TONDO LOW-INCOME HOUSING STUDY

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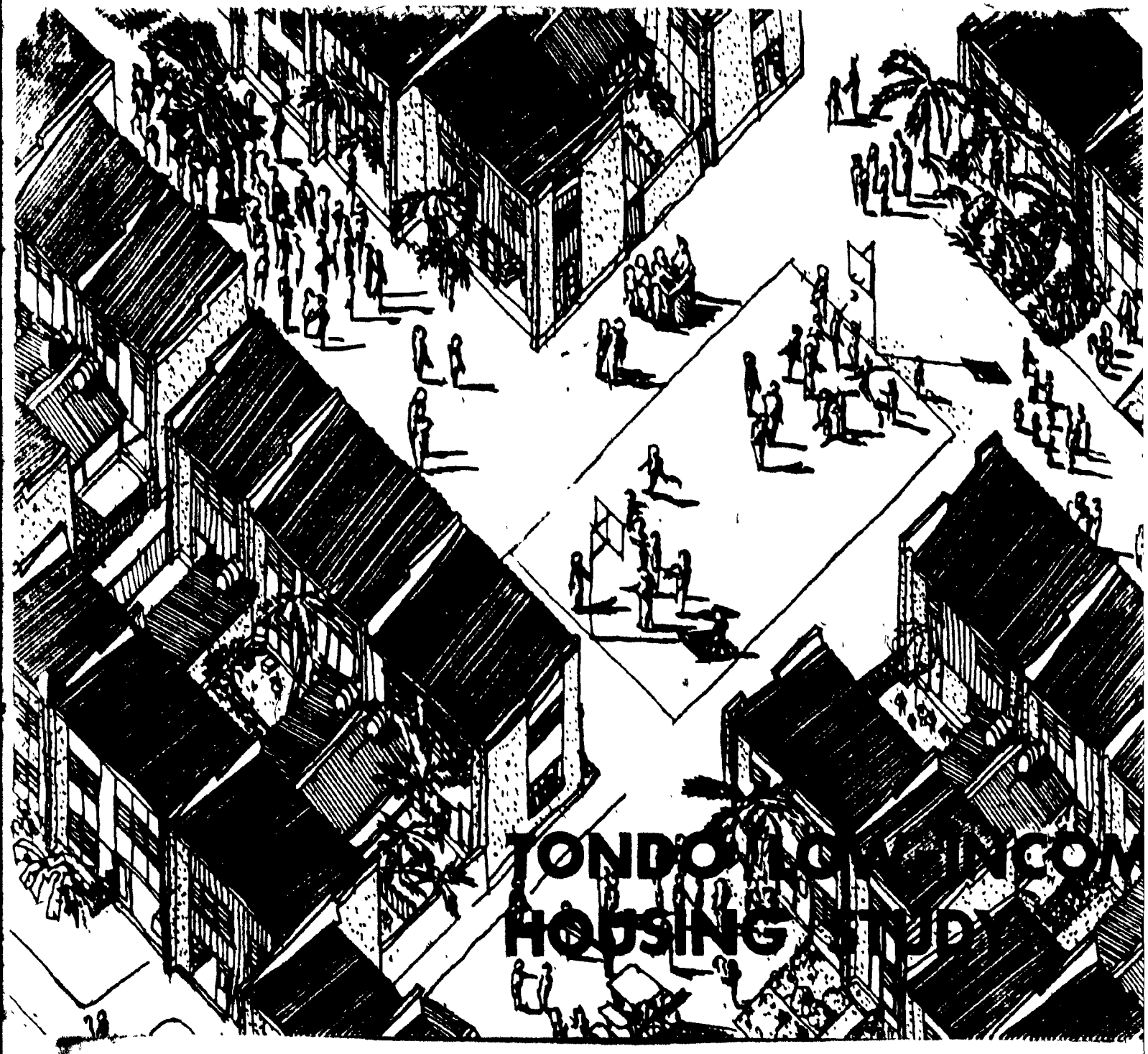
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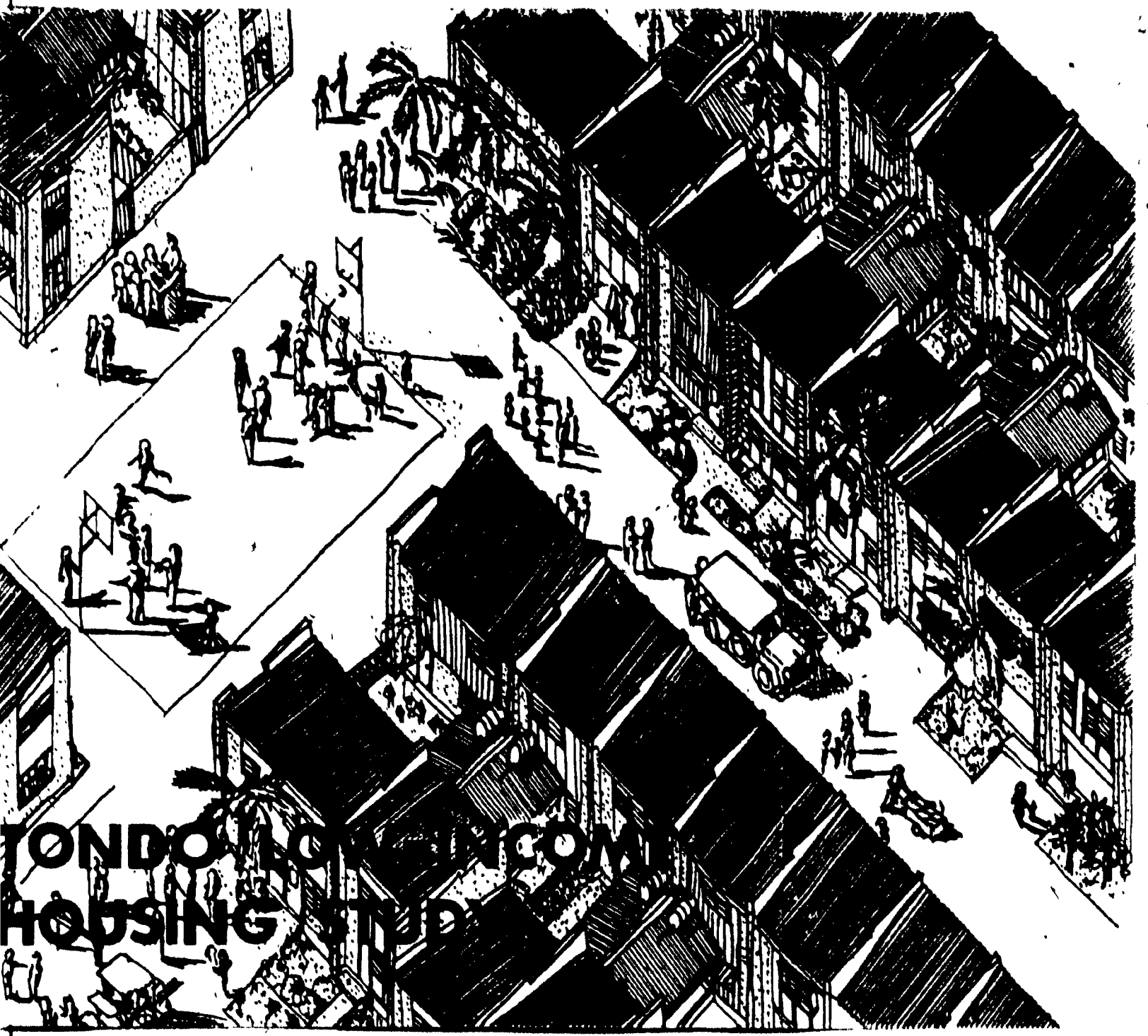
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ABSTRACT

The problem of squatter housing is a dilemma facing viturally every developing nation. It is a problem which defies conventional architectural solutions, since it is invariably a consequence of complex socio-economic and political factors.

This thesis is a study of squatter housing and planning problems in the Tondo Foreshore Land of Manila, the Philippines. The study presents observations of socio-economic and physical conditions in the area and a critical analysis of existing strategies and attempted solutions with a view to developing a new approach to the housing problem by means of a specific architectural proposal based on new strategies.

ABREGE

La question du logement des squatters constitue un problème réel auquel chaque pays en voie de développement a à faire face. C'est un problème qui défie les solutions architecturales classiques, car il découle toujours de facteurs politiques et socio-économiques complexes.

Cette thèse est une étude portant sur l'habitation des squatters et les problèmes de planification dans la région de Tondo Foreshore, à Manila, aux Philippines. Elle comporte des observations sur la situation physique et socio-économique de la région et une analyse critique des stratégies actuelles ainsi que des tentatives de solution élaborées dans le but de développer une nouvelle approche du problème de l'habitation au moyen d'un projet architectural spécifique appuyé sur de nouvelles stratégies.

ACKNOWLEDGEMENTS

Many persons were both helpful and encouraging in the development of this thesis. The author is especially grateful to Prof. Brian McCloskey, and Dr. Aprodicio A. Laquian for their guidance and advice, and to the Faculty of Graduate Studies and Research, McGill University, whose financial assistance enabled her to carry out the on-site research in Manila. To those people in the Philippines who so generously guided her in her research goes a word of special thanks: to General Gaudencio V. Tobias and the Tondo Foreshore Development Authority (TFDA); to Father Denis Murphy (S.J.), Father William J. Keyes (S.J.), Mr. Eduardo Samonte and the members of the Institute of Social Order (I.S.O.); to Prof. Honorato G. Paloma (College of Architecture, University of the Philippines); to Mrs. Mary R. Hollnsteiner (Institute of Philippine Culture, Ateneo de Manila University); to the General Manager, Mr.S.Santiago, and the staffs of the People's Homesite and Housing Corporation; and finally to Mrs. Trinidad B. Herrera and all the residents in the Tondo Foreshore Land, who were invaluable sources of information and experience. Acknowledgements are also due to Mrs. Lorraine Rilstone for typing and to Mrs. Jill McCloskey and Miss M. Anderson for their help editing the text and to Mr. George Fridley for his assistance with technical aspects of the study.

INTRODUCTION

A squatter settlement is an area occupied by settlers who do not possess title or right to the land in question.

The problem of squatter settlements in developing countries has become an issue of increasing international concern in recent years.

The formation of squatter settlements is closely related to the phenomenon of rapid urbanization. Inequitable land distribution and the economic inability of the city to support large numbers of new migrants is a prime cause for the existence of such illegal settlements.

"Squatter settlements" are characterized by poor physical housing conditions, inadequate infrastructure and services and the lack of environmental planning. Solutions to this problem have been attempted by governments and international agencies, and the subject is of considerable interest to many students in the fields of both architectural design and social planning.

This study deals with housing and planning problems in the squatter settlement of Tondo Foreshore Land in Manila, the Philippines.

Housing problems are closely related to problems of socio-economic development of the area and a realistic physical solution can be approached only through a comprehensive socio-economic study. There is no single architectural solution to low-cost housing for squatters. However, any attempt to solve the problem has to recognize both the positive and negative aspects present in the situation.

The foundations of the ideal solution must emphasize the positive aspects such as cheap trainable labour and an underlying sense of social cohesiveness, which if recognized in development proposals, can encourage economically viable systems involving self-help.

As far back as 1968, with the publication of the work on the squatter settlement in Tondo Foreshore Land of Manila by Dr. Laquian, (1) this squatter area has received considerable national as well as international attention. (2)

Through Dr. Laquian, a proposal was made to test the feasibility of providing a physical housing solution using his socio-economic research in the area.

In the summer of 1974, with a travel grant from the Faculty of Graduate Studies and Research, McGill University, the author was given the opportunity to gather data for this study. (3)

In February 1975, the International Architectural Foundation Inc. together with the Philippine Government announced a jointly sponsored International Design Competition for the Urban Environment of Developing Countries focused on Manila. At this time, the decision was made to modify the original thesis, so as to conform with the constraints of the competition.

This study is organized in four parts. The first part presents information on existing conditions, a summary of the overall squatter situation in the Philippines and Metropolitan Manila and a detailed analysis of the socio-economic and physical data on the Tondo Foreshore squatter settlement.

(1) Aprodicio A. Laquian, Slums are for People, (Honolulu: The East-West Centre Press, 1971).

(2) Even as this report is being written, the Philippine Government, with its own Tondo Foreshore Development Authority, has established the Tondo Foreshore Urban Renewal Project concurrent with a study by the World Bank.

(3) During the author's period of residence (May 22-Aug. 13, 1974) in the Tondo Foreshore, the government decided to resettle the Foreshore residents in the North in the land fill area known as Dagat-Dagatan. It was decided at this time to change the location of the site to this new area and to develop a proposal for the relocation of the Tondo people.

The second part deals with an analysis of existing strategies and recommendations by both the government and private agencies.

The third part is a proposed design by the author. This part also includes recommendations for implementation of this proposal.

The last part contains references, and is organized under appendices and bibliography.

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PART III PROPOSAL

PART I

BACKGROUND INFORMATION

1. PHILIPPINE CONTEXT

Urban Population Growth

The total land mass of the Philippines is 300,000 square kilometers consisting of more than 7,100 islands. The largest and most populous island is Luzon, comprising 53% of the land mass and having 53% of the population. (1)

The 1970 census indicates a total population of 36,590,068 with an estimated birth rate of 3.5%. (2) Approximately 32% of the population resides in urban areas. (3)

Since World War II, urbanization in the Philippines has produced an influx of migrants from rural areas. This has resulted in a rapid growth of the urban population. (4)

Comparing these percentages with the national average (36.2%) (5) during the same period indicates a more rapid population growth in urban areas. This growth has overburdened the administrative, economic, and physical structure of the cities.

Housing Shortage

Lack of adequate housing is one of the major problems accompanying these rapid urban population growths. According to the 1970 United Nations report, (6) covering the twenty year period of 1960 - 1980, the Philippines needs 5,790,000 new houses and another 3,640,000 to

(1) Mila A. Reforma, Internal migrations in the Philippines (Quezon City: University of the Philippines, 1972), Chapter I, p. 7.

(2) IAF, The Internation Design Competition for the Urban Environment of Developing Countries Focused on Manila (New York: International Architectural Foundation, 1975).

(3) Reforma, Chapter V, Table II. 4.

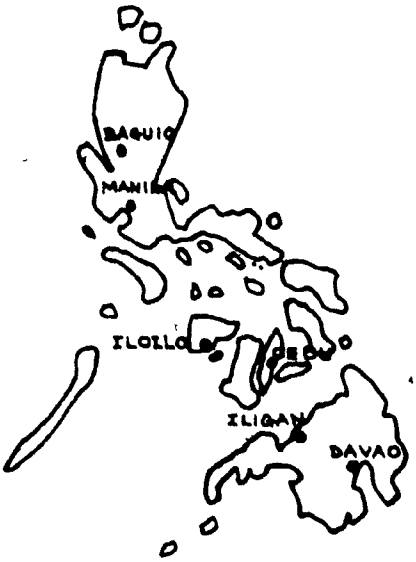
(4) Population growth of the six main cities from 1960 to 1970.

Metropolitan Manila	41.4%
Baguio	67.6%
Iloilo	38.7%
Cebu	38.2%
Iligan	78.3%
Davao	74.1%

(5) Reforma, Chapter I. Table II. 2.

(6) United Nations, Improvement of Slums and Uncontrolled Settlements, (New York: U.N., 1971), p. 49.

(7) Jesus M. Capili, Policy Approaches to Lower Cost Housing: The Philippine Experience (Quezon City: People's Homesite and Housing Corporation, 1974), p. 2.



Illus. #1 Location of 6 Cities

(8) The percentages of squatter population of the six main cities are as follows:

Manila	33%
Baguio	14%
Cebu	25%
Iloilo	32%
Iligan	10%
Davao	22%

replace those which are obsolescent, or have been destroyed. Currently 5.7% of the gross national product is required to fill this housing shortage, versus 1.7% in 1965 and 2.8% in 1967. On the other hand, a recent report, (7) by the People's Homesite and Housing Corporation indicates that in 1970 the total number of existing dwelling units in the country was 5,186,873 [1,089,328 (21%) in urban areas and 4,097,759 (79%) in rural areas]. The shortage is 1,121,759 units (918,510 in urban areas and 203,249 in rural areas). Taking into account the shortage, the population growth and the need for replacement housing, 470,000 dwelling units per year are now required. The Government's small investment in housing has not helped to improve this condition. As rural-urban migration continues to increase, greater housing shortages occur in the cities. More and more migrants are thus driven into slums or squatter settlements.

Squatter Problems in the Philippine Cities

The reasons for the large migrant movement are two-fold, i.e. one, a fascination with the urban way of life and two, a dissatisfaction with the agricultural economic system in the rural areas. People migrate to large urban areas seeking a better and fuller life, but due to their lack of education and vocational training, work is unattainable in the city. Therefore, they have no alternative but to find shelter in a squatter settlement. Yet most urban areas lack the infrastructure and economic opportunity required to support large migrant inflows of population.

Because a significant percentage (8) of the total population of the

6 main urban areas of the Philippines are squatters the cities must provide and enforce an adequate counterplan to solve their problems, not only for the sake of the squatters but also for the common good of all its inhabitants and for the future of the city itself.

Characteristics of Philippine Squatter Settlements

The report by Dr. A.A. Laquian, "Slums and Squatters in Six Philippine Cities" (9) describes the conditions in these six cities (Manila, Baguio, Cebu, Iloilo, Iligan and Davao). Each squatter settlement has similar characteristics.

(9) A.A. Laquian, Slums and Squatters in Six Philippine Cities (New York : The Southeast Asia Development Advisory Group (SEADAG) of the Asia Society, 1972), p.4.

Economic Characteristics:

(a) Most of the squatters belong to the "low-income"group.

(b) Employment opportunities are limited since most squatters are unskilled or semi-skilled labourers.

(c) The cost of living in squatter communities is less than elsewhere.

(d) Many squatters believe their economic condition in the squatter settlement is better than it was in the rural area.

Social Characteristics:

(a) New migrants come into the cities depending on the relatives and friends who have preceded them. Thus the traditions of rural community organization are maintained through new patterns of cooperation and a community solidarity is established.

(b) This Community Solidarity:

(i) unites the squatters' aspirations for their betterment both for individuals and for the community as a whole.

(ii) acts as a vehicle for solving political problems, particularly on the issue of land tenure.

(iii) ensures the maintenance of peace and order.

(c) The squatters' attitude towards governmental programs is cynical and they prefer to rely on themselves.

Physical Characteristics:

(a) Squatters' settlements normally occur on undeveloped public land, marginal land, or private land owned by slum landlords. Although ownership of house and land are the primary motivations in squatting, the government often refuses to recognize the squatters' tenure on such land. All squatter settlements are characterized by disorder and dilapidation such a makeshift housing, narrow unplanned streets and inadequate infrastructures and services which result in serious health hazards and sanitation problems.

(b) The type and multiplicity of housing construction results in an almost total consumption of the land, leaving a negligible area for schools, infrastructures, green areas, playgrounds, gardens and the like. Housing densities are further increased by the division of interiors for multiple family occupancy resulting in an entire family living in one room only.

Despite high densities and lack of public and private services, most squatters wish to stay within the community. The reasons are a

mixture of social and economic factors:

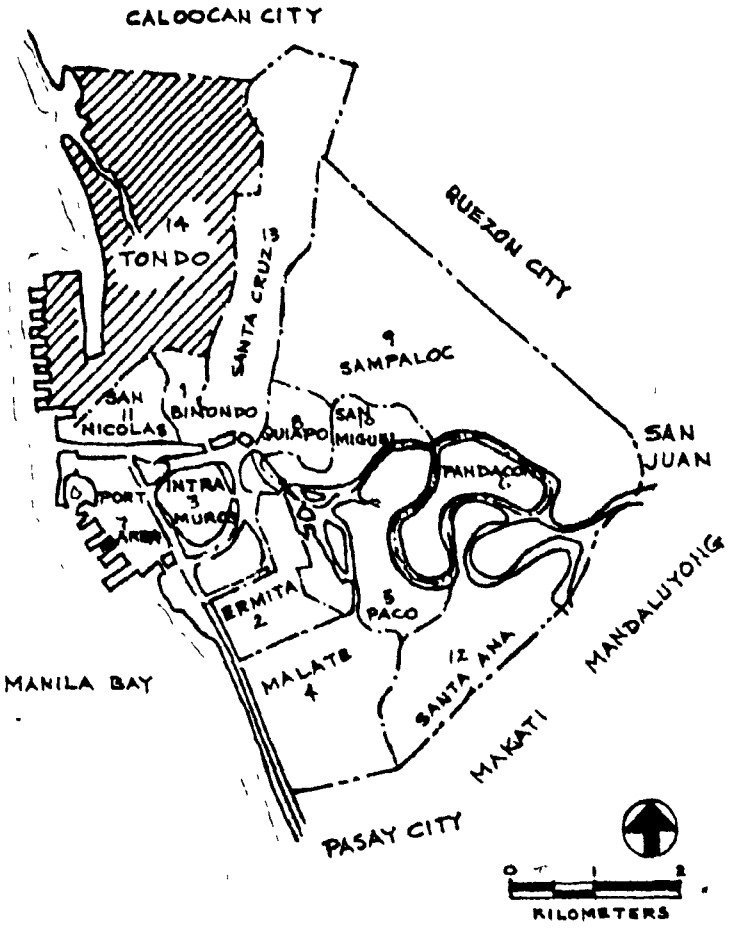
(a) They are accustomed to living within the community where their relatives, friends and neighbours are.

(b) The settlement is usually near their place of work.

(c) They have invested a considerable amount of money and "sweat-equity" for their houses and community services.

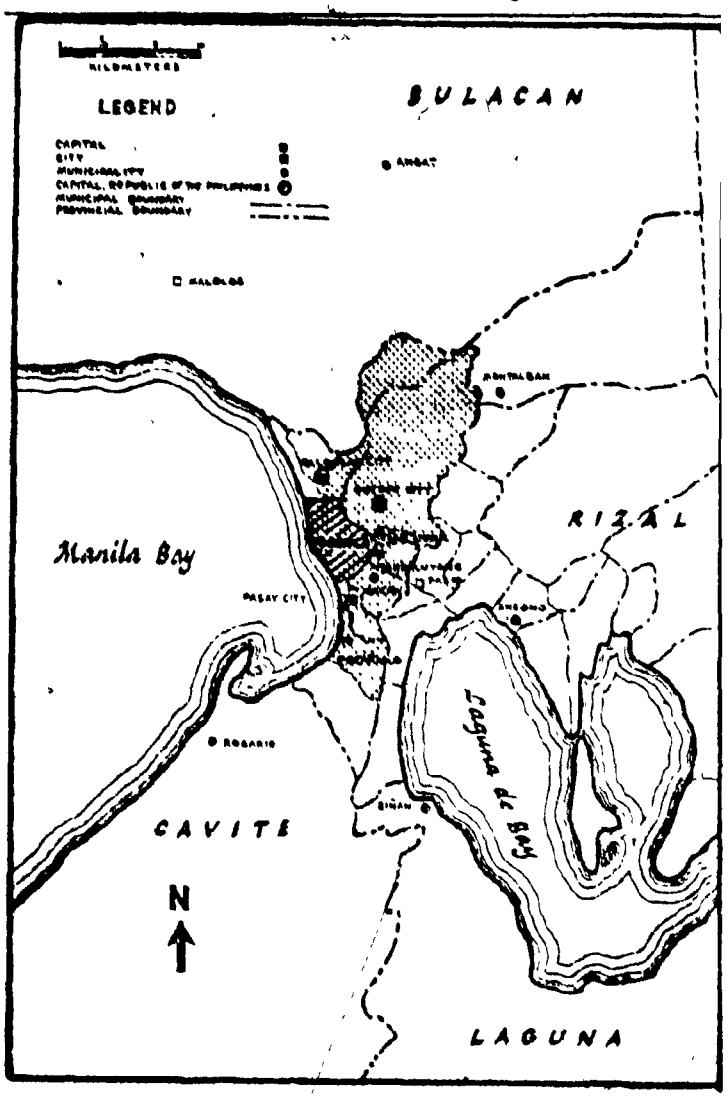
(d) The cost of living is lower.

The problem of squatter settlements exists in many cities throughout the country, but the most serious problems exist in Metropolitan Manila.



SOURCE : INSTITUTE OF PHILIPPINE CULTURE, PAPERS #7

MANILA CITY Illus. #2



Location map showing relative position of the City of Manila (black), Greater Manila (shaded), and outlying provinces.

Source: Bureau of the Census and Statistics Census of the Philippines, 196[illegible] population and housing. Vol. I. Manila, Bureau of the Census and Statistics, 196[illegible]

PHILIPPINE ISLAND WORLD

METROPOLITAN MANILA Illus. #3

2. METROPOLITAN MANILA CONTEXT

Metropolitan Manila Area

The City of Manila was chartered in 1571 as the capital of the Philippines which was a Spanish Colony from 1521 to 1899 and occupied by the United States from 1899 to 1946. The city has been expanding its role as the center of politics, economy, culture and education for the nation, spreading outwards into the adjacent provinces and the area so formed is referred to as Metropolitan Manila. (See Illus. #2 and #3).

Population Growth in Metropolitan Manila

The population of the Metropolitan Manila area in 1970 was approximately 3.2 million. (10) This was about 8.6% of the nation's total population of 36.9 million. The percentage of the population growth in Metropolitan Manila from 1960 - 1970 was 5% per annum as compared to the nation's 3.5%.

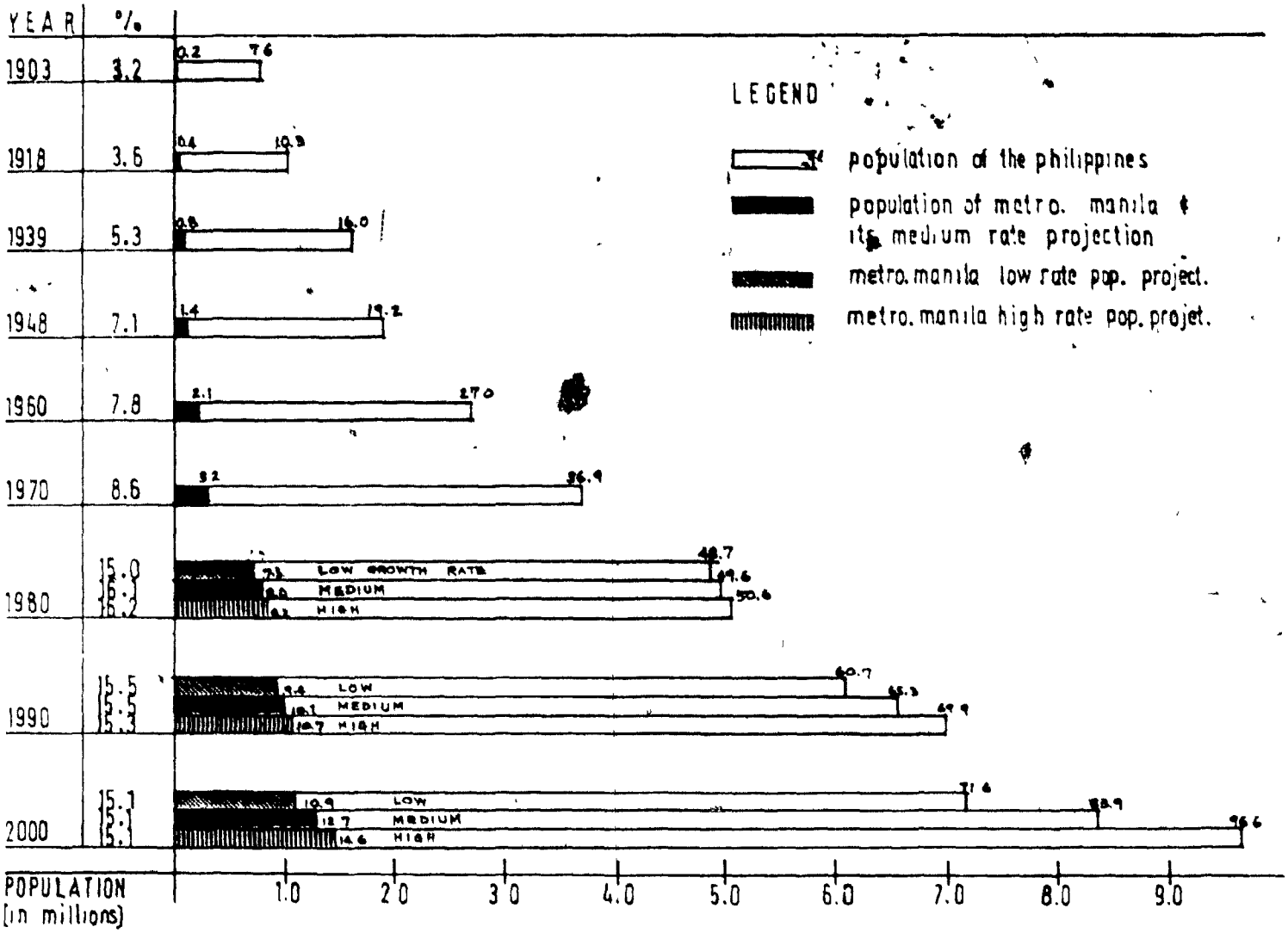
(10) Reforma, Chapter II, Table II, 1.

In 1970, Manila's population density was 34,554.3 persons per square kilometer while the nation's population density was 121.9 persons per square kilometer. (11)

(11) Reforma, Chapter I, Table I. 1.

The population projection for this area in the year 2000 is expected to reach 14.6 million, (more than four times that of 1970), while the total national population projection is expected to reach 96.6 million, (2.4 times that in 1970) (12) (See Illus., #4).

(12) IAF, p. 3.



THE PHILIPPINES & METROPOLITAN MANILA Illus. #4

POPULATION [1903-1970] ; **ITS PROJECTION** [1970-2000]

SOURCE : BUREAU OF CENSUS AND STATISTICS

INTERNATIONAL ARCHITECTURAL FOUNDATION, INC

Squatter and Slum-dweller Population - Some Problems and Characteristics.

In 1968, approximately one third of the population of Metropolitan Manila lived in slums and squatter settlements. (see Illus. #5). The squatter and slum population in 1970 was estimated to be 1,383,043, with a growth rate of 12% annually.

Following are some of the problems related to Manila's squatter settlements:

(a) incidence of crime such a smuggling, theft etc.
(b) large costly fires in slum and squatter areas.
(c) incidence of respiratory and gastro-intestinal diseases.
(d) breakdown of moral and social behaviour.
(e) low property values resulting in low tax income.

These problems have made both government officials and private individuals realize the necessity of gathering accurate information on squatters and slum dwellers to serve as a basis for new development policies. In 1968, a special committee was created to conduct a survey of squatter settlements and slum dwellings to define their scope, analyze their nature and draw up specific recommendations. (13) Many studies have been conducted by the government and other institutions to assess the nature of squatter settlements and slum areas in Metropolitan Manila. The Tondo Foreshore Urban Renewal Project, the largest study attempted by the government, is used as a basis for reference in the present report.

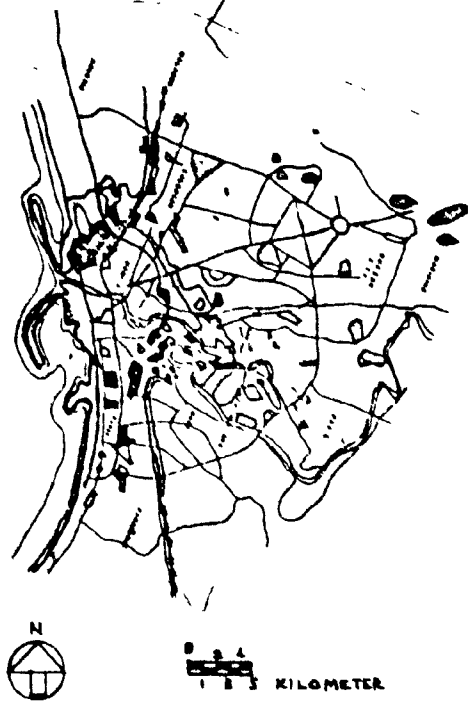
(13) Laquian, Slums are for People, p. 213.

ESTIMATED NUMBER OF SQUATTERS AND SLUM DWELLERS IN METROPOLITAN MANILA, 1968 (in Families)

	SQUATTERS	%	SLUM - DWELLERS	%	TOTAL	%
Manila	35,329	27.6	45,107	80.7	80,436	43.8
Malabon	9,000	7.1			9,000	4.9
Navotas	4,000	3.1			4,000	2.2
Caloocan	21,650	16.9	2,350	4.2	24,000	13.1
Quezon City	31,297	24.5	1,450	2.6	32,747	17.8
Mandaluyong	15,250	11.9	6,000	10.7	21,250	11.7
San Juan	3,384	2.7			3,384	1.8
Marikina	456	.4			456	.2
Pasig	196	.2			196	.1
Tagúig	200	.2			200	.1
Cainta	80	.0			80	.0
Makati	971	.8	200	.4	1,171	.6
Pasay	1,939	1.5	800	1.4	2,739	1.5
Paranaque	3,600	2.7			3,600	1.9
Las Pinas	500	.4			500	.3
Metropolitan Manila	127,852	100.0	55,907	100.0	183,759	100.0

SOURCE : A.A. LAQUIAN, RURAL URBAN MIGRANTS AND METROPOLITAN DEVELOPMENT (TORONTO: INTERMET, 1970)

LOCATION OF SLUMS AND SQUATTERS



Illus. #5

3. TONDO FORESHORE LAND CONTEXT

Location and Area

The Tondo Foreshore Land is located at the northwest corner of Manila. (See Illus. #2 and #6). The land area is approximately 184.1 hectares. (14)

(14) IFA, p. 33.

The Tondo Foreshore Land is classified as public land, within the jurisdiction of the Department of Agriculture and Natural Resources, under the provisions of the Public Act. (15)

(15) Information obtained from Tondo Foreshore Urban Renewal Project Office, 1974.

The land fronts the North Harbor [illegible] is adjacent to the transport terminals and Divisoria Market wh[illegible] fresh produce (from Central Luzon) is brought for local distribution.

History

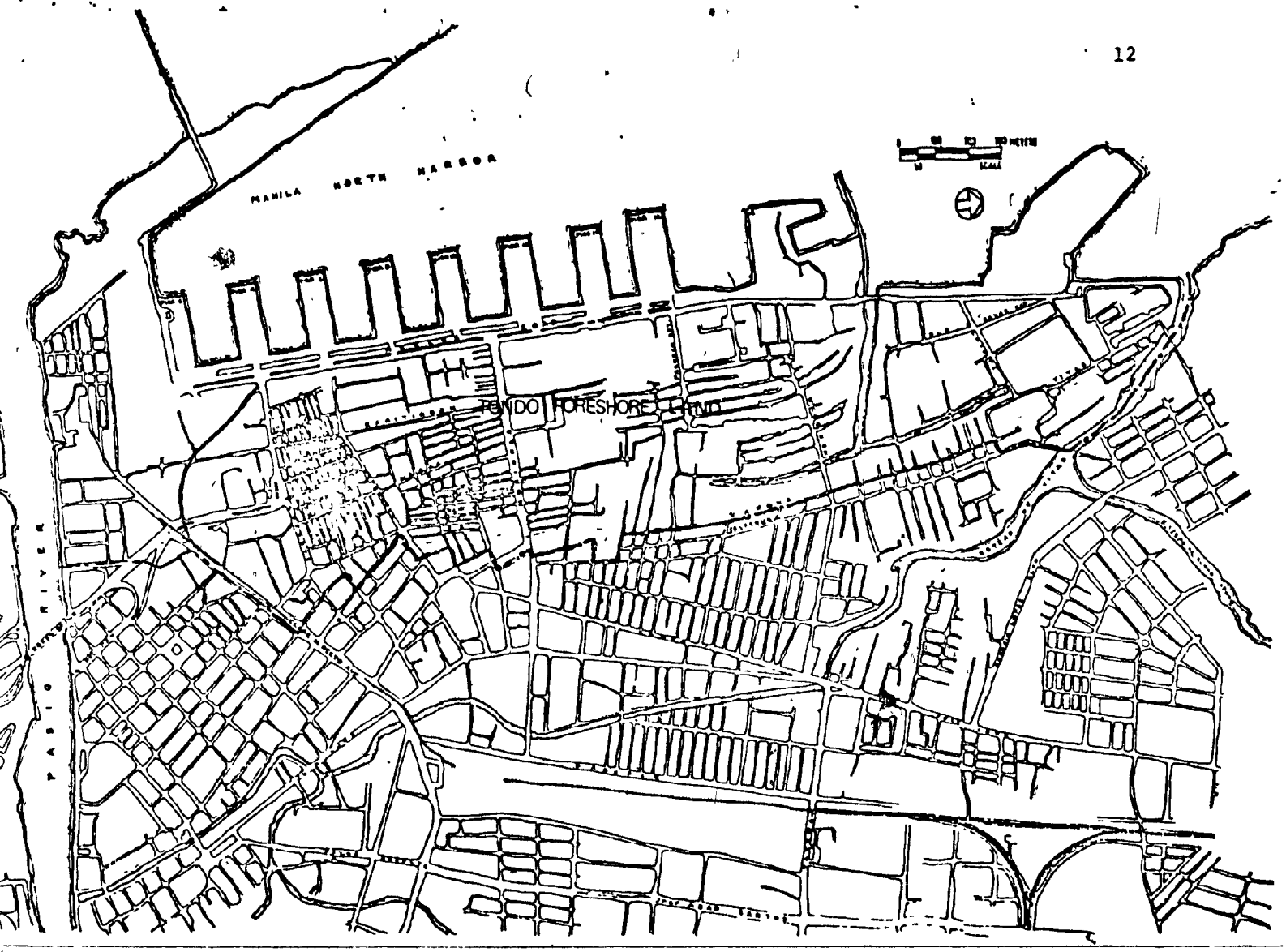
The Tondo Foreshore Land is an extension of the Tondo District. Starting in 1940 the government reclaimed the shoreline to establish an inter-island port. However, before the installation of the port facilities could be accomplished, squatters had occupied the area thereby extending the old slum area of Tondo.

The issue regarding legal occupancy (or possession) of this created land is of the greatest importance to the squatters. The conflict over land tenure between the government and the squatters has been ceaseless since the beginning of the settlement. Several laws pertaining to this land have been enacted by the government.

TONDO FORESHORE BO

TONDO FORESHORE LAND

Illus. #6



—·—·— TONDO FORESHORE BOUNDARY

TONDO FORESHORE LAND

Illus. #6

2 of 2

Proclamation No. 187 was signed by President Elpido Quirino on 17th June 1950, declaring the reservation of the site at the northern part of Tondo Foreshore Land for a low-cost housing project under the administration of the People's Homesite and Housing Corporation. The Republic Act No. 1597 (Tondo Foreshore Land Act of 1956) approved on June 16, 1956, proclaimed the subdivision of the Tondo Foreshore Land into lots and provided for their sale to their lessees or the bona-fide occupants of the lots. However, the subdivision survey of the land was never completed, and the provisions of the Act were not carried out, although many residents possess a temporary certification of occupancy of their lot. (16)

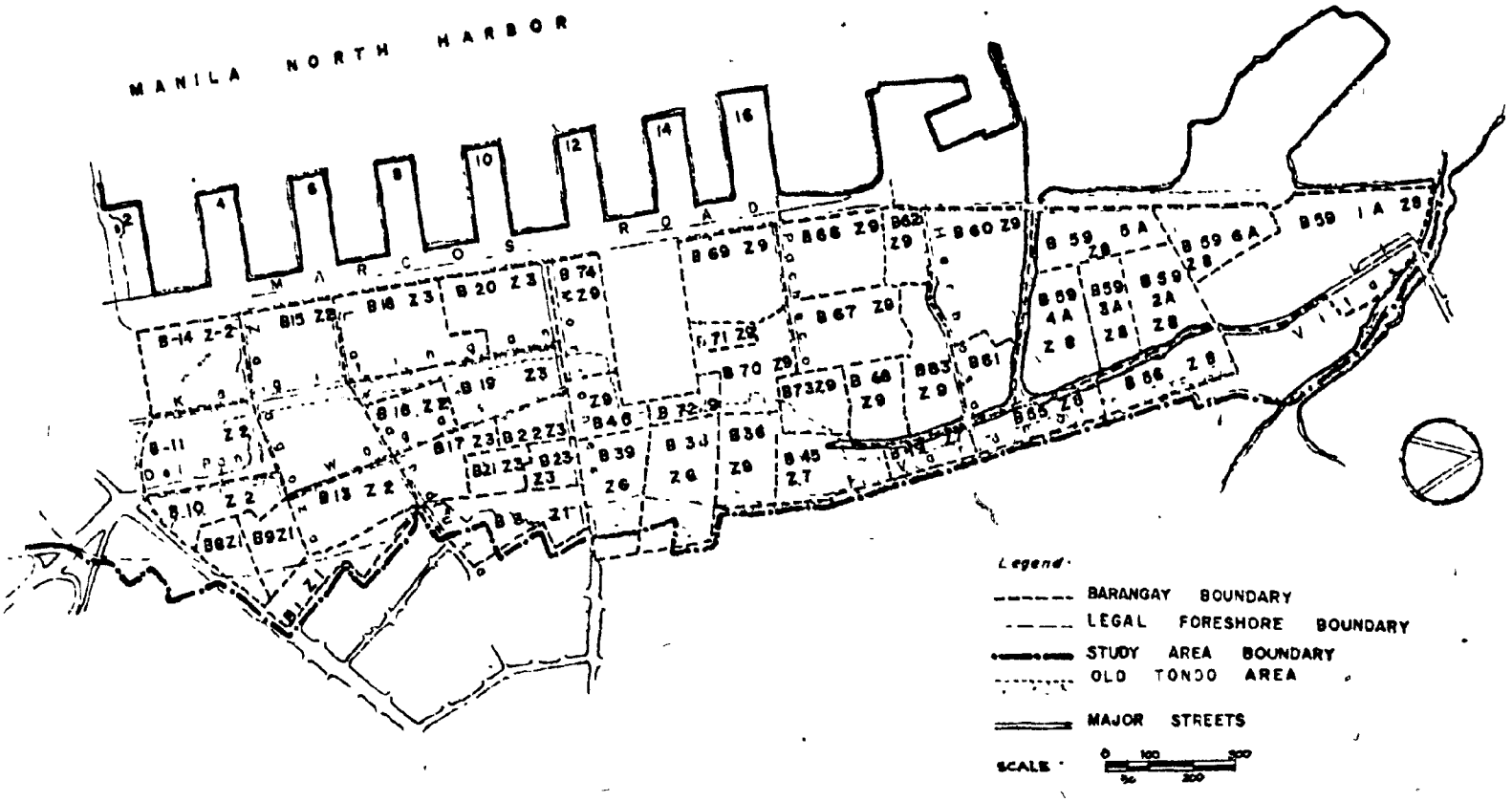
(16) Information obtained from TFURP Office.

As a result of the proclamation of Martial Law on 21 September 1972 the Tondo Foreshore land was divided into political units, or "zones", and later was subdivided into "barangays", as was the rest of Manila. (See Illus. #7).

In May 1973 President Marcos promulgated the implementation of an eight-billion-peso Manila Bay Project, (17) involving the Tondo Foreshore Land Area.

(17) The Land, the People and the Birth of ZOTO, ZOTO is People's Power (Tondo, Manila: May 13, 1973), p. 7.

In January 1974, the Tondo Foreshore Urban Renewal Project Team was established as a joint effort by the Housing and Urban Development Team (HUD) and the Development of Academy of the Philippines (DAP) to undertake a comprehensive and integrated renewal plan for the Tondo Foreshore Area.



TONDO FORESHORE BARANGAY SUBDIVISION Illus. #7

SOURCE: TONDO FORESHORE URBAN RENEWAL PROJECT

(18) Data presented herein obtained from TFURP office unless otherwise noted.

(19) Approximately 15% of Manila's population is congregated within this area.

Demography (18)

Population

The population living within the area as defined in the Tondo Foreshore Act 1956 is approximately 172,000. (19) In addition there are approximately 21,000 persons living to the south of the mandated area.

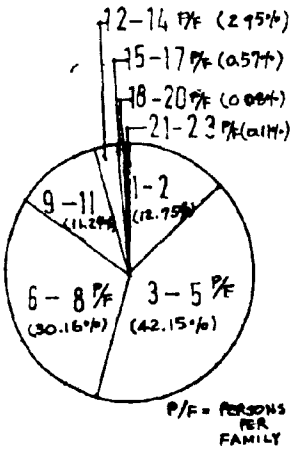
The current population increase rate is approximately 12% per annum, An outmigration percentage estimate was not available.

Population Density

Although the average population density is approximately 1,500 persons per hectare, in some areas density reaches approximately 3,650 persons per hectare.

Age Groups (See Illus. #9)

In the Tondo Foreshore Area, the average age is 20 years. The average age of the household head is 22 years. Twenty-nine percent of the population is 10 years old or less. Seventy-three percent of the population is 30 years old or less.

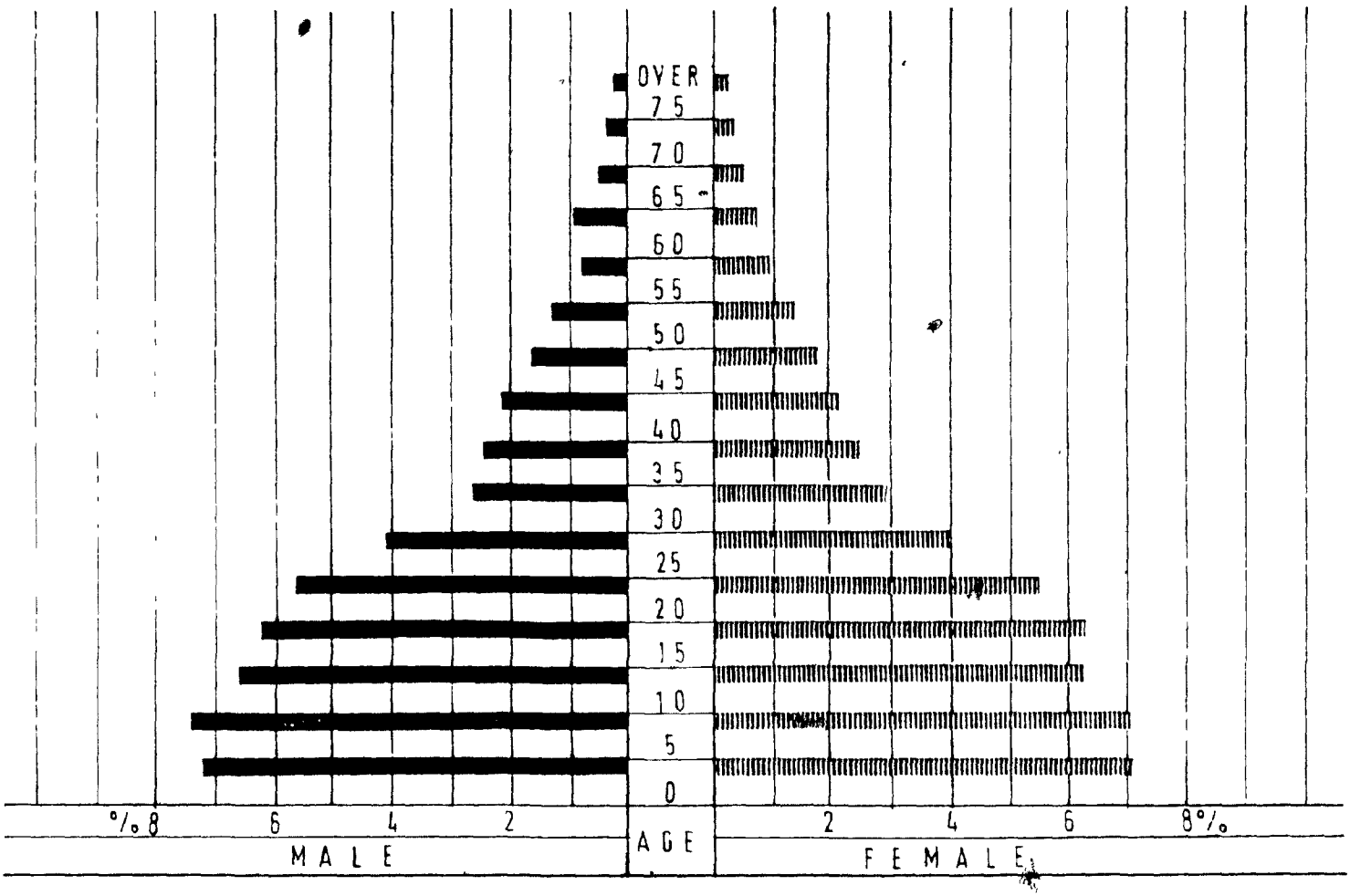


Family Size

Illus. #8

Family Size

The average family group is composed of 6.5 persons. (See Illus.#8).



male	50.43 %
female	49.57 %
total	100.00 %
average age	20 years

HOUSEHOLD MEMBERS BY AGE & SEX GROUPS

Illus. #9

SOURCE : TONDO FORESHORE URBAN RENEWAL PROJECT

Household Head Civil Status

The statistics for the civil status of residents are as follows:

Married household head	86.5%
Widows household head	7.6%
Single household head	4.1%
Others household head	1.7%

Language Groups

Tagalog, the national language, is used by approximately 50% of the population. The next largest language group (13%) speaks the Waray tongue (dialect of Samoa and Leyte regions). In addition to these major languages many dialects are spoken. English (also an official language) has limited use within the area.

Origin of Birth

The birthplace of heads of households are as follows:

Manila and its suburbs	27.3%
Central Luzon	20.1%
East and West Visaya	26.8%
Others	25.8%

Religious Groups

The largest percentage of the population (86.6%) is Roman

Catholic. The Iglesia ni Kristo (Philippinized Catholic Church) claims 2.8% of the population. The balance is divided among other religious groups such as Protestants, (1.2%) and Moslems (0.8%). Religious celebrations are an important social activity of the community.

A Community Library

Illus. #10

Social Aspects

Political Organization

The desire to secure the land on which they have squatted has served to unite the squatters and as a result, several community organizations have been established which are politically active against existing government policies such as eviction, resettlement and construction of multiple tenement housing.

Zone One Tondo Organization (ZOTO) is the most powerful of these community organizations (20) and is supported by religious groups within the country (21) and abroad. (22) ZOTO has been involved not only in the land issue but also in other social movements both within and around the Tondo Foreshore Land thereby frequently irritating the Government.

The community organizations also operate various social programmes, such as environmental improvement, a service for vocational training and economic advancement, disaster relief and a publications service.

(20) Its membership is 10,000 households (60,000 people).

(21) The Philippine Ecumentical Council on Community Organization (PECCO)

(22) The Protestant Central Agency for Development Aid of West Germany.

Education

The majority of the population has received some formal education, however 33.8% of heads of households have not completed elementary schooling. The percentage of high school graduates among heads of households is 11.7%. (23)

(23) Data by TFURP office.

Despite their educational level and background, the people are considered very literate because of their use of mass media i.e. T.V., newspapers, etc.

Naturally, the level of educational attainment correlates with the individual's standard of living, i.e. the higher the education, the better the occupation and the higher the income. The style of living, awareness of sanitation and health, maintenance of the house and its surroundings are all by-products of education. (24)

(24) Laquian, Slums are for People, p. 82.

The Tondo Foreshore people have many opportunities to continue educational pursuits in areas other than formal schooling. Community organizations provide vocational training programmes. The Don Bosco Youth Centre and Tulungan Centres (government welfare centres) provide vocational training.

Vocational Training at a Tulungan Centre

Illus. #11

Social Activities and Life Style

Life in squatter settlements often represents a transition from rural to urban living and rural traditions persist in both personal and social life. Mutual aid during times of trouble

such as death, illness, financial difficulties, etc. and during important social activities such as weddings, baptisms and religious festivals, forms strong bonds between residents and has become the main force in uniting the tightly knit community.

Life in Tondo Foreshore

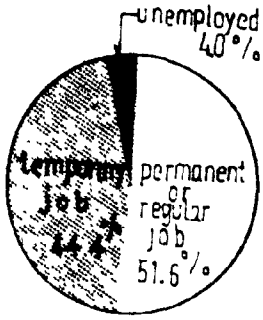
Illus. #12

(25) Low-income families get food and daily needs from sari-sari stores where it is easier to obtain credit by buying in small amounts.

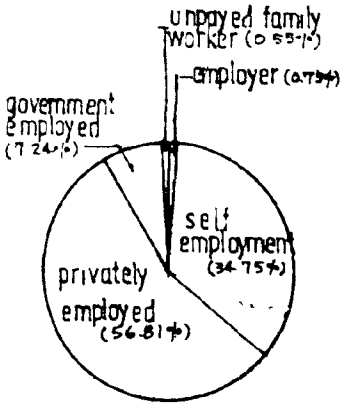
The standard of living of individual families naturally differs according to income. Some families have a high enough income to own refrigerators (which enables them to buy larger quantities of food and to store it). They sleep on beds rather than on straw mats; they go to movies frequently and in some cases have acquired such modern luxuries as automobiles, coloured televisions and stereo-sets. However for the majority, family life is humble: There is almost no furniture in the house; most families sleep on straw mats on the floor, shop for food several times a day (25) in order to avoid extra consumption, and also because of lack of storage space and refrigeration. They spend their free time chatting with neighbours or hanging around the main parts of the community or just staying at home.

Basketball is almost the national sport. In many communities, the only open space is reserved for basketball courts and these are the most active places in the area.

(26) Figures by TFURP office unless otherwise noted.



Employment
Illus. #13



Employment Status

Illus. #14

(27) U.S. 1 dollar 7.0 pesos

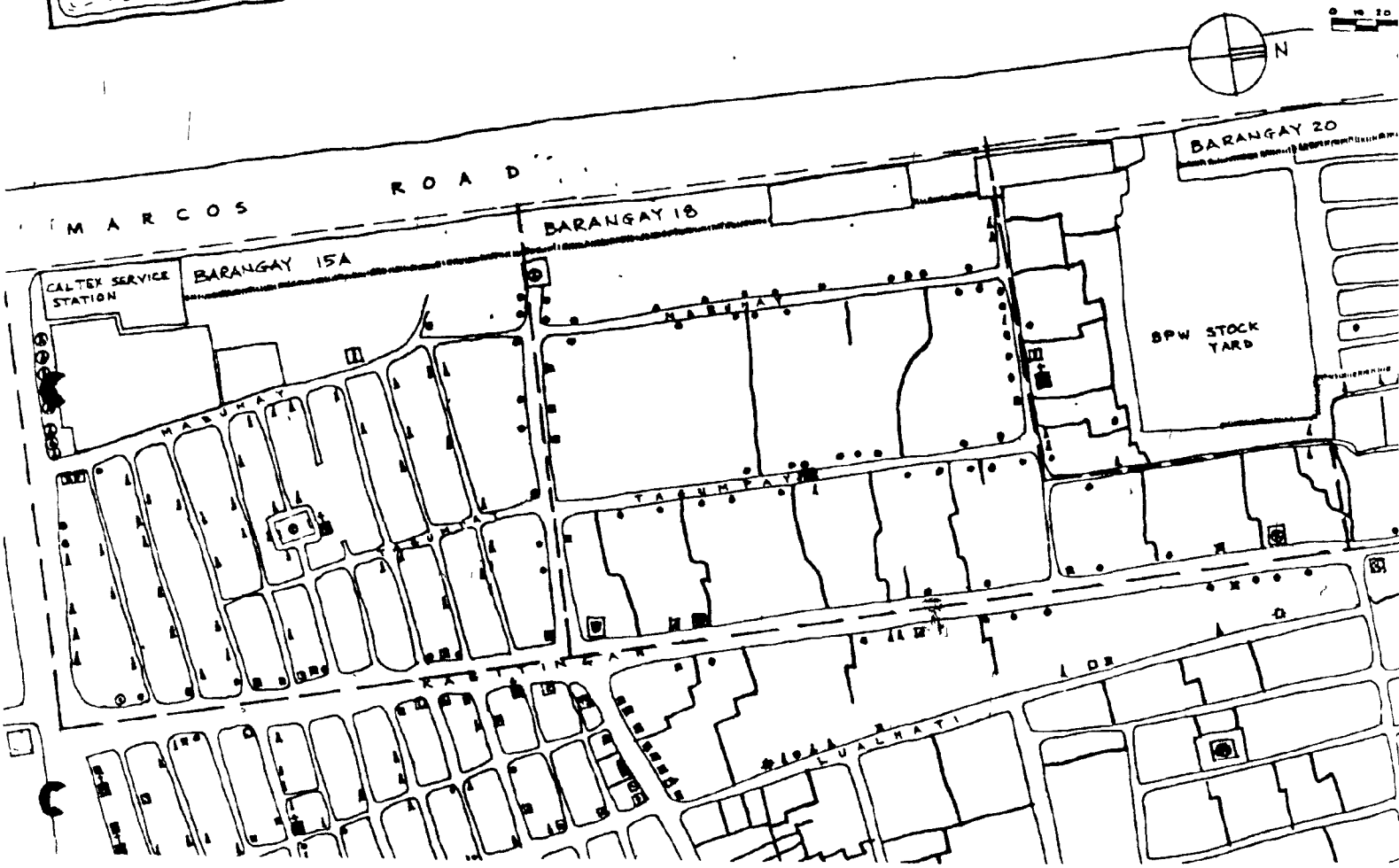
Economy (26)

Employment and Occupation

Illustration #13 shows the employment situation of household heads. Nearly half of them are unemployed or work under unstable conditions, i.e. on a temporary or commission basis.

Sales workers	27.16%
Craftsmen and production process workers	17.50%
Stevedores and related freight handlers	17.00%
Workers in transportation and communications	15.27%
Service, sport and related workers	11.25%
Farmers, fishermen, loggers and related workers	4.96%
Clerical workers	2.75%
Professional technical and ancillary occupations	2.40%
Administrative, executive and managerial	0.78%
Workers not classified by occupation and/or members of the armed forces.	0.62%

Illustration #14 shows the employment status of household heads. There is a high percentage of self-employment in the area. Ninety-one percent of the businesses established within the Tondo Foreshore Area are owned by the residents. Special retail and sari-sari stores are the main businesses. (See Illus. #15). The capital invested in these business establishments is small; in approximately 45% the capital is less than 500 pesos (27) and approximately 70% of the establishments depend on the unpaid labour of household members.



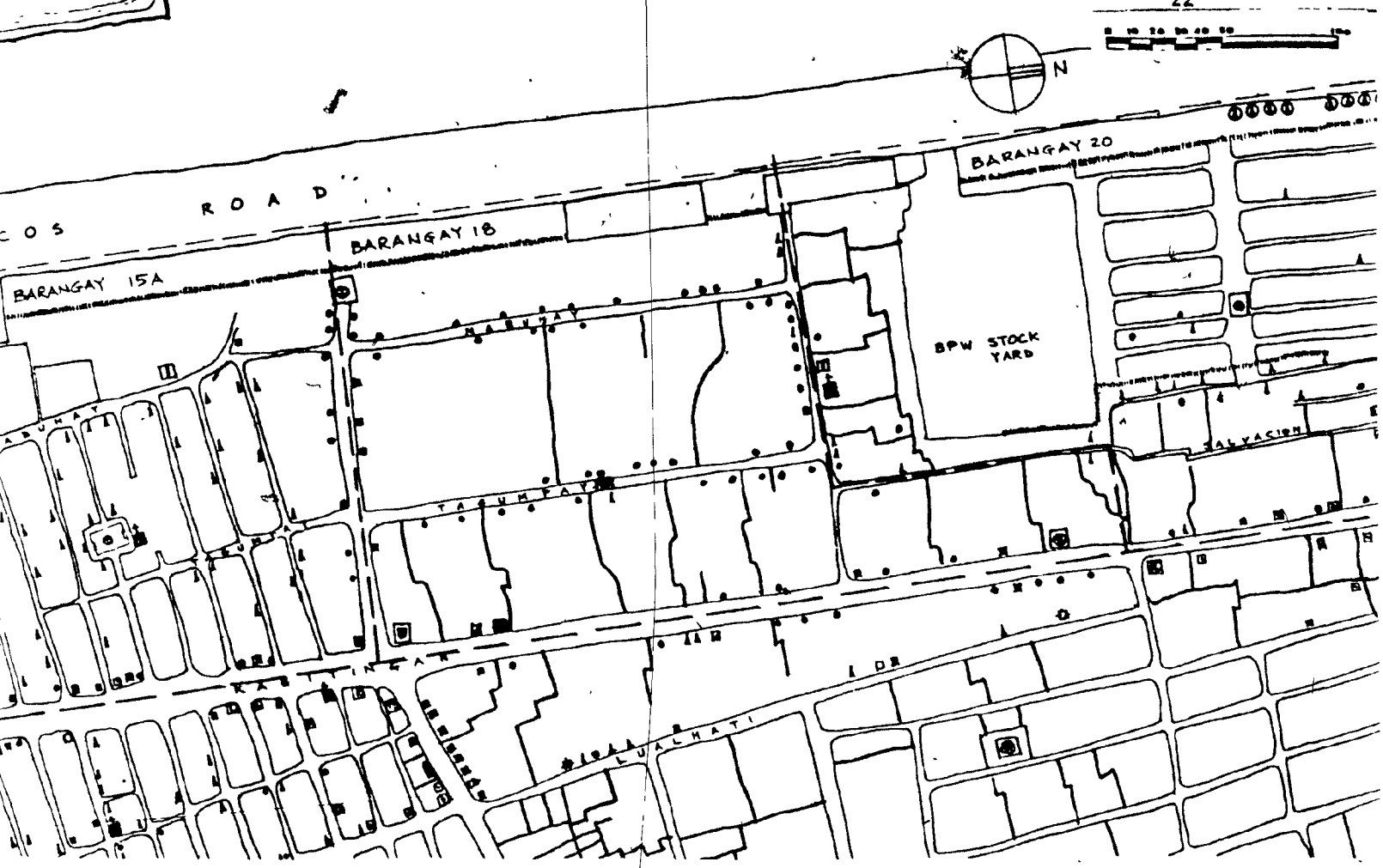
LEGEND

- ROLLING STORE
- SMALL SARI-SARI STORE
- MEDIUM SARI-SARI STORE
- LARGE SARI-SARI STORE
- GROCERY
- BAKERY
- JUNK STORE
- TAILOR SHOP
- DRESS SHOP
- OPTICAL SHOP
- BEER HOUSE
- RESTAURANT
- LUMBER YARD
- BILLIARD HALL
- POLICE OUTPOST
- BARANGAY HEADQUARTERS
- CHAPEL
- BASKETBALL COURT
- PATHWAY

Illus. #15

BUSINESSES IN BARAGAYs 15A, 18, 20

(SOURCE. TONDO FORESHORE URBAN RENEWA



LEGEND

- ROLLING STORE
- SMALL SARI-SARI STORE
- MEDIUM SARI-SARI STORE
- LARGE SARI-SARI STORE
- GROCERY
- BAKERY
- JUNK STORE
- TAILOR SHOP
- DRESS SHOP
- OPTICAL SHOP
- BEER HOUSE
- RESTAURANT
- LUMBER YARD
- BILLIARD HALL
- POLICE OUTPOST
- BARANGAY HEADQUARTERS
- CHAPEL
- BASKETBALL COURT
- PATHWAY

Illus. #15

BUSINESSES IN BARAGAYs 15A, 18, 20

(SOURCE TONDO FORESHORE URBAN RENEWAL PROJECT)

2 OF 2

A Tailor Shop

Illus. #16

A Fish Peddler

Illus. #17

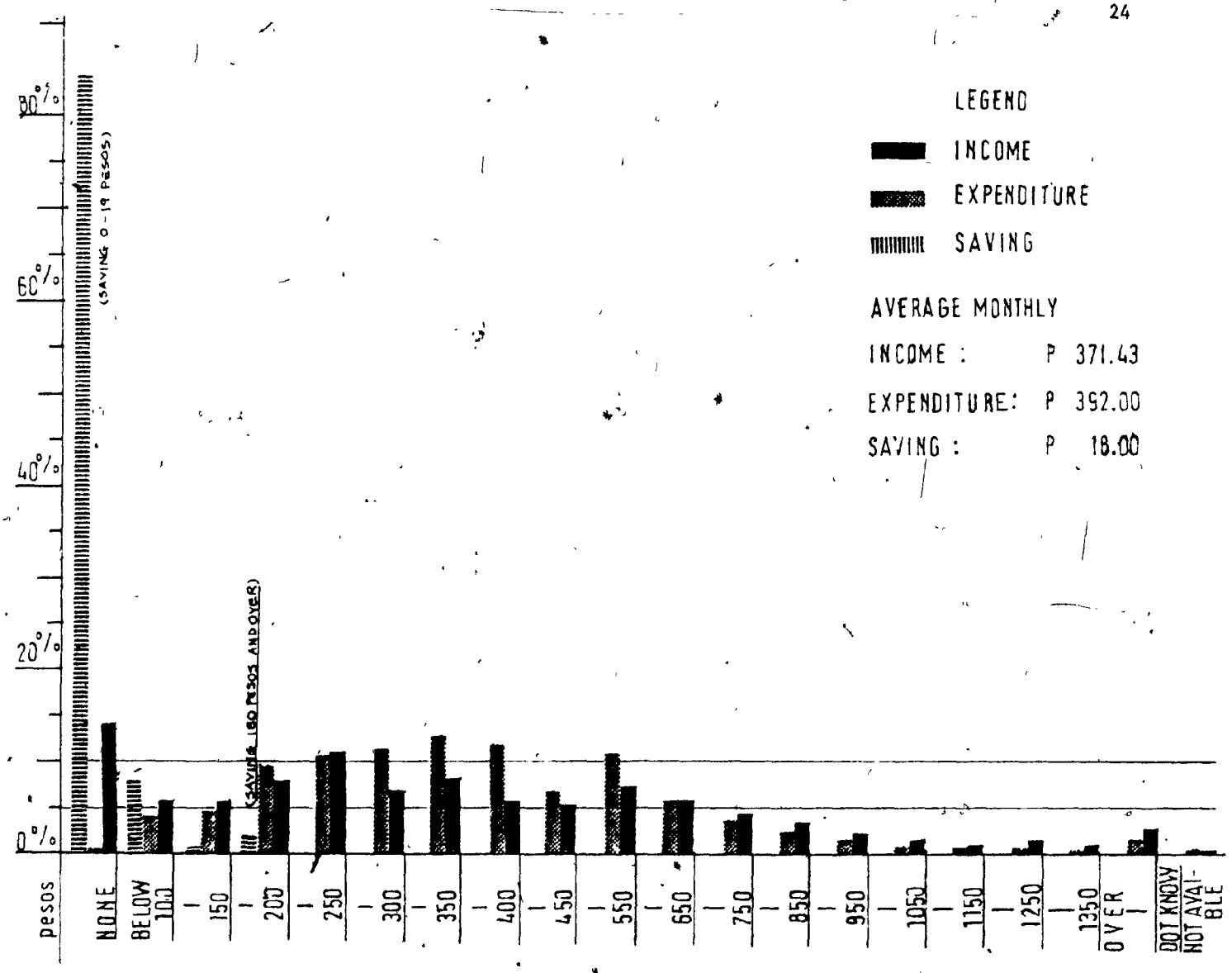
The subsistence of the majority of the owners (82.1%) is entirely dependent on the income from their business. Their capital comes from their own savings (40.0%) or from that of relatives (25.7%) or friends (12.85%). Banks and pawn shops are seldom used (approximately 3.6% in each case). Because of the lack of capital, small businesses are difficult to operate and approximately 48% of them tend to fail.

In squatter settlements, the wives and children also try to find an income source. Persons ten years of age and older are considered as part of the labour force and 23% of these household members are employed. Approximately half the household members have acquired vocational skills such as handicrafts (tailoring, machine knitting, and embroidery, etc.), mechanical techniques (auto mechanics, practical electricity, radio mechanics) and construction skills. Another noticeable feature is that residents try to find employment near their home. About 29% of household heads work on their own premises or within walking distance. Another 21.9% work outside of the Tondo Foreshore Land but within the Tondo District.

Income Expenditures and Savings

Illustration #18 indicates the distribution of family income, expenditures and savings.

The Philippine National Standard of family income classes are



HOUSEHOLDS BY TOTAL MONTHLY INCOME, EXPENDITURE, SAVING

Illus. # 18

SOURCE. INTERNATIONAL ARCHITECTURAL FOUNDATION, INC. ; TONDO FORESHORE URBAN RENEWAL PROJECT

as follows: (28)

Category	Annual Income (pesos)	Philippines (%)	Tondo Foreshore (%)
Low-income	500 - 2,999	59	44
Middle-income	3000 - 5,999	25	30
High-income	6000 - above	16	26

(28) Bureau of Census and Statistics, 1971 quoted from Capili, Policy Approaches to Lower Cost Housing: The Philippine Experience, p. 3.

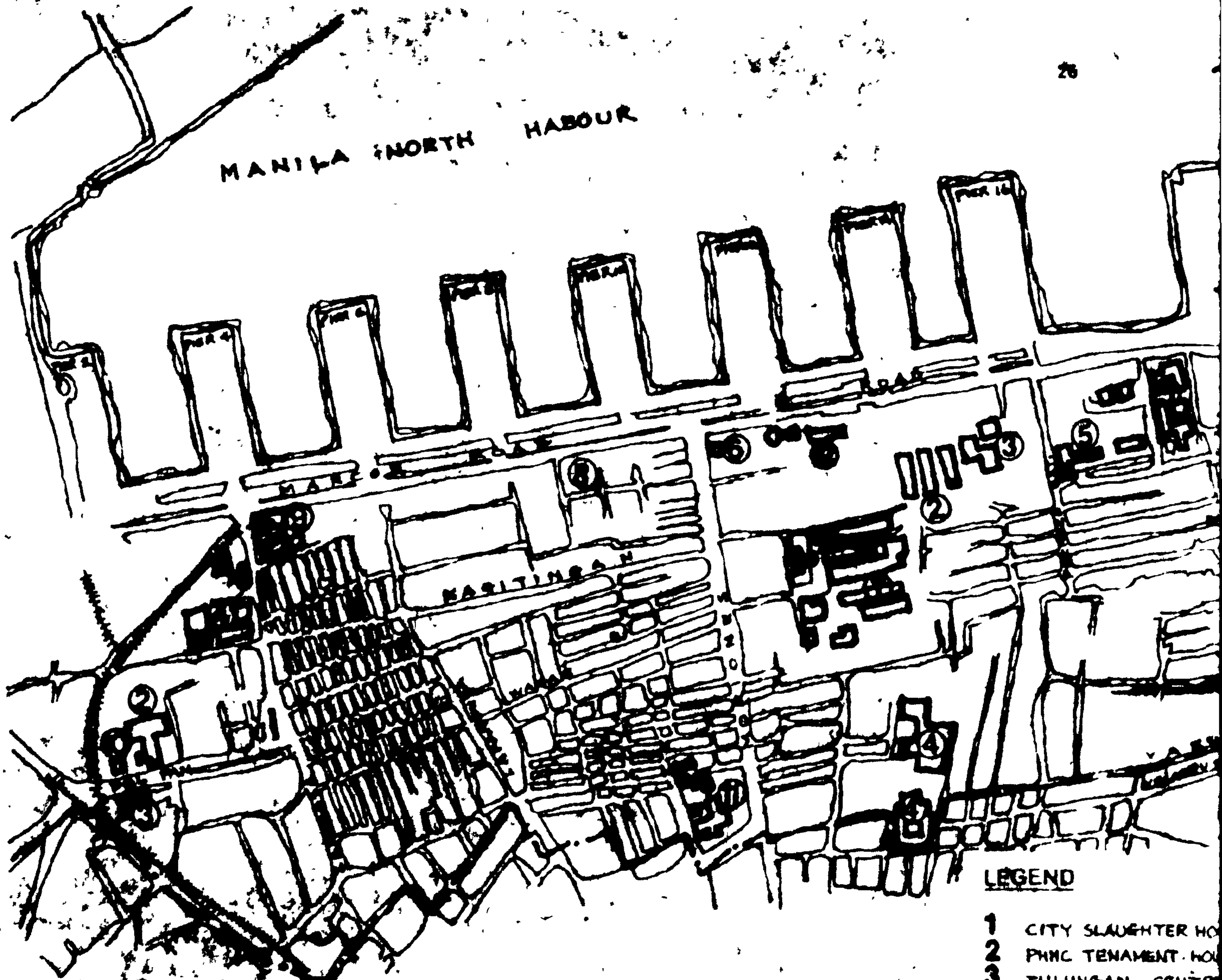
According to the above, the standard of family income in Tondo Foreshore Land is higher than the National average.

The main expenditure is for food. The balance is for clothing, education, medical care etc. The majority of families (92%) spend less than 20 pesos per month for recreational activities.

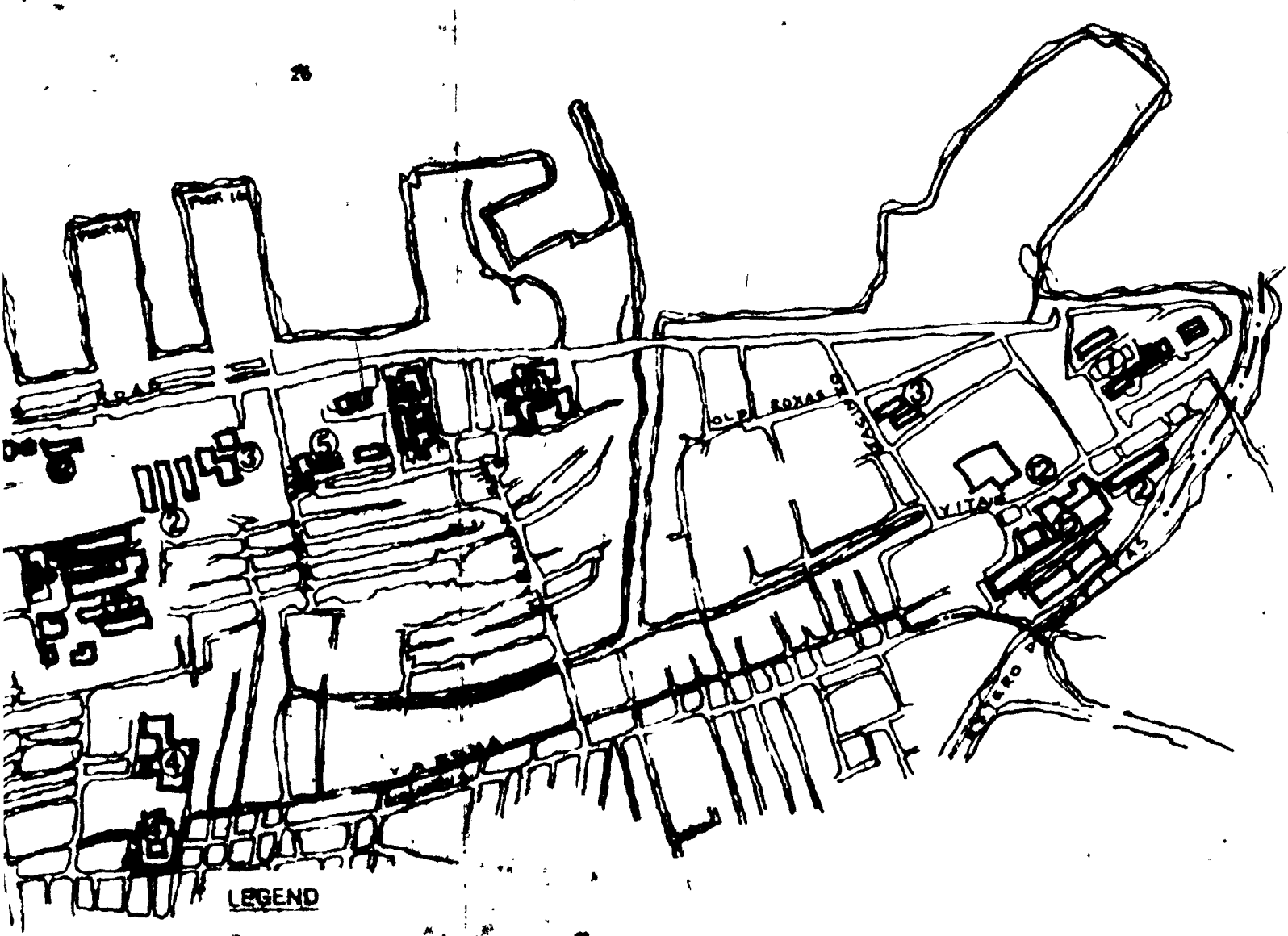
Approximately 68% of the families spend less than 40 pesos per month for housing, the average expenditure in the area for housing being 37 pesos.

The study of Barrio Magsaysay Pilot Project is not very recent (1966) (29), however it reveals many interesting aspects regarding the realization of the residents' aspirations through savings. In the study there were three income groups: low-income (A), middle-income (B) and high-income (C). For groups A and B, the most important items to save for were furniture and household appliances. For the high-income group C, the most important item was the children's education and in group C, 50% of the families were saving for this purpose. The second most important item for groups A & B was the repair and improvement of the home.

(29) Laquian, Slums are for People, pp. 191-194.



TONDO FORESHORE LAND FACILITIES Illus. #19



LEGEND

1 CITY SLAUGHTER HOUSE
2 PHHC TENAMENT HOUSING
3 TULUNGAN CENTER
4 ELEMENTARY SCHOOL
5 DON BOSCO YOUTH CENTER
6 POST OFFICE
7 BUREAU OF PUBLIC WORKS WAREHOUSE
8 BUREAU OF PUBLIC WORKS STOCKYARD
9 GASOLINE STATION
10 WATER PUMPING STATION
11 MARY JOHNSTON HOSPITAL
12 FACTORY

0 10 100
50 200 METERS

2 OF 2

As the houses in the high-income group were already comfortable and habitable, investment in business was possible and about 31% of this group used their savings for investment. To people in the low-income group A, providing food was still a considerable problem, and any spare money was spent for food.

Illustration #18 reveals that many households spend more than they earn. These families survive by:

a) the possibility of hidden income,
b) the availability of loans,
c) the possibility of getting food from fishing & gardening, from friends and neighbours, and even from the market, and from what is discarded at the garbage dumps. (30)

(30) Laquian, Slums are for People, p. 191.

Physical Characteristics

Land Use

Land use in the Tondo Foreshore Land is approximately the following: (31)

(31) Data obtained from TFURP office.

residential	75.7%
institutional	14.0%
industrial	9.3%
commercial	1.0%

The main facilities of the area are shown on Illustration # 19.

Circulation and Transportation

Major and minor roads and transportation systems, bus and jeepney routes, are shown on Illustration # 21.

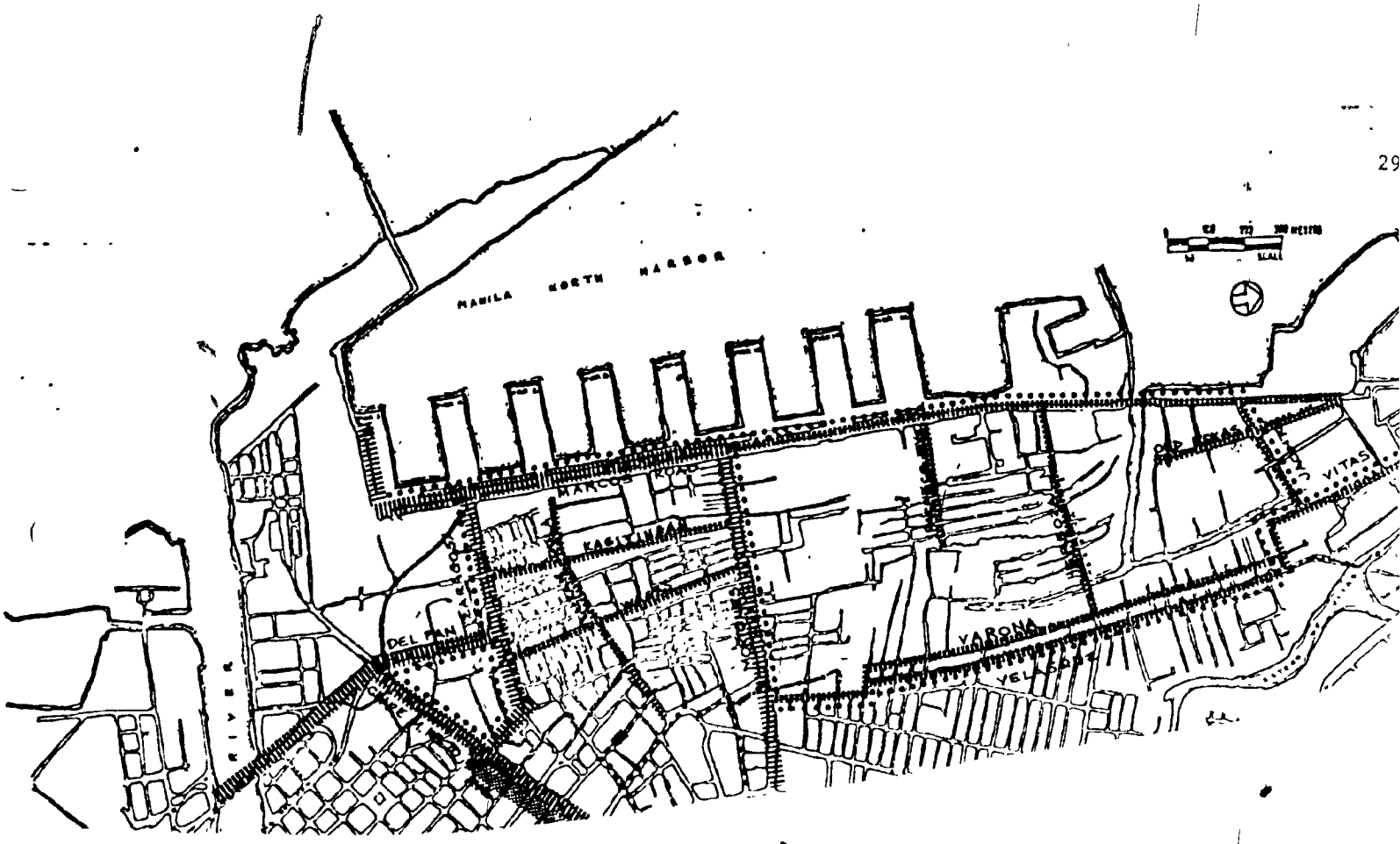
Bus and Jeepneys
Illus. #20

Most of the area has no road systems; there are no clear property lines or marks, and pathways (usually 2.0 meters wide or less) meander between houses. Jeepneys are the more common means of transportation and are a modification of the Army jeep. It is not uncommon to see six to ten people as passengers. The vehicles are richly and wildly decorated by their owners each having a distinctive design. People get on and off whenever and wherever they wish. The fare is commonly twenty centavos per passenger. Luggage and parcels are carried in a catchall hanging at the rear of the jeepney and each passenger is responsible for his own packages.

Security

Small shacks built from light and flammable materials have little resistance to typhoons, earthquakes and fires. The narrow unplanned road systems prevent normal police and fire-fighting services. Because the area is a slum and also contains the harbour and the city slaughter house, and therefore has workers who are both tough and bold the name Tondo represents a fearful and troubled place to outsiders. (32) The Tondo residents however, now cooperate to maintain peace and order and fire prevention within the area despite the physical disadvantage of their environment.

(32) Laquian, Slums are for People, p. 98.



MAJOR ROAD

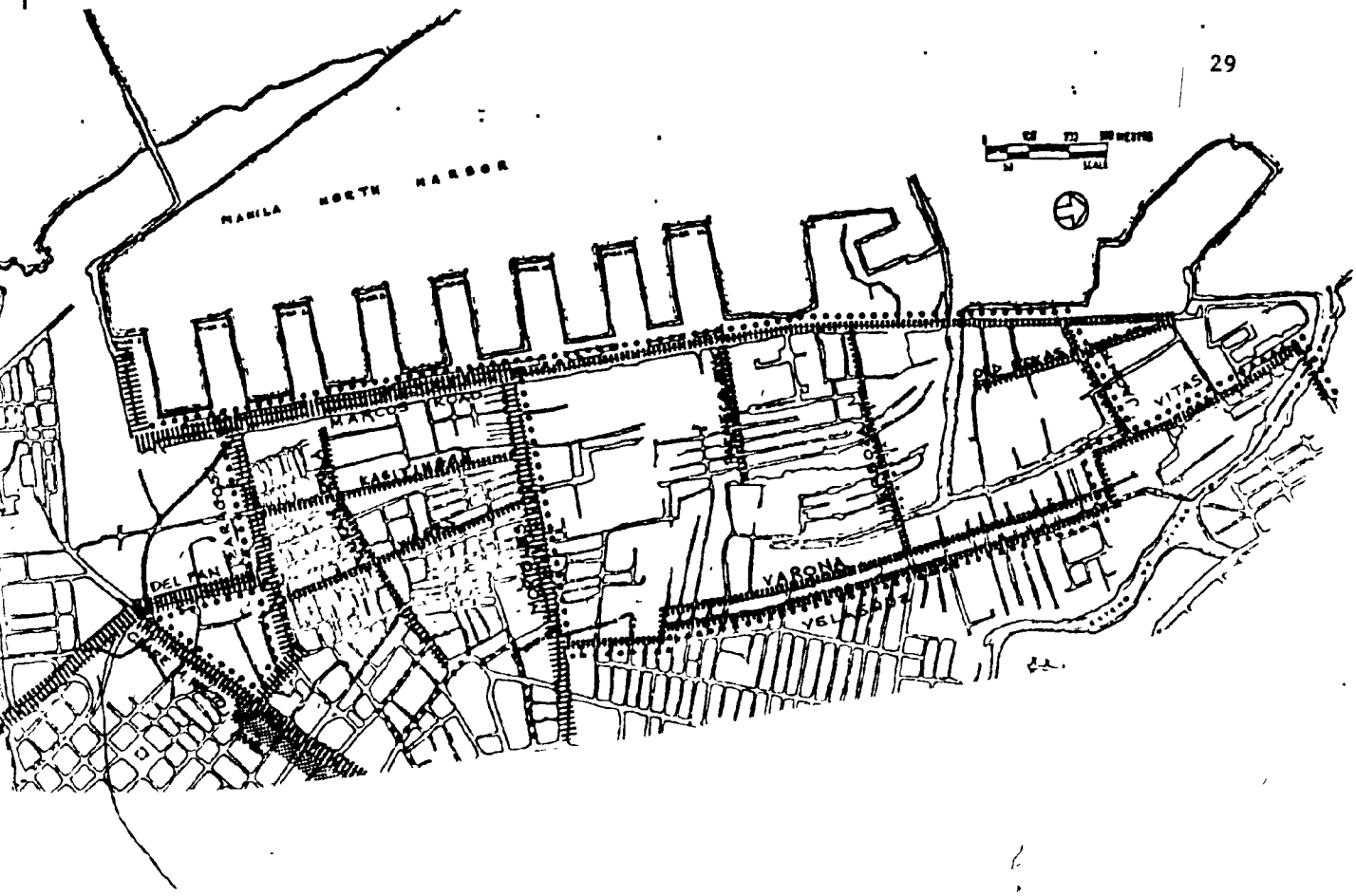
MINOR ROAD

BUS ROUTE

JEEPNEY ROUTE

ROAD SYSTEM & TRANSPORTATION

Illus.



MAJOR ROAD

MINOR ROAD

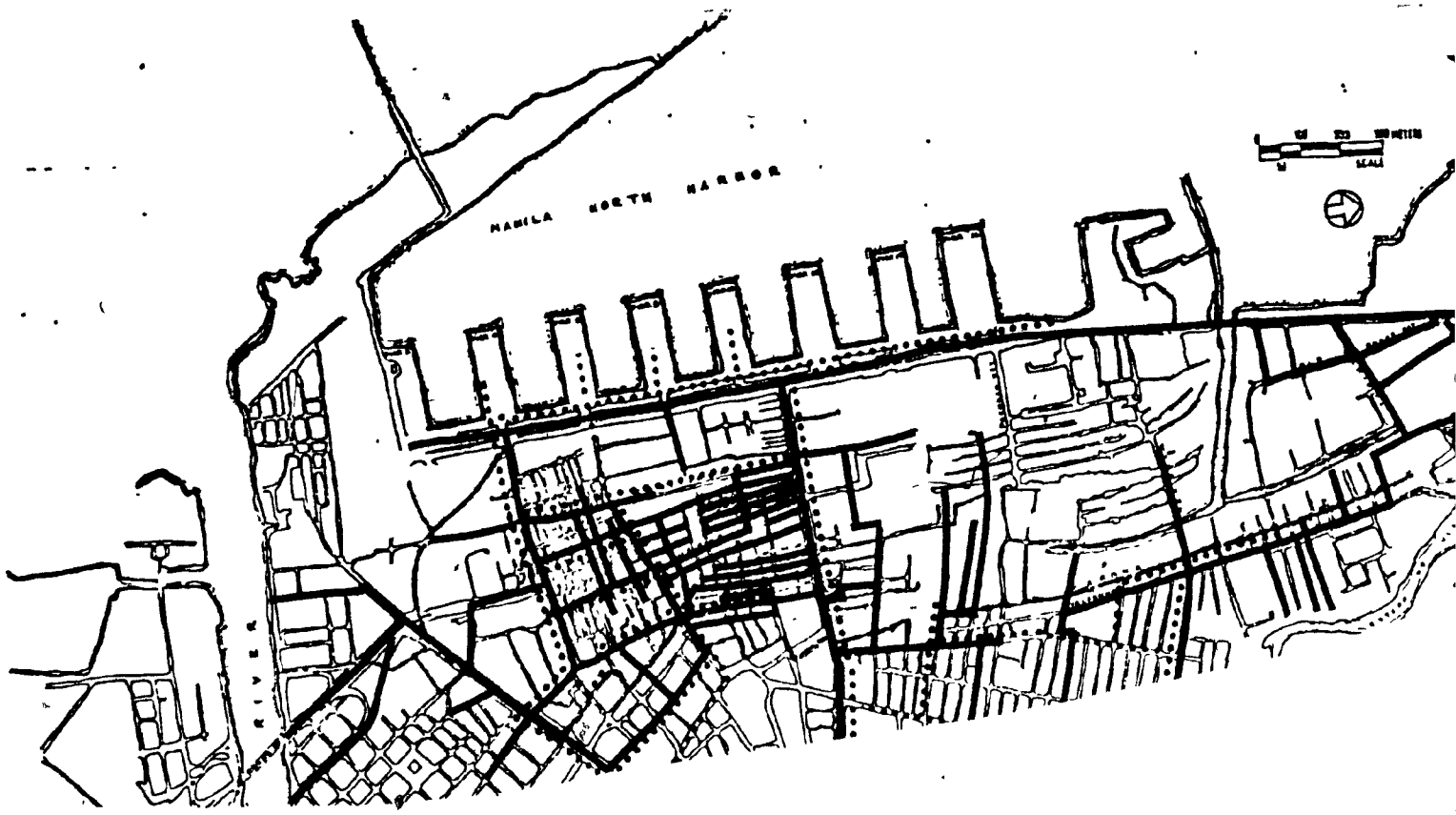
BUS ROUTE

JEEPNEY ROUTE

AD SYSTEM & TRANSPORTATION

Illus. #21

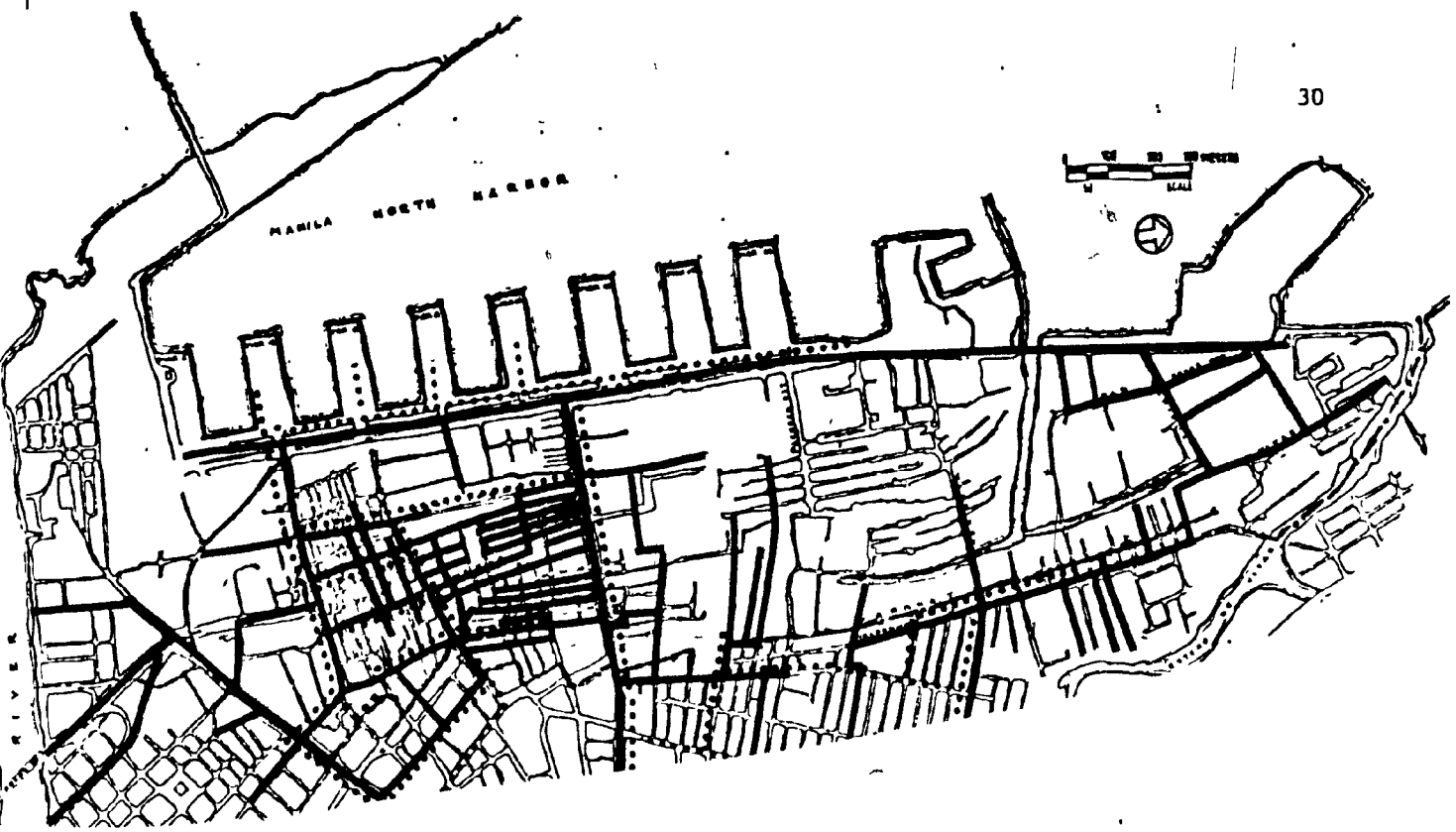
202



POWER

COMMUNICATION

UTILITY LINES (power, communication)

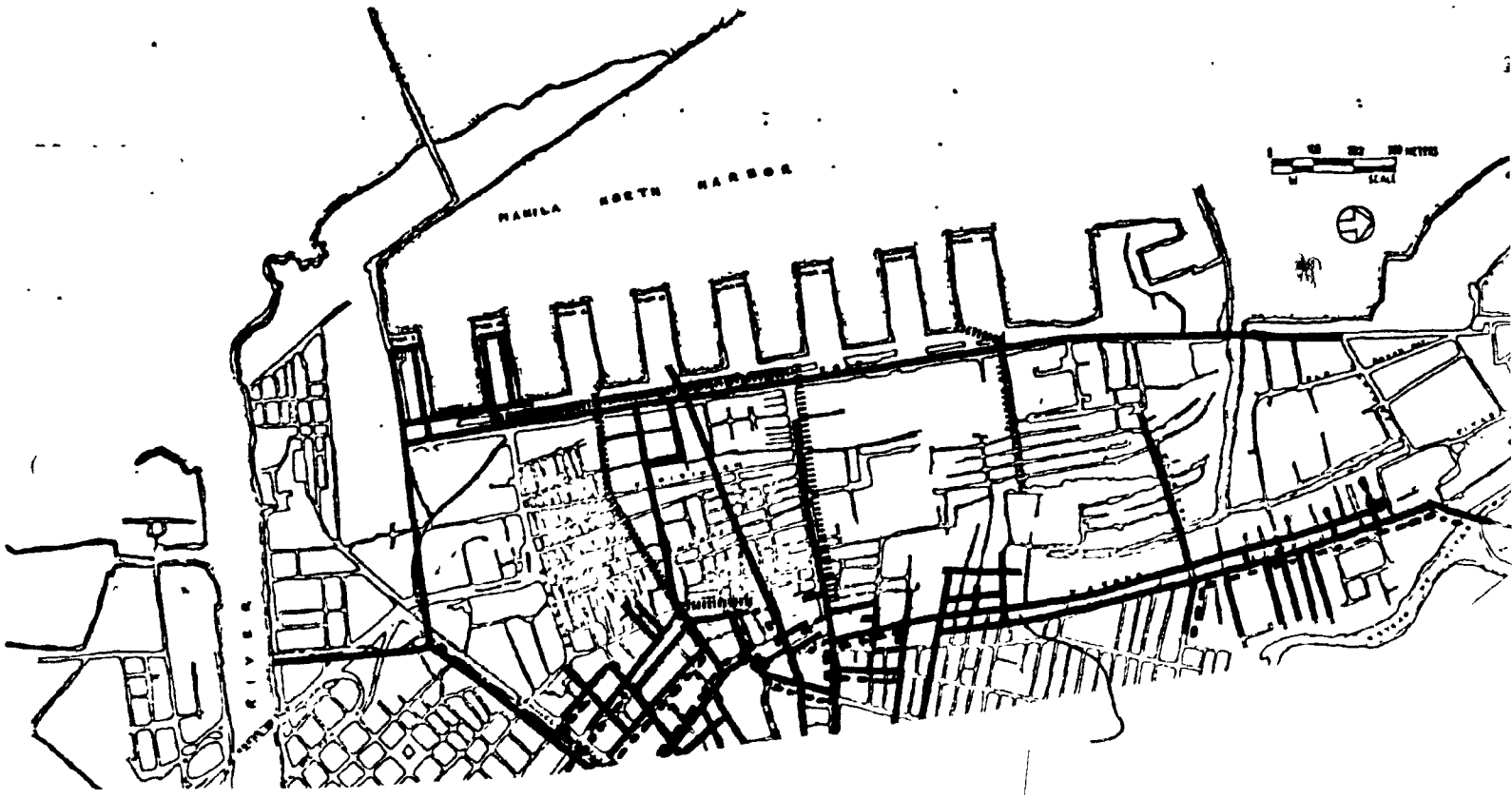


LITY LINES (power, communication)

POWER

COMMUNICATION

Illus. #22



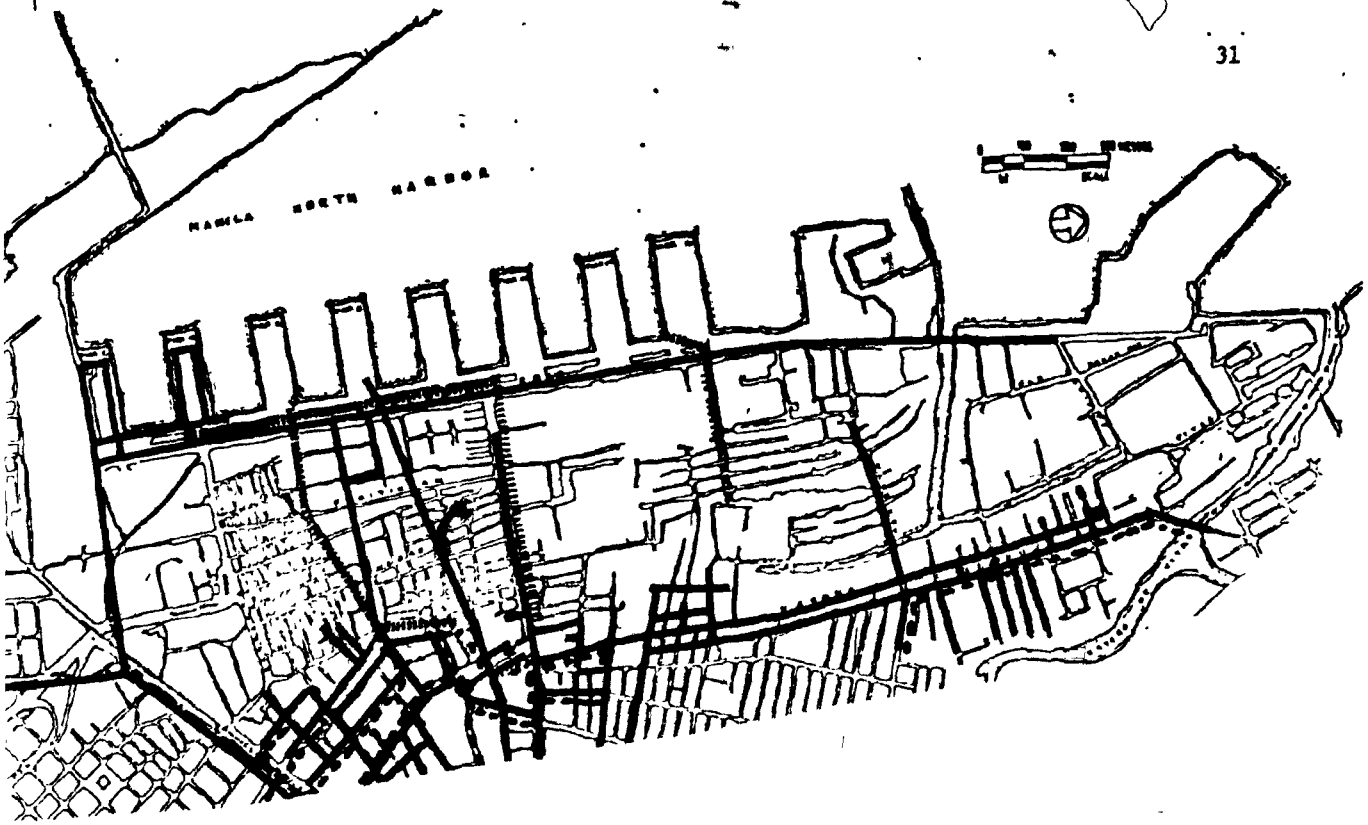
WATER

STORM DRAINAGE

GAS

UTILIY LINES. (water, drainage, gas)

Illus.



WATER

STORM DRAINAGE

GAS

LINES (water, drainage, gas)

Illus. #23

Utilities

Illustration # 22 and #23 show existing utility lines in the area. There is no sewerage line and the inadequate storm drainage system aggravates flooding in every rainy season (July-September) and during typhoons. Because most of the land in the area is below sea level, it is technically very difficult to install a storm drainage system.

Housing

The existing housing usage and conditions are shown in Illustrations # 24, # 25, and # 26. Most of the houses are built as single units but later may be extended to accommodate more than one household. These extended houses may or may not have separate access to each unit and usually the occupants share laundry and toilet facilities. Many houses are shared by more than one family and the majority of the families occupy only one room.

Electric Meters
Illus. #27

Household Utilities

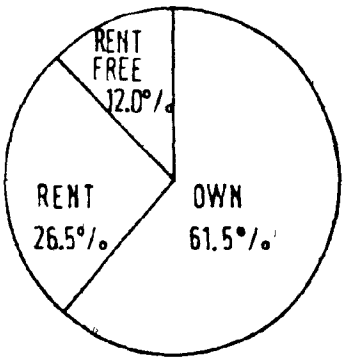
Utilities are shown in Illustration # 27. Compared with other facilities, electricity is well supplied, and many families tap for free the lines of the few who have the Manila Electric Company's connection. The supply of potable water is one of the biggest problems in the area. More than half the households buy water fed by plastic hoses from private taps to an oil drum reservoir in each house or from water peddlers. The most serious

Plastic Water Supply Hoses Running on the Pathway

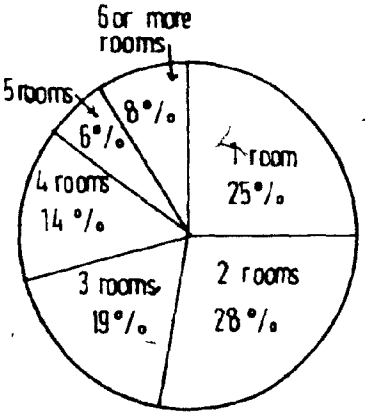
Illus. # 28

problem is the lack of toilet facilities. Many people dispose of waste by wrapping it in paper and throwing it into the nearest river or the sea. In the Philippines, most people wash themselves by taking a cold water shower or by pouring water over themselves using a small pail. They do not use hot water or bathtubs. In spite of the lack and inadequacy of utilities people tend to be independent and ~~like~~ their privacy. They do not want to share facilities but one tenth of the families must share laundry facilities and approximately one quarter of the families must share toilets.

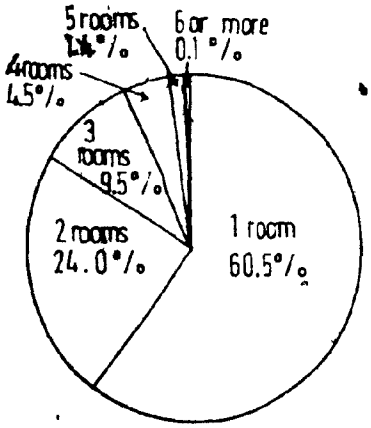
OWNERSHIP:



NUMBER OF ROOMS PER UNIT:

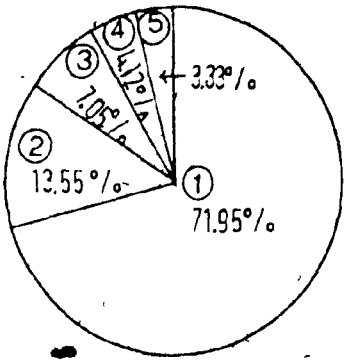


NUMBER OF ROOMS USED BY ONE HOUSEHOLD:



HOUSING CONDITIONS (1)

Illus. #24



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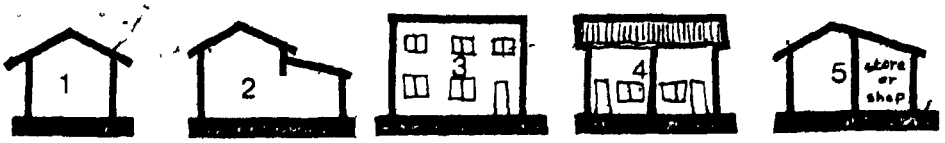
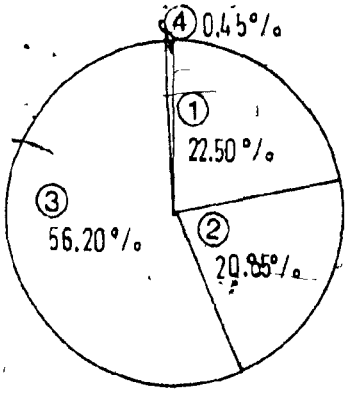
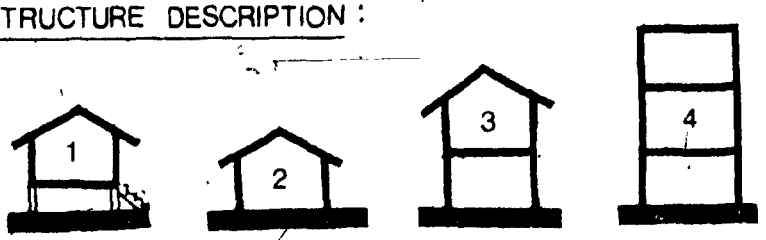


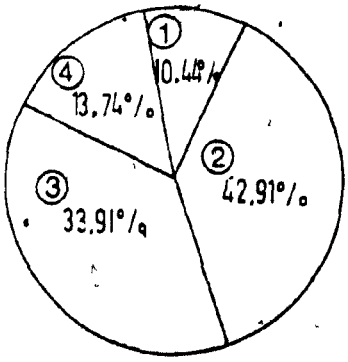
SINGLE EXTENDED APARTMENT DUPLEX ACCESSORIAS (RESIDENTIAL USE / OTHER USE)



STRUCTURE DESCRIPTION :



ONE-STOREY ON STILTS ONE-STOREY TWO-STOREY THREE-STOREY

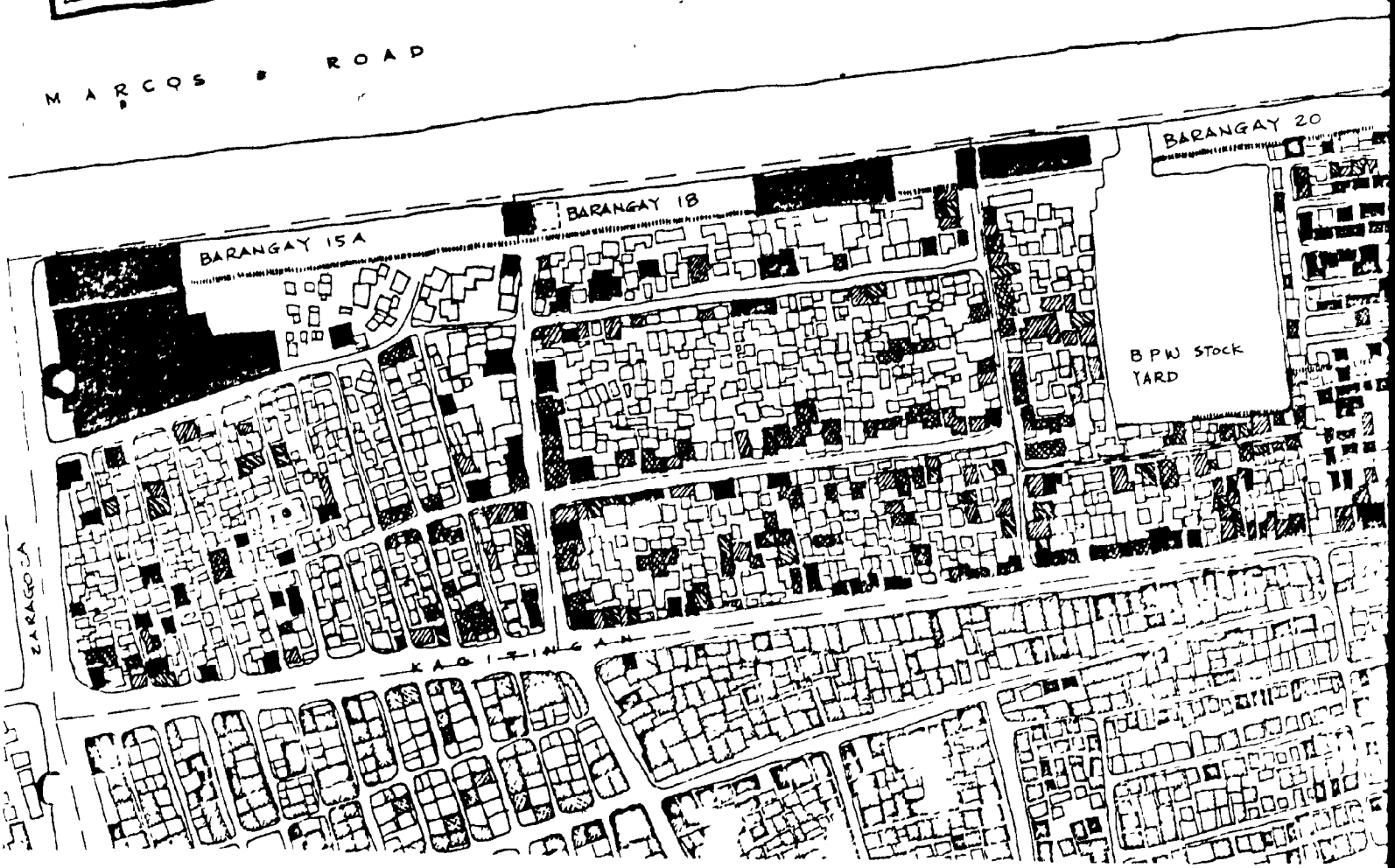


MATERIALS

1 LIGHT MATERIALS :	NIPA, SAWALI (WOVEN BAMBOO MAT).
2 MIXED MATERIALS :	COMBINATION OF LIGHT AND HEAVY MATERIALS.
3 HEAVY MATERIALS :	CONCRETE BLOCKS, GALVANIZED IRON, AND WOOD EXPECTED TO BE MORE-OR-LESS PERMANENT WITH LITTLE OR NO SIGN OF DETERIORATION.
4 SALVAGED MATERIALS ;	CARD BOARD, TIN, OLD WOOD LIGHT SALVAGED MATERIALS WHICH ALREADY SHOW. DETERIORATION.

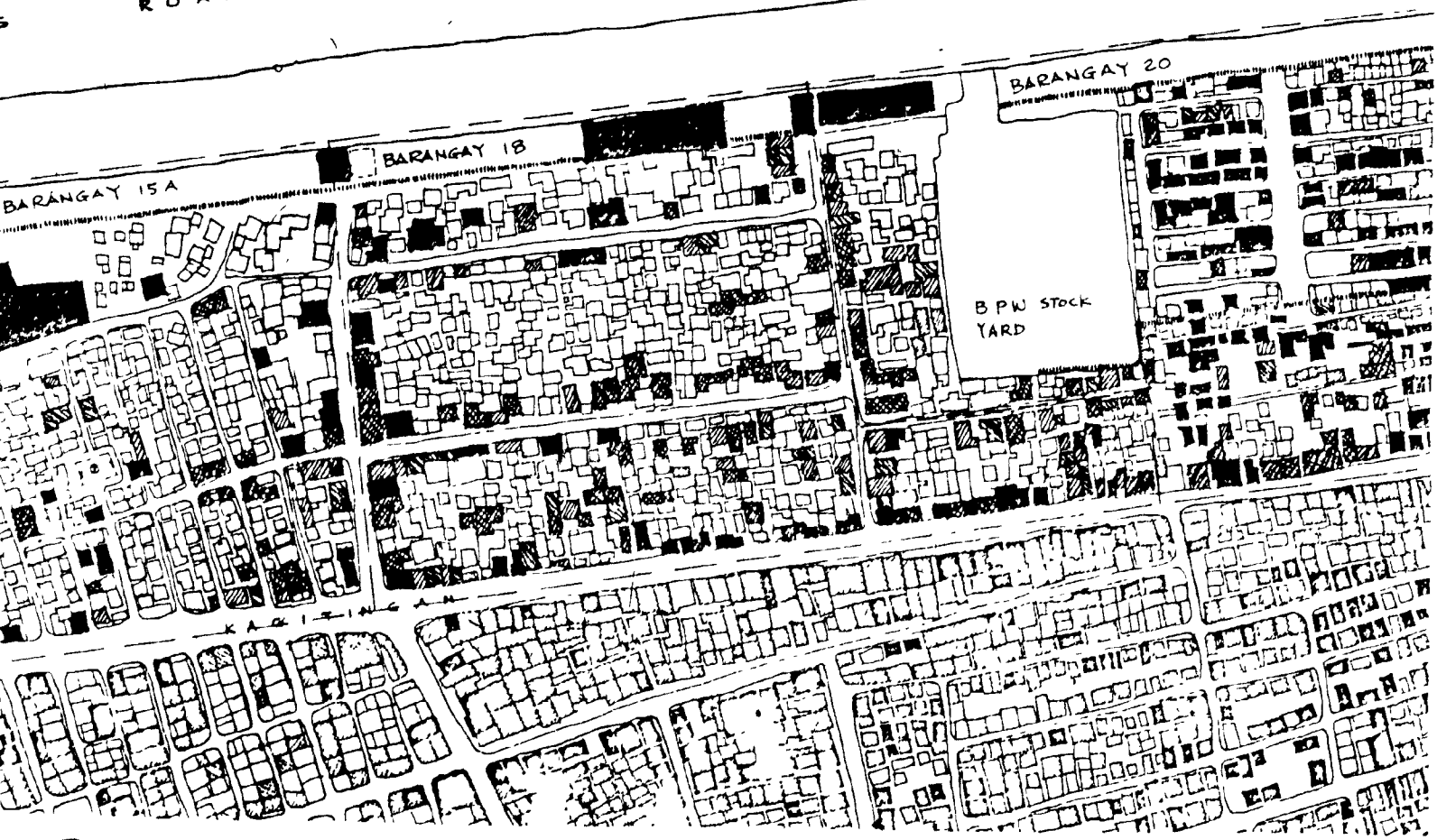
HOUSING CONDITIONS (2)

Illus. #25



Illus. #26

STRUCTURAL QUALITY IN BARANGAYs 15A, 18, 20



N

0 10 20 30 40 50 100 METERS

LEGEND

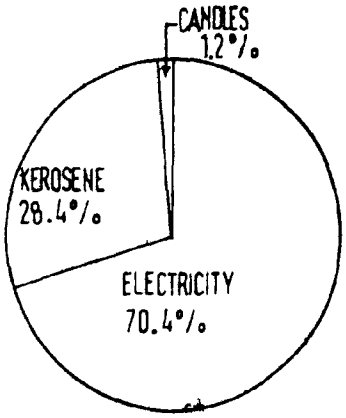
- SEVERE DETERIORATION AND DILAPIDATION
- MAJOR EVIDENCE OF DETERIORATION AND DILAPIDATION
- MINOR EVIDENCE OF DETERIORATION AND DILAPIDATION
- LITTLE OR NO EVIDENCE OF DETERIORATION AND DILAPIDATION

(SOURCE TONDO FORESHORE URBAN RENEWAL PROJECT)

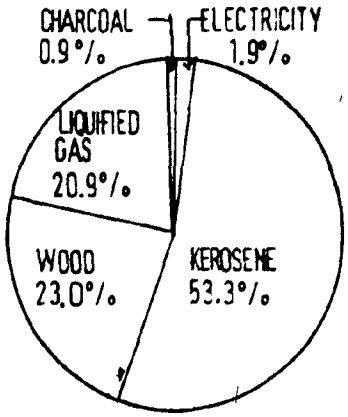
Illus. #26

RAL QUALITY IN BARANGAYs 15A, 18, 20

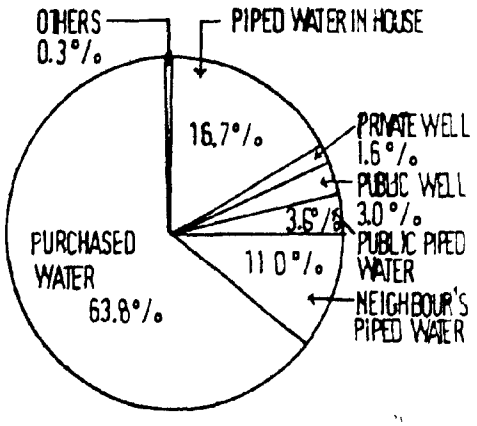
LIGHT:



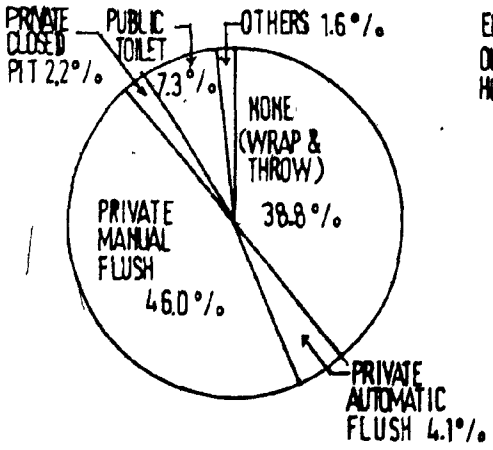
COOKING FUEL:



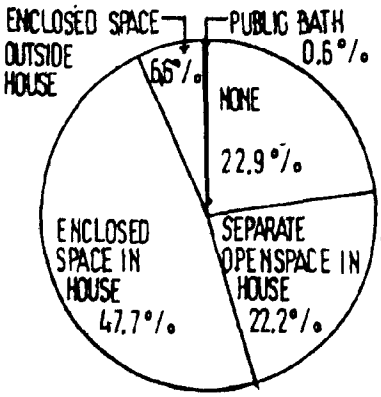
WATER:



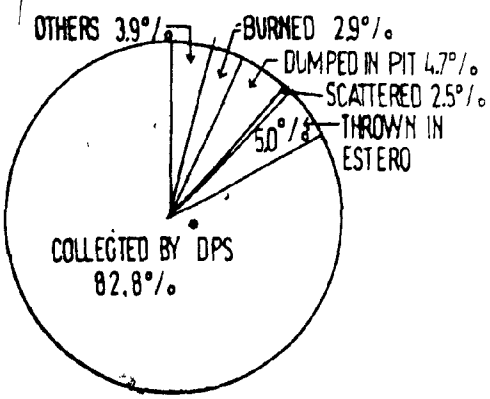
SANITATION:



BATHROOM FACILITY:



GARBAGE DISPOSAL:



DEPARTMENT OF PUBLIC SERVICE

HOUSEHOLD UTILITIES

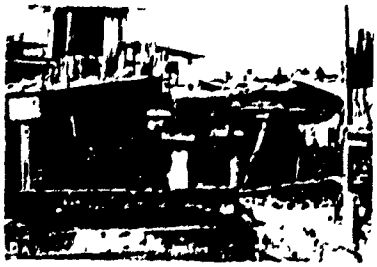
Illus. #29

The foregoing statistics and information are mainly derived from data obtained from the Tondo Foreshore Urban Renewal Project Team. In order to supplement the data and to observe first hand the life and feelings of the Tondo Foreshore Land residents, the author personally interviewed 43 families.

Interviews

The purpose of the interviews was:

a) to observe individual housing conditions and the living conditions and morale of the residents, both individually and as a community.
b) to discover the aspirations of the people with respect to their housing.



Slip Zero Area

Illus. #30

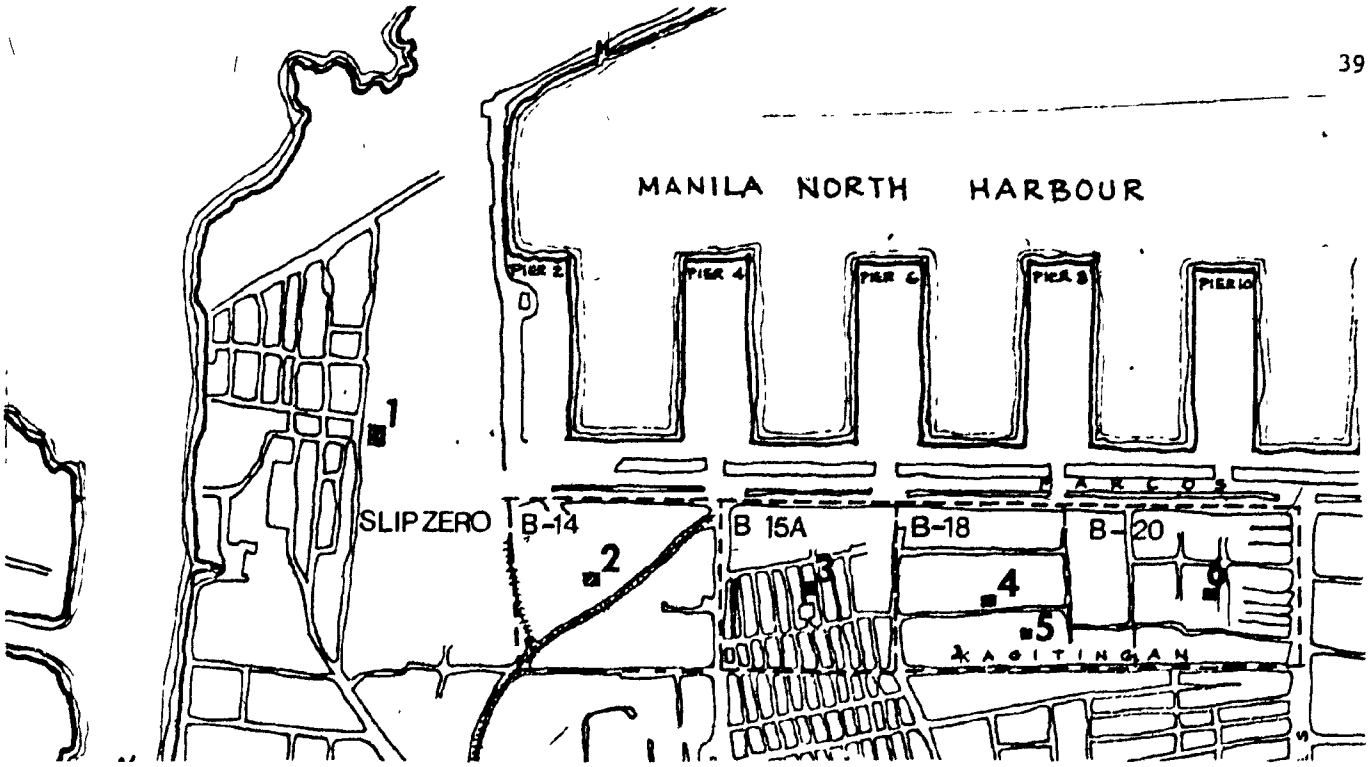
The interviews were held in the south-west part of the Tondo Foreshore Area, Barangays 14,15,18 and 20, and in the area commonly called "Slip Zero". These areas were made accessible to the author through an introduction by ZOTO.

The method of interviewing was based on the questionnaire formulated by the author (33) who was introduced to the secretary of ZOTO and to each Barangay leader. The Barangay leaders each chose one percent of their households for interviewing. The interviews were made possible because the Barangay leaders spoke English and assisted with interpretation when necessary.

(33) See appendix, Sample Questionnaire.

Individual Families

The following six interviews are typical as to living and housing conditions. The area where the Candidos' house (See (1) Illus. #31 and #32) was built is called Slip Zero and is not covered by the Republic Act 1597. The Candidos are members of ZOTO through which they hope to solve the land and housing problems. Their house is well kept, clean and pleasantly decorated with the daughter's handicrafts. The Bandal family's house (See (2) Illus. #31 and #33) is relatively well built from a structural point of view, however the rooms look rather bare with no pictures or decorations on the walls and almost no furniture. Another family plus a bachelor share the house, and in this overcrowded situation each family has its own cooking space. Their preference for not sharing a common kitchen only leads to more crowded conditions. The Tamblero house (See (3) #31 and #34) is one of the oldest in the area and is built almost completely of reclaimed wood. The unique feature of the house is that the exterior walls are of wood lattice work except for the walls around the bedrooms and bathroom areas. In spite of the lattice walls, however, the interior is dark and has no special decoration or furniture except for an altar placed in the living room. Mr. Tablero wishes to have a concrete floor included under the raised wooded floor to eliminate dampness. A small blackboard is hung at the entrance for Mr. Tamblero (the area President and the Vice-President of ZOTO) to keep track of his social activities. In spite of the dreariness of the house, there is a great warmth reflecting the activity and spirit of the residents. The Drante and Pesimo houses are situated in one of the most congested and physically



KEY MAP FOR INTERVIEWED HOUSES

Illus. #31

1 CANDIDO HOUSE
2 BANDAL HOUSE
3 TAMBLERO HOUSE
4 DRANTE HOUSE
5 PESIMO HOUSE
6 REYES HOUSE

LEGEND

MALE
FEMALE
HOUSE OWNER (M)
HOUSE OWNER (F)
HEAD OF HOUSE OR ROOM RENTER (M)
HEAD OF HOUSE OR ROOM RENTER (F)

1 CANDIDO HOUSE

Family :

Age :

HEAD

43 40 20 17

Family Head Occupation : DRIVER

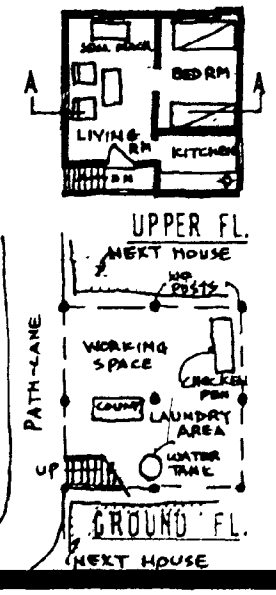
Total income : 300 PESOS

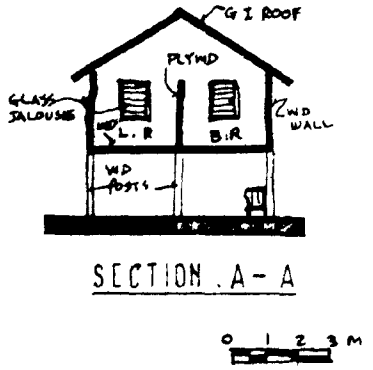
Location of House : SLIP ZERO

Total Floor Area : 24.5 M²

Year of House Built : 1971

Cost : 1000 PESOS





Illus. #32

2 BANDAL HOUSE

Family :

Age :

HEAD

1. 34 27 6 5 4 1½ 65

2. 48 20 4 (RELATIVES)

3 20 (RELATIVES)

Family Head Occupation : PAINTER

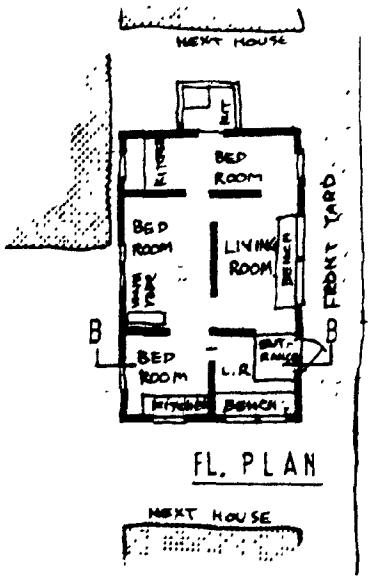
Total Income : 252 PESOS

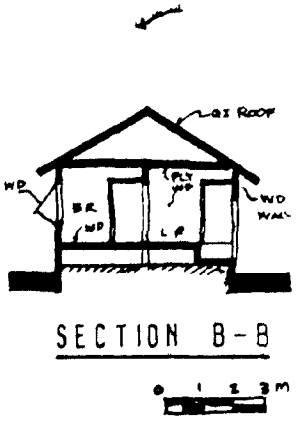
Location of House BARANGAY 20

Total Floor Area : 34.0 M²

Year of House Built : 1969

Cost : 4,000 PESOS





Illus. #33

3 TAMBLERO HOUSE

Family : HEAD

Age : 65 40 23 21 19 17 16 13 12 9 5

Family Head Occupation : FISH DEALER ; PAPER BAG MANUFACTURER

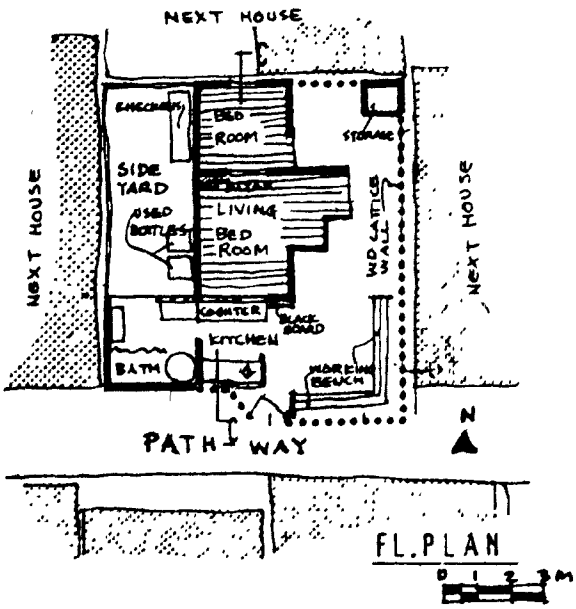
Total Income : 1,130 PESOS

Location of House : BARANGAY 15

Total Floor Area : 59.5 M²

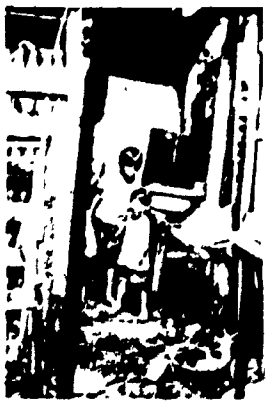
Year of House Built : 1946

Cost : 500 PESOS

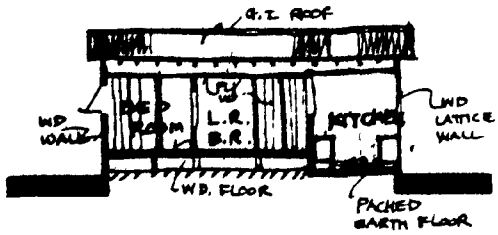


Note:

Pathway acts as an extended workshop.



The Side Yard



SECTION C – C

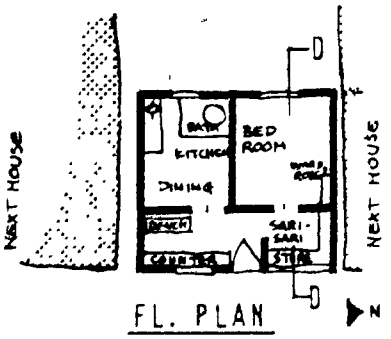
Illus. #34

4 DRANTE HOUSE

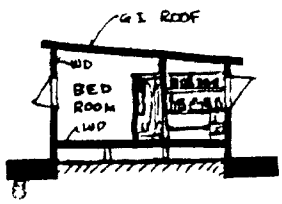
Family : 1 (HEAD) 43 19 17 15 14 12 10

Age : 2 20 3 0.3 (DAUGHTER'S FAMILY)

Family Head Occupation :	SARI-SARI STORE OWNER
Total Income :	335 PESOS
Location of House :	BARANGAY 18
Total Floor Area :	26.0 M²
Year of House Built :	1953, ALTERED 1961
Cost :	1,000 PESOS



FL. PLAN



SECTION D-D

0 1 2 3M

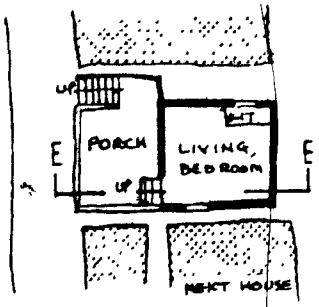
Illus. #35

5 PESIMO HOUSE

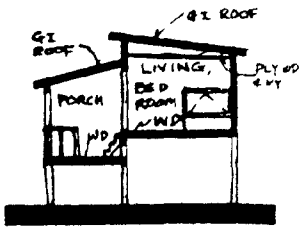
Family : 1 (HEAD) 44 41 17 14 12 10 4

Age :

Family Head Occupation :	BUYING & SELLING OF HOUSEHOLD GOODS
Total Income :	220 PESOS
Location of House :	BARANGAY 18
Total Floor Area :	15.5 M²
Year of House Built :	DATA NOT AVAILABLE
Cost :	DATA NOT AVAILABLE



FL. PLAN



SECTION E-E

0 1 2 3M

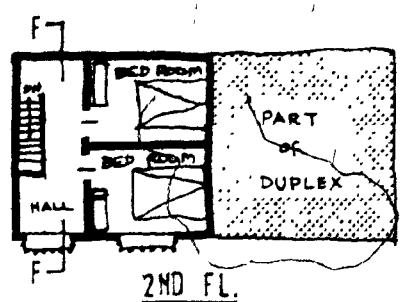
Illus. #36

6 REYES HOUSE

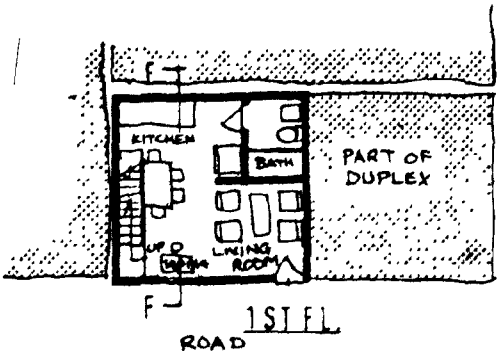
Family :	1	HEAD 26	19 02
Age :	2	29	26 2
			(RELATIVES)
Family Head Occupation :			CHEMICAL ENGINEER
Total Income :			1120 PESOS
Location of House :			BARANGAY 20
Total Floor Area :			66.0 M²
Year of House Built :			1971
Cost :			12,500 PESOS

Dining Area

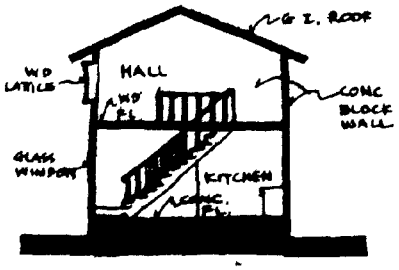
Exterior



2ND FL.



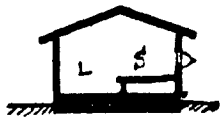
1ST FL.



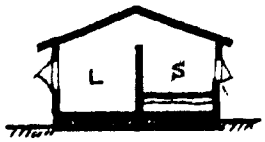
SECTION F-F

Illus. #37

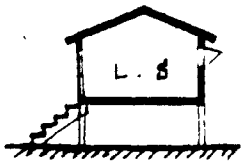
'W-1'



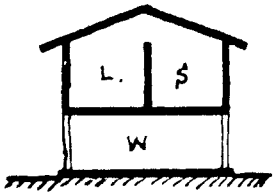
'W-2'



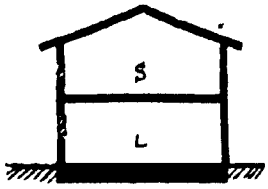
'W-3'



'W-4'



'W-5'



S — sleeping area
L — living area
W — working area

Wooden Structures
Illus. #38

deteriorated areas. (See (4) and (5) in Illus. #31, #35, and #36). The ground is damp and has an unpleasant smell. In spite of the dilapidation of the houses, the residents are cheerful and optimistic as to their future. The Drante house, having a small sari-sari store, faces the most active street where children play basketball and people set up small tables to sell locally made food or beverages. The Reyes house (See (6) in Illus. #30 and #37) is one of the few contemporary houses in the Tondo Foreshore land and is the kind desired by the majority of the people. Mr. Reyes is very contented with his house, even though having to purchase water is a nuisance. The house is shared by the family of Mr. Reyes' cousin. They pay only 60 pesos per month for food and lodging, but the Reyes are happy in sharing because the relationship between the families prevents loneliness.

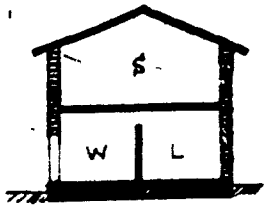
Space Use and Types of Structures

A description of the types of structures and their percentages has been given already in Illustration #25. In this section the space use relative to the structure types is given. There are two main building materials: wood and concrete building blocks. Wooden structures roughly comprise five types. (See Illus. #38) Type "W-1" and "W-2" are one-storey structures with no crawl space; the "W-1" layout is typical of small houses, i.e. one space which is too small to divide for individual use, the floor of packed earth or concrete and a raised wooden or bamboo area for sitting and sleeping. In type "W-2" partitions segregate the private space (sleeping or dressing) from the common space (family gathering

cooking, or dining). The Philippino traditional house is a wooden structure, built on stilts, and may be classified into two types, "W-3" and "W-4". Type "W-3" has stilts, usually less than 1.50 meters high, and in urban areas the space under the floor is not used. In rural areas, the space is used for storage or for securing animals. Type "W-4" is on stilts high enough to allow the use of the space under the floor, sometimes as a working area or for storage, or when partially enclosed by wooden latticed walls, for cooking and/or sitting. The upper floor may have one space to serve all purposes or may be separated into two or three rooms. There are not many examples of this type in the Tondo Foreshore Land, since land is too precious to be used merely for storage or for other secondary uses. Type "W-5" is the typical two-storey wooden structure. The first floor is usually used as living quarters (for family gatherings, dining, cooking, and bathing) with or without partitions. The first floor may also have a small sari-sari store or working corner for a small industry. The second floor is for sleeping; it may be separated into one or more rooms depending on the family situation.

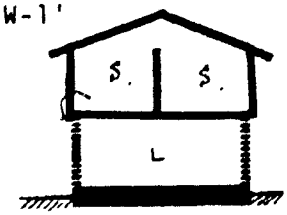
Wooden houses are usually "post and beam" construction. The exterior walls are wood board (old or new) on 2" x 2" studs, and usually have no interior walls. The interior partitions are normally 1.80 meters high, with plywood sheets on one side of the studs. The rooms seldom have ceilings. The roofs are almost all galvanized iron sheets. Other houses are built of concrete blocks alone, or of concrete blocks and wood.

'CB-1'



Concrete Block Structure
Illus. #39

'CB.W-1'



S — sleeping area
L — living area
W — working area

Concrete Block & Wood
Illus. #40

(34) Mary R. Hollnsteiner, Metamorphosis: From Tondo Squatter to Tondo Settler (Quezon City: I.P.C. Ateneo de Manila University, 1973), p p. 7,8.

Concrete building blocks are used for two-storey structures, (See Illus. #39, type "CB-1") and occasionally for three-storey structures. Usually block walls are mortared. The first floor is of concrete and the second floor of wooden flooring. The use of space is similar as that in type "W-5", that is, the first floor is for family use and for small commercial or industrial use, and the second floor is for private use (sleeping). Type "CB.W-1" is a combination of concrete block and wood in one structure. (See Illus. #40, CB.W-1).

While most of the houses in the Tondo Foreshore Land may be generally classified in the above mentioned types, there are exceptions since all the homes are built by residents according to need and materials available.

Preferences for Living

The most significant preference as mentioned by approximately 98% of the respondents is for a single detached house. This preference is greatly related to land tenure. The residents want to have the security of owning their land and house, and ownership of a parcel of land provides the opportunity to build their own house. The importance of land ownership is well illustrated in the study of Magsaysay Village, conducted by Mary Hollnsteiner. (34)

A question relating to the choice between the renting of a si

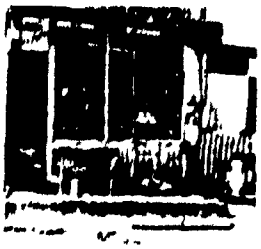
family detached house versus the purchase of an apartment in a tenement building, assuming rental and purchase payment price were the same, and the space in each case were equivalent, was answered with fully 74% opting for the purchased apartment.

However in Mrs. Hollnsteiner's study, one out of five chose to rent a single family house in order to leave over-crowded tenement accommodation and its lack of privacy. In the author's observation, the only seven-storey tenement house in the area gives the impression of almost intolerable living conditions, in a seven-storey walk-up building in which because of mechanical failure domestic water is supplied to the first floor only. The second preference is a desire for privacy. This is revealed in replies to the question: What are you most concerned about in reference to housing? - (1) space, (2) privacy, (3) facilities, (4) temperature of room, (5) natural light, or (6) noise.

The answer "privacy" was given by 28 respondents out of 43, approximately 65%; the respondents who answered "facilities" were 21% and "space" 14%. The present overcrowded living conditions seem to make the residents feel a strong need for privacy rather than for better facilities. Heat, ventilation, humidity and other climatic disadvantages affecting housing are of less or of no concern to the residents. No respondent cited room temperature, natural light or noise, as a major concern.

The third preference has to do with the actual construction of

Chickens under Kitchen Counter
Illus. #41



A Pig Tied in front of a Sari-sari Store

Illus. #42

the house and is revealed in replies to the question concerning the residents' preference to build their house by themselves or have it built by the government. The survey indicated that 29 out of 43 (67.5%) preferred to build their house themselves, and that 14 out of 43 (32.5%) preferred to have their house built by the government. The respondents who preferred governmental housing tended to be the low-income group who felt that their financial capacity was not sufficient to build a house; and who therefore had to depend upon the government. The respondents who preferred to build their house by themselves were classified in two categories: 1) those who were financially able to hire professional builders and 2) those who, despite a limited financial capacity, still preferred to have the freedom to build their own house on a self-help basis in order to avoid having an obligation to the government.

Respondents in the 2nd category, who were also members of ZOTO, expected assistance from that organization in the building of their homes.

The fourth preference was for outside space. The majority of people wanted to have space for cultivation and for keeping animals. The main purpose for growing vegetables in their own garden was to save on food expenditures. People also wanted to have space for flowers and other plants to beautify their surroundings, as well as space to raise chickens and pigs to increase the family income. The author saw chickens being raised under the kitchen counter on the third floor of a tenement house, and chickens tied with a string to a post on

the pathway and a pig tied in front of a sari-sari store, and another happily sleeping in a living room. In most areas however, conditions are too crowded to allow the raising of animals, but in one of the barangays, where conditions might have allowed it, the leader prohibited the raising of animals for reasons of sanitation.

Summary of the Tondo Foreshore Settlement

Based on information already given, characteristics of the Tondo Foreshore squatter settlement are analyzed as follows:

The most important issue to the squatters is land ownership. The squatters want to feel secure about the land on which they are squatting, and generally, this means ownership. The desire for ownership has developed into a mutual interest which has motivated the formation of the present community organization, a strong viable group active in both politics and social affairs. For the squatter, the acquisition of the legal title to his home-site land removes the fear of eviction or forced relocation to another area and is thus a requisite to the improvement of his own housing.

Investment and development cannot proceed without a resolution of the squatter settlement problem. The Tondo Foreshore study area is the most populous squatter settlement in the Philippines and occupies the largest public land area in Metropolitan Manila. Due to its location and size, it is impeding development of several important national projects, such as the new International

Harbour and the Roxas Boulevard extension projects.

The squatters are utterly dependent on the proximity of industry for employment. Their land area is adjacent to a large job market providing employment opportunities which in turn leads to even denser urban settlements. Yet the government's policy of economic development implies the elimination of many squatter slums; while industry, which is dependent upon this cheap labour source, requires that their proximity be maintained.

The community has a unified and powerful social organization which is the best asset of the settlement. Clinard, the author of "Slum and Community Development", describes slum dwellers as "generally displaying about their conditions, apathy associated with intolerance of conventional ambitions. Often accompanying this sense of resignation there is an attitude of "fatalism" towards life". (35) Dwellers in the Tondo squatter settlement, however, do not show this kind of apathy. Their aspirations for a better life are high. Uniting themselves through community organizations, they react strongly to political, social and economic issues. In many respects the government sees this as a threat to its own stability; however it is a very positive factor in the solving of the squatter' problems.

Because the population is mainly composed of people under 30 years of age, there is an increasing need for housing which will put even greater demands on municipal services and institutions.

(35) Marshall B. Clinard, Slums and Community Development (New York: The Free Press, 1970), p. 12.

The income of residents is unevenly distributed and this income diversity is one of the assets of the Tondo squatter settlement. The area, although generally considered to be one of the poorest, does contain a surprising number of people with a relatively high income who tend to remain in the area even when their economic situation has improved. Although the majority of the residents are poor, and their physical condition reflects their economic status, the upper level income dwellers are indirectly improving the area, and thus are saving the community from complete deterioration.

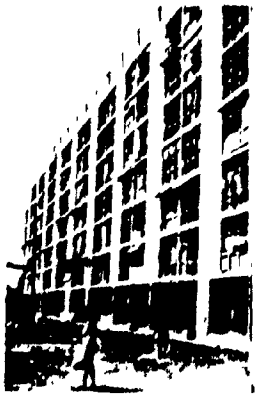
There are many small scale economic activities. The economic activities existing in this area offer income opportunities and employment to the dwellers, and serve to create an active atmosphere in the community. Participation in these activities shows the economic capabilities of some of the dwellers.

Installation of infrastructure is very costly because the land is below sea level. The most serious physical disadvantage of this area is that the land is below sea level. This makes the installation of most infrastructure work (i.e. for drainage and sewage) extremely difficult. The land needs filling or alternatively, a technological solution must be found. Until this basic problem is solved, it will be difficult to introduce an adequate infrastructure.

PART II STRATEGIES

1. GOVERNMENT STRATEGIES

Several strategies for solving the problem of multiplying squatter settlements in Metropolitan Manila have been attempted by the government, such as: subsidized low-income housing on the existing site, relocation of squatters outside Metropolitan Manila and a proposal to return squatters to their home provinces by government-furnished transportation. Two of these strategies are examined below:



The Vitas Tenement House

Illus. #43

Low-rent Tenement Housing

One government strategy is low-rent housing: In 1965, the first multi-storey housing for low-income tenancy was built by the government agency, People's Homesite and Housing Corporation (PHHC), at Vitas in the Tondo Foreshore Land. Priority of occupancy was granted to the squatters and rents were subsidized at 5.00 to 15.00 pesos per month for all 252 units. Shortly after their tenancy began, however, many occupants sold their "right of occupancy" at prices ranging from a few hundred pesos to as high as three thousand pesos and returned to their old squatter status. The same phenomenon was observed in high-rise low-income housing built in three other areas in Metropolitan Manila. Through individual interviews, the following reasons were given for selling the "right of occupancy". (1)

> Regular rent payments were required of tenants, otherwise they would be evicted and it was a risk to commit themselves to regular payments because of their fluctuating incomes.

(1) Mary R. Hollnsteiner, The Case of the People versus Mr. Urbano Planner and Administrator (Quezon City: Ateneo de Manila University, 1973), pp. 10-15.

The opportunity to sell the "right of occupancy" for a substantial cash amount was a great temptation to attain assets without having expended any capital. Living in a concrete apartment was more expensive than living in a wooden house. Concrete floors necessitated beds and other furniture. Because of the prohibition of wood and charcoal stoves, modern cooking equipment was required.

The Site of the PHHC Site Project

The physical planning of high-rise apartment housing creates such problems as: difficulty of access due to lack of elevators, difficulty for parents to maintain supervision and care of their children playing below; fear of living in high-rise buildings (because of frequency of earthquakes etc.); a tendency towards breakdown of the traditional social environment because of the physical structure of the building (long narrow corridors with impersonal closed doors tend to prevent the creation of intimacy and a neighbourly environment and permit the use of unobserved areas for criminal acts, such as mugging, assault, etc.). Maintenance is another problem. Broken electric light bulbs and other glass litter the hallways, unrepaired water-pumps force tenants to carry water up the stairway and along corridors. Security is neglected because broken lamps are not replaced thereby creating dark, dismal areas in the hallways and stairways. The PHHC's attitude is that since many tenants do not pay their rent, there is not enough money for repairs.

In newer apartment buildings, further limitations to tenancy are imposed by the PHHC and include such regulations as the following:(2)

Tenants whose minimum income is 300 pesos or more per month may

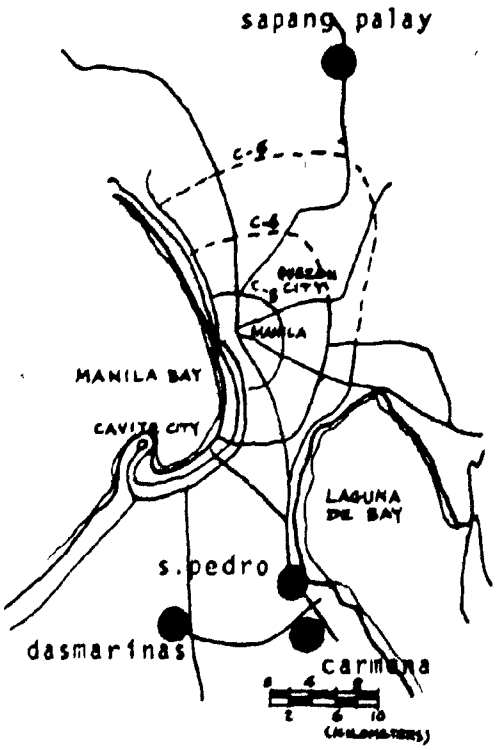
(2) PHHC, Operational Policies and Procedures for the PHHC Tondo Foreshore Urban Rental Project, Del Pan Tondo Manila (Quezon City: PHHC, Feb. 28, 1974).

rent the first floor units at 75 pesos per month. Tenants having a minimum income of less than 300 pesos are assigned to the next three floors of the building. The lowest income groups are relegated the the fourth floor at a rental of 50 pesos per month.

Statistics shown to the author by officials of the Tondo Foreshore Urban Renewal Project Office show that the average income per family in the area is 371.43 pesos per month. Existing expenditures for housing average only 37 pesos per month per family, and the PHHC rental rates of 50 to 75 pesos per monthare higher than most families can afford.

The squatters, who wish to attain some permanency of livelihood, and who are seeking better housing and social amenities, would rather be placed in a "land-ownership" situation than rent a government-owned space with little or no hope of ownership and always in the shadow of eviction due to inability to pay the rent. In 1974, during this study in Manila, there were five buildings in the Tondo Foreshore area nearing completion. The squatters' interests at that time leaned towards possible resettlement in a new development outside the Tondo Foreshore Area with some form of land-ownership rather than renting an apartment in one of the buildings within it.

As of 1974, the total number of rental units proposed under the PHHC administration would only accomodate 5% of the total squatter population then residing within the Tondo Foreshore Land. Taking into account the foregoing information, it is felt generally that the policies promulgated by the PHHC have been to date a failure.



Illus. #45

This is evident through the multiplicity of squatters, the lack of government financing, and the PHHC policy for low-income housing. The sophistication and aspirations of the squatters today will aggravate the housing situation under such a PHHC strategy.

Relocation

Another government strategy for squatter settlement is the relocation of squatters outside of Metropolitan Manila.

In the early nineteen sixties, the government relocated squatters from central Manilagto government lands outside of the Metropolitan Area: Sapan Palay in Bulacan Province, Carmona in Cavite Province, and San Pedro Tunasan in Laguna Province. (See Illus. #45). The PHHC 4-year housing program (1974-1977) plans to relocate a total of another 35,700 families in San Pedro Tunasan, Sapan Palay, Montalban in Rizal Province and Dasmarinas in Cavite. (3)

To date, none of these relocation programs has been successful. Most families left the relocation sites and returned to the Metropolitan area to resume squatter living, and some of the families who remained in their relocation site suffered both physically and economically.

The results of the unsuccessful relocation experiments are that in the new area there are very few opportunities to obtain even a minimum income. In general the quality of life is far below even the worst existing conditions in the urban areas, and educational opportunities and health services are almost nil.

(3) Hollnsteiner, The Case of the People versus Mr. Urbano Planner and Administrator, pp. 16-19

Economy:

In the vicinities of the relocation sites, there are few skilled or semi-skilled employment opportunities. Family wage-earners, therefore, continue to work at former jobs or seek new work in the city. However the distance and transportation costs make commuting very difficult. The government operates a commuter train from Carmona to central Manila, but subsidized fares of 1.5 pesos per day are too high for workers earning an average 8 pesos per day. Therefore, the wage-earners (usually husbands) remain in the city during the week or for the month, and wives and children stay in the relocation sites. The feeling of being isolated from his family often drives the husband to gambling or other women, ultimately leading to the collapse of the family structure.

A counter plan is to raise the income level with on-site vocational training and to introduce more industry. As part of this plan, the government and religious groups offer vocational training mainly in handicrafts: embroidery, wood carving, dressmaking etc.

Tahanan Foundation
Illus. #46

Presently, the largest employment entity in the Carmona Relocation Site is the Carmona Social Development Centre (Tahanan Foundation) which is supported by several government agencies, and employs 400 workers and trainees who are paid 5 pesos per day. However the Centre is too small to be an effective job market in a 7,000 family community. The development of private industry in the relocation area has not been successful, in spite of government support. The city already provides a large labour force and has

all the convenient services required by industries. Therefore, enterprises hesitate to construct factories near the relocation sites, where water, electricity, and other services are not available. Thus, the family head, by living in a relocation area, is the victim of a lower income. For the same reason, potential earnings normally available to other members of the family are practically nil. On the other hand, when they lived in the city, the fact that they were among mixed-income groups provided several small income opportunities. For example, wives worked as laundry women and children did small chores or sold small items. Therefore, relocation, instead of enchancing wage earning opportunities, resulted in lower wage earning and took away altogether any opportunity for auxilliary pay.

Services:

Infrastructures in the centre of major world cities, such as Manila, are already established, whereas in resettlement or relocation areas new services are required which implies the immediate investment of large sums of government money and many man hours of labour, neither of which seems to be available in sufficient quantity. Therefore, physical conditions in the relocation areas are worse than they are in the squatter settlements of the city. For example, in SapangPalay, only one open well is available for drinking water, and there is no sewerage, drainage or electricity. There is no road system, and people of necessity have to walk over red-clay mountain-trails which are often very dangerous in the rainy season. Their shacks are more miserable than the shacks in the city, and

SapangPalay Resettlement

Illus. #47

the poor sanitation and environmental conditions are detrimental to the settlers' health.

Carmona Resettlement
Illus. #48

In Carmona, a few water-pumps are provided, but most dwellers have to carry water a great distance after having waited a long time to obtain the water. The author's impression, from a short visit to both sites, was that although Carmona lacked all the basic amenities for human settlements, its physical conditions seemed to be better than those of Sapang Palay.

2. STRATEGIES BY PRIVATE AND OTHER AGENCIES

In addition to the government's counter plan for the solving of squatter problems, private and other institutions are also concerne with these problems and have provided several alternatives. Many religious groups are also active in the squatter settlements, help with materials and educational support.

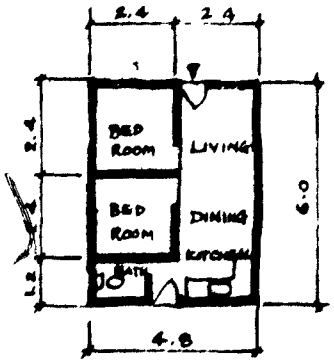
Experimental Houses

Two houses were built on a self-help basis, with people from the community directed by a young engineer, Mr. Samonte, from the Institute of Social Order. One house was built in Dulo Puting Bato and the other was built in Slip Zero, both locations in the Tondo Foreshore Land Area.

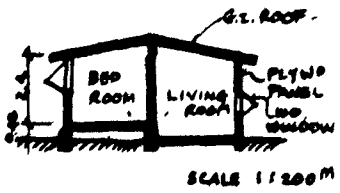
The house in Slip Zero is one storey contruction consisting of living and dining room, kitchen, and bathroom. (See Illus. #50) The toilet is flushed with a pail of water and empties into a sep tank. This house, having a floor area of 28.8 square meters, cos 1,200 pesos in 1972.

The house in Dulo Puting Bato is older than the house in Slip Ze but the size and planning are almost identical.

At present, the Slip Zero house is occupied by the president of ZOTO and her husband and mother. A young married couple lives the Dulo Puting Bato house. The tenants are satisfied with the houses except for a few complaints about the maintenance of the



PLAN

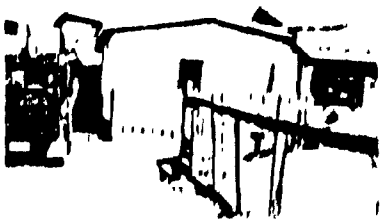


Illus. #50

SECTION

Experimental House in Slip Zero
Illus. #49

exterior walls. The exterior plywood panelling requires painting every other year, and is at the expense of the residents. The houses are neat and very livable in comparison with the surrounding squatter houses.



Exterior of the Experimental House

Illus. #50

The durability and combustibility of the building materials used are a major problem especially in dense housing areas.

Father Murphy of the Institute of Social Order and Mr. Samonte would like to continue with the experimental housing project using new materials, but it seems to be very difficult to find the necessary money for construction.

Another series of self-help experimental houses were built under the guidance of Prof. Bruce Etherington of the University of Hawaii. (4)

(4) Prof. Etherington's MA (Regional Planning) thesis dealt with the squatter problem in the Tondo Foreshore Land.

Professor Etherington's experimental house was built in Magsaysay Village and constructed on stilts in the traditional style. The main aim was to evaluate the use of new building materials.

The house was constructed with sawali panels (woven bamboo) which were coated on their exterior surfaces with a cement stucco. (5)

(5) A.B. Etherington, *Low-Cost Housing for Squatter Communities in Humid Tropical Climates* (Honolulu: University of Hawaii, 1973), p. 10.

This new building material , which was both indigenous and inexpensive was supposed to be fire and weather resistant. Unfortunately, the experiment was not successful, since the cement did not bond to the sawali thus allowing the rain water to penetrate into the house.

Prof. Etherington and his students also presented a study report, (6) which dealt with interlocking sand cement blocks. Their theory claimed that the production of the blocks and the construction of the housing could be done on a self-help basis. They estimated that a house having a floor area of 218 square feet (20.41 square meters) would cost approximately 926 pesos in 1972. This type of construction seems to have a greater possibility of utilization especially in view of the non-inflammability and durability of the blocks.

(6) Z. Jattery, C.Y. Ko, A.B. Etherington, Low-cost Housing in Sand Cement Block (Honolulu: University of Hawaii, 1973),

Cement Stucco on Bawali Panel

Illus. #51

While no experimental project of this type had been started at the time of the author's visit in 1974, one has recently been completed and is considered to be quite successful.

Land Acquisition

Not only did the squatters indicate their ability to construct housing units through self-help techniques but they were also impressive in their collective ability to organize and maintain a co-operative system. One such example is the group led by a social worker, Miss Felix, who organized squatter families to buy land through the fabrication and sale of handicrafts. She trained the wives to embroider and to make small articles. They managed to sell their production abroad through a religious group. This type of effort raised money for the squatters to buy their land which in many instances was the land they had originally squatted upon.

In this instance, the land was situated in the middle of the rice field area in the outskirts of Manila. There are many middle-class

housing developments nearby. The land values here are 50 to 250 pesos per square meter (1974). Because the site is surrounded by rice fields and has no access to the road, it allowed them to negotiate with the landowner to buy at 25 pesos per square meter. Twelve families (including Miss Felix) own approximately 200 square meters of land in this area and are now trying to raise the money to build houses and provide other amenities through their co-operative effort. It is only a small success, when measured against the total problem, but this type of co-operative effort may in the end provide a definite solution to one of the many socio-economic aspects in the complex housing problem.

3. OTHER RECOMMENDED STRATEGIES

Condominium Housing

While the PHHC renting policy is restricted to tenants whose income level is less than 600 pesos per month, a study on Magsaysay Village squatters indicates that the majority of the squatters (74%) prefer to buy an apartment in a tenement building rather than rent a single family detached house, (7) thus emphasizing the overwhelming desire for security or ownership in any form. Recommendations have also been made that these apartments be made available to low-income tenants for purchase as a condominium. (8)

The feasibility of the medium-high rise co-operative condominium should be studied as a serious long range solution, which may work in limited well planned areas.

In Manila, and many other large cities, the use of valuable metropolitan area land for low density housing is not possible because of the prohibitive land cost. Ordinarily the metropolitan land area is far too small to accomodate the immense population of the city. One solution would be high-rise condominium housing. Planners should create better accommodation in a more habitable environment thereby enabling a far greater number of people to enjoy the many conveniences of inner-city living.

Site-and-Service at Relocation Areas

One alternative to the PHHC policy of relocating people on unserviced

(7) Hollnsteiner, Metamorphosis: From Tondo Squatter to Tondo Settlement (Quezon City: I.P.C. Ateneo de Manila University, 1973), p. 8.

(8) Clinard exposes the critical problem of rent control, recommending the sale of apartments to the tenants as means to alleviate the problem. Clinard, p. 99.

land areas is a site-and-service project. (9) To reinforce this site-and-service project, there must be a large economically mixed permanent population in or near the relocation site. There must be active industries and the availability of cheap and rapid public transportation. There must also be the means provided for the establishment of a modern-socio-political administrative structure having local decision-making potentiality for self-help projects by the community.

(9) Mary R. Hollnsteiner, The Relocation Strategy in the Light of Asian Urbanization (Quezon City: I.P.C. Ateneo de Manila University, 1974), p. 2.

It has been recommended that closely knit neighbourhoods be transferred intact to a relocation area. (10) This would preserve their system of mutual aid and unity which is so necessary to their way of life.

(10) Laquian, Slums are for People, p. 206.

One such site-and-service project visited by the author was Dasmarinas being created under the guidance of the PHHC staff.

Dasmarinas Relocation Site

Illus. #52

The land was allocated for residential, commercial and industrial use. The main road was completed and ready for use. Two elementary schools, a high-school, a hospital and several water-pump stations were under construction. The PHHC group expected to sign contracts with several industries to build factories on the site prior to the advent of settlers.

Architect Reyes of PHHC explained that there were many difficulties in establishing a new community even in a serviced relocation area. For example, while the Dasmarinas site had many favourable conditions compared with some other relocation sites, nevertheless it was very difficult to pursuade industries to relocate there.

Dr. Laquian's system of "neighbourhood relocation" is financially more economical and less traumatic than other methods of resettlement. The city of Manila benefits by the resettlement of the group outside the inner-city core and the Nation attains a new and viable self-supporting community which reduces the indirect and direct subsidy of low-income citizens. Notwithstanding the plus-factors the success of Dr. Laquian's alternative to the government's relocation policy and strategy appears doubtful because despite the availability of adequate services, it is still very difficult to persuade industrial and commercial establishments to relocate.

Site-and-Service Projects within the City

Site-and-service and self-help areas in existing sites within the city already have the necessary employment opportunities and social amenities which provided the prime motive for squatting in the first place. Most of the squatter settlements have established close knit community organizations. For these reasons it would be wiser to improve the existing settlements rather than force people to relocate to unfavourable areas. However, the lack of an overall infrastructure is an ongoing basic problem which is costly and in many cases would need specialized research technology to overcome. While this technology must be furnished by the government, the basic infrastructure for the housing and community can be done by the residents. The community effort can begin once the government has expropriated all the necessary land, or the government owned rural land has been exchanged for private owned urban land. (11)

(11) Hollnsteiner, The Relocation Strategy in the Light of Asian Urbanization, p. 2.

Development of Building Materials and Technology

The present high cost of building materials prevents low-income families from building or buying their own house. There is a need to develop and produce low-cost building materials suitable for local housing. Some work in this area is being done at the Department of Agriculture at the University of the Philippines. They are conducting experimental work in hollow blocks, made from rice husks and coconut fibers. They also are doing work in coconut fiber particle boards and have built a few houses with these new materials. The coconut fiber blocks seem to be usable, but the particle boards have a water-proofing problem when used for exterior walls.

U.P. Experimental Hollow Blocks

Illus. #53

Unfortunately, neither the University of the Philippines nor private experimental groups have properly published their work, so there is little access to their research. There is, in fact, very little money for private research. Mr. Samonte, an engineer, wanted to experiment with his new idea for clay blocks. The experimental work has been delayed because of the difficulty in finding financial aid. In the author's view, it is of the greatest importance to establish a centre for the dissemination of information and facilities for experimentation, construction and testing. Such experimentation should be directed toward the developing of suitable low-cost building materials and construction elements which can be manufactured and produced by the residents living in squatter settlements or in re-location areas, as self-help projects. Technological schemes such as "The Core Unit", which attempts to solve service facility problems could be implemented. (12) This unit comprises an overhead water

(12) A.B. Etherington, Tondo Study, M.A. Thesis, (Honolulu: University of Hawaii, 1971), pp. 147-153.

storage tank, a waste disposal tank which also generates methane gas for cooking, a solar heating unit for domestic water, a shower head and valve and an electrical circuit breaker and outlet box.

In addition, there is always the possibility of mass production benefits in developing an economically self sufficient industry.

Rural Centre Development

The despair resulting from rural conditions is often the cause for migration into urban squatter settlements.

To prevent this migration socio-political, economic and cultural activities should be restructured in order to develop the rural areas and to provide income opportunities.

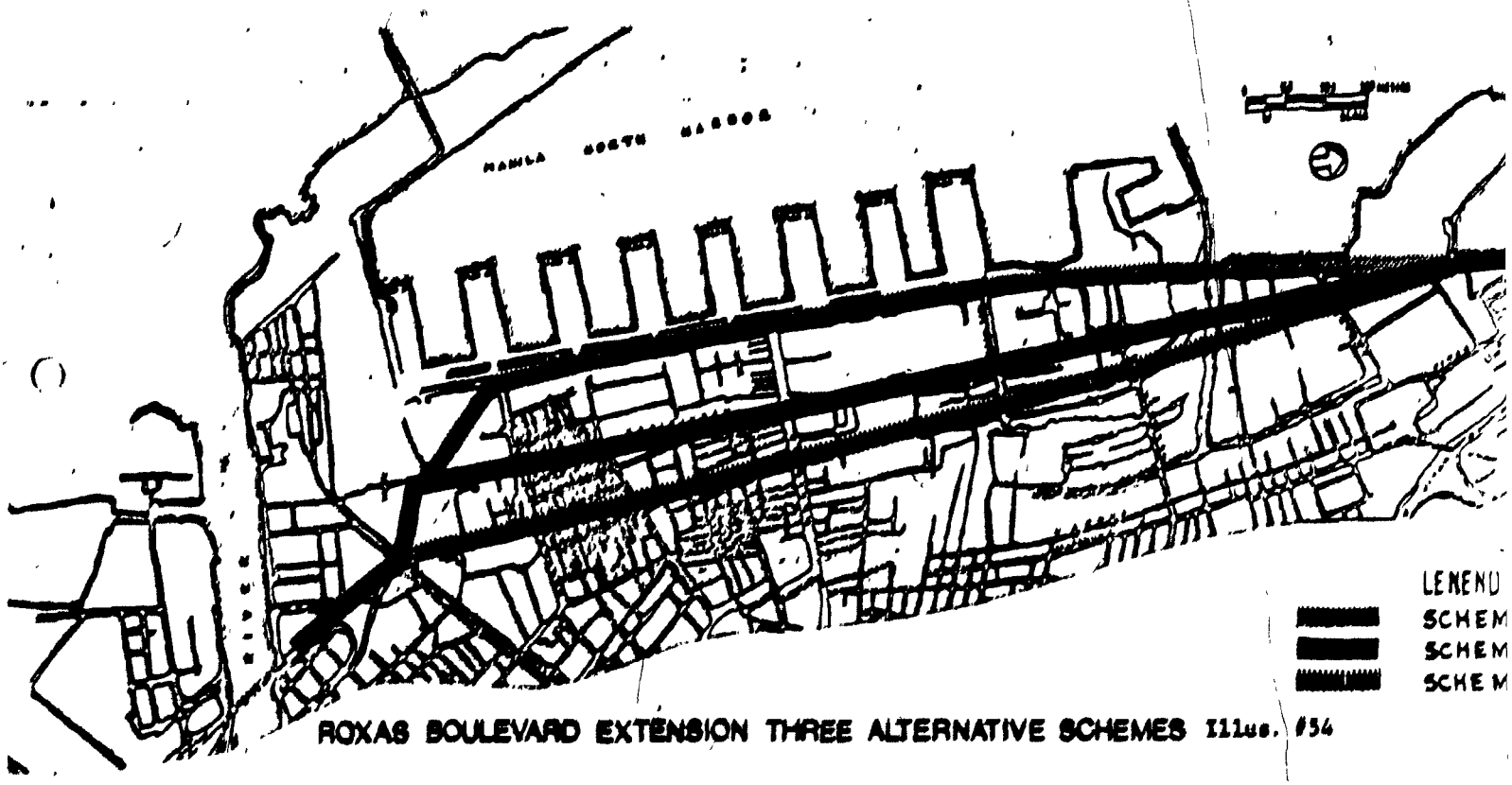
A government policy should be instituted for resettling such people to rural areas having infrastructures and services capable of sustaining the community. It is hoped that the diversion of the squatter groups or the relocating of potential squatters will relieve the density of population in Metropolitan Manila.

PART III PROPOSAL

1. DAGAT-DAGATAN PROJECT

Background of the Project

The Dagat-Dagatan Project was announced by the Government a
end of June, 1974, during the period the author was in Mani
The decision to implement this project was related to two o
projects in the Tondo Foreshore Land Area, "The Internation
Harbour" and "The Roxas Boulevard Extension".

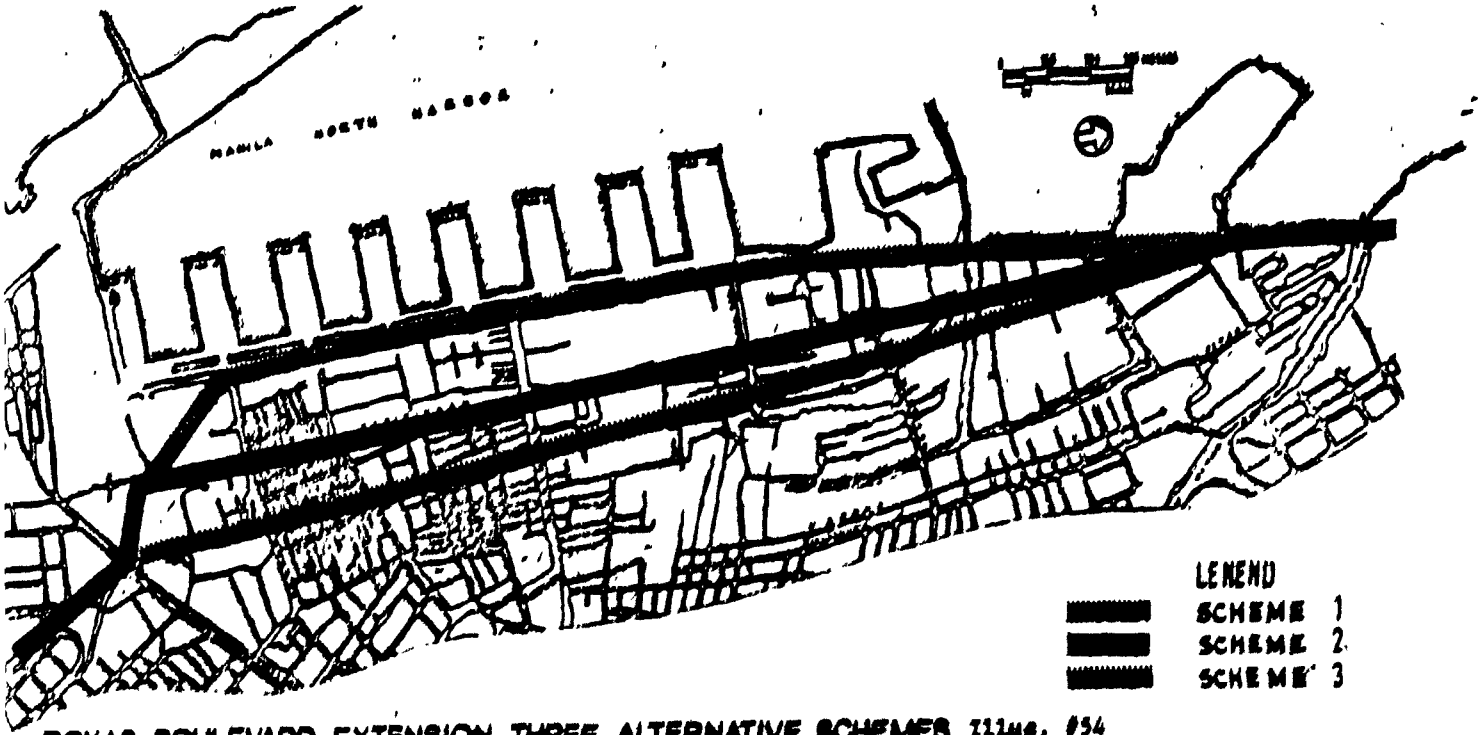


ROXAS BOULEVARD EXTENSION THREE ALTERNATIVE SCHEMES Illus. #54

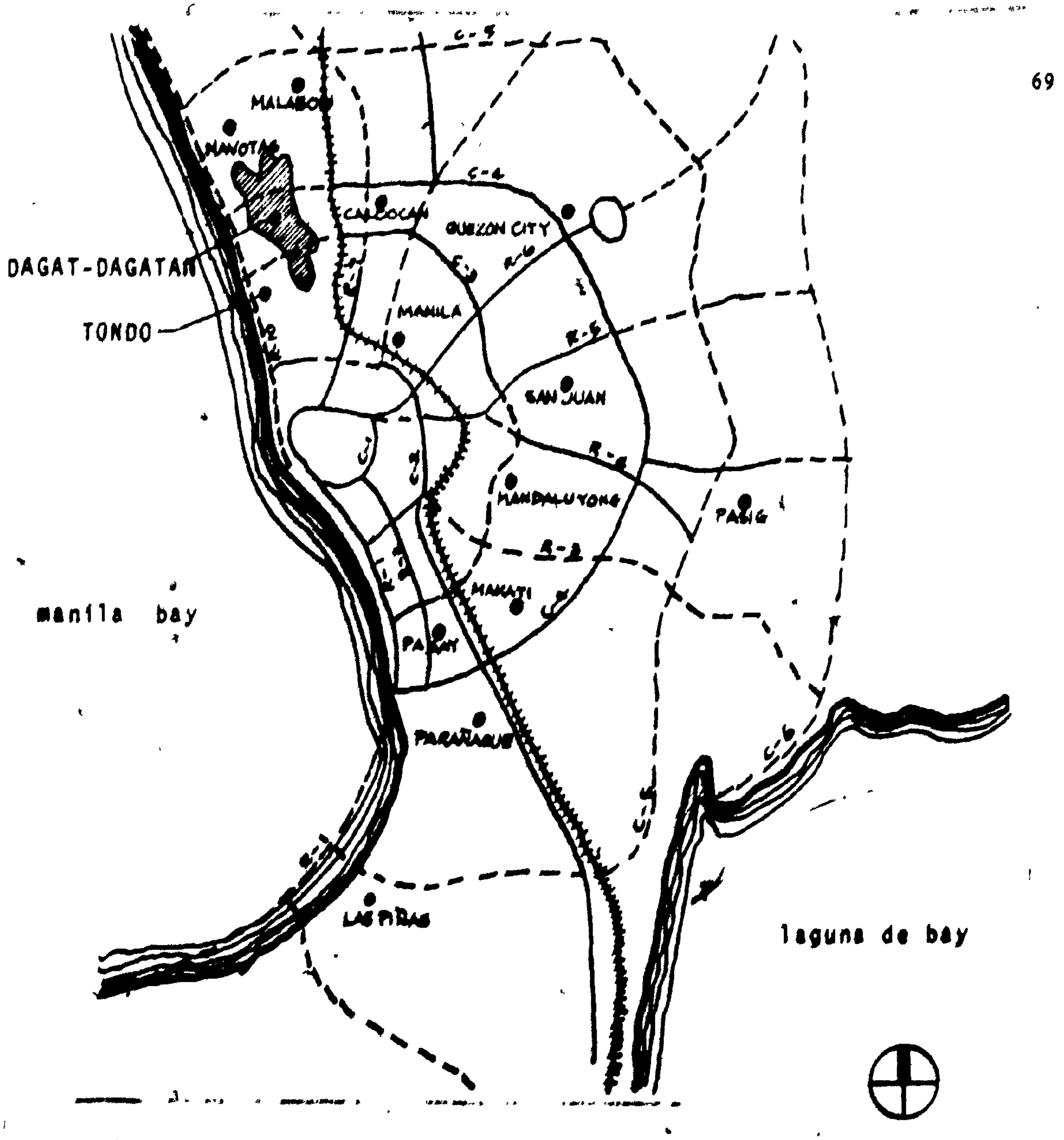
1. DACAT-DAGATAN PROJECT

Background of the Project

The Dagat-Dagatan Project was announced by the Government at the end of June, 1974, during the period the author was in Manila. The decision to implement this project was related to two earlier projects in the Tondo Foreshore Land Area, "The International Harbour" and "The Roxas Boulevard Extension".



ROXAS BOULEVARD EXTENSION THREE ALTERNATIVE SCHEMES Illus. #54



DAGAT - DAGATAN LOCATION Illus. #55

SOURCE : TONDO FORESHORE URBAN RENEWAL PROJECT

The Roxas Boulevard Extension Project originally consisted of three alternative schemes as shown in Illustration #54. The second of these schemes, which involved the particular area under study, was chosen as being the most feasible. These two projects would involve the relocation of 17,000 to 20,000 squatter families including the families who were the subjects of this study, and the Dagat-Dagatan lagoon area came out as the most acceptable site because of its size and location. (See Illus. # 55).

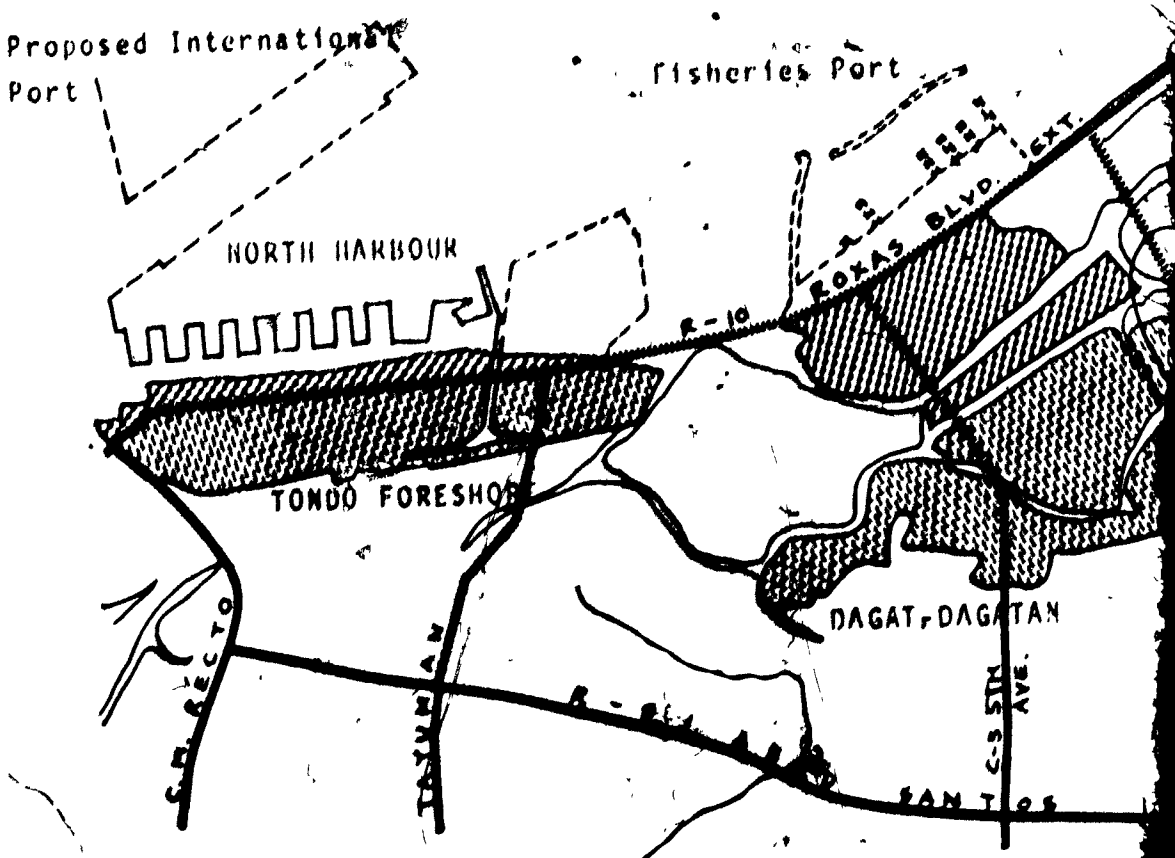
In this plan, the area of Barangays 14, 15A, 18, and 20, which the author had originally chosen as the design site, will be used as an industrial area. (See Illus. # 57). The area's present residents will be relocated in the New Settlement in Dagat-Dagatan. During the study of the socio-economic background of the area, the author opted to change the design site to Dagat-Dagatan with the recommendations of the thesis advisors. During the course of the present study, the International Design Competition was published and in February 1975, the Dagat-Dagatan Resettlement Project was chosen as the competition site.

Dagat-Dagatan Lagoon

Illus. #56

Dagat-Dagatan Site

The lagoon is situated along Manila Bay, about three kilometers north of the Tondo Foreshore Land. It has an approximate area of 430 hectares and in the future it will be expanded to include a total 515 hectares. The lagoon is presently being used as fishponds. The fishponds are owned by several private individuals. The site is under the political jurisdiction of two cities, Manila and Caloocan,



LAND USE

	Residential Area	Industrial-Commercial Area
TONDO	78 Hectars	35 hectars
DAGAT-DAGATAN	280 Hectars	150 Hectars

TRANSPORTATION

Propose
Thorou

Existi
Thorou

PROPOSED LAND USE AND TRANSPORTATION Illus.

SOURCE: TONDO FORESHORE URBAN RENEWAL PROJECT

and two municipalities, Navotas and Malabon. A new fisheries Port is under construction to the west of the Roxas Blvd. Extension and the Dagat-Dagatan site.

2. DESIGN PROPOSAL

Design Criteria

The design for the new resettlement project is considered in three parts.

1. The New Town
2. The Barangay and Neighbourhood Units
3. The Dwelling Units

The design is focused on the individual dwelling unit. Since the individual dwelling unit should not be designed without consideration of the surrounding environment, an overall lay-out of the New Town is proposed as well as a site plan for a Barangay unit which will be applicable to the entire site.

The following criteria will be considered:

1. The New Town

Land Use

The following land use plan has been determined by the Government (See Illus. #57).

Total Land Area	430 hectares
Residential Use	280 hectares
Industrial; Commercial Use	150 hectares

The residential area should be divided into 8 to 11 zones, and each zone should be composed of 3 to 5 Barangay units.

The industrial and commercial areas should be planned to absorb the labour force and to provide economic subsistence for the residents.

Facilities

The New Town should be planned to function as a semi-autonomous town containing the following facilities:

an administration building
a police headquarters
a hospital
a highschool
a library
a sports centre
markets
parks and green areas

The above facilities will form the Town Centre.

Transportation

The inter-metropolitan roads and the major inter-town roads have been proposed by the Government as shown on the Drawing D-3.

2. Barangay and Neighbourhood Units

Social Structure

As previously mentioned, physical planning must take into consideration the existing social structure in order to maintain and improve the community both socially and physically. Hence, the following is proposed.

a) Preservation of present community units: each existing community social group should be transferred as a unit to the New Town resettlement, Barangay, as recommended by Dr. Laquian.
b) Establishment of a self-help community: administration of the community should be managed by the residents rather than by the Government, although the Government may guide or assist in promoting a self-help operation.

Land Use and Accomodation

It is proposed that a Barangay land area of approximately 5 hectares will accomodate the following facilities to create a semi-autonomous community.

a) 500 dwelling units (3,500 people), with a density of 100 families per hectare; or 650 people per hectare.
b) Barangay Centre should include: the administration centre, a political meeting place, and a community space for social activities.

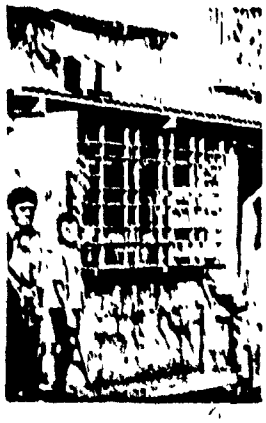
c) The Health Clinic should include: medical services and educational facilities for hygiene, sanitation, nutrition, health and the like.

d) The Elementary School should include: adequate classrooms for all school-age children in the Barangay, and should be sufficiently flexible to allow the use of existing facilities for adult eduction, and a modicum of isolation should be provided between school activities and public activities to prevent noise distrations.

e) The Chapel should provide: space for religious teachings, weddings, funerals and the like, and a place for welfare in case of emergency.

A Basketball Court
Illus. #58

The above facilities (b-e) shoud be easily accessible from any part of a Barangay unit, not only to facilitate the necessary services but also to promote the social activities of the community.



A Sari-sari Store
Illus. #59

f) Shops and Storesare necessary to sell commodities to the residents and to promote domestic industries (cottage industries).

Neighbourhood Unit

One Barangay unit will be subdivided into 4 or 5 neighbourhoods, (100-150 families each) containing the following facilities: Nursery school, basketball court (playground), sari-sari stores and open market area.

Circulation and Transportation

The circulation and transportation system must be pedestrian oriented and must provide space for social interaction. It must also include accessible public transportation, jeepneys and/or buses less than 300 meters from any point of the community.

Vehicular circulation should be limited but allow the following:

a) service to and from stores and shops
b) emergency facilities (police, ambulance, fire fighting) to every home.

Security

Police

Although the criminal rate is expected to be low because of the existing social organization, there must be a police car access to each neighbourhood in case of emergency.

Fire

Fire hydrants should be installed and means of access for fire fighting equipment provided in all parts of the neighbourhood.

Natural Calamity

In view of the frequency of earthquakes and typhoons safety zones must be provided and consideration must be taken of the topography to prevent flooding.

Equipment and Utilities

A domestic water system is required for the provision of drinking water to each building structure.

An adequate sewer system must be provided. Surface water and storm drainage systems must be installed.

Electricity should be provided to each building structure and street lights should be installed.

A garbage collection space should be provided in each neighbourhood unit.

3. The Dwelling Unit

The physical form of a house reflects its inhabitants' life-style, economic and social status and aspirations. Before enumerating the general criteria on the design of the dwelling units, three criteria which will especially apply to this particular project should be emphasized.

1. The design must take into consideration the many levels of income-groups in the community.
2. The design must respond to the people's aspirations for a middle-class style of housing. The new middle-class housing developments in Manila are similar to those found in North America. Low-income people aspire to the life of the middle class. Accordingly, the house style they are apt to copy is that of the middle-class. In the interviews conducted by the author, fully 100% of the squatters said they would like to sleep on beds, whether they could afford to own them or not.
3. The construction of the housing units must be done on a self-help basis.

(This is one of the requirements of the competition).

Space Use

Present squatter houses exhibit many varieties of space use. Therefore in the proposed units the householder should be able to decide as freely as possible how the space should be used according to family conditions, occupations and financial situation.

Essential space requirements are listed below:

family activity space (gathering, eating).
sleeping space
cooking space
bathing and toilet space

space for washing and drying clothes (clothes must be dried indoors during the rainy season)

Space for the following activities is optional:

working and/or selling space
animal quarters (pigs, chickens)
gardening space

Protection/Security

Fire

Access to each dwelling unit should be provided for fire fighting equipment. Exterior of dwelling must be built of low-combustible materials. Fire block should be provided between units.

Natural Hazards and Climatic Conditions

Dwelling units should be resistant to typhoons, flooding, and earthquakes. Buildings should be properly oriented from the point of view of climatic conditions:

a) to allow for cross ventilation
b) to shield from direct sunlight
c) to provide daylight to each room

Social Aspects

Houses should be located so as to encourage contact, but family privacy should be maintained.

The design of each house should include safety measures against unwanted intrusion.

Equipment and Utilities

Each house should be provided with the following equipment and utilities:

- means for gathering and storing of rain water
- electric lighting in each room
- electric outlets as required
- proper surface water drainage

All the requirements mentioned in this chapter are summarized in Illustration # 60.

HIERACHY OF REQUIREMENTS FOR DAGAT-DAGATAN DEVELOPMENT PROPOSAL

UNIT	SPACE USE	FACILITIES	TRANSPORTATION
New Town	Residential Use: 8-11 Zones. 25- 35 Barangays 15,000-20,000 Families 100,000-140,000 Persons Industrial and Commercial Use.	1. Administration Building 2. Police Headquarters 3. Fire Station 4. Hospital 5. High School 6. Library 7. Sports Centre 8. Parks and Green Area 9. Markets	1. Inter-Metropolitan vehicular roads 2. Inter-New Town vehicular roads 3. Pedestrian ways
Zone	3 - 5 Barangays 1,500 - 2,500 Families 10,000-15,000 Persons	1. Zone Centre 2. Tulungan Centre (Welfare Centre) 3. Police Outpost	1. Inter-New Town vehicular road 2. Inter-Barangay vehicular roads 3. Pedestrian ways
Barangay	4 - 5 Neighbourhoods 500 -750 Families 3,5000-5,000 Persons	1. Barangay Centre 2. Elementary School 3. Health Clinic 4. Chapel 5. Shops and Stores 6. Park	1. Vehicular roads 2. Pedestrian ways
Neighbourhood	100 -150 Families 650 -1,000 Persons	1. Nursery School 2. Basket Court 3. Sari-sari Stores 4. Open Market Space	1. Vehicular road 2. Pedestrian ways
Group of Families	10 - 20 Families 100-130 Persons	1. Communal Space	1. Pedestrian way
Family	5 - 10 Persons	1. Sheltered Space 2. Sanitary Facilities 3. Outside Space	1. Access to Pedestrian way
Person		1. Space for Privacy	

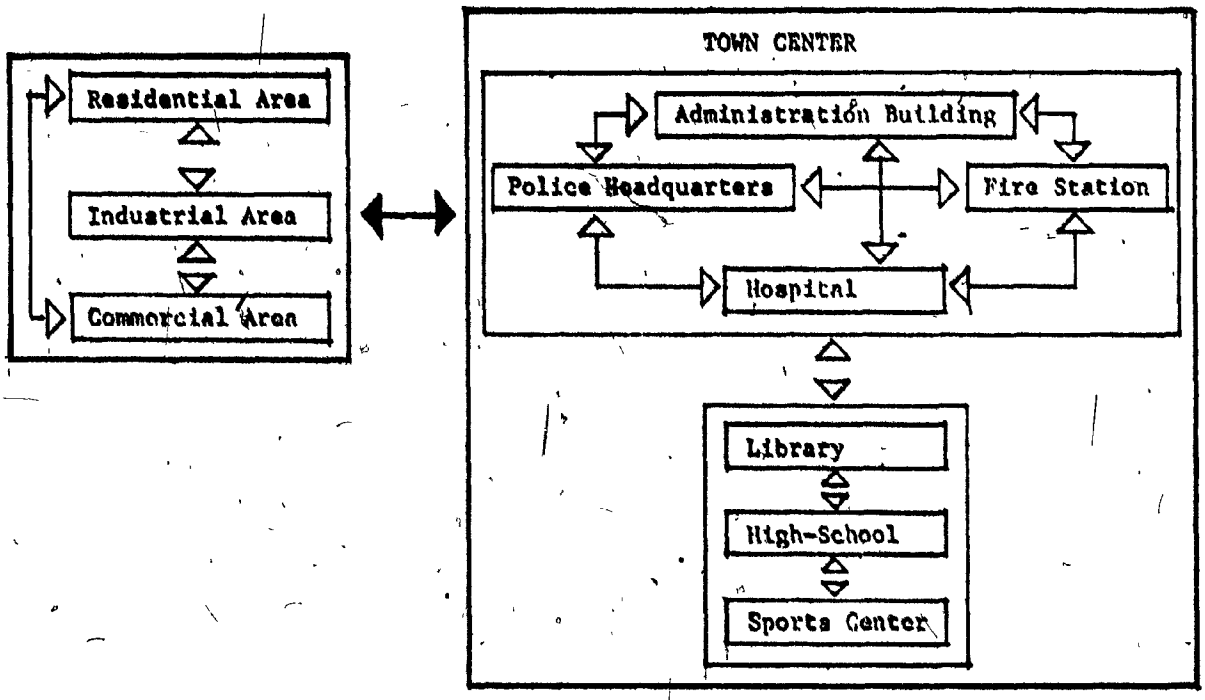
Illus. #60

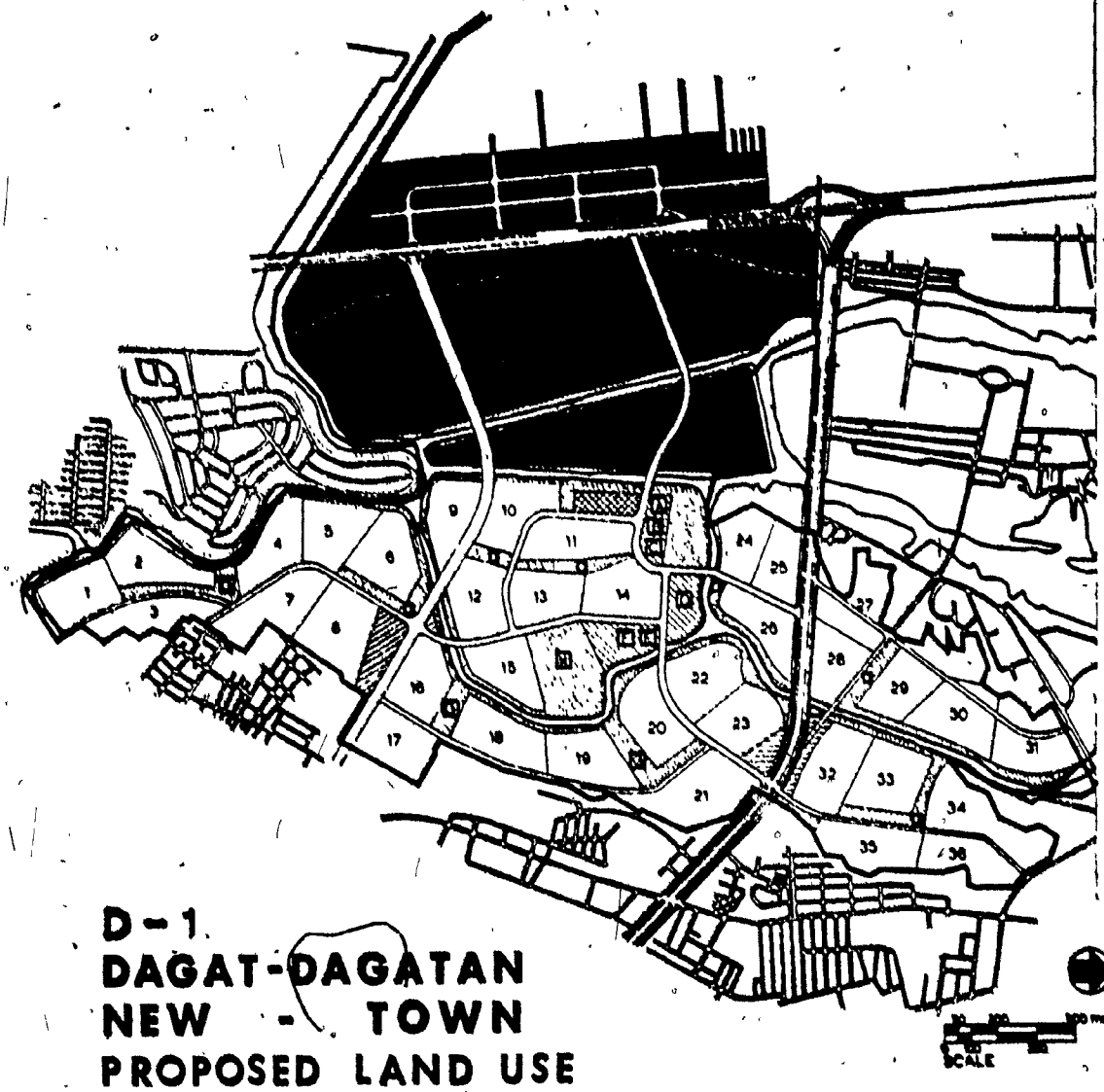
Design Concept

1. The New Town

Town Facilities

The facilities are grouped as shown below according to their use. The grouping of facilities as shown indicates their natural relationship each to the other.

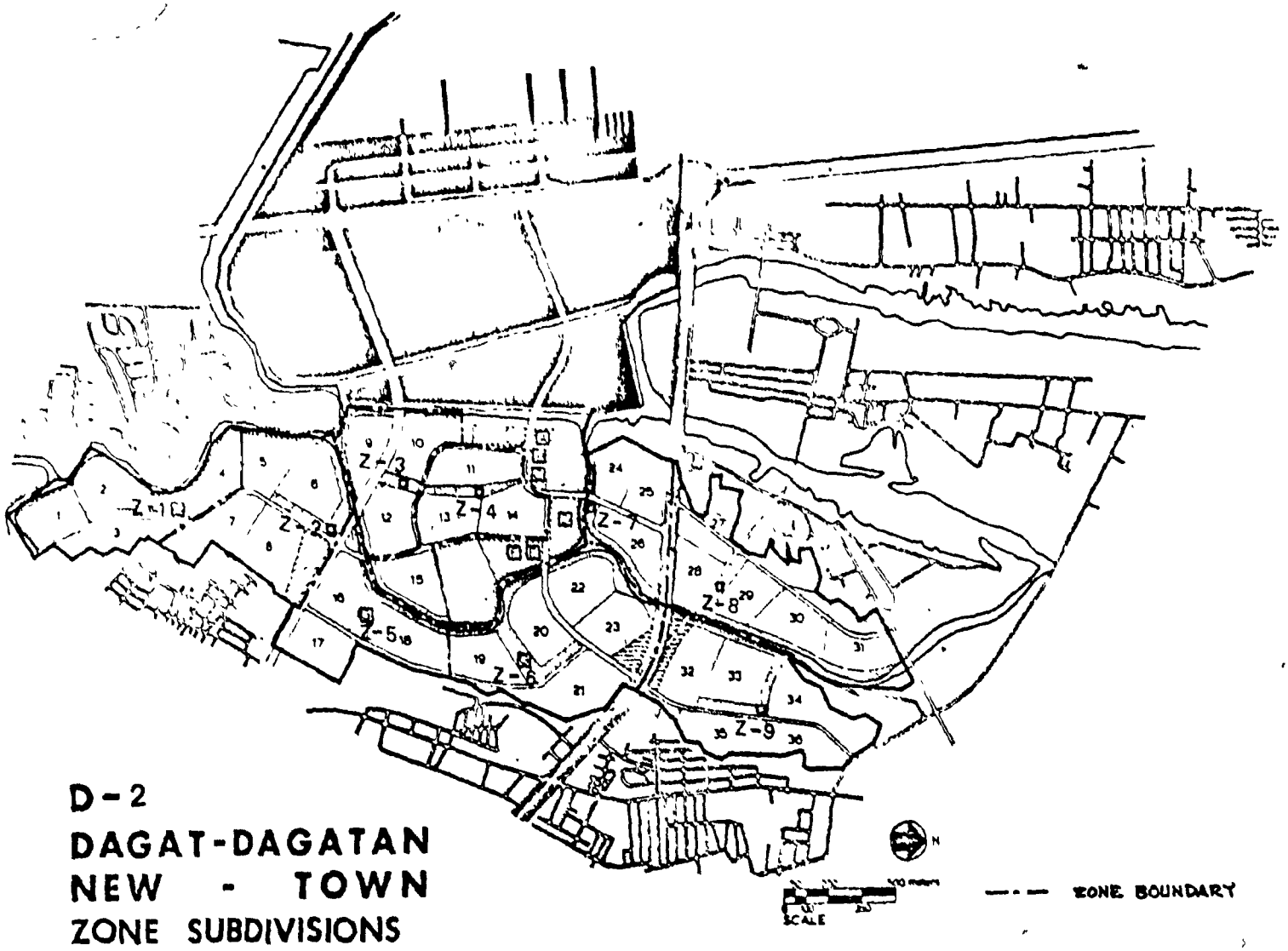




D-1
DAGAT-DAGATAN
NEW - TOWN
PROPOSED LAND USE

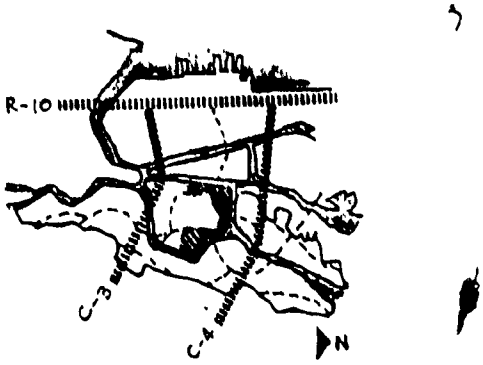
LEGEND

- Project area boundary
- river
- future river dredging
- proposed barangay units
- green area; parks
- commercial area; markets
- mixed commercial & institutional area
- institutional area
- industrial & commercial area
- A fire station
- B police headquarters
- C administration building
- D hospital
- E library
- F high-school
- G zone centre; police output
- H sports centre



D-2
DAGAT-DAGATAN
NEW - TOWN
ZONE SUBDIVISIONS

Location of the Town Centre (see Drawing D-1)



Location of Town Centre
Illus. #61

The western portion of the site has been reserved for industrial and commercial use. (See Drawing D-1) Considering the geographical condition of the site and the proposed road system, it is logical to place the Town Centre in the island which forms the centre of the site. In this location, the buildings become a part of the green belt which borders the rivers, and become the focal point in the public space. (See Illus. # 61 and drawing D-1).

The Fire Station "A" and Police Headquarters "B" are placed near the industrial/commercial areas. These two buildings are on the main internal road and near the loop road in the middle island. Access to any part of the residential area is provided by the proposed internal road/street system.

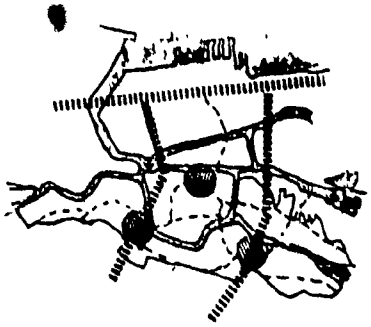
The Administration Building "C" is located so as to be easily accessible and to interconnect with external road systems.

The Hospital "D" including out-patient clinics is located at the junction of the three rivers where it is easily accessible.

The Library "E" and High-School "F" are grouped together. The Library is open to all the residents of the New Town but major users will be students.

The Sports Centre "X" is located adjacent to the High-School

as an integral part of the school facilities, and is also available for general public use.

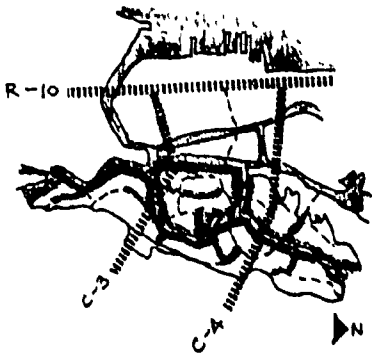


Market

Illus. #62

Location of Markets, indicated as ▨ on Drawing D-1

Market areas have been included in residential districts where major inter-metropolitan roads (C-3) and (C-4) meet with the internal circulation system. These markets will also serve as jeepney and bus transfer points and jeepney stations. A mixed institutional and commercial area is also proposed as a part of the Town Centre. Restaurants and some shops may be required by the people who use the Town Centre facilities as well as by local workers. Banks and branch offices of the government are also located in the same area. (See Illus. # 62).



Green Belt

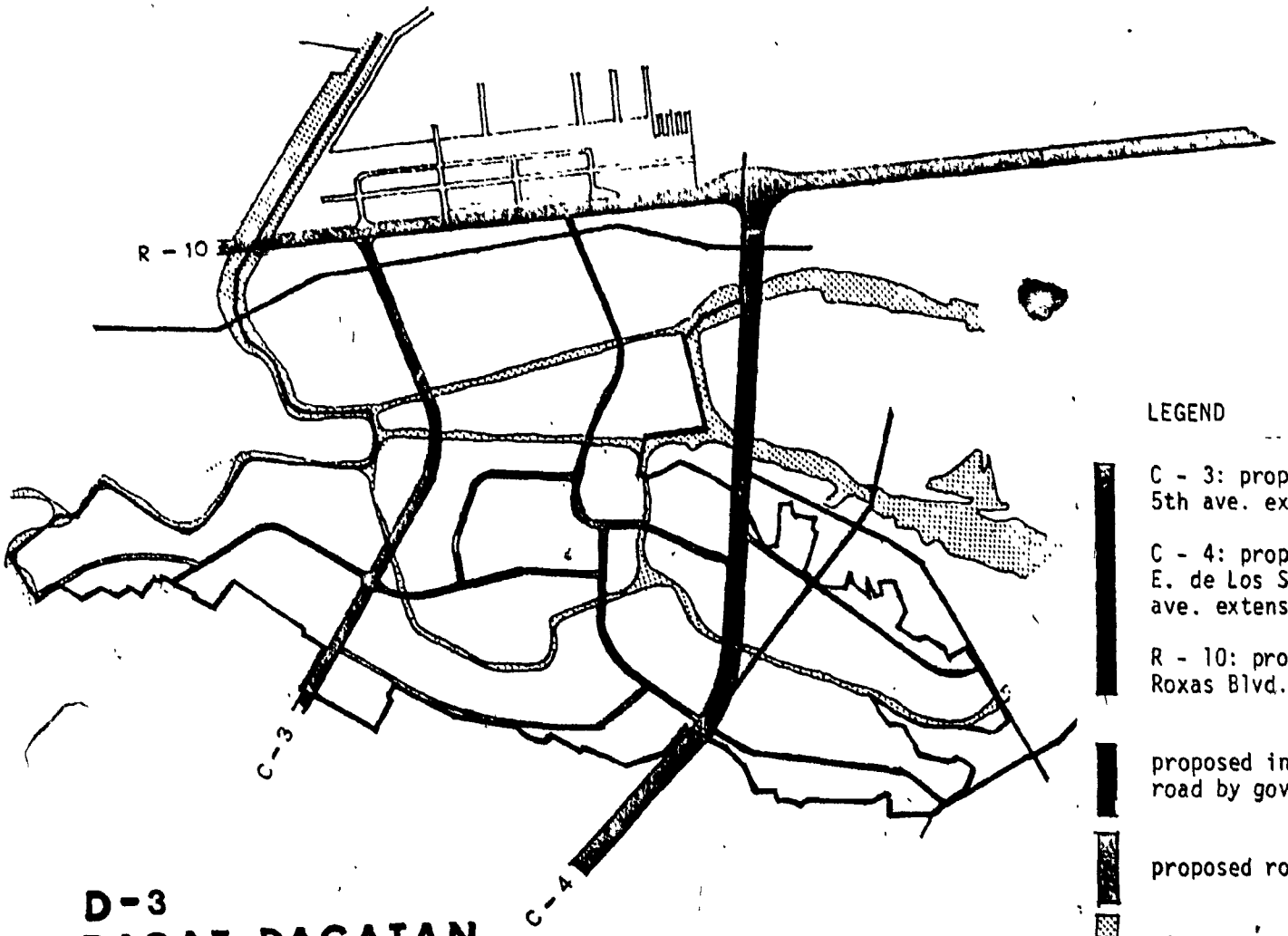
Illus. #63

Green Areas and Parks indicated as ▨ on Drawing D-1

Since soil conditions make the river banks unsuitable for construction, the banks are used as green areas and parks. The river water and green areas will provide a continuous public space through the New Town, and a possible space for growing of vegetables. Green areas are also proposed along the main vehicular roads and in the zone centres.

The zone facilities "G" - comprising a zone centre, A Tulungan Centre (governmental Welfare Centre) and a police out-post, will be located within the green area as shown.

These green areas will partially buffer the noise of traffic



D-3
DAGAT-DAGATAN
NEW - TOWN
MAIN ROAD SYSTEM

LEGEND

C - 3: proposed 5th ave. extension

C - 4: proposed E. de Los Santos ave. extension

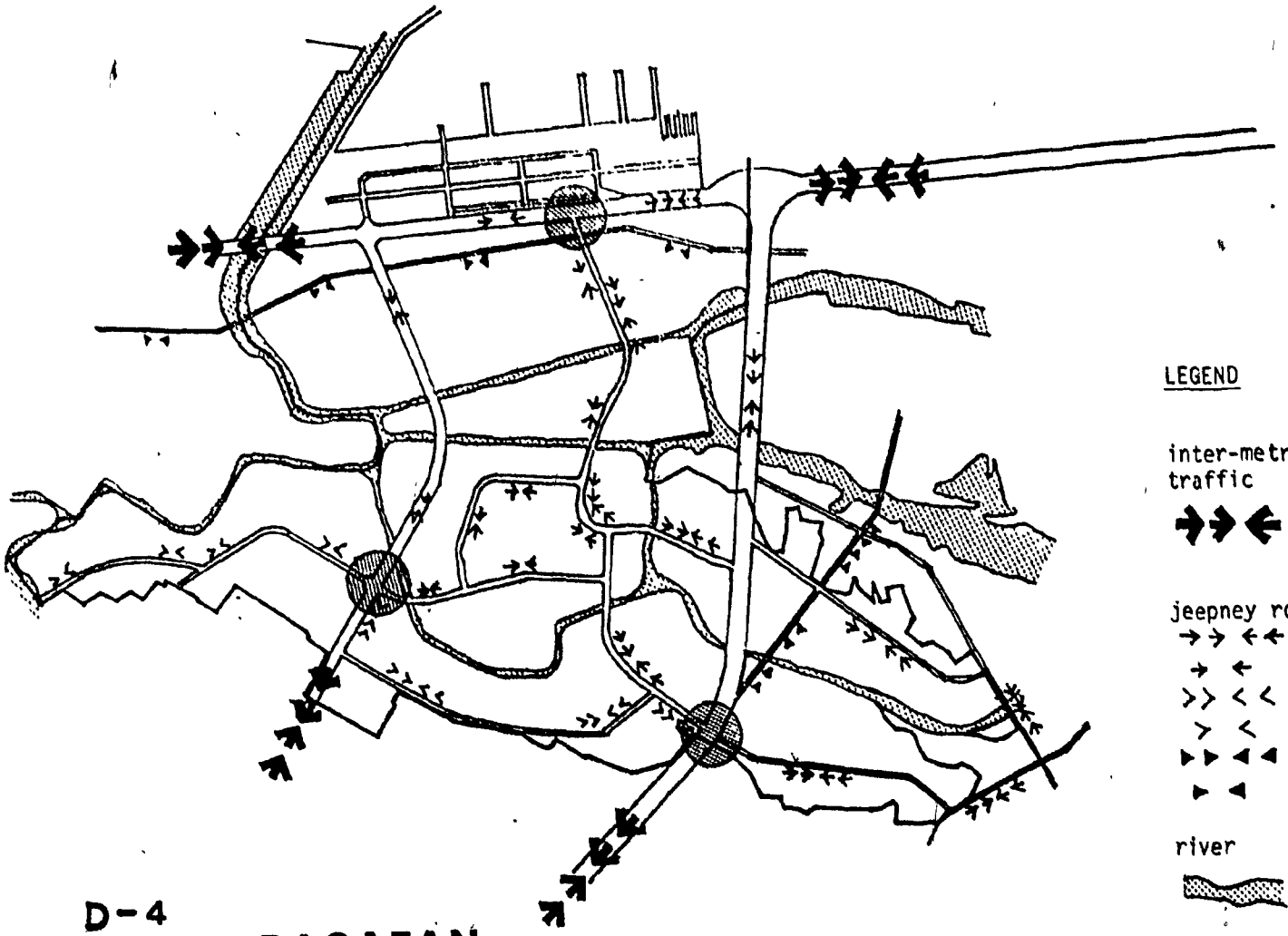
R - 10: proposed Roxas Blvd. ext.

proposed internal road by government

proposed road

river - water way

existing road



LEGEND

inter-metropolitan traffic

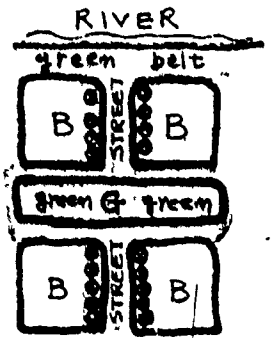
jeepney routes

river

node

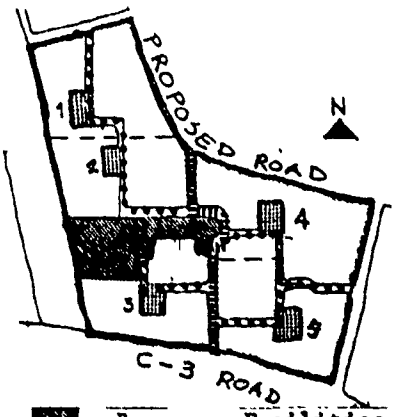
SCALE

D-4
DAGAT-DAGATAN
NEW - