URBAN DWELLING ENVIRONMENTS: TAIPEI, TAIWAN

by

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PREFACE

CONTENT: This research describes and evaluates the low income dwelling environment in Taipei City. The focus of this study is on seven selected situations existing at the present time in the metropolitan area. The following is included: a description of "national context"; a description of "urban context"; seven "case studies" which deal with all the low income housing situations (four cases deal with the government housing supply); and "dwelling and land evaluation " on the physical aspects, utilities and services,land utilization and time/process perspectives of the cases presented. Each case is summarily described in similar terms: DRAWINGS: locality segment plan, locality block plan, locality block land utilization, dwelling plan, dwelling facade, and dwelling section; DESCRIPTION DATA: socio-economic and physical; PHOTOGRAPHS: environment and dwelling. The cases provide first-hand material with which to identify basic patterns in different aspects of the housing process, particularly in the matter of land utilization.

PURPOSE: This study attempts to identify and analyse the physical structure of different housing systems in Taipei City, based on low income dwelling types and their environments. The material is intended to stimulate the formulation of policies regarding low income housing. The research provides a comparative framework for the analysis and evaluation of low income housing, including government housing packages.

APPLICATION: This research provides a reference for the understanding of low income housing and its urban environment: the case studies are arranged so they can be viewed isolated or by relating them to different housing systems. It offers a reference base for tackling realistically low income housing, by taking advantage of existing housing and its service infrastructure. It can orient decision makers in optimizing the allocation of financial resources in housing, housing improvement and urban development.

DATA: This study is derived from field research carried out by the author during the summer of 1974 and 1975, complemented by maps, photographs and mentioned bibliographic materials. The case study analysis is based on a methodology developed in the Urban Settlement Design Program, directed by Professor Horacio Caminos.

SUMMARY

Detailed studies indicate that in Taipei City 34 per cent of all housing is rented. Only 46 per cent is owner occupied of which only 1.8 per cent is provided by the government. In Taipei City, an average of 1.6 households live in each dwelling unit, indicating that several families share the dwelling facilities. The seven case studies of this report, however, indicate that rental situations occur in most of the low/middle income dwelling environments. (see physical data matrix)

The case studies also indicate that most of low income dwelling environments do not reach minimum living standards. The quality of existing low income housing, with respect to space, utilities, facilities, and access to light, air, sunshine, is deficient. Most of the government sponsored housing provides dwelling units with a maximum space of $40m^2$. (see cases 4,5) The resultant over-crowded living conditions cause much illegal construction in order to expand the living space. (see particularly case 6) Most of the low income dwelling environments are also critically deficient in park and recreation space. (see Land Utilization: Patterns, Percentages, Densities) A gross density of more than 1,000 persons per hectare can be found in many dwelling environments, in which the need for parks, playgrounds, and other public open spaces becomes a critical necessity.

I. URBAN POPULATION GROWTH CONTEXT: While urbanization in the entire island of Taiwan is clearly proceeding rapidly, the development of Taipei City is even more dramatic. The total population of Taipei City has increased from 1,224,600 in 1967 to 2,003,600 in 1974. The annual population increase rate, was 4.17 per cent over the period from 1967 to 1971 and 3.2 per cent from 1971 to 1974. Approximately half of the population increase is due to low income migrants from the provincial area. In spite of a recent reduction in the birth, the high porportion of children and young people makes it inevitable that the population must continue to grow for a considerable time before it can be stabilized. This urban population growth will enhance the gap between the demand and supply of housing more serious. Following the present population growth, in 1979, the total population of Taipei City will reach 2,500,000, which is the city's maximum projected population. It is expected that the future population growth must be controlled. Besides the effort on birth reduction, some alternatives must be carried out to control the migration trend. Further population growth must be channelled to existing or new satellite towns having their own industry and other job-providing activities instead of the already over-crowded urban area.

II. URBAN LAND CONTEXT: Among the total 27,214 hectares of Taipei City, an estimated area of only 11,070 hectares are level land which can be developed. The rest of 16,144 hectares are mostly sloped lands and low-lying grounds. According to the Master Plan of Taipei City, only 5,634 hectares are for residential use, representing 20.7 per cent of the city land. High land price is the leading inhibiting

factor making market financed housing unavailable to low and even middle income families. The shortage of urban land leads to high land prices. Furthermore, the problem is aggravated by speculation. Land taxes do not sufficiently penalize holders of vacent or under-utilized land. The doubling and tripling of land prices within two years, especially in the vicinity of recent improved land, is a common occurrence. Unbridled land speculation has forced land prices in Taipei often as high as in Tokyo and New York City. Speculation in vacant land has also made it difficult for public housing to be built in any orderly fashion, and private housing is being built in a scattered uncontrolled pattern with no relation to urban development plans. The public power to control land use in Taipei City should be strengthened. The existing law of condemnation (compulsory purchase) of land needed for carrying out urban development, such as for public housing, should be strengthened and utilized whenever necessary. The city's future dwelling development should not be limited to the Taipei area. The population should be evenly distributed in the region of which Taipei City is an integral part, in order to reduce the population pressure and land costs.

III. URBAN HOUSING POLICIES CONTEXT: Although the low income people are hard-working, thrifty and a considerable amount of savings exist, there is no mechanism other than the government assistance, by which low income families can have access to their dwellings. The gap between the low household income and the high housing cost is by no means small. In fact, without the governmental intervention to bridge the gap, the great majority of families will never be able to acquire decent dwelling unit. It is obvious that the government housing program while making some inroads, has failed to fulfill the need of the growing urban population. The rate of national investment in housing is only 2-2.5 per cent of the GNP compared with 4-5 per cent found in countries which are solving their housing problems through large-scale programs. For many years, the policy of the government of Taipei City has focussed almost entirely on squatter families and government employees. (see cases 3,4,5) Future housing policies should cover all of the low income families. Besides the construction of new public housing, the existing low income dwelling environments should be up-graded.

IV. URBAN PHYSICAL DWELLING DEVELOPMENT CONTEXT: Much wasted land can be found in many low income dwelling environments. Lack of parks and playgrounds is a common problem for most of these areas. Densities in more recently developed areas are extremely high, and may itself be the reason for high land prices. In spite of high land cost, the construction cost of low income public housing is still high and can not be afforded by lower income families. It is clear that gross densities should not be allowed to go beyond 1,000 persons per hectare. Parks, playgrounds, and some other open spaces should be properly provided together with dwelling units. Alternative means of lowering costs of low income housing must be investigated in future developments.

CONTEXTS

The following section contains the descriptions of the country and the urban area within which the case studies are surveyed. It includes:

NATIONAL CONTEXT
- *National Description*
- *National Development Regions*

URBAN CONTEXT
- *Urban Description*
- *Climate Diagrams/Graphs*
- *Urban Population Graphs*
- *Urban Topography and Circulation*
- *Urban Land Use Pattern*
- *Urban Income Pattern*
- *Urban Growth Pattern*

TAIWAN, REPUBLIC OF CHINA

NATIONAL CONTEXT

1. PRIMARY INFORMATION: Taiwan, which is also known as Formosa, is an island situated off the southeastern coast of the Chinese mainland, latitude 21°45' - 25°37' North, longitude 119°18' - 122°6' East. Taiwan is dominated by the Central Mountain Range, which runs from north to south and divides the island into the rocky, rugged regions of the east and the fertile plains of the west. Because of the mountainous terrain, less than one-third of the island's 35,961 square kilometers can be considered areable. High forested mountains cover most of the rest of the island. Taiwan's climate is sub-tropical in the north and tropical in the south with average temperature 22° C. Hot humid summers last from May to October and winters are mild and humid. Occasional earthquakes have caused little or no damage, but typhoons with wind velocity as high as 250 kilometers per hour have been known to bring serious floods and damage to crops and homes in the late summer.

2. HISTORY: The original inhabitants of Taiwan are believed to be of Polynesian stock. The Chinese crossed the Taiwan Straits from the Provinces of Fukien and Kwangtung as early as the 12th century. From 1624 to 1646, Taiwan was under Spanish and Dutch domination, population was 30,000. In 1661, the Dutch were ousted by Cheng Chen-Kung who held out from the Chinese mainland after the Manchus and made a prefecture of Fukien. Large-scale immigration began and by 1810, the population had reached 2,000,000. The Manchu government made Taiwan a province in 1885. In 1895, Taiwan was ceded to Japan at the conclusion of the first Sino-Japanese War. In 1945, Taiwan returned to China as a result of the Cairo Agreement, but since 1949, Taiwan became the effective territory of the Republic of China. Taipei is the temporary capital.

3. ECONOMY: In 1973, the annual per capita income of Taiwan was approximately US $ 467 and GNP reached US $ 9.4 billion. Industry contributes about 37 percent of the GNP compared with 15 per cent for agriculture. But agriculture is still the biggest Taiwan employer, it contributes 40 percent of jobs, compared with 15 percent for manufacturing and 28 percent for services. In order to get balanced economic growth, Taiwan is divided into seven development regions.

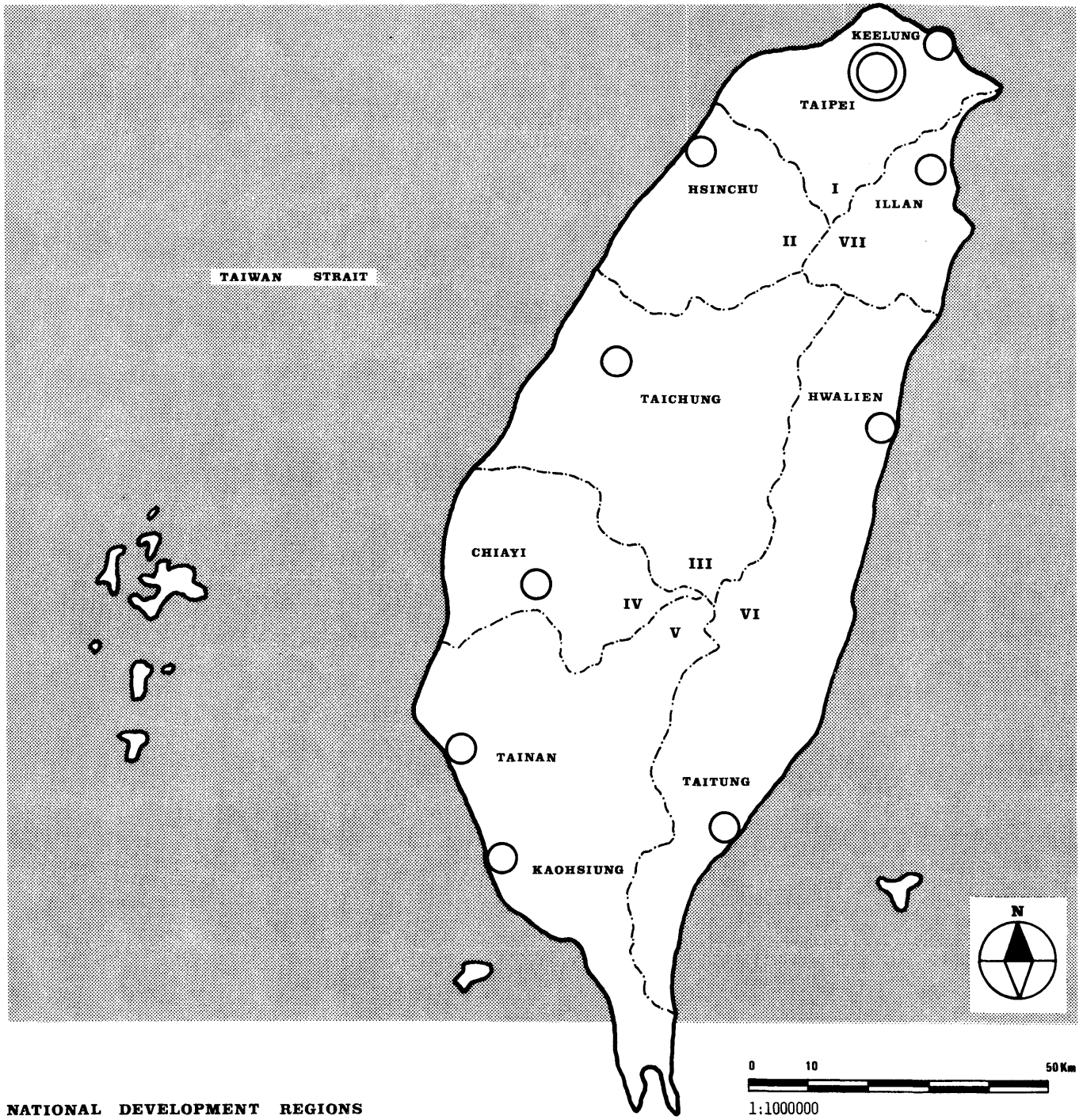
4. GOVERNMENT: The Taiwan Provinicial Government as well as the Taipei Special Municipality are under the jurisdiction of the Executive Yuan of the National Government.

5. DEMOGRAPHY: The population of Taiwan in 1974 was 15,682,000, with an annual growth rate of 2.5 per cent. With a density of 440 persons per square kilometer, the island ranks only after Hong Kong and Singapore among Asia's most densely populated areas.

6. SOCIO-CULTURAL: About 1/5 of the population is made up of the mainland-born or first generation Chinese, with the exception of 200,000 aborigines, the rest are descendants of Chinese who came to Taiwan before 1895. In 1970, there were 2,623,265 households in Taiwan, and the average household size was 5.5 persons. About 40 per cent of households belong to low income sector with annual income less than US $ 900 and 15 per cent more than US $ 1,800 (high income).

7. SOCIO-ECONOMIC: The lowest income sectors are concentrated in rural areas and in squatter settlements. Urbanization is progressing in Taiwan at a very rapid rate. Urban population accounted for 51 per cent of the total population in 1961, but rose to 62 per cent in 1975.

8. HOUSING: Land is limited due to the high population density and the fact that much of the island consists of high, steep mountains. In 1973, the government estimated a housing need for as many as 140,000 dwelling units per year, of which only approximately 45,000 units have been constructed. In Taiwan, average floor area is 71 square meters per dwelling unit and 12 square meters per person.



NATIONAL DEVELOPMENT REGIONS

REGIONS

I	TAIPEI - KEELUNG REGION
II	HSINCHU REGION
III	TAICHUNG REGION
IV	CHIAYI REGION
V	KAOHSIUNG - TAINAN REGION
VI	EAST REGION
VII	ILLAN REGION

NATIONAL CONTEXT SOURCES

Resources
Development regions: *(accurate) Comprehensive Development Regions for Taiwan Area, 1972.*
General Information: *(accurate) IBID.*

TAIPEI, TAIWAN

URBAN CONTEXT

1. PRIMARY INFORMATION: Taipei is located on a large prehistoric lake basin, at latitude 25° North, longitude 121° East. On the east, south and north sides are mountains. Tatun and Seven Stars are two peaks, which have an altitude of more than 1,000 meters. On the west, there are three rivers, Tamsui. Hsintien and Keelung. By its northern location Taipei is in the subtropics but the ocean nearby makes its climate balmy, with an annual average temperature of 22° C. The mean annual rainfall is about 2,118 mm. Taipei belongs to seasonal wind weather zone. The period from July to September is typhoon season.

2. HISTORY: Taipei was made a prefecture in 1885, and an area of 441 hectares were laid out as its administrative district. Initial construction started in 1895. The development objectives at that time were primarily farming, irrigation and transportation. In 1895, 4,424 hectares were added to the original district. And in 1932,another 1,833 hectares were added. Taipei was made a provincial city in 1945, when Taiwan was returned to the Republic of China from Japanese occupation. In 1967, Taipei became a special municipality and the city area was expanded to include six surrounding districts, with a total area of 27,214 hectares. The present city plan was drafted after Taipei was made a special municipality. At present, Taipei is the political, cultural and economic center of the Republic of China.

3. ECONOMY: In 1973, the annual per capita income of the metropolitan area was estimated at US $ 497 and represented 10.8 per cent of the GNP. The majority of industries in Taipei are textile, chemical, printing, machine and electronic.

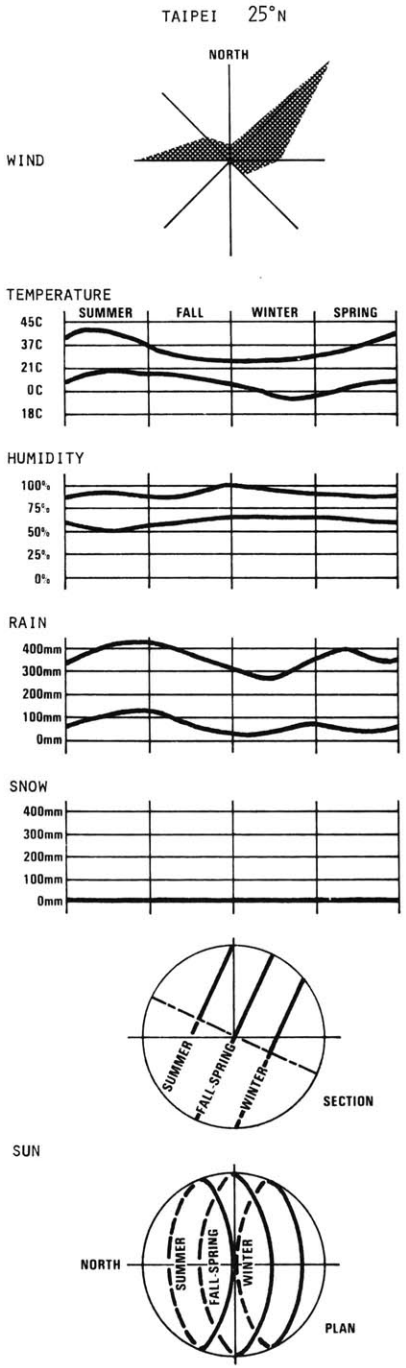
4. GOVERNMENT: Taipei is the temporary capital of the Republic of China. It became a special municipality in 1967 and is coequal with Taiwan province, directly under the jurisdiction of the Executive Yuan. The metropolitan area is divided into 16 districts whose authority over urban development is limited to the administration of land/building ownership. Authorization for subdivisions and issuing of building licenses are made by the Bureau of Public Works of the Taipei City Government.

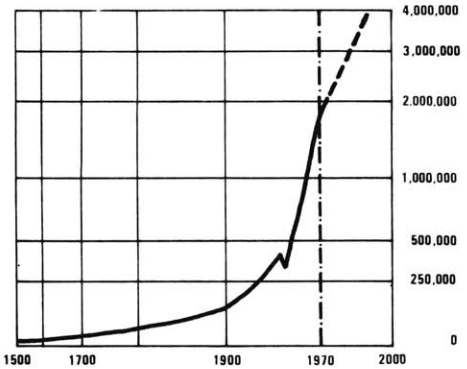
5. DEMOGRAPHY: The population of Taipei in 1974 was 2,003,600. The annual population increase rate was 4.17 per cent over the period from 1967 to 1971 and 3.2 per cent from 1971 to 1974, approximately half of the increase is due to immigration from provincial areas. About 35 per cent of the metropolitan population is under 14, and 3 per cent are men over 65. The ratio of men and women is 116:100.

6. SOCIO-CULTURAL: In 1972, there were 400,890 households in Taipei, with an average size of 5.2 persons. The household increase was about 13,000 every year. In 1972, the annual per capita income of the metropolitan area was US $ 420. About 38 per cent of households belong to low income sector with annual income less than US $ 1,600, and 7.21 per cent more than US $ 4,000 (high income).

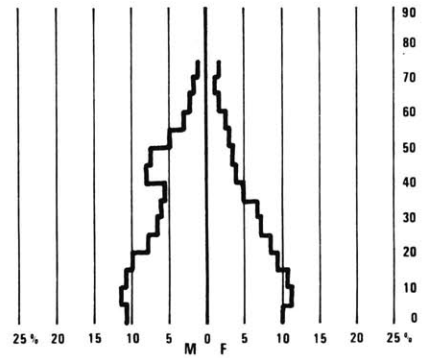
7. SOCIO-ECONOMIC: The lowest income sectors are living in the squatter settlements and rural type of dwellings. Walk-up apartments have been the most common type of housing for low and middle income families. The high income sectors are always living in high-rise apartments near downtown, or in detached houses around the city periphery.

8. HOUSING: High population density, limited land and unbridled land speculation has forced land price in Taipei often as high as in Tokyo or New York. High land prices are the leading factor making market financed housing unavailable to low and middle income families. In 1972, there were 215,000 households, representing 52 per cent of households in Taipei, who cannot own a living place. The demand of housing in Taipei is 25,000 annually, of which only approximately 12,000 have been built. In the metropolitan area, average floor area is 40 square meters per dwelling unit and 8.0 square meters per person.

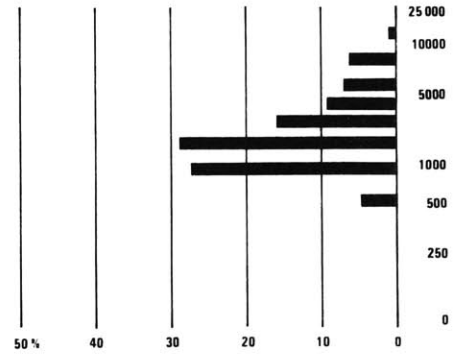




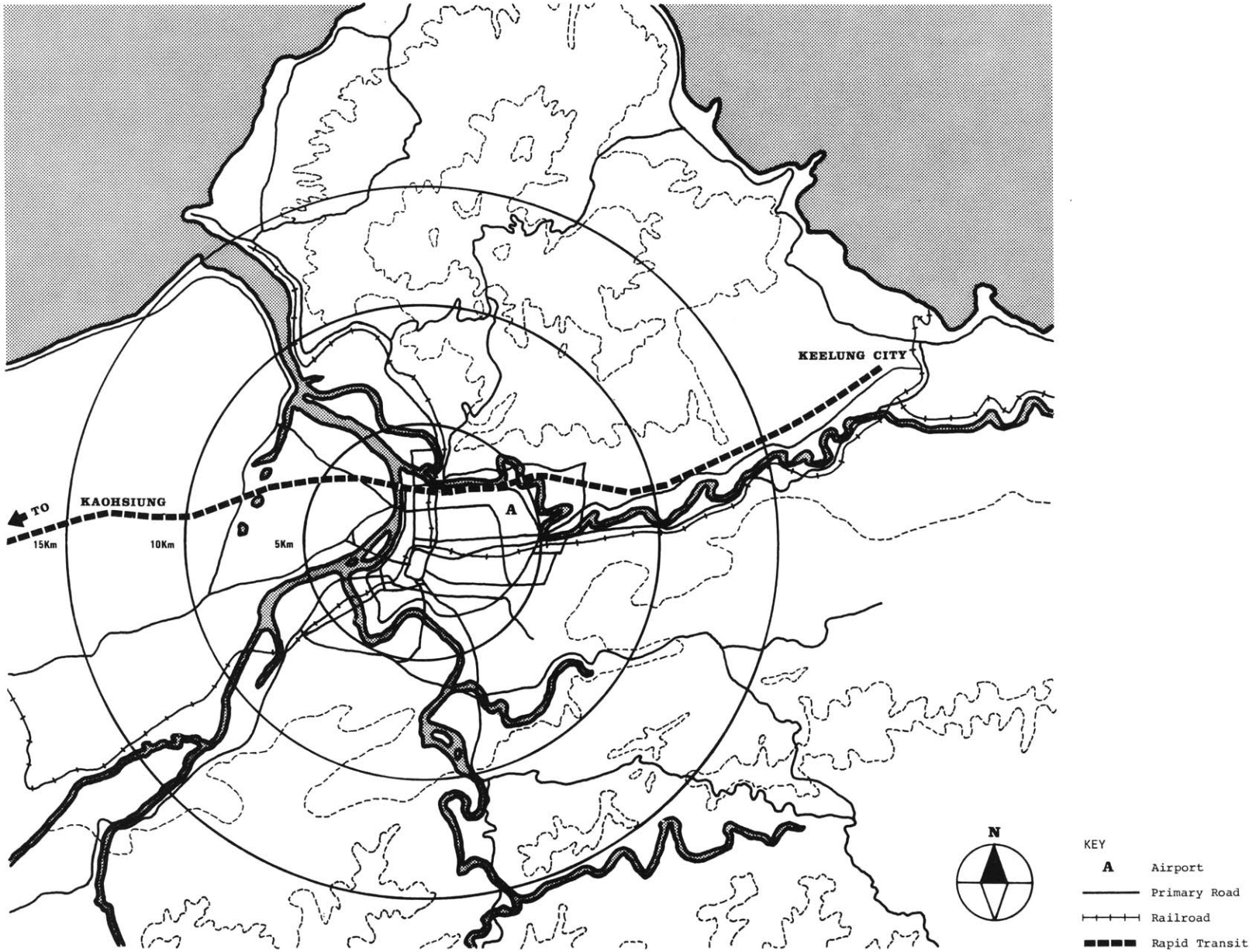
URBAN POPULATION GROWTH
horizontal: dates vertical: population
Source: Bureau of Public Works, Taipei City Government, 1973



