower:	-
kitchen:	2
rooms:	3
other:	LATRINE/STORAGE AREA

Opposite Page
QALA, Kabul: (left) View looking to the massive entrance of the qala. The guest room is located on top of the entrance. The structure can be clearly seen, note the massive mud walls and the elaborated wood framing.

(right top) A view showing the inside court of the guest house located on top of the entrance. Due to expansion of the families the guest house is now used as a residence.

(bottom right) A view looking from outside to the east section of the qala. The towers at one time were used for security purposes.



TIME/PROCESS PERSPECTIVE

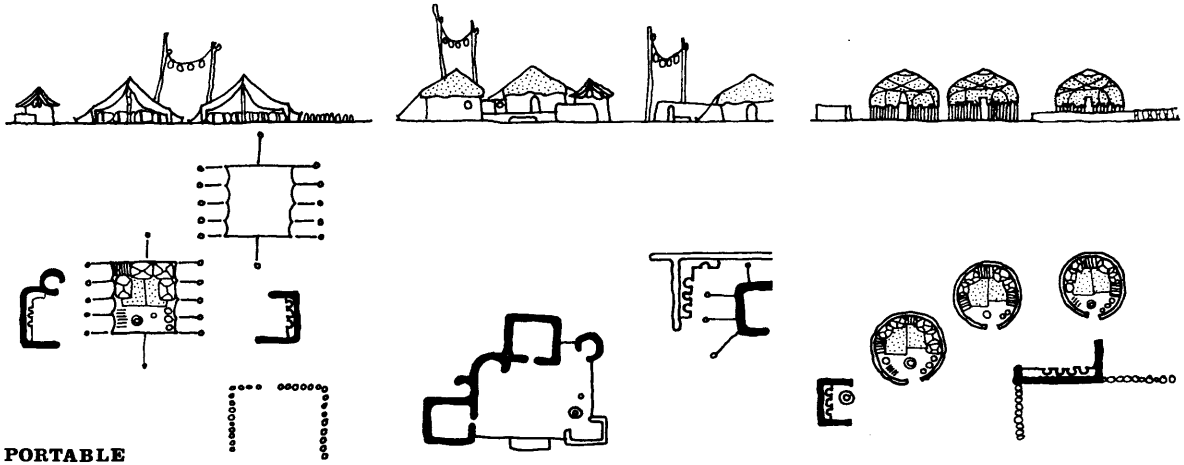
The existing housing models are the most valuable source of information or reference in formulating urban land policies and housing programs. The models provide a guide to general and basic questions of land use, land distribution and land subdivision, their relation to different cultural values, and accessibility to different income groups.

The case studies and other dwelling/land situations which have not been included in this study have been distributed in charts in an attempt to relate them to their originating models and to see them in a broader time/process perspective.

In general the dwelling forms shown here are catagorized as portable and permanent shelter forms. The three portable shelters are used by nomads. Nomads are herdsman or seasonal farm laborers and move collectively with the season and live in their portable tents or yurts (see the opposite chart).

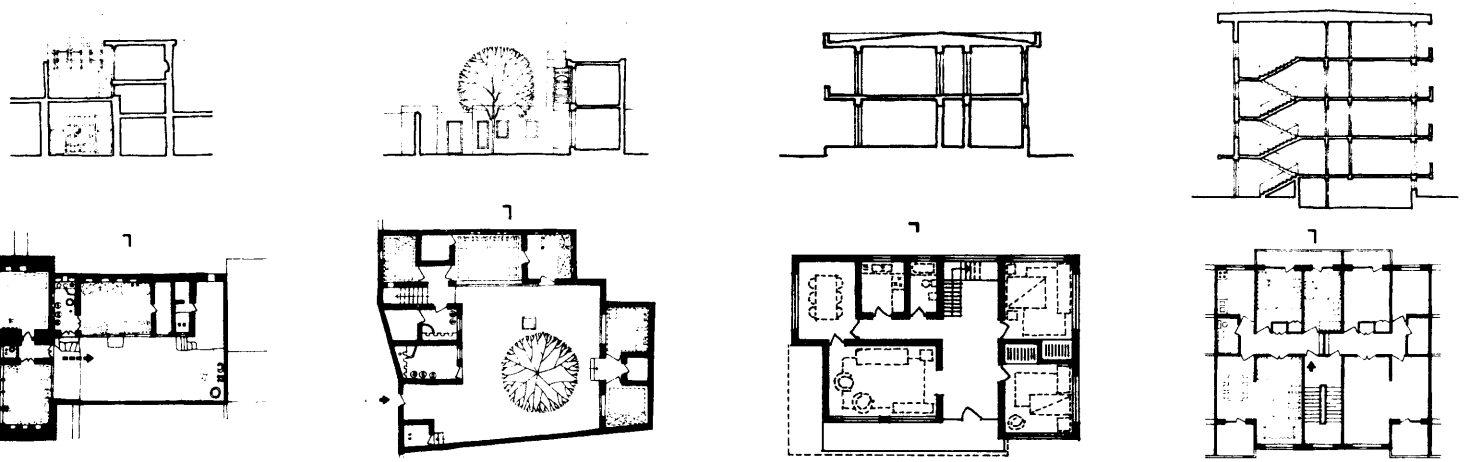
From the four permanent dwelling forms two models are Afghan traditional models and it is important to emphasize that they are culturally adaptable to the life styles, they are accessible to all income groups, exhibits good land utilization, and have the potential for economic provision of utilities and services.

The last two models shown in the chart are contemporary European models which are only accessible to higher income groups.



PORTABLE

	KOCHI TENT	JAT & QAWAL TENT	TURKOMAN & UZBAK YURT
Characteristics	Separate or in groups; movable; generally one per family unit. Represents 3% of population.	Grouped semi-permanent shelters, small rooms of differnt sizes and shapes built of mud with tent roof.	Separated or in groups, hemispherical, wooden, portable structure; one per family unit.
THE PAST	Indigenous Afghan nomadic-tribal culture	Indigenous Afghan nomadic-tribal culture	Indigenous Afghan nomadic-tribal culture.
Users	Kochi tribes or other nomadic ethnic groups	Jats and Qawals, who migrate on periodic basis.	semi-nomads
PRESENT MODEL	No change from original	No change from original	No change from original
Users	Kochi tribes are herdsman who move in a group from summer to winter pastures and back again. The nomads supply wool, milk products, and animals to the market places, and are considered economically important.	Semi-nomads, low income, who move seasonally to farms in harvest time, they settle temporarily for the season near or in the cities for the employment opportunities.	Semi-nomads, who move collectively with the seasons, or farmers who move with their families to their farms at harvest time.
THE PRESENT			
Case Studies	See above, similar type found throughout country.	See above, similar type found throughout country.	see above, similar type found in north-east and north Afghanistan.
FUTURE MODEL	Questionable if will be continued.	Questionable if will be continued.	Questionable if will be continued.
Trends	Decreasing in use since the government is encouraging permanent defined tenure.	Decreasing in use since the government is encouraging permanent defined tenure.	Decreasing in use since the government encouraging permanent dwellings and defined tenure.
THE FUTURE			
Land Issues	Little restriction to the use of the land since on public pasture land and of temporary nature.	Can be critical since the settlement mostly squats on the public land in or near cities and towns, same time becomes permanent.	Little restriction to the use of the land since on public pasture land and of temporary nature.
Comments	Cultural values should be retained and incorporated into eventual permanent settlements.	The model is not a long lasting form of dwelling. An economical mean should be provided to encourage the gradual change to a permanent settlement.	The model is an efficient, adaptable form of shelter in its regional and environmental context. Cultural values should be retained and incorporated into the eventual permanent settlement.



SECTION

PLAN

PERMANENT

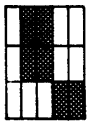
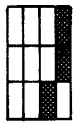
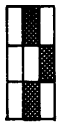
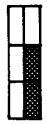
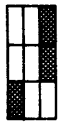
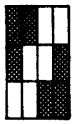
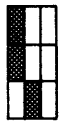
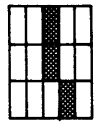
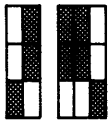
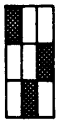
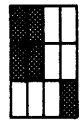
RURAL/TRADITIONAL HOUSE	URBAN/TRADITIONAL HOUSE	URBAN/CONTEMPORARY HOUSE	URBAN/CONTEMPORARY APARTMENTS	
Group houses, in square or rectangular form inside a compound, with interior courtyards, 2-3 stories; the entrance to each house opens to the courtyard.	Houses, in an irregular compact pattern, of different sizes and shapes, the basic house plan is the arrangement of rooms around a courtyard, one to four stories high.	Large lots, back to back within a rectangular block. Houses are detached, located in the center of compound walls, one to two stories.	Groups of several small apartment units per floor, large apartment blocks, 4-5 stories, amorphous planned layout.	*Characteristics*
Afghan rural villages and qalas	Pre-industrial/Afghan urban pattern	Contemporary European; intruduced in the 1930's	Contemporary European; built in 1969	*ORIGINAL MODEL*
Afghan tribes and ethnic groups, rural population	High/medium income groups; urban population	High/medium income	High/medium income	*Users*
No change from original other than gradual expansion.	Changing and deteriorating, but it has always occupied what is considered to be the heart of the city.	The same as original	Same as original model	*PRESENT MODEL*
Rural population of mixed income groups. A village is a social unit, and the village life is based on family and lineage, it is a self-sufficient economic unit in terms of agricultural products. The inhabitants of the village are mostly farmers. Wealth in land and animals are the criterea of high social status.	Low income group, urban population, considered the old and slum neighborhood of the city.	High income groups. Residents are mainly government civil servants, businessman, or foreign nationals.	High/medium income groups, mostly government employees. The apartments are subsidized to users on long term installement payments, and on monthly bases.	*Users*
Qala in Shewaki	Old city of Kabul		Micro-Royan	*Case Studies*
Decreasing in use	Disappearing	No change expected	No change expected	*FUTURE MODEL*
Questionable if will be continued. Rural-urban migration due to lack of oppartunities in villages, population pressure, productivity of the rural agriculture, scarcity of arable land, lack of agricultural occupation in villages, and the attractive elements of urban life are the factors for the destruction of the villages.	Decreasing in use, since it has becoming a slum area and not provided with facilities and services, unsanitary environment and with deteriorating structure.	Increasing in use, since western life style is becoming fashionable; and also public facilities and services are better because of the high income group.	Increasing in use since the type represents the only residential development in Kabul which is provided with full service centralized utilities.	*Trends*
The settlements in rural areas are villages and qalas, in the form of clusters or groups of houses sharing semi-private spaces. The physical setting and specific layout of the villages depends on topography, climate, water,and security. The densities are relatively low and clearly defined land use.	The settlement is an example of pre-industrial/ Afghan urban pattern, narrow and tortuous streets pedestrian oriented, predominantly residential with attached houses, high densities and clearly defined tenure.	Gridiron layout, blocks are rectangular, streets are used both by automobiles and pedestrians. Predominantly residential with some of the land used for commercial and other public facilities. The density is low.	Lack of immediate access to the land and the lack of physical control over the open spaces are the crucial aspects of the bad land utilization. The density is low.	*Land Issues*
The model is consistent with the Afghan culture and should be retained; it exhibits good land utilization. Model has the potential for economic provision of communal utilities and services.	The model should be encouraged; it has cultural consistency, and permits the gradual upgrading of the dwelling, and has the potential for economic provision of utilities and services.	Model should be improved: to allow mixed-income groups, to incorporate cultural values; to provide a more efficient layout and higher densities.	Model should be greatly improved, to incorporate cultural traditions; to allow user control and responsibility over semi-public spaces, which minimizes public land; optimum population densities should be determined.	*Comments*

THE PAST

THE PRESENT

THE FUTURE

PHYSICAL DATA MATRIX

Category	Population of Kabul per Category	% of Total Population	LOCALITIES (representative of different categories)	USER	DWELLING UNIT				LAND/LOT			DWELLING					DWELLING DEVELOPMENT						
				5 Income	6 Type	7 Area	8 Tenure	9 Rent/ Mort.	10 Utilization	11 Area	12 Tenure	13 Location	14 Type	15 No. Floors	16 Utilizatn	17 Phy. State	18 Mode	19 Developer	20 Builder	21 Construction Type	22 Date	23 Den.	
				very Low Low Moderately Low Middle High	Shanty Room Apartment House	50 m^2 or less 51 - 100 m^2 101 m^2 or more	Legal Rental Legal ownership	20% or less of income 21% or more of income	Public Semi-Public Private	m^2	Extralegal; rental Extralegal: ownership Legal: rental Legal: ownership	City Center Inner Ring Periphery	Detached Semi-Detached Row/Grouped Walk-up High-rise	1 2 3 or more	Single Multiple	Bad Fair Good	Incremental Instant	Populat Public Private	Self-Help Artisan Small Contractor Large Contractor	Shack Mud and Wattle Wood Masonry/Wood Masonry/Concrete Concrete	Year of Settlement	People/Ha	
A	30,000	6	1. DEH-AFGHANAN							81											1916	700	1
B	107,000	20	2. OLD CITY							114											1878	1000	2
C	10,000	2	3. MICRO-ROYAN							90											1972	100	3
	373,000	72	LOW, MIDDLE, AND, HIGH INCOME (not represented)																				
	520,000	100	TOTAL POPULATION																				

The physical data of the three case studies of dwelling environments existing in the Metropolitan area of Kabul is summarized in the physical data matrix and in the following comments. The matrix permits:
- A comprehensive view of the spectrum of the dwelling types.
- A comparison and determination of trends and patterns.

The population figures correspond to the inhabitants of similar dwelling systems in urban areas of Kabul.

(1) CATEGORY; (2) POPULATION PER CATEGORY: Number of people; (3) PERCENT OF TOTAL POPULATION; (4) NAME OF LOCALITY. The three urban case studies are grouped in two different categories, identifying different income groups, housing systems, and selected physical characteristics. The categories are identified as follows:

Cat./income	Housing Systems	Dwelling
A. Low	Squatters	House
B. Low	Traditional Urban	House
C. Middle/High	Public Housing	Apartment

(5) USER INCOME GROUP: The income level is considered an indicator to the analysis of housing systems, and has a direct relationship to the quality, size, and the construction technology involved. The higher is the income the better is the degree of indicator. The provision of the dwelling and its process becomes a matter of survival and security for the low income groups, whereas in the middle and high income groups it is a commodity and service.

(6) DWELLING UNIT TYPE: Almost in all income groups and dwelling systems, the house is the common dwelling unit type. Apartments are used mostly by high and middle income groups.

(7) DWELLING UNIT AREA: The three urban dwelling types are studied (12 m^2/p, 7 m^2/p,and 6 m^2/p) indicates that the higher is the income the larger is the area per person.

(8) DWELLING UNIT TENURE: In all income groups three situations are considered: legal ownership of the dwelling on the legally occupied land, ownership purchase from the first occupant, and the extralegal ownership of the dwelling on the illegally occupied land.

(9) DWELLING UNIT-PERCENT INCOME FOR RENT/ MORTGAGE: Only the middle and high income groups are observed to pay more than 20% of their income as rent or mortgage. It is also related to the developed and undeveloped areas in the city and the level of services available. The ratio of rent-income moves upward as an area develops, its land values increasing and its location becoming more important within the expanding of city boundaries.

(10) LAND/LOT UTILIZATION: It is clear in all case studies that whenever the lot boundary is defined, clearly the land utilization remains private, among all income groups and the land and lot becomes essential as a living area as well as for future expansion. Whereas in the Micro-Royan housing project, the lack of immediate access to the land as well as the lack of physical controls over the public open spaces becomes crucial and as a result the land is wasted.

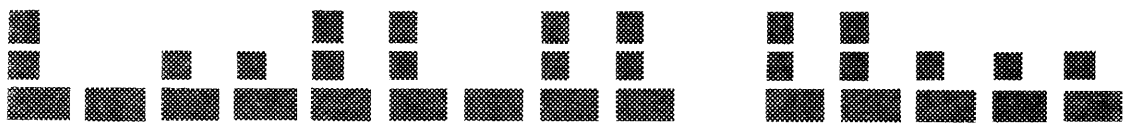
(11) LAND/LOT AREA: In the unplanned areas of low income settlements the sizes of the lots are usually large and of varied sizes and different shapes, but the dwellers clearly define lot boundaries. In case of Micro-Royan it is difficult to reflect the concept of lot/ land subdivision.

(12) LAND/LOT TENURE: Extralegal rental/ ownership is found among those of low income and in the unplanned areas. Legal rental/ ownership is frequent in the middle and high income groups.

(13) DWELLING LOCATION: The low income groups are usually located in the old neighborhoods

COMMUNITY FACILITIES, UTILITIES/SERVICES MATRIX

Category	Population of Kabul per Category	% of Total Population	LOCALITIES (representative of different categories)
A	30,000	6	1. DEH-AFGHANAN
B	107,000	20	2. OLD CITY
C	10,000	2	3. MICRO-ROYAN
	373,000	72	LOW, MIDDLE, AND HIGH INCOME (not represented)
	520,000	100	TOTAL POPULATION



and in undeveloped areas. The high and middle dwellings are usually found in the developed areas which has better services.

(14) DWELLING TYPES: Medium and high income people live in detached houses situated in private garden-like courtyards and apartments. Row/grouped houses are found throughout the remaining income croups.

(15) DWELLING FLOORS: The height of the dwelling units in traditional and squatter areas vary from one to three stories. The high income dwelling units are mostly one and two stories, with the exception of Apartments.

(16) DWELLING UTILIZATION: Single occupancy of the dwelling is a predominant form of utilization of high and middle income dwelling units. Most of the low income dwellings have multiple forms of dwelling/land utilization.

(17) DWELLING PHYSICAL STATE: A bad situation can be found in the traditional and squatter houses left to deteriorate. A good physical state is typical of high and medium income dwellings.

(18) DWELLING DEVELOPMENT MODE: The incremental mode of development is used by low income groups, instant development is typical of housing built by private and public sectors.

(19) DWELLING DEVELOPER: The popular is generally found in the low income groups particularly squatter areas. The private sector is oriented towards middle and high income groups. The public sector's role is confined mainly to provision of services for all income groups.

(20) DWELLING BUILDER: The low income group built their own houses and sometimes with the help of an artisan. Artisans and small contractors are employed widely by the remaining income groups. Large contractors are generally used by the public sector for large scale developments.

(21) DWELLING CONSTRUCTION TYPE: Masonry-wood and mud-wood are typical construction types for the low income groups. The higher income groups use masonry-concrete construction.

(22) DWELLING DEVELOPMENT YEAR OF CONSTRUCTION: The oldest case is the traditional type located in the old city, dating back to 1878. The squatters started with the farther growth of Deh-Afghanan settlement and some of the dwellings in this area are more than 30 years old. Micro-Royan is a new development built by prefabrication in 1972.

(23) DWELLING DEVELOPMENT DENSITY: Low densities are typical of high income and new publicly planned developments. The higher densities are achieved in older areas of the city particularly in the old city.

The matrix illustrates the approximate availability of community facilities, utilities, and services in the three dwelling environments. Three levels are indicated as follows:

No provision at all

Limited or occasional

Adequate or normal

The population figures correspond to the inhabitants of similar dwelling systems in urban areas of Kabul.

Deh-Afghanan is an example of the squatter settlements. There are no community facilities and sanitary services or water supply available in the site. The locality depends on pit-latrines provided in the dwellings. Water is carried a long distance by water carriers, from the nearest water pipeline provided by the municipality. The site is not served by the municipality. The site is served by electricity.

The Old-City is an example of low income areas that grew from once wealthy residential areas left to deteriorate. In 1910 the first piped public water supply was constructed for the old city with a capacity of 1200 m^3. Due to the recent expansion of this area and the increase of population this source of water is not enough and the common source of water in many areas of the old city is the shallow wells which are located inside the courtyards of each house. There is no municipal public sewer system in this area. The underground storm sewer was constructed in the old city approximately 70 years ago and provided only limited storm and sanitary drainage to some parts of this locality, but it is almost deteriorated now. The site is served by electricity. There are 12 schools, 132 mosques 3 hospitals, and several other public facilities provided in the site, but they are not in a sufficient manner.

Public facilities and utilities are provided for the Micro-Royan residential project which is a high and middle income area. A water supply system is planned and built as the integral part of the development. In addition hot water is also supplied to the apartments from a central boiler. This locality is the only major residential development in Kabul which is provided with conventional sewage collection and treatment facilities. The site has sufficient electricity and other public facilities such as schools, open spaces, and etc.

CUMMUNITY FACILITIES:

- Police: Generally available throughout the metropolitan area.
- Fire Protection: In general there is no fire protection in the old residential and unplanned areas, although some provisions are made for the new developments which are of an inadequate nature.
- Health: About 10 large hospitals are located in different sections of the city, in in addition several other health units are located in the suburbs in different areas of Kabul.
- Schools, Playgrounds: Elementary and secondary schools, and playgrounds are generally located in newly developed areas. High schools are constructed throughout the city center and in the large developed residential areas.
- Recreation: The development of a section and the proximity to the city center affect the availablity and type of recreation facilities.

UTILITIES AND SERVICES:

- Water: The existing municipal water supply is not adequate and it provides only limited services to the city. New projects for water-supply in the city are under construction and expected to provide adequate services in the near future.
- Sewage: The existing city of Kabul does not have a municipal sewage system. Existing network or treated sewage systems are strictly of a local and private nature. Except for the Micro-Royan which is the only major residential development provided with a sewage collection and treatment facilities, almost all of the residential areas are served by pit-latrines, cess-pits, and septic tanks.
- Storm Drainage: The common ways of drainage are ditches, juies, natural streams, and roadside ditches which provide the basic drainage.
- Electricity: Networks are generally not adequate. Limited illegal connections occur in squatter areas.
- Gas: Gas networks do not exist in the city Bottled gas is used, but limited common use.
- Refuse Collection: Generally adequate throughout the city's new development areas and the city center. The squatter areas have no formal refuse collection system.
- Public Transportation: Except for the more isolated settlements which have limited services, public and private bus services are readily available.
- Paved Roads, Walkways: The majority of the new development communty which are located in the inner ranges of the city, all the roads and walkways are paved, with the exception of the old city and the squatter areas.
- Telephone: Service is limited predominantly to the high income groups. Public telephones are available throughout the city.
- Street Lighting: Networks are generally adequate throughout the city.

LAND UTILIZATION: PATTERNS, PERCENTAGES, DENSITIES

The different case studies are represented on the opposite page, in terms of land utilization (patterns, percentages, and densities) in a format that allows the comparison and evaluation of the urban layout of each dwelling system. The criteria used in the evaluation of the efficiency of the urban layouts are the followings:

- LAYOUT PATTERN
  Lot configuration, blocks, and circulation. This determines the infrastructure network. e.g. Certain layouts result in complicated infrastructure networks requiring excessive lengths of service lines and therefore, resulting in higher costs per person.

- LAND UTILIZATION DISTRIBUTION
  Proportions of public and private areas within the layout. This determines the maintenance responsibility, user control and functional efficiency. e.g. A high percentage of circulation area means higher cost of development per person and, therefore indicates an inefficient layout.

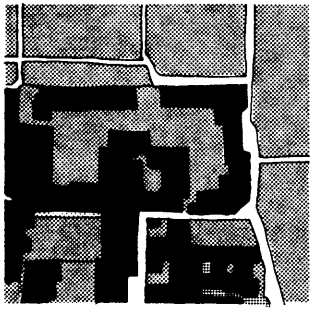
- POPULATION DENSITIES
  Number of persons per hectare; related to the number and type of dwellings per hectare. This determines the intensity of land use; e.g. Low densities mean higher cost of development per person.

RURAL, CASE STUDIES

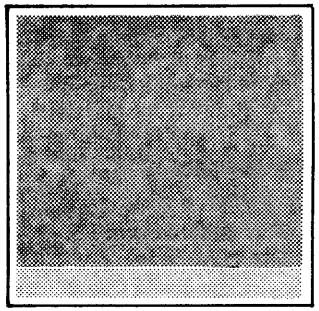
1 VILLAGE

Rural Traditional Settlement

Very low percentage of land for streets and walkways; high percentage of land for private and semi-private areas; low and medium population densities. Overall, a good system if utilities/ services and communal facilities are made available.

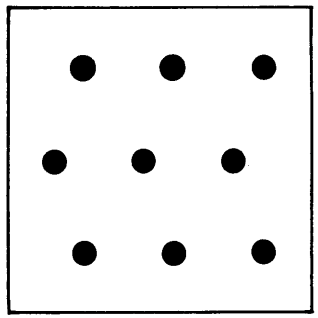


1 Hectare



PERCENTAGES

Streets/walkways	7%
Playgrounds	10%
Cluster Courts	35%
Dwellings/Lots	48%

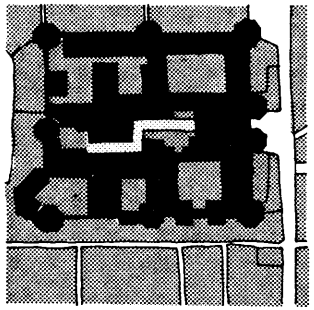


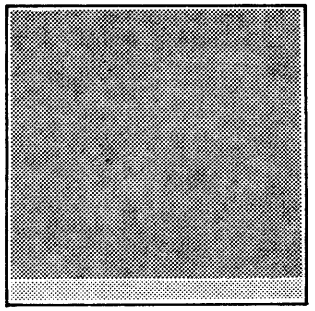
DENSITY Persons/Hectare 180 P/Ha

2 QALA

Rural Traditional Settlement

Very low percentage of land for streets and walkways; high percentage of land for private and semi-private areas; low and medium population densities. Exhibits good land utilization if provisions for communal facilities, utilities/services are made.





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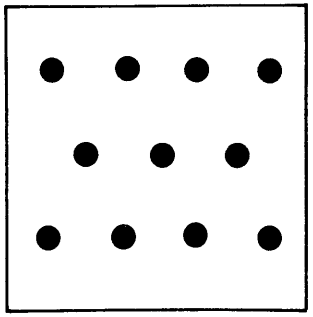


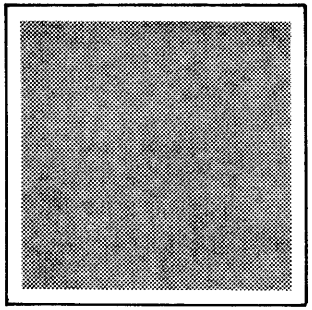
227 P/Ha

URBAN, CASE STUDIES

1 DEH AFGHANAN

Popular, Low Income
Urban Squatter Settlement

Low percentage of land for streets and walkways; High percentage of land for private and semi-private areas; high population density. Development potential/provision of services are restricted by topography and layout.



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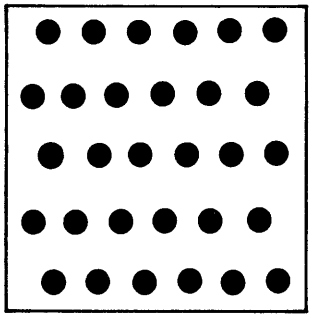
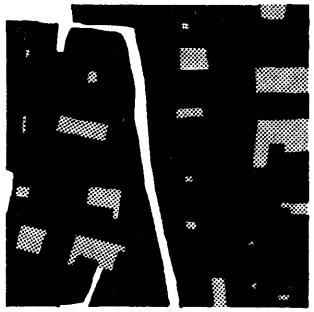


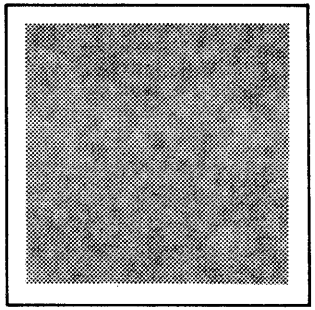
600 P/Ha

2 OLD CITY

Private, Low Income,
Urban Traditional Settlement

Low percentage of land for street and walkways; high percentage of land for private and semi-private areas; high population density. Deteriorating standard of services due to layout pattern and high population density.





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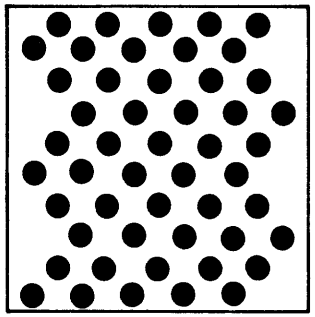
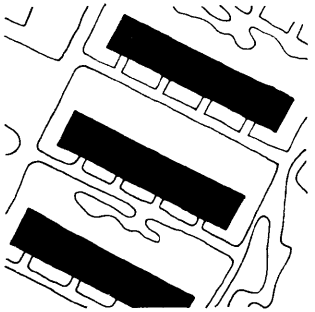


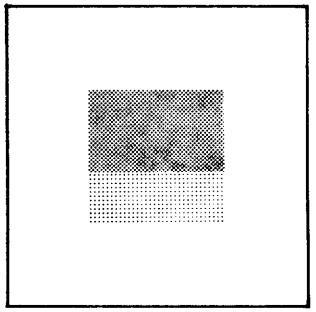
1000 P/Ha

3 NADER SHAH MAINA

Public, High/Middle Income,
Walk-up Apartments, Urban project

High percentage of land for streets, walkways, and public open spaces; low percentage of land for private and semi-private areas; low population density. Excessive public space does not recognize user needs for private/semi-private open area.





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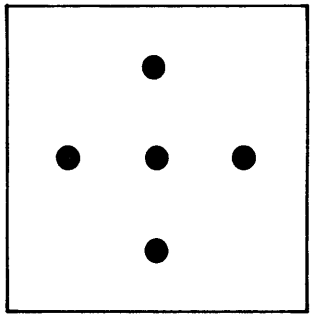


100 P/Ha

PROPOSED MODEL

Considering a 5% annual population growth in Kabul which is the result of the natural explosion of the population and migration from rural areas and other cities, approximately 30,000 new inhabitants will be added each year to the city. This impact is seen in the rising land values, and the increasing cost of construction materials, which make the housing situation more and more difficult for an average city dweller, particularly in the low income group. Essential factors such as the efficient subdivision of land, and distribution of land is completely ignored. As a result the urban land is wasted. In addition the projects developed by the government lack social and economical considerations that are important and imperative factors in site development. The combination of these factors necessitates new solutions to the housing problems of the city and demand a controlled urbanization process.

According to an estimate, the population of Kabul will reach 676,000 persons by the year 1981. Assuming a 27% working population ratio, this would lead to a labor force of about 182,000 people by the same year, which would require the provision of 26,000 housing units during the period of 1976 to 1981.

Considering the existing dwelling environment of the low income, it is evident from the case studies done in previous sections that the major problem of the low income housing is not the dwelling but the framework in which they exist. Because of municipal planning as well as the illegal status of the squatter settlements, the city grew in irregular patterns, which would make the level of the application of services and infrastructure more difficult for both user and public sector.

The purpose of the urbanization model is to propose an alternative method of residential development. It focuses specifically on physical layout and land subdivision in an effort to minimize public sector costs in implementation, maintenance, operation of services and to provide maximum amenity to the user, and to meet various family needs. It will provide a reference source for the provision of the dwelling and land that incorporate the technology within the existing socio-economic and political context. The case studies and evaluation also provide a basis for the understanding of critical land development issues and physical planning elements.

It should be understood that this study is not a solution to the problems of urbanization and urban dwelling environments, but only an indicator to the responsible agencies in order to maximize the use of scarce resources.

THE PROJECT POLICIES/GOALS

PRIMARY USE: The primary use of the site will be residential with the supporting commercial and community facilities serving a gross population of about 60,000 people at the saturation stage.

TARGET INCOME GROUPS: In order to make a higher level of services and public facilities possible, the project should encourage mixed incomes from high, medium, and low income groups. The possibility exists of devising a mechanism by which the profits are made on those who can afford it and be distributed to those who can not. According to a sample survey by the Central Authority of Town Planning, 1974, the income groups are as follows:

Low income	$30 - 60 per month
Medium income	$60 - 100 per month
High income	over $100 per month

TENURE: The development of the site should offer different land tenure options, which will include predominantly private ownership, through long term installment purchase, and direct purchase of the land.

INTENSITIES OF LAND USE: Medium density; ranges of gross densities planned for the site are between 200-500 persons per hectares. (The lower the density, the larger is the land required for a given population, which results in higher costs of land and infrastructure. On the other hand very high densities not only may put excessive load on the services, but will create negative and destructive social conditions).

FINANCING GROUPS: Public financing is needed to carry out the overall site planning development and the provision of public facilities and infrastructure. The emphasise on the completion of the project will be more by the popular and private sector through site and services developments.

NETWORKS: Circulation: Predominantly pedestrians. The public streets will be shared with vehicles, but pedestrians will dominate over vehicles. Control of traffic frequency, character and speed are mainly established by the street layout and use. Infrastructure network of water, sewer, storm drainage and electricity will be connected to the proposed master plan network.

DEVELOPMENT MODE: The site will be developed progressively and by stages. The planning/design/development will include the following:

- Initial stage of development (5 to 10 years) will include the detailed physical and financial planning and the provision through gradual construction of utilities and services, to the minimum level of services.

- The period involving the gradual upgrading of utilities, facilities, and different options for the upgrading of dwelling units, until the standard level is achieved. (5 to 15 years)

Evaluation and revision of policies and design will be carried out as needed after every period of development.

THE SITE

LOCATION: According to the regional zoning of the master plan of Kabul, the site is the second phase of the Ayub-Khan-Mena. It is located to the west of the Sher-Darwaza mountain, between the Darul-Aman Road and Kabul River. It is in the municipality of Kabul approximately 5 Km to the south-west of the city center.

ACCESS: The existing primary approach is from the Darul-Aman Road, located on the west of the site. It will provide the main access. Darul-Aman Road is considered an important access to this area and to the surroundings, and connects the localities to the main routes leading to the city center and other employment centers.

TRANSPORTATION: Existing public and private bus lines serve the surrounding localities, along the Darul-Aman Road. The development of this site would mean the extension of the existing line incorporated into the city's transporation system.

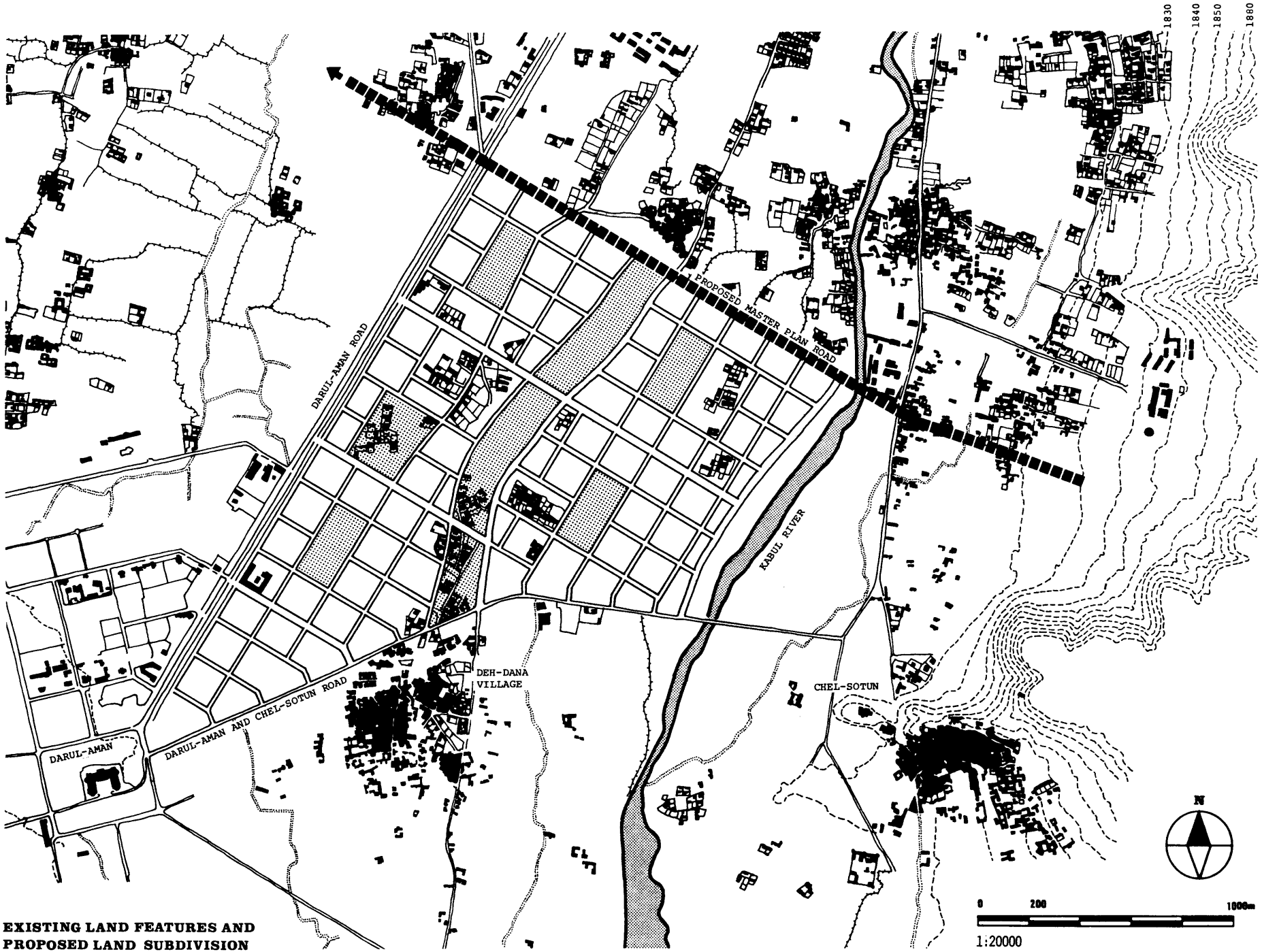
AREA: The site covers an area of approximately 290 Hectares, out of which about 16 Hectares are taken by Kabul River and Darul-Aman Road and 274 Hectares are assumed to be available for residential development.

TOPOGRAPHY/NATURAL FEATURES: The site is flat without any obstructive physical feature. Part of the land is used for agriculture with small streams for irrigation. The Kabul River which is located to the east as well as several other streams provide the natural drainage channels. The slope of the land is approximately two to three percent.

BOUNDARIES: To the north is assumed a proposed road by master plan. It also provides the boundary between the first phase of the development and further expansion. To the south is the unpaved road of Chil-Sutoon and Darul-Aman. To the east is the Kabul River, and to the west is the Darul-Aman Road connecting the site to the main network of the city and employment centers.

EXISTING STRUCTURES: The small village of Deh-Dana located to the south, and the village of Deh-Muradkhan, in the upper north boundary are the two main existing settlements. Aside from these, there are other numerous structures scattered on the site as well.

UTILITIES: Connections are made to the existing city network, and to proposed installations outlined in the Kabul master plan.



EXISTING LAND FEATURES AND PROPOSED LAND SUBDIVISION

CIRCULATION AND LAND USE

The circulation network provides a primary framework around which the supporting uses of the community are organized. The existing pattern of circulation is a major determinant of circulation. The utility lines follow the public circulation lines throughout the site and provide continuous access for maintenance and control. The land that is utilized by the circulation network is considered to be under public ownership providing for both pedestrian and vehicular access. The circulation layout is based upon:

- Recognition of the existing circulation pattern.
- Recognition of the predominant pedestrian mode of circulation within the residential development.
- Recognition of minimizing the development cost as well as the cost of infrastructure, its operation and its maintenance.

CIRCULATION MODES:

The following circulation modes are considered in the network:

MODE I: Existing main road of Darul-Aman to the west and the proposed master plan road to the north of the site; they are assumed and expected to carry heavy vehicles for the city transportation system. They will also be used by pedestrians and cyclists to and from the employment centers.
MODE II: Primary streets; the use is shared equally by pedestrians and vehicles with pedestrians dominant in use.
MODE III: Secondary streets; predominantly pedestrians and used mainly as access to the lots, cluster courts, and community facilities.
MODE IV: Exclusively used by pedestrians; walkways within the cluster courts.

LAND USE PLAN shows the various land uses as follows:

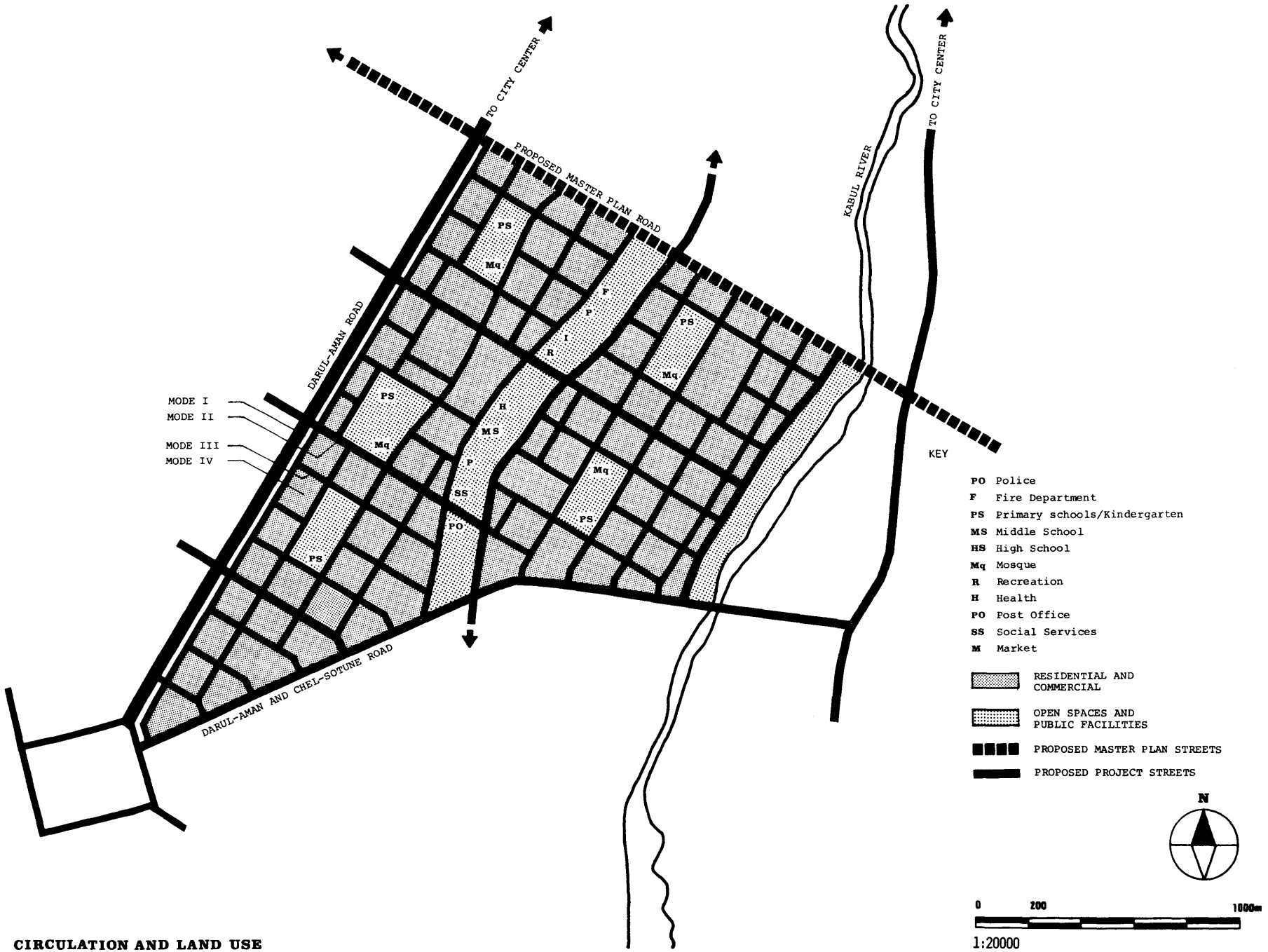
RESIDENTIAL: The site development should be planned accordingly, not in terms of community services but also in terms of: different income groups, diversity in housing programs, public and private developers and funding.

PUBLIC FACILITIES: Schools, playgrounds, and community centers are located in the center of most sections for easy accessibility and recognizing their need for future expansion and space requirements. Other public facilities like markets, community halls, health centers, etc. have also been centrally located for convenience. Open areas within these facilities are intended to be used occasionally for religious, cultural, or any other festivities.

COMMERCIAL AREA: Major commercial areas are planned in such a manner that they will be able to re-adjust to higher land values and other priorities through incremental planning. The major commercial pattern is assumed to follow alone the main roads of Darul-Aman to the west and the proposed master plan road to the north of the site, and along the primary proposed streets. Smaller commercial developments for immediate shopping needs will be permitted/encouraged within each section of the residential development.

The gross area within the boundaries of the site is 290 ha. out of which 16 ha. is assumed taken by the Kabul River and Darul-Aman Road. Available land for development is about 274 ha.

		Ha.	%
PUBLIC LAND:	- Circulation	44	16
	- Schools, playgrounds, parks, open spaces, markets, community halls, and facilities	58	21
PRIVATE LAND:	- Residential, commercial, small scale industries	172	63
	TOTAL	274	100



CIRCULATION AND LAND USE

BLOCKS, LOTS, AND LOT CLUSTERS

BLOCK. is a primary residential area bounded and served by public streets and walkways.

LOT. is a measured parcel of land having fixed boundaries and access to public circulation.

LOT CLUSTER. is a group of lots (owned individually) around a semi-private common court (owned in condominium).

CONDOMINIUM. is a system of direct ownership of a single unit in a multi-unit whole. The individual owns the unit in much the same manner as if were a single family dwelling: he holds direct legal title to the unit and a proportionate interest in the common land and areas: horizontal: detached, semi-detached, row/grouped dwelling types; vertical: walk-up, high-rise dwelling types.

PROPOSED BLOCK LAND SUBDIVISION/BLOCK, LOTS, LAND CREW:
Since the majority of population are either rural migrants, or are living in the same traditional manner in the city, the urban model will focus particularly on the physical layout/subdivision of the land according to the traditional rural structure of cluster "QALA", which is a group of houses and families living around a semi-private or private space. Furthermore this kind of layout is efficient in terms of cost and is functionally viable in development and the primary determinants, such as administration, maintenance, etc. The design of the block will incorporate the traditional way of life with utilities and services in a complementary way. The evaluation and study done on the Qala in Shewaki (opposite pages) provides base for the utilization of land: land coverages, proportion of open areas versus covered areas, size and shape of the lots, family sizes, densities, and other related informations.

Characteristics of the proposed layout are illustrated as follows:

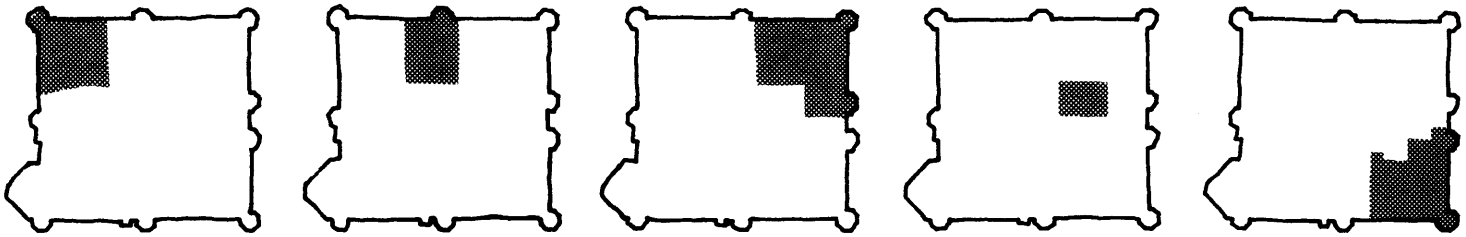
- Lots are grouped around a common court that serves as access as well as a semi-private open space. This court is owned in condominium by the lot occupants who control/share the use of, and share the responsibility for the maintenance of the court.
- Minimizing of public ownership of land to reduce public responsibilities and control for its maintenance.
-Maximization of the number of families that can be given a legal/lot tenure through effective land utilization.
- Minimization of public land in circulation and the length of utilities.
- Minimization of cost of the development by adopting a dwelling component approach.

The blocks are larger and due to their proportions offer a greater flexibility to match different social

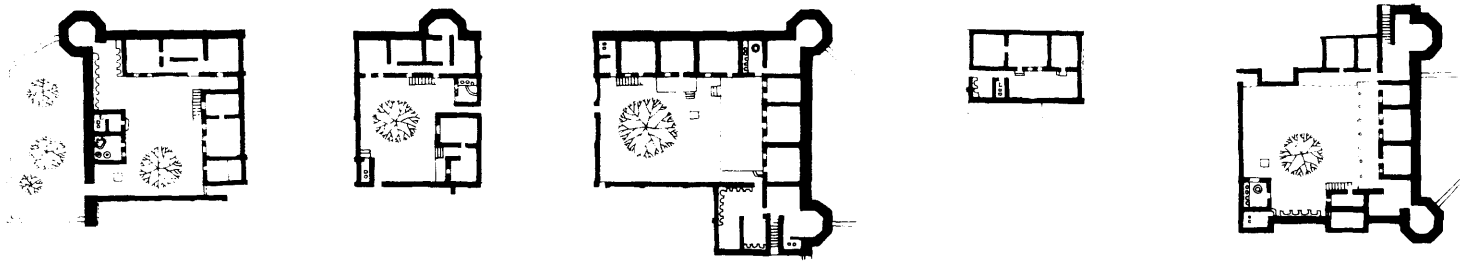
and community requirements. They facilitate expansion and transformation of buildings in the form of both horizontal and vertical expansion, without changing lot cluster courts. They are similar in shape and still they permit the accommodation of different uses, such as: residential, residential/ commercial, light industries, schools, playgrounds, parks, reserved areas and other uses. Lot clusters are of minimum optimum dimension to permit flexibility in terms of: progressive development units, tenements units, commercial/small industries with residential facilities, medium and high densities, and they allow different types of land tenure without legal/administrative complications.

The subdivision of the block is achieved by means of a central semi-private area around which private small lots are organized. The small lots are interior lots and having access only to semi-private space. The larger lots are located along the streets and the size/ shape of the lots will offer variety of options such as commercial growth, absorb higher densities, and permit different family sizes. The large lots are exterior lots and have access only to public streets. The average size of the block is determined by the anticipated circulation model with corresponding street widths and the sizes. An average block is about 160m X 160m but varies in size and shape according to the site conditions/limitations.

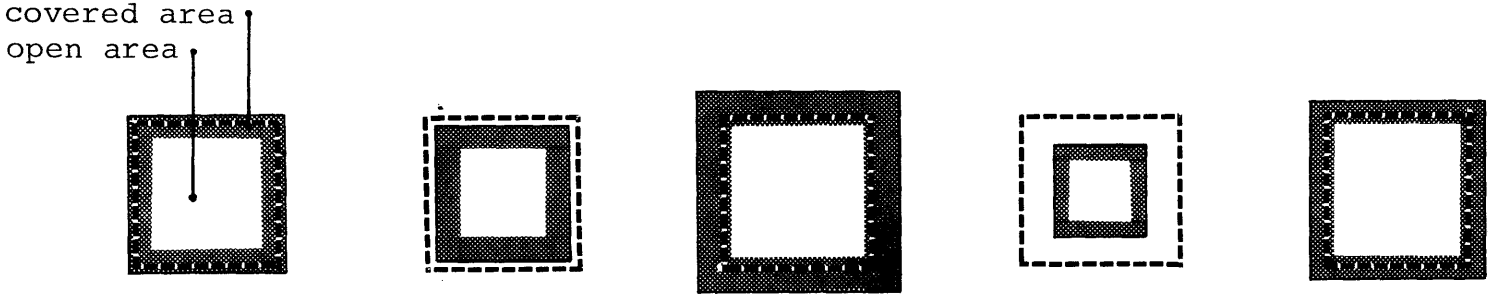
DWELLING LOCATION KEY



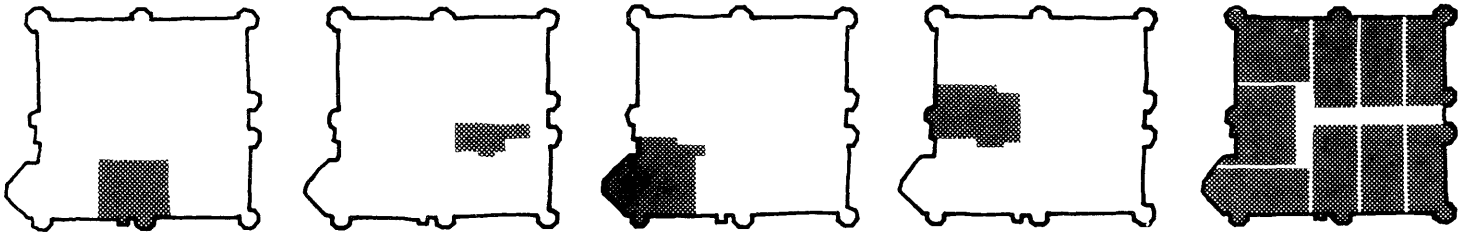
DWELLING



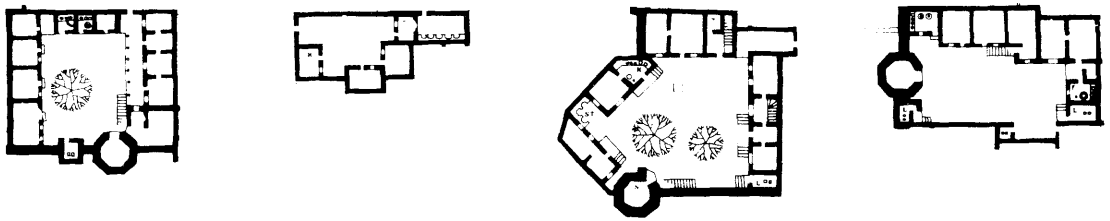
DWELLING SIZE



	21X21	18X18	27X27	13X13	24X24
DWELLING AREA (M^2)	462	332	728	171	591
% OPEN AREA	48	45	42	25	49
% COVERED AREA	52	55	58	75	51
AREA (M^2)/PERSON	33	33	38	28	49
NUMBER OF PEOPLE	14	10	19	6	12
NUMBER OF FAMILIES	3	2	4	1	2
NUMBER OF FLOORS	2	2	2	2	2
NUMBER OF ROOMS	10	12	17	7	13

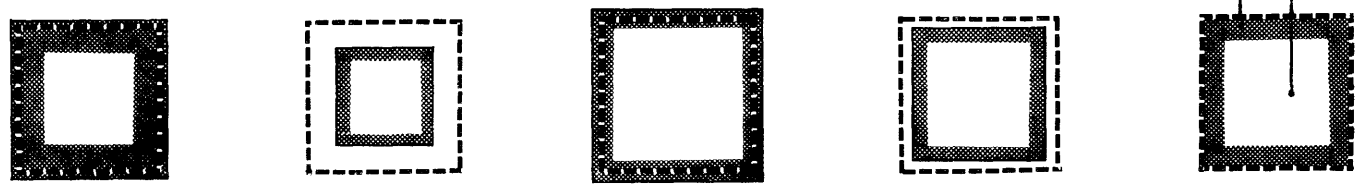


DWELLING LOCATION KEY



AVERAGE LOT SIZE

DWELLING

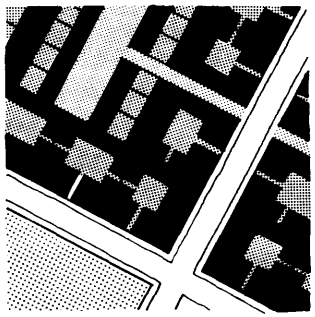


DWELLING SIZE

21X21	12X12	23X23	20X20	20X20	
427	143	576	403	420	DWELLING AREA (M^2)
35	61	50	47	45	% OPEN AREA
65	39	50	53	55	% COVERED AREA
53	20	37	67	40	AREA (M^2)/PERSON
8	7	14	6	11	NUMBER OF PEOPLE
2	1	2	2	2	NUMBER OF FAMILIES
2	1	1	2	2	NUMBER OF FLOORS
10	4	11	7	10	NUMBER OF ROOMS

LAND UTILIZATION DIAGRAMS

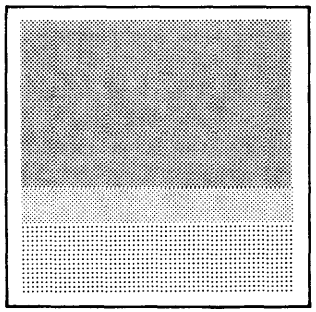
1 Hectare



PATTERN

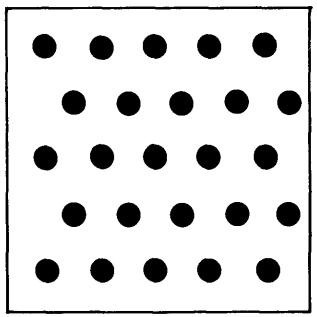
Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

1 Hectare



PERCENTAGES		
	Streets/walkways	16
	Playgrounds	21
	Cluster Courts	8
	Dwellings/Lots	55

1 Hectare



DENSITY Persons/Hectare 500

● 20 Persons

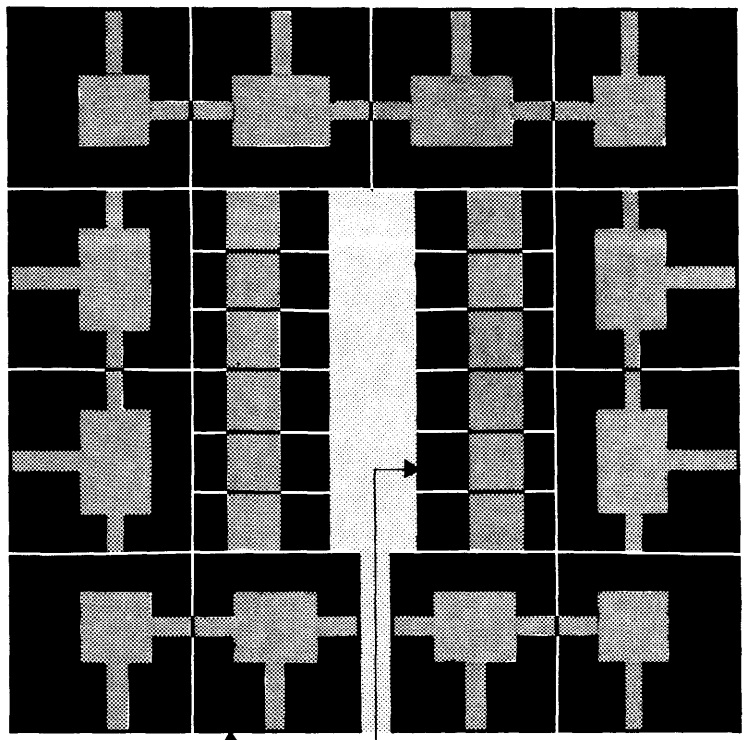
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	24	1.17	20.5
DWELLING UNITS	60	1.17	51.3
PEOPLE	360	1.17	308

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.24	22
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	0.83	72
SEMI-PRIVATE (cluster courts)	0.10	6
TOTAL	1.17	100

NETWORK EFFICIENCY

$$R = \frac{\text{network length (circulation)}}{\text{areas served (circulation, lots)}} = 348 \text{ m/ha}$$

AVERAGE LOT AREA = 487 m^2



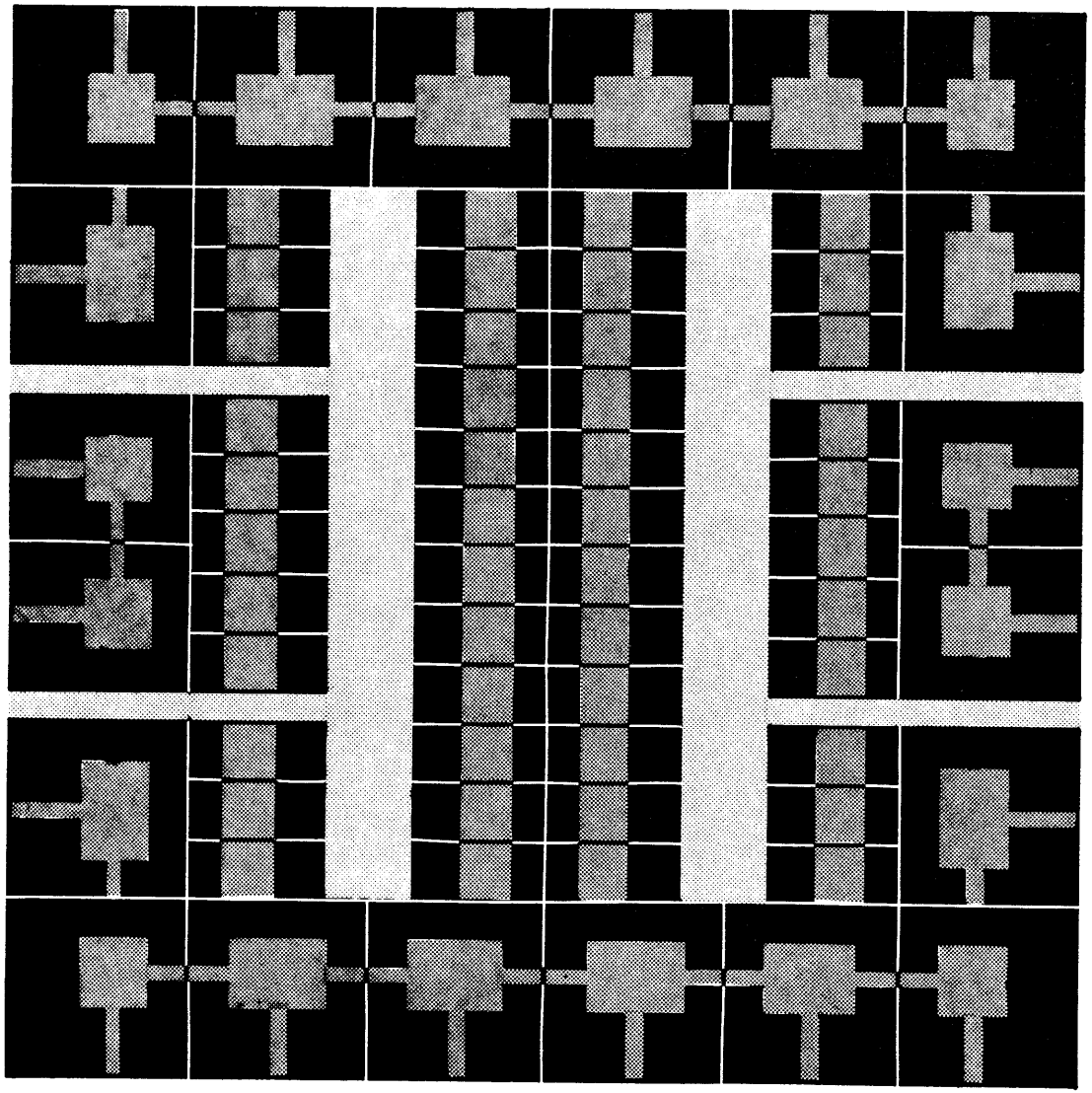
SMALL LOTS: Several individual dwelling units grouped around a court shared in condominium. Users: single or extended families, medium and low income groups.

LARGE LOTS: Several dwelling/shop units grouped around a common private court. Users: extended families, high/medium income groups.

0 10 50m

1:1000

PROPOSED TYPICAL BLOCK, (1)



DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	66	2.43	27
DWELLING UNITS	126	2.43	53
PEOPLE	756	2.43	310

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.36	15
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	1.77	73
SEMI-PRIVATE (cluster courts)	0.3	12
TOTAL	2.43	100

NETWORK EFFICIENCY

$$R = \frac{\text{network length (circulation)}}{\text{areas served (circulation, lots)}} = 329 \text{ m/ha}$$

AVERAGE LOT AREA = 368 m^2

PROPOSED TYPICAL BLOCK, ②

0 100 500m

1:10000

GLOSSARY

The criteria for the preparation of the definitions have been as follows:
-FIRST PREFERENCE: definitions from "Webster's Third New International Dictionary", Merriam-Webster, 1971.
-SECOND PREFERENCE: definitions from technical dictionaries, text books, or reference manuals.
-THIRD PREFERENCE: definitions from the Urban Settlement Design Program (U.S.D.P.) Files. They are used when existing sources were not quite appropriate/satisfactory.

Words included for specificity and to focus on a particular context are indicated in parenthesis.

Sources of definitions are indicated in parenthesis.

ACCESSES. The pedestrian/vehicular linkages from/to the site to/from existing or planned approaches (urban streets, limited access highways, public transportation systems, and other systems such as: waterways, airlines, etc.) (U.S.D.P.)

ACTUAL LAND COST. "(The cost of land is)...set solely by the level of demand. The price of land is not a function of any cost conditions; it is set by the users themselves in competition."(Turner, 1971)

AD VALOREM (TAX). A tax based on a property's value; the value taxed by local governments is not always or even usually the market value, but only a valuation for tax purposes. (U.S.D.P.)

AIRPORT DISTURBANCE. The act or process of destroying the rest, tranquility, or settled state of (the site by the annoyance of airport noise, vibration, hazards, etc.) (Merriam-Webster, 1971)

AIRPORT ZONING RESTRICTIONS. The regulation of the height or type of structures in the path of moving aircraft. (Abrams, 1971)

ALTERNATINC CURRENT (A.C.) (an electric) current that reverses its direction of flow at regular intervals. (ROTC ST 45-7, 1953)

AMENITY. Something that conduces to physical or material comfort or convenience, or which contributes satisfaction rather than money income to its owner. (Merriam-Webster, 1971)

AMPERES. Amperes (amp) are a measure of the rate of flow of electricity. It is somewhat comparable to the rate of flow of water (quantity/time). A steady current produced by one volt applied across a resistance of one ohm. (ROTC ST 45-7, 1953)

APPRAISAL. An estimate and opinion of value, especially by one fitted to judge. (Merriam-Webster, 1971)

APPROACHES. The main routes external to the site (pedestrian/vehicular) by which the site can be reached from other parts of the urban context. (U.S.D.P.)

ASSESSED VALUE. A valuation placed upon property by a public officer or board as a basis for taxation. (Keyes, 1971)

ASSESSMENT. The valuation of property for the purpose of levying a tax or the amount of the tax levied. (Keyes, 1971)

BACKFILL. Earth or other material used to replace material removed during construction, such as in culvert, sewer, and pipeline trenches and behind bridge abutments and retaining walls or between an old structure and a new lining. (DePina, 1972)

BARRIER. (A boundary) as a topographic feature or a physical or psychological quality that tends to separate or restrict the free movement (to and from the site). (Merriam-Webster, 1971)

BETTERMENT (TAX). A tax on the increment in value accruing to an owner because of development and improvement work carried out by local authorities. (U.S.D.P.)

BINDER COURSE. A transitional layer of bituminous paving between the crushed stone base and the surface course (to increase bond between base and surface course). (DePina, 1972)

BITUMINOUS. A coating of or containing bitumin; as asphalt or tar. (DePina, 1972)

BLOCK. A block is a portion of land bounded and served by lines of public streets. (U.S.D.P.)

BOUNDARY. Something (a line or area) that fixes or indicates a limit or extent (of the site). (Merriam-Webster, 1971)

BUILDING CODE. "A body of legislative regulations or by-laws that provide minimum standards to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures within the city, and certain equipment specifically regulated therein." (BOCA, 1967)

BUILDING DRAIN. Lowest horizontal piping of the building drainage system receiving discharge from soil, waste, and other drainage pipes. It is connected to the building sewer. (ROTC ST 45-7, 1953)

BUILDING MAIN. Water-supply pipe and fittings from the water main or other source of supply to the first branch of the water-distribution system of a building. (ROTC ST 45-7, 1953)

CESS POOL. An underground catch basin that is used where there is no sewer and into which household sewage or other liquid waste is drained to permit leaching of the liquid into the surrounding soil. (Merriam-Webster, 1971)

CIRCULATION. System(s) of movement/passage of people, goods from place to place; streets, walkways, parking areas. (U.S.D.P.)

CLAY. A lusterless colloidal substance, plastic when moist (crystalline grains less than 0.002mm in diameter). (U.S.D.P.)

CLEANOUT. A plug or similar fitting to permit access to traps or sewer lines. Cleanouts are usually used at turns and other points of collection. (ROTC ST 45-7, 1953)

CLIMATE. The average condition of the weather at a particular place over a period of years as exhibited by temperature, wind, precipitation, sun energy, humidity, etc. (Merriam-Webster, 1971)

COLLECTION SYSTEM. The system of pipes in a sewage network, comprised of house service, collection lines, manholes, laterals, mains. (U.S.D.P.)

COMBINED SEWER. A sewer that carries both storm water and sanitary or industrial wastes. (DePina, 1972)

COMMUNITY. The people living in a particular place or region and usually linked by common interests: the region itself; any population cluster. (U.S.D.P.)

COMMUNITY FACILITIES/SERVICES. Facilities/services used in common by a number of people. It may include: schools, health, recreation, police, fire, public transportation, community center, etc. (U.S.D.P.)

