

URBAN DWELLING ENVIRONMENTS IN RAPIDLY GROWING CITIES

Case study: Unayzah, Saudi Arabia

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by

Yousef Nasser Alohal
May 1983

Submitted to the Department of Architecture in partial fulfillment of the requirements
for the degree of Master of Science in Architecture Studies.

ABSTRACT

The study is concerned with two critical issues: a) the housing situation of middle income groups; b) the use of land in new developments.

A tentative planning model for urban land development and a survey of existing dwelling environment from Unayzah urban area are provided.

The development of the model is based on three case studies from the existing dwelling environment, stressing land utilization, density, and circulation efficiency. A modified layout is designed at Al-Slimaneih to compare with the one being built. Essentially, the redesigned layout is concerned with reducing costs of urban development and public responsibility by optimizing the physical design elements of the settlement. The design aims toward an efficient layout by minimizing public areas, circulation areas and lengths, infrastructure, and by maximizing private and usable areas.

The survey of the existing dwelling environment identifies, analyzes, and evaluates three distinct urban areas in Unayzah which are characterized by their location, origins, layouts and socio-economic characteristics of their inhabitants.

The study is intended to:

*Provide a reference for understanding and evaluating the existing housing conditions and urban environment.

*Develop guidelines for those involved in planning of residential development and as a reference in the formulation of housing policies.

Thesis Supervisor: Horacio Caminos

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Cover: A general view of Unayzah, shows the new and
and the traditional houses.

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P R E F A C E

This study is based on my field research in Unayzah, Saudi Arabia during the summer of 1981. The surveys included the physical and socio-economic aspects of selected Unayzah urban dwelling environments. The study focuses on a design proposal which will contribute to a primary land subdivision model in an urban area.

I gratefully acknowledge the guidance and support of Professor Horacio Caminos during two years of study. I also sincerely appreciate the critique, assistance and friendship of Reinhard Goethart at various stages. I extend good wishes to members of my class of 1979-82 for their companionship, comments and to Sameer A. Khashugjee and thanks to William J. Tardiff for editing and typing the text.

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INTRODUCTION

In the summer of 1962, the General Department of Statistics, Saudi Arabia, conducted a census of existing housing conditions and the population in the city of Unayzah. The housing survey showed that there is 29% (935 out of 3225 dwelling units) more houses than families (2317). Clearly, there was no housing shortage.

During 1975, the Kingdom of Saudi Arabia experienced an extraordinary economic growth rate due to its stability and increase in the national income from exports from crude oil. As a result, changes developed in the traditional pattern of population distribution and living style.

Unayzah, one of the important cities in the Qaseem region, is an example of a rapidly urbanizing area where the living conditions and physical environment are rapidly changing. In particular, the old is now perceived as outdated, and therefore, during the past few years, residents of the old part of the city have moved out to new urban areas, leaving it for low income groups and rural migrants, as well as temporary migrants from foreign and nearby countries.

This negative attitude towards traditional housing has been affected by the following factors:

1. Drastic changes in their economic status and their motivation toward modernization have changed housing preferences. People have turned to villas as alternatives to traditional houses.
2. Basic service and utilities in traditional housing such as water, sewage, and electricity is limited, although this is the same throughout the city.

3. The Real Estate Development Fund, established in 1975-76 by the government, provides interest-free loans to individuals, corporations, and institutions for the purpose of funding construction of buildings in general, and housing in particular. These factors encouraged people to build a house even though they may already own one or more. It is not surprising therefore, that most of the newly-built, (3486) housing units in Unayzah are funded by the REDF.

Establishment of the REDF has both positive and negative impact on housing issues. On one hand, the REDF provides an interest-free loan of almost 70% of the total estimated cost of the individual's housing unit and 50% of the total estimated cost of buildings by corporations or institutions for investment purposes, not exceeding S.R. 300000 (\$87719) for individual housing units and S.R. 10000000 (\$2923977) for speculative buildings. On the other hand, individuals and companies are eligible for an interest-free loan if they own a piece of land. In Unayzah, 60% of the population are in the high and middle income bracket and therefore are capable of purchasing a piece of land.

Due to the lack of price controls on land in local markets, lack of adequate planning controls, and uncoordinated administrative structure, land prices soared after the REDF started. A one meter square in a reasonable location in a city may sell for \$30 to \$40, although cheaper land may be available five to fifteen kilometers from a development area. In fact, a considerable number of houses were built far from the city center. They are isolated, mislocated, and perhaps uninhabited. This poor land utilization is

going to be a critical matter in the provision of utilities and services, making it more difficult and uneconomical. Furthermore, it will increase implementation, maintenance, and operation costs of water supply, sewage disposal, street lighting, street paving, and electricity. In total, this represents a severe misallocation of funds.

The focus of this thesis on two critical issues: a) the housing situation of middle income groups; b) the inefficient use of land in new developments. The study is divided in two sections: A tentative planning model for urban land development and a survey of existing dwelling environments. In addition, the urban content of Unayzah is included for reference.

The development of the model is based on three case studies from the existing dwelling environments, stressing land utilization, density, and circulation efficiency. A modified layout is designed at Al-Slimaneh to compare with the one being built. Essentially, the redesigned layout is concerned with reducing costs of urban development and public responsibility by optimizing the physical design elements of the settlement. The design aims toward an efficient layout by minimizing public areas, circulation areas and lengths, infrastructure, and by maximizing private and usable areas.

The survey of the existing dwelling environments identifies, analyzes, and evaluates three distinct urban areas in Unayzah which are characterized by their location, origins, layouts and socio-economic characteristics of

their inhabitants. The following were chosen: Ad-Dira (old traditional settlement;) Al-Jadidah (traditional settlement;) and Al-Malah (transition settlement).

The cases were analyzed on four different levels: the locality with reference to its context; a segment showing the main elements; streets, dwellings, lots, open spaces, commercial areas, and community facilities; a typical block; and a typical dwelling.

In summary, the study is intended to:

- *Provide a reference for understanding and evaluating the existing housing conditions and urban environment.
- *Develop guidelines for those involved in planning of residential developments and as a reference in the formulation of housing policies.

HOUSING ISSUES

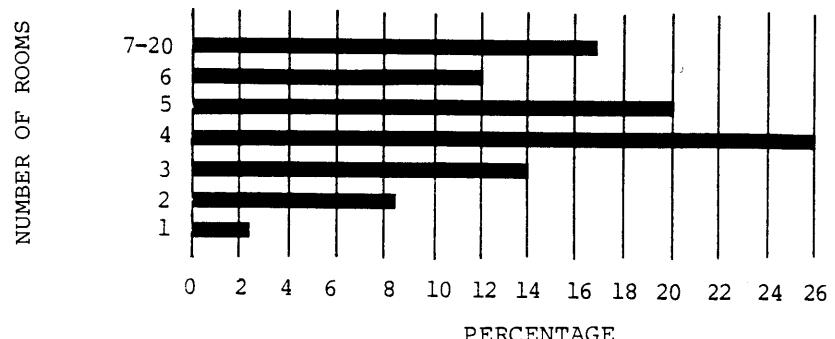
PHYSICAL ASPECTS: In Unayzah, two main types of housing can be identified. One is the traditional mud-built house, found mainly in the old town and partly in the newly developing sectors of the town. The other is the more recent type of construction, utilizing new methods and materials.

The traditional mud-built house is, in turn, comprised of two main types; the mud house which was built within the walled town and the mud house built in the more recent sector of the town. The traditional mud houses built in the old sectors consist mainly of two stories, and in some cases, three stories. The open area in the courts is comparatively small when compared with more recent ones. Traditional mud houses built in newer areas of the town consist mainly of one story and have large open areas. Other types of houses are built with more recent construction methods and materials and are primarily found in the newly developing areas of the town.

In addition to the above, there are also a few recently constructed apartment buildings. These are found mainly along the commercial street Adh Dhuluy'ah and include shops on the ground floor and apartments on the upper floors.

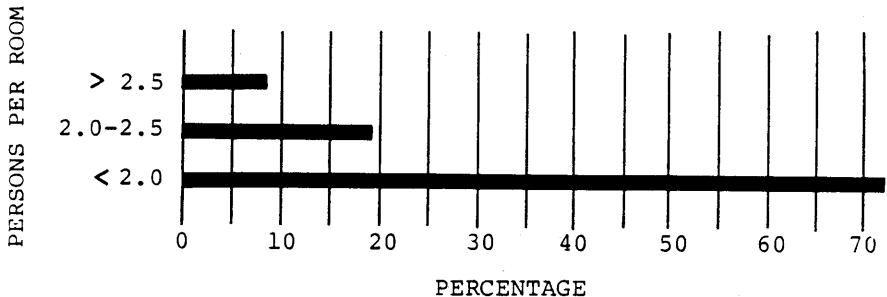
CONSTRUCTION MATERIALS: The greater part of the dwelling units in Unayzah are constructed out of adobe (87.3% of the total) with reinforced concrete structures second (8.0%) while cement block buildings represent only 1.9% of the total. There are no stone buildings and only a small proportion (2.8%) of the buildings are constructed of various other materials (tin, hardboard sheets, etc.)

NUMBER OF ROOMS PER HOUSEHOLD:



The average number of room per household is 4.89 with a total number of 14200 rooms corresponding to 2904 households.

NUMBER OF PERSONS PER HOUSEHOLD:



The diagram shows that the majority of the households are living in a dwelling at a density of less than two persons per room.

TENURE: 55.4% of the total number of dwellings are owned by their tenants, whereas 38.8% are rented and another 5.8% are rent free.

HOUSEHOLD INCOME: The average monthly income per person is estimated at \$40 (June 1973) but the average per capita income per year is equal to approximately \$388.

There is a big difference in per capita income between districts. The poorest district is Al-Hilal (south of the town) with an annual per capita income of \$193 as compared to nearly \$388 for the town as a whole. At the other extreme, we have the old town (Al-Khraizah) in which per capita income is \$491 or approximately 27% higher than the average. The people living in the other districts are very close to the average.

HOUSEHOLD INCOME AND DWELLING UNIT FACILITIES: 91.7% of the total number of households indicate a bath or a shower available in the dwelling unit. The households with higher incomes were more often equipped with a bath or a shower than households with lower income.

DEMAND: Housing needs arise from three factors: a rapid increase in population, changes in family structure from extended to nuclear families and the gradual replacement of existing dwellings.

The annual growth rate for the town is 3%. The rapid increase in population can be explained by the following observations:

1. The younger groups which represent a high proportion of the total population brought about by the comparatively high birth rates and the continuing rapid progress in reduction of infant mortality. More than 34% of the total population are below ten years of age.
2. The substantial flow of immigrants from nomadic and rural areas, as well as from nearby countries seeking employment opportunities derived from the functions of the city as an administrative, commercial, civic, and trans-

portation center for the wider region.

Unayzah society has several family types. One, is the simple family composed of only the parents and their children. The joint family is composed of the parents and their married sons or daughters and their spouses, or of several brothers and their wives and children. The average family has approximately seven to nine members.

Nowadays, the family structure has been changed to a predominately nuclear family with an average three to six members. The main reason for this is the improvement in living standards and socio-economic status.

The gradual replacement of existing dwellings are usually of sub-standard dwellings, houses in poor or fair condition which have not been maintained.

The total housing needs by the year 1993 call for 4664 additional dwelling units. Replacement represents 1595 units of the total with new dwellings amounting to 3069 units.

SUPPLY: The private sector supplied most of the housing and was financed by the REDF. The housing supply has not been able to keep pace with the demand. During the years 1975-82, approximately 3486 urban dwelling units were constructed, compared with the need for 4664 new houses and replacement units.

A considerable number of houses which have been built are isolated, mislocated, and uninhabited because of the lack of utilities.

CONCLUSION: It is obvious that Unayzah's past housing situation, (before 1975) was generally not problematic. They were traditionally built dwellings and no shortage or

over-crowding existed. Facilities, utilities, and services were limited but provided.

Presently, the city of Unayzah is experiencing a rapid rate of urbanization, following the increase in population with drastic changes in economic status and their motivation toward modernization through the establishment of the REDF. This process of rapid urbanization is causing tremendous problems. Housing shortages, lack of facilities, utilities and services, traffic congestion, and uncontrolled development are just some of these problems.

Finally, the study is an attempt to provide insights and suggestions to stimulate further study for the development of residential sections. The primary influence and point of departure is based on three selected existing situations,

representing different housing conditions in the Unayzah urban area.

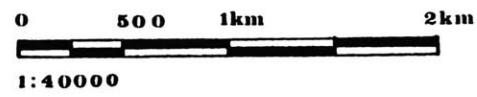
In the next section, a tentative planning model is designed at Al-Slimanieh to compare with the one being built. Essentially, the redesigned layout is concerned with reducing costs of urban development and public responsibility, by optimizing the physical design elements of the settlement.

A TENTATIVE PLANNING MODEL

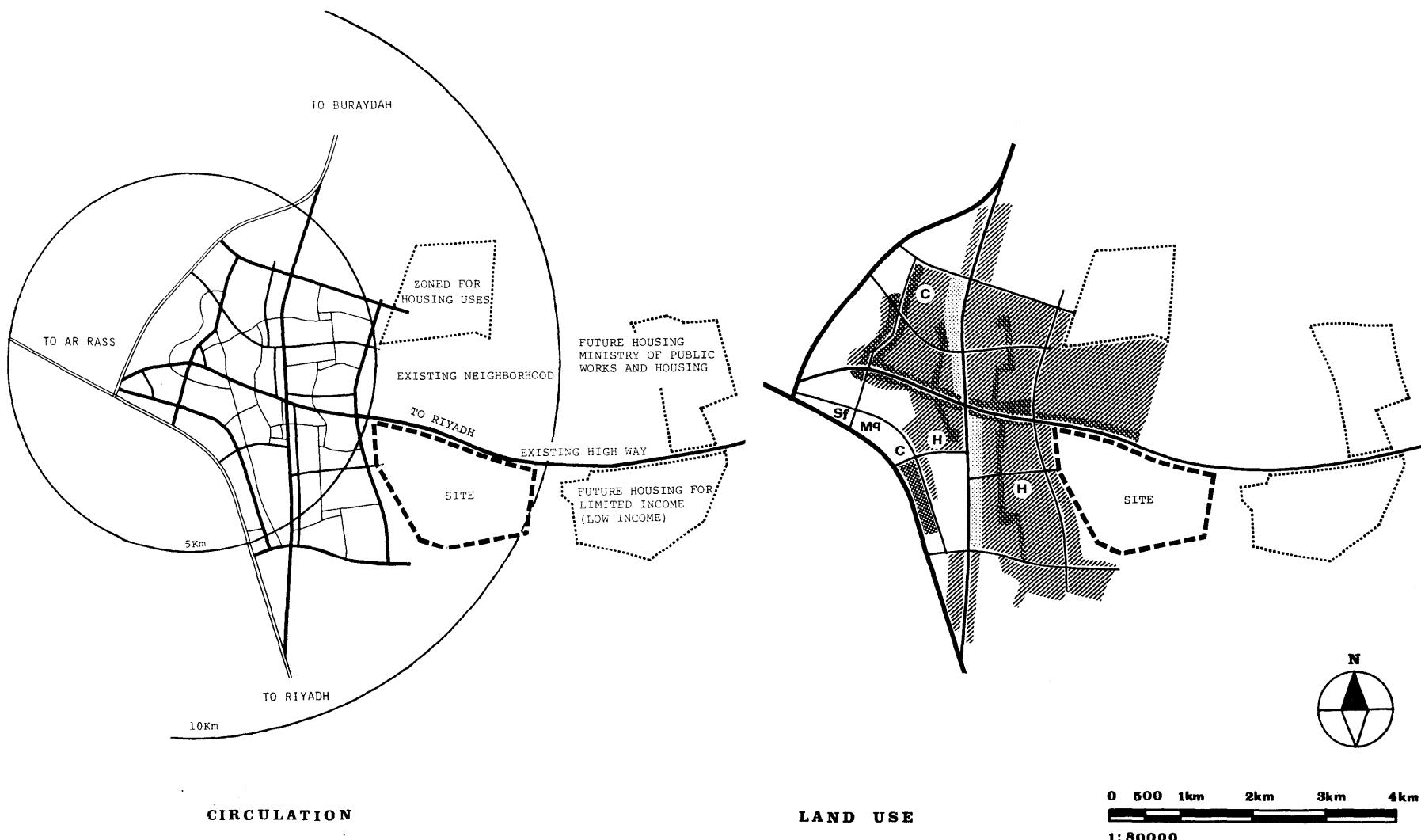




PHOTOGRAPH. Air photograph of the site
The site is surrounded on the western and
northern boundary by middle and high income
housing developments. Riyadh-Unayzah highway
passes on the northern boundary.



SITE LOCATION



The site is located in the Al-slimanieh section. It is a new rapidly growing residential area on the periphery of Unayzah, within a 5 Km radius along the Riyadh-Unayzah high-way. Schools, a health center, government agencies, a commercial center and Mosques are nearby within 1.5 Km. On the east side of the site, a future housing development for limited income (low income) and middle income is planned.

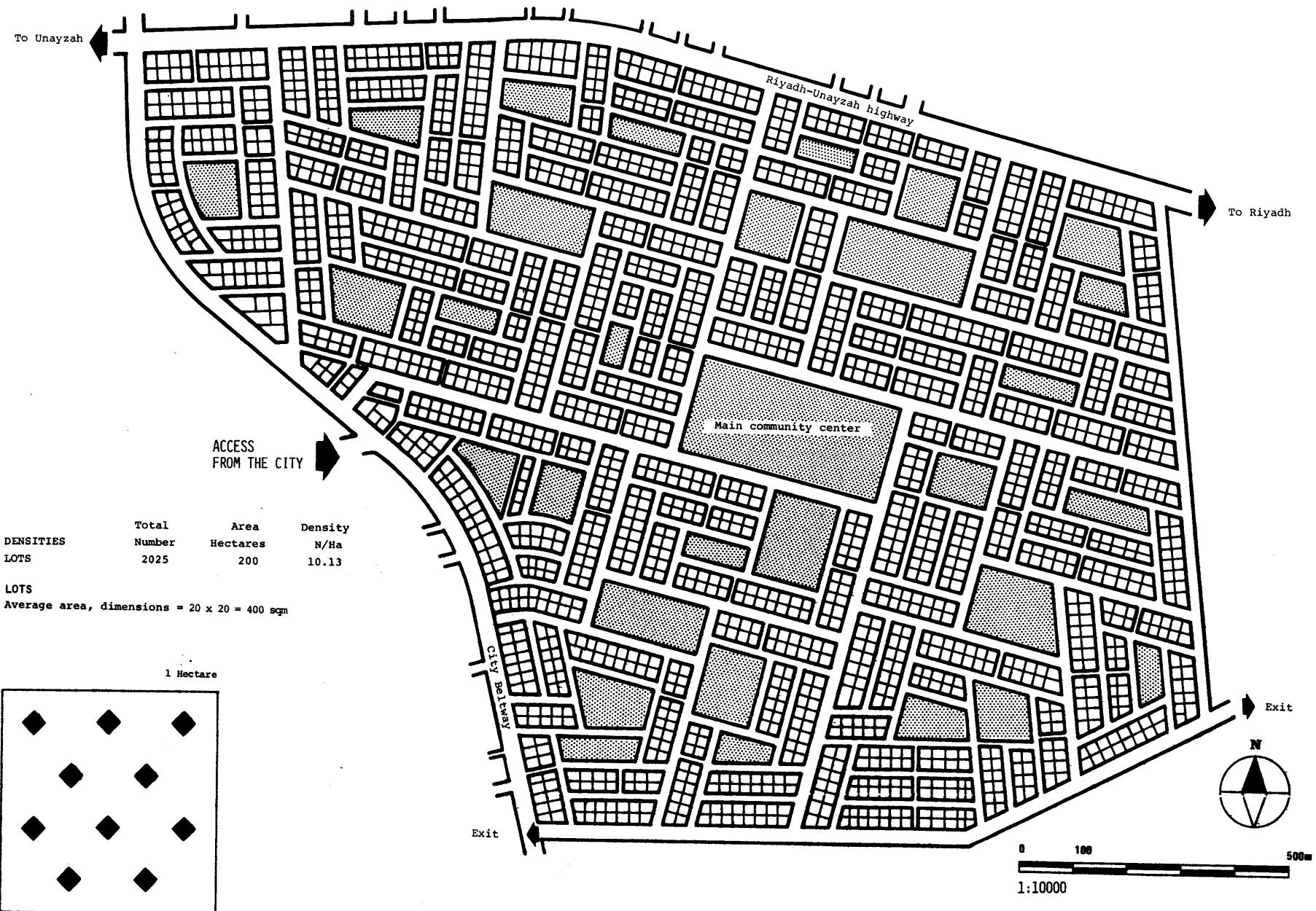
AREAS	KEY
RESIDENTIAL	H Hospital
COMMERCIAL	C Cemetery
INDUSTRIAL	Mq Eid mosque
ADMINISTRATION & INSTITUTIONS	Sf Sports center

SITE DATA

LOCATION	East Unayzah,, on the Riyadh-Unayzah highway and 5km from the city center.	Topography	Flat
Land Utilization Pattern	Residential, commercial, small industries.	Soil	Limestone outcrops
Population Density Pattern	60-100 persons/Hectare.	Transportation	Minibuses, taxi, private cars
Income Group Pattern	Medium income	Climate	Generally described as being arid and continental.
Land Cost Pattern	\$40-60 M ²		Chief characteristic are very hot summer temperatures and mild winters with variable amounts of rainfall.
Infrastructure Available	Water supply-none existing, available one km financed by government.	Boundaries	South: Privately owned land North: Unayzah-Riyadh highway.
(P)Projected	(P) Sewage disposal-feasible by government. (P) Storm drainage-feasible by government. (P) Refuse disposal-feasible by government.	Views	East: Privately owned by same owner. West: Future highway (ring-road)
(E)Existing	(E) Electricity-available (E) Telephone-available	Flooding	Agricultural land which surrounds city on most sides.
Community Facilities	Education, health, social nearby city 2km	Dust, Dirt, Smoke, Fumes, Odors, Noise	Outside of floodway
Sources of Employment	Government employees, social and personal services 1-2km	Fire, Explosion Hazards	None
Approaches	Unayzah-Riyadh, existing highway	Airport Disturbance and Zoning Restrictions	None
Accesses	Along Unayzah-Riyadh highway and highway (ring road) come from the city center.	Existing Structures	Nearby existing housing project
Size, Shape	200 Hectares; irregular, average length 1900m, average width 1100m.	Government Regulations	Zoning laws of Quaseem district
		Land Tenure	Public agency legal owner

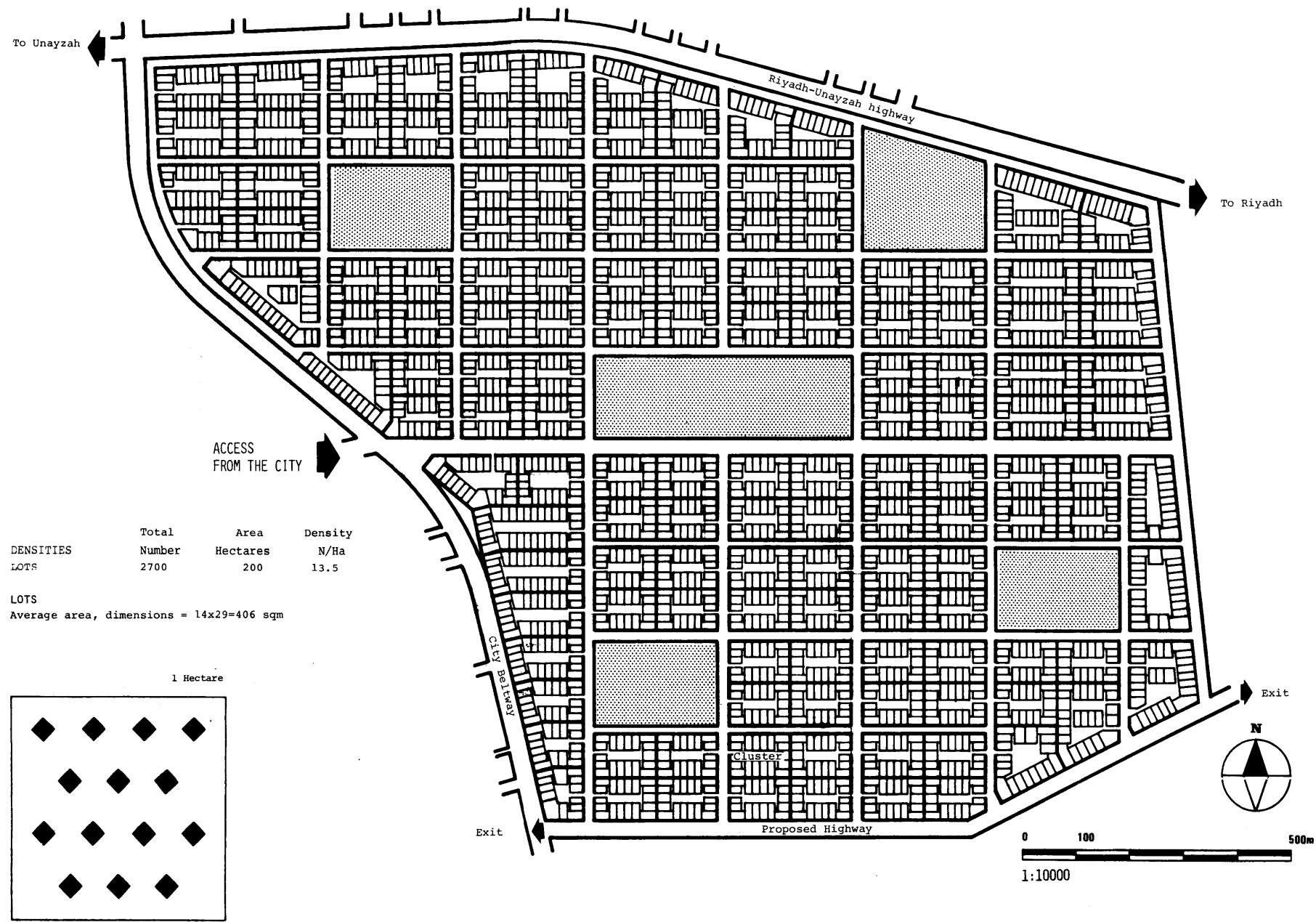
PROJECT PROGRAM

	Existing	Proposed
TOTAL AREA	200 Ha	200 Ha
GROSS DENSITY (Person/Ha)	60	81
NET DENSITY (Person/Ha)	127	116
POPULATION Persons (From middle income)	12150	16200
LAND UTILIZATION		
PUBLIC (Streets, walkways, open spaces)	80 Ha	40% 36 Ha 18%
SEMI-PUBLIC (Schools, community centers)	24 Ha	12% 24 Ha 12%
PRIVATE AND SEMI-PRIVATE (Dwellings, lots, cluster courts)	96 Ha	48% 140 Ha 70%
	TOTAL 200 Ha	100% 200 Ha 100%
RESIDENTIAL AREAS		
NUMBER OF LOTS (Assuming 6 persons/lot)	2025	2700
DIMENSION OF LOTS (Average m x m) 2	20 x 20	14 x 29
AVERAGE LOT AREA (m ²)	400	406
COMMUNITY FACILITIES	Primary Schools: (2) Boys, girls Secondary Schools: (2) Boys, girls High Schools: (1) Boys (2) Boys, girls Community centers: Each center contains: market, post office, health center, mosque, police station, administration, park, fire station.	
TARGET INCOME GROUP (US\$ per month/household) 1975	Low 0-1760 Middle 1760-7038 High 7038 and above	40% 51% 9% 0-1760 1760-7038 7038 and above
DEVELOPMENT	Progressive in stages	
DESIGNER	Ministry of Municipal and Rural Affairs	Thesis proposal



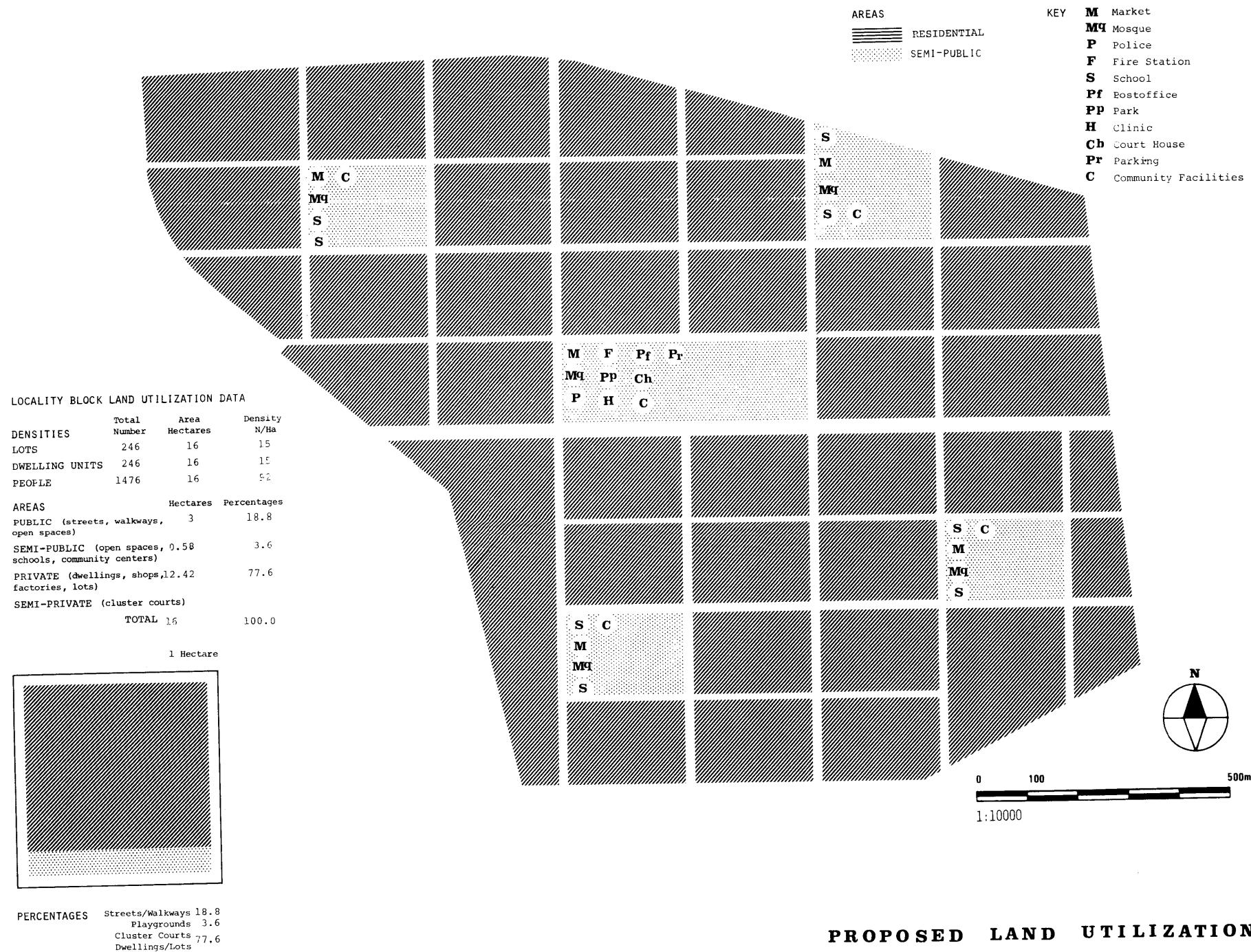
LOTS DENSITY
Lot/Hectare
◆ 1 Lot 10

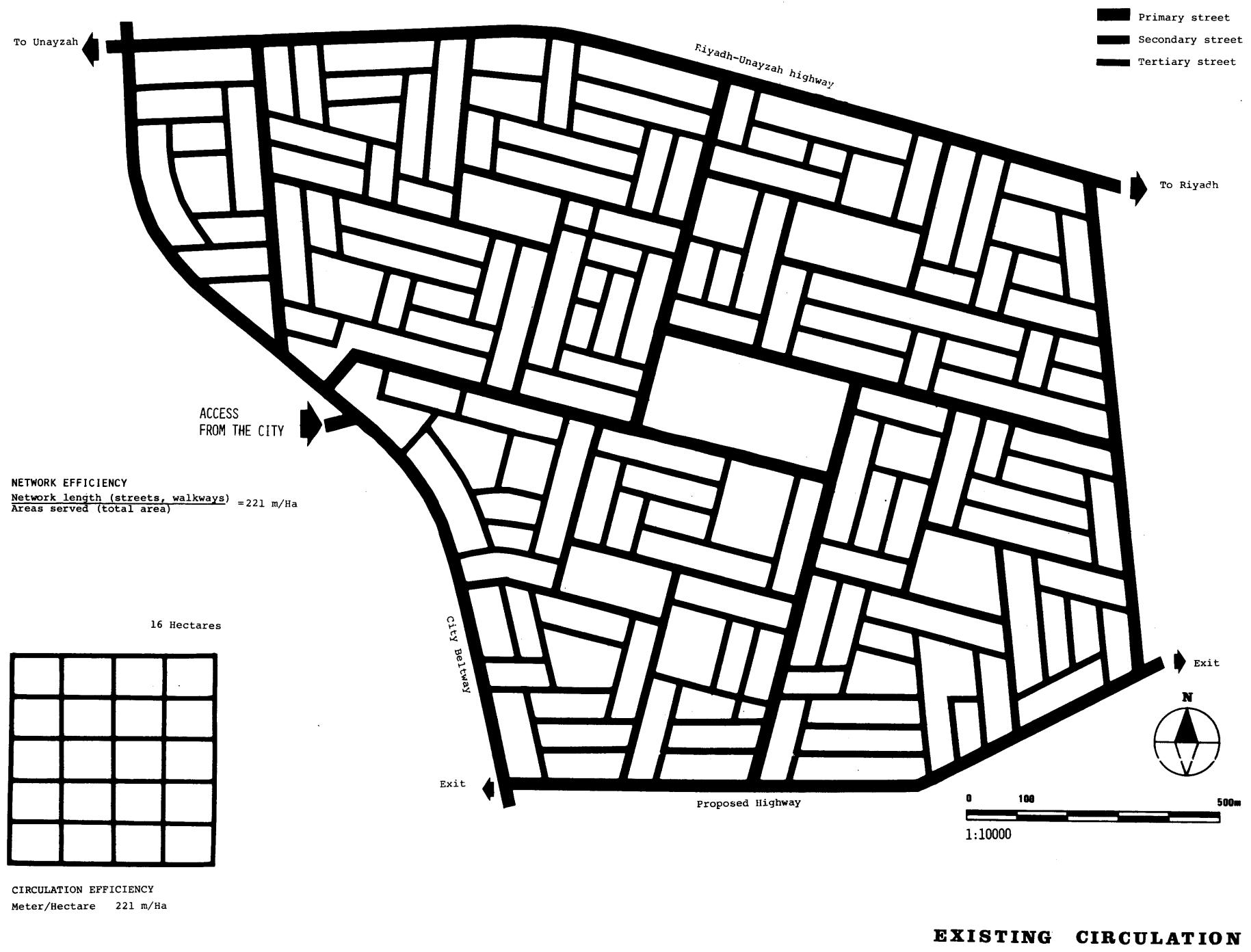
EXISTING LAND SUBDIVISION

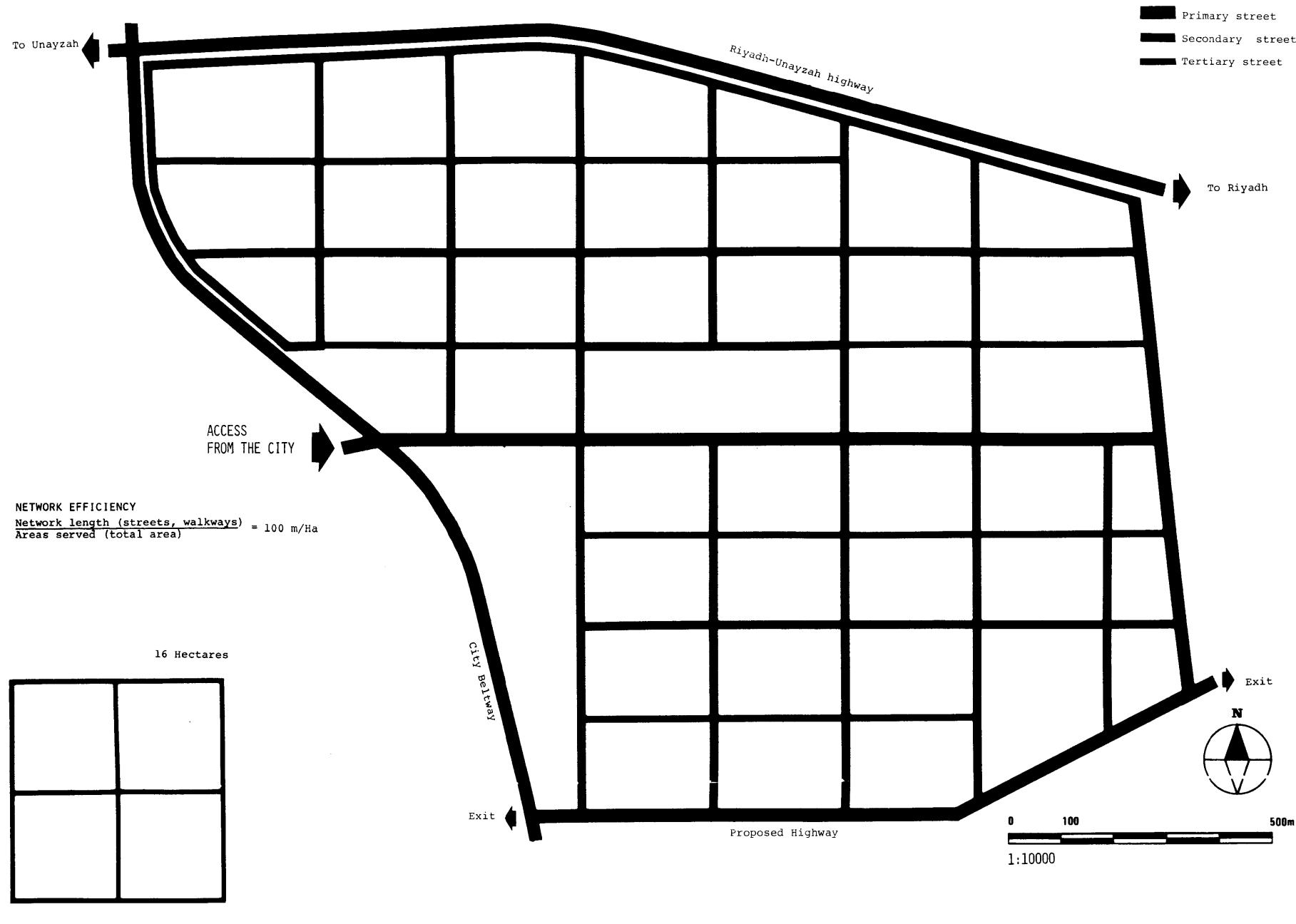


PROPOSED LAND SUBDIVISION









PROPOSED CIRCULATION

EXISTING BLOCK

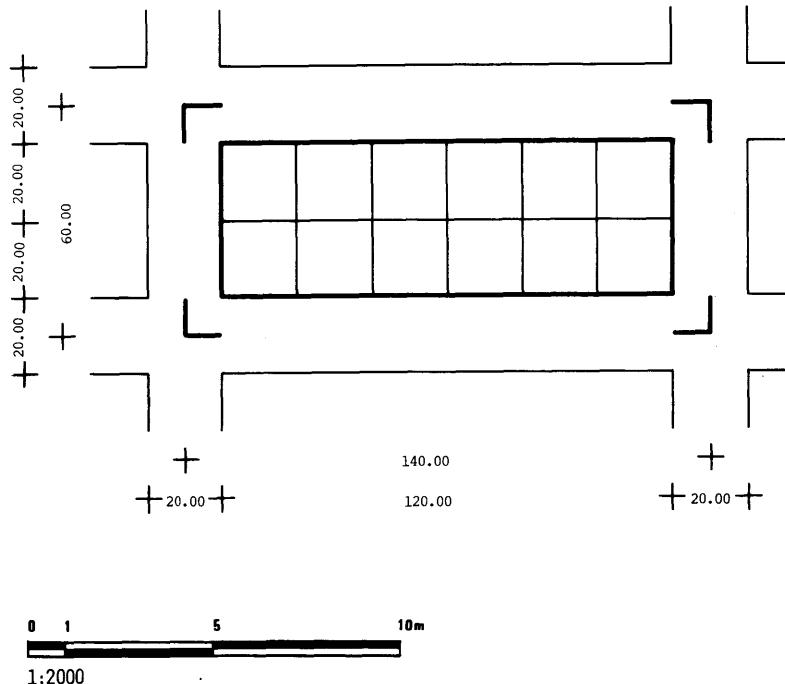
The existing blocks show the typical layout of an average dimensions. The block is defined as being surrounded by public circulation that provides access directly to each lot. The lot proportions, 1:1 (20x20) decreases the number of lots per block and increase the circulation length. Consequently, the length of circulation per area is much greater than that of the proposed layout. This implies a higher construction cost and is an added, unnecessary burden for the government to maintain, particularly concerning the infrastructure. In addition, this design and type of ownership does not encourage private responsibility and participation of the community.

PROPOSED BLOCK

BLOCK is a portion of land bounded and served by public lines of circulation. LOT is a measured parcel of land having fixed boundaries and access to public lines of circulation. CLUSTER is a group of lots (owned individually) around a semi-private court (owned in condominium). CONDOMINIUM is a system of direct ownership of a single unit in a multi-unit arrangement. 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 appropriate interest in the common areas and underlying ground.

The revised block layout is designed to illustrate a land subdivision which allows minimization of public ownership of land, decreased lengths of infrastructure per area, and maximization of private ownership of land and private participation and responsibility.

The block plan shows a typical block with lots grouped around a semi-private common court that serves as access to the lots as well as for other activities of their occupants. This court is owned in condominium by the owners of the lots who share its use. The court is assured of better control and maintenance by virtue of its condominium ownership, being dead-ended and with a limited number of users. Moreover, the ownership and mutual maintenance provides the potential for increased social interaction among the residents and increased resident participation in community activities.

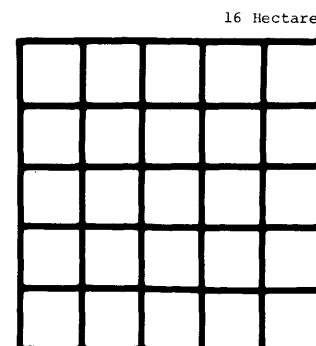
**EXISTING BLOCK****LOCALITY BLOCK LAND UTILIZATION DATA**

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	12	0.84	14
DWELLING UNITS	12	0.84	14
PEOPLE	72	0.84	86

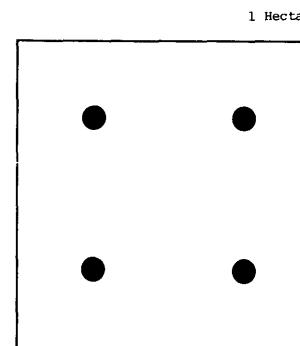
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.36	43
SEMI-PUBLIC (open spaces, schools, community centers)	0.48	57
PRIVATE (dwellings, shops, factories, lots)	0.84	100
SEMI-PRIVATE (cluster courts)		
TOTAL	0.84	100

NETWORK EFFICIENCY
Network length (streets, walkways) = 238 M/Ha
Areas served (total area)

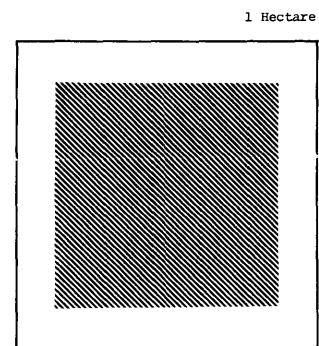
LOTS
Average area, dimensions = 20x20= 400 M²

LAND UTILIZATION DIAGRAMS

CIRCULATION EFFICIENCY
Meter/Hectare 238



DENSITY Persons/Hectare 86
● 20 Persons



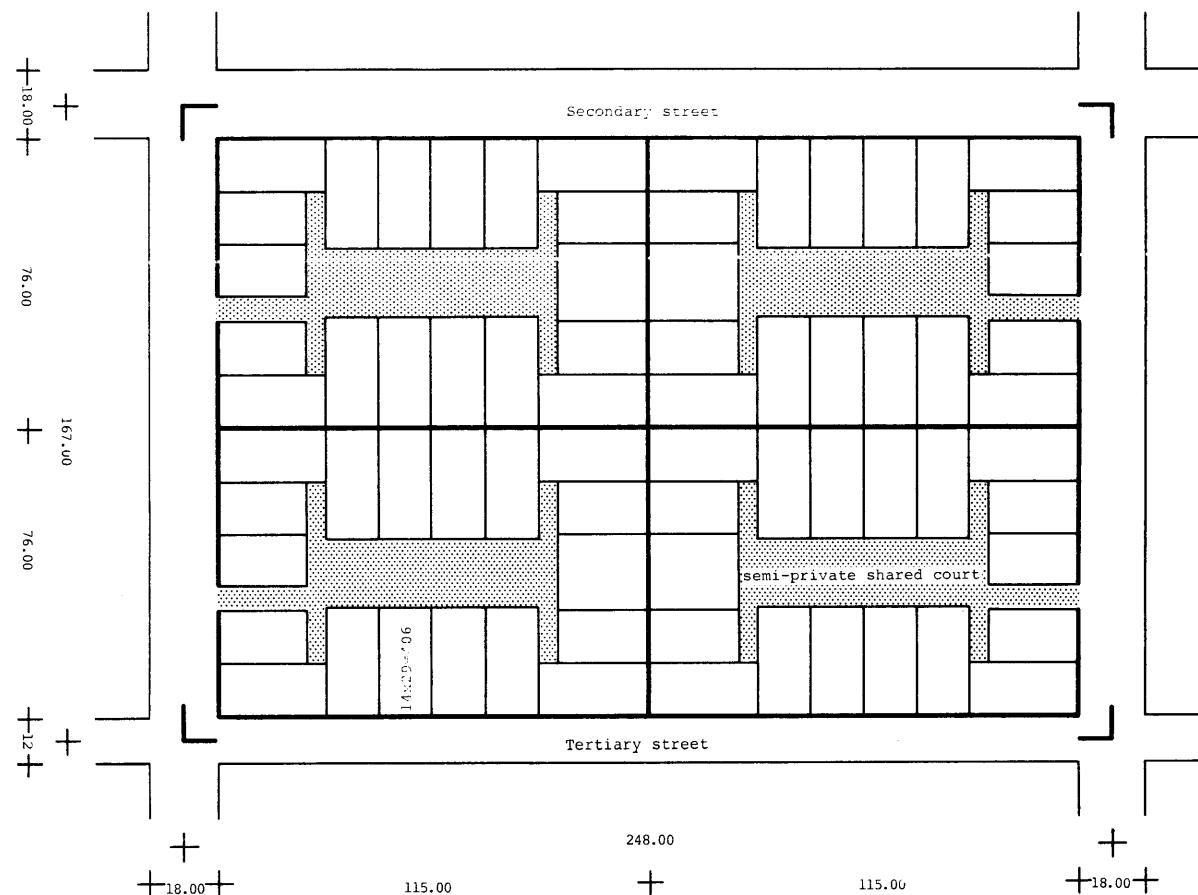
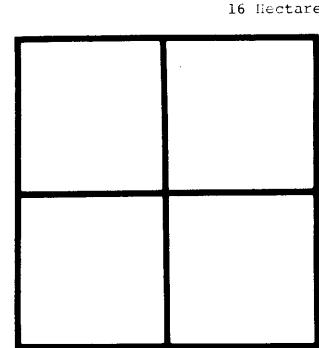
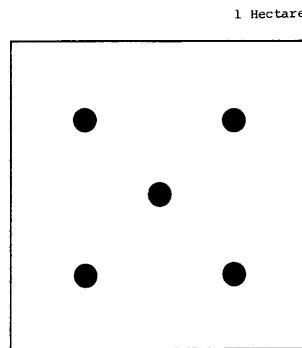
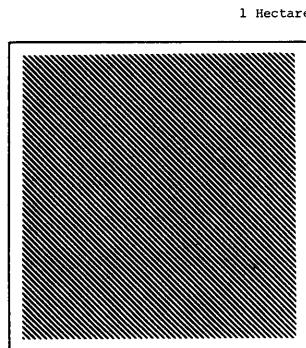
PERCENTAGES Streets/Walkways 43
Playgrounds -
Cluster Courts -
Dwellings/Lots 57

PROPOSED BLOCK**LOCALITY BLOCK LAND UTILIZATION DATA**

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	72	4.14	17
DWELLING UNITS	72	4.14	17
PEOPLE	432	4.14	104
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		0.64	15.5
SEMI-PUBLIC (open spaces, schools, community centers)			
PRIVATE (dwellings, shops, factories, lots)		2.8	67.6
SEMI-PRIVATE (cluster courts)		0.7	16.9
TOTAL		4.14	100.

NETWORK EFFICIENCY
Network length (streets, walkways) = 100 M/Ha
Areas served (total area)

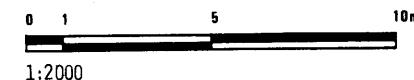
LOTS
 Average area, dimensions = $14 \times 29 = 406 \text{ M}^2$

**LAND UTILIZATION DIAGRAMS**

PERCENTAGES
 Streets/Walkways 15.5
 Playgrounds -
 Cluster Courts 16.9
 Dwellings/Lots 67.6

DENSITY Persons/Hectare 104
 ● 20 Persons

CIRCULATION EFFICIENCY Meter/Hectare 100



EXISTING PROJECT

LAND SUBDIVISION:

The site has no defined entrance or exit. There are several accesses along the Riyadh-Unayzah highway: on the western boundary, along the city ring-road on the western boundary, and along the southern and eastern boundary. These major roads will attract commercial activities along the site periphery, which could retard the social life and commercial activities in the main community center. Consequently, it is incompatible to have pedestrian activities along the major highway and in addition, land values will not be distributed equally.

The block layout is a gridiron pattern. The lot size determined the block size and established street layouts. As a result, the block is small which increases the public area in terms of percentages and lengths of utilities.

LAND UTILIZATION:

The public land in the existing layout is two times greater than in the proposed layout. This contributes to high construction cost of infrastructure and utilities as well as high maintenance cost. The small public areas scattered throughout the site do not clearly define users' responsibilities and do not provide physical control.

The total semi-public space is more than the community requires. Local community centers and schools are distributed on small pieces of ungrouped land. As a result, these lands could attract garbage. Private land utilization does not provide any opportunity for private participation in community activities.

PROPOSED PROJECT

Access is based on consideration of convenience and efficiency of the circulation. At present accesses to the site along the boundaries are inadequate. The proposed layout has a defined entrance on the western boundary and exits on the western and eastern boundary. The entrance leads to the main community center which will stimulate social and commercial activities. Furthermore, the land value would be better distributed.

The block layout is based on a grid pattern which minimizes public land and infrastructure networks and provides flexibility in land subdivision, independent of street layout and the variation of lot sizes.

The utilization of public land is to minimize the circulation length per area, public responsibility, and to offer more land for private use. The proposed layout will reduce by 50% the public land by replacing the gridiron layout with a grid layout and the public open spaces with semi-private shared courts.

Designation of the semi-public land (community facilities, park, and market) provides equal access and emphasizes the importance of the central spine. To provide equal access for the whole community, the local community centers and schools have been relocated to 4 central sites.

The private land is designed to maximize private use, responsibility, and participation by allocating lots in condominium to create social interaction.

CIRCULATION:

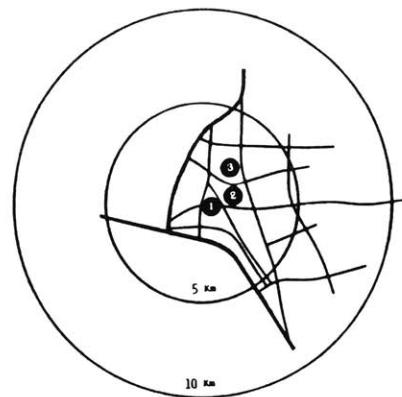
The circulation network is based on a gridiron system. The size of intervals is directly related to the size of the lots. This increases the percentage of public land use and increases cost of construction and maintenance. It also does not provide direct access to all community activities.

The primary street is a central spine running through the center of the site. The community facilities are located on this street to focus activities. The secondary streets are both parallel and perpendicular to the primary street, providing direct entrance to all lots. This layout does direct the residents to the local community centers and schools, and, consequently, it lowers the incentive for social interaction.

The circulation network is based upon a grid system. The size intervals are within 150 x 230, being small enough to facilitate the pedestrian circulation among the various community elements: shops, services, dwellings, and large enough to minimize land areas and reduce public costs of construction, maintenance, and operation of utilities and services.

The primary street is a central spine running through the center of the site. The community facilities are located along this street to focus activities. A mini-bus route is also maintained on this spine. The secondary streets are perpendicular to the primary street, providing entrances to all clusters and giving clear direction to the residents for access to central activities and other events along the boundary. The peripheral streets serve as service roads and buffer zone to separate the traffic inside the site from traffic on the highway.

CASE STUDIES



Unayzah's urban pattern is compact and intricate. The reason was the initial development of the city which was taking place within productive agricultural land. Any urban expansion meant the loss of the main source of life for the inhabitants of the city. This, naturally, resulted in the maximum utilization of the urban area, by building the houses very close together and developing methods which permitted them to go two and three floors up. The street and public open space suffered as a result, developing into narrow cracks and small gaps in a continuous mass of solid, built-up areas.

The street pattern in the old city is irregular and can be classified into main streets, carrying movement between residential clusters to public and commercial areas, or secondary cul-de-sac streets serving the residential blocks.

Public open spaces within the urban pattern are few and usually formed as a result of the meeting of several streets or the enlargement of a street at one point. But the lack of such public spaces is felt less in Unayzah due to the existence of large green areas within and around the city sectors.

The new areas of Unayzah developed to the east and northeast of the old city. The street pattern is almost regular and wide. The houses are one or one and a half floors. This is according to the change in social, economic and technical factors.

1- AD-DIRA

The city center is mainly residential and accommodates the main commercial area. Private, high/middle/low income residents. Traditional row/grouped houses, consist mainly of two stories, and in some parts, of three stories. The street is narrow and has a lot of overpass.

2- AL-JADIDAH

It is mainly residential. Private, high/middle/low income residents. Traditional row/grouped houses, consist mainly one and a half to two stories. The streets are wider than the streets in Ad-Dira and the overpass starts to disappear.

3- AL-MALAH

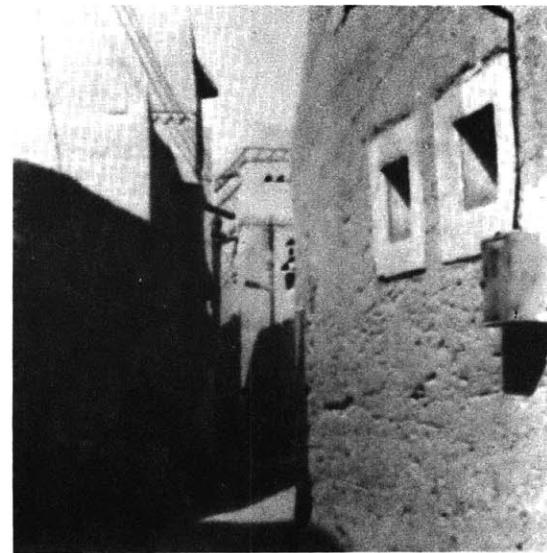
It is mainly residential, accommodates the administration and educational functions. Private, high/middle/low income residents. Traditional row houses, consist mainly of one story. The street is wide, 10-15 meters and no overpass.



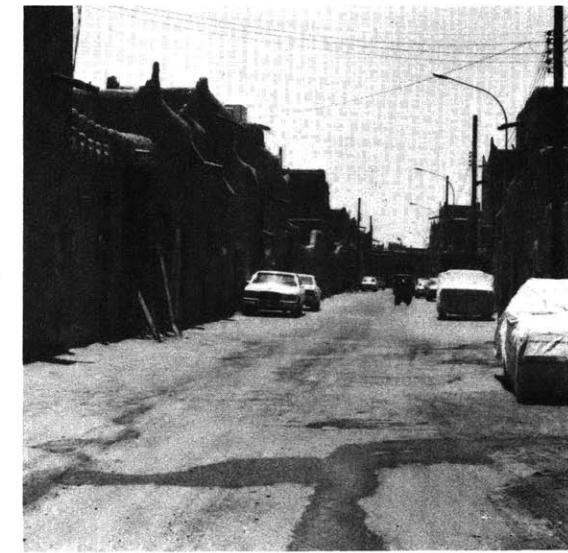
**1 OLD TRADITIONAL
AD-DIRAH**



**2 TRADITIONAL
AL-JADIDAH**



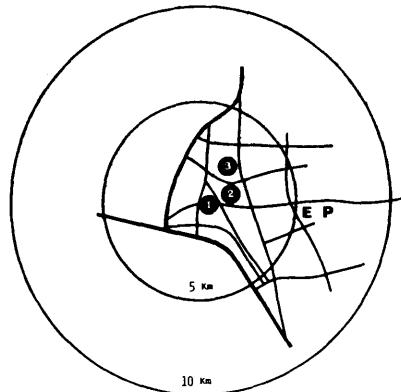
3 TRANSITION



PATTERNS.



C O M P A R I S O N S



The case studies depict selected dwelling environments/situations in the Unayzah urban area at the present time. The three cases were selected according to income groups, housing systems, and proportion of the population that each system houses. They have been evaluated and compared with the existing and proposed layout at Al-Slimanieh. The evaluations provide a comparative view of the percentages, density, and network efficiency.

The existing housing systems provide the most important sources of information for formulating the housing policies, a guideline to land utilization, distribution and subdivisions, also insight into issues concerning population, densities, income ranges, cultural, and social values.

The proposed layout is based on information from the existing housing systems. It is designed and compared to the existing one to illustrate the main efficient scheme in the utilization.

The proposed layout has two advantages: the first is the most efficient circulation. This minimizes the investment in construction of infrastructure and utility networks and reduces the public responsibility and cost of maintenance and operation due to reduced circulation length per area. Second, the optimal amount of privately owned land is also achieved, not only in terms of saleable land but also the increase of private responsibility. The system of condominium ownership is used to create social interaction among the users to share use and responsibility. As a result, these create both social and economic positive effects within the settlement.

The diagrams on the next page provide a summary of the evaluations of the case studies in a comparative manner.

LAND UTILIZATION:

PERCENTAGES

Proportions of public and private areas are indicators in determining maintenance, responsibility, user control and functional efficiency of a layout. For example, a large percentage of land used for circulation results in high costs of installation per sector, indicating an inefficient layout.

DENSITIES

The number of persons per hectare relates to both the number of lots and the types of dwelling per hectare. This determines the intensity of land use; low densities reflect higher development costs per person.