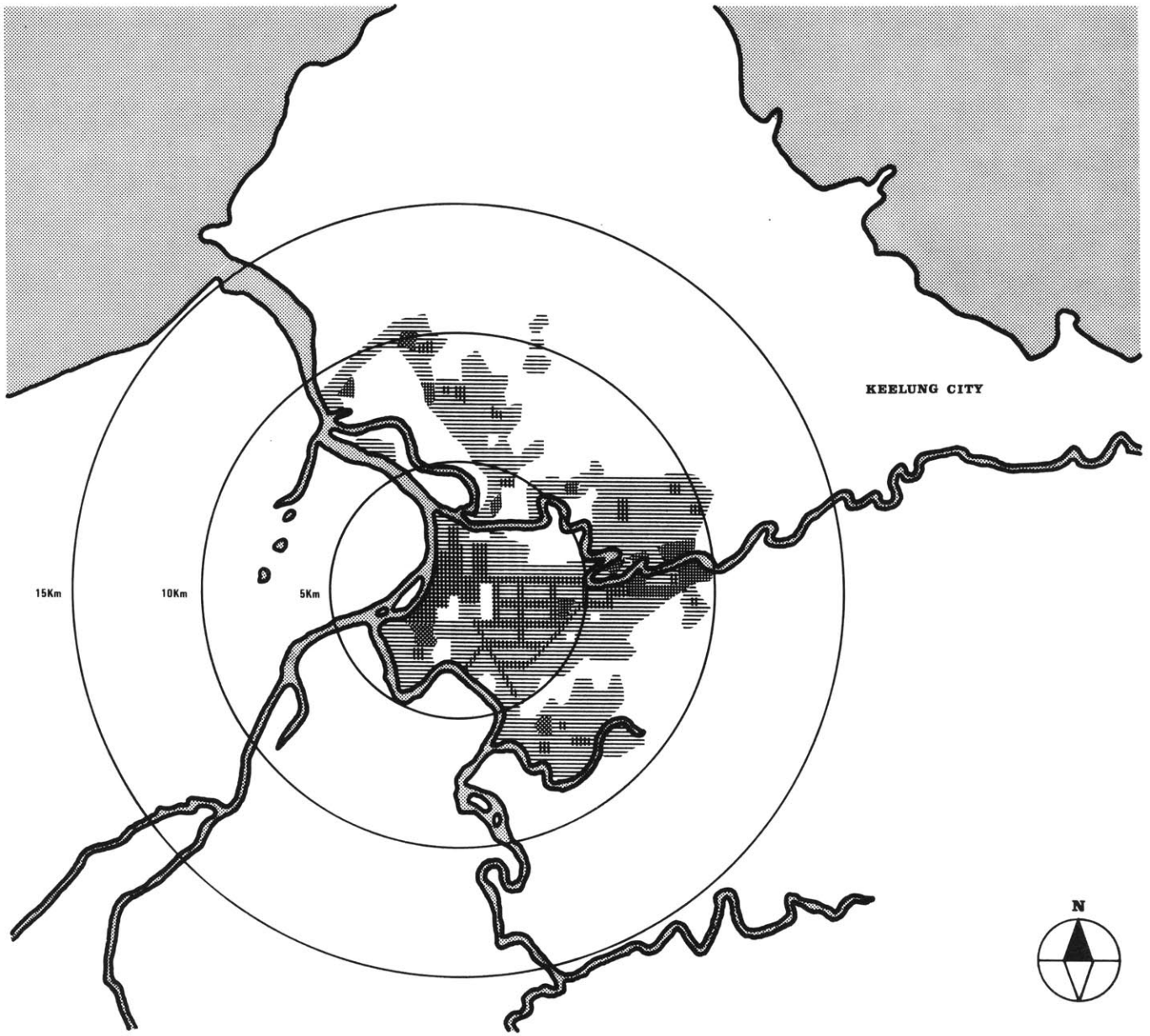
URBAN POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M females: F
Source: Bureau of Public Works, Taipei City Government, 1973



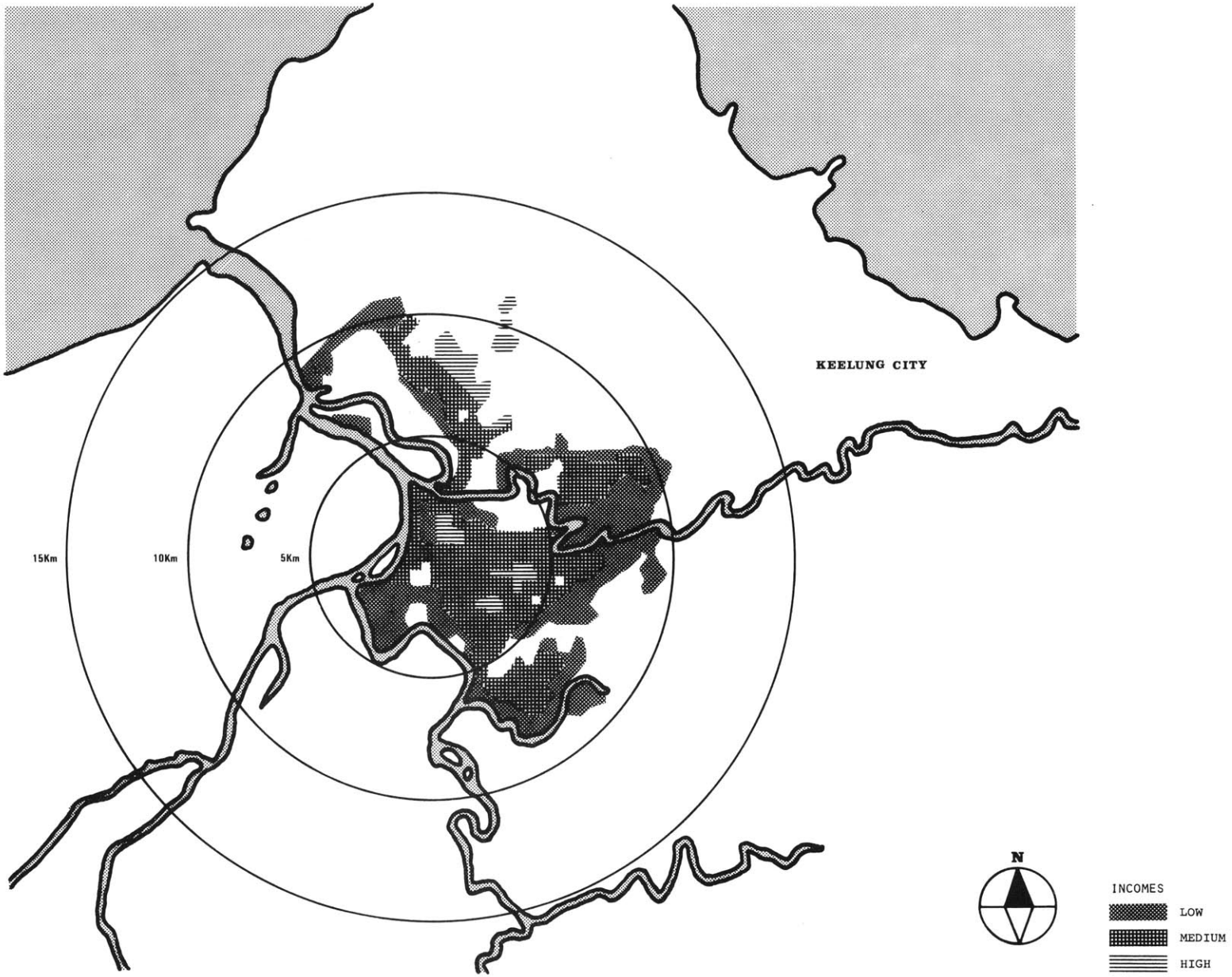
URBAN ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Source: Department of Statistics, Taipei City Government, 1972



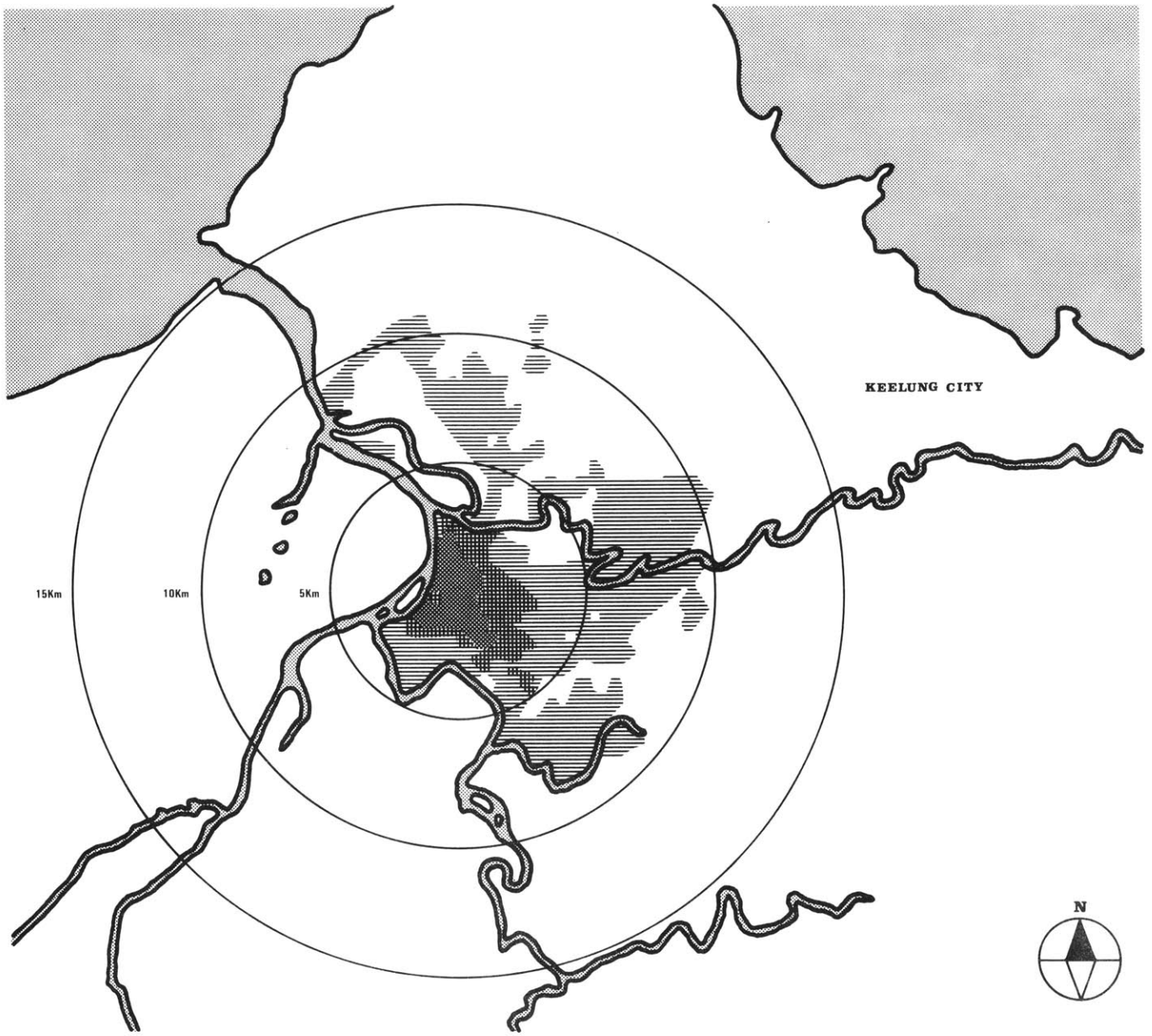
URBAN TOPOGRAPHY AND CIRCULATION



URBAN LAND USE PATTERN



URBAN INCOME PATTERN



URBAN GROWTH PATTERN

TAIPEI, Taiwan: (top left) The apartments located at Min Shen East Road community are typical dwellings for the middle income sector. (1975)

(top right) A mixture of squatter shacks, middle income walk-ups, and high income high-rises are a common view in Taipei City. (1975)

(bottom) From this aerial view, facing the north, one can see the texture of a rapidly sprawling city. Mountains in the background constrain the growth of Taipei City. (1974)

URBAN CONTEXT SOURCES

Topography and Circulation:	*(accurate) The Reference Map of Taipei City Plan, December, 1973.*
Land use Pattern:	*(accurate) The Zoning Plan Map of Taipei City Plan, October, 1973.*
Income Pattern:	*(approximate) "The 1975 Taipei Statistics Reference".*
Growth Pattern:	*(accurate) "Preliminary (Sketch) Plan for the City of Taipei", 1968.*
Climate:	*(approximate) "A Brief Introduction of the City Planning of Taipei", 1973.*
Photographs:	*Author*
General Information:	*"A Brief Introduction of the City Planning of Taipei", 1973.* *"The 1970 Sample Census of Population and Housing", 1972.*

CASE STUDIES

The following section contains case studies, describing selected dwelling environments. The seven cases were selected according to income groups and housing systems, representing all the major low income dwelling types in Taipei City.

Case studies are represented at three scales:

LOCALITY SEGEMENT: An area of 400 by 400 meters is taken for purposes of comparison.

BLOCK: Within each locality segment, a typical residential block has been selected to allow comparison of land utilization (patterns, percentages, and densities).

DWELLING UNIT: Within each block, a typical self-contained unit for an individual, a family, or a group has been selected for comparison.

CASE STUDIES SURVEYED:

1. *CHU AN: Private, Very Low/Low Income, Traditional Rural House.*
2. *LU LIU: Private, Very Low/Low Income, Shanties.*
3. *HWA CHIANG: Public, Low/Moderately Low, 4-6 Stories Walk-Up Apartments.*
4. *NAN GI CHANG III: Public, Low/Moderately Low, 4-6 Stories Walk-Up Apartments.*
5. *NAN GI CHANG I: Public, Low/Moderately Low, 4-6 Stories Walk-Up Apartments.*
6. *CHEN HO: Public, Moderately Low/Middle Income, 2-3 Stories Walk-Up Apartments*
7. *TZU SHENG: Private, Moderately Low/Middle Income, Brick, Shop-Home.*

LOCATION OF CASE STUDIES

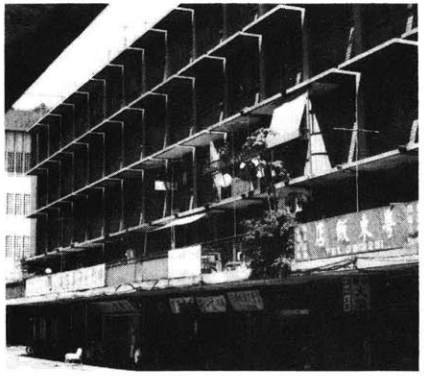
1 CHU AN

2 LU LIU

3 HUA CHIANG

4 NAN CHI CHANG III

5 NAN CHI CHANG I

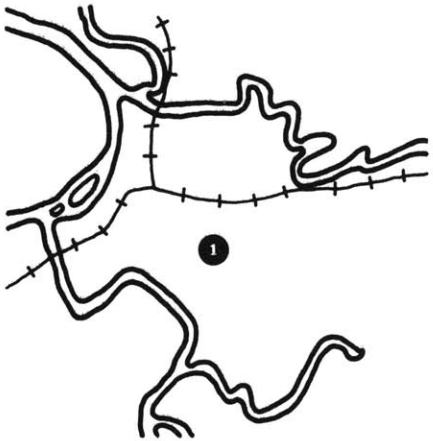


6 CHEN HO

7 TZU SHENG

1 CHU AN, TAIPEI

CASE STUDY



LOCATION: The case is located within Ta An District, in the southern part of the city.

ORIGINS: This area was originally developed for agricultural use in the latter half of nineteenth century by Lin Family those who immigrated from Fu-Kien Province of mainland China. For many years, they lived together as extended family in this place. But, by the influence of industrial age, no longer can the old patriarch dominate this environment. The unrelated or haphazard additions to the original house represent a breakdown of the shared image of the house. Today the house no longer functions as a single unit, many parts are occupied by unrelated strangers. Most parts of the land and dwelling became illegal after the city plan was established.

CHU AN, Taipei: (top left) The traditional rural dwelling environment contrasts with its modern high-rise neighbor.

(top right) This dwelling environment is a burden to the city because of low population density.

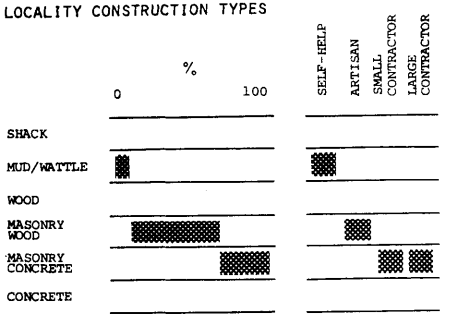
(bottom) This shows the original main house and its additions. The buildings in the background are middle income apartments.

0 50 100 150m

1:2500

LOCALITY SEGMENT PLAN

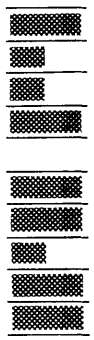
LOCALITY CONSTRUCTION TYPES



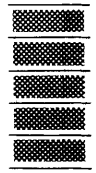
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



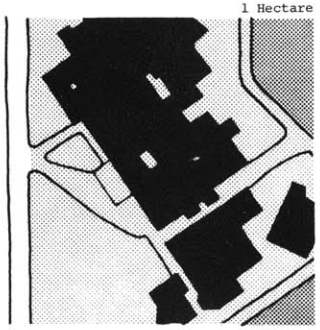
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

Selected locality block is marked with brackets.

LAND UTILIZATION DIAGRAMS

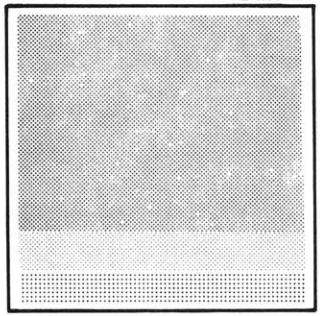
1 Hectare



PATTERN

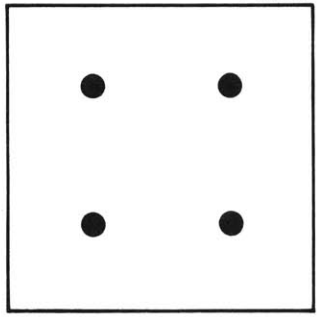
Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

1 Hectare



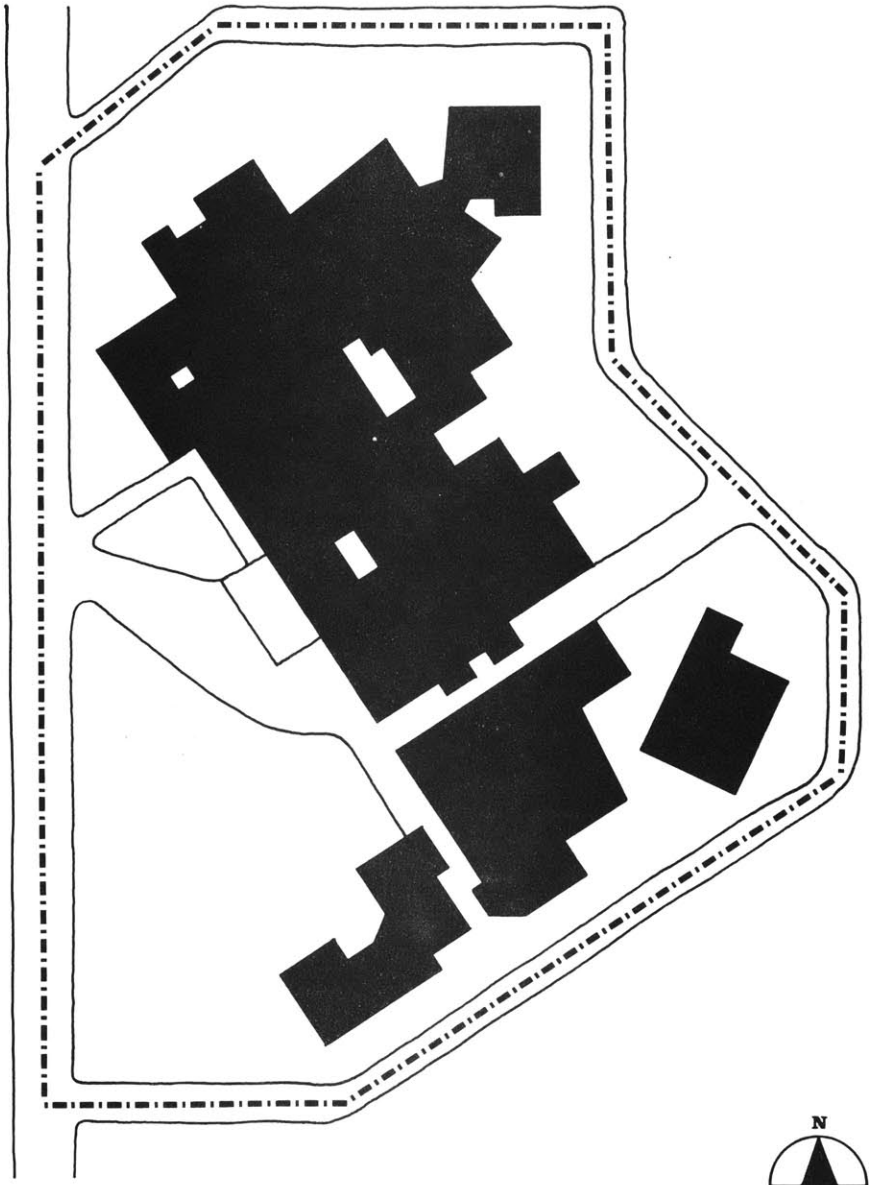
PERCENTAGES		
	Streets/Walkways	9%
	Playgrounds	11%
	Cluster Courts	11%
	Dwellings/Lots	69%

1 Hectare



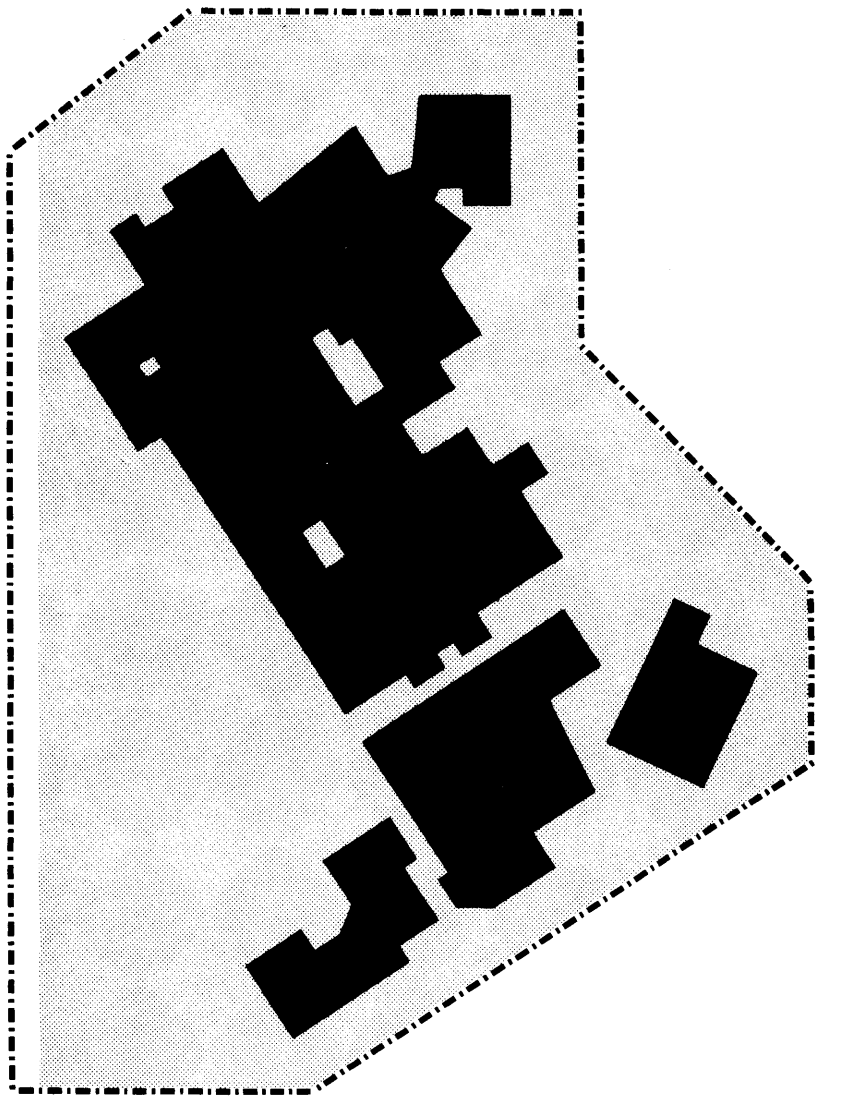
DENSITY Persons/Hectare 70

● 20 Persons



LOCALITY BLOCK PLAN

1:1000



LOCALITY BLOCK LAND UTILIZATION 1:1000

LOCALITY SEGMENT LAND UTILIZATION DATA

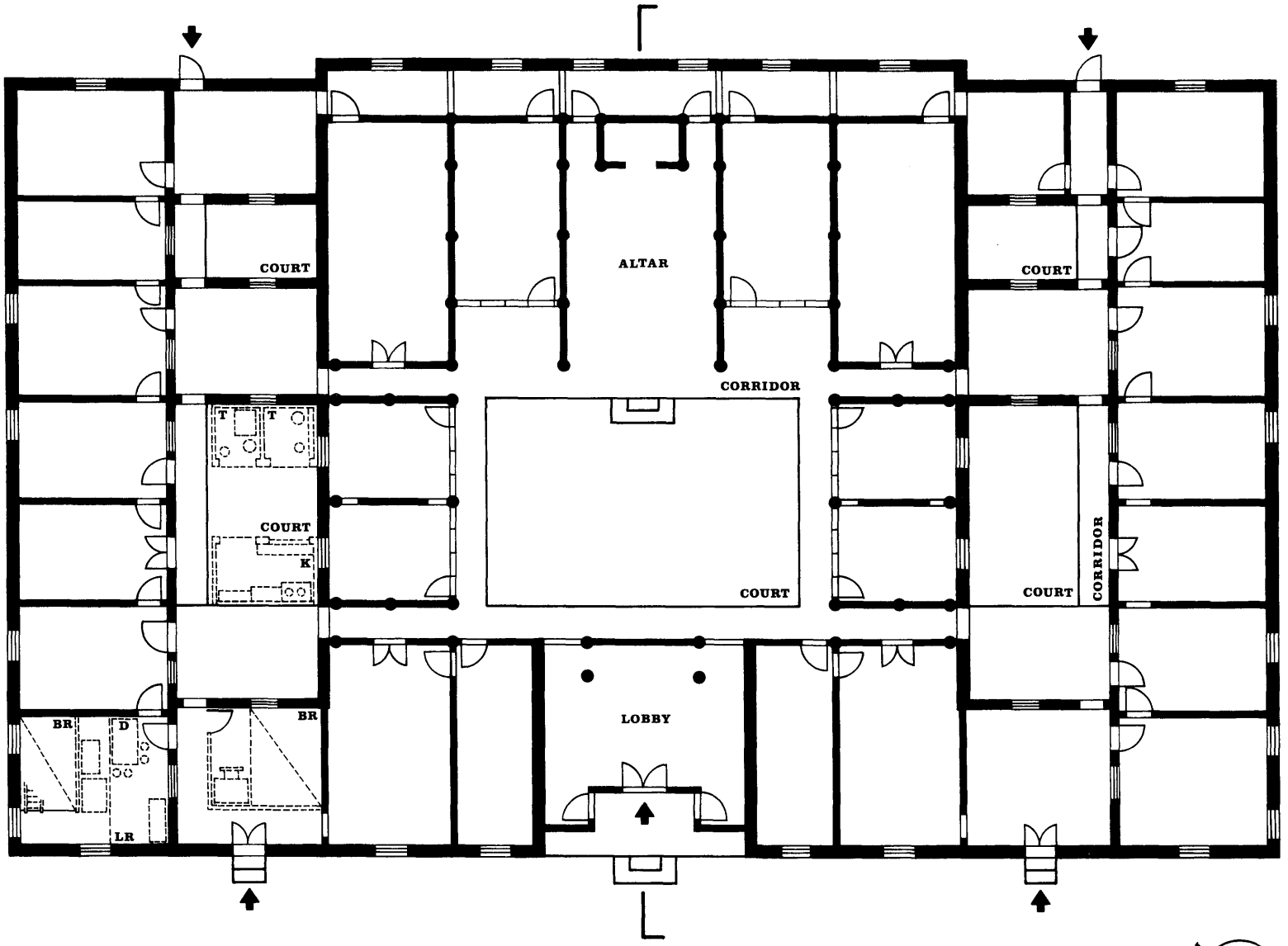
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	3	11.84	-
DWELLING UNITS	-	11.84	-
PEOPLE	825	11.84	70

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	1.07	9
SEMI-PUBLIC (open spaces, schools, community centers)	1.30	11
PRIVATE (dwellings, shops, factories, lots)	8.17	69
SEMI-PRIVATE (cluster courts)	1.30	11
TOTAL	11.84	100

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	1	1.05	-
DWELLING UNITS	-	1.05	-
PEOPLE	275	1.05	262

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.10	10
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.58	55
SEMI-PRIVATE (cluster courts)	0.37	35
TOTAL	1.05	100



PLAN

KEY

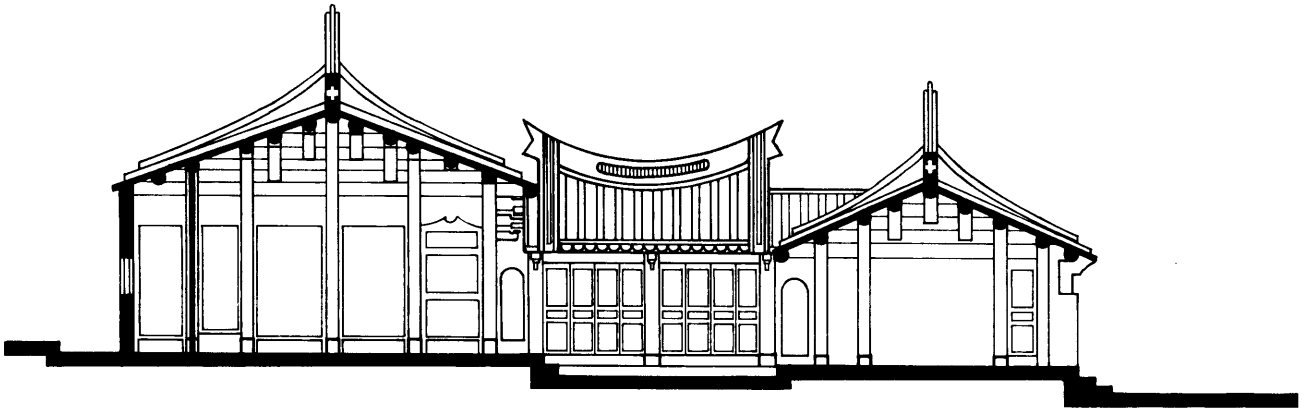
LR	Living Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Laundry
C	Closet
S	Storage
R	Room (multi-use)

N

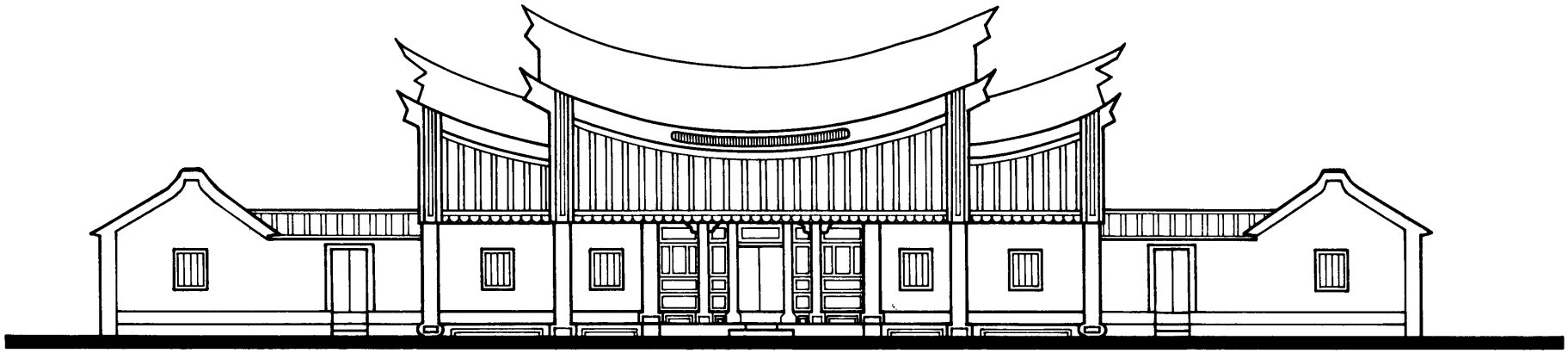
0 1 5 10m

1:200

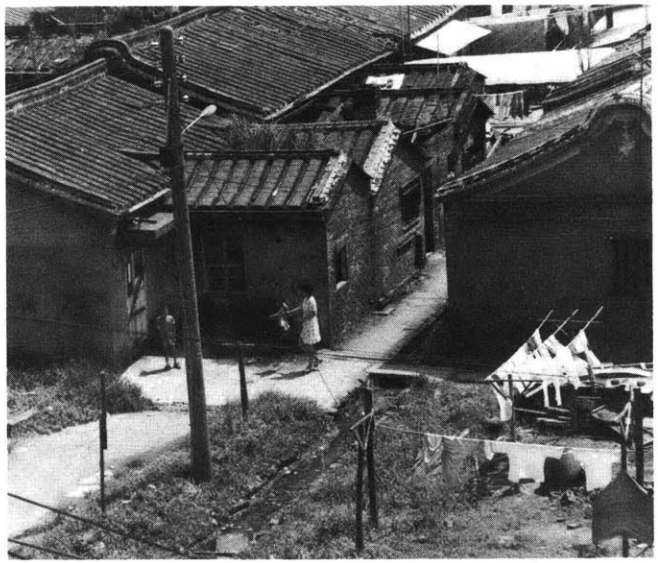
TYPICAL DWELLING

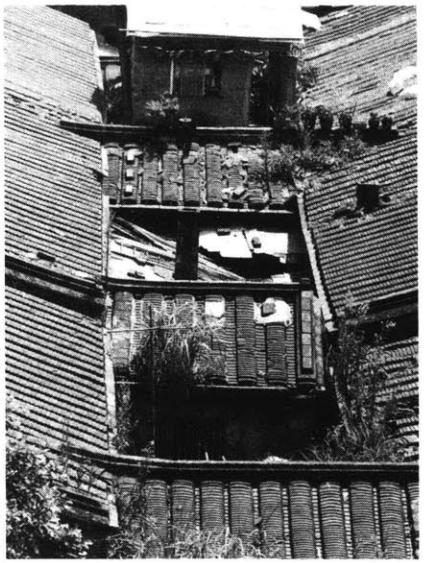


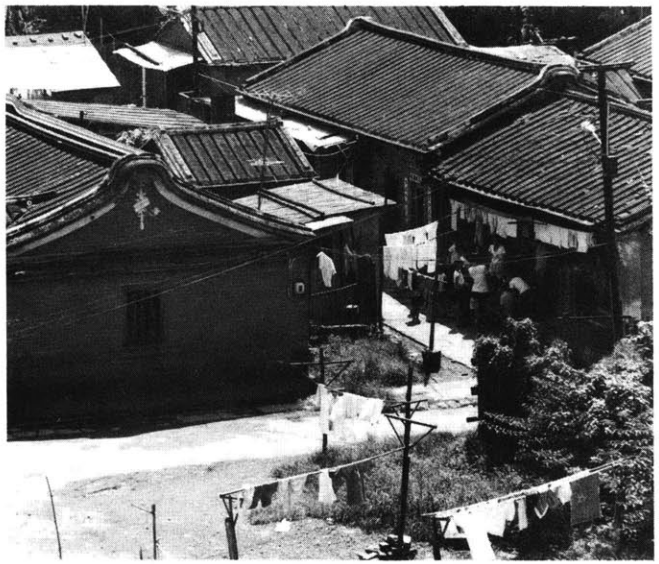
SECTION

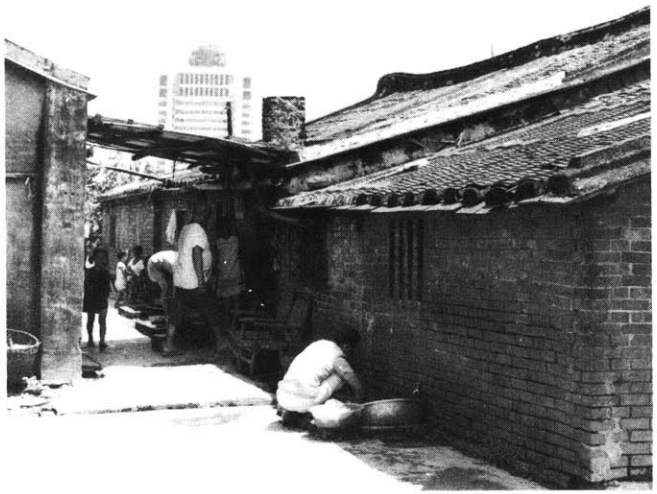


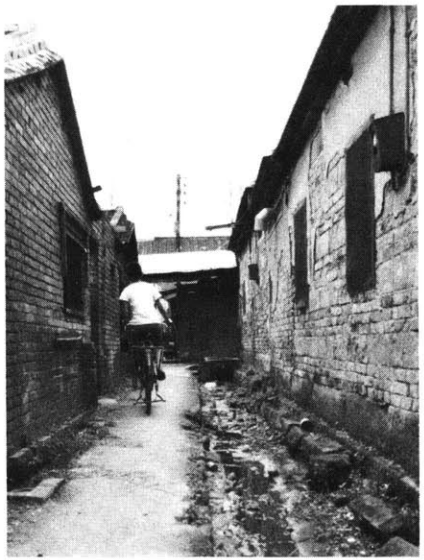
ELEVATION

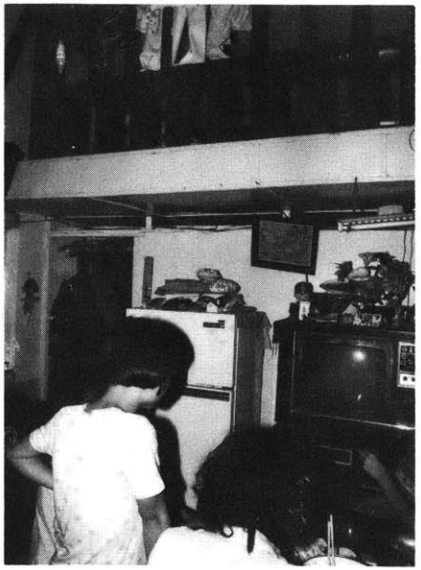












PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	HOUSE
area (sq m):	940
tenure:	LEGAL RENTAL/OWNERSHIP
LAND/LOT	
utilization:	PUBLIC/PRIVATE
area (sq m):	5800
tenure:	EXTRA LEGAL AND LEGAL RENTAL/OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	DETACHED
number of floors:	1
utilization:	SINGLE
physical state:	BAD
DWELLING DEVELOPMENT	
mode:	INCREMENTAL
developer:	PRIVATE
builder:	ARTISAN
construction type:	MUD/WATTLE, MASONRY/WOOD
year of construction:	1877
MATERIALS	
foundation:	CUT STONE
floors:	STONE, BRICK
walls:	WOOD, BRICK
roof:	WOOD, TILE
DWELLING FACILITIES	
wc:	2
shower:	2
kitchen:	6
rooms:	27
other:	NONE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	FU KIEN PROVINCE
place of birth:	TAIWAN
education level:	PRIMARY SCHOOL
NUMBER OF USERS	
married:	21
single:	11
children:	15
total:	47
MIGRATION PATTERN	
number of moves:	0
rural - urban:	-
urban - urban:	-
urban - rural:	-
why came to urban area:	-
GENERAL: ECONOMIC	
user's income group:	VERY LOW
employment:	LABOR
distance to work:	1 KM
mode of travel:	WALK
COSTS	
dwelling unit:	N.A.
land - market value:	$366/M^2
DWELLING UNIT PAYMENTS	
financing:	PRIVATE
rent/mortgage:	$22/MONTH
% income for rent/mortgage:	19%

CHU AN, Taipei: (opposite top row) Aerial views of the community.

(opposite bottom row) Utilities and services in this community are provided at minimum level.

(left) Interior court has been partially covered for additional bathrooms.

(center) Very intensive use of interior space can always be found.

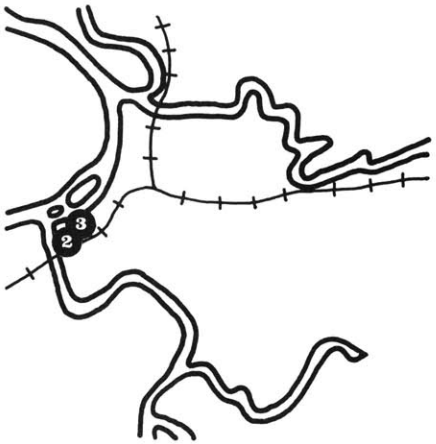
(right) Old traditional generation contrasts with new western generation.

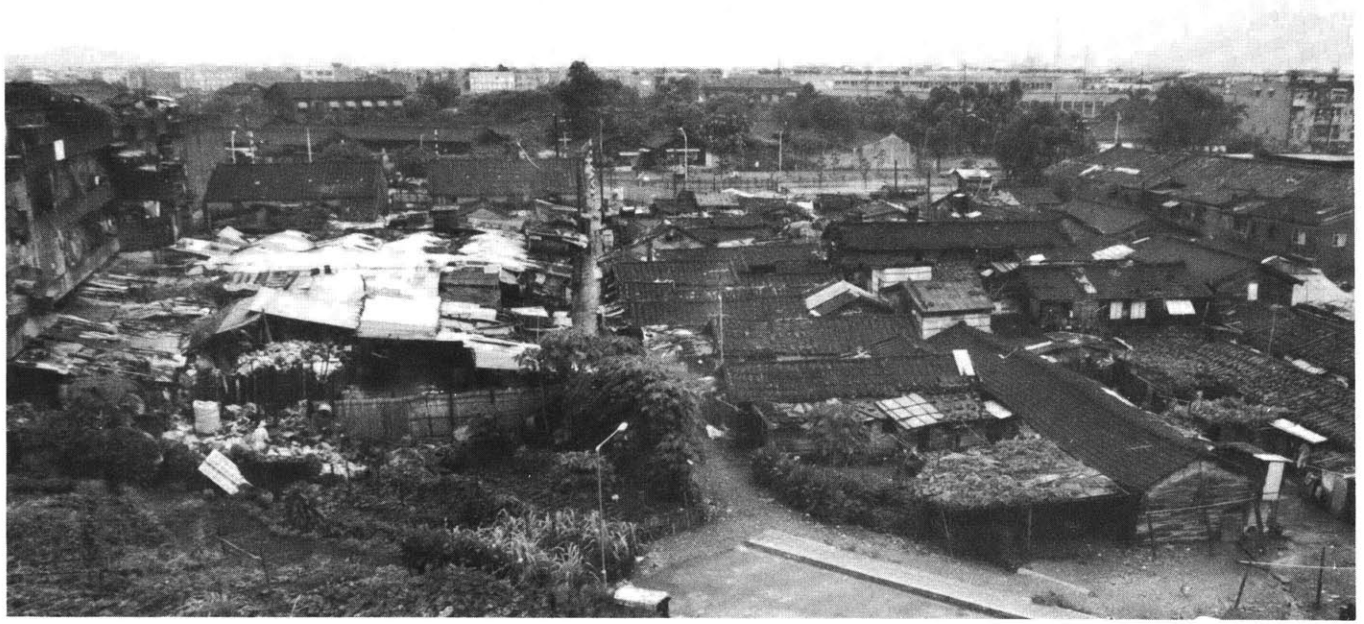
CASE STUDY SOURCES

Locality Segment Plan:	*(accurate) City of Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(accurate) A Survey of Traditional Architecture of Taiwan, Dillingham, R., 1971.*
Locality Block Land Utilization:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID.*
Physical Data:	*(approximate) Field Surveys, 1975.*
Socio-Economic Data:	*(approximate) IBID.*
Photographs:	*Author.*
General Information:	*A Survey of Traditional Architecture of Taiwan, Dillingham, R., 1971. Field Surveys, 1975.*

2 LU LIU, TAIPEI
3 HUA CHIANG, TAIPEI

CASE STUDY



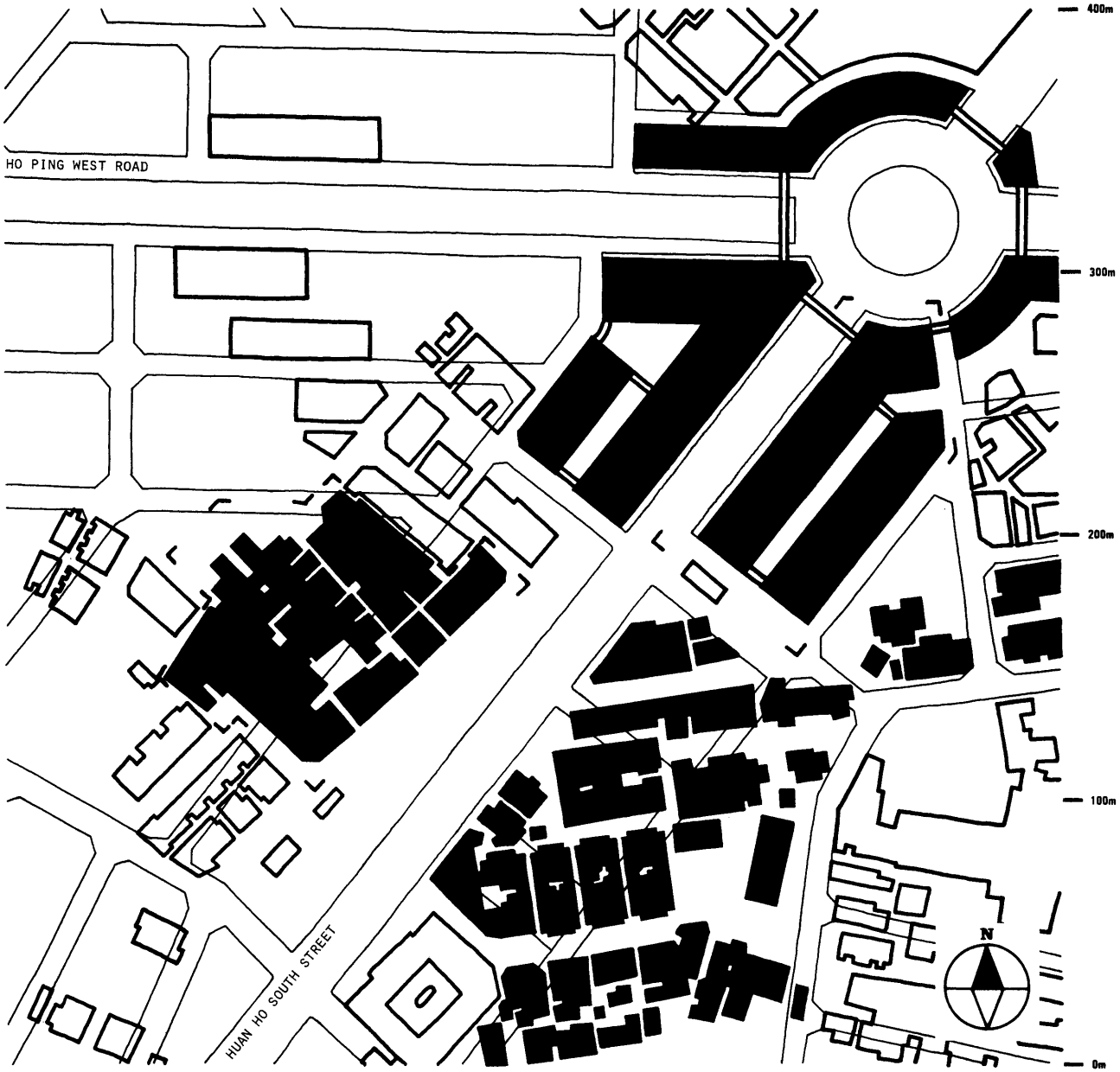


LOCATION: The cases are adjacent to the Hua Chiang bridge in the southwestern part of the city, within Shuang Yuan District.

ORIGINS: This area was originally subject to flood, and was just for agriculture use. As urbanization began, it was occupied by squatter's settlements. Thousands of squatter families lived in this area with less utilities and services. They were also threatened by floods during typhoon seasons. In 1963, the City Government rebuilt the surrounding bank which solved the flooding problem. In 1971, the City Government started a renewal program, about 12.7 hectare of land had been planned and redeveloped in this area. The first stage of this program was completed in 1974.

LU LIU, Taipei: (top) This is an overall view of Lu Liu squatter settlement. It shows that a lot of capital has already been invested in this area.

HUA CHIANG, Taipei: (bottom) surrounding the rotary are government built walk-up apartments. A mix of commercial and residential development occupies the first two floors.

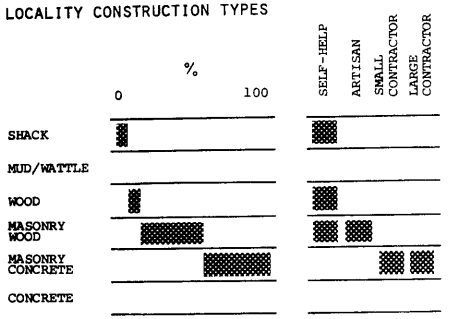


0 50 100 150m

1:2500

LOCALITY SEGMENT PLAN

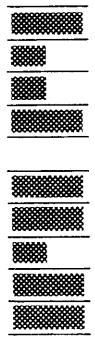
LOCALITY CONSTRUCTION TYPES



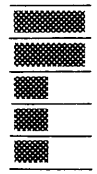
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



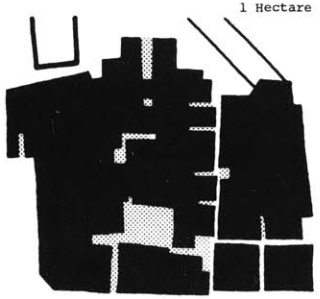
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

Selected locality blocks are marked with brackets. The block for locality 2 is on the low left, the block for locality 3 is on the upper right.