COMMUNITY RECREATION FACILITIES. Facilities for activities voluntarily undertaken for pleasure, fun, relaxation, exercise, self-expression, or release from boredom, worry, or tension. (U.S.D.P.)

COMPONENT. A constituent part of the utility network. (U.S.D.P.)

CONDOMINIUM. Condominium is a system of direct ownership of a single unit in a multi-unit whole. The individual owns the unit in much the same manner as if it were a single family dwelling: he holds direct legal title to the unit and a proportionate interest in the common land and areas. Two types of condominiums are recognized: *HORIZONTAL:* detached, semi-detached, row/grouped dwelling types; *VERTICAL:* walk-up, high-use dwelling types. (U.S.D.P.)

CONDUCTORS. Materials which allow current to flow such as aluminum, copper, iron. (ROTC ST 45-7, 1953)

CONDUIT. A pipe or other opening, buried or above ground, for conveying hydraulic traffic, pipelines, cables, or other utilities. (DePina, 1972)

CONSERVATION EASEMENT. An easement acquired by the public and designed to open privately owned lands for recreational purposes or to restrict the use of private land in order to preserve open space and protect certain natural resources. (U.S.D.P.)

CONSTRUCTION BORING. A subsurface boring done at the planned location of all infrastructure and building footings and roadway sub-bases for design of foundation systems. (U.S.D.P.)

CONVEYANCE. The transfer of ownership (of land). (Merriam-Webster, 1971)

CORPORATION COCK/CORPORATION STOP. A water or gas cock by means of which utility-company employees connect or disconnect service lines to a consumer. (Merriam-Webster, 1971)

COSTS OF URBANIZATION. Include the following: *CAPITAL:* cost of land and infrastructure; *OPERATING:* cost of administration, maintenance, etc.; *DIRECT:* include capital and operating costs; *INDIRECT:* include environmental and personal effects. (U.S.D.P.)

CURRENT (See: ALTERNATING CURRENT, DIRECT CURRENT). An electric current is a movement of positive or negative electric particles (as electrons) accompanied by such observable effects as the production of heat, of a magnetic field, or of chemical transformation. (Merriam-Webster, 1971)

CYCLE. One complete performance of a vibration, electric oscillation, current alternation, or other periodic process. (Merriam-Webster, 1971)

DAM. A barrier preventing the flow of water; a barrier built across a water course to confine and keep back flowing water. (Merriam-Webster, 1971)

DEPRECIATION ACCELERATION (TAX). A tax incentive designed to encourage new construction by allowing a faster write-off during the early life of a building. (U.S.D.P.)

DESIGN. 1) The arrangement of elements that make up a work of art, a machine or other man-made object. 2) The process of selecting the means and contriving the elements, steps, and procedures for producing what will adequately satisfy some need. (Merriam-Webster, 1971)

DETACHED DWELLING. Individual dwelling unit, separated from others. (U.S.D.P.)

DEVELOPMENT. Gradual advance or growth through progressive changes; a developed tract of land (U.S.D.P.)

DEVELOPMENT SIZE. There are two general ranges of size: *LARGE:* may be independent communities requiring their own utilities, services, and community facilities; *SMALL:* generally are part of an adjacent urbanization and can use its supporting utilities, services, and community facilities. (U.S.D.P.)

DIRECT CURRENT (D.C.) (An electric current that) flows continuously in one direction. (ROTC ST 45-7, 1953)

DISCHARGE (Q). Flow from a culvert, sewer, channel, etc. (DePina, 1972)

DISTANCE. The degree or amount of separation between two points (the site and each other element of the urban context) measured along the shortest path adjoining them (paths of travel). (Merriam-Webster, 1971)

DISTRIBUTION (STATION). The part of an electric supply system between bulk power sources (as generating stations or transformation station tapped from transmission lines) and the consumers' service switches. (Merriam-Webster, 1971)

DISTURBED SOIL. Soils that have been disturbed by artificial process, such as excavation, transportation, and compaction in fill. (U.S.D.P.)

DRAINAGE. Interception and removal of ground water or surface water, by artificial or natural means. (De Pina, 1972)

DUST/DIRT. Fine dry pulverized particles of earth, grit, refuse, waste, litter, etc. (Merriam-Webster, 1971)

DWELLING. The general, global designation of a building/shelter in which people live. A dwelling contains one or more 'dwelling units'. (U.S.D.P.)

DWELLING BUILDER. Four groups are considered: *SELF-HELP BUILT:* where the dwelling unit is directly built by the user or occupant; *ARTISAN BUILT:* where the dwelling unit is totally or partially built by a skilled craftsman hired by the user or occupant; payments can be monetary or an exchange of services; *SMALL CONTRACTOR BUILT:* where the dwelling unit is totally built by a small organization hired by the user, occupant, or developer; 'small' contractor is defined by the scale of operations, financially and materially; the scale being limited to the construction of single dwelling units or single complexes; *LARGE CONTRACTOR BUILT:* where the dwelling unit is totally built by a large organization hired by a developer; 'large' contractor is defined by the scale of operations, financially and materially; the scale reflects a more comprehensive and larger size of operations encompassing the building of large quantities of similar units, or a singularly large complex. (U.S.D.P.)

DWELLING DENSITY. The number of dwellings, dwelling units, people or families per unit hectare. Gross density is the density of an overall area (ex. including lots, streets). Net density is the density of selected, discrete portions of an area (ex. including only lots). (U.S.D.P.)

DWELLING DEVELOPER. Three sectors are considered in the supply of dwellings: *POPULAR SECTOR:* the marginal sector with limited or no access to the formal financial, administrative, legal, technical institutions involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Popular Sector generally for 'self use' and sometimes for profit. *PUBLIC SEC-*

TOR: the government or non-profit organizations involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Public Sector for service (non-profit or subsidized housing). *PRIVATE SECTOR:* the individuals, groups or societies, who have access to the formal financial, administrative, legal, technical institutions in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Private Sector for profit. (U.S.D.P.)

DWELLING DEVELOPMENT MODE. Two modes are considered: *PROGRESSIVE:* the construction of the dwelling and the development of the local infrastructure to modern standards by stages, often starting with provisional structures and underdeveloped land. This essentially traditional procedure is generally practiced by squatters with de facto security of tenure and an adequate building site. *INSTANT:* the formal development procedure in which all structures and services are completed before occupation. (U.S.D.P.)

DWELLING FLOORS. The following numbers are considered: *ONE:* single story; generally associated with detached, semi-detached and row/group dwelling types. *TWO:* double story; generally associated with detached, semi-detached and row/group dwelling types. *THREE OR MORE:* generally associated with walk-up and high-rise dwelling types. (U.S.D.P.)

DWELLING GROUP. The context of the dwelling in its immediate surroundings. (U.S.D.P.)

DWELLING/LAND SYSTEM. A distinct dwelling environment/housing situation characterized by its users as well as by its physical environment. (U.S.D.P.)

DWELLING LOCATION. Three sectors are considered in single or multi-center urban areas. Sectors are identified by position as well as by the density of buildings as follows: *CENTER:* the area recognized as the business center of the city, generally the most densely built-up sector; *INNER RING:* the area located between the city center and the urban periphery, generally a densely built-up sector; *PERIPHERY:* the area located between the inner ring and the rural areas, generally a scatteredly built-up sector. (U.S.D.P.)

DWELLING PHYSICAL STATE. A qualitative evaluation of the physical condition of the dwelling types: room, apartment, house; the shanty unit is not evaluated. *BAD:* generally poor state of structural stability, weather protection, and maintenance. *FAIR:* generally acceptable state of structural stability, weather protection, and maintenance with some deviation. *GOOD:* generally acceptable state of structural stability, weather protection, and maintenance without deviation. (U.S.D.P.)

DWELLING TYPE. The physical arrangement of the dwelling unit: *DETACHED:* individual dwelling unit, separated from others. *SEMI-DETACHED:* two dwelling units sharing a common wall (duplex). *ROW/GROUPED:* dwelling units grouped together linearly or in clusters. *WALK-UP:* dwelling units grouped in two to five stories with stairs for vertical circulation. *HIGH-RISE:* dwelling units grouped in five or more stories with stairs and lifts for vertical circulation. (U.S.D.P.)

DWELLING UNIT. A self-contained unit in a dwelling for an individual, a family, or a group. (U.S.D.P.)

DWELLING UNIT AREA. The dwelling unit area (m^2) is the built-up, covered area of a dwelling unit. (U.S.D.P.)

DWELLING UNIT COST. The initial amount of money paid for the dwelling unit or the present monetary equivalent for replacing the dwelling unit. (U.S.D.P.)

DWELLING UNIT TYPE. Four types of dwelling units are considered: *ROOM:* A SINGLE SPACE usually bounded by partitions and specifically used for living; for example, a living room, a dining room, a bedroom, but not a bath/toilet, kitchen, laundry, or storage room. SEVERAL ROOM UNITS are contained in a building/shelter and share the use of the parcel of land on which they are built (open spaces) as well as common facilities (circulation, toilets, kitchens). *APARTMENT:* A MULTIPLE SPACE (room/set of rooms with bath, kitchen, etc.) SEVERAL APARTMENT UNITS are contained in a building and share the use of the parcel of land on which they are built (open spaces) as well as some common facilities (circulation). *HOUSE:* A MULTIPLE SPACE (room/set of rooms with or without bath, kitchen, etc.) ONE HOUSE UNIT is contained in a building/shelter and has the private use of the parcel of land on which it is built (open spaces) as well as the facilities available. *SHANTY:* A SINGLE OR MULTIPLE SPACE (small, crudely built). ONE SHANTY UNIT is contained in a shelter and shares with other shanties the use of the parcel of land on which they are built (open spaces). (U.S.D.P.)

DWELLING UTILIZATION. The utilization indicates the type of use with respect to the number of inhabitants/families. *SINGLE:* an individual or family inhabiting a dwelling. *MULTIPLE:* a group of individuals or families inhabiting a dwelling. (U.S.D.P.)

EASEMENT. Servitude: a right in respect of an object (as land owned by one person) in virtue of which the object (land) is subject to a specified use or enjoyment by another person or for the benefit of another thing. (Merriam-Webster, 1971)

EFFICIENCY. Capacity to produce desired results with a minimum expenditure of energy, time, money or materials. (Merriam-Webster, 1971)

EFFLUENT. Outflow or discharge from a sewer or sewage treatment equipment. (DePina, 1972)

ELECTRIC FEEDER. That part of the electric distribution system between the transformer and the service drop or drops. (HUD, Mobile Court Guide, 1970)

ELECTRIC SERVICE DROP. That part of the electric distribution system from a feeder to the user's service equipment serving one or more lots. (HUD, Mobile Court Guide, 1970)

ELECTRIC TRANSFORMER. A device which changes the magnitude of alternating voltages and currents; generally from distribution voltages to user voltages; a distribution component that converts power to usable voltage. (TM 5 765 US Army, 1970; U.S.D.P.)

ELECTRICAL CIRCUIT. A closed, complete electrical path with various connected loads. Circuits may either be 'parallel' (voltage constant for all connected loads) or 'series' (voltage divided among connected loads). Parallel circuits are fixtures wired independent of each other, which are used in nearly all building wiring. (U.S.D.P.; ROTC ST 45-7, 1953)

ELECTRICAL FREQUENCY. The number of times an alternating electric current changes direction in a given period of time. Measured in cycles per second: hertz. (ROTC ST 45-7, 1953)

ELECTRIC GROUND. The electrical connection with the earth or other ground. (Merriam-Webster, 1971)

ELECTRICAL NETWORK COMPONENTS. It is composed of the following: *GENERATION:* produces electricity; *TRANSMISSION:* transports energy to user groups; *DISTRIBUTION STATION:* divides power among main user groups; *SUBSTATION:* manipulates power into useful energy levels for consumption; *DISTRIBUTION NETWORKS:* provides electric service to user. (U.S.D.P.)

ELECTRIC PHASE. May be either a single-phase circuit (for small electrical devices) or a three-phase circuit (for heavy equipment, large electrical devices). In single-phase only one current is flowing through the circuit with the voltage dropping to zero twice in each cycle. In three-phase currents flow through the circuit with the power never dropping to zero. (U.S.D.P.)

ELECTRICAL POWER. The source or means of supplying energy for use; measured in watts. (U.S.D.P.)

ELECTRICAL WIRING SYSTEMS. May either be single-phase or three-phase. *SINGLE-PHASE:* 2 hot wires with 1 neutral wire; *THREE-PHASE:* 3 hot wires with 1 neutral wire. (ROTC ST 45-7, 1953)

ELECTRICITY. Electrification: the process (network) for supplying (the site) with electric power. (Merriam-Webster, 1971)

EMBANKMENT (or FILL). A bank of earth, rock, or other material constructed above the natural ground surface. (DePina, 1972)

EROSION. The general process whereby materials of the earth's crust are worn away and removed by natural agencies including weathering, solution, corrosion, and transportation; (specific) land destruction and simultaneous removal of particles (as of soil) by running water, waves and currents, moving ice, or wind. (Merriam-Webster, 1971)

EXCRETA. Waste matter eliminated from the body. (U.S.D.P.)

EXISTING STRUCTURE. Something constructed or built (on the site). (U.S.D.P.)

EXPLORATORY BORING. Initial subsurface investigations (borings) are done on a grid superimposed on the areas of interest and on areas indicated as limited/restricted/hazard in the initial survey. (U.S.D.P.)

EXTERIOR CIRCULATION/ACCESSES (SITE PLANNING). The existing and proposed circulation system/accesses outside but affecting the site. These include limited access highways as well as meshing access to the surrounding area. Exterior circulation/accesses are generally given conditions. (U.S.D.P.)

FAUCET (also TAP). A fixture for drawing liquid from a pipe, cask, or other vessel. (Merriam-Webster, 1971)

FINANCING. The process of raising or providing funds. *SELF FINANCED:* provided by own funds; *PRIVATE/PUBLIC FINANCED:* provided by loan; *PUBLIC SUBSIDIZED:* provided by grant or aid. (U.S.D.P.)

FIRE/EXPLOSION HAZARDS. Danger: the state of being exposed to harm; liable to injury, pain, or loss from fire/explosion (at or near the site). (Merriam-Webster, 1971)

FIRE FLOW. The quantity (in time) of water available for fire-protection purposes in excess of that required for other purposes. (Merriam-Webster, 1971)

FIRE HYDRANT. A water tap to which fire hoses are connected in order to smother fires. (U.S.D.P.)

FIRE PROTECTION. Measures and practices for preventing or reducing injury and loss of life or property by fire. (Merriam-Webster, 1971)

FLEXIBLE PAVEMENT. A pavement structure which maintains intimate contact with and distributes loads to the subgrade and depends upon aggregate interlock, particle friction, and cohesion for stability. (DePina, 1972)

FLOODING. A rising and overflowing of a body of water that covers land not usually under water. (U.S.D.P.)

FLOODWAY FRINGE. The floodplain area landward of the natural floodway which would be inundated by low velocity flood waters. (U.S.D.P.)

FLOW METER. A device to measure flow of water. (U.S.D.P.)

FLUSH TANK TOILET. Toilet with storage tank of water used for flushing bowl. (U.S.D.P.)

FLUSH VALVE TOILET. Toilet with self-closing valve which supplies water directly from pipe. It requires adequate pressure for proper functioning. (U.S.D.P.)

FOOT CANDLE. A unit of illuminance on a surface that is everywhere one foot from a uniform point source of light of one candle and equal to one lumen per square foot. (Merriam-Webster, 1971)

FUMES. Gaseous emissions that are usually odorous and sometimes noxious. (Merriam-Webster, 1971)

GAS. A system for supplying natural gas, manufactured gas, or liquefied petroleum gas to the site and individual users. (U.S.D.P.)

GRADE. Profile of the center of a roadway, or the invert of a culvert or sewer. (DePina, 1972)

GRID BLOCKS. The block determined by a convenient public circulation and not by dimensions of lots. In grid blocks some lots have indirect access to public streets. (U.S.D.P.)

GRIDIRON BLOCKS. The blocks determined by the dimensions of the lots. In gridiron blocks all the lots have direct access to public streets. (U.S.D.P.)

GRID LAYOUTS. The urban layouts with grid blocks. (U.S.D.P.)

GRIDIRON LAYOUTS. The urban layouts with gridiron blocks. (U.S.D.P.)

GOVERNMENT/MUNICIPAL REGULATIONS. In urban areas, the development of the physical environment is a process usually controlled by a government/municipality through all or some of the following regulations: Master Plan, Zoning Ordinance, Subdivision Regulations, Building Code. (U.S.D.P.)

HEAD. (Static). The height of water above any plane or point of reference. Head in feet = (lb/sq. in. x 144)/(Density in lb/cu. ft.) For water at 68°F. (DePina, 1972)

HIGH-RISE. Dwelling units grouped in five or more stories with stairs and lifts for vertical circulation. (U.S.D.P.)

HOT WIRE. Wire carrying voltage between itself and a ground. (ROTC ST 45-7, 1953)

HYDRAULICS. That branch of science or engineering that deals with water or other fluid in motion. (DePina, 1972)

ILLEGAL. That which is contrary to or violating a rule or regulation or something having the force of law. (Merriam-Webster, 1971)

INCOME. The amount (measured in money) of gains from capital or labor. The amount of such gain received by a family per year may be used as an indicator of income groups. (U.S.D.P.)

INCOME GROUPS. A group of people or families within the same range of incomes. (U.S.D.P.)

INCREMENT (TAX). A special tax on the increased value of land, which is due to no labor/expenditure by the owner, but rather to natural causes such as the increase of population, general progress of society, etc. (U.S.D.P.)

INFRASTRUCTURE. The underlying foundation or basic framework for utilities and services: streets; sewage, water network; storm drainage, electrical network;

gas network; telephone network, public transportation; police and fire protection; refuse collection, health, schools, playgrounds, parks, open spaces. (U.S.D.P.)

INSULATOR. A material or body that is a poor conductor of electricity, heat, or sound. (Merriam-Webster, 1971)

INTERIOR CIRCULATION NETWORK (SITE PLANNING). The pedestrian/vehicular circulation system inside the site. It should be designed based upon the exterior circulation/accesses and land development requirements. (U.S.D.P.)

INTERVAL. A space of time (or distance) between the recurrences of similar conditions or states. (Merriam-Webster, 1971)

KILOWATT (kw). (1000 watts) A convenient manner of expressing large wattages. Kilowatt hours (kwh) measure the total quantity of energy consumed in a given time. One kwh represents the use of an average of 1 kilowatt of electrical energy for a period of 1 hour. (ROTC ST 45-7, 1953)

LAMPHOLE. A vertical pipe or shaft leading from the surface of the ground to a sewer, for admitting light for purposes of inspection. (U.S.D.P.)

LAND COST. Price: the amount of money given or set as the amount to be given as a consideration for the sale of a specific thing (the site). (Merriam-Webster, 1971)

LAND DEVELOPMENT COSTS. The costs of making raw land ready for development through the provision of utilities, services, accesses, etc. (U.S.D.P.)

LAND LEASE. The renting of land for a term of years for an agreed sum; leases of land may run as long as 99 years. (U.S.D.P.)

LAND-MARKET VALUE. Refers to: 1) the present monetary equivalent to replace the land; 2) the present tax based value of the land; or 3) the present commercial market value of the land. (U.S.D.P.)

LAND OWNERSHIP. The exclusive right of control and possession of a parcel of land. (U.S.D.P.)

LAND SUBDIVISION. The division of the land in blocks, lots and laying out streets. (U.S.D.P.)

LAND TENANCY. The temporary holding or mode of holding a parcel of land of another. (U.S.D.P.)

LAND UTILIZATION. A qualification of the land around a dwelling in relation to user, physical controls and responsiblity. *PUBLIC* (streets, walkways, open spaces): user -anyone/unlimited; physical controls -minimum; responsibility -public sector. *SEMIPUBLIC* (open spaces, playgrounds, schools): user -limited group of people; physical controls -partial or complete; responsibility -public sector and user. *PRIVATE* (dwellings, lots): user -owner or tenant or squatter; physical controls -complete; responsibility -user. *SEMI-PRIVATE* (cluster courts): user -group of owners and/or tenants; physical controls -partial or complete; responsibility -user. (U.S.D.P.)

LAND UTILIZATION: PHYSICAL CONTROLS. The physical/legal means or methods of directing, regulating, and coordinating the use and maintenance of land by the owners/users. (U.S.D.P.)

LAND UTILIZATION: RESPONSIBILITY. The quality/state of being morally/legally responsible for the use and maintenance of land by the owners/users. (U.S.D.P.)

LATERAL SEWER. A collector pipe receiving sewage from building connection only. (U.S.D.P.)

LATRINE. A receptacle (as a pit in the earth or a water closet) for use in defecation and urination, or a room (as in a barracks or hospital) or enclosure (as in a camp) containing such a receptacle. (Merriam-Webster, 1971)

LAYOUT. The plan or design or arrangement of something that is laid out. (Merriam-Webster, 1971)

LEVELS OF SERVICES. Two levels are considered: *MINIMUM*, are admissible or possible levels below the standard; *STANDARD*, are levels set up and established by authority, custom of general consent, as a model, example or rule for the measure of quantity, weight extent, value or quality. (U.S.D.P.)

LIFT PUMP. A collection system component that forces sewage to a higher elevation to avoid deep pipe networks. (U.S.D.P.)

LOCALITY. A relatively self-contained residential area/community/neighborhood/settlement within an urban area which may contain one or more dwelling/land systems. (U.S.D.P.)

LOCALITY SEGMENT. A 400m x 400m area taken from and representing the residential character and layout of a locality. (U.S.D.P.)

LOCATION. Situation: the way in which something (the site) is placed in relation to its surroundings (the urban context). (Merriam-Webster, 1971)

LOT. A measured parcel of land having fixed boundaries and access to public circulation. (U.S.D.P.)

LOT CLUSTER. A group of lots (owned individually) around a semipublic common court (owned in condominium). (U.S.D.P.)

LOT COVERAGE. The ratio of building area to the total lot area. (U.S.D.P.)

LOT PROPORTION. The ratio of lot width to lot depth. (U.S.D.P.)

LUMINAIRE. In highway lighting, a complete lighting device consisting of a light source, plus a globe, reflector, refractor, housing and such support as is integral with the housing. (DePina, 1972)

MANHOLE. An access hole sized for a man to enter, particularly in sewer and storm drainage pipe systems for cleaning, maintenance and inspection. (U.S.D.P.)

MATRIX (OF BASIC REFERENCE MODELS). A set of models of urban layouts arranged in rows and columns. (U.S.D.P.)

MASTER PLAN. A comprehensive, long range plan intended to guide the growth and development of a city, town or region, expressing official contemplations on the course its transportation, housing and community facilities should take, and making proposals for industrial settlement, commerce, population distribution and other aspects of growth and development. (Abrams, 1972).

MEDIAN BARRIER. A double-faced guard rail in the median or island dividing two adjacent roadways. (DePina, 1972)

MESHING BOUNDARIES. Characterized by continuing, homogeneous land uses or topography, expressed as: *LINES:* property lines, political or municipal divisions, main streets, etc.; *AREAS:* similar residential uses, compatible uses (as parks with residential). (U.S.D.P.)

MICROCLIMATE. The local climate of a given site or habitat varying in size from a tiny crevice to a large land area, but being usually characterized by considerable uniformity of climate. (Merriam-Webster, 1971)

MODE OF TRAVEL. Manner of moving from one place (the site) to another (other parts of the urban context). (U.S.D.P.)

MODEL (OF URBAN LAYOUT). A representation of an urban residential area illustrating circulation, land utilization, land subdivision, and utility network of a specific layout and lot. (U.S.D.P.)

MUTUAL OWNERSHIP. Private land ownership shared by two or more persons and their heir under mutual agreement. (U.S.D.P.)

NATURAL FEATURES. Prominent objects in or produced by nature. (U.S.D.P.)

NATURAL UNDISTURBED SOIL. Soils that have not been disturbed by artificial process. Although natural, they depend greatly on local conditions, environment, and past geological history of the formations. (U.S.D.P.)

NEIGHBORHOOD. A section lived in by neighbors and having distinguishing characteristics. (U.S.D.P.)

NETWORK EFFICIENCY (LAYOUT EFFICIENCY). The ratio of the length of the network to the area(s) contained within; or tangent to it. (U.S.D.P.)

NEUTRAL WIRE. Wire carrying no voltage between itself and a ground. (ROTC ST 45-7, 1953)

NOISE. Any sound (affecting the site) that is undesired (such as that produced by: traffic, airports, industry, etc.) (Merriam-Webster, 1971)

ODOR. A quality of something that affects the sense of smell. (Merriam-Webster, 1971)

OHMS (electrical). The unit of resistance to the flow electricity. The higher the number of ohms, the greater the resistance. When resistance is constant, amperage (and wattage) are in direct proportion to voltage. Resistance varies inversely with the cross-sectional area of the wire. Ohms = volts/amperes. R = E/I. The practical mks unit of electrical resistance that is equal to the resistance of a circuit in which a potential difference of one volt produces a current of one ampere or to the resistance in which one watt of power is dissipated when one ampere flows through it and that is taken as standard in the U.S. (U.S.D.P.; ROTC ST 45-7, 1953; Merriam-Webster, 1971)

OPTIMIZE/OPTIMALIZE. To bring to a peak of economic efficiency, specially by the use of precise analytical methods. (Merriam-Webster, 1971)

ORGANIC SOILS. Soils composed mostly of plant material. (U.S.D.P.)

OXIDATION POND (LAGOON). A method of sewage treatment using action of bacteria and algae to digest/decompose wastes. (U.S.D.P.)

PERCENT RENT/MORTGAGE. The fraction of income allocated for dwelling rental or dwelling mortgage payments; expressed as a percentage of total family income. (U.S.D.P.)

PIT PRIVY/LATRINE. A simple hole in the ground, usually hand dug, covered with slab and protective superstructure; for disposal of human excreta. (U.S.D.P.)

PLANNING. The establishment of goals, policies, and procedures for a social or economic unit, i.e. city. (U.S.D.P.)

PLOT/LOT. A measured parcel of land having fixed boundaries and access to public circulation. (U.S.D.P.)

POLICE PROTECTION. Police force: a body of trained men and women entrusted by a government with the maintenance of public peace and order, enforcement of laws, prevention and detection of crime. (Merriam-Webster, 1971)

POPULATION DENSITY. It is the ratio between the population of a given area and the area. It is expressed in people per hectare. It can be: *GROSS DENSITY:* includes any kind of land utilization, residential, circulation, public facilities, etc. *NET DENSITY:* includes only the residential land and does not include land for other uses. (U.S.D.P.)

POSITION. The point or area in space actually occupied by a physical object (the site). (Merriam-Webster, 1971)

PRIMER. A small introductory book on a specific subject. (U.S.D.P.)

PRIVATE LAND OWNERSHIP. The absolute tenure of land to a person and his heirs without restriction of time. (U.S.D.P.)

PRIVY. A small, often detached building having a bench with one or more round or oval holes through which the user may defecate or urinate (as into a pit or tub) and ordinarily lacking any means of automatic discharge of the matter deposited. (Merriam-Webster, 1971)

PROJECT. A plan undertaken; a specific plan or design. (U.S.D.P.)

PUBLIC CIRCULATION. The circulation network which is owned, controlled, and maintained by public agencies and is accessible to all members of a community. (U.S.D.P.)

PUBLIC FACILITIES. Facilities such as schools, playgrounds, parks, other facilities accessible to all members of a community which are owned, controlled, and maintained by public agencies. (U.S.D.P.)

PUBLIC SERVICES AND COMMUNITY FACILITES. Includes: public transportation, police protection, fire protection, refuse collection, health, schools, and playgrounds, recreation and open spaces, other community facilities, business, commercial, small industries, markets. (U.S.D.P.)

PUBLIC SYSTEM (general). A system which is owned and operated by a local governmental authority or by an established public utility company which is controlled and regulated by a governmental authority. (HUD/AID, Minimum Standards, 1966)

PUBLIC UTILITIES. Includes: water supply, sanitary sewerage, storm drainage, electricity, street lighting, telephone, circulation networks. (U.S.D.P.)

PUMP. A device or machine that raises, transfers, or compresses fluids or that attenuates gases especially by suction or pressure or both. (Merriam-Webster, 1971)

REFUSE COLLECTION. The service for collection and disposal of all the solid wastes from a community. (U.S.D.P.)

RESERVOIR. Large-scale storage of water; also functions to control fluctuations in supply and pressure. (U.S.D.P.)

RESIDENTIAL AREA. An area containing the basic needs/requirements for daily life activities: housing, education, recreation, shopping, work. (U.S.D.P.)

RESISTANCE. The opposition to electrical flow. (Resistance increases as the length of wires is increased and decreases as the cross-sectional area of wires is increased). (ROTC ST 45-7, 1953)

RIGHT-OF-WAY. A legal right of passage over another person's ground (land), the area or way over which a right-of-way exists such as: a path or thorough-fare which one may lawfully use, the strip of land devoted to or over which is built a public road, the land

occupied by a railroad, the land used by a public utility. Rights-of-way may be shared (as streets; pedestrians and automobiles) or exclusive (as rapid transit routes; subways, railroads, etc.) (Merriam-Webster, 1971; U.S.D.P.)

ROADWAY (HIGHWAY). Portion of the highway included between the outside lines of gutter or side ditches, including all slopes, ditches, channels, and appurtenances necessary to proper drainage, protection, and use. (DePina, 1972)

ROW/GROUPED HOUSING. Dwelling units grouped together linearly or in clusters. (U.S.D.P.)

RUNOFF. That part of precipitation carried off from the area upon which it falls. (DePina, 1972)

RUNOFF-RAINFALL RATIO. The percentage (ratio) of stormwater runoff that is not reduced by evaporation, depression storage, surface wetting, and percolation; with increased rainfall duration, runoff-rainfall ratios rise increasing runoff flow. (U.S.D.P.)

SAND. Loose, distinguishable grains of quartz/feldspar, mica (ranging from 2mm to 0.02mm in diameter). (U.S.D.P.)

SANITARY SEWERAGE. The system of artificial usually subterranean conduits to carry off sewage composed of: *excreta:* waste matter eliminated from the human body; *domestic wastes:* used water from a home/community containing 0.1% total solids; and some *industrial wastes*, but not water from ground, surface, or storm. (U.S.D.P.)

SEMI-DETACHED DWELLING. Two dwelling units sharing a common wall (duplex). (U.S.D.P.)

SEPTIC TANK. A tank in which the organic solid matter of continuously flowing sewage is deposited and retained until it has been disintegrated by anaerobic bacteria. (Merriam-Webster, 1971)

SERIES CIRCUIT. Fixtures connected in a circuit by a single wire. When one fixture is out, the circuit is broken. Fixtures with different amperages cannot be used efficiently in the same circuit. (ROTC ST 45-7, 1953)

SETTLEMENT. Occupation by settlers to establish a residence or colony. (U.S.D.P.)

SEWAGE. The effluent in a sewer network. (U.S.D.P.)

SEWER. The conduit in a subterranean network used to carry off water and waste matter. (U.S.D.P.)

SEWER BUILDING CONNECTION. The pipe connecting the dwelling with the sewer network. (U.S.D.P.)

SEWERAGE. Sewerage system: the system of sewers in a city, town or locality. (Merriam-Webster, 1971)

SHAPE. Form/configuration of the site surface as defined by its perimeter/boundaries. (U.S.D.P.)

SHOPPING. (Facilities for) searching for, inspecting, or buying available goods or services. (U.S.D.P.)

SILT. Loose, unconsolidated sedimentary rock particles (ranging from 0.02mm to 0.002mm in diameter). (U.S.D.P.)

SITE. Land (that could be) made suitable for building purposes by dividing into lots, laying out streets and providing facilities. (Merriam-Webster, 1971)

SITE AREAS. Two types are considered: *GROSS AREA:* includes the whole site or the bounded piece of ground. *USABLE AREA:* includes only the portion of the site that can be fully utilized for buildings, streets, playgrounds, recreation facilities, gardens, or other structures. (U.S.D.P.)

SITE AND SERVICES. The subdivision of urban land and the provision of services for residential use and complementary commercial use. Site and services projects are aimed to improve the housing conditions for the low income groups of the population by providing: *a) SITE:* the access to a piece of land where people can build their own dwellings; *b) SERVICES:* the opportunity of access to employment, utilities, services and community facilities, financing and communications. (U.S.D.P.)

SIZE. Physical magnitude or extent (of the site), relative or proportionate dimensions (of the site). (Merriam-Webster, 1971)

SLOPE. Degree or extent of deviation (of the land surface) from the horizontal. (Merriam-Webster, 1971)

SMOKE. The gaseous products of burning carbonaceous materials made visible by the presence of carbon particles. (Merriam-Webster, 1971)

SOIL. Soil structure: the arrangement of soil particles in various aggregates differring in shape, size, stability, and degree of adhesion to one another. (Merriam-Webster, 1971)

SOIL INVESTIGATION. It is the process to find the soil structure and other characteristics. It may include the following stages: initial soil survey, exploratory boring, construction boring. (U.S.D.P.)

SOIL PIPE. The pipe in a dwelling which carries the pipe discharge from water closets. (U.S.D.P.)

SOIL SURVEY (INITIAL). An on-site examination of surface soil conditions and reference to a GENERAL SOIL MAP. It is used to reveal obvious limitations/restrictions/hazards for early planning consideration. (U.S.D.P.)

STACK. The vertical pipe in a dwelling of the soil-, waste-, or vent-pipe systems. (ROTC ST 45-7, 1953)

STANDARD. 1) Something that is established by authority, custom or general consent as a model or example to be followed. 2) Something that is set up and established by authority as a rule for the measure of quantity, weight, extent, value or quality. (Merriam-Webster, 1971)

STANDPIPE. A pipe riser with tap used as a source of water for domestic purposes. (HUD/AID, Minimum Standards, 1966)

STORM DRAINAGE. Storm sewer: a sewer (system) designed to carry water wastes except sewage (exclusively storm water, surface runoff, or street wash). (Merriam-Webster, 1971)

STREET LIGHTING. Illumination to improve vision at night for security and for the extension of activities. (U.S.D.P.)

SUBDIVISION REGULATIONS. Regulations governing the development of raw land for residential or other purposes. (Abrams, 1972)

SUBGRADE. The layer of natural soil or fill (compacted soil) upon which the pavement structure including curbs is constructed. (DePina, 1972)

SUBMAIN or BRANCH SEWER. A collector pipe receiving sewage from lateral sewer only. (U.S.D.P.)

SUBSISTENCE INCOME. The minimum amount of money required for the purchase of food and fuel for an average family to survive. (U.S.D.P.)

SULLAGE. Drainage or refuse especially from a house, farmyard, or street. (Merriam-Webster, 1971)

TAP (also FAUCET). A fixture for drawing a liquid from a pipe, cask, or other vessel. (Merriam-Webster, 1971)

TAX EXEMPTION. A grant by a government of immunity from taxes; (a ten-year tax exemption on new housing in New York stimulated new construction in the 1920's; to ease its housing shortage, Turkey granted a ten-year tax exemption on new buildings). (Abrams, 1966)

TAX INCENTIVE. Favorable tax treatment to induce the beneficiary to do something he would not otherwise be likely to do. (U.S.D.P.)

TAX STRUCTURE - TAXATION. The method by which a nation (state, municipality) implements decisions to transfer resources from the private sector to the public sector. (U.S.D.P.)

TELEPHONE. An electrical voice communication network interconnecting all subscribing individuals and transmitting over wires. (U.S.D.P.)

TENURE. Two situations of tenure of the dwelling units and/or the lot/land are considered: *LEGAL:* having formal status derived from law; *EXTRALEGAL:* not regulated or sanctioned by law. Four types of tenure are considered: *RENTAL:* where the users pay a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the lot/land; *LEASE:* where the users pay a fee for long-term use (generally for a year) for a dwelling unit and/or the lot/land from the owner (an individual, a public agency, or a private organization); *OWNERSHIP:* where the users hold in freehold the dwelling unit and/or the lot/land which the unit occupies; *EMPLOYER-PROVIDED:* where the users are provided a dwelling unit by an employer in exchange for services, i.e. domestic live-in servant. (U.S.D.P.)

TITLE. The instrument (as a deed) that constitutes a legally just cause of exclusive possession (of land, dwellings, or both). (Merriam-Webster, 1971)

TOILET. A fixture for defecation and urination, esp. water closet. (7th Collegiate Webster, 1963)

TOPOGRAPHY. The configuration of a (land) surface including its relief and the position of its natural and man-made features. (Merriam-Webster, 1971)

TRANSPORTATION. Means of conveyance or travel from one place (the site) to another (other parts of the urban context). (Merriam-Webster, 1971)

TRAP. A fitting that provides a water seal to prevent sewer gases and odors being discharged through fixtures. (ROTC ST 45-7, 1953)

TREATMENT WORKS. Filtration plant, reservoirs, and all other construction required for the treatment of a water supply. (ROTC ST 45-7, 1953)

UNIT. A determinate quantity adopted as a standard of measurement for other quantities of the same kind. (Merriam-Webster, 1971)

URBAN TRANSPORTATION. Means of conveyance of passengers or goods from one place to another along ways, routes of circulation in a metropolitan context. (U.S.D.P.)

URBANIZATION. The quality or state of being or becoming urbanized; to cause to take on urban characteristics. (U.S.D.P.)

USE TAX. The tax on land aimed primarily at enforcing its use or improvement. (U.S.D.P.)

USER INCOME GROUPS. Based upon the subsistence (minimum wage) income per year, five income groups are distinguished: *VERY LOW (below subsistence level):* the income group with no household income available for housing, services, or transportation; *LOW (1 x subsistence level):* the income group that can afford no or very limited subsidized housing; *MODERATE (3 x subsistence level):* the income group that can afford limited housing and rent only with government assistance; *HIGH (5 x subsistence level):* the income group that can afford housing without subsidy, by cash purchase, through mortgage payments, or by rent; *VERY HIGH (10 x subsistence level):* the income group that represents the most economically mobile sector of the population. (U.S.D.P.)

USUFRUCT. The right to profit from a parcel of land or control of a parcel of land without becoming the owner or formal leasee; legal possession by decree without charge. (U.S.D.P.)

UTILITIES. Include: water supply, sanitary sewerage, storm drainage, electricity, street lighting, gas, telephone. (U.S.D.P.)

UTILITY/SERVICE. The organization and/or infrastructure for meeting the general need (as for water supply, wastewater removal, electricity, etc.) in the public interest. (U.S.D.P.)

VALVE. A water supply distribution component which interrupts the supply for maintenance purposes. (U.S.D.P.)

VENT. A pipe opening to the atmosphere, which provides ventilation for a drainage system and prevents trap siphonage or back pressure. (ROTC ST 45-7, 1953)

VIBRATION. A quivering or trembling motion (such as that produced by: heavy traffic, industry, aircraft, etc. (Merriam-Webster, 1971)

VIEWS. That which is revealed to the vision or can be seen (from the site). (Merriam-Webster, 1971)

WALK-UP. Dwelling units grouped in two to five stories with stairs for vertical circulation. (U.S.D.P.)

WASTE PIPE. A pipe (in a dwelling) which carries water from wash basins, sinks, and similar fixtures. (ROTC ST 45-7, 1953)

WATER SUPPLY. Source, means, or process of supplying water, (as for a community) usually involving reservoirs, pipelines, and often the watershed from which the water is ultimately drawn. (Merriam-Webster, 1971)

WATERSHED. The catchment area or drainage basin from which the waters of a stream or stream system are drawn. (Merriam-Webster, 1971)

WATERWORKS. The whole system of reservoirs, channels, mains, and pumping and purifying equipment by which a water supply is obtained and distributed to consumers. (Merriam-Webster, 1971)

WATT. Watts (w) measure the power of the flow of energy through a circuit. Wattage is the product of volts times amperes. Both watts and hosepower denote the rate of work being done. 746w = 1hp. (ROTC ST 45-7, 1953)

ZONING ORDINANCE. The demarcation of a city by ordinance into zones (areas/districts) and the establishment of regulations to govern the use of land and the location, bulk, height, shape, use, population density, and coverage of structures within each zone. (U.S.D.P.)

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EXPLANATORY NOTE

QUALITY OF INFORMATION
The quality of information given in the drawings, charts, and descriptions have been qualified in the following manner.

Approximate:	when deducted from different and/or not completely reliable sources.
Accurate:	when taken from reliable or actual sources.
Tentative:	when based upon rough estimations of limited sources.

QUALITY OF SERVICES, FACILITIES AND UTILITIES

None:	when the existence of services, facilities and utilities are unavailable to a locality.
Limited:	when the existence of services, facilities and utilities are available to a locality in a limited manner due to proximity.
Adequate:	when the existence of services, facilities and utilities are available in/to a locality.

METRIC SYSTEM EQUIVALENTS

Linear Measures

1 centimeter	= 0.3937 inches
1 meter (100 centimeter)	= 39.37 inches or 3.28 feet
1 kilometer (1,000 meters)	= 3,280.83 feet or 0.62137 miles
1 inch	= 2.54 centimeters
1 foot (12 inches)	= 0.3048 meters
1 mile (5,280 feet)	= 1.60935 kilometers

Square Measures

1 square meter	= 1,550 square inches or 10.7639 square feet
1 hectare (10,000 sq. meters)	= 2.4711 acres
1 square foot	= 0.0929 square meters
1 acre (43,560 sq. feet)	= 0.4087 hectares

All income, cost and rent/mortgage data have been expressed in terms of the U.S. equivalent;
1 U.S. dollar = 50 Afghanis (July 1976).