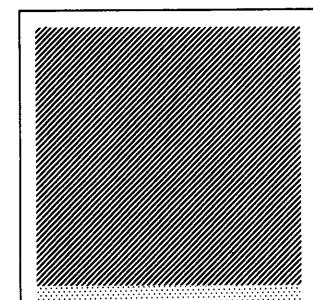
CIRCULATION

A relation between public circulation lengths and the areas served indicates the network efficiency; high ratio reflects a less efficient network in terms of direct capital investment and future maintenance costs.

COMPARATIVE PROJECTS**AL-SLIMANIEH****PROPOSED**

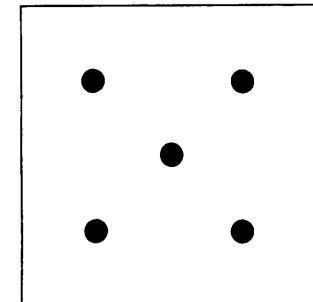
-Detached houses. High/middle incomes.
-Acceptable density and large blocks and very good land utilization.

1 Hectare



PERCENTAGES
Streets/Walkways 18.8
Playgrounds 3.6
Cluster Courts -
Dwellings/Lots 77.6

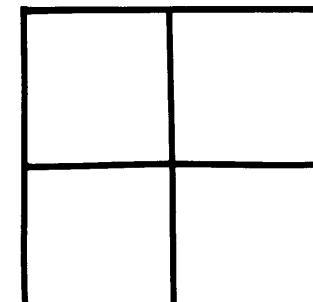
1 Hectare



DENSITY Persons/Hectare 92

● 20 Persons

16 Hectare



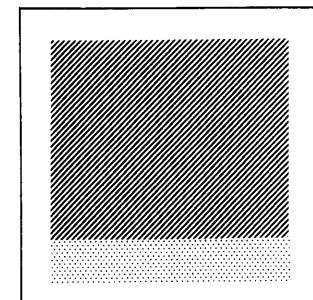
CIRCULATION EFFICIENCY

Meter/Hectare

AL-SLIMANIEH

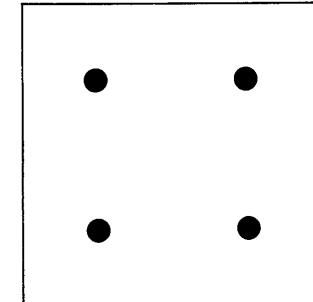
EXISTING
-Detached houses. High/middle incomes.
-Unacceptable density and high percentage of unused land and high circulation efficiency.

1 Hectare



PERCENTAGES
Streets/Walkways 38.0
Playgrounds 11.0
Cluster Courts 1.00
Dwellings/Lots 51.0

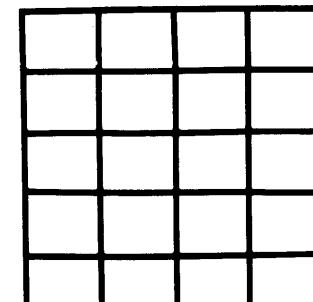
1 Hectare



DENSITY Persons/Hectare 72.0

● 20 Persons

16 Hectare



CIRCULATION EFFICIENCY

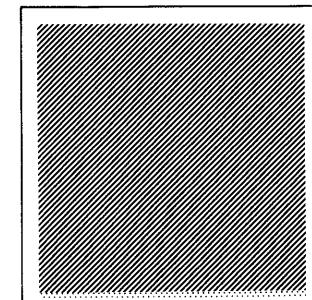
Meter/Hectare

221

CASE STUDIES**1 OLD TRADITIONAL****AD-DIRA**

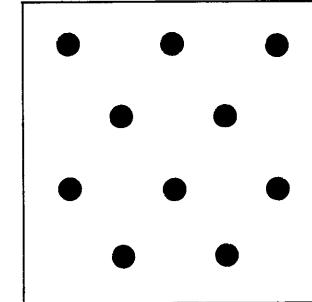
-Row/grouped houses. High/middle/low incomes.
-Acceptable density, large blocks and very good land utilization.

1 Hectare



PERCENTAGES
Streets/Walkways 15.0
Playgrounds 3.00
Cluster Courts 1.00
Dwellings/Lots 81.00

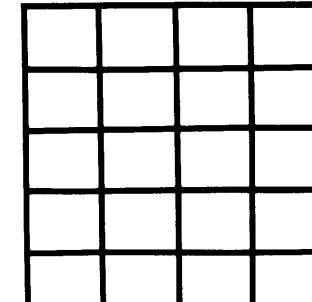
1 Hectare



DENSITY Persons/Hectare 200.0

● 20 Persons

16 Hectare



CIRCULATION EFFICIENCY

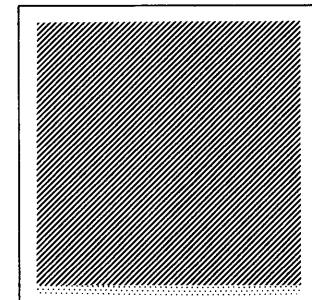
Meter/Hectare

214

2 TRADITIONAL**AL-JADIDAH**

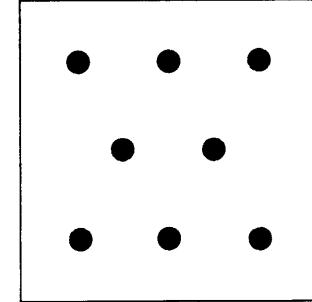
-Row/grouped houses. High/middle/low incomes.
-Acceptable density, large blocks and very good land utilization.

1 Hectare



PERCENTAGES
Streets/Walkways 15.0
Playgrounds 5.00
Cluster Courts 2.00
Dwellings/Lots 78.00

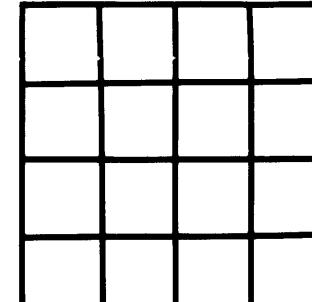
1 Hectare



DENSITY Persons/Hectare 160

● 20 Persons

16 Hectare



CIRCULATION EFFICIENCY

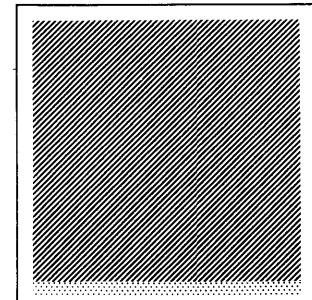
Meter/Hectare

198

3 TRANSITION**AL-MALAH**

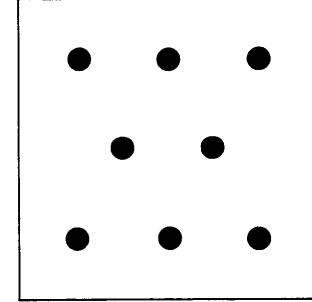
-Row houses. High/middle/low incomes.
-Acceptable density medium blocks and good land utilization.

1 Hectare



PERCENTAGES
Streets/Walkways 19.0
Playgrounds 3.0
Cluster Courts -
Dwellings/Lots 78.0

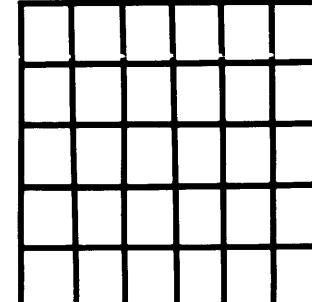
1 Hectare



DENSITY Persons/Hectare 160

● 20 Persons

16 Hectare



CIRCULATION EFFICIENCY

Meter/Hectare

267

APPENDIX

This section provides supporting and complementary references that have been utilized for the design of a proposed project at Al-Slimenieh. It will permit one to look further into the existing housing condition by the documentation of socio-economic and physical surveys of dwelling environments in Unayzah.

This section is comprised of 2 parts:

- 1) Unayzah urban context
- 2) Three case studies

This is followed by a glossary, references and explanatory notes.

URBAN CONTEXT

UNAYZAH



LOCATION:

Unayzah is located in the Quaseem region in the north central part of the Arabian Peninsula. It lies in the southern Ar'rimah Valley at 44 degrees east longitude and 26.2 degrees north latitude, and situated at the intersection of the main highways between the capital, Riyadh, to the southeast, Hayel to the north, and Madinah to the west. Located at an altitude of 700 meters, it is one of the highest areas in the Quaseem region.

HISTORY:

Little has been recorded about the history of Unayzah before Islam and during the few centuries that followed. However, it is evident that long before Islam, the place was frequented by travelers and neighboring tribes, as it constituted an oasis that offered water and shelter. The well "Um Al-Quabaur" is thought to belong to that period and was put to use again around 653 A.D. (32 A.H.) by Abdullah Ben Krais, the governor of Al-Basrah to secure the water supply for the pilgrimage route from Al-Basrah to the Holy Land.

The first settlers of Unayzah were people of Banin Khaled who built their houses on the western wing of the wadi where they cultivated their land. This is the reason why the oldest sector of Unayzah is known as Al-Janah, which literally means "the wing". The date this development

took place is unknown, but estimates put it back to 1100 A.D. Later on, the sector of Adh-Dhabt was built to the east of Al-Janah, and separated from it by the fields.

Around 1232 A.D., a person named Zahri Ben Jarah and his tribe settled in the land south of Al-Janah and Adh-Dhabt sectors close to Um-Al-Qubaur well and started the development of Al-Oqayliyah sector. Later, the sectors of Al-Malah and Al-Khraizah came into being.

At that time, each of those five sectors was an independent village, surrounded by a wall and governed by its own prince, but Al-Janah remained as the main center of influence. However, this situation did not last long, for in 1685, Al-Sharif Ahmad Ben Zeid, governor of Mecca, assisted the Al-Oqayliyah, Al-Malah and Al-Khraizah sectors. This resulted in the physical and administrative unification of those sectors by building a wall to enclose the three villages and the establishment of one principality to govern them.

When King Abdulaziz Al Saud conquered Unayzah, the town had already expanded eastwards to reach what we know as Al-Silsilah Street, where at that time, the eastern wall of the town existed. Outside the wall, the sectors of Al-Malah, Al-Bowayen and old Adh-Dhulay'ah were already built.

Besides this wall, Unayzah already had several other walls that were built at different times. However, these contained large areas of agricultural land, and were not indicative of the growth of the city.

PHYSICAL EXPANSION:

Physical and political factors played an important role in the shaping of the development trends of Unayzah in the past.

The initial development of the town was formed of five separate villages as political and tribal differences kept the people of those villages apart. The existence of valuable agricultural land in the immediate surroundings of each of these villages forced the development of the other villages a distance from them.

The unification of the villages of Al-Oqayliyah, Al-Malah and Al-Khraizah started the growth of Unayzah as a larger

settlement. Considering Al-Oqayliyah as the starting point of this major expansion, the choices of directions were limited because the immediate surroundings at that time were either valuable agricultural land or sand dune areas. The land east and northeast of Al-Oqayliyah absorbed the new development which was attracted to the hard soil and the lower agricultural value of the land on that side. The existence of the older sectors of Al-Janah and Adh-Dhabt was also a point of attraction for the new expanding areas. The major development took place in the last 30 years and included areas such as Al-Hiliah and Al-Sulaymaniyah.

At present, the factors that influence the expansion directions of Unayzah are, more or less, the same as those of the past.

The agricultural lands to the north, west and south of the town are still a major element in stopping expansion trends in those directions. Recently, the tendency to increase areas of farming lands in Unayzah has grown and will become an important factor when directions of expansion are sought.

To the east, the city has expanded, more or less, continuously and only small agricultural plots have been preserved. Recent urban settlements are occupying the small farmlands within the urban area. This is a serious matter. Unayzah will be deprived of valuable assets that characterized the city from other settlements of the region.

The construction of the new Riyadh-Unayzah-Buraydah highway has given impetus to the development in this direction. Today, on both sides of this highway, more new buildings are continuously being built. The construction of the highway to Al-Medinah has also attracted development along this direction.

The existence of a rather low (10-15m) but steep escarpment at a distance of between 250 and 700 meters to the east of the highway, forms a natural barrier, but it is apparent that it does not constitute an obstacle to urban expansion, especially after the new Riyadh-Unayzah highway has been constructed.

THE POPULATION:

Population statistics in Saudi Arabia are generally not accurate because there has never been any formal census. However, in the summer of 1962, the Status Office Agency conducted an informal study of Unayzah and the surrounding region.

	<u>Nomads</u>	<u>Town Inhabitants</u>	<u>Population</u>
Unayzah & Vicinity	3,986	26,176	30,159
Unayzah Only	607	22,848	23,455

According to a Doxiadis report (1979), the town's population forecasts will be as follows:

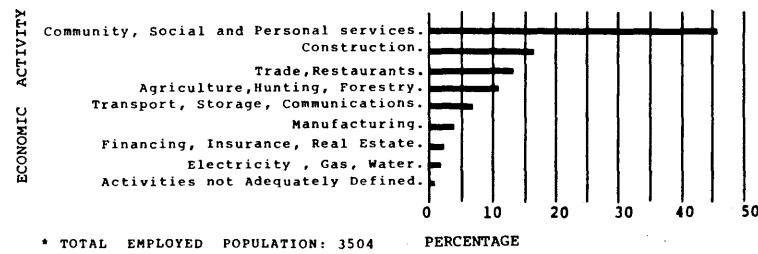
<u>Year</u>	<u>Population</u>	<u>Annual Rate of Increase</u>
1980	27,200	
1985	31,800	3.4%
1993	40,000	2.4%

ACTIVE POPULATION:

As can be seen from the population pyramid, out of a total population of 23,455, only 4,409 males are between the age of 20 to 60 (18.8%), the productive ages. This number is small because females remain at home and are not part of the employed labor force. In addition, they have to support a large number of children resulting from a high birth rate and low infant mortality.

EMPLOYMENT BY SECTOR OF ECONOMIC ACTIVITY:

EMPLOYED POPULATION BY ECONOMIC ACTIVITY



As can be seen from the figures which show the proportional composition of the employed population, the most important sector, from the point of view of the number of people employed in it, is community, social and personal services which employs 45.9% of the total employed forces in the city.

Other sectors of economic activity absorbing smaller but considerable parts of the total, are the wholesale and retail trade sector (13.0%), the construction sector (16.5%) and the agricultural sector (11.2%).

*Note: It is believed that all of the activities have substantially changed, with "real estate and financing" now comprising largest percentage.

In general, it can be said that the economic base of the town is constituted out of two major activities; mainly agriculture on the one hand, and on the other hand commercial and administrative services to the people in the area of influence of the town.

URBAN CONTEXT SOURCES

Urban Topography and Circulation: (accurate) Doxiadis, Unayzah EXISTING CONDITIONS, 1973.

Urban Land Use Pattern: (approximately)

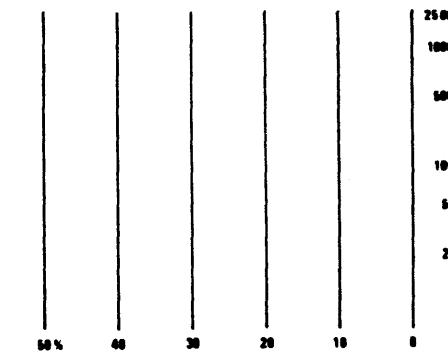
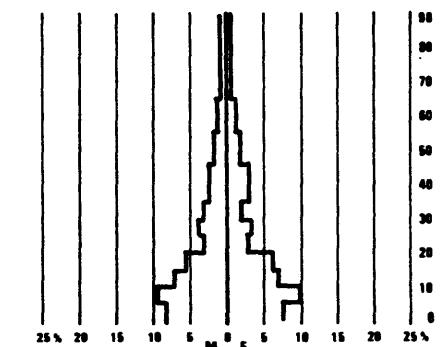
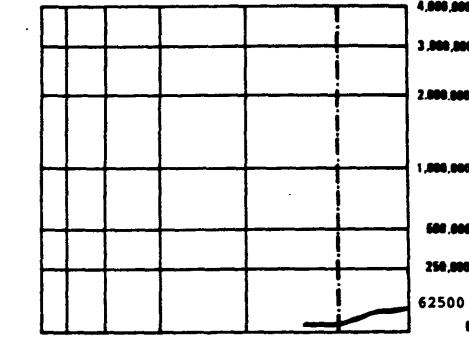
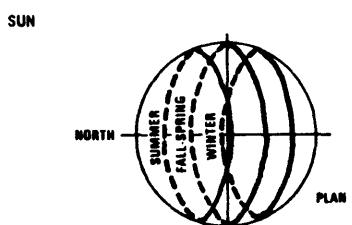
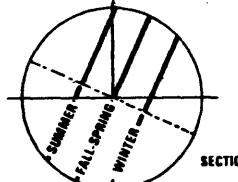
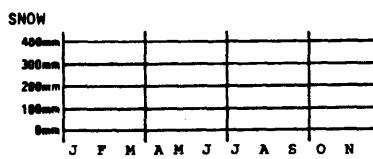
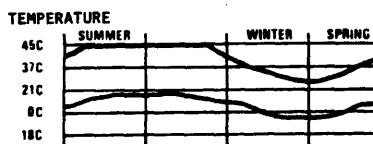
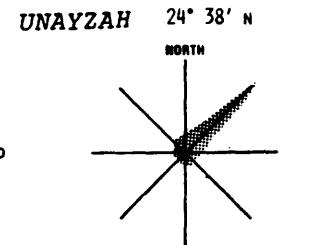
Urban Growth Pattern: (approximately) Y. Alohal

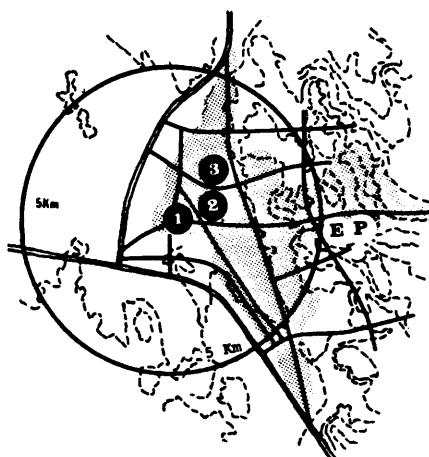
Urban Land Value Pattern: (approximately)

Climate: (accurate)

Photographs: Field Surveys, Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS, 1973





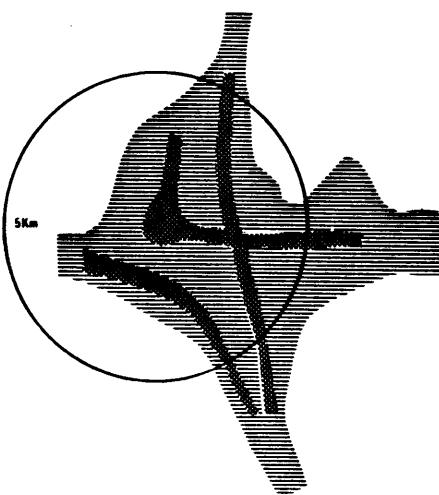
URBAN TOPOGRAPHY AND

CIRCULATION

The site of the city itself is relatively flat and featureless, it is tightly surrounded by date farms. Immediately to the east of the city, however, little more than 100m beyond the Riyadh-Buraydah highway, there is a pronounced north-south escarpment associated with the outcropping of the Khuff limestone formation.

In virtually all directions except the east, sand dunes tightly surround the urban area and its adjacent farmlands.

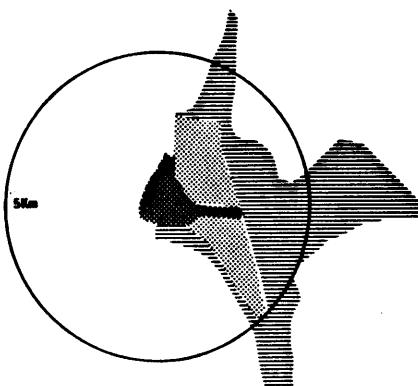
Unayzah lies at the junction of major roads in the central region. The Riyadh-Buraydah highway running south north divides the city into two parts, the old residential area to the west and the new residential to the east. From the east another major highway coming from Riyadh and connects with the Riyadh-Buraydah highway. On the west is the Riyadh-Al-Madinah highway.



URBAN LAND USE PATTERN

Residential areas exist throughout the city. The old section of the city consists mainly of mud houses of two or three stories. Apartment blocks and new shopping areas have developed along both sides of Commercial Street, as well as along the Ad-Dughaythiriyah, Adh-Khulay'h, As-Silsilah, streets and the southern part of Adh-Dhabt street, and Riyadh-Buraydah highway. New residential areas have developed to the south and the east of the city. Houses are constructed of reinforced concrete, one to two stories and mostly for middle/high income groups.

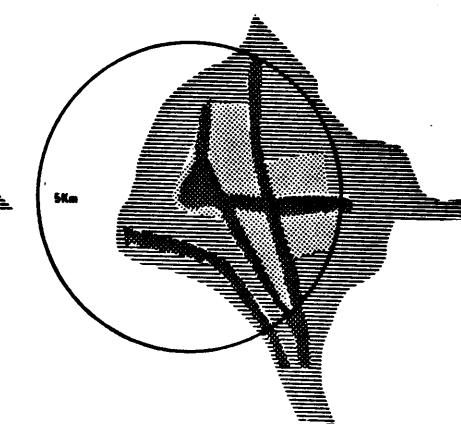
- | AREAS | | DENSITIES | | PRICES | |
|----------------|-------------|--------------|-------------------------|--------|--|
| 1 (Ad-Dira) | RESIDENTIAL | 102 P./Ha. | \$150 and above | | |
| 2 (Al-Jadidah) | COMMERCIAL | 97 P./Ha. | \$55-150/m ² | | |
| 3 (Al-Malah) | INDUSTRIAL | 50-70 P./Ha. | \$20-55/m ² | | |
| E existing | | | | | |
| P proposed | | | | | |



URBAN DENSITY PATTERN

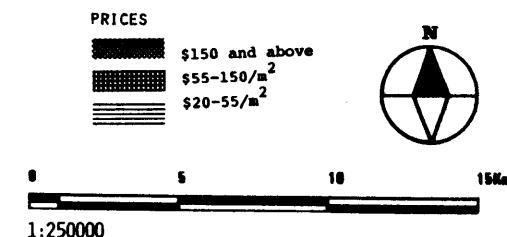
The estimated population of Unayzah was 20,000 in 1973. The average annual rate of increase has been 3%.

A high population density is concentrated in the city center 102 persons per hectare, (Ad-Dira and Al-Jadidah and around the city center, Al-Malah and Adh-Dhulay'ah with 97 person per hectare. The new residential areas in the northern, eastern and southern parts of the city have the lowest density 50-70 persons per hectare, and are comparatively rich districts.



URBAN LAND VALUE PATTERN

Land prices in the central district are in the range of \$150 and above per square meter. They continue to be high along the commercial streets and the main streets. In the old city, outside of the central business district, prices slide from \$55 to \$150 per square meter. In the new residential areas prices range from \$20 to \$55 per square meter. Note: Prices are from 1973. Prices have now approximately tripled following the kingdom's economic growth.



CASE STUDIES

The following section presents case studies of selected dwelling situations in the Unayzah urban area at the present time. The three examples were selected according to their established time, income group, housing facilities, and urban pattern. The case studies are represented at four levels:

LOCALITY: A locality is defined as a relatively self-contained area. It is generally within physical boundaries.

LOCALITY SEGMENT: All localities differ in size and shape; for purposes of comparison, a segment of 400 meters by 400 meters is taken from each locality.

LOCALITY BLOCK: Within each locality segment, a typical residential block is selected in order to compare land utilization (patterns, percentages, densities, and circulation).

DWELLING UNIT: A typical self-contained unit for an individual, a family or group is selected from the locality segment.

The case studies are arranged by locality as indicated in the following:

1- OLD TRADITIONAL (AD-DIRA)

The city center is mainly residential and accommodates the main commercial area. Private, high/middle/low income residents. Traditional row/grouped houses, consist mainly of two stories, and in some parts, of three stories. The street is narrow and has a lot of overpass.

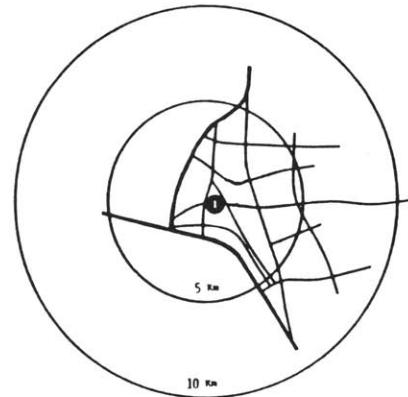
2- TRADITIONAL (AL-JADIDAH)

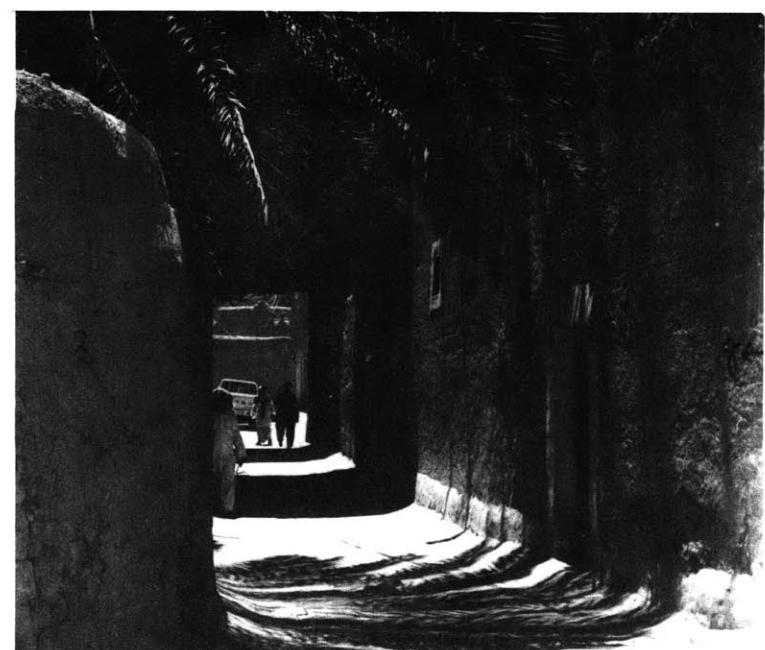
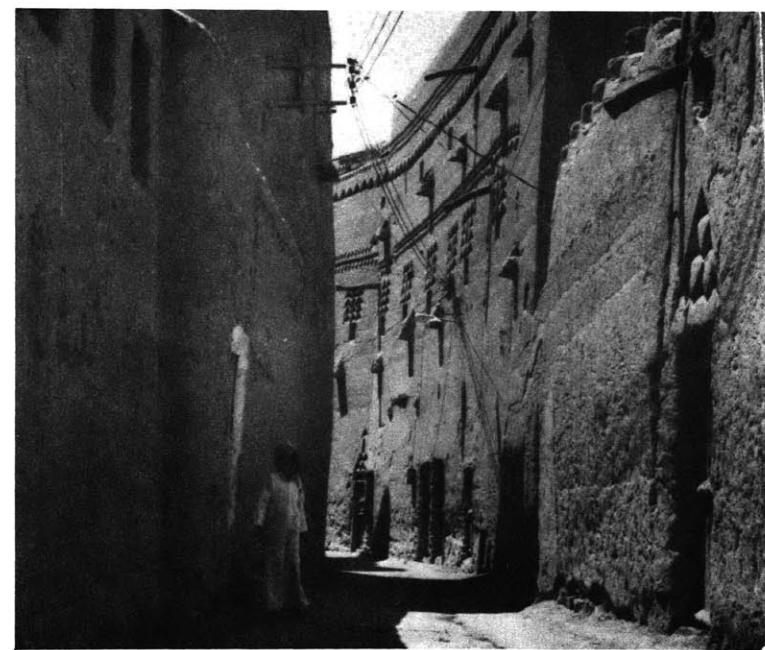
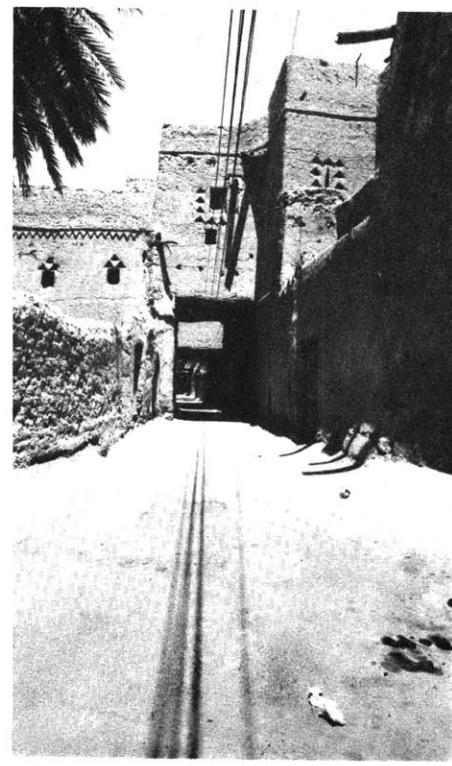
It is mainly residential. Private, high/middle/ low income residents. Traditional row/grouped houses, consist mainly one and a half to two stories. The streets are wider than the streets of Ad-Dira and the overpass starts to disappear.

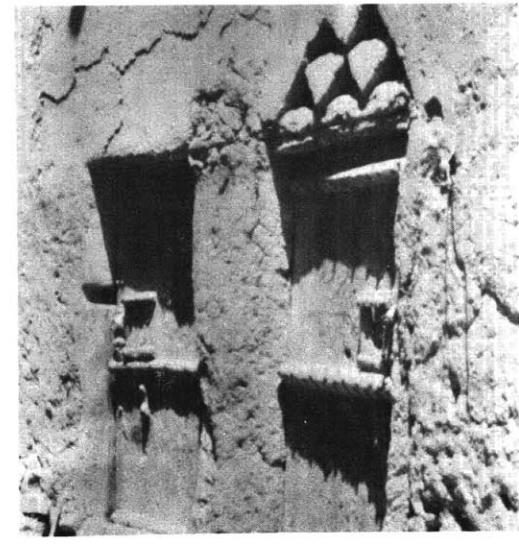
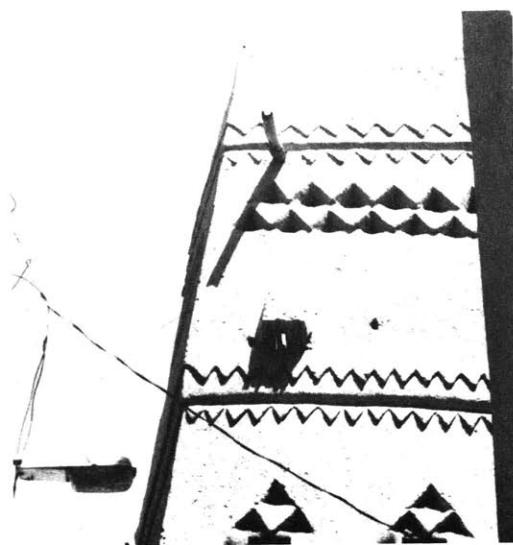
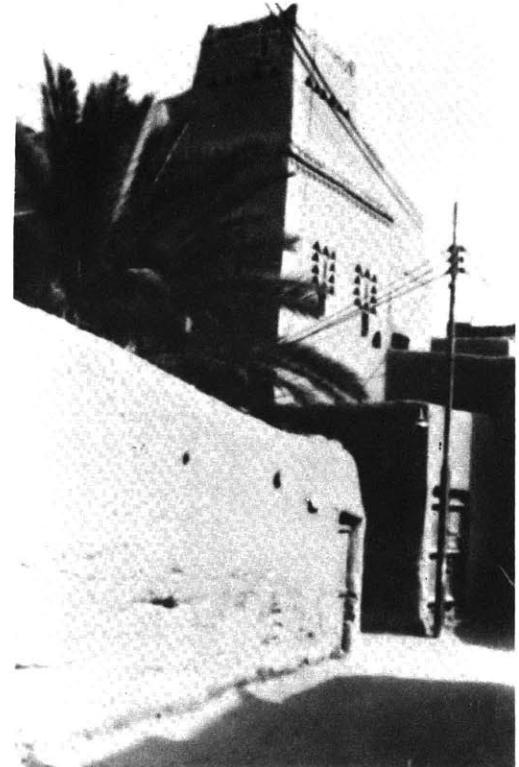
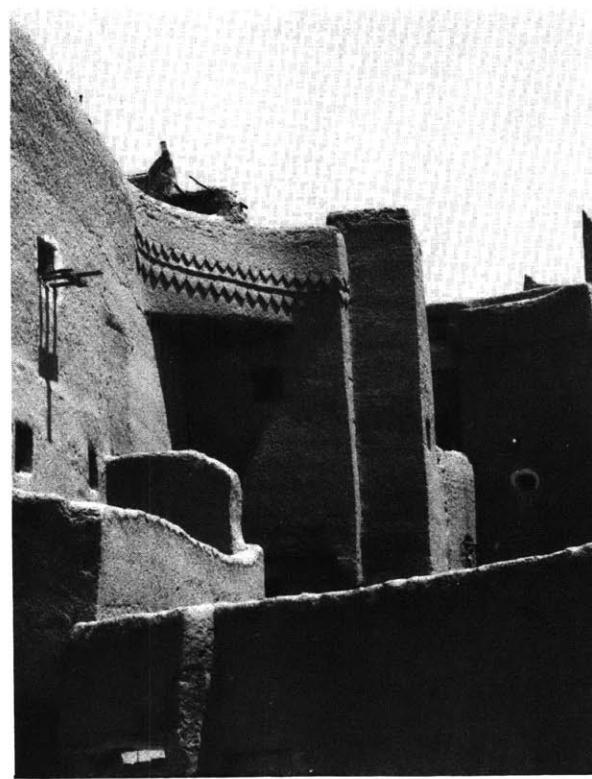
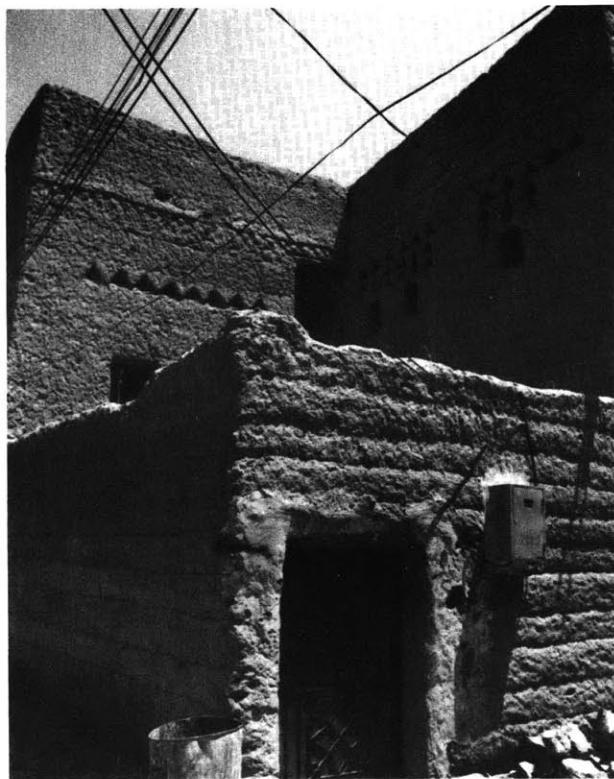
3- TRANSITION (AL-MALAH)

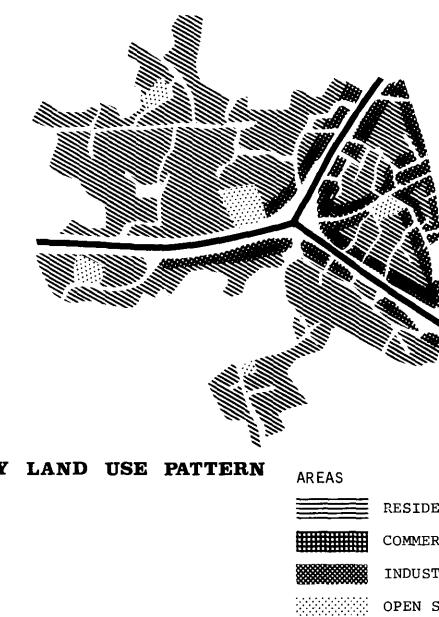
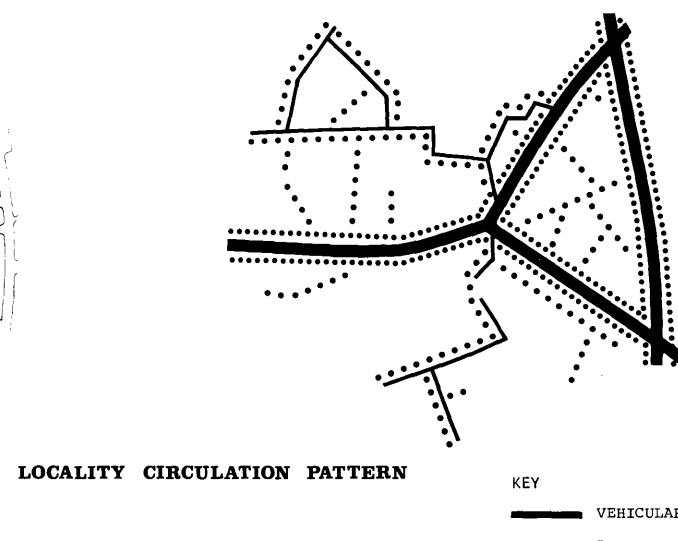
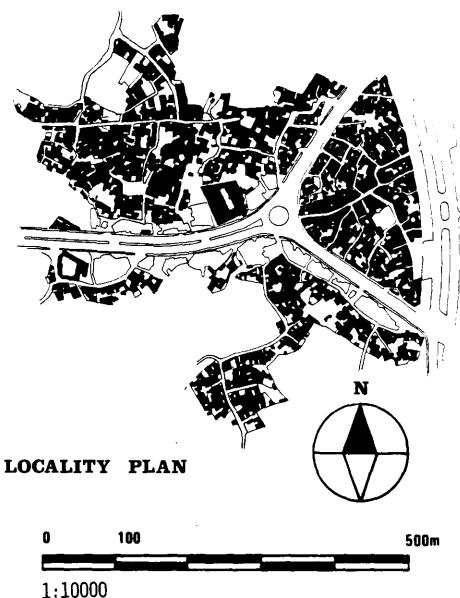
It is mainly residential, accommodates the administration and educational functions. Private, high/middle/low income residents. Traditional row houses, consist mainly of one story. The street is wide, 10-15 meters and no overpass.

**1 OLD TRADITIONAL
AD-DIRA**









LOCATION: It is located in the old city which includes the central business district and the Great Friday Mosque.

ORIGINS: Around 1232 A.D., a person named Zahri Ben Jarah and his tribe settled in the land south of the Al-Janah and Adh-Dhabt sectors close to the Um-Qubour well. Later, the sectors of Malieha and Al-Khraizah (known as Ad-Dira) came to being. At that time, each of those five sectors constituted an independent village, surrounded by a wall and governed by its own prince, but Al-Janah remained as the main center of influence. However, this situation did not last long, in 1685 Al-Sharif Ahmad Ben Zeid, governor of Macca, encouraged the Al-Oqayliyah, Malieha and Al-Khraizah sectors (known as Ad-Dira). This resulted in the physical and administrative unification of those sectors by building a wall to enclose the three villages and the establishment one principality to govern them. The unification of the villages of Al-Oqayliyah, Malieha and Al-Khraizah

started the growth of Unayzah as a larger settlement. Considering Al-Oqayliyah as the starting point of this major expansion, the choices of directions were limited, because the immediate surroundings at that time were either valuable agricultural land or sand dune areas. The land east and northeast of Al-Oqayliyah absorbed the new development which was attracted to the hard soil and the lower agricultural value of the land on that side. Also the existence of the older sectors of Al-Janah and Adh-Dhabt was a point of attraction for the new expanding areas.

LAYOUT: The nucleus of the old city is clustered around the Great Mosque, in the western part of Unayzah surrounded by the farms. The initial development of the city was taking place on productive agricultural land. Any urban expansion meant the loss of the main source of life for the inhabitants of the city. This, along with climatic factors, resulted in the maximum utilization of the urban area, by building the houses very close together, and

developing the methods which permitted them to go two and three floors up. The mud houses of the old city represent examples of work of noticeable aesthetic value. The elaborate decorated facades of those houses, though some of them date few generations back, have kept their fine detail and texture through the years.

CIRCULATION: The street pattern is irregular and can be classified into main street, carrying movement between residential clusters, and from residential clusters to public and commercial areas, or secondary cul-de-sac streets serving the residential blocks.

Public open spaces within the urban pattern are few and usually formed as a result of the meeting of several streets or the enlargement of a street at one point. But the lack of such public spaces is less felt in Unayzah due to the existence of large date groves within and around the city sectors.

The streets in the old city are narrow and winding, mainly pedestrian and the use of

cars is impossible. A large part of the streets is covered by overhead passages.

LAND USE: In the western part of the old city, and adjacent to the Great Mosque, was the old market area of Unayzah. After the opening of the new streets, (Ad-Dughaythiriyah and western) only few shops remained on the south side of Western Street and a shopping street that leads to a more recent market area to the northeast. The new shopping area has been developed along both sides of the 40m wide Commercial Street. An open air market exists in the southern part Commercial Street in the central shopping area. Fruits, vegetables and animal feed is sold in the market.

Page 32: Top to the right: A general view of Ad-Dira (the residential area) Underneath: The Friday Mosque and the Market area .

To the left: Another view of the Market area and the Friday Mosque.

Page 33: Examples of street in Ad-Dira area. (Note the streets' width, building height, and the overhead passes).

Page 34: Pictures on the top show examples houses from Ad-Dira area (Note the distinctively decorated facade).

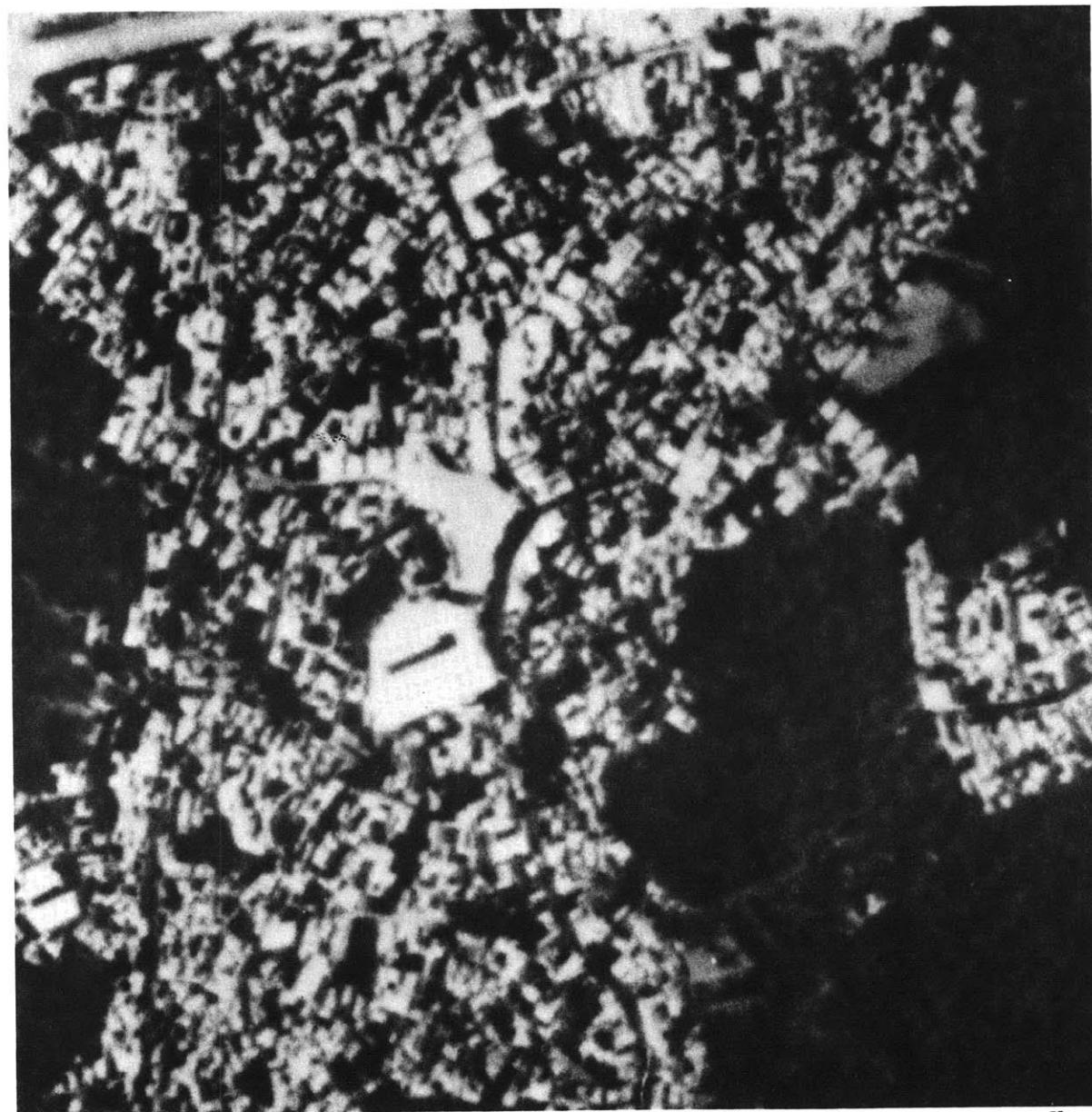
Below: From left to right, details to the facades' decorations. Picture to the right show the dwellings entrances.

LOCALITY SEGMENT LAND UTILIZATION DATA

	Total Number	Area Hectares	Density N/Ha
DENSITIES			
LOTS	368	12.9	29
DWELLING UNITS	368	12.9	29
PEOPLE	2576	12.9	200
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	2.0	15	
SEMI-PUBLIC (open spaces, schools, community centers)	0.4	3	
PRIVATE (dwellings, shops, factories, lots)	10.4	81	
SEMI-PRIVATE (cluster courts)	0.1	1	
TOTAL	12.9	100	

NETWORK EFFICIENCY

$$\text{Network length (streets, walkways)} = \frac{2750}{12.9} = 214 \text{m/Ha}$$



LOCALITY SEGMENT AIR PHOTOGRAPH

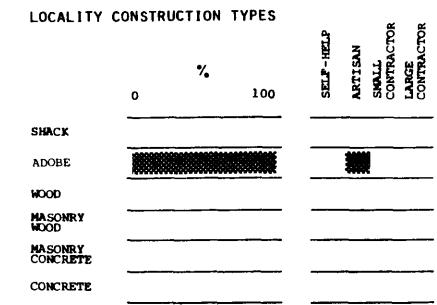
1:2500

0 50 100 150m





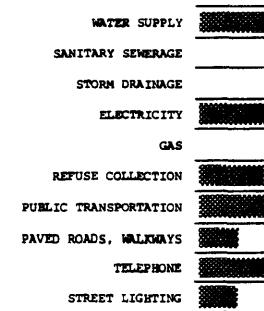
LOCALITY CONSTRUCTION TYPES



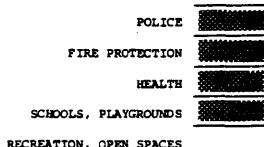
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

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

SELECTED BLOCK



LOCALITY BLOCK LAND UTILIZATION DATA

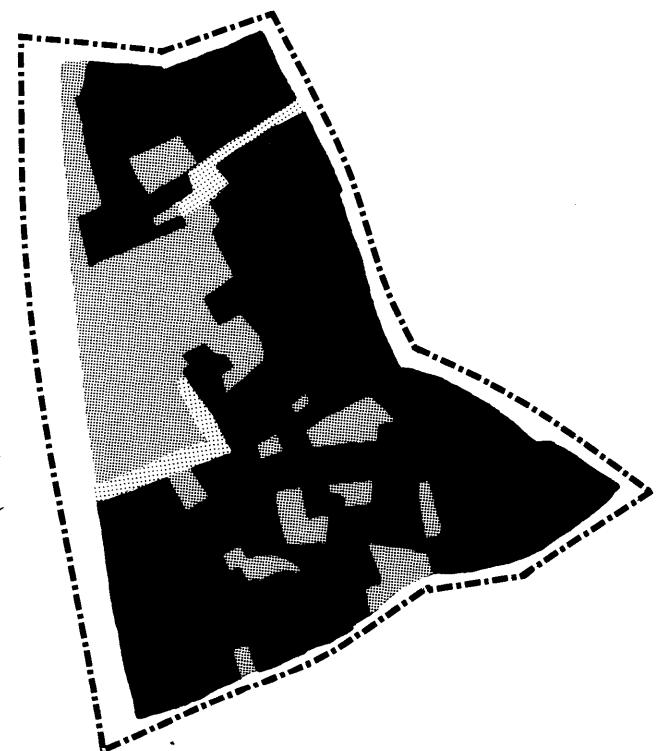
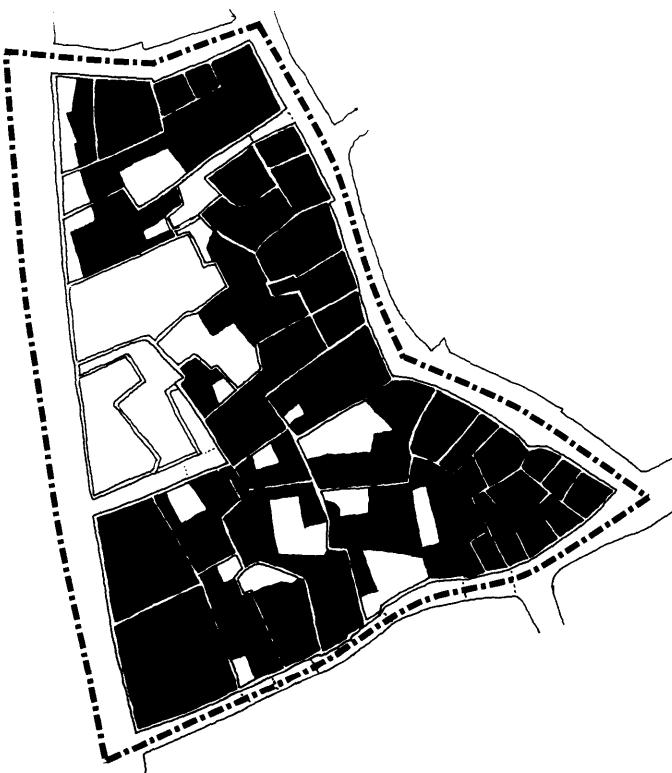
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	39	0.45	87
DWELLING UNITS	36	0.45	80
PEOPLE	252	0.45	560
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)		0.09	20%
SEMI-PUBLIC (open spaces, schools, community centers)		—	—
PRIVATE (dwellings, shops, factories, lots)		0.34	75.6%
SEMI-PRIVATE (cluster courts)	0.02	—	4.4%
TOTAL	0.45	—	100.0

NETWORK EFFICIENCY

Network length (streets, walkways) = 658 M/Ha
 Areas served (total area)

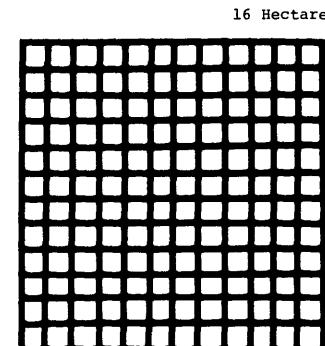
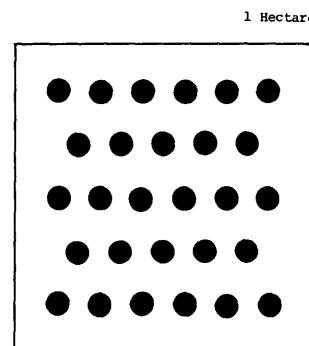
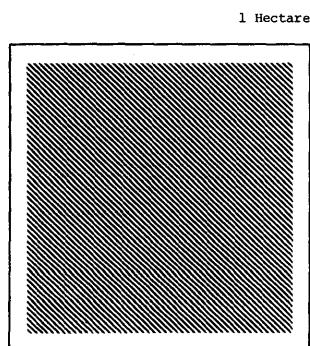
LOTS

Average area, dimensions = 115 M²



LOCALITY BLOCK PLAN

LAND UTILIZATION DIAGRAMS



PERCENTAGES Streets/Walkways 20%
 Playgrounds 0%
 Cluster Courts 4.4%
 Dwellings/Lots 75.6%

DENSITY Persons/Hectare 560
 ● 20 Persons

CIRCULATION EFFICIENCY 658
 Meters/Hectare

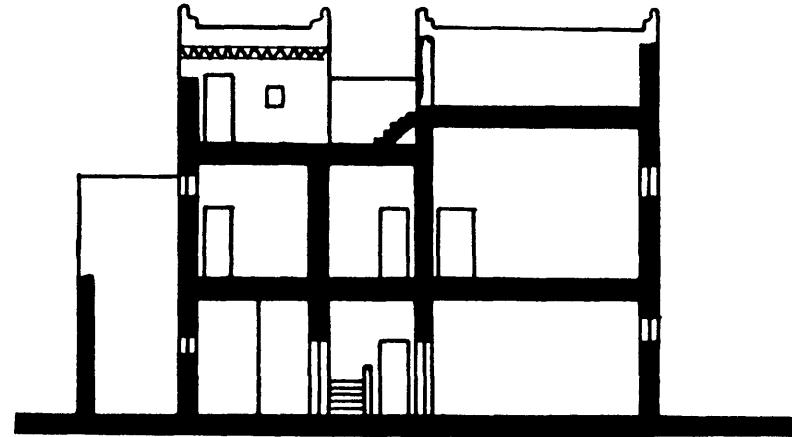
PATTERN

Public:	streets/walkways	[white box]
Semi-Public:	playgrounds	[diagonal lines box]
Semi-Private:	cluster courts	[horizontal lines box]
Private:	lots	[vertical lines box]
	dwellings	[solid black box]



PHOTOGRAPH: (Opposite page). Show the old market after it was demolished.
 (Note: People have started to build temporary shops constructed of various materials, (tin, hardboard sheets, etc.

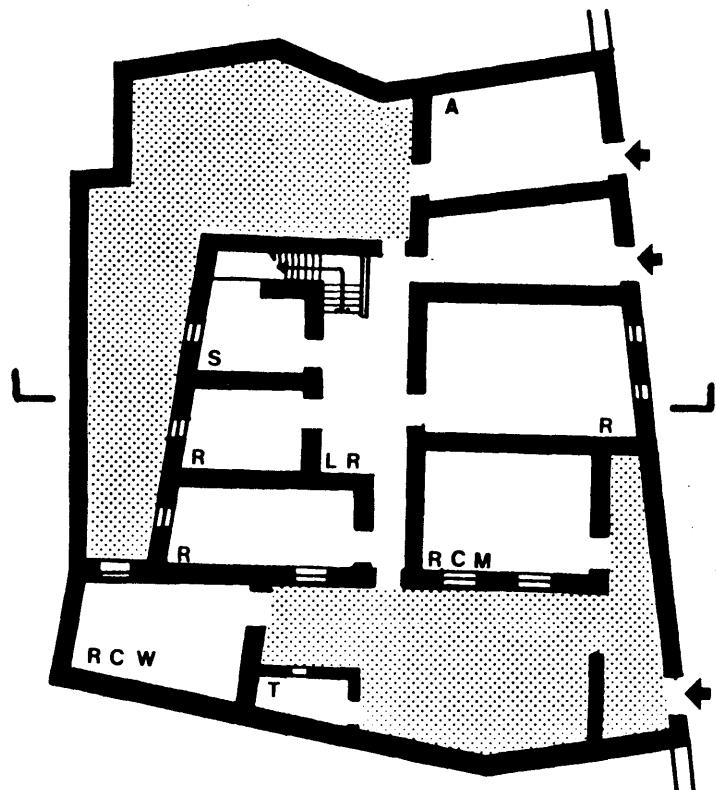




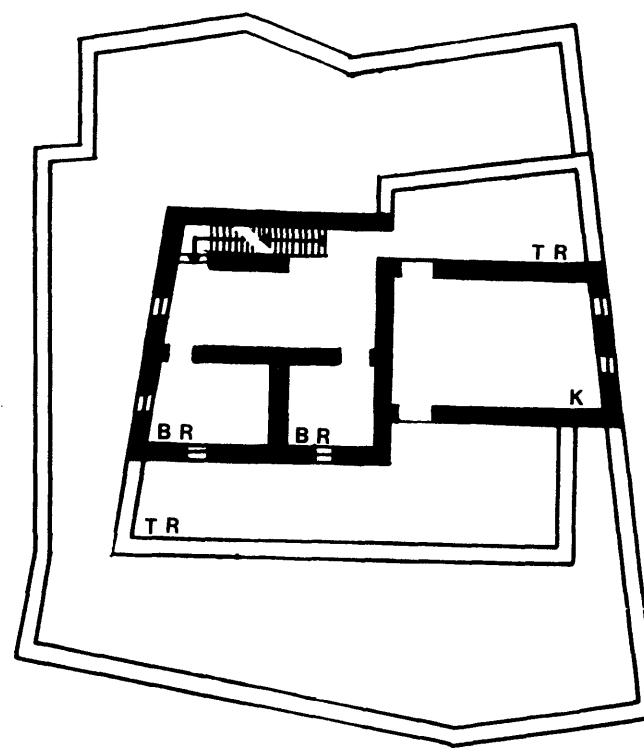
SECTION

KEY

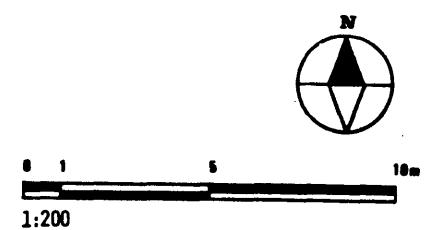
R C M	Reception Room for men
R C W	Reception Room for women
L R	Living Room
D R	Dining Room/Eating Area
B R	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
S	Storage
R	Room(multi-use)
R F	Roof
T R	Terrace
A	Animals house



GROUND FLOOR PLAN



FIRST FLOOR PLAN

**TYPICAL DWELLING**

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 165
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 255
tenure: Legal ownership

DWELLING
location: City center
type: Row-grouped
number of floors: 2
utilization: Single family
physical state: Fair

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction:

MATERIALS
foundation: Rubble
floors: Mud
walls: Adobe
roof: Wood, straw, clay

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 10
other: Courts

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: None

NUMBER OF USERS
married: 2
single: 0
children: 6
total: 8

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Commerce

GENERAL: ECONOMIC
user's income group: Middle
employment: Trade
distance to work: 1 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self-financed
rent/mortgage: -
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of
Aerial Photogrammetry. Ministry of Petroleum
and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS

Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of
Aerial Photogrammetry, Ministry of Petroleum and
Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

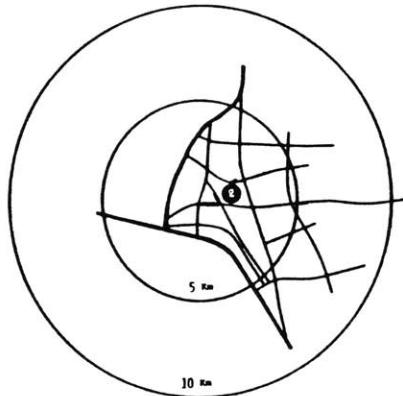
Block Land Utilization: (accurate)
Typical Dwelling: (accurate) Field Surveys, Y. Alohal

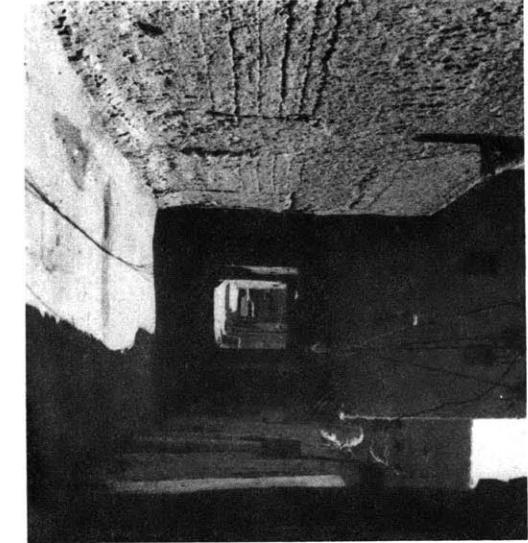
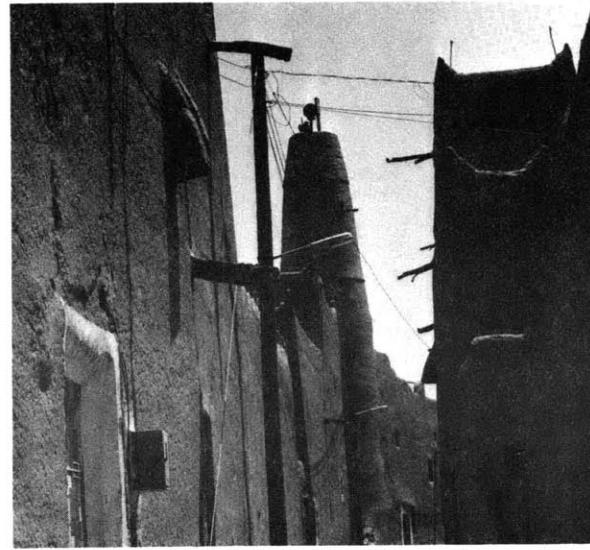
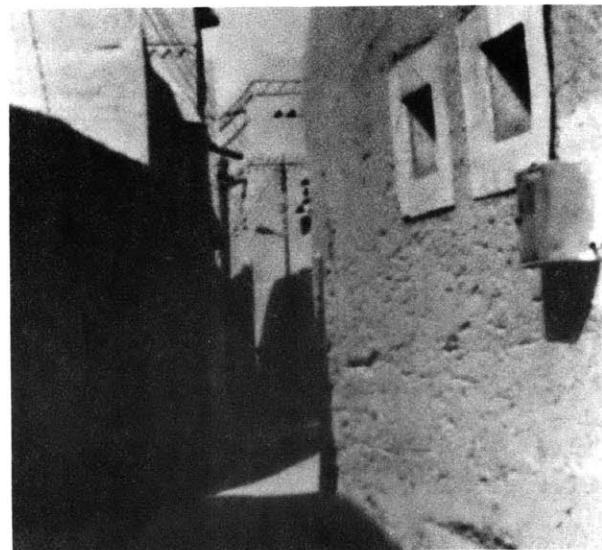
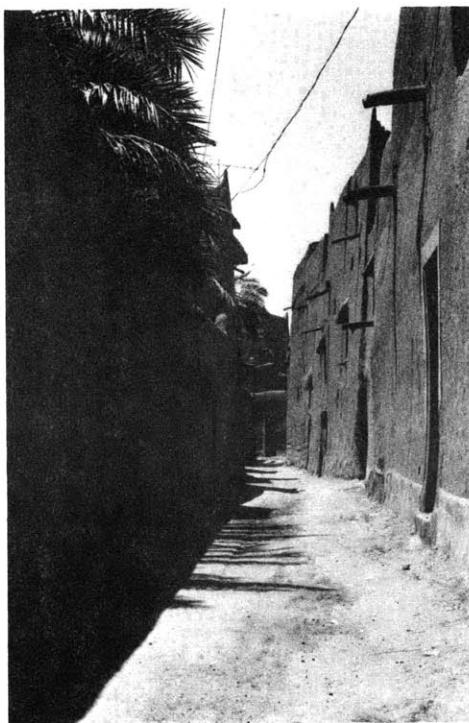
Physical Data: (approximate) Field Surveys, Y. Alohal
Socio-Economic Data: (approximate) Y. Alohal

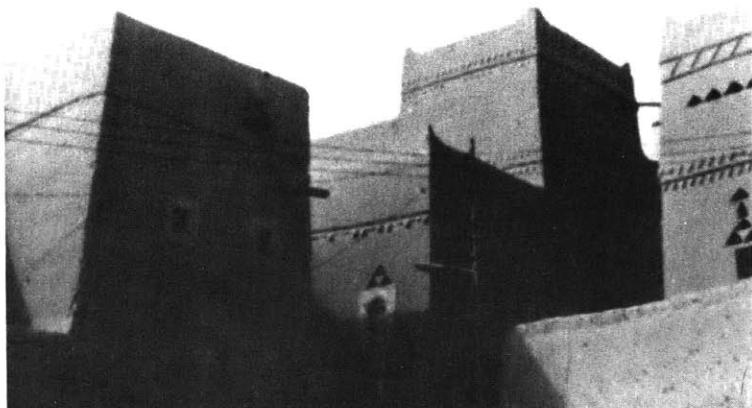
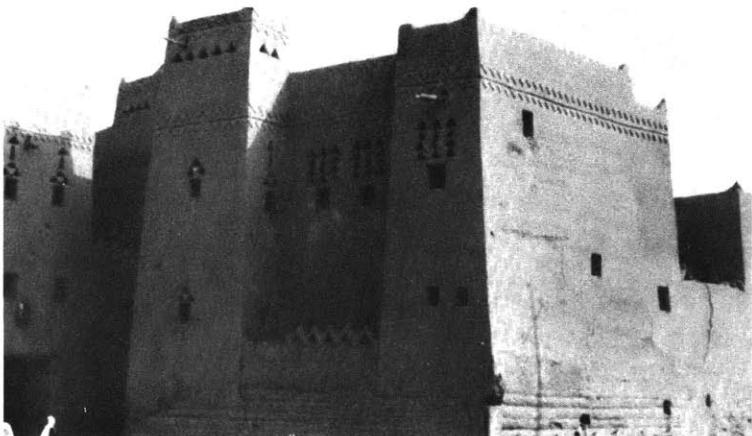
Photographs: Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

**2 TRADITIONAL
AL-JADIDAH**







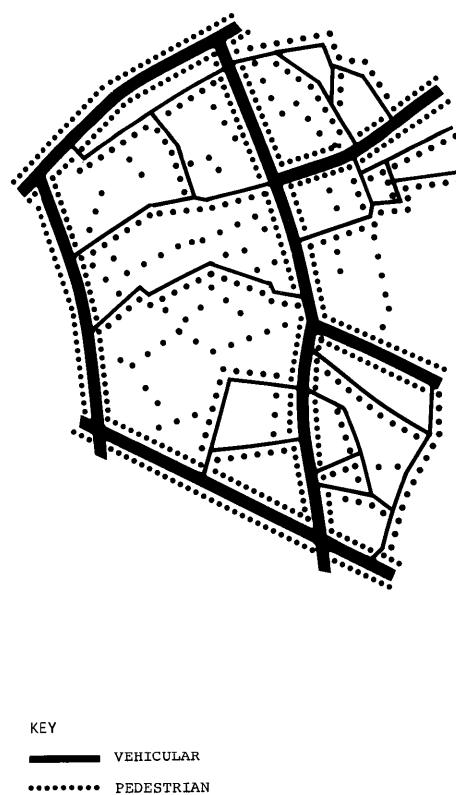


LOCALITY PLAN

LOCATION: It is located to the east of Ad-Dira areas and lies between As-Silslah Street and Commercial Street. It is limited to the south by Ad-Dhulay'ah Street and to the northwest by Ad-Dughaythiriyyah Street.

ORIGINS: It was one of three villages which Al-Sharif Ahmad Ben Zeid, governor of Macca, contained inside a city wall in order to govern them. Note: For more information see the Ad-Dira origins, page 35.

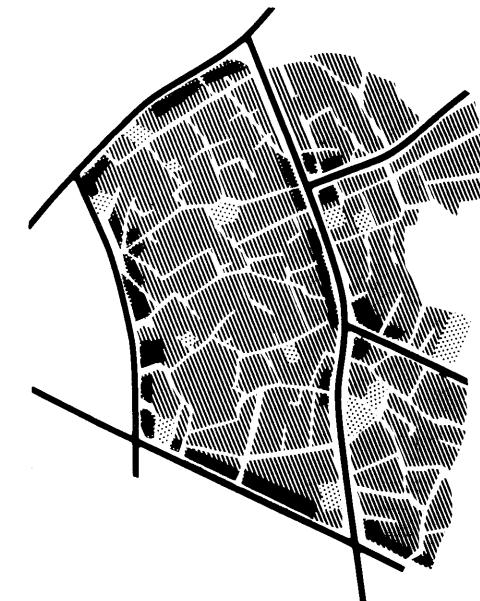
CIRCULATION: The street pattern is irregular and can be classified into main street, carrying movement between residential clusters, and from residential clusters to public, or secondary cul-de-sac streets serving the



LOCALITY CIRCULATION PATTERN

residential blocks. The streets are narrow, but wider than that in the old city (4-8 meters). Streets are unpaved mainly pedestrian but the use of cars is possible in some parts. The overhead passages as in the older areas are rare.

LAND USE: It is mainly a residential, however, commercial functions are developing within this community along As-Silsilah, Ad-Dhula'ah, Commercial Street and Ad-Dughaythiriyyah Streets.



AREAS
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
OPEN SPACES

LOCALITY LAND USE PATTERN

Photographs:

Page 42: A general view of Al-Jadidah area taken from different angles.
 Page 43: Examples of streets from Al-Jadidah area. (Note: Street width, buildings' height and overpasses; notice the increase in street width and the decrease in buildings' height.
 Page 44: Examples of the houses in Al-Jadidah area and details from facade decorations.
 Bottom pictures from right to left show the decorative details of inside doors. Next to it a portrait of the main entrance door.

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density H/Ha
LOTS	366	16	23
DWELLING UNITS	366	16	23
PEOPLE	2560	16	160
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	2.46	15	
SEMI-PUBLIC (open spaces, schools, community centers)	0.84	5	
PRIVATE (dwellings, shops, factories, lots)	12.4	78	
SEMI-PRIVATE (cluster courts)	0.3	2	
TOTAL	16.0	100'	

NETWORK EFFICIENCY

$$\frac{\text{Network length (streets, walkways)}}{\text{Areas served (total area)}} = \frac{3320}{16} =$$

208m/Ha

400m —

300m —

200m —

100m —

0m —



LOCALITY SEGMENT AIR PHOTOGRAPH

0 50 100 150m
1:2500

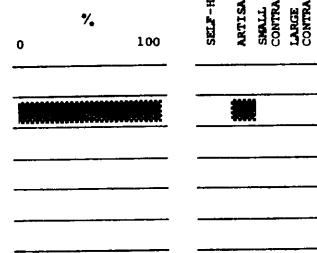




LOCALITY SEGMENT PLAN

1:2500

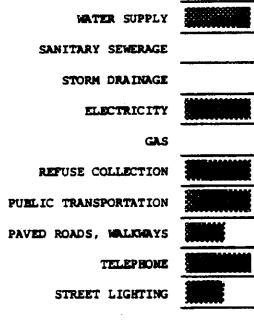
LOCALITY CONSTRUCTION TYPES



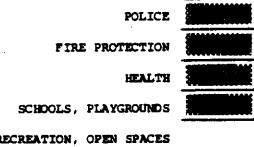
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

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

SELECTED BLOCK



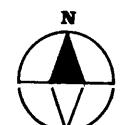
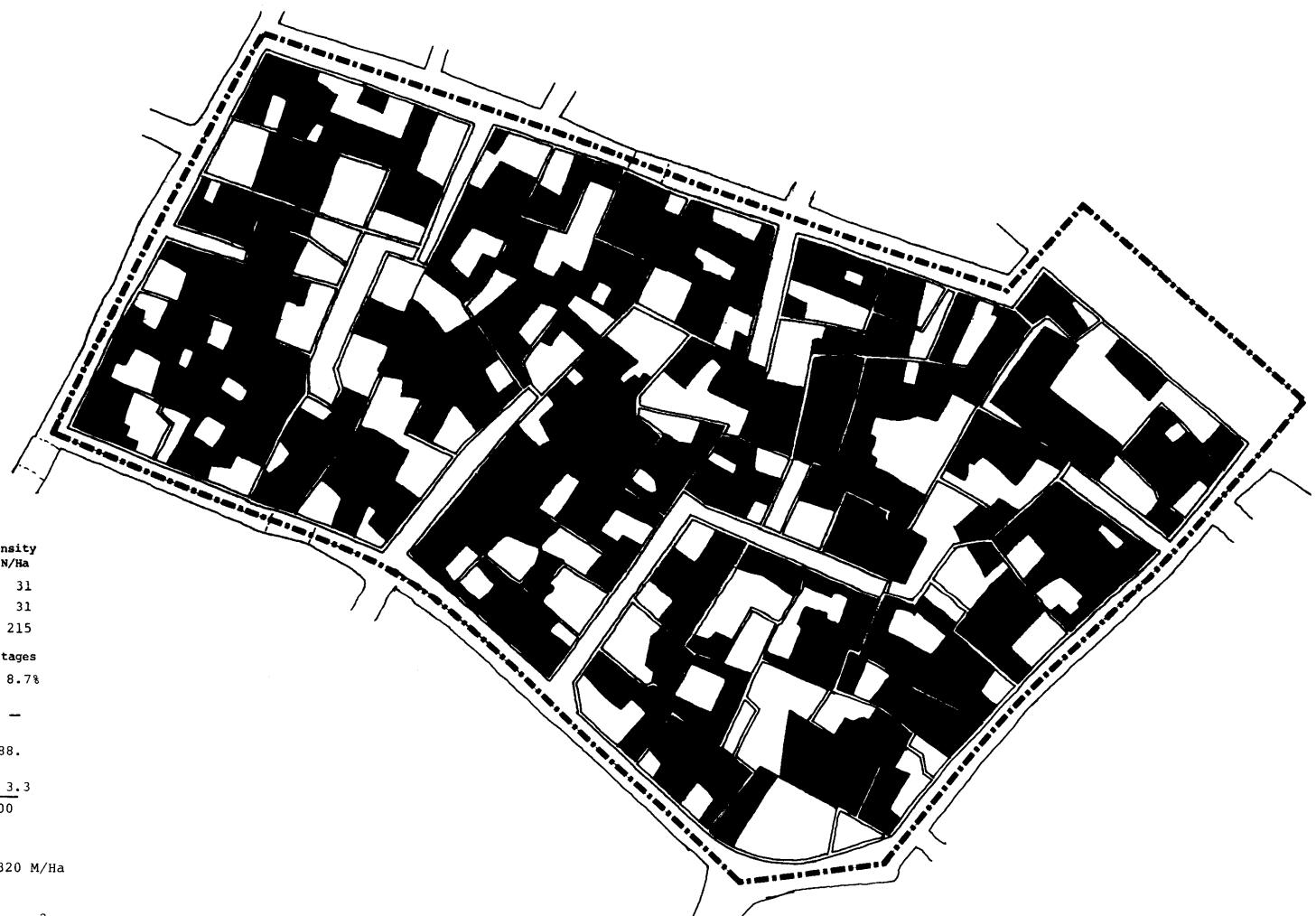
LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	47	1.5	31
DWELLING UNITS	46	1.5	31
PEOPLE	322	1.5	215
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	—	0.13	8.7%
SEMI-PUBLIC (open spaces, schools, community centers)	—	—	—
PRIVATE (dwellings, shops, factories, lots)	—	1.32	88.
SEMI-PRIVATE (cluster courts)	0.05	3.3	—
TOTAL	1.5	100	—

NETWORK EFFICIENCY

Network length (streets, walkways) = 320 M/Ha
 Areas served (total area)

LOTS
 Average area, dimensions = 319 M²



LOCALITY BLOCK PLAN

LAND UTILIZATION DIAGRAMS

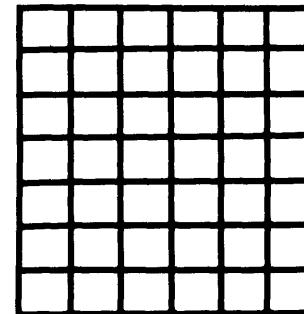
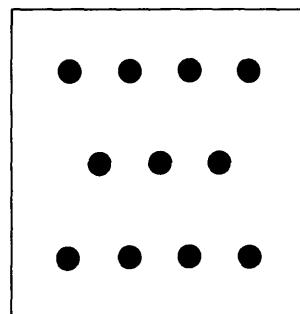
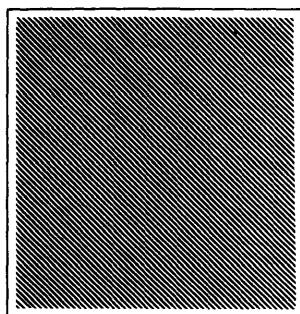
1 Hectare	1 Hectare	1 Hectare
PATTERN		
Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	



1 Hectare

1 Hectare

16 Hectare

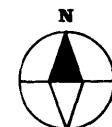


PERCENTAGES Streets/Walkways 8%
Playgrounds 00%
Cluster Courts 4%
Dwellings/Lots 88%

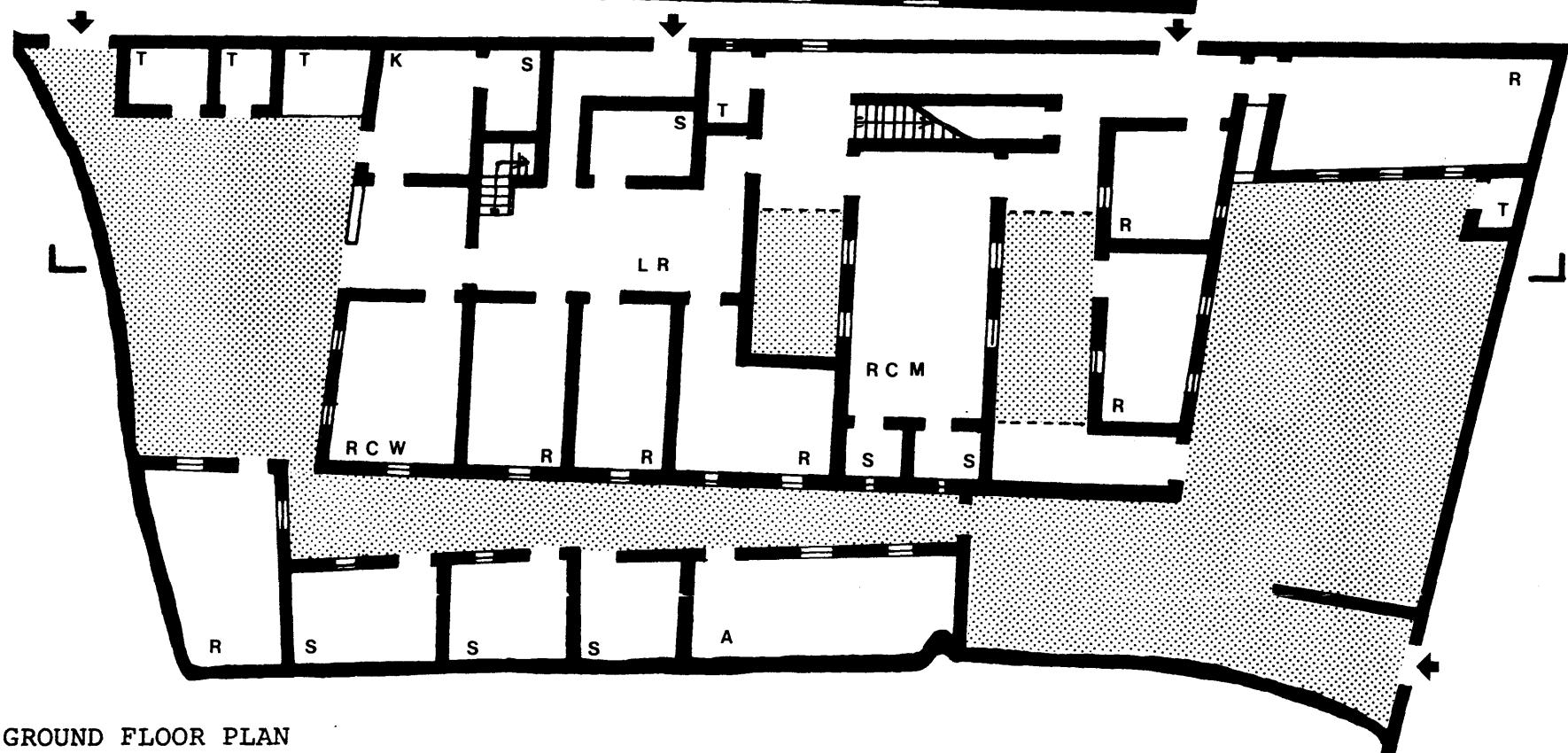
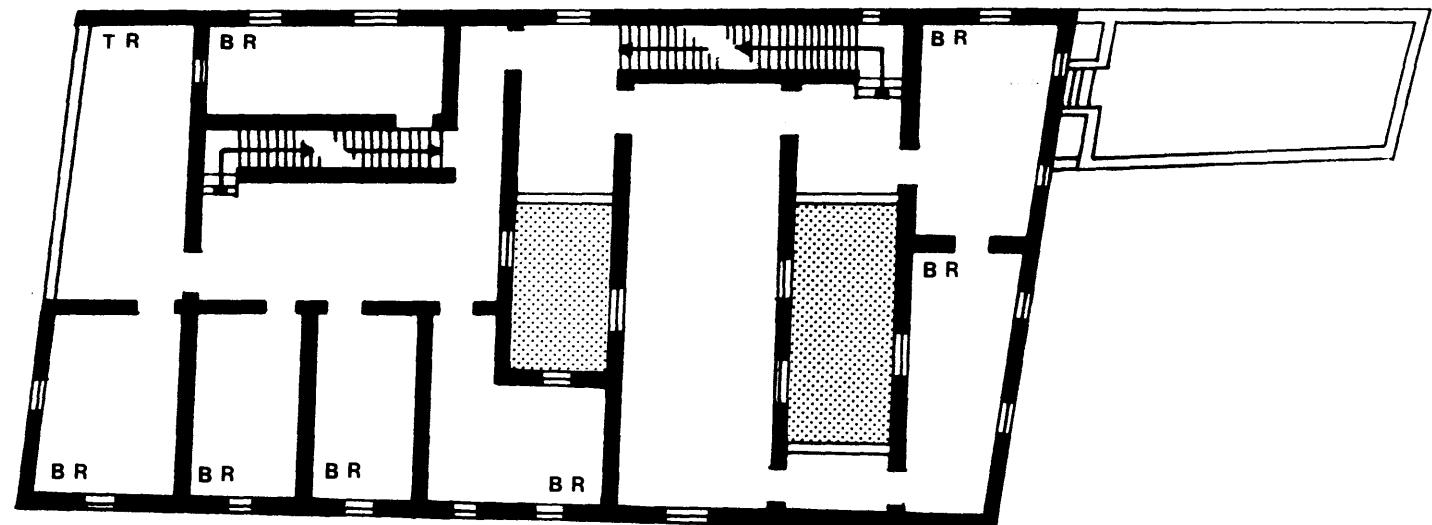
DENSITY Persons/Hectare 215
● 20 Persons

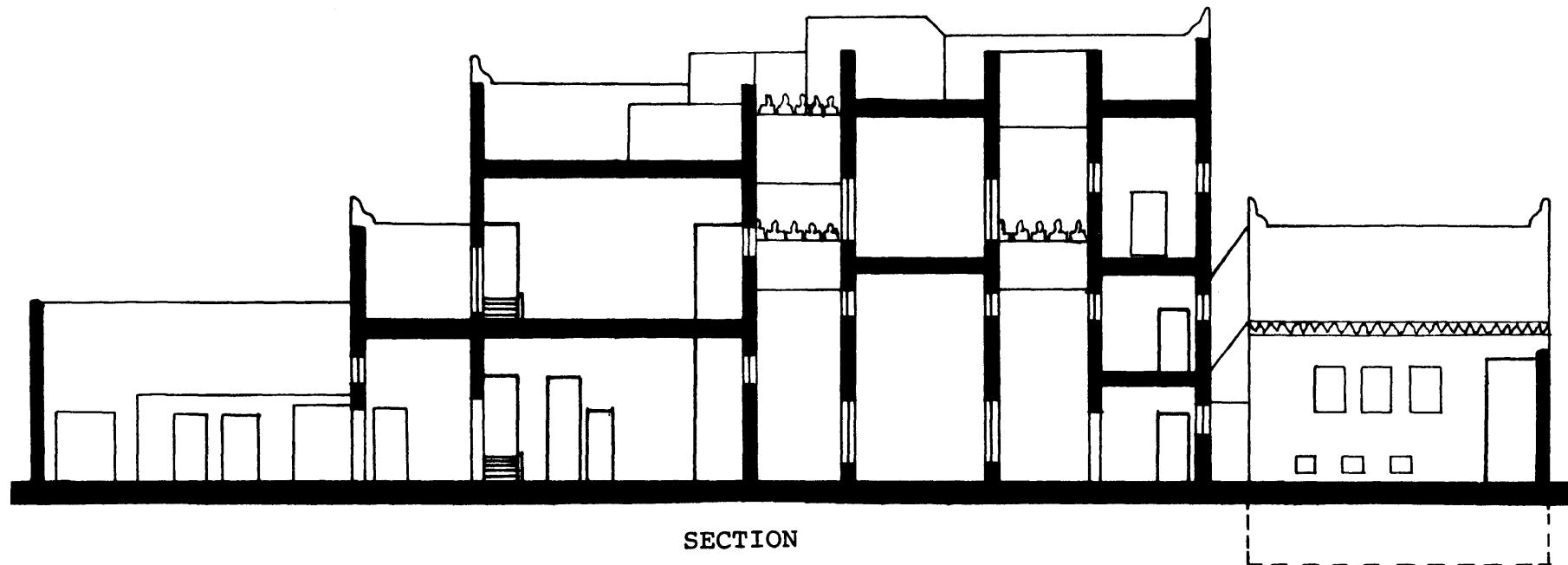
CIRCULATION EFFICIENCY 320
Meters/Hectare

0 100 500m
1:1000

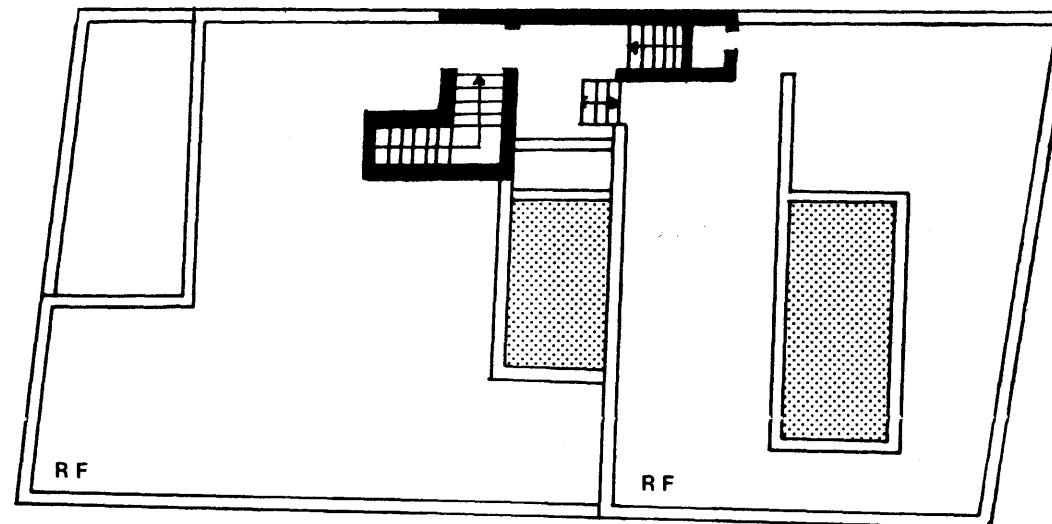


LOCALITY BLOCK LAND UTILIZATION

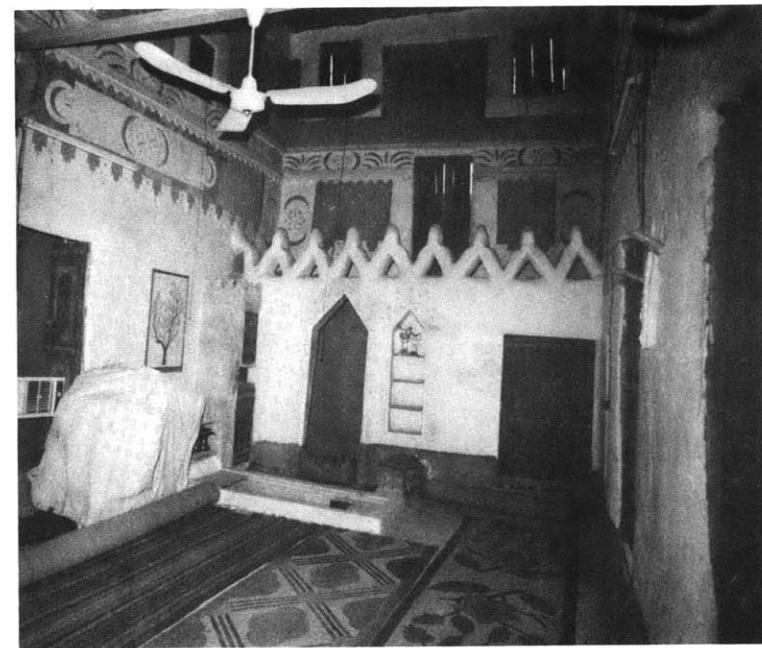
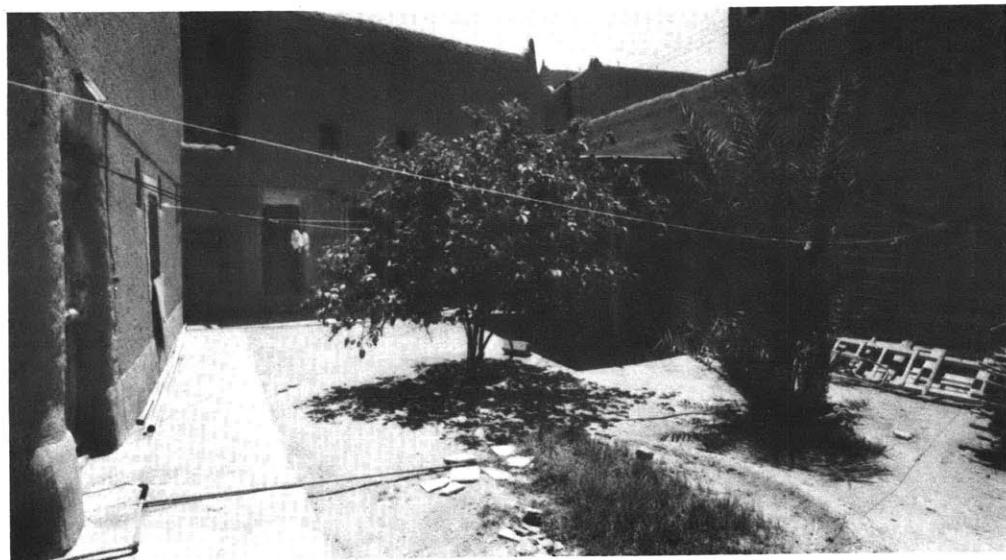
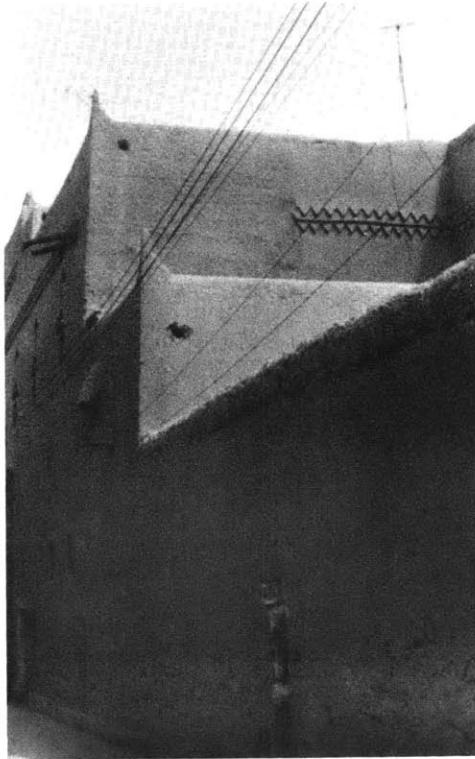
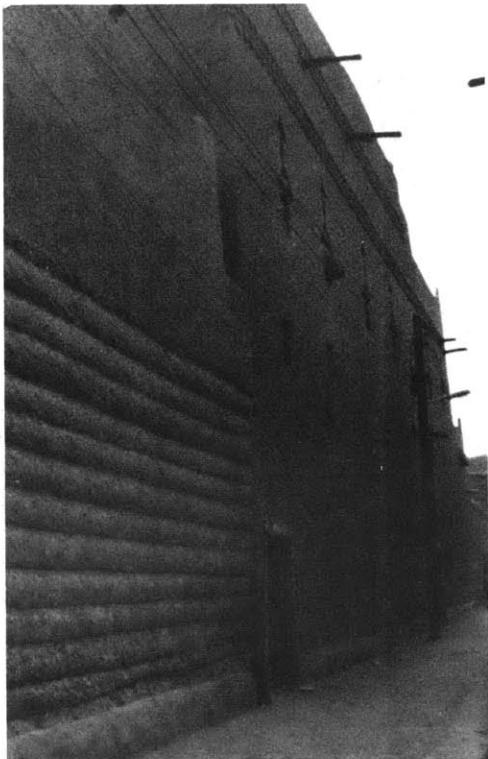


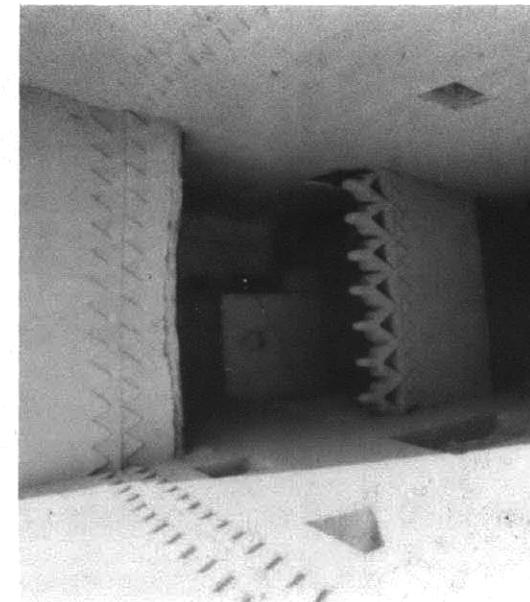
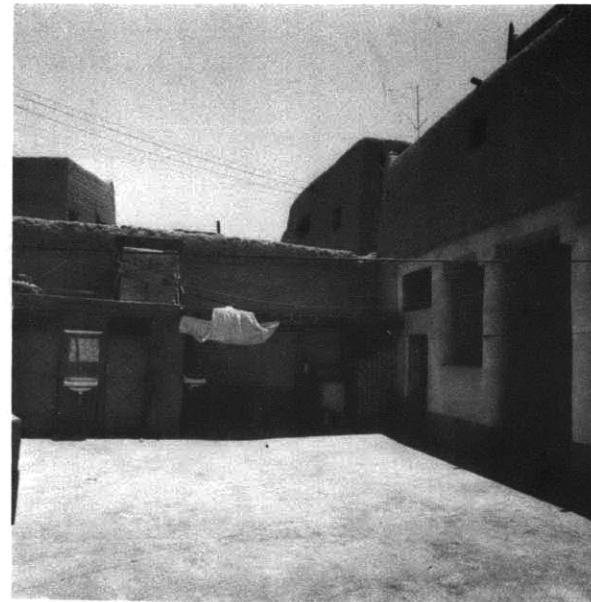
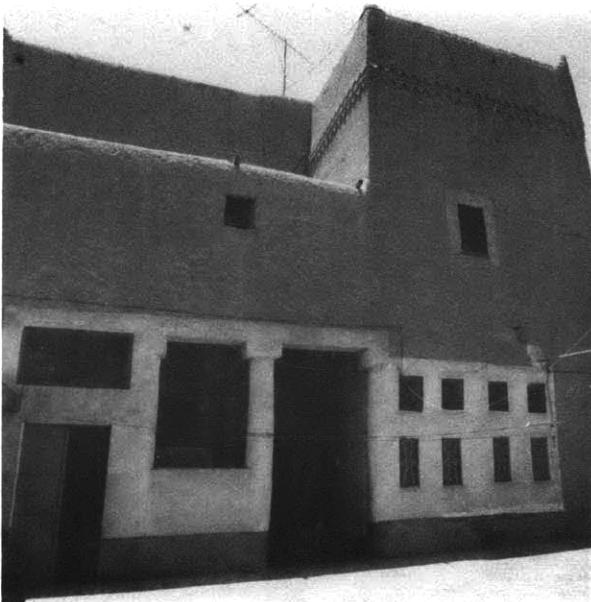
**KEY**

- R C M Reception Room for men
- R C W Reception Room for women
- L R Living Room
- D R Dining Room/Eating Area
- B R Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- S Storage
- R Room(multi-use)
- R F Roof
- T R Terrace
- A Animals house

**TYPICAL DWELLING****SECOND FLOOR PLAN**

0 1 5 10m
1:200





PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 499
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 768
tenure: Legal ownership

DWELLING
location: City center
type: Row-grouped
number of floors: 2
utilization: Single family
physical state: Good

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction:

MATERIALS
foundation: Rubble
floors: Concrete
walls: Adobe
roof: Wood, straw, clay

DWELLING FACILITIES
wc: 4
shower: 2
kitchen: 1
rooms: 25
other: Courts

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: None

NUMBER OF USERS
married: 2
single: 0
children: 9
total: 11

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Commerce

GENERAL: ECONOMIC
user's income group: High
employment: Trade
distance to work: 1 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self-financing
rent/mortgage: -
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS
Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

Block Land Utilization: (accurate)

Typical Dwelling: (accurate) Field Surveys, Y. Alohal

Physical Data: (approximate) Field Surveys, Y. Alohal

Socio-Economic Data: (approximate) Y. Alohal

Photographs: Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

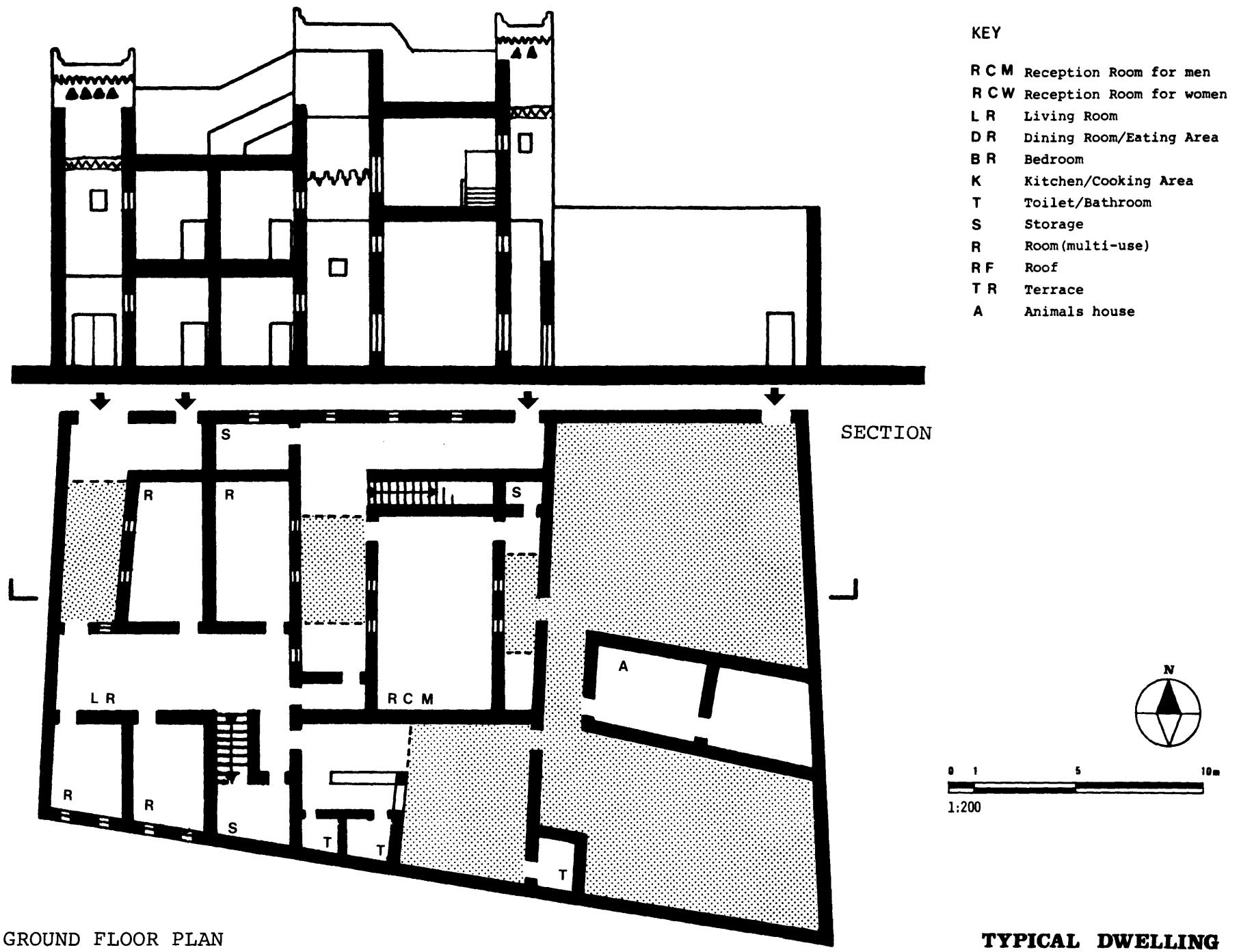
Photographs:

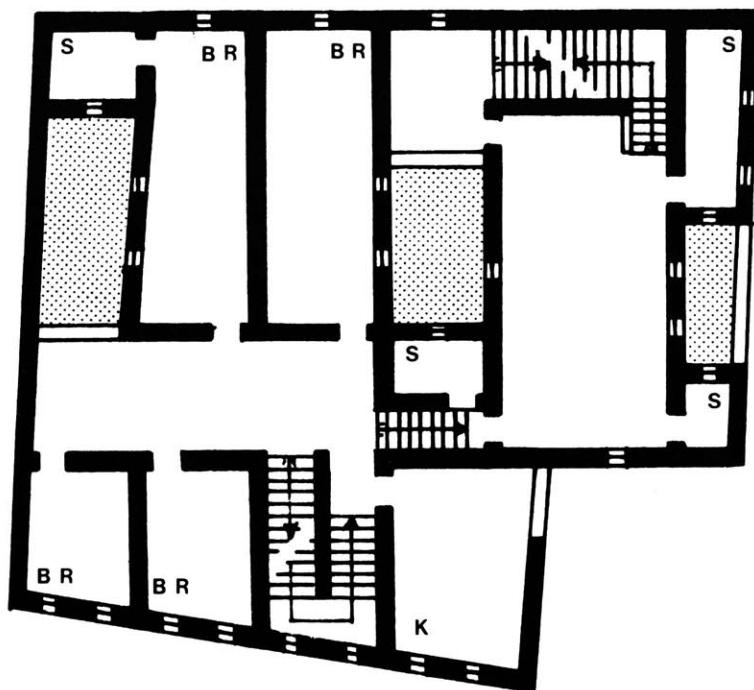
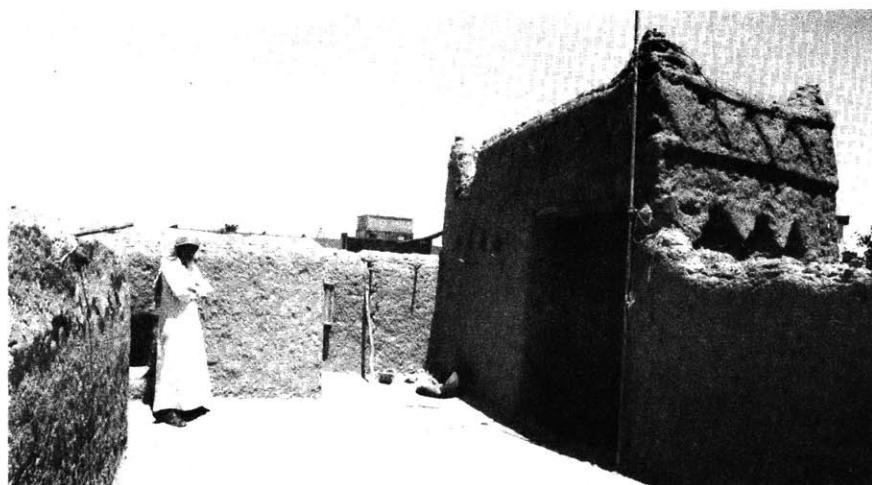
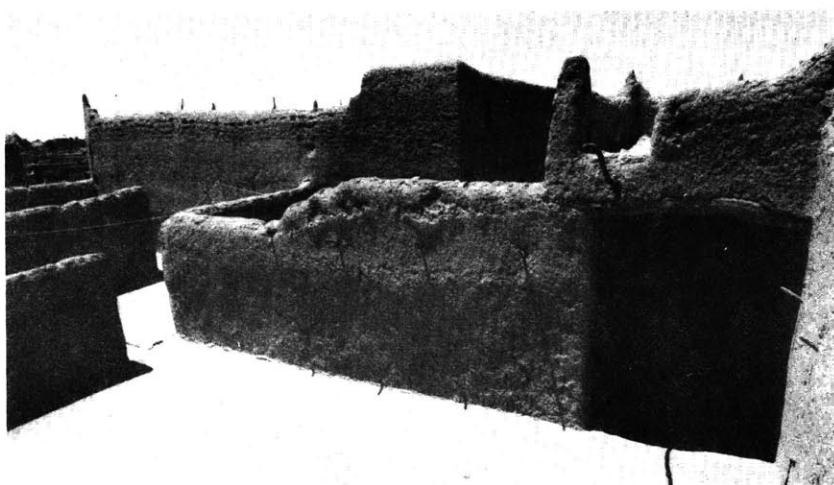
Page 52: Top from left to right: Two views of a house exterior from opposite direction.

Below to the left: Service courtyard.

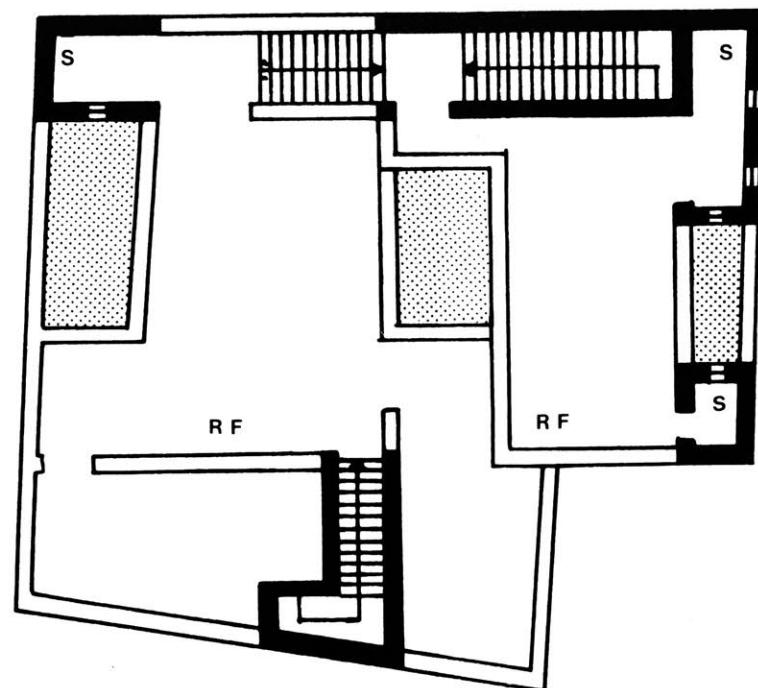
To the right: Two views of men's reception from opposite angles.

Page 53: From left to right: Women's courtyard and an overview of guest courtyard.

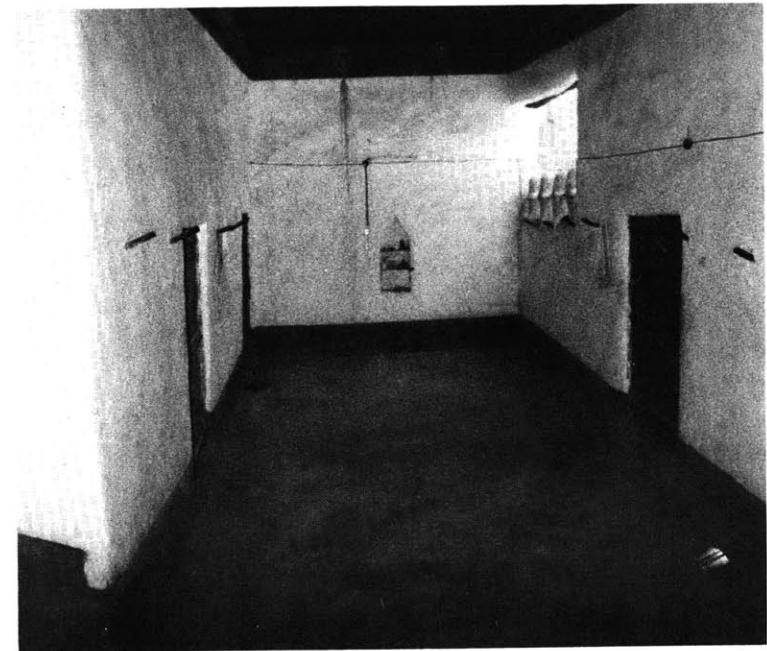
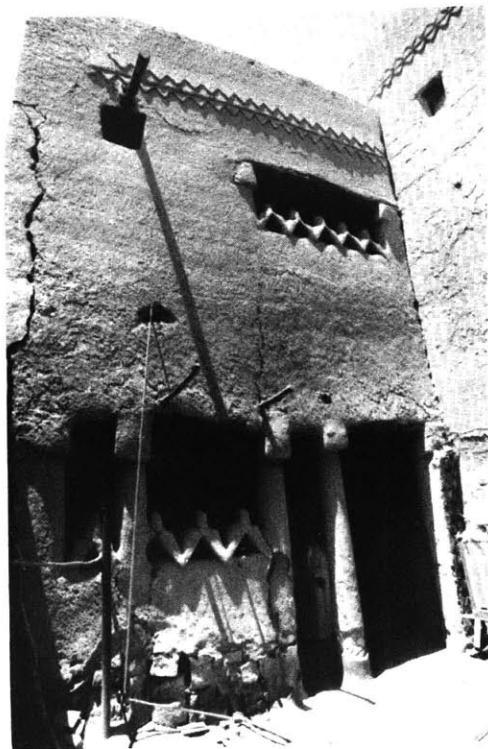
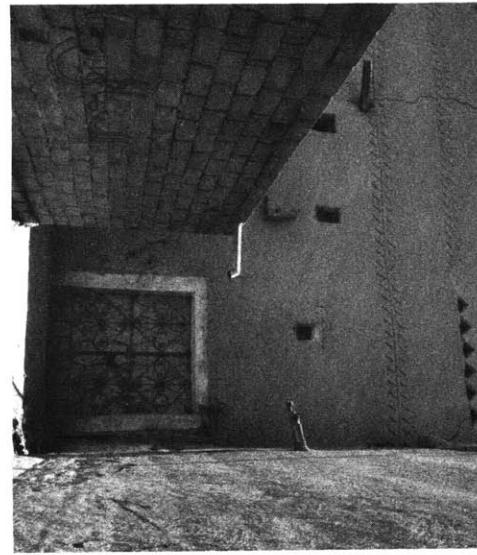


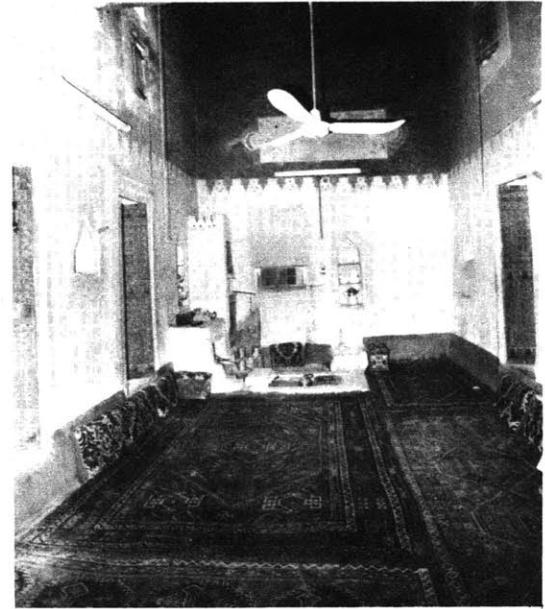
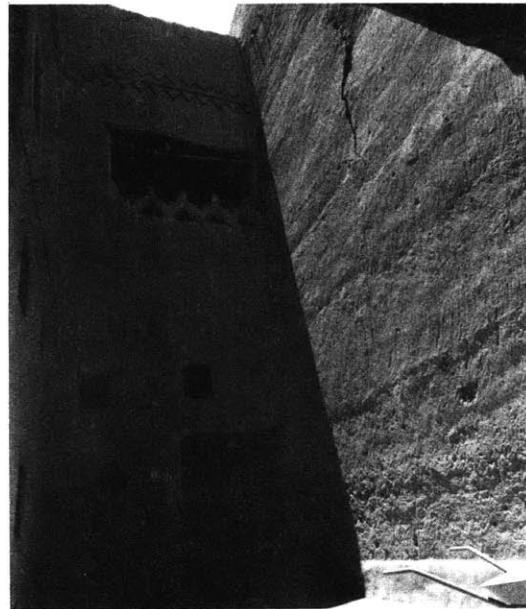
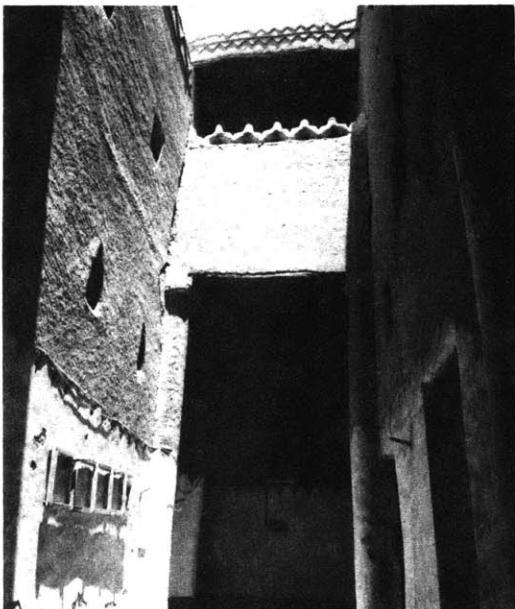


FIRST FLOOR PLAN



SECOND FLOOR PLAN





PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 404
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 525
tenure: Legal ownership

DWELLING
location: City center
type: Row-grouped
number of floors: 2
utilization: Single family
physical state: Good

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction:

MATERIALS
foundation: Rubble
floors: Concrete
walls: Adobe
roof: Wood, straw, clay

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 16
other: Courts

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: University

NUMBER OF USERS
married: 1
single: 0
children: 8
total: 9

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Employment

GENERAL: ECONOMIC
user's income group: Middle
employment: Government employee
distance to work: 2 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self-financing
rent/mortgage:
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS
Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

Block Land Utilization: (accurate)

Typical Dwelling: (accurate) Field Surveys, Y. Alohal
Physical Data: (approximate) Field Surveys, Y. Alohal

Socio-Economic Data: (approximate) Y. Alohal
Photographs: Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

Photographs:

Page 55: Storage area on the roofs of the house.

Page 56: Top to the left: Two views of house exterior from opposite direction.

To the right: Living room area

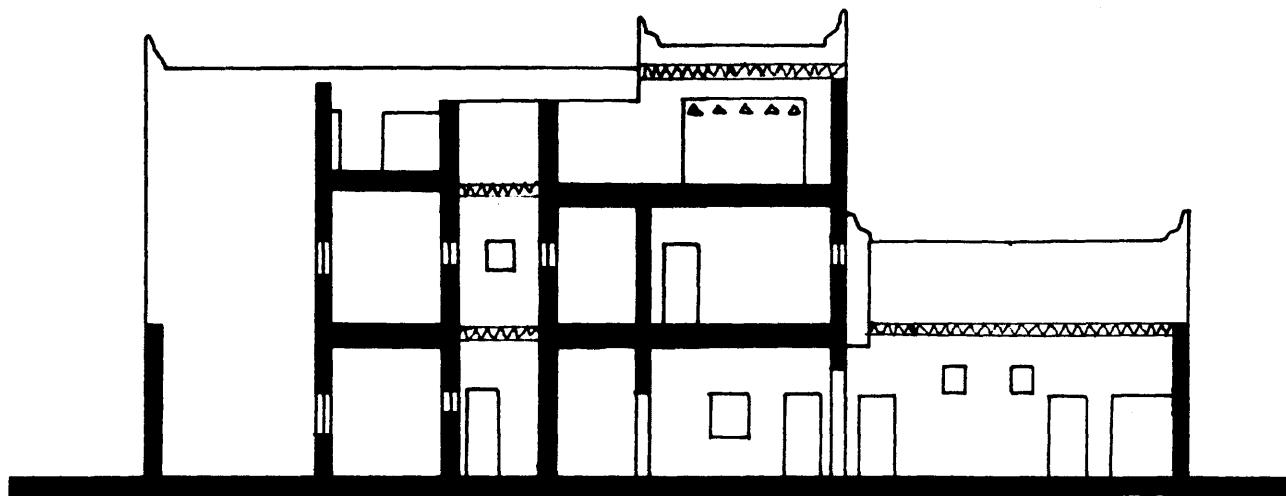
Below: From the left: Men's reception.

To the right: Views from the interior.

Page 57: To the left: Men's quarter's court.

Middle: Service court.

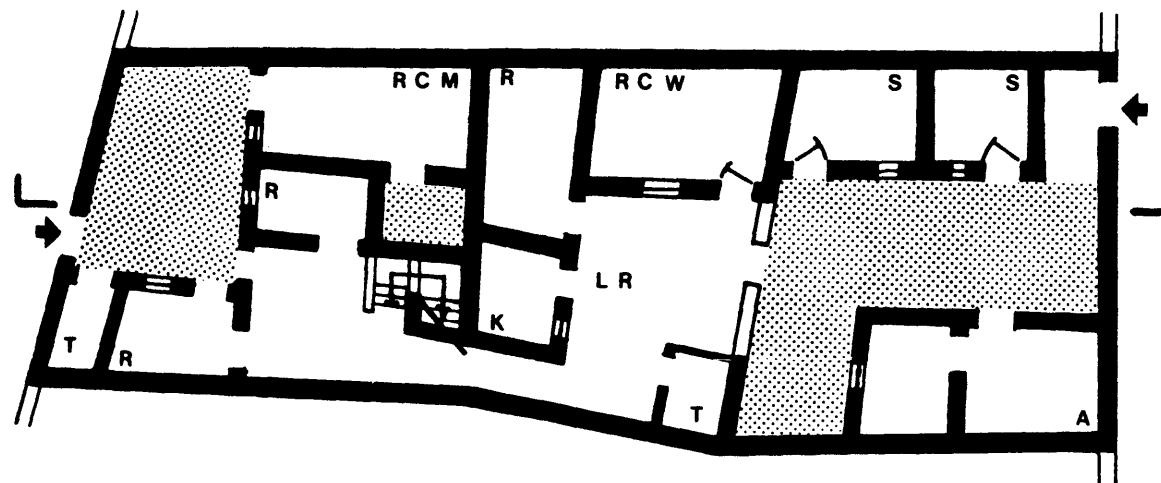
Right: Women's quarter's court.



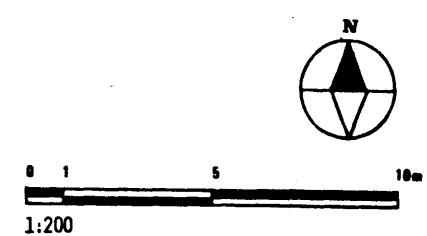
SECTION

KEY

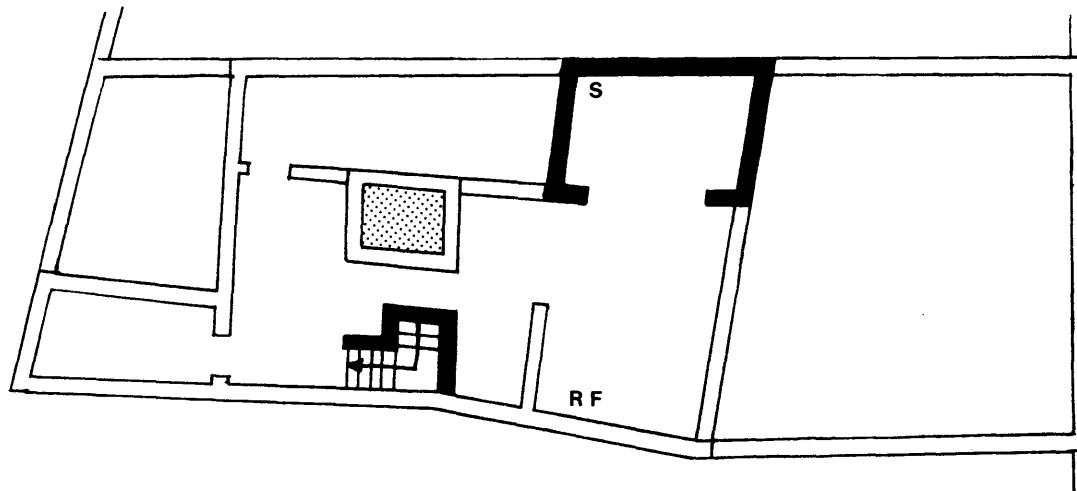
R C M	Reception Room for men
R C W	Reception Room for women
L R	Living Room
D R	Dining Room/Eating Area
B R	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
S	Storage
R	Room(multi-use)
R F	Roof
T R	Terrace
A	Animals house



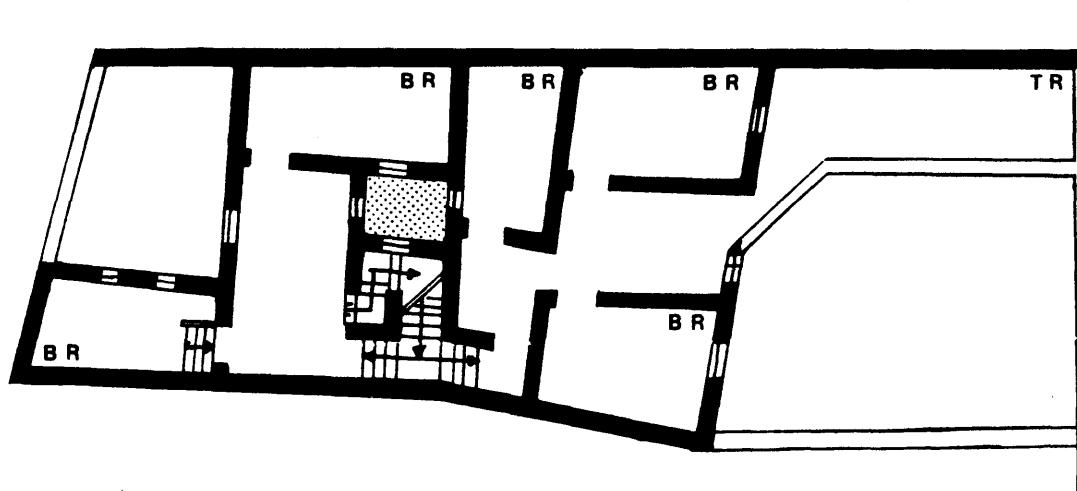
GROUND FLOOR PLAN



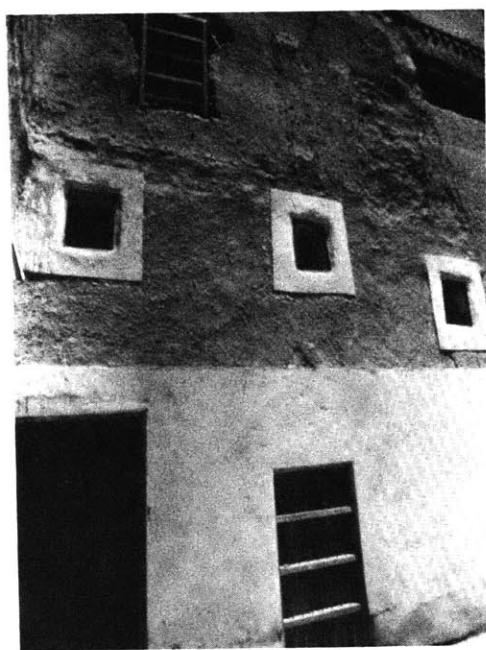
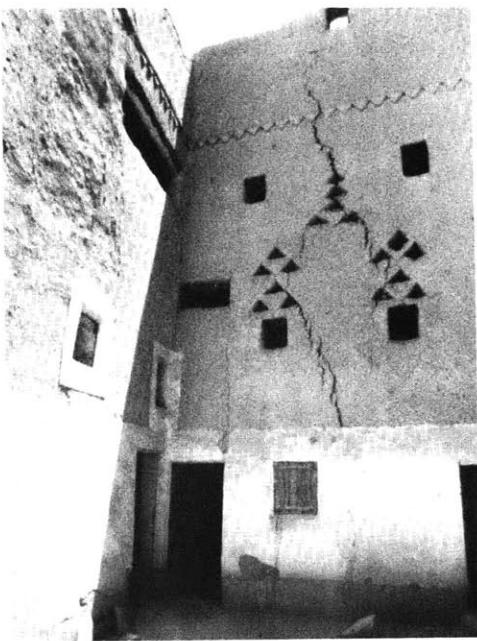
TYPICAL DWELLING

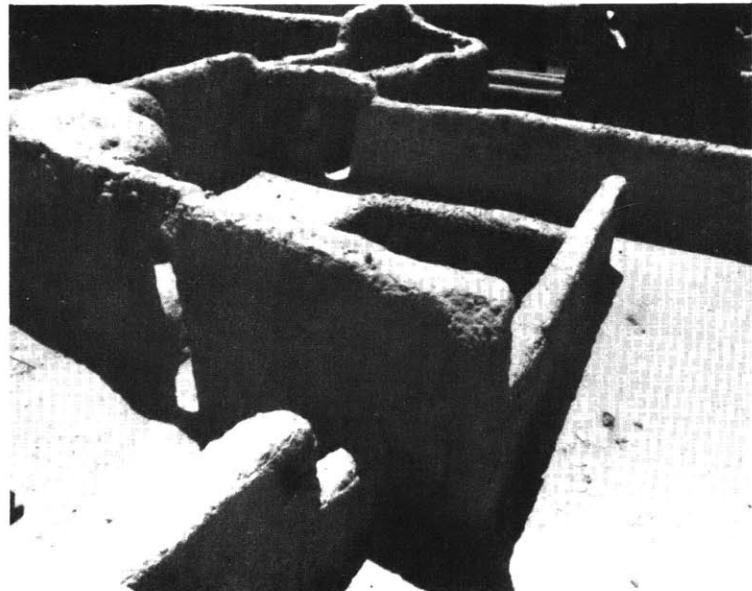


SECOND FLOOR PLAN



FIRST FLOOR PLAN





PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 262
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 262
tenure: Legal ownership

DWELLING
location: City center
type: Row-grouped
number of floors: 2
utilization: Single family
physical state: Fair

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction:

MATERIALS
foundation: Rubble
floors: Mud
walls: Adobe
roof: Wood, straw, clay

DWELLING FACILITIES
wc: 2
shower: 1
kitchen: 1
rooms: 15
other: Courts

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: None

NUMBER OF USERS
married: 2
single: 0
children: 5
total: 7

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Employment

GENERAL: ECONOMIC
user's income group: Middle
employment: Government employee
distance to work: 1 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self financed
rent/mortgage: -
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS
Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

Block Land Utilization: (accurate)

Typical Dwelling: (accurate) Field Surveys, Y. Alohal

Physical Data: (approximate) Field Surveys, Y. Alohal

Socio-Economic Data: (approximate) Y. Alohal

Photographs: Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

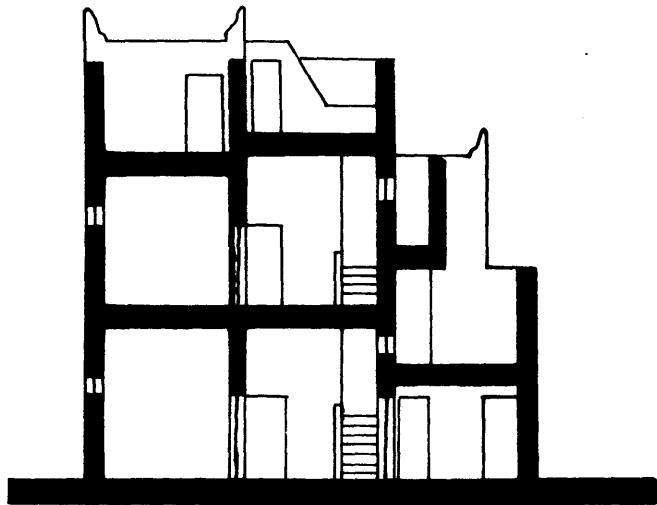
Photographs:

Page 60: Top left: An overview of the typical dwelling.

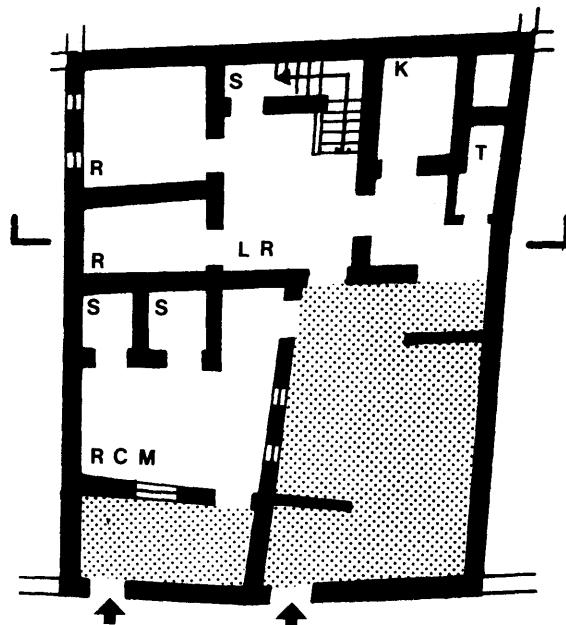
Below: A portrait of guest quarters taken from different angles.

Page 61: To the left: Family quarters.

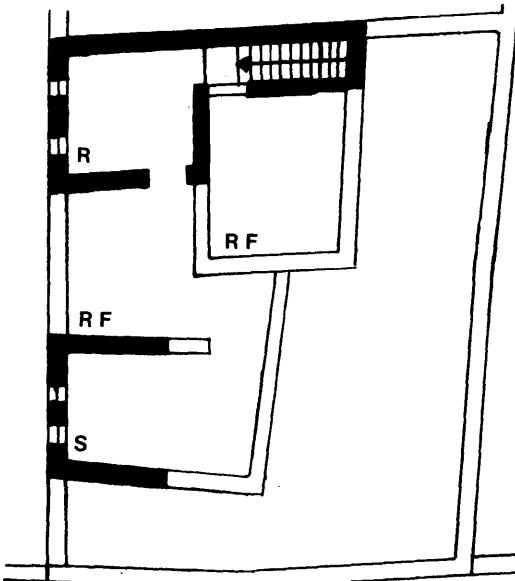
To the right: A view to the roof.



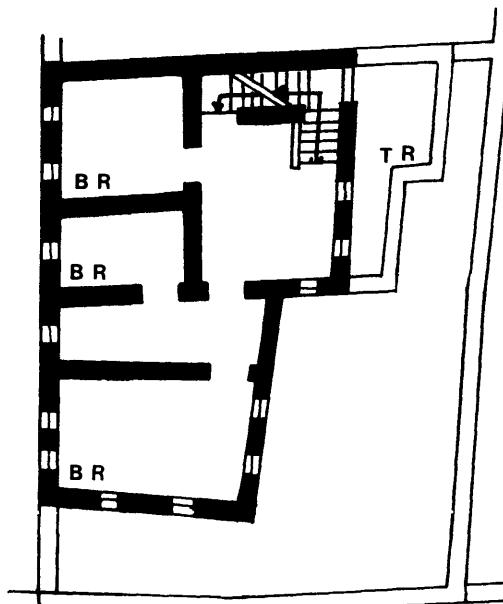
SECTION



GROUND FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

KEY

R C M	Reception Room for men
R C W	Reception Room for women
L R	Living Room
D R	Dining Room/Eating Area
B R	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
S	Storage
R	Room (multi-use)
R F	Roof
T R	Terrace
A	Animals house



TYPICAL DWELLING

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 122
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 167
tenure: Legal ownership

DWELLING
location: City center
type: Row-grouped
number of floors: 2
utilization: Single family
physical state: Fair

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction: -

MATERIALS
foundation: Rubble
floors: Mud
walls: Adobe
roof: Wood,straw/clay

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 10
other: Courts

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: None

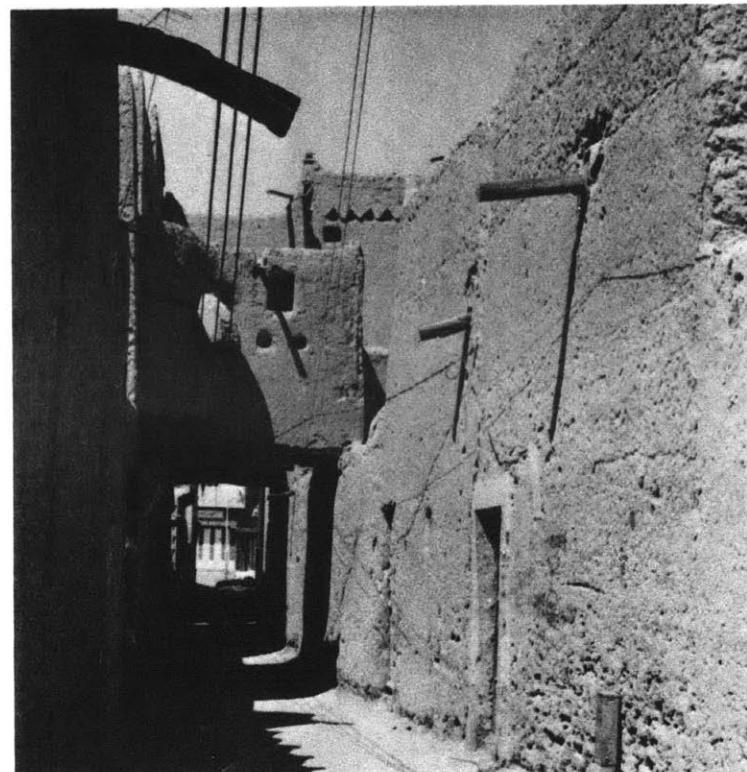
NUMBER OF USERS
married: 1
single: 0
children: 5
total: 6

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Commerce

GENERAL: ECONOMIC
user's income group: Middle
employment: Trade
distance to work: 1 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self financed
rent/mortgage: -
% income for rent/mortgage: Not available



LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS

Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

Block Land Utilization: (accurate)

Typical Dwelling: (accurate) Field Surveys, Y. Alohal

Physical Data: (approximate) Field Surveys, Y. Alohal

Socio-Economic Data: (approximate) Y. Alohal

Photographs: Y. Alohal

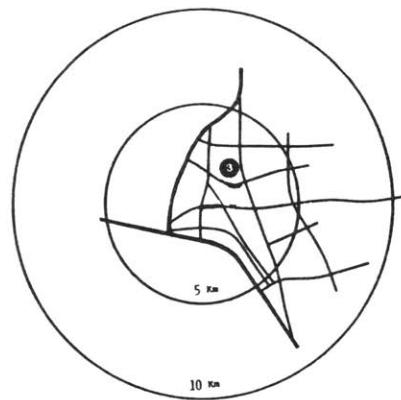
General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

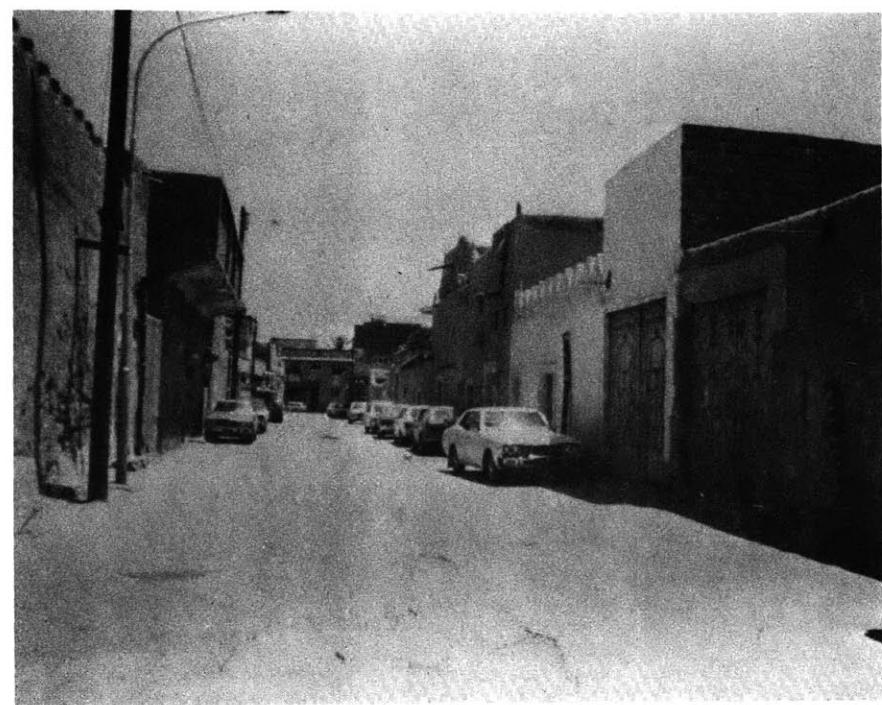
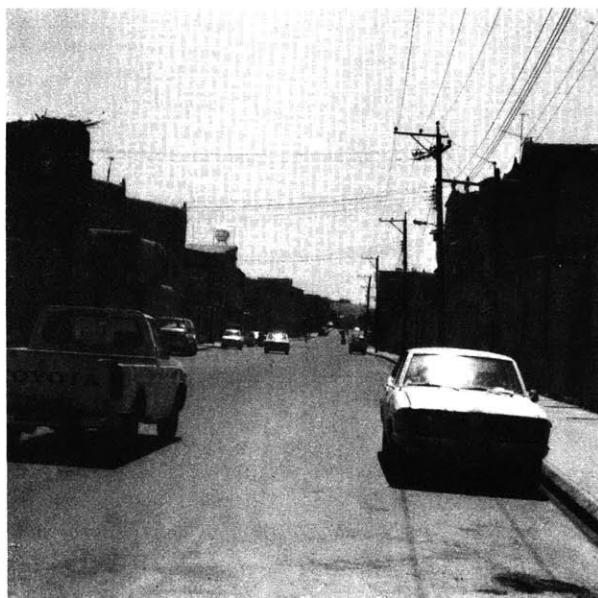
Photographs:

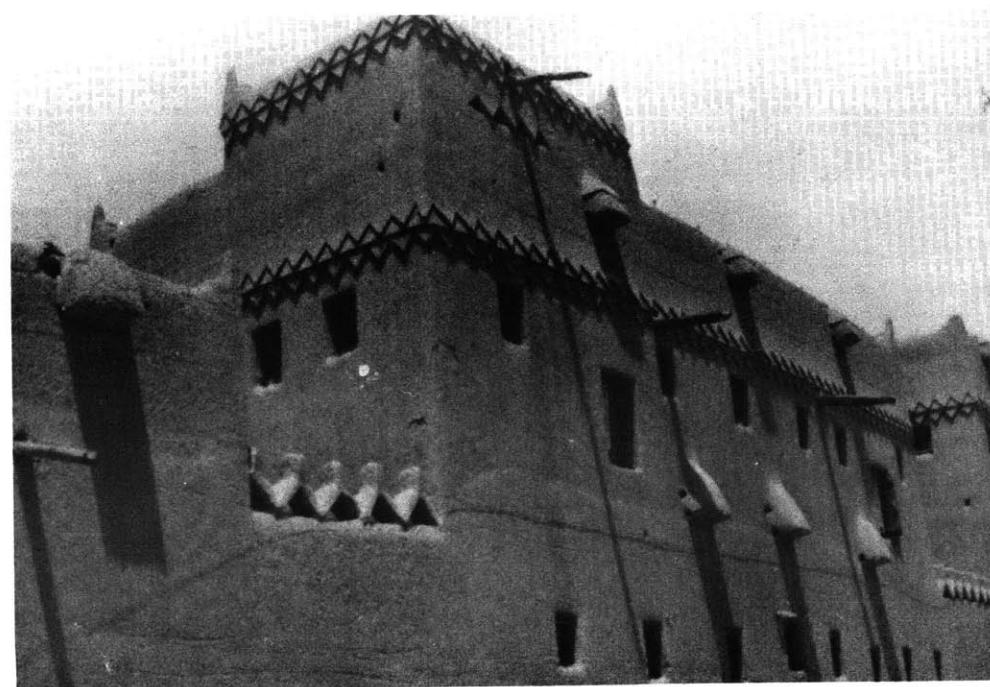
Page 63: Exterior of a house.

3 TRANSITION

AL-MALAH



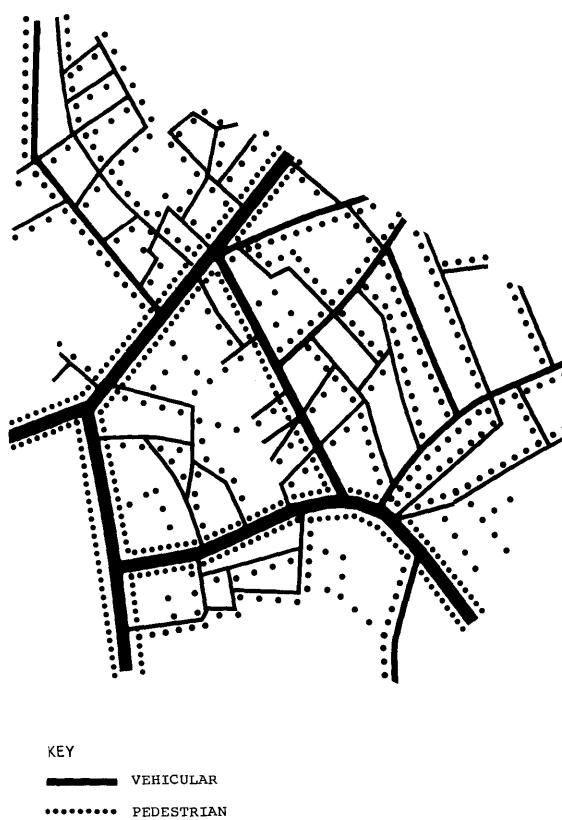




**LOCALITY PLAN**

LOCATION: It is located to the east of Ad-Dira, Al-Jadidah and lies between Adh-Dhabt and Hellah Street.

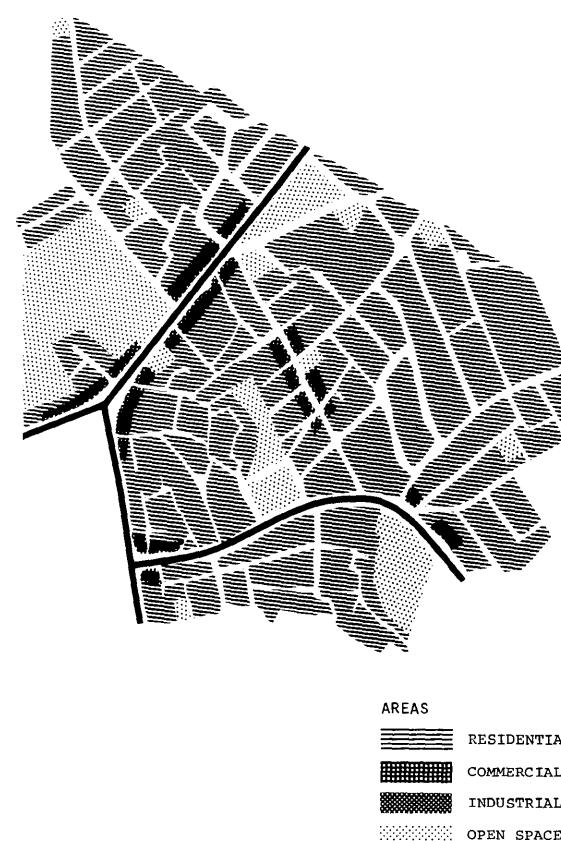
ORIGINS: When King Abdulaziz Al Saud conquered Unayzah about 1930, the city had already expanded eastwards to reach what we know now as As-Silsilah Street, where at that time, the eastern wall of the city existed. Outside the wall, the sectors of Al-Malah, Al-Buwayten and old Ad-Dhula'ah were already built.

**LOCALITY CIRCULATION PATTERN**

CIRCULATION: The streets are wider and not winding and no overhead passages. Streets are open to vehicular and pedestrian use, with few exceptions.

LAND USE: It has mainly residential

LAND USE: It is mainly residential, but also includes a large concentration of administration and educational functions. Commerce is developing along Adg-Dhabt Street at the northern part of this community.

**LOCALITY LAND USE PATTERN****Photographs:**

- Page 64: Top: An overview of Al-Malah area (Note the traditional and contemporary houses).
 Below: An overview of the contemporary houses which began to replace the traditional houses.
 Below: To the left: Paved street in the old residential area.
 Page 65: Examples of streets in Al-Malah area. (Note the street width and the building height).
 Page 66: Different views of houses in Al-Malah area (Note height and facade decorations).

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	366	16	23
DWELLING UNITS	366	16	23
PEOPLE	2560	16	160
AREAS		Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	3	19	
SEMI-PUBLIC (open spaces, schools, community centers)	0.51	3	
PRIVATE (dwellings, shops, factories, lots)	12.42	78	
SEMI-PRIVATE (cluster courts)	0.07	-	
TOTAL	16.0	100	

NETWORK EFFICIENCY

Network length (streets, walkways) = 4275
 Areas served (total area) = 16

$$= 267 \text{ m/Ha}$$

400m —

300m —

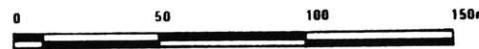
200m —

100m —

0m —

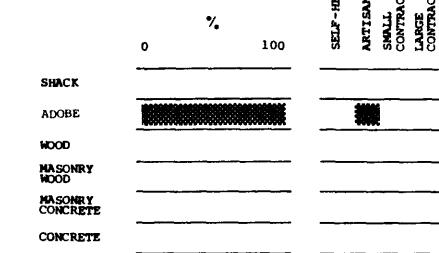
LOCALITY SEGMENT AIR PHOTOGRAPH

1:2500





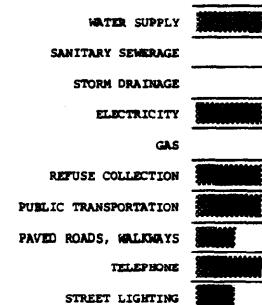
LOCALITY CONSTRUCTION TYPES



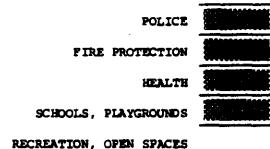
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



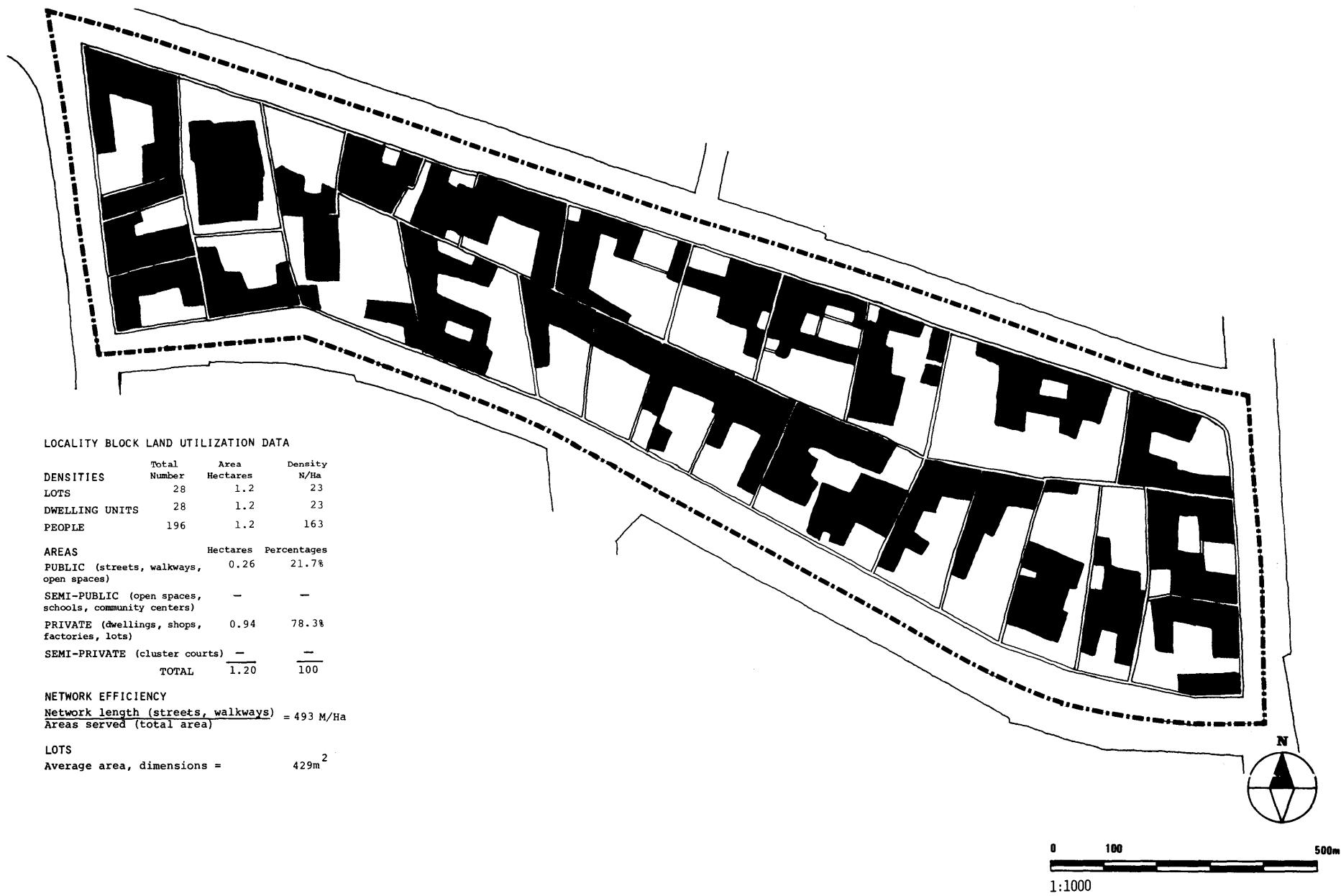
LOCALITY COMMUNITY FACILITIES



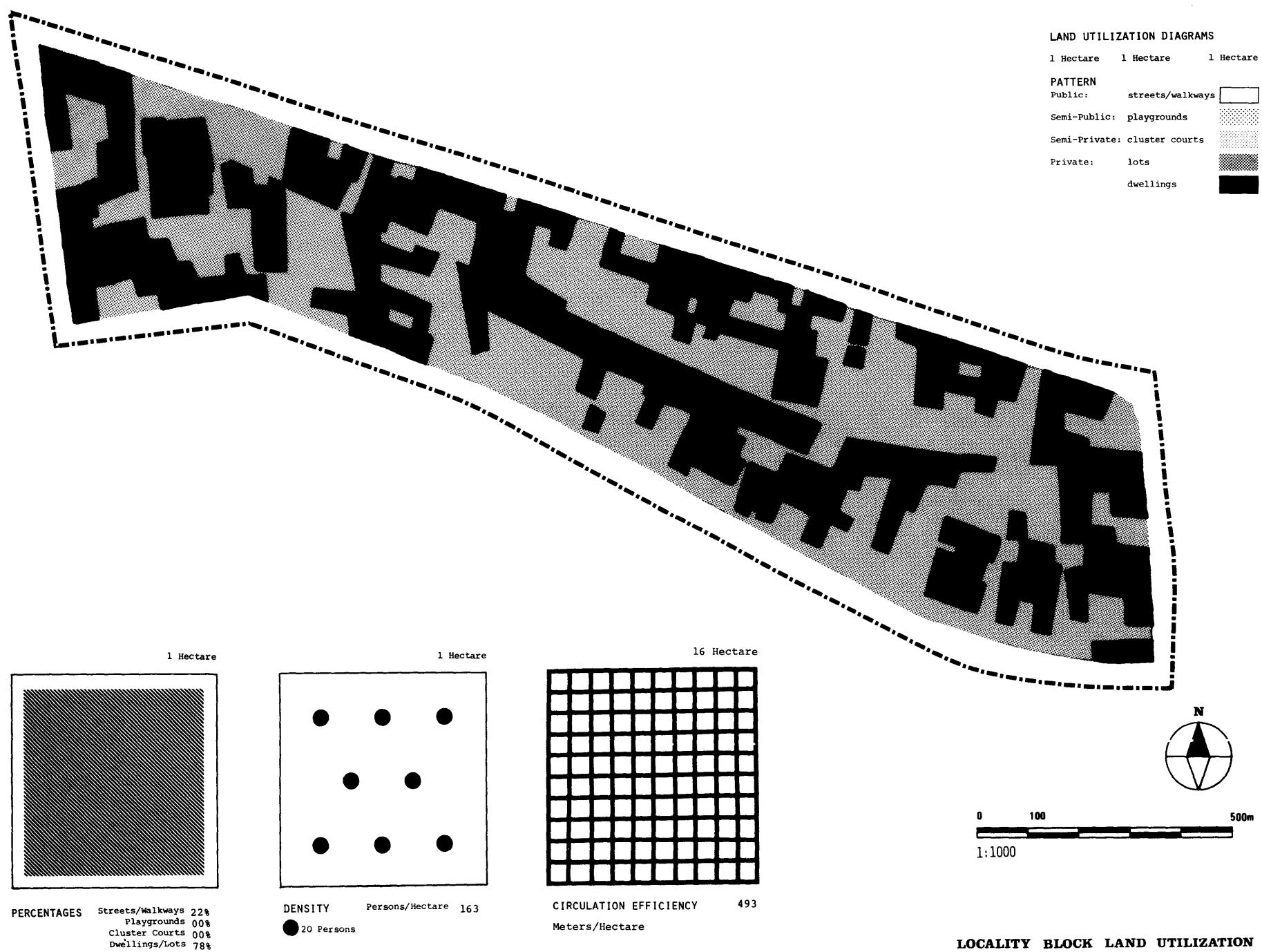
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

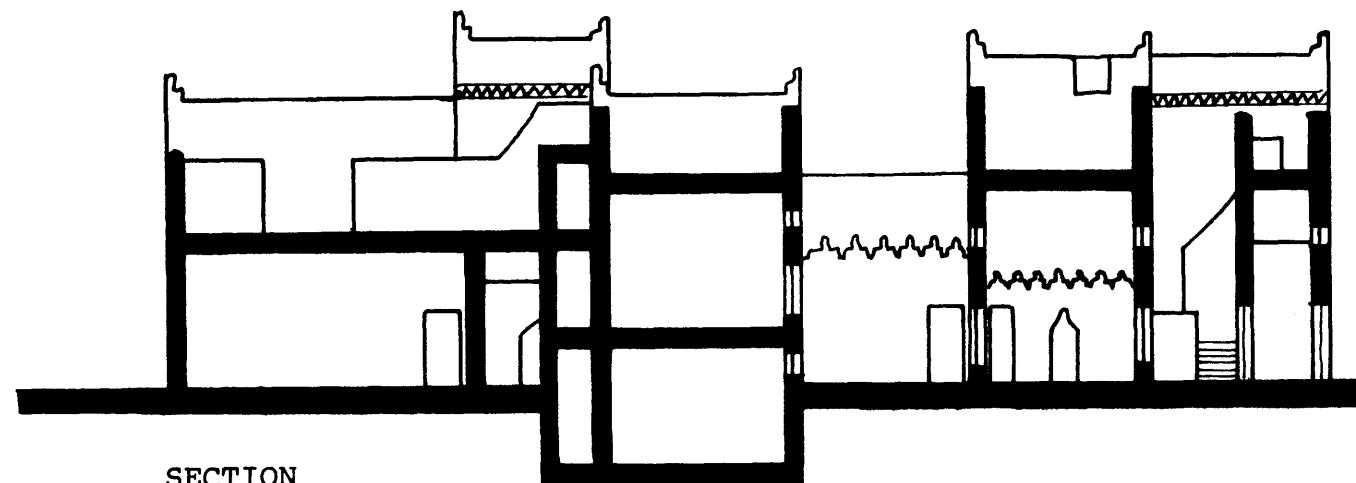
Quality of information: Approximate

SELECTED
BLOCK



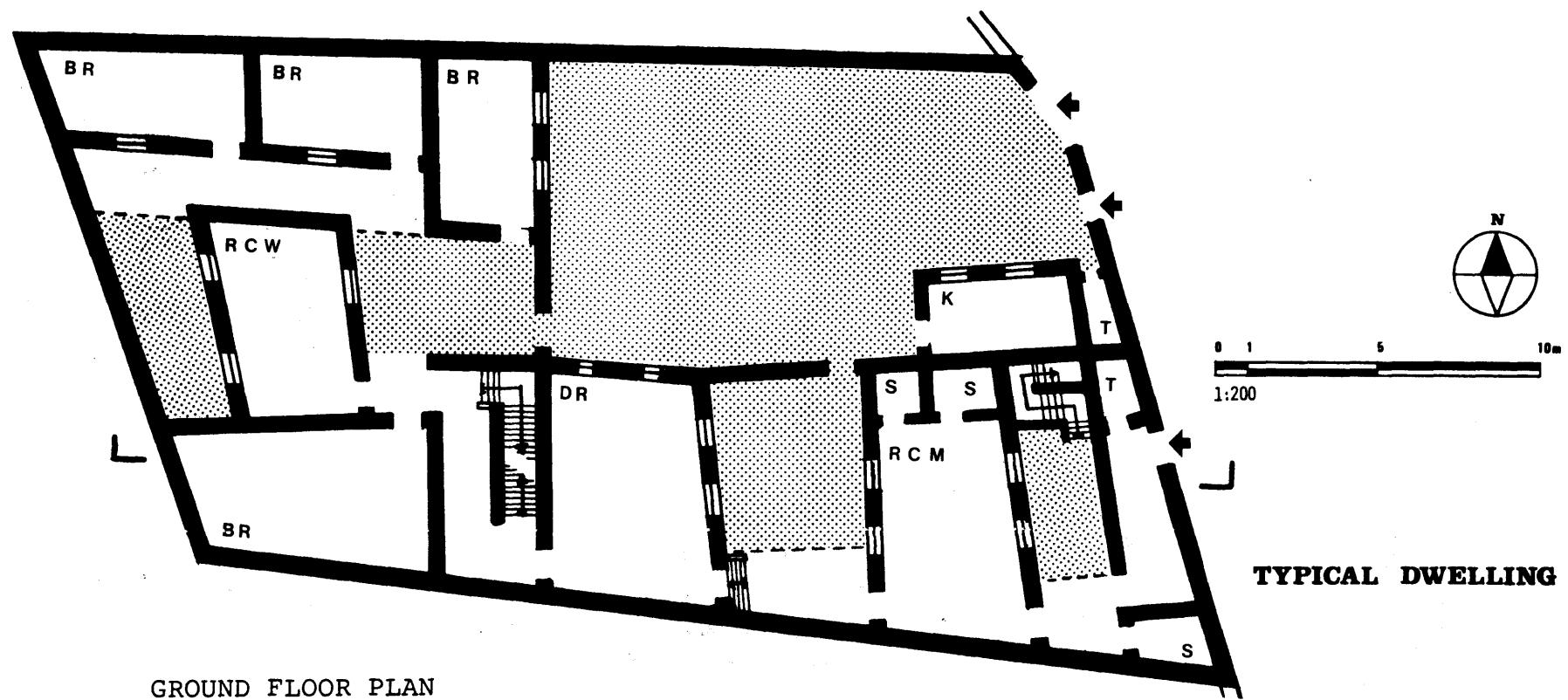
LOCALITY BLOCK PLAN





KEY

R C M	Reception Room for men
R C W	Reception Room for women
L R	Living Room
D R	Dining Room/Eating Area
B R	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
S	Storage
R	Room(multi-use)
R F	Roof
T R	Terrace
A	Animals house



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 402
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 536
tenure: Legal ownership

DWELLING
location: Inner ring
type: Row-grouped
number of floors: 1½
utilization: Single family
physical state: Good

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction:

MATERIALS
foundation: Rubble
floors: Concrete
walls: Adobe
roof: Wood, straw, clay

DWELLING FACILITIES
wc: 2
shower: 2
kitchen: 1
rooms: 11
other: Courts

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: None

NUMBER OF USERS
married: 2
single: 0
children: 4
total: 6

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Commerce

GENERAL: ECONOMIC
user's income group: Middle
employment: Trade
distance to work: 2 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self-financed
rent/mortgage: -
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of
Aerial Photogrammetry, Ministry of Petroleum
and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS
Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of
Aerial Photogrammetry, Ministry of Petroleum and
Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

Block Land Utilization: (accurate)

Typical Dwelling: (accurate) Field Surveys, Y. Alohal

Physical Data: (approximate) Field Surveys, Y. Alohal

Socio-Economic Data: (approximate) Y. Alohal

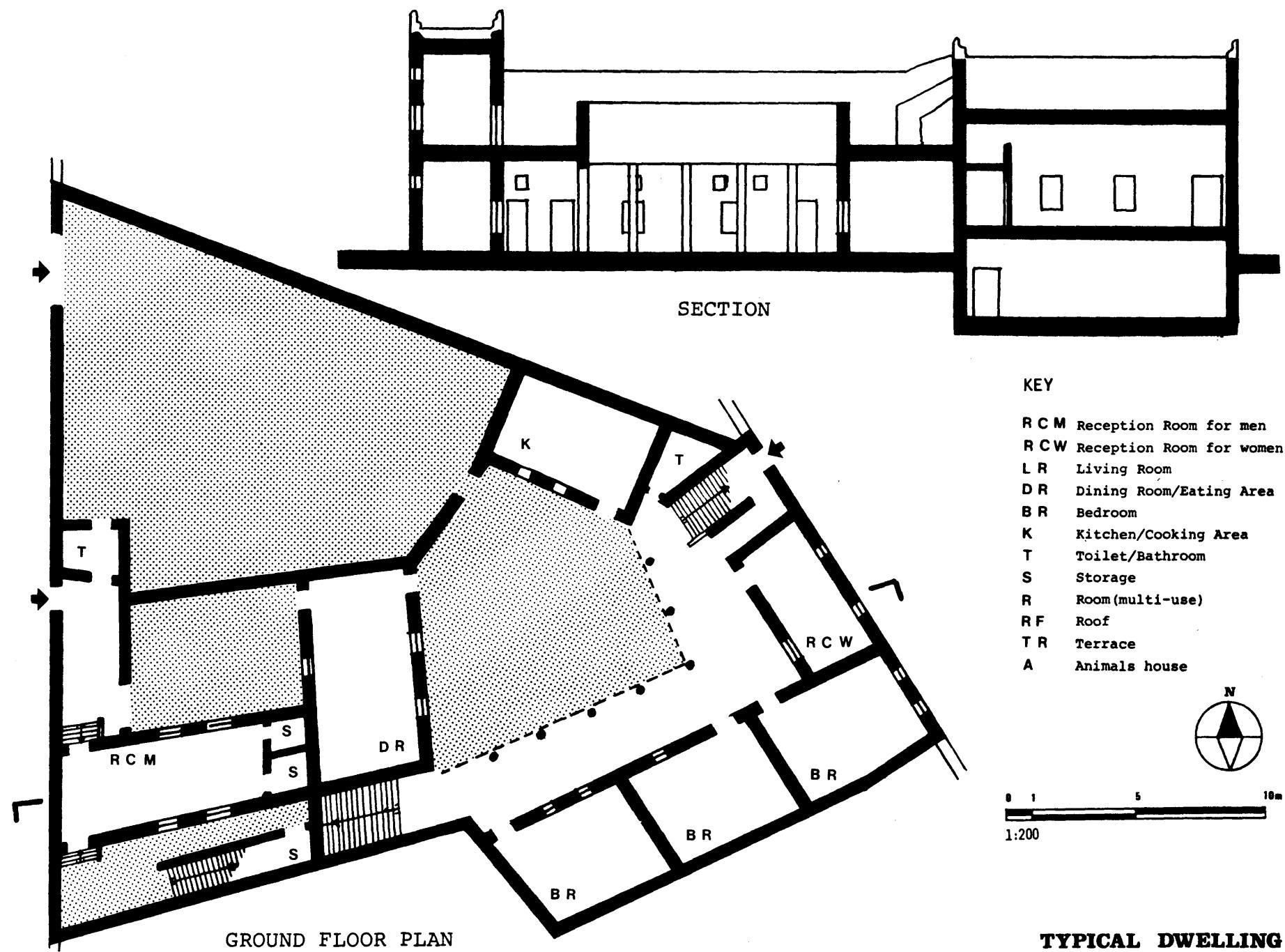
Photographs: Y. Alohal

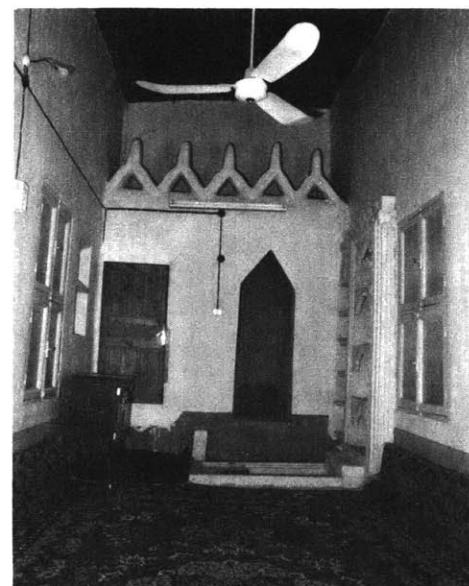
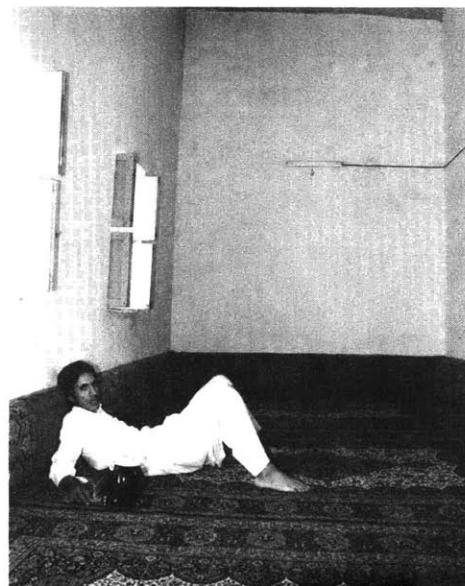
General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

Photographs:

Page 73: Top: A view of men's reception.
Middle: Men's courtyard.
Below: Family courtyard.







PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 435
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 613
tenure: Legal ownership

DWELLING
location: City center
type: Row-grouped
number of floors: 1½
utilization: Single family
physical state: Good

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction:

MATERIALS
foundation: Rubble
floors: Concrete
walls: Adobe
roof: Wood, straw, clay

DWELLING FACILITIES
wc: 2
shower: 2
kitchen: 1
rooms: 8
other: Courts

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: University

NUMBER OF USERS
married: 0
single: 2
children: 2
total: 5

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Employment

GENERAL: ECONOMIC
user's income group: Middle
employment: Government employee
distance to work: 2 Km
mode of travel: Bus

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self financed
rent/mortgage: -
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Land Use Pattern: (accurate) DOXIADIS, UNAYZAH EXISTING CONDITIONS

Circulation Pattern: (approximate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry, Ministry of Petroleum and Minerals, 1980.

Segment Plan: (accurate)

Block Plan: (accurate) Y. Alohal

Block Land Utilization: (accurate)

Typical Dwelling: (accurate) Field Surveys, Y. Alohal

Physical Data: (approximate) Field Surveys, Y. Alohal

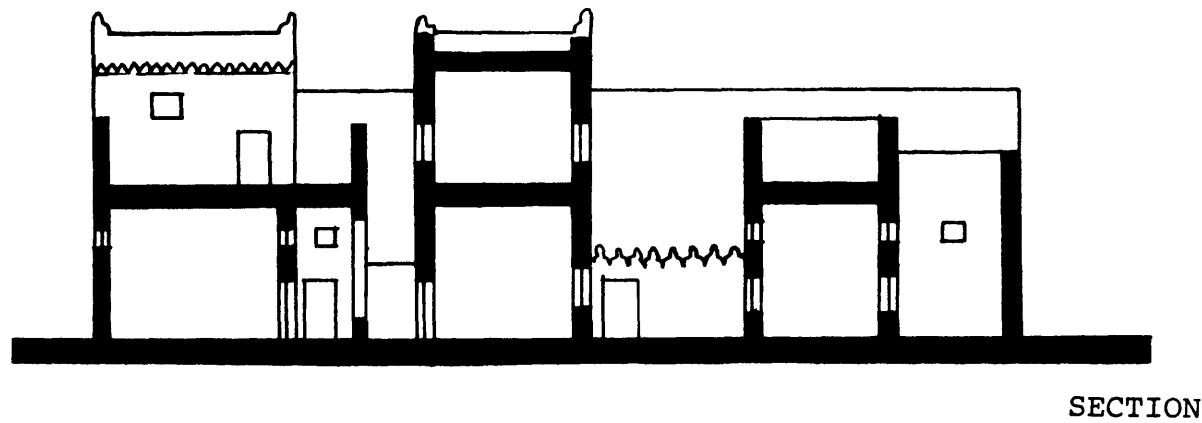
Socio-Economic Data: (approximate) Y. Alohal

Photographs: Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

Photographs:

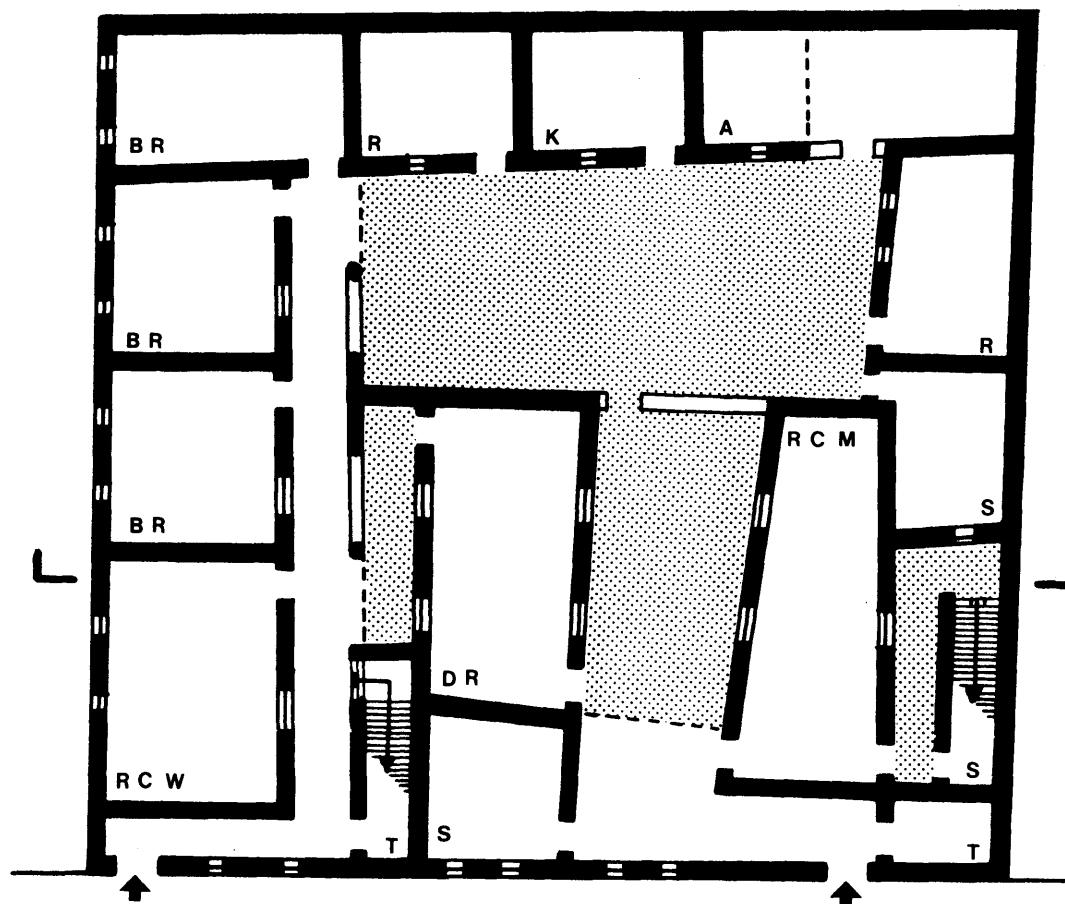
Page 75: Left: Family courtyard.
Middle: Dining room.
Right: Men's reception.



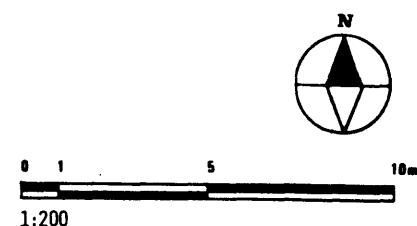
SECTION

KEY

R C M	Reception Room for men
R C W	Reception Room for women
L R	Living Room
D R	Dining Room/Eating Area
B R	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
S	Storage
R	Room(multi-use)
R F	Roof
T R	Terrace
A	Animals house



GROUND FLOOR PLAN



TYPICAL DWELLING



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: House
area (sq m): 455
tenure: Legal ownership

LAND/LOT
utilization: Private
area (sq m): 539
tenure: Legal ownership

DWELLING
location: Inner ring
type: Row-grouped
number of floors: 1
utilization: Single family
physical state: Good

DWELLING DEVELOPMENT
mode: Instant
developer: Private
builder: Artisan
construction type: Adobe
year of construction: -

MATERIALS
foundation: Rubble
floors: Concrete
walls: Adobe
roof: Wood/straw/clay

DWELLING FACILITIES
wc: 3
shower: 2
kitchen: 1
rooms: 14
other: Courts

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: Saudi
place of birth: Unayzah
education level: None

NUMBER OF USERS
married: 2
single: 0
children: 6
total: 8

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: x
urban - rural: -
why came to urban area: Employment

GENERAL: ECONOMIC
user's income group: Middle
employment: Government employee
distance to work: 2 Km
mode of travel: Walking

COSTS
dwelling unit: -
land - market value: -

DWELLING UNIT PAYMENTS
financing: Self financed
rent/mortgage: -
% income for rent/mortgage: Not available

LOCALITY SOURCES

Locality Plan: (accurate) AERIAL PHOTOGRAPH. Department of Aerial Photogrammetry. Ministry of Petroleum and Minerals, 1980.

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Typical Dwelling: (accurate) Field Surveys, Y. Alohal

Physical Data: (approximate) Field Surveys, Y. Alohal

Socio-Economic Data: (approximate) Y. Alohal

Photographs: Y. Alohal

General Information: DOXIADIS, UNAYZAH EXISTING CONDITIONS 1973

Photographs:

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. (See also: REFERENCES).

ACCESESSES. 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)

ALTERNATING 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.)

CONURBATION. Area of large urban communities where towns, etc. have spread and became joined beyond their administrative boundaries. (A.S. Hornby, A.P. Cowie, J. Windsor Lewis, 1975)

CONURBATION. An aggregation or continuous network of urban communities. (Merriam-Webster, 1963)

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. **SIMPLE:** 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 enjoyed 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. (FM 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 systems/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; **PUBLIC/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 = $(lb/sq. in. \times 144)/(Density in lb/cu. ft.)$ 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. (NOTC 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 responsibility. 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/legal 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 or 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. (Defina, 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 heirs 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. (NOTC 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)

OMMS (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.; NOTC ST 45-7, 1953; Merriam-Webster, 1971)

OPTIMIZE/OPTIMIZE. To bring to a peak of economic efficiency, especially 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 FACILITIES. 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 function 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). (NOTC 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 thoroughfare 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 differing 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 leases; 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)

VISUAL. 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 horsepower 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 NOTES

METRIC SYSTEM EQUIVALENTS

Linear Measures

1 centimeter	= 0.3937 inches
1 meter	= 100 centimeter = 39.37 inches or 3.28 feet
1 kilometer	= 1000 meters = 3280.38 feet or 0.62137 miles
1 inch	= 2.54 centimeters
1 foot	= 0.3084 meters
1 mile	= 1.60935 kilometers

Square Meters

1 square meter	= 1550 square inches or 10.7639 square feet
1 hectare = 10000 sq meters	= 2.4711 acres
1 square foot	= 0.0929 square meters
1 acre	= 0.4087 hectares

DOLLAR EQUIVALENT

All income, cost, and rent/mortgage data have been
expressed in terms of U.S. equivalent,
1 U.S. dollar equals 3.43 Saudi Riyals.

QUALITY OF INFORMATION

The quality of information given in the drawings have
been qualified in the following manner:

Tentative: when based upon rough estimations of lim-
ited sources.

Approximate: when deducted from different and/or not
completely reliable sources.

Accurate: when taken from reliable or actual 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.

Adequate: when the existence of services, facilities
and utilities are available in/to a locality.