LAND UTILIZATION DIAGRAMS

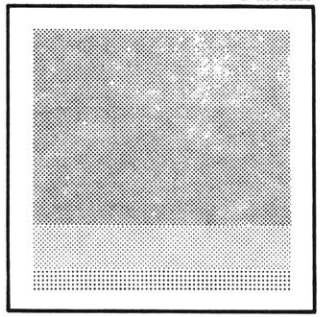
1 Hectare



PATTERN

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

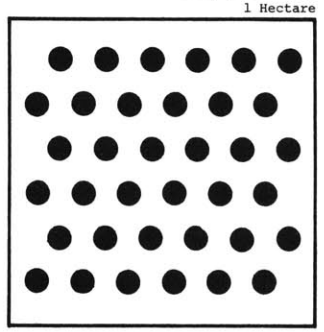
1 Hectare



PERCENTAGES

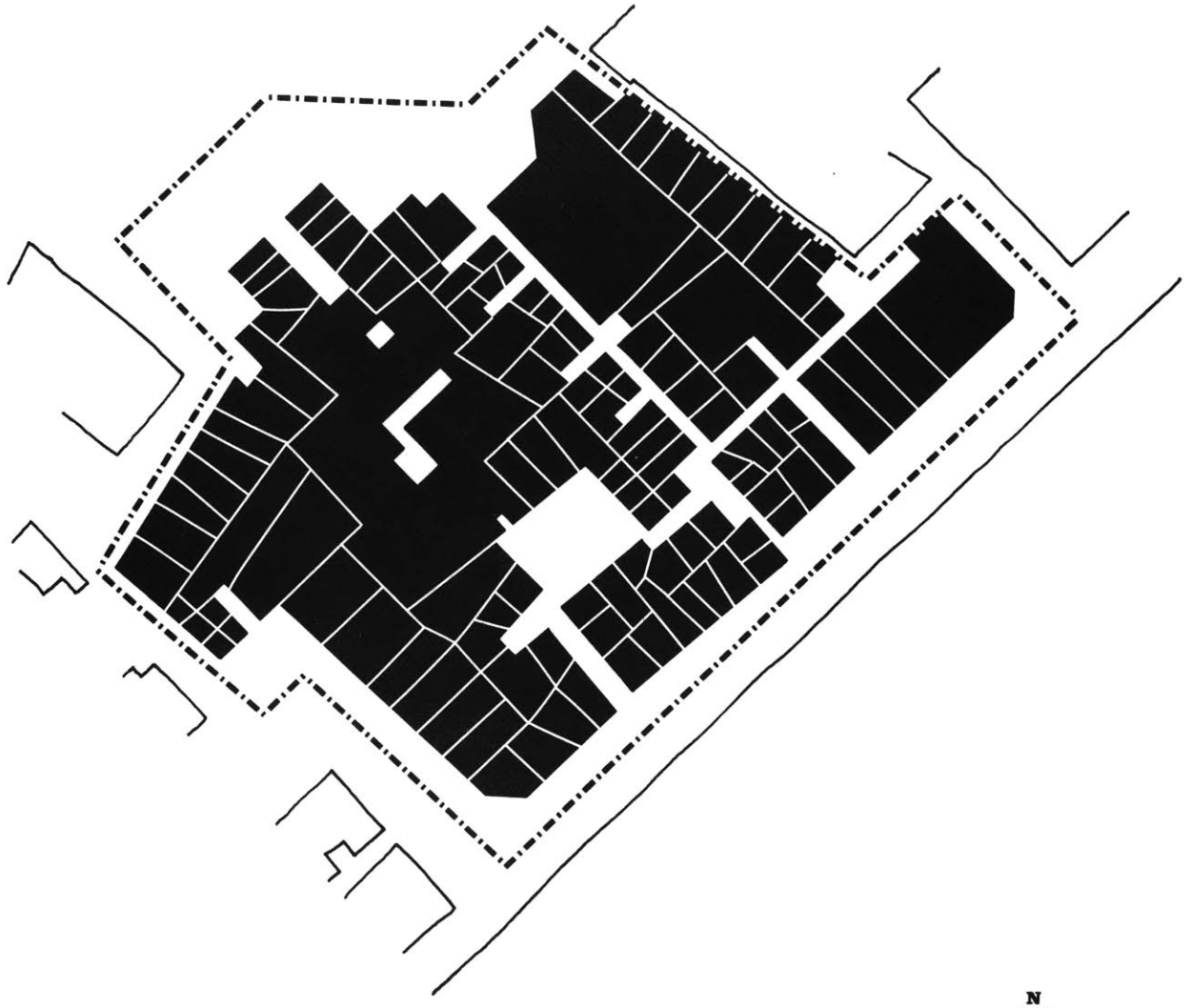
Streets/Walkways	29%
Playgrounds	6%
Cluster Courts	12%
Dwellings/Lots	53%

1 Hectare



DENSITY Persons/Hectare 715

● 20 persons

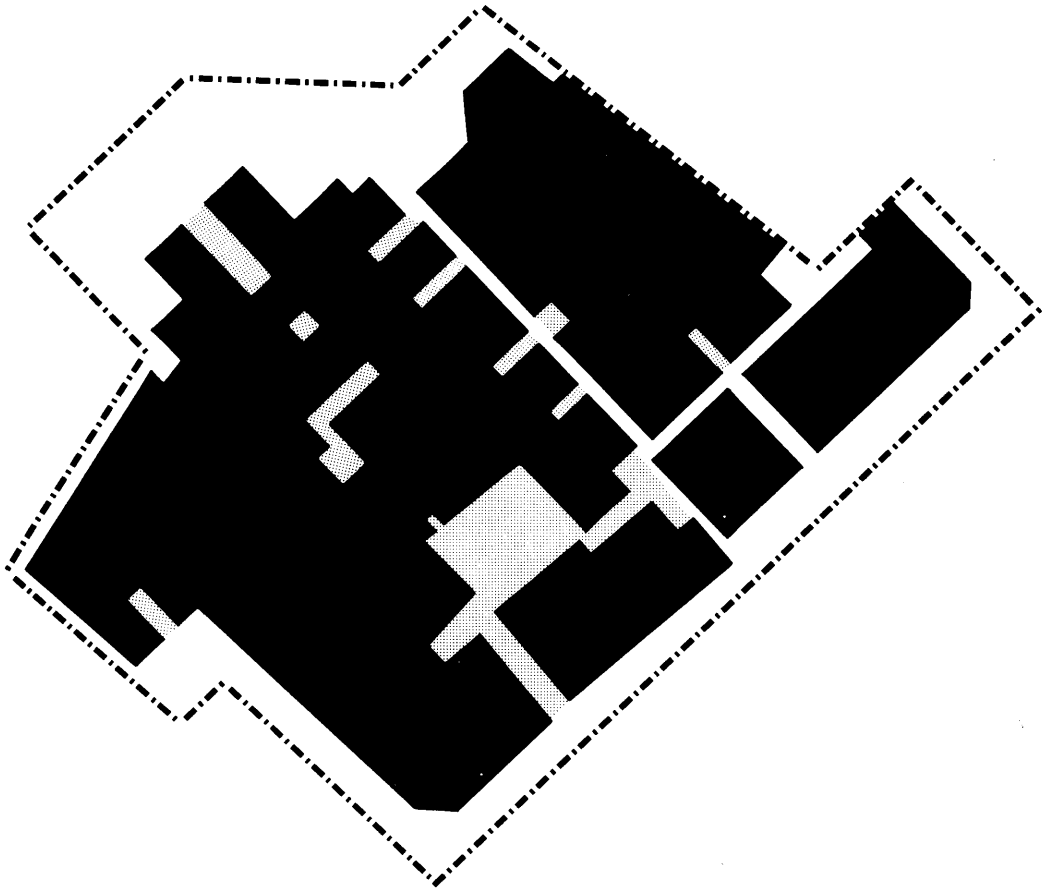


LOCALITY BLOCK PLAN

N

0 10 50m

1:1000



LOCALITY BLOCK LAND UTILIZATION

1:1000

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	726	5.08	143
DWELLING UNITS	726	5.08	143
PEOPLE	3,630	5.08	715

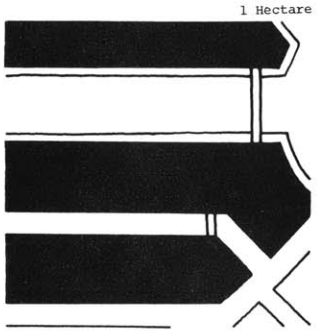
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	1.47	29
SEMI-PUBLIC (open spaces, schools, community centers)	0.31	6
PRIVATE (dwellings, shops, factories, lots)	2.69	53
SEMI-PRIVATE (cluster courts)	0.61	12
TOTAL	5.08	100

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	149	0.84	177
DWELLING UNITS	149	0.84	177
PEOPLE	963	0.84	1,146

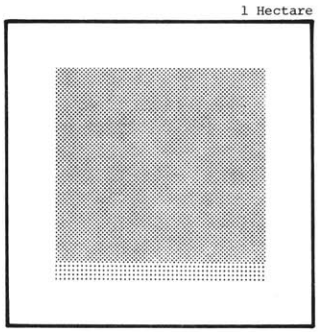
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.13	15
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.63	75
SEMI-PRIVATE (cluster courts)	0.08	10
TOTAL	0.84	100

LAND UTILIZATION DIAGRAMS

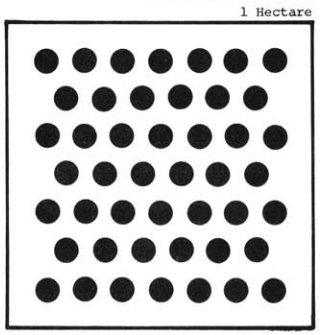


PATTERN

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

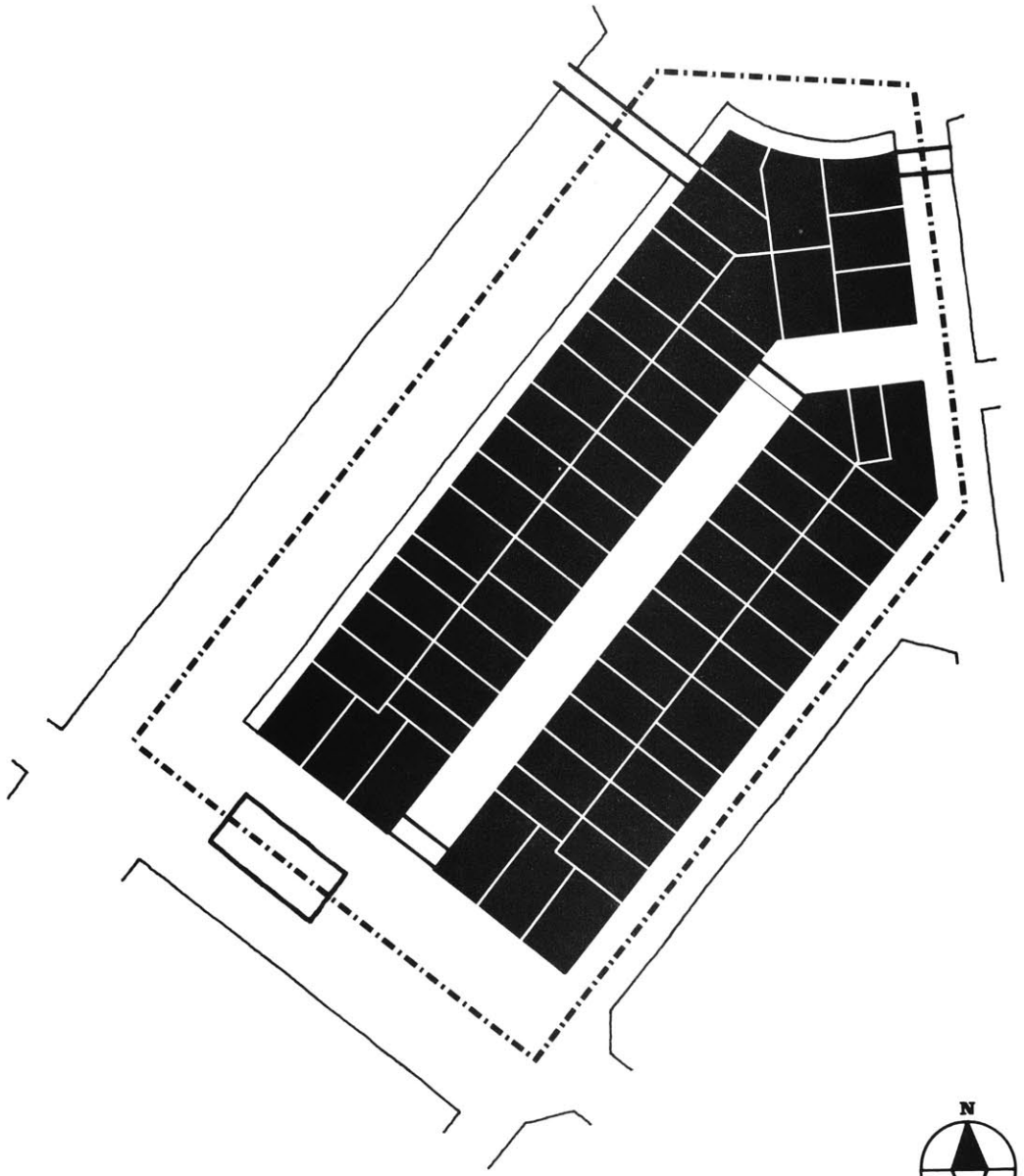


PERCENTAGES		
	Streets/Walkways	53%
	Playgrounds	4%
	Cluster Courts	0%
	Dwellings/Lots	43%



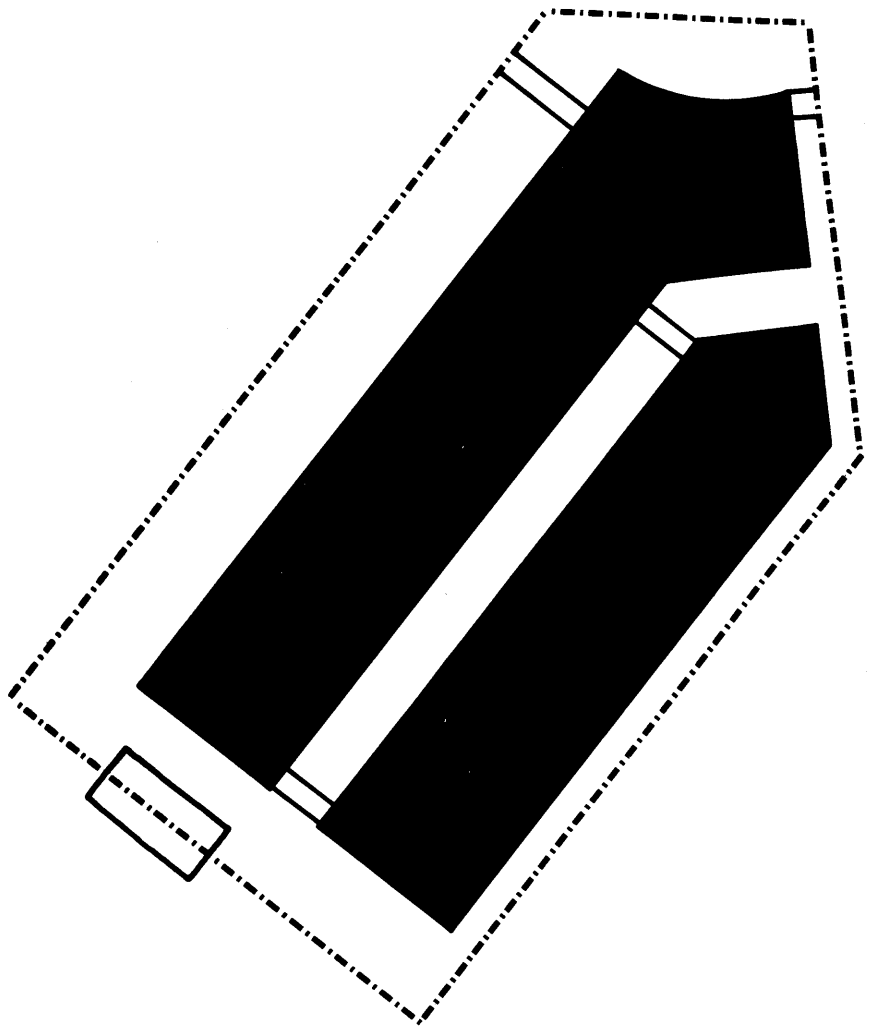
DENSITY Persons/Hectare 922

● 20 persons



LOCALITY BLOCK PLAN

1:1000



LOCALITY BLOCK LAND UTILIZATION 1:1000

LOCALITY SEGMENT LAND UTILIZATION DATA

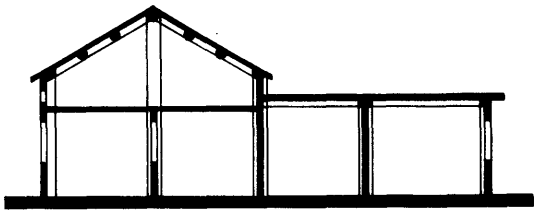
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	7	3.25	-
DWELLING UNITS	473	3.25	146
PEOPLE	2,996	3.25	922

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	1.72	53
SEMI-PUBLIC (open spaces, schools, community centers)	0.13	4
PRIVATE (dwellings, shops, factories, lots)	1.40	43
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	3.25	100

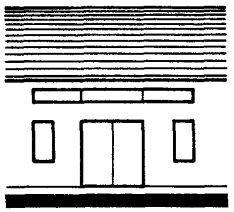
LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	2	0.83	-
DWELLING UNITS	178	0.83	214
PEOPLE	890	0.83	1,072

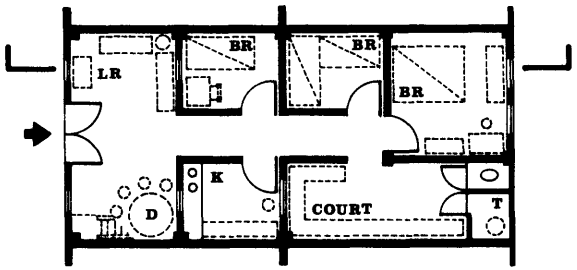
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.38	46
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.45	54
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	0.83	100



SECTION



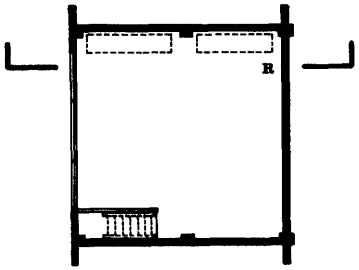
ELEVATION



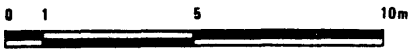
FIRST FLOOR PLAN

KEY

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

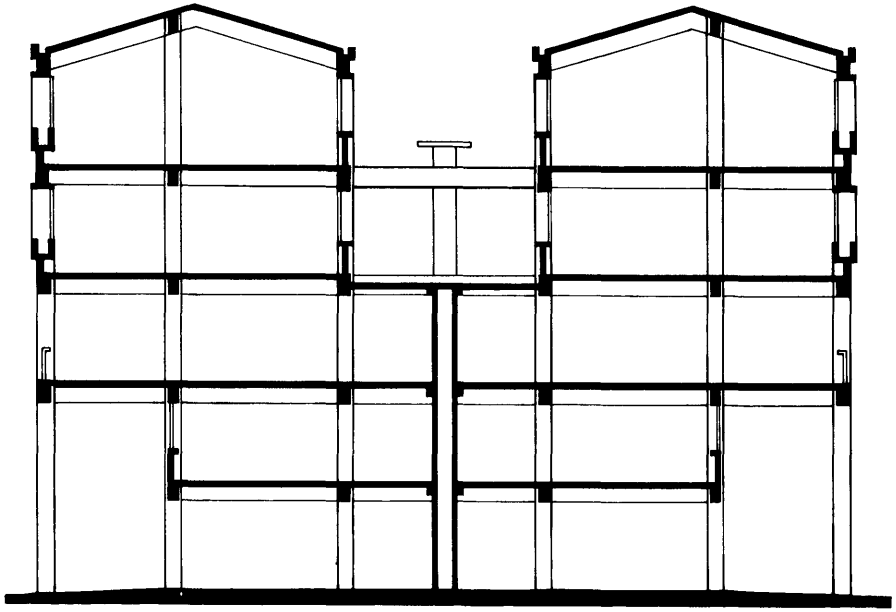


SECOND FLOOR PLAN



1:200

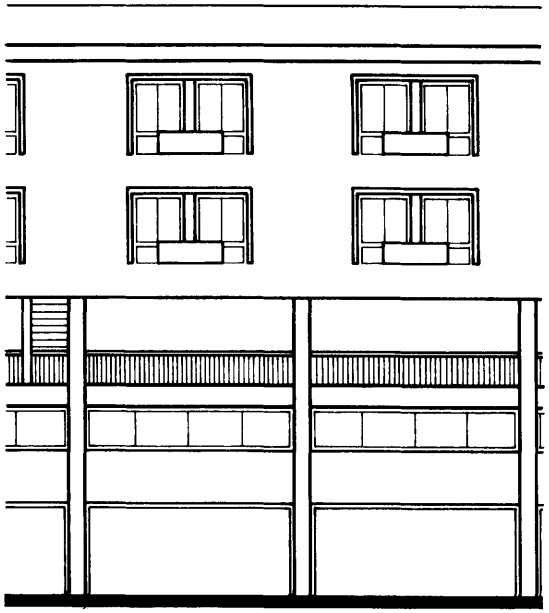
TYPICAL DWELLING



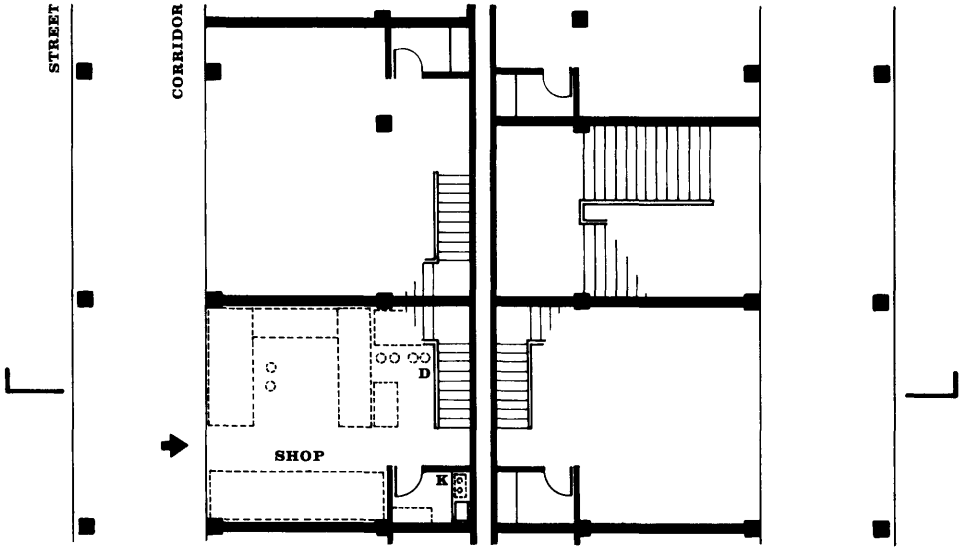
SECTION

KEY

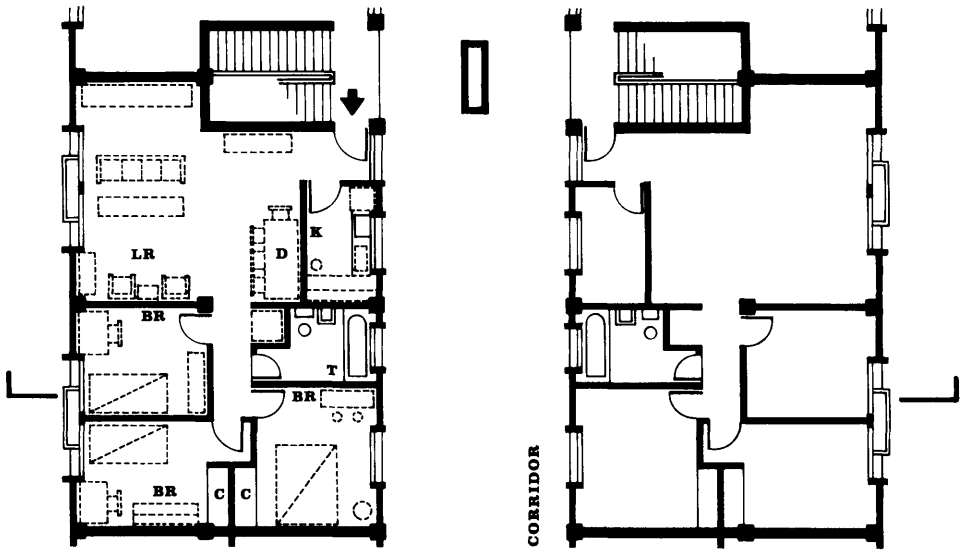
LR	Living Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Laundry
C	Closet
S	Storage
R	Room (multi-use)



ELEVATION



FIRST FLOOR PLAN



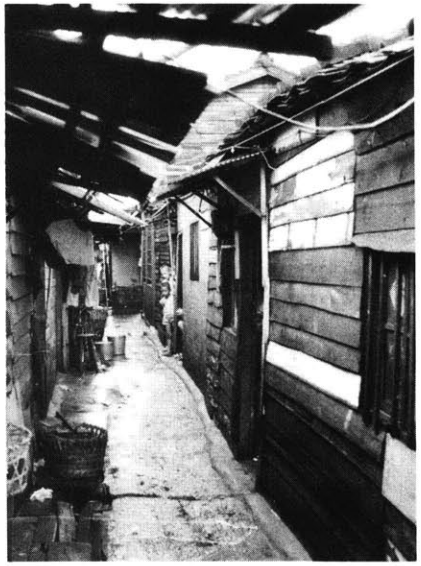
UPPER FLOOR PLAN

0 1 5 10m

1:200

N

TYPICAL DWELLING



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	SHANTY
area (sq m):	36
tenure:	LEGAL RENTAL/OWNERSHIP
LAND/LOT	
utilization:	PUBLIC
area (sq m):	42
tenure:	EXTRA LEGAL RENTAL/OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	ROW/GROUPED
number of floors:	1, 2
utilization:	MULTIPLE
physical state:	BAD
DWELLING DEVELOPMENT	
mode:	INCREMENTAL
developer:	PRIVATE
builder:	SELF-HELP
construction type:	WOOD, MASONRY
year of construction:	1950
MATERIALS	
foundation:	BRICK
floors:	BRICK
walls:	WOOD, BRICK
roof:	WOOD, TILE
DWELLING FACILITIES	
wc:	1
shower:	1
kitchen:	1
rooms:	5
other:	NONE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	FU KIEN PROVINCE
place of birth:	TAIWAN
education level:	PRIMARY SCHOOL
NUMBER OF USERS	
married:	2
single:	0
children:	3
total:	5
MIGRATION PATTERN	
number of moves:	1
rural - urban:	1948
urban - urban:	-
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	VERY LOW
employment:	LABOR
distance to work:	5 KM
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	N.A.
land - market value:	$320/M^2
DWELLING UNIT PAYMENTS	
financing:	PRIVATE
rent/mortgage:	$19/MONTH
% income for rent/mortgage:	20%

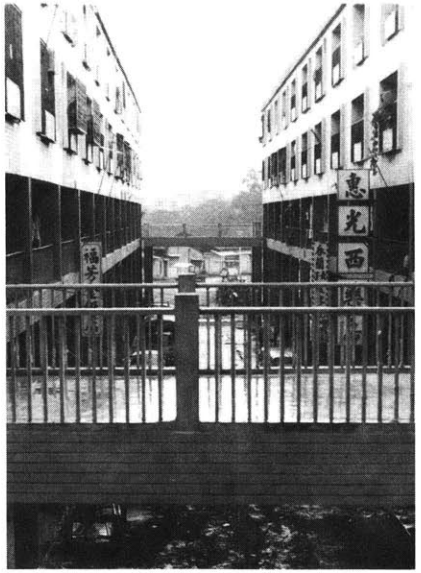
LU LIU, Taipei: (left) Utilities and services are provided at minimum level as shown by a commual standpipe and two garbage containers.

(center) Very narrow alleys function as the main access and playground in Lu Liu community.

(right) Television antennas are very common even in the squatter area.

CASE STUDY SOURCES

Locality Segment Plan:	*(accurate) City of Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(approximate) IBID.*
Locality Block Land Utilization:	*(approximate) IBID.*
Typical Dwelling:	*(approximate) Field Surveys, 1975.*
Physical Data:	*(approximate) IBID.*
Socio-Economic Data:	*(approximate) IBID.*
Photographs:	*Author*
General Information:	*"Survey of Ai Shen and Lu Liu Community in Taipei", C.C.D.R.T., 1972.* *Field Surveys, 1975.*



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	APARTMENT
area (sq m):	84
tenure:	LEGAL OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	2250
tenure:	LEGAL OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	WALK-UP
number of floors:	5
utilization:	MULTIPLE
physical state:	GOOD
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PUBLIC
builder:	LARGE CONTRACTOR
construction type:	MASONRY/CONCRETE
year of construction:	1974
MATERIALS	
foundation:	CONCRETE
floors:	CONCRETE
walls:	BRICK
roof:	CONCRETE
DWELLING FACILITIES	
wc:	1
shower:	1
kitchen:	1
rooms:	?
other:	NONE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	KIANG SU PROVINCE
place of birth:	MAINLAND CHINA
education level:	MIDDLE SCHOOL
NUMBER OF USERS	
married:	4
single:	0
children:	3
total:	7
MIGRATION PATTERN	
number of moves:	2
rural - urban:	1954
urban - urban:	1975
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	LOW/MODERATELY LOW
employment:	GROCER
distance to work:	0
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	$5,000
land - market value:	$320/M^2
DWELLING UNIT PAYMENTS	
financing:	PUBLIC SUBSIDIZED
rent/mortgage:	$35/MONTH
% income for rent/mortgage:	19%

HUA CHIANG, Taipei: (left) The buildings provide mixed residential and commercial use in first and second floors. Upper floors are apartments facing a central court.

(center) Bridges are used to connect each building.

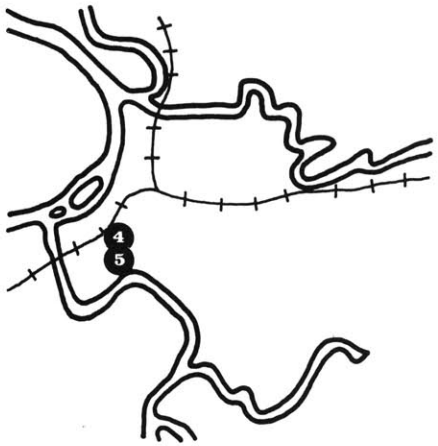
(right) Corridors are used for playing, drying clothes, etc.

CASE STUDY SOURCES

Locality Segment Plan:	*(accurate) City of Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(accurate) Department of Housing, Taipei City Government.*
Locality Block Land Utilization:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID.*
Physical Data:	*(approximate) Field Surveys, 1975.*
Socio-Economic Data:	*(approximate) IBID.*
Photographs:	*Author*
General Information:	*Field Surveys, 1975.*

4 NAN CHI CHANG III, 5 NAN CHI CHANG I, TAIPEI

CASE STUDY

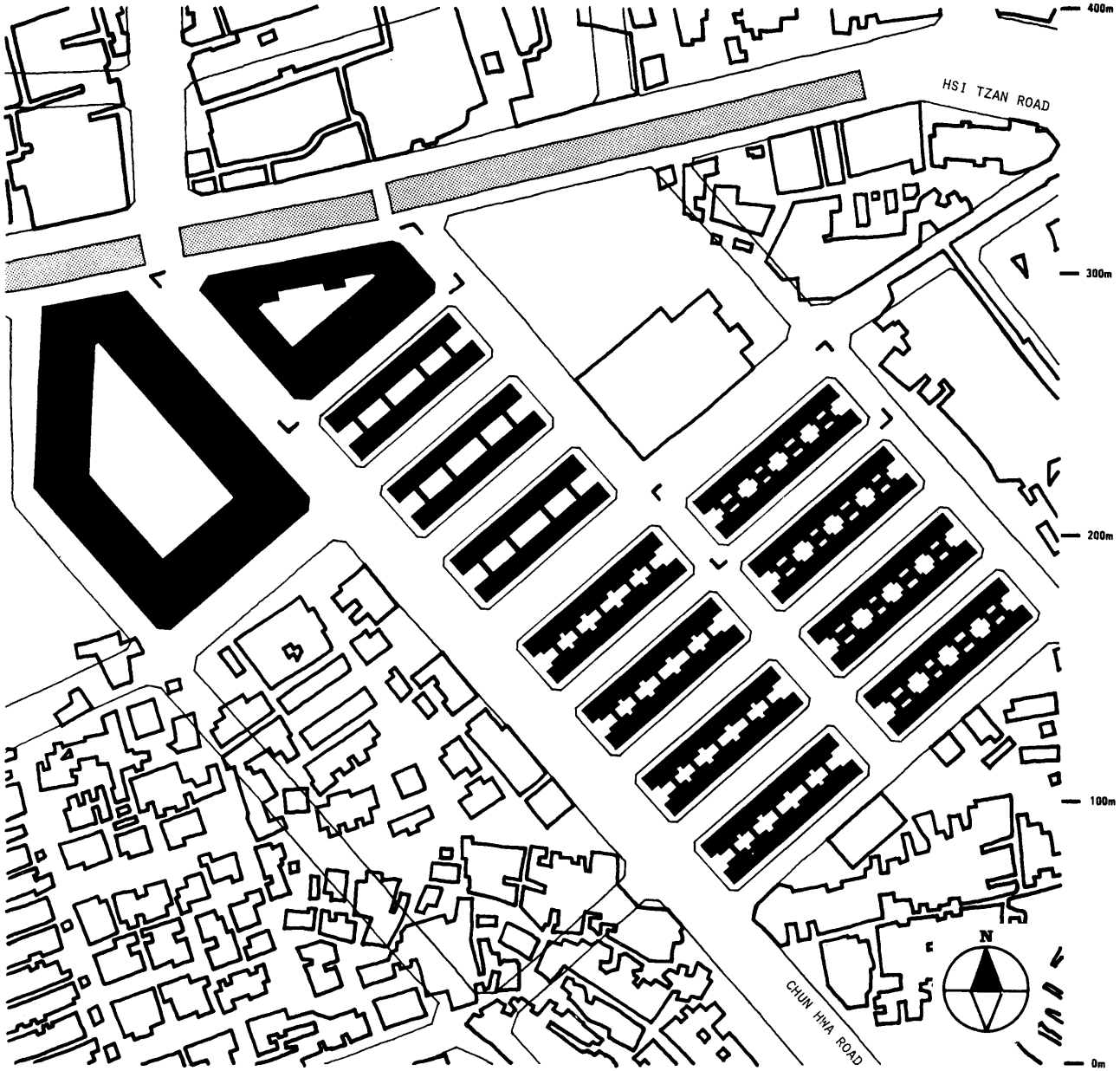


LOCATION: The cases are within Kuting District, in the southwestern part of the city.

ORIGINS: This area, originally was occupied by the biggest squatter settlement of the city. In 1964, Taipei City Government started its first stage of a renewal program and built eleven five-story apartments to settle squatter families. In 1968, the second stage was completed and a five-story apartment with central court was built. The third stage was completed in 1971, with a design similar to the second stage.

NAN CHI CHANG III, Taipei: (top) six stories walk-up with central court is the main feature of this case. Mixed commercial and residential development occupies the first floor. In the right is a similar designed building of Nan Chi Chang phase II.

NAN CHI CHANG I, Taipei: (bottom) aligned along streets are 11 five stories walk-up apartments. Some families have invaded the rain shields and balconies.

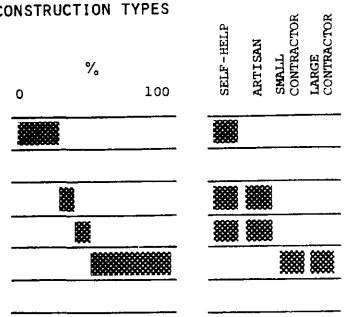


0 50 100 150m

1:2500

LOCALITY SEGMENT PLAN

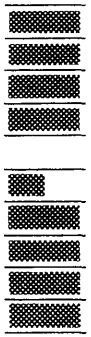
LOCALITY CONSTRUCTION TYPES



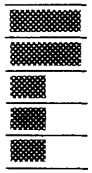
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



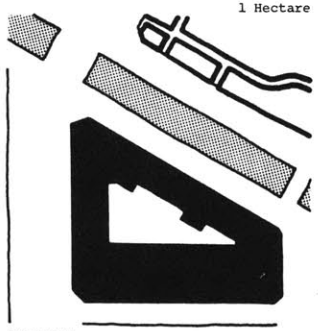
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

Selected locality blocks are marked with brackets. The block for locality 4 is on the upper left, the block for locality 5 is on the low right.

LAND UTILIZATION DIAGRAMS

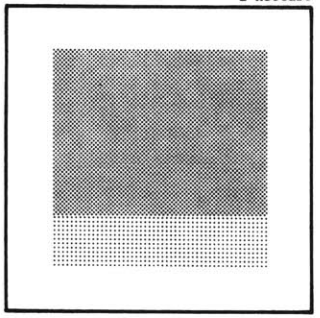
1 Hectare



PATTERN

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

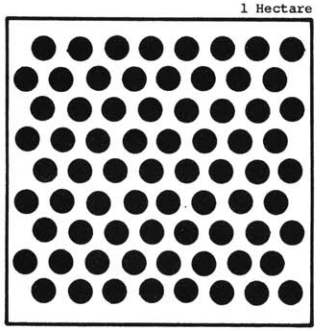
1 Hectare



PERCENTAGES

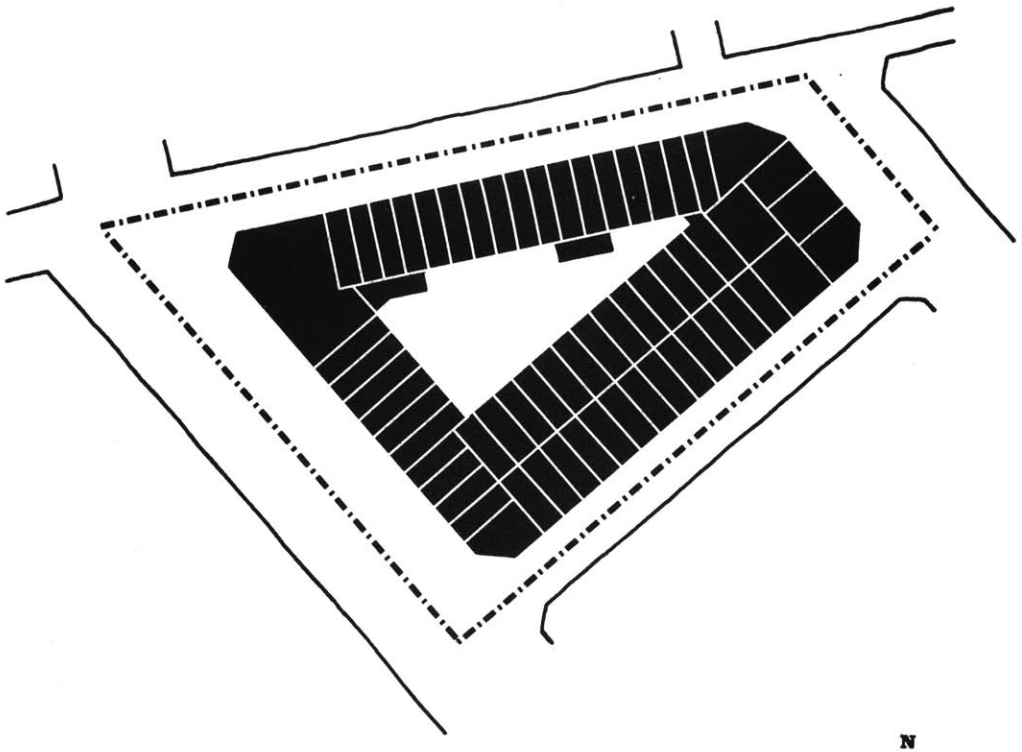
Streets/Walkways	51%
Playgrounds	12%
Cluster Courts	0%
Dwellings/Lots	37%

1 Hectare



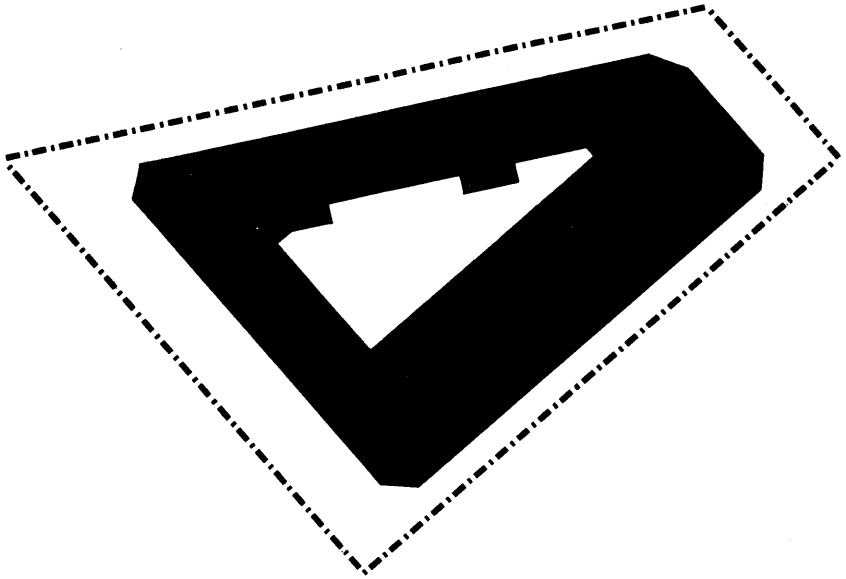
DENSITY Persons/Hectare 1,437

● 20 persons



1:1000

LOCALITY BLOCK PLAN



N

0 10 50m

1:1000

LOCALITY BLOCK LAND UTILIZATION

LOCALITY SEGMENT LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	13	7.52	-
DWELLING UNITS	2,105	7.52	280
PEOPLE	10,806	7.52	1,437

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	3.84	51
SEMI-PUBLIC (open spaces, schools, community centers)	0.90	12
PRIVATE (dwellings, shops, factories, lots)	2.78	37
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	7.52	100

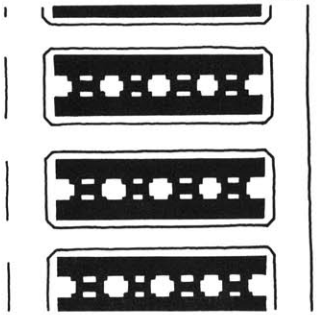
LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	1	0.41	-
DWELLING UNITS	262	0.41	639
PEOPLE	1,310	0.41	3,195

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.19	46
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.22	54
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	0.41	100

LAND UTILIZATION DIAGRAMS

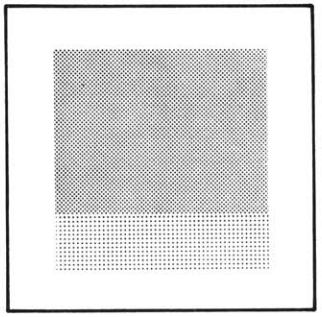
1 Hectare



PATTERN

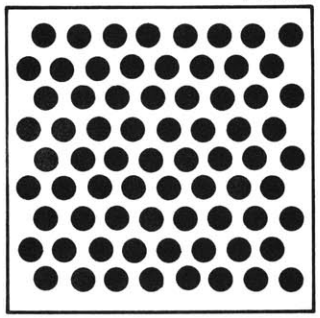
Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

1 Hectare



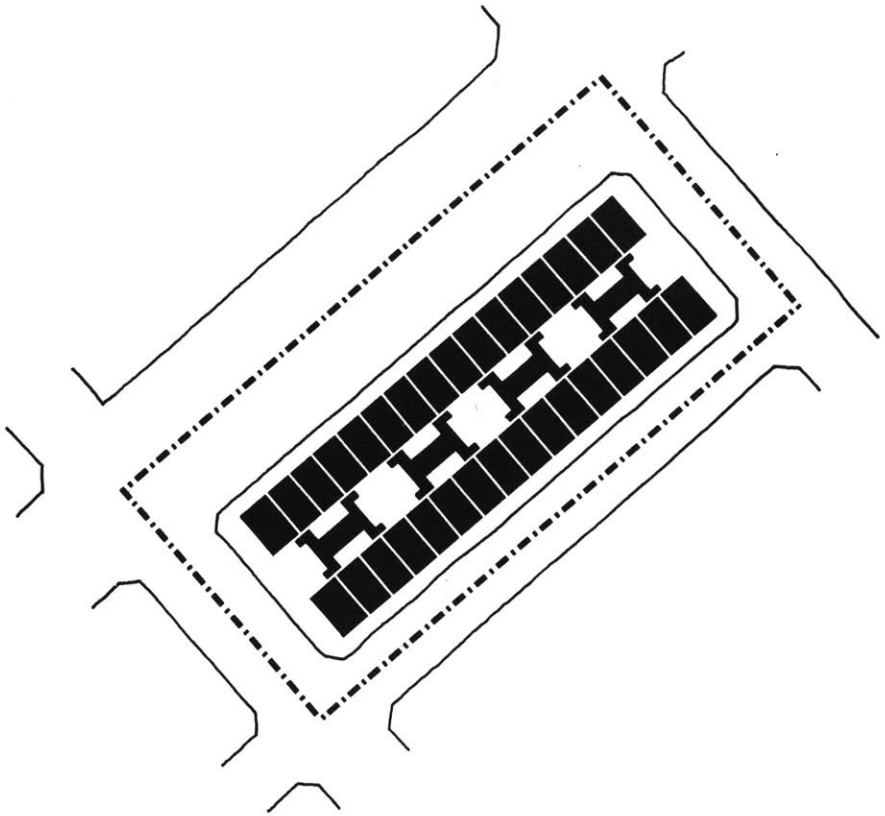
PERCENTAGES		
	Streets/Walkways	51%
	Playgrounds	12%
	Cluster Courts	0%
	Dwellings/Lots	37%

1 Hectare



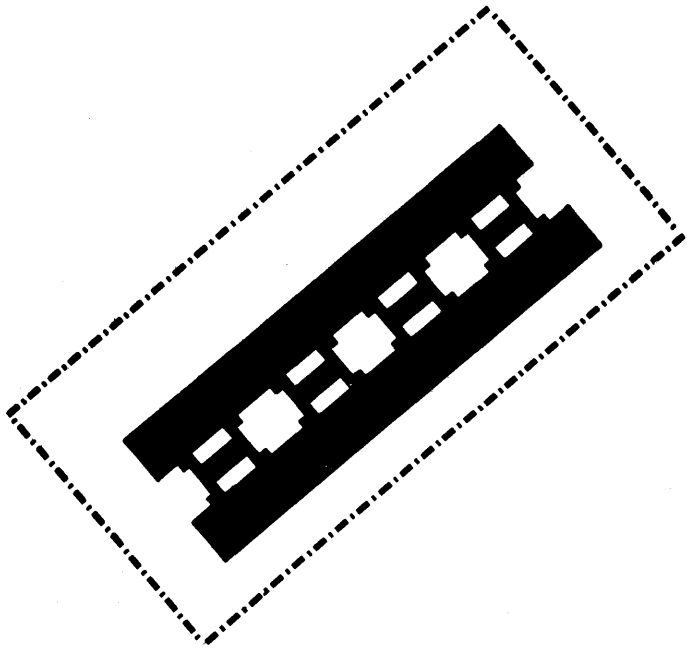
DENSITY Persons/Hectare 1,437

● 20 persons

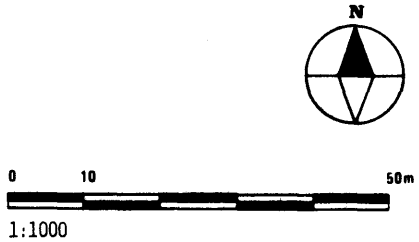


LOCALITY BLOCK PLAN

1:1000



LOCALITY BLOCK LAND UTILIZATION



LOCALITY SEGMENT LAND UTILIZATION DATA

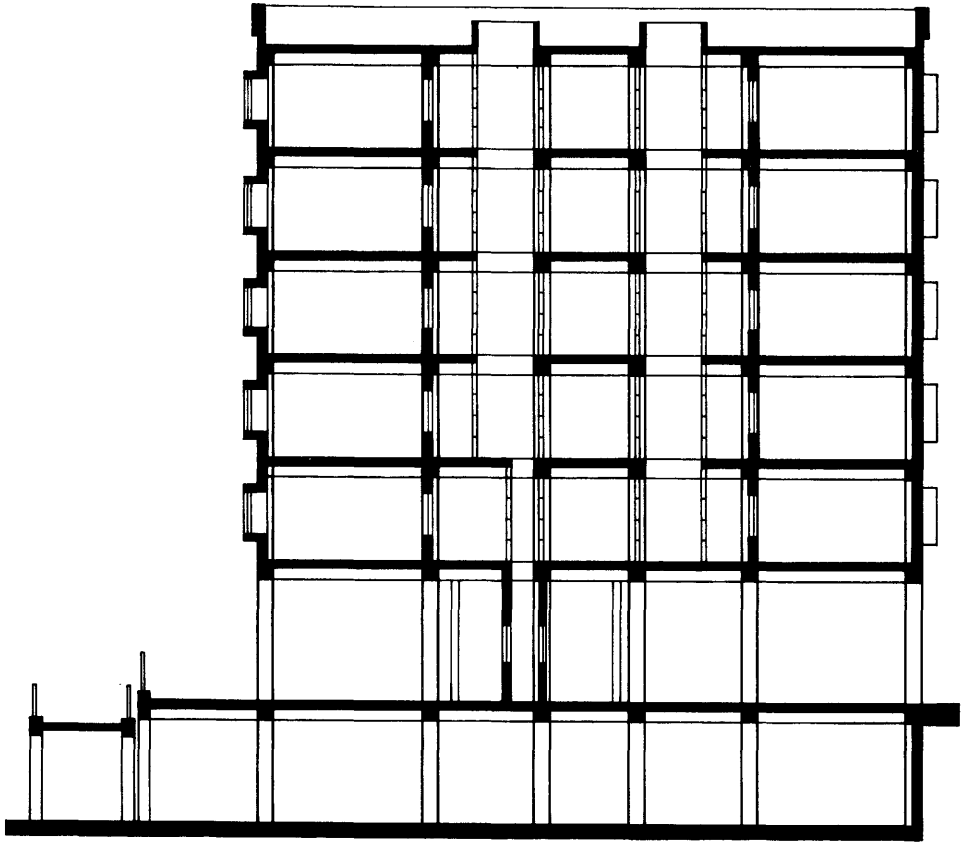
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	13	7.52	-
DWELLING UNITS	2,105	7.52	280
PEOPLE	10,806	7.52	1,437

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	3.84	51
SEMI-PUBLIC (open spaces, schools, community centers)	0.90	12
PRIVATE (dwellings, shops, factories, lots)	2.78	37
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	7.52	100

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	2	0.32	-
DWELLING UNITS	158	0.32	494
PEOPLE	790	0.32	2,469

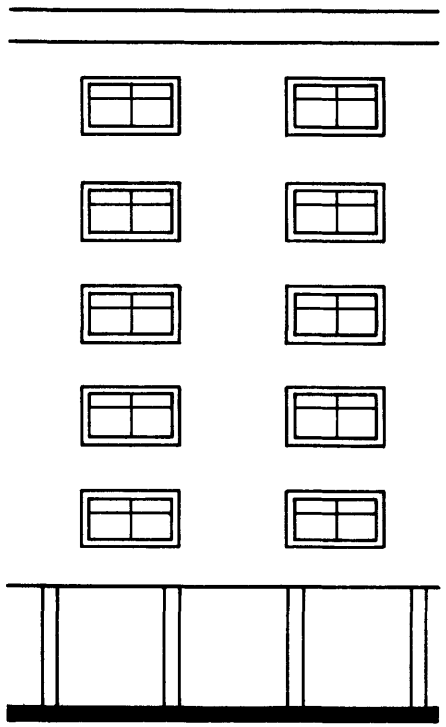
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.21	65
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.11	35
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	0.32	100



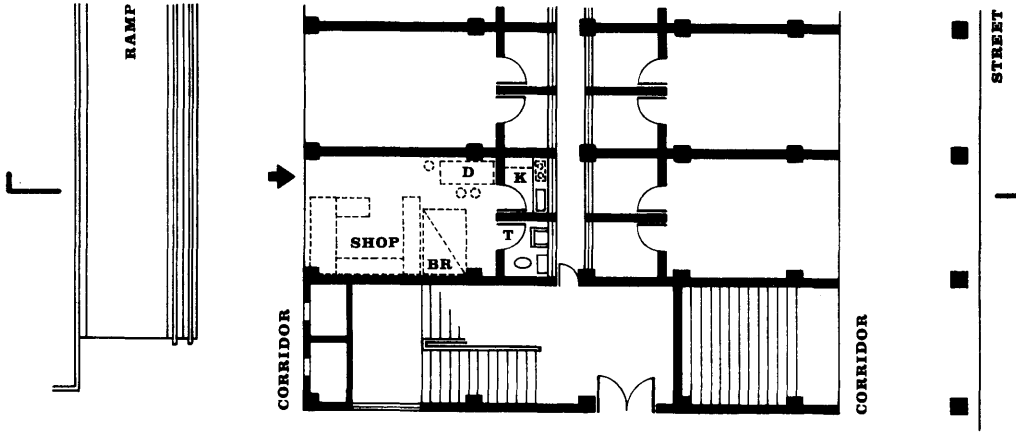
SECTION

KEY

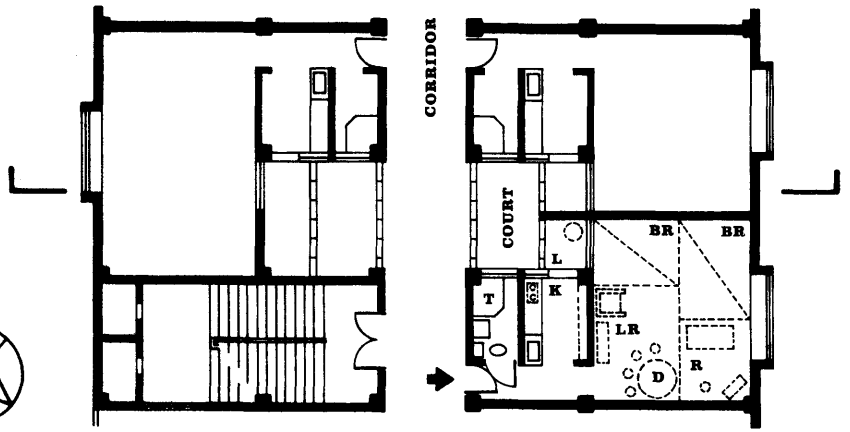
LR	Living Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Laundry
C	Closet
S	Storage
R	Room (multi-use)



ELEVATION

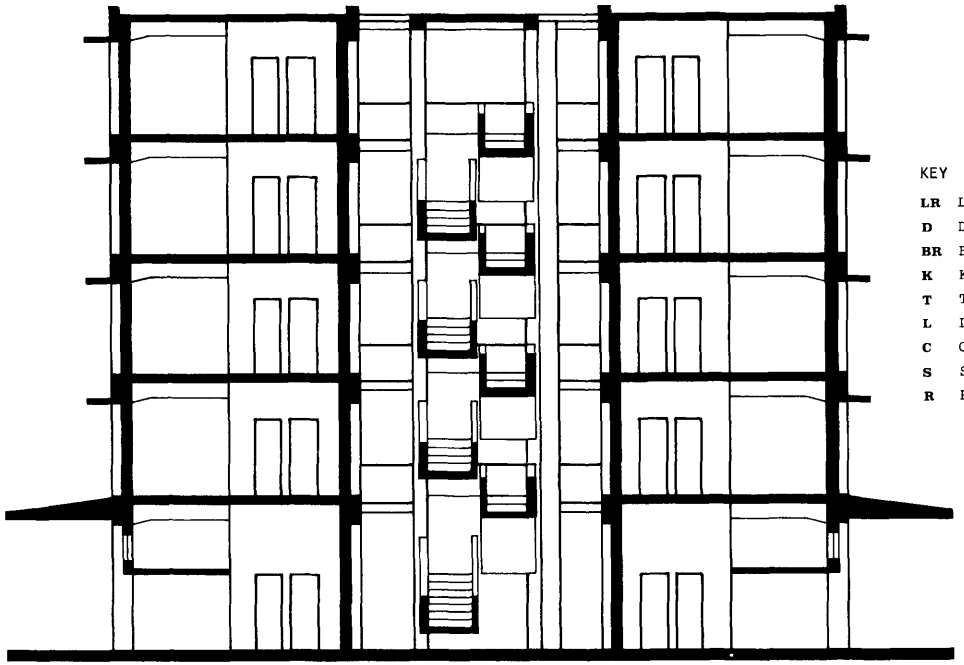


FIRST FLOOR PLAN



UPPER FLOOR PLAN

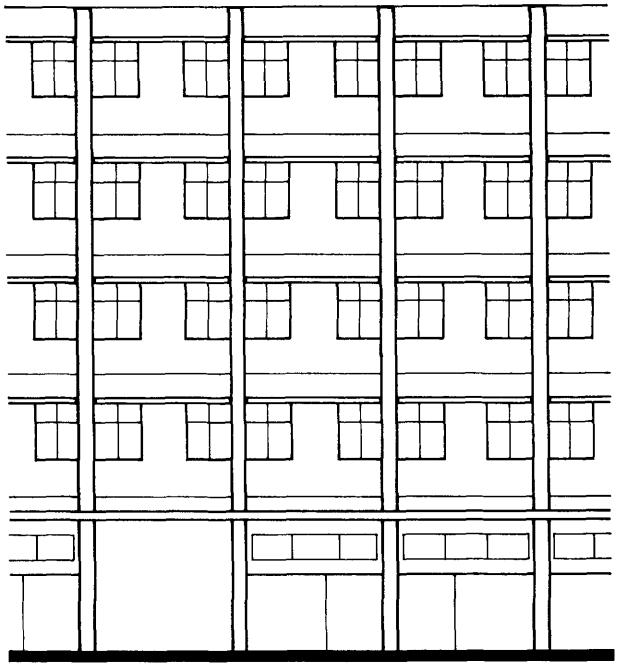
TYPICAL DWELLING



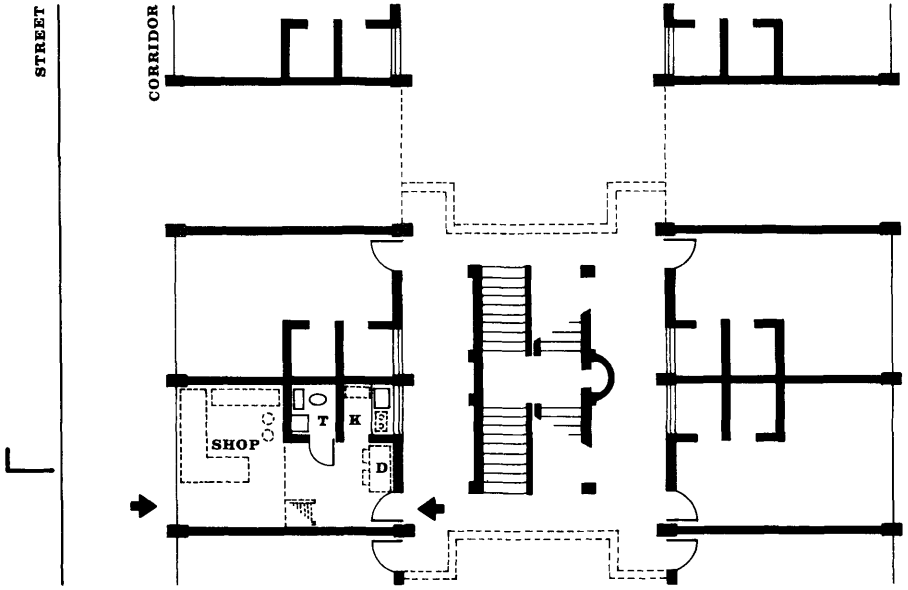
SECTION

KEY

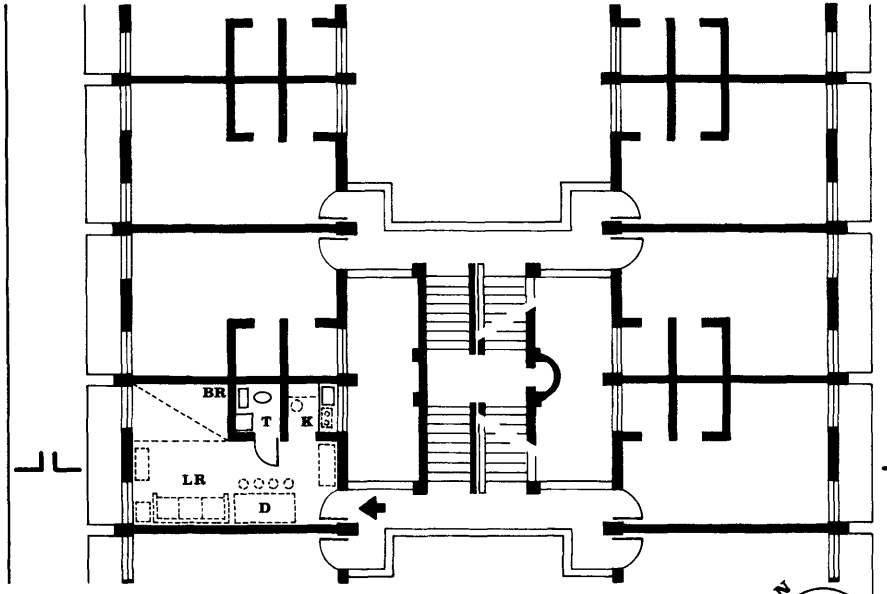
LR	Living Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Laundry
C	Closet
S	Storage
R	Room (multi-use)



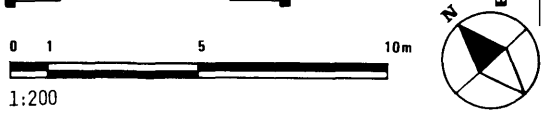
ELEVATION



FIRST FLOOR PLAN



SECOND FLOOR PLAN



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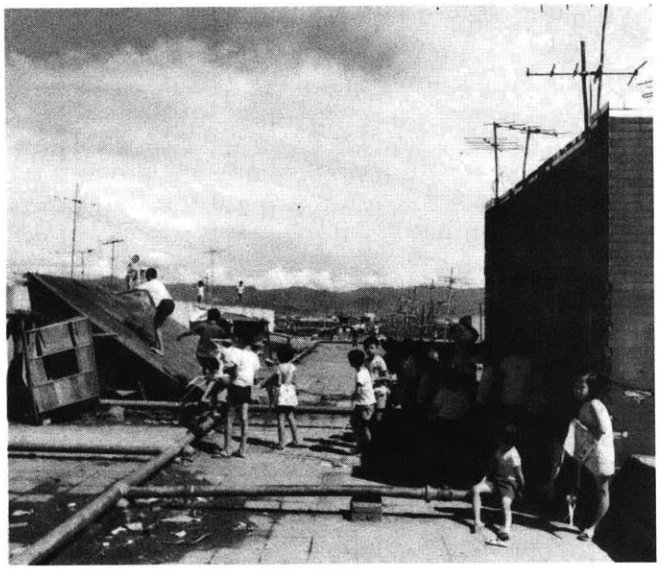
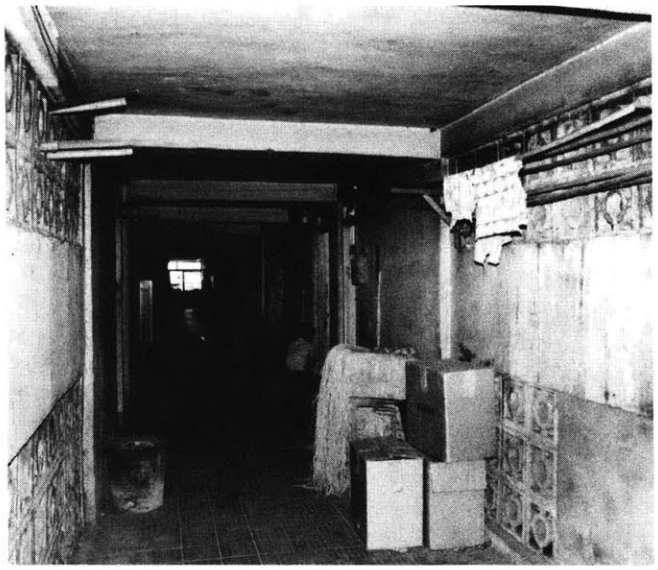
TYPICAL DWELLING





PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	APARTMENT
area (sq m):	33
tenure:	LEGAL RENTAL/OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	2200
tenure:	LEGAL RENTAL/OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	WALK-UP
number of floors:	6
utilization:	MULTIPLE
physical state:	BAD
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PUBLIC
builder:	LARGE CONTRACTOR
construction type:	MASONRY/CONCRETE
year of construction:	1971
MATERIALS	
foundation:	CONCRETE
floors:	CONCRETE
walls:	BRICK
roof:	CONCRETE
DWELLING FACILITIES	
wc:	1
shower:	1
kitchen:	1
rooms:	1
other:	NONE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	KWANG TUNG PROVINCE
place of birth:	MAINLAND CHINA
education level:	PRIMARY SCHOOL
NUMBER OF USERS	
married:	2
single:	1
children:	2
total:	5
MIGRATION PATTERN	
number of moves:	1
rural - urban:	1950
urban - urban:	-
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	MODERATELY LOW
employment:	LABOR
distance to work:	2 KM
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	$2500
land - market value:	$240/M^2
DWELLING UNIT PAYMENTS	
financing:	Public Subsidized
rent/mortgage:	$27/MONTH
% income for rent/mortgage:	20%

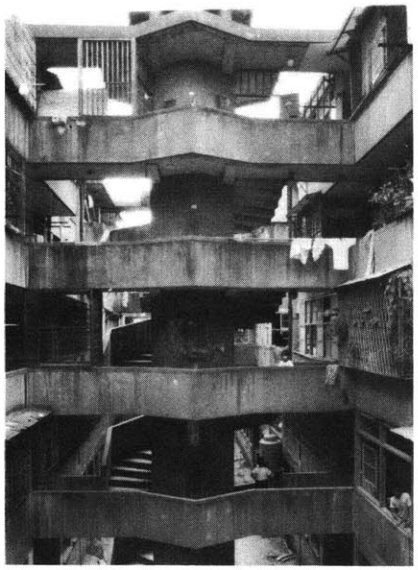
NAN GI CHANG III: (left) The roof is the only, and most dangerous, playground for the children.

(center) A ramp is used to connect the underground market with ground floor.

(right) Housewives are always doing some pieceworks in the central corridor, also a very badly maintained corridor with interior courts on both sides is shown.

CASE STUDY SOURCES

Locality Segment Plan:	*(accurate) City of Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(accurate) Department of Housing, Taipei City Government.*
Locality Block Land Utilization:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID.*
Physical Data:	*(approximate) Field Surveys, 1975.*
Socio-Economic Data:	*(approximate) IBID.*
Photographs:	*Author.*
General Information:	*Report of Nan Gi Chang III Resettlement Housing Construction, Department of Housing, Taipei City Government,1974. Field Surveys, 1975.*



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	APARTMENT
area (sq m):	24
tenure:	LEGAL RENTAL/OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	550
tenure:	LEGAL RENTAL/OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	WALK-UP
number of floors:	5
utilization:	MULTIPLE
physical state:	BAD
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PUBLIC
builder:	LARGE CONTRACTOR
construction type:	MASONRY-CONCRETE
year of construction:	1964
MATERIALS	
foundation:	CONCRETE
floors:	CONCRETE
walls:	BRICK
roof:	CONCRETE
DWELLING FACILITIES	
wc:	1
shower:	1
kitchen:	1
rooms:	1
other:	NONE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	FU KIEN
place of birth:	MAINLAND CHINA
education level:	HIGH SCHOOL
NUMBER OF USERS	
married:	2
single:	0
children:	3
total:	5
MIGRATION PATTERN	
number of moves:	3
rural - urban:	1950
urban - urban:	1959, 1970
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	LOW
employment:	SALES
distance to work:	0 KM
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	$750
land - market value:	$240/M^2
DWELLING UNIT PAYMENTS	
financing:	PUBLIC SUBSIDIZED
rent/mortgage:	$25/MONTH
% income for rent/mortgage:	19%

NAN CHI CHANG I, Taipei: (left) Due to lack of playgrounds, children have to play in the streets.

(center) The five-story buildings are very close together and the open space between rear walls is taken up with massive concrete stairways.

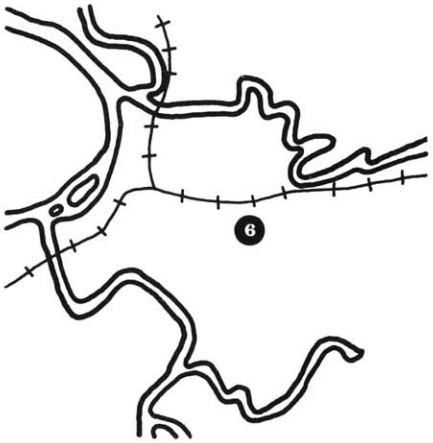
(right) Garbage overflowing from the chute is a serious problem in this locality.

CASE STUDY SOURCES

Locality Segment Plan:	*(accurate) City of Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(accurate) Department of Housing, Taipei City Government.*
Locality Block Land Utilization:	*(accurate) IBID.*
Typical Dwelling:	*(accurate) IBID.*
Physical Data:	*(accurate) Report of Nan Gi Chang in Taipei City, Taipei City Government, 1968. Field Surveys, 1975.*
Socio-Economic Data:	*(approximate) IBID.*
Photographs:	*Author.*
General Information:	*Report of Nan Gi Chang in Taipei City, Taipei City Government, 1968. Field Surveys, 1975.*

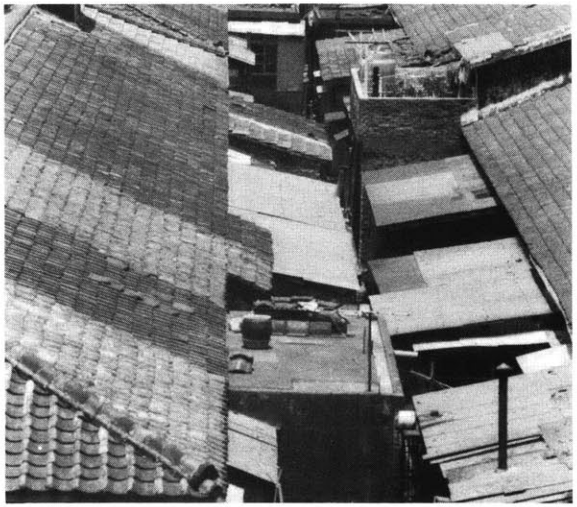
6 CHEN HO, TAIPEI

CASE STUDY



LOCATION: The case is located in front of the Sun Yat Sen Memorial Hall, within Sung Shan District.

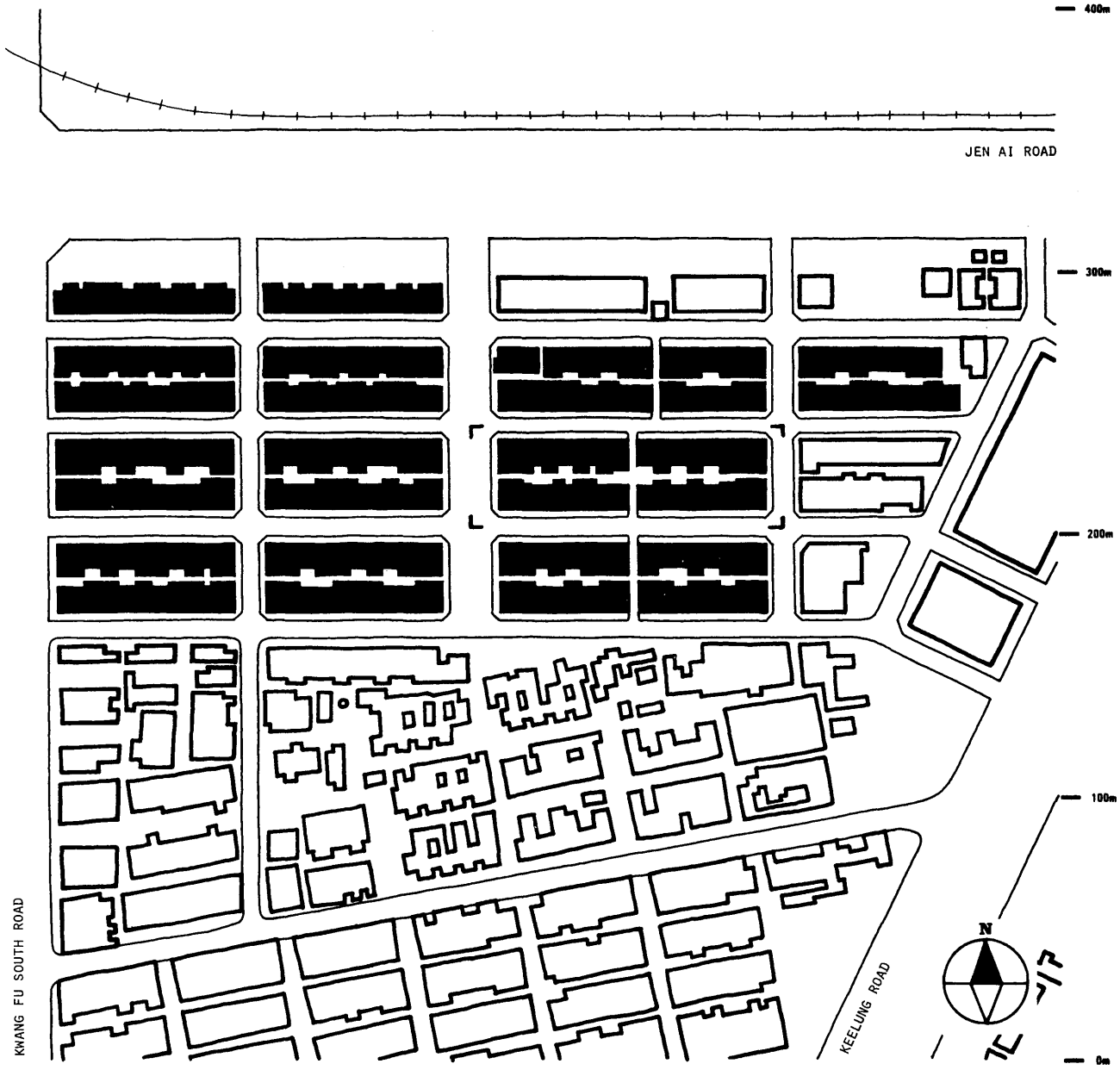
ORIGINS: This area was developed in the latter half of this century. Originally, it was only for agricultural and military use. In 1956, when the population pressure began, the City Government with some private firms started a co-operative housing program in this area to build 2-3 stories apartments for low/middle income families. After the construction of Sun Yat Sen Memorial Hall and Chun Shan Park in 1972, this area was considered a decent dwelling environment in the city.



CHEN HO, Taipei: (top left) Not well defined public space between two buildings has been invaded by most families.

(top right) The entrances facing Kwang Fu South Road, have been closed by putting chains to limit vehicular domination.

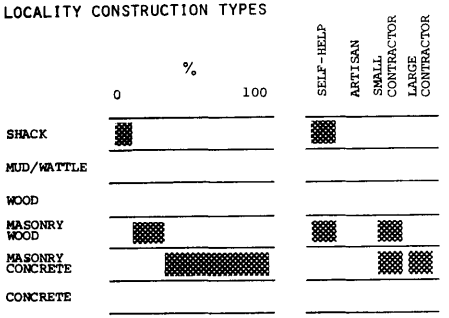
(bottom) An overall view of Chen Ho Community, with the high-rise buildings in the background implies a revolutionary intensive land use.



LOCALITY SEGMENT PLAN

1:2500

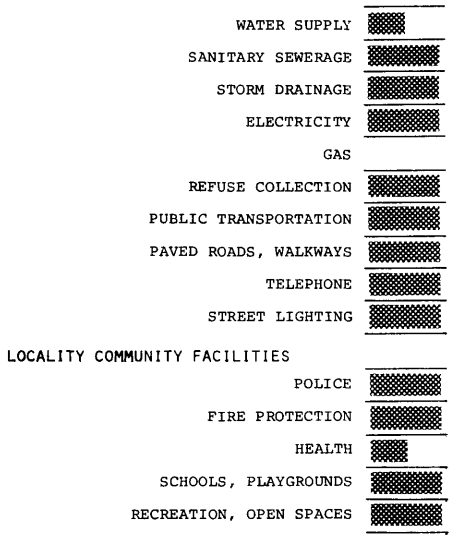
LOCALITY CONSTRUCTION TYPES



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

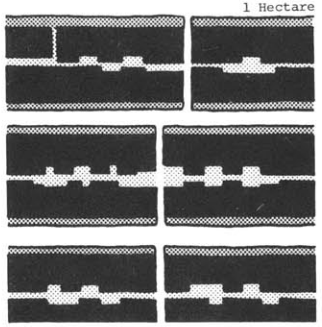
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

Selected locality block is marked with brackets.

LAND UTILIZATION DIAGRAMS

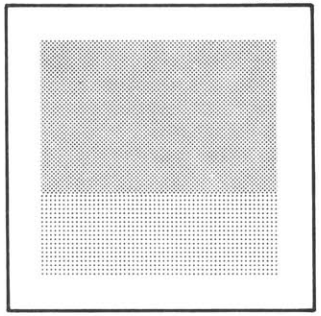
1 Hectare



PATTERN

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

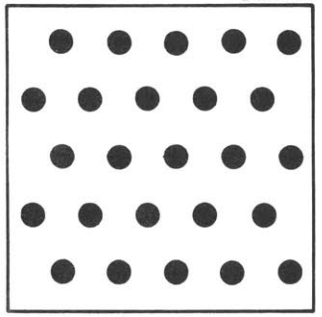
1 Hectare



PERCENTAGES

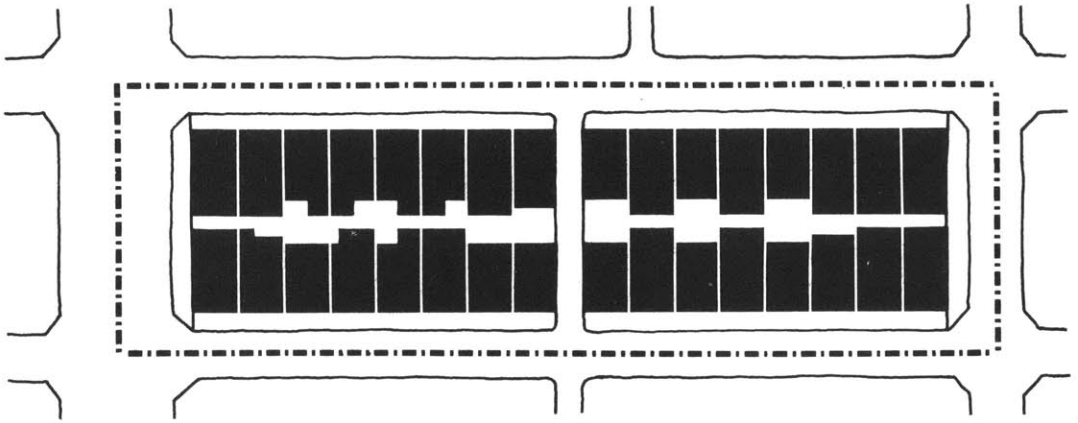
Streets/Walkways	41%
Playgrounds	21%
Cluster Courts	0%
Dwellings/Lots	38%

1 Hectare



DENSITY Persons/Hectare 495

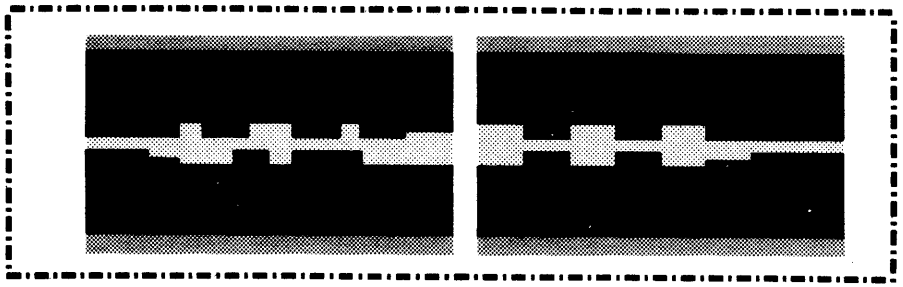
● 20 persons



LOCALITY BLOCK PLAN

0 10 50m

1:1000



N

0 10 50m

1:1000

LOCALITY BLOCK LAND UTILIZATION

LOCALITY SEGMENT LAND UTILIZATION DATA

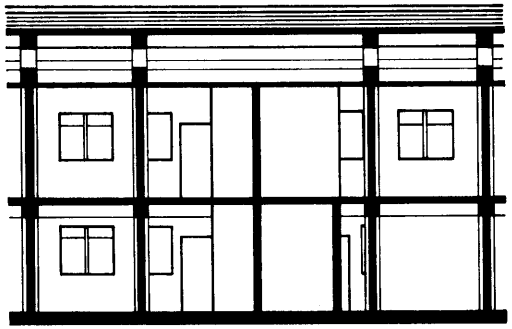
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	28	5.64	-
DWELLING UNITS	598	5.64	106
PEOPLE	2,793	5.64	495

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	2.31	41
SEMI-PUBLIC (open spaces, schools, community centers)	1.18	21
PRIVATE (dwellings, shops, factories, lots)	2.15	38
SEMI-PRIVATE (cluster courts)	0	0
TOTAL	5.64	100

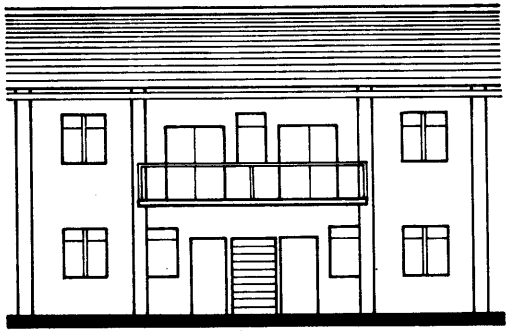
LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	4	0.41	-
DWELLING UNITS	64	0.41	156
PEOPLE	320	0.41	780

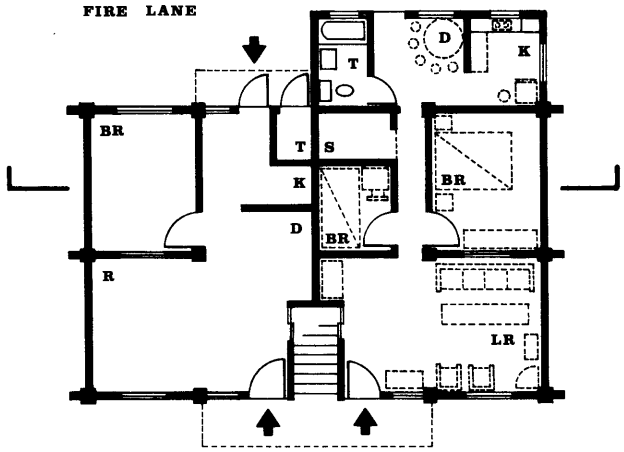
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.12	30
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.24	59
SEMI-PRIVATE (cluster courts)	0.05	11
TOTAL	0.41	100



SECTION



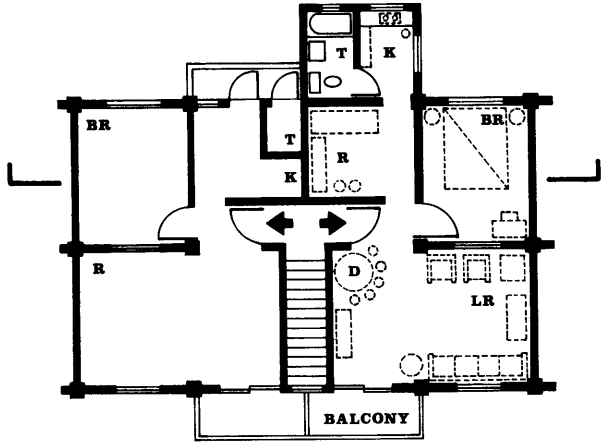
ELEVATION



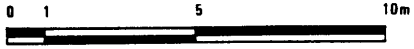
FIRST FLOOR PLAN

KEY

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

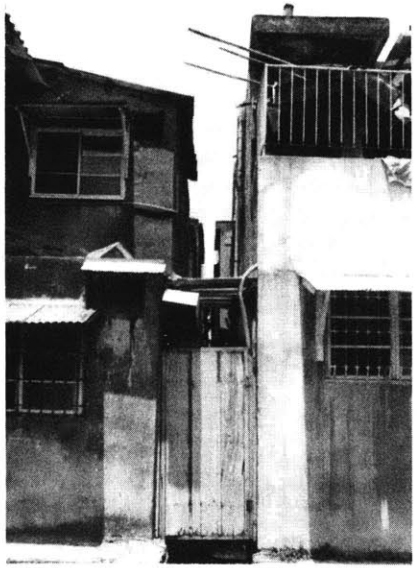


SECOND FLOOR PLAN



1:200

TYPICAL DWELLING



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	APARTMENT
area (sq m):	90
tenure:	LEGAL RENTAL/OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	600
tenure:	LEGAL RENTAL/OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	WALK-UP
number of floors:	2
utilization:	MULTIPLE
physical state:	FAIR
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PUBLIC
builder:	LARGE CONTRACTOR
construction type:	MASONRY-CONCRETE
year of construction:	1956
MATERIALS	
foundation:	CONCRETE
floors:	CONCRETE
walls:	BRICK
roof:	CONCRETE
DWELLING FACILITIES	
wc:	1
shower:	1
kitchen:	1
rooms:	3
other:	NONE

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	AN HWEI PROVINCE
place of birth:	MAINLAND CHINA
education level:	HIGH SCHOOL
NUMBER OF USERS	
married:	2
single:	0
children:	2
total:	4
MIGRATION PATTERN	
number of moves:	1
rural - urban:	-
urban - urban:	1956
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	MODERATELY LOW
employment:	PUBLIC SERVICE
distance to work:	8 KM
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	N.A.
land - market value:	$366/M^2
DWELLING UNIT PAYMENTS	
financing:	PUBLIC SUBSIDIZED
rent/mortgage:	$50/MONTH
% income for rent/mortgage:	20%

CHEN HO, Taipei: (left) Two story apartments aligned along street is the main feature of Chen Ho community.

(center) Originally not well defined public area in the back of two buildings is in private and semi-private use.

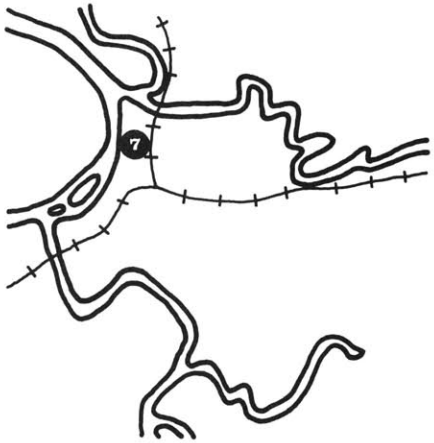
(right) Combined commercial and residential use is also very common in Chen Ho community.

CASE STUDY SOURCES

Locality Segment Plan:	*(accurate) City of Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(approximate) IBID.*
Locality Block Land Utilization:	*(approximate) IBID.*
Typical Dwelling:	*Reference of Public Housing, U.H.D.C., C.I.E.C.D., 1970*
Physical Data:	*Survey of Chen Ho community in Taipei, C.C.D.R.T.,1971.*
Socio-Economic Data:	*IBID.*
Photographs:	*Author*
General Information:	*Survey of Chen Ho Community in Taipei, C.C.D.R.T., 1971. Field Surveys, 1975.*

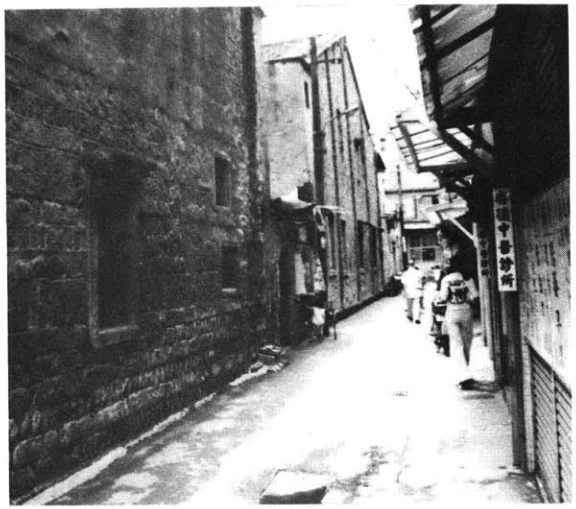
7 TZU SHENG, TAIPEI

CASE STUDY



LOCATION: The case is located within Yen Ping District in the western part of the city.

ORIGIN: This area was developed in seventeenth century as commercial area. It was originally called Ta Dau Chen, as one of the oldest communities in Taipei City. Through commercial contacts, this area was influenced by Dutch and Spanish cultures. Most of the existing buildings are old brick ones. The name of community was derived from the Tzu Sheng Temple in this area.



TZU SHENG, Taipei: (top left) This shows a typical alley in Tzu Sheng community. A service wedge of pit latrine can even be found along the alley.

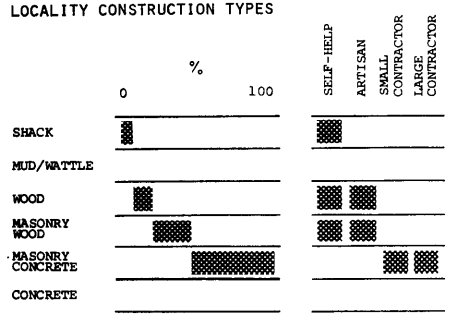
(top right) The open space in front of Tzu Sheng Temple provides a very important social function.

(bottom) A mix of commercial and residential development, the facade of buildings was influenced by Dutch culture.

LOCALITY SEGMENT PLAN

1:2500

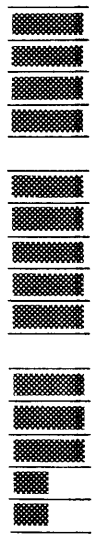
LOCALITY CONSTRUCTION TYPES



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

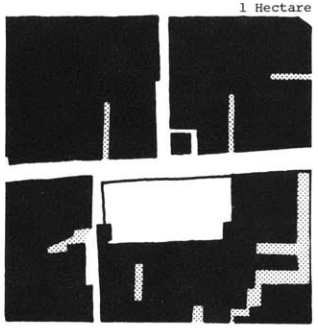
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

Selected locality block is marked with brackets.

LAND UTILIZATION DIAGRAMS

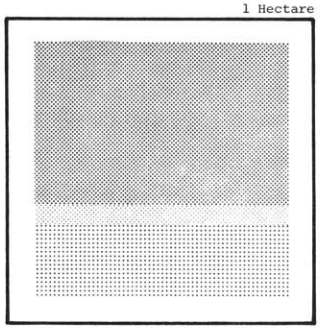
1 Hectare



PATTERN

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

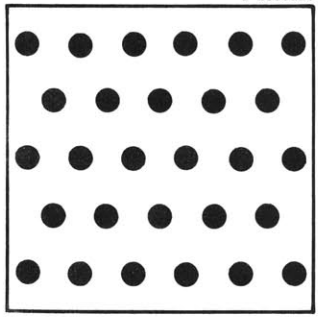
1 Hectare



PERCENTAGES

Streets/Walkways	30%
Playgrounds	15%
Cluster Courts	6%
Dwellings/Lots	49%

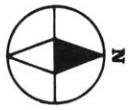
1 Hectare



DENSITY Persons/Hectare 562

20 persons

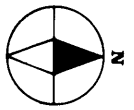
LOCALITY BLOCK PLAN



0 10 50m

1:1000

LOCALITY BLOCK LAND UTILIZATION



1:1000

LOCALITY SEGMENT LAND UTILIZATION DATA

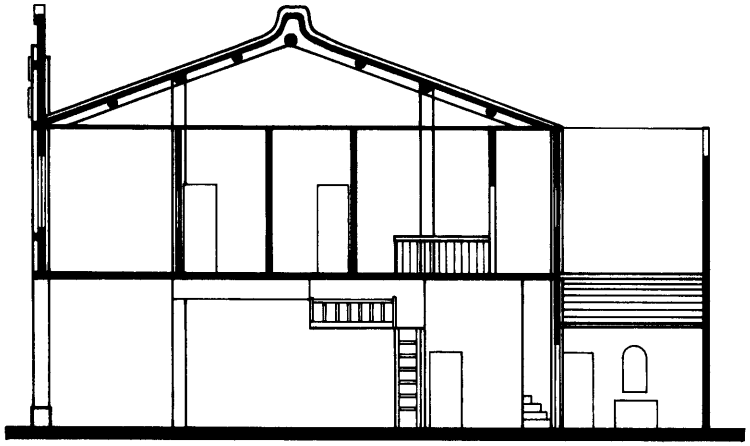
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	140	3.75	37
DWELLING UNITS	380	3.75	101
PEOPLE	2,108	3.75	562

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	1.13	30
SEMI-PUBLIC (open spaces, schools, community centers)	0.56	15
PRIVATE (dwellings, shops, factories, lots)	1.84	49
SEMI-PRIVATE (cluster courts)	0.22	6
TOTAL	3.75	100

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	36	1.00	36
DWELLING UNITS	118	1.00	118
PEOPLE	892	1.00	892

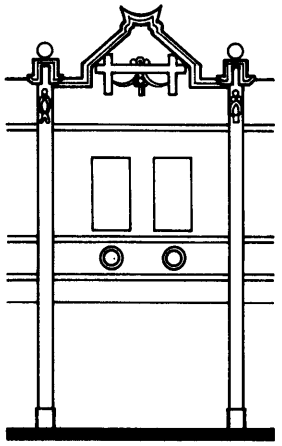
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.25	25
SEMI-PUBLIC (open spaces, schools, community centers)	0	0
PRIVATE (dwellings, shops, factories, lots)	0.67	67
SEMI-PRIVATE (cluster courts)	0.08	8
TOTAL	1.00	100



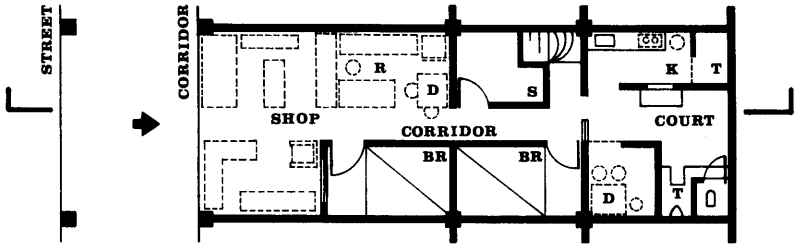
SECTION

KEY

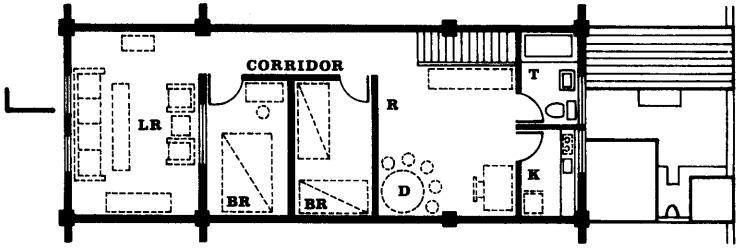
LR	Living Room
D	Dining/Eating Area
BR	Bedroom
K	Kitchen/Cooking Area
T	Toilet/Bathroom
L	Laundry
C	Closet
S	Storage
R	Room (multi-use)



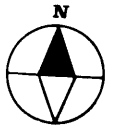
ELEVATION

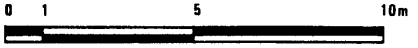


FIRST FLOOR PLAN



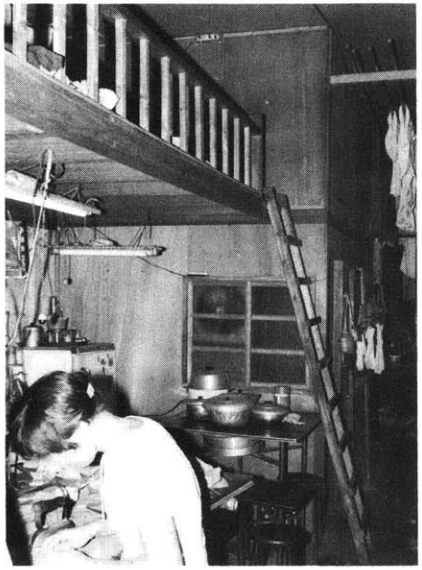
SECOND FLOOR PLAN

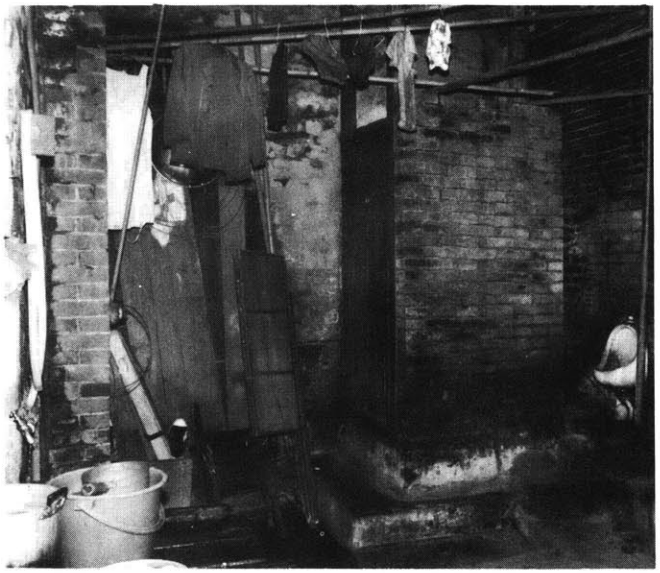




1:200

TYPICAL DWELLING





PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT	
type:	HOUSE
area (sq m):	55
tenure:	LEGAL RENTAL/OWNERSHIP
LAND/LOT	
utilization:	PRIVATE
area (sq m):	186
tenure:	LEGAL RENTAL/OWNERSHIP
DWELLING	
location:	CITY CENTER
type:	ROW/GROUPED
number of floors:	2, 3
utilization:	MULTIPLE
physical state:	FAIR
DWELLING DEVELOPMENT	
mode:	INSTANT
developer:	PRIVATE
builder:	ARTISAN/SMALL CONTRACTOR
construction type:	MASONRY/WOOD
year of construction:	1902
MATERIALS	
foundation:	CUT STONE
floors:	BRICK, WOOD
walls:	BRICK
roof:	WOOD, TILE
DWELLING FACILITIES	
wc:	2
shower:	2
kitchen:	2
rooms:	6
other:	STORAGE 1

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL	
user's ethnic origin:	FU KIEN PROVINCE
place of birth:	TAIWAN
education level:	MIDDLE SCHOOL
NUMBER OF USERS	
married:	8
single:	0
children:	6
total:	14
MIGRATION PATTERN	
number of moves:	1
rural - urban:	1930
urban - urban:	-
urban - rural:	-
why came to urban area:	EMPLOYMENT
GENERAL: ECONOMIC	
user's income group:	MODERATELY LOW
employment:	TAILER
distance to work:	0 KM
mode of travel:	PUBLIC TRANSPORTATION
COSTS	
dwelling unit:	N.A.
land - market value:	$1,270/M^2
DWELLING UNIT PAYMENTS	
financing:	PRIVATE
rent/mortgage:	$60/MONTH
% income for rent/mortgage:	20%

TZU SHENG, Taipei: (left) This shows the facade of a dwelling decorated with commercial signs.

(center) Very intensive use of interior space can be found in most of dwellings

(right) The tenants use commual pipe, pit latrine & lab in back court.

CASE STUDY SOURCES

Locality Segment Plan:	*(approximate) City Taipei, Topographic Survey, 1969.*
Locality Block Plan:	*(approximate) IBID.*
Locality Block Land Utilization:	*(approximate) IBID.*
Typical Dwelling:	*Field Surveys, 1975.*
Physical Data:	*"Survey of Tzu Sheng Community in Yen Ping District of Taipei City, Department of Social, Taipei City Government, 1974.*
Socio-Economic Data:	*IBID.*
Photographs:	*Author.*
General Information:	*"Survey of Tzu Sheng Community in Yen Ping District of Taipei City, Department of Social, Taipei City Government, 1974.* *Field Surveys, 1975.*

EVALUATIONS

The following section contains evaluations of:

COMMUNITY FACILITIES, UTILITIES, SERVICES MATRIX, a summary of the availability of facilities.

PHYSICAL DATA MATRIX, a comprehensive summary of the data with comments.

TIME/PROCESS PERSPECTIVE, models relating the case studies to their originating models.

LAND UTILIZATION: patterns, percentages, densities, a graphic comparison of land utilization.

LAND UTILIZATION: OPTIMUM RANGES, a cross comparison of densities and percentages of land utilization.

COMMUNITY FACILITIES, UTILITIES/SERVICES MATRIX

Category	Population per Category	% of Total Population	LOCALITIES	COMMUNITY FACILITIES: Police	Fire Protection	Health	Schools, Playgrounds	Recreation	UTILITIES AND SERVICES: Water	Sewerage	Storm Drainage	Electricity	Gas	Refuse Collection	Public Transportation	Paved Roads, Walkways	Telephone	Street Lighting	Locality
A	118,561	6.7	1. CHU AN	▓	▓	▓	▓	▓	▓	▒	▓	▓		▓	▓	▒	▓	▓	1
B	447,701	25.3	2. LU LIU	▓	▓	▒	▒	▒	▓	▒	▓	▓		▓	▓	▒	▓	▓	2
			3. HUA CHIANG	▓	▓	▒	▒	▒	▓	▒	▓	▓		▓	▓	▒	▓	▓	3
			4. NAN CHI CHANG III	▓	▓	▒	▒	▒	▓	▓	▓	▓		▒	▓	▓	▓	▓	4
C	399,922	22.6	5. NAN CHI CHANG I	▓	▓	▒	▒	▒	▓	▓	▓	▓		▒	▓	▓	▓	▓	5
D	233,583	13.2	6. CHEN HO	▓	▓	▒	▓	▓	▒	▓	▓	▓		▓	▓	▓	▓	▓	6
E	254,817	14.4	7.TZU SHENG	▓	▓	▓	▒	▒	▓	▓	▓	▓		▓	▓	▓	▓	▓	7
	1,454,584	82.2	TOTAL																
	314,984	17.8	OTHER (MIDDLE - HIGH INCOME)																
	1,769,568	100.0	TOTAL POPULATION																

The matrix illustrates the approximate availability of community facilities, utilities, and services in the 7 dwelling environments. Three levels are indicated as follows:

No provision at all ☐

Limited or occasional ▒

Adequate or normal ▓

PHYSICAL DATA MATRIX

Category	Population per Category	% of Total Population	LOCALITIES	USER: 5 Income (Very Low / Low / Moderately Low / Middle / High)	DWELLING UNIT: 6 Type (Shanty / Room / Apartment / House)	7 Area ($50m^2$ or less / 51 - 100m / 101- or more)	8 Tenure (Legal Rental / Legal Ownership)	9 Rent/Mort. (20% or less of income / 21% or more of income)	LAND/LOT: 10 Utilization (Public / Semi-Public / Private / Semi-Private)	11 Area (m^2)	12 Tenure (Extralegal: rental / Extralegal: ownership / Legal: rental / Legal: ownership)	DWELLING: 13 Location (City Center / Inner Ring / Periphery)	14 Type (Detached / Semi-Detached / Row/Grouped / Walk-up / High rise)	15 No. Floors (1 / 2 / 3 or more)	16 Utilizat'n (Single / Multiple)	17 Phy. State (Bad / Fair / Good)	DWELLING DEVELOPMENT: 18 Mode (Incremental / Instant)	19 Developer (Popular / Public / Private)	20 Builder (Self-Help / Artisan / Small Contractor / Large Contractor)	21 Construct'n Type (Shack / Mud and Wattle / Wood / Masonry/ Wood / Masonry/concrete / Concrete)	22 Date (Year of Construction)	23 Den. (People/Ha)	Locality
A	118,561	6.7	1. CHU AN							5800												1877	70	1
B	447,701	25.3	2. LU LIU							42												1950	715	2
			3. HUA CHIANG							2250												1974	922	3
			4. NAN CHI CHANG III							2200												1971	1437	4
C	399,922	22.6	5. NAN CHI CHANG I							550												1964	1437	5
D	233,583	13.2	6. CHEN HO							600												1956	495	6
E	254,817	14.4	7. TZU SHENG							186												1902	562	7
	1,454,584	82.2	TOTAL																					
	314,984	17.8	OTHER (MIDDLE - HIGH INCOME)																					
	1,769,568	100.0	TOTAL POPULATION																					

The physical data of the 7 case studies of dwelling environments existing in Taipei City is summarized in the physical data matrix and in the following comments. The matrix permits: a) a comprehensive view of the spectrum of dwelling types; b) a comparison and determination of trends and patterns.

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

Category/income		Housing System
A	Very Low/Low	Traditional Rural House
B	Very Low/Low	Shanty
C	Low/M. Low/Middle	4-6 Stories Apt.
D	M. Low/Middle	2-3 Stories Apt.
E	M. Low/Middle	Brick, Shop-House

The total categories include low/middle income groups and represent the majority of the population (82.2%).

(5) USER INCOME GROUP: The income level is the basic indicator in the expected pattern: The higher the income, the higher is the level of the indicator. The process of housing for the low income groups is a matter of survival whereas in the higher income group is a service or a commodity.

(6) DWELLING UNIT TYPE: A pattern is defined in terms of income groups: SHANTY: very low income; ROOM: moderately low income tenements; APARTMENT: low, moderately low and middle income groups; HOUSE: very low, low, moderately low and middle income groups.

(7) DWELLING UNIT AREA: With exception of the traditional rural house for the extended families, the dwelling units are very small for low/middle income groups. The government provides an area ranging from 26 m^2 to 40 m^2 in most of the public housing projects.

(8) DWELLING UNIT TENURE: Rental situation can be found in most of the cases. Due to the risk of profit, housing for rent does not exist in the city.

(9) PERCENTAGE OF INCOME FOR RENT: A clear trend emerges from the case studies: 20% or less of income is paid by all income groups.

(10) LAND/LOT UTILIZATION: It is clear that the lower income groups (very low/low) are always occupying public land. Other groups have complete control of their land.

(11) LAND/LOT AREA: Lot boundaries were difined by the physical use of dwelling and land. In some cases, although the land/lot is shared by several dwellers, it is still a unique lot.

(12) LAND/LOT TENURE: Extralegal tenure is found only in lower income groups. Rental situation is common in most of the cases.

(13) DWELLING LOCATION: All the cases are located at city center. There is no distinguished relationship between income level and dwelling location in the metropolitan city.

(14) DWELLING TYPES: Walk-up apartments became the most accessible dwelling type for the low/middle income groups, after 1960. With exception of remained traditional houses, the detached, semi-detached and high rise dwelling types are only accessible for high income group.

(15) DWELLING FLOORS: Due to extremely high land price, most of recent built dwellings for low/middle income groups are 4-6 stories walk-up apartments.

(16) DWELLING UTILIZATION: Single occupancy can only be found in traditional rural houses among the cases.

(17) DWELLING PHYSICAL STATE: Bad states are found in all lower income groups. Due to limited dwelling unit space, some public housing became instant slum with very bad physical condition.

(18) DWELLING DEVELOPMENT MODE: Incremental mode is only used by very low/low income groups.

(19) DWELLING DEVELOPER: Large scale development for low/middle income housing is rarely found in the city. In the urban area, land is already subdivided by the City Government.

(20) DWELLING BUILDER: Self-help methods are employed by the very low income squatter sectors. The government generally employs large contractors for the construction of public housing.

(21) DWELLING CONSTRUCTION TYPES: In general, the lower the income, the lower is the type of dwelling construction. Masonry/concrete has become the major type in the urban area since 1950.

(22) DWELLING DEVELOPMENT - YEAR OF CONST.: The oldest dwellings for low income group are traditional rural houses.

(23) DWELLING DEVELOPMENT - DENSITY: Population densities are intended as indicators for each dwelling group. The public settlements provided by the government always have a relatively high density, more than 1,000 persons/hectare.

TIME/PROCESS PERSPECTIVE

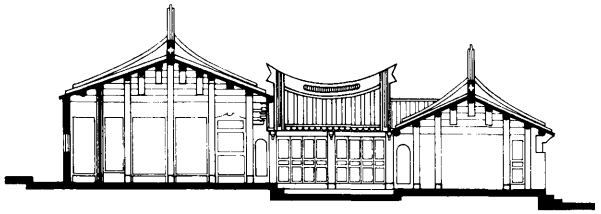
The seven case studies of Taipei City are representative models of existing low/middle income situations which illustrate different cases of land utilization.

The case studies have been distributed in the chart in an attempt to relate them to their originating models and to see them in a broader time/process perspective.

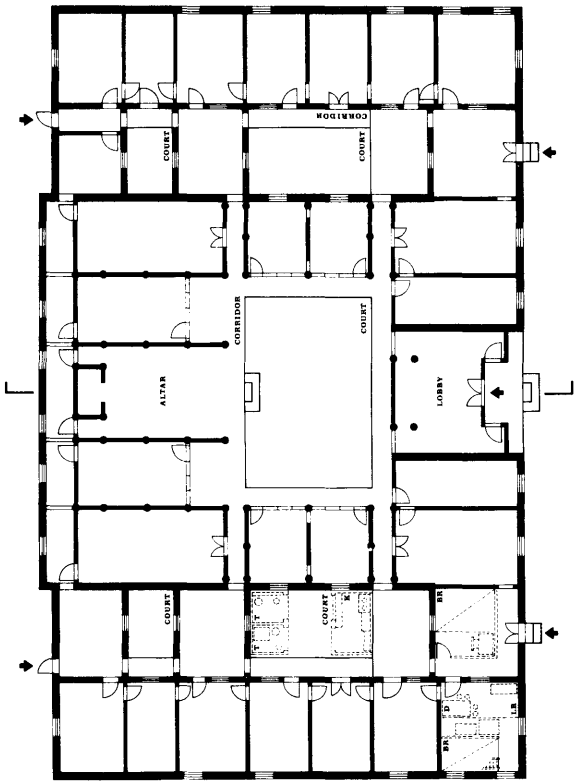
Existing housing models are the most valuable source of information or reference in formulating urban land policies and housing programs. The models provide a guide to general yet basic questions of land use (for what?), land distribution (to whom?), land subdivision (how to?). The models also provide a guide to more specific questions: How do they relate to different cultures and values? What range of population densities do they permit? To what income groups are they accesible? How efficient is the land utilization which they provide?

EXAMPLES

Section



Plan



THE PAST

ORIGINAL MODEL — TRADITIONAL RURAL HOUSES

Physical characteristics — Farm houses, interior courts, isolated in the rural area, 1 story.

Population Density — LOW density

Land/Layout — Social structure/organization is major constraint.

Users — CHINESE TRADITIONAL MODEL used by low/middle income extended families.

THE PRESENT

TAIPEI MODEL — Model was developed in Taipei in the latter half of nineteenth century. Most of the existing houses have become illegal since the city plan was drafted.

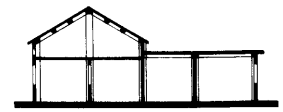
Users — Model no longer functions as a single unit, many of the existing houses are occupied by unrelated strangers. The model has become an old and uncomfortable tenement for low income sector.

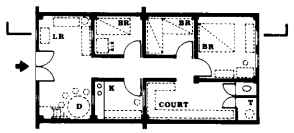
Case Studies — 1. CHU AN

THE FUTURE

LAND ISSUES — CHINESE culture.
Permits LOW population density.
Accessible to VERY LOW/LOW income groups.
Less efficient land utilization in urban area.
(See case study 1).

Comments — Model has no potential to solve urban population pressure, should be changed to make way for new models. The future value of the model will be only in culture and historic.





SHANTIES

Groups of shanties aligned along a narrow alley or clustered in courts. 1-2 stories.

MEDIUM density

Layout provides minimum utilities, services, and facilities is major constraint.

UNIVERSAL/TRADITIONAL MODEL used by low and very low income migrants.

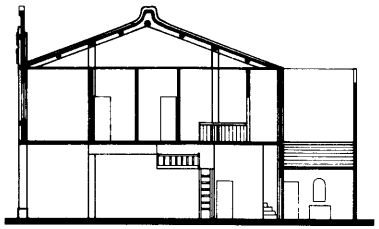
Model was developed in Taipei in the latter half of twentieth century, widely shown in squatters' settlements with minimum utilities and facilities.

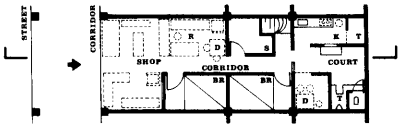
Model is used by low and very low income migrants from provincial area for employment.

2. LU LIU

UNIVERSAL.
Permits MEDIUM population density.
Accessible to VERY LOW/LOW income groups.
Efficient land utilization.
(See case study 2).

Model is substandard for utilities and facilities, should be up-graded.





BRICK, SHOP-HOME

Row houses aligned along streets with commercial space in front, and living space in back or upper floors. 1-3 stories.

MEDIUM density

Economic use of land is constraint.

DUTCH/TRADITIONAL MODEL used by low/middle income groups.

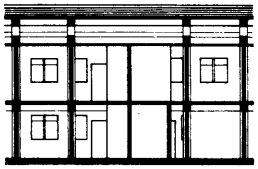
Model was influenced by Dutch culture, and developed in Taipei after seventeenth century.

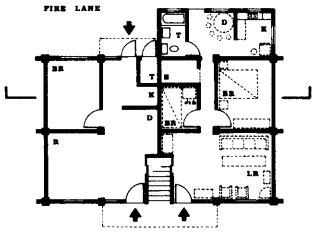
Model is used by low/middle income groups with small business.

7. TZU SHENG

DUTCH/CHINESE culture.
Permits MEDIUM population density.
Accessible to LOW/MEDIUM income groups.
Efficient land utilization.
(See case study 7).

Models as built can be up-graded in terms of dwelling utilities and facilities.





2-3 STORIES WALK-UP APARTMENTS

Apartments aligned along streets, concrete-masonry built, 2-3 stories.

MEDIUM/HIGH density

Economic use of land is relative constraint.

UNIVERSAL MODEL used by middle income groups.

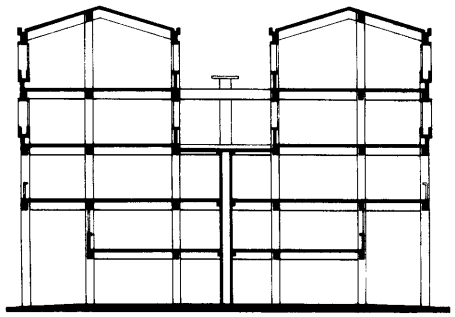
Model was imported to Taipei in 1950's, as the population pressure just began.

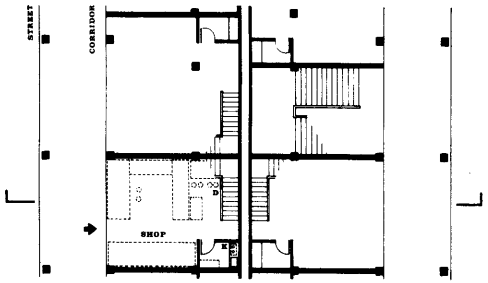
Model is used by low and middle income nuclear families.

6. CHEN HO

UNIVERSAL.
Permits MEDIUM/HIGH population densities.
Accessible to MODERATELY LOW/MIDDLE income groups.
Not efficient land utilization.
(See case study 6)

Models as built can be easily up-graded by maximize users' control and responsibility over some wasteful public space.





4-6 STORIES WALK-UP APARTMENTS

Apartments aligned along streets, concrete-masonry built, 4-6 stories.

HIGH density

Higher densities, not economic use of land, is major constraint.

UNIVERSAL MODEL used by middle income groups.

Model was imported to Taipei in 1960's, as the population pressure became more serious.

Model is used by low and middle income nuclear families.

3. HUA CHIANG 4. NAN CHI CHANG III 5. NAN CHI CHANG I

UNIVERSAL.
Permits HIGH population density.
Accessible to LOW/HIGH income groups.
Not efficient land utilization.
(See case studies 3, 4, 5).

Model should be improved to use land more efficiently, to maximize users' control and responsibility over some wasteful public space. The model, as public housing became unlivable when certain population ranges are exceeded.

LAND UTILIZATION:
PATTERNS, PERCENTAGES, DENSITIES

KEY

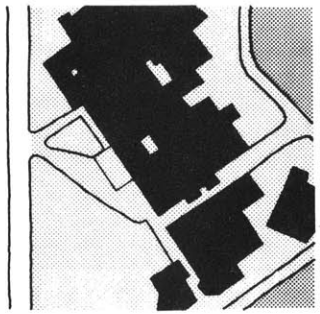
Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
private:	lots	
	dwellings	

20 persons

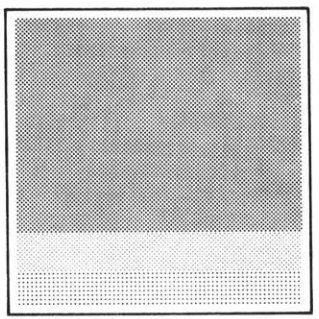
1 CHU AN

Private Very Low Income Houses

Very low percentage of land for streets and walkways; high percentage of land for lots; private owned open land used as semi-private space. Land utilization had little basis in physical function, but in traditional ideas of family, religion, and society.

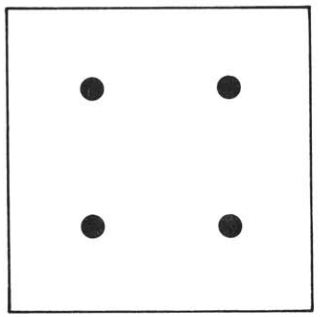


PATTERNS



PERCENTAGES

Streets/Walkways	9%
Playgrounds	11%
Cluster Courts	11%
Dwellings/Lots	69%



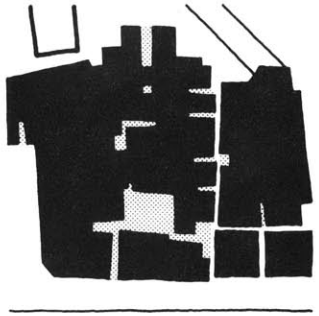
DENSITIES

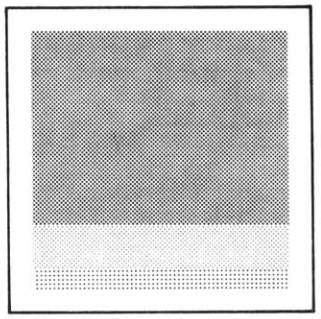
Persons/Hectare 70

2 LU LIU

Private Very Low Income Shanties

All the land with private utilization is the sheltered area. Medium percentage of land for streets, walkways, and open spaces; low percentage of land for playgrounds; organic land development; medium population density.





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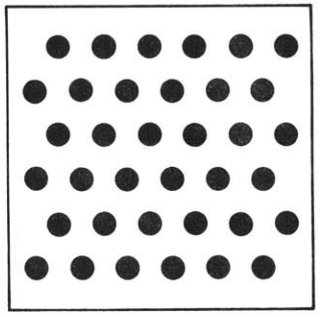
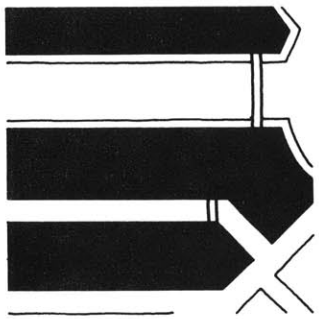


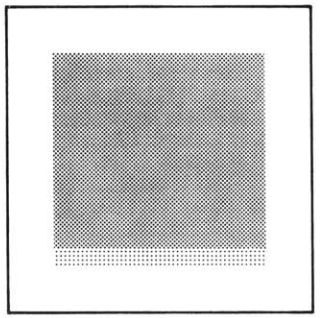
715 P/Ha

3 HUA CHIANG

Private Low Income Apartments

High percentage of land for streets and walkways; low percentage of land for playgrounds. All the land with private utilization is the sheltered area. High population density.





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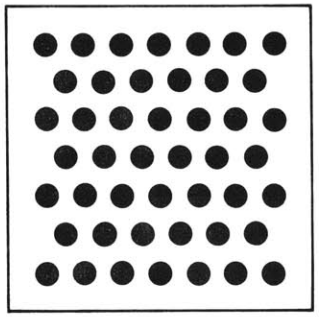
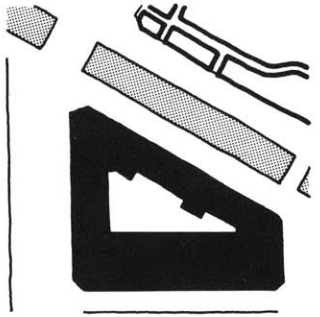


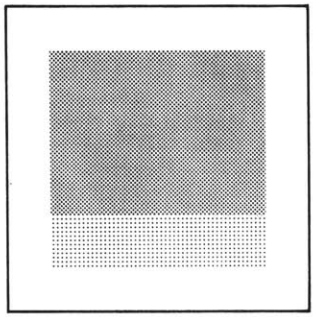
922 P/Ha

4 NAN CHI CHANG III

Private Low Income Apartments

High percentage of land for streets and walkways. All the land with private utilization is the sheltered area. Not efficient land use; extremely high population density.





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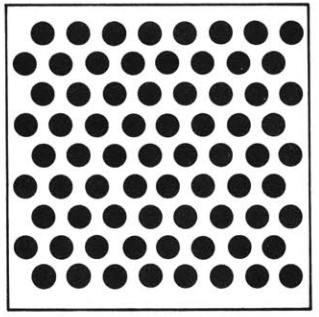
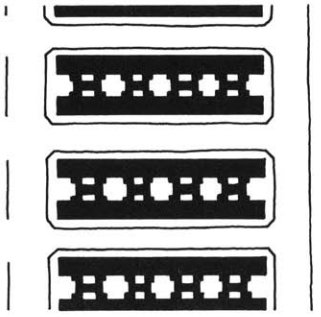


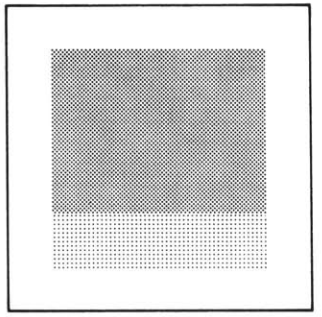
1,437 P/Ha

5 NAN CHI CHANG I

Private Low Income Apartments

High percentage of land for streets and walkways. All the land with private utilization is the sheltered area. Not efficient land use; extremely high population density.





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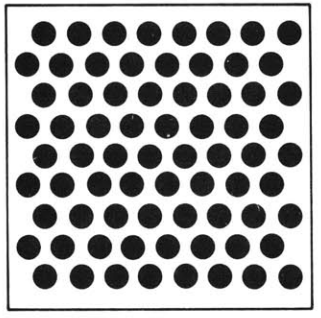
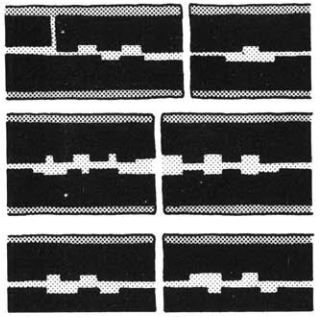


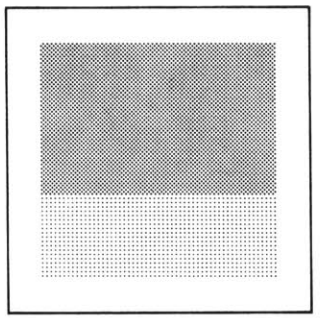
1,437 P/Ha

6 CHEN HO

Private M. Low Income Apartments

High percentage of land for streets and walkways; high percentage of land for playgrounds and open space; poor layout with not well defined public space results in illegal private invasion. Medium density.





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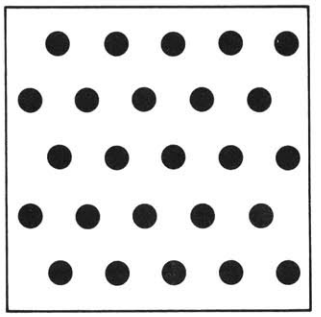
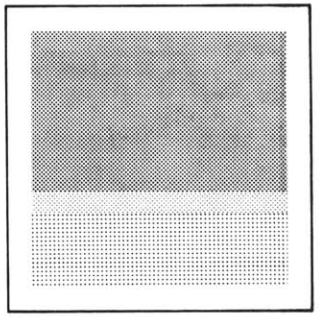


495 P/Ha

7 TZU SHENG

Private M. Low Income Houses

Medium percentage of land for streets, walkways, and open spaces. Most of the land with private utilization is the shelered area. Medium population density; very good land utilization.



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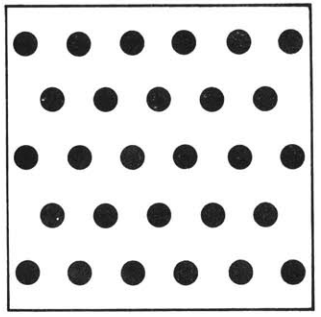


LAND UTILIZATION: OPTIMUM RANGES

The three graphs shown are used to evaluate and to compare the seven case studies in terms of LAND UTILIZATION PERCENTAGES and GROSS POPULATION DENSITY.

Land utilization percentages are computed for the following areas: a) PUBLIC: streets, walkways, open spaces; b) SEMI-PUBLIC: open spaces; c) SEMI-PRIVATE: cluster courts; d) PRIVATE: dwellings, lots.

The range of desired/acceptable densities is 440 persons per Ha to 880 persons per Ha, assuming that the dwelling development in Taipei City is of 3-6 stories. This range is derived from densities in relation to assumptions of specific physical characteristics, based upon case studies and accepted zoning standards in different urban contexts in developing countries.

LAND UTILIZATION: Circulation 20%; Semipublic 15% (open 12% + building 3%); Private 65% (open 43% + covered 22%).
DWELLINGS: rooms in tenements, apartments, houses, row and groups; Land coverage 1/3 of private land; Dwelling area per person $12m^2$; Shop and miscellaneous area per person $3m^2$; Open area per person $10m^2$.

NUMBER OF FLOORS:	1	2	3	4	5	6
GROSS DENSITY (p/Ha):	147	294	441	588	735	882

KEY
VERTICAL SCALE: Land utilization percentages (0 to 100%).
HORIZONTAL SCALE: Residential population density (0 to 2,000 persons per Ha shown on logarithmic scale).
CURVE: Range of optimum land utilization percentages (optimum values vary for different densities based upon case studies and accepted zoning standards in different contexts).
SHADED AREA: Desired/optimum efficiency of land utilization (the intersection of desired/accepted residential population densities and desired/accepted land utilization percentages).
NUMBER DOTS: case studies

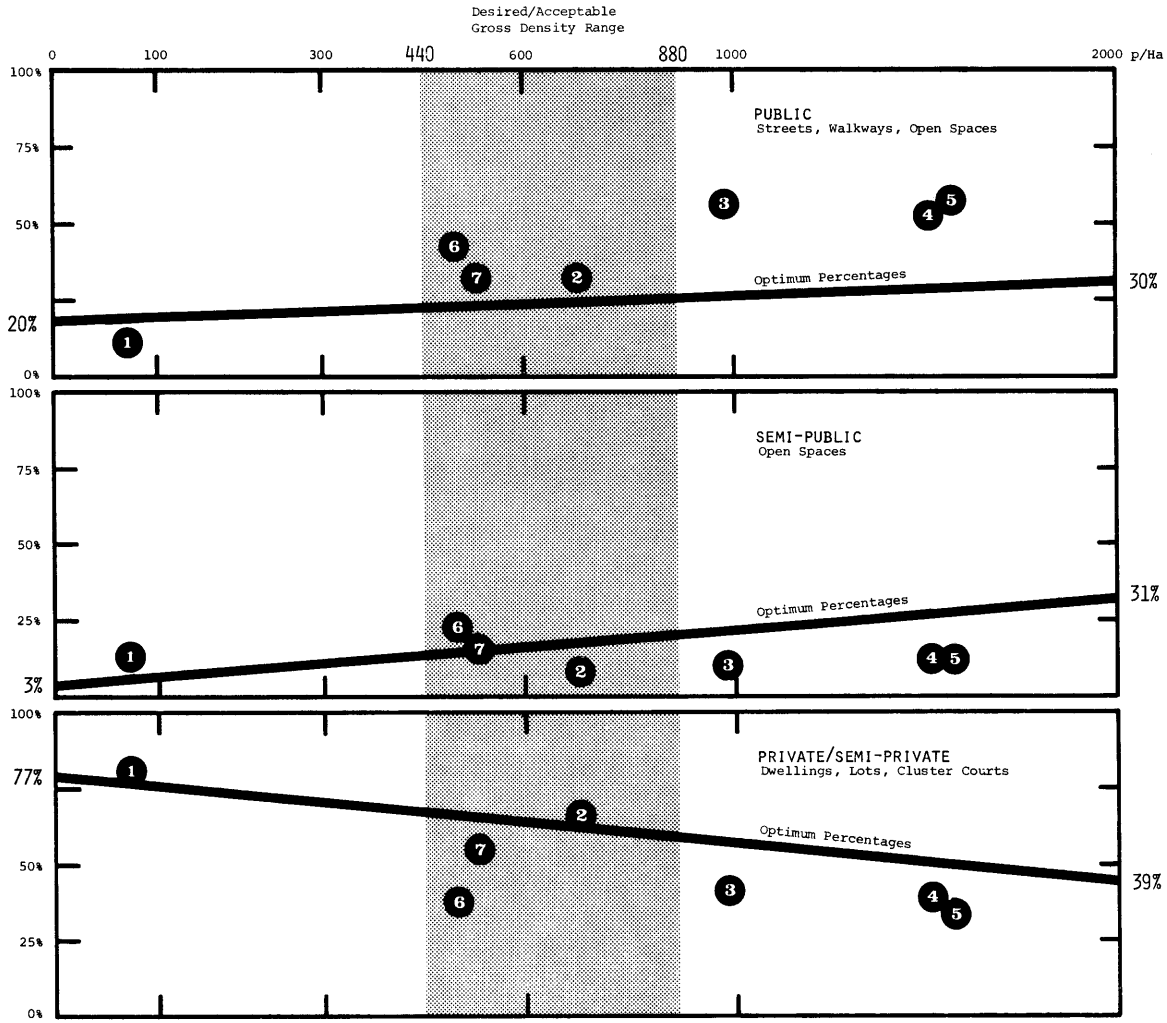
● PUBLIC: streets, walkways, open spaces. Areas within an urban layout used for pedestrian and vehicular circulation. The land has minimum physical controls and maximum public responsibility in initial purchase, development and maintenance.
The CURVE shows: optimum area percentages for streets, walkways and open spaces. (20-30%, based upon case studies in Latin America and in the U.S.A.) The percentage of street and walkway areas varies slightly with density.

● SEMI-PUBLIC: open spaces. Areas within an urban layout used for supporting facilities and services. (Open spaces-playgrounds are only considered since the percentages are based upon a small sector). The land has partial or complete physical controls and public/user responsibility in development and maintenance.
The CURVE shows: optimum area percentages for open spaces. (3-31%, based upon case studies in Latin America and in U.S.A.) The percentage of open spaces varies considerably with density.

● SEMI-PRIVATE: cluster courts. Areas within an urban layout used by group of owners and/or tenents. The land has complete physical controls and user responsibility in development and maintenance.

PRIVATE: dwellings, lots. Areas within an urban layout used for residential and commercial use. The land has maximum physical controls and owner/tenant/user responsibility in development and maintenance.

The CURVE shows: optimum area percentages for dwellings and lots. (The range of optimum percentages of land for public areas is 20-30% with 3-31% for semi-public areas; therefore, the remaining 77-38% of land is for private use).



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).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

EXPLANATORY NOTES

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

Accurate: when taken from reliable or actual sources.

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

Tentative: when based upon rough estimations of limited wources.

QUALITY OF SERVICES, FACILITIES AND UTILITIES

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

Limited: when the existence of services, facilities and utilities are available to locality in a limited manner due to proximity.

None: when the existence of services, facilities and utilities are unavailable to a locality.

METRIC SYSTEM EQUIVALENTS

Linear Measures

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

Square Measures

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

DOLLAR EQUIVALENTS
All income, cost and rent/mortgage data have been expressed in terms of the U.S. equivalent;
1 U.S. dollar = 38.00 N.T. dollars (May, 1976)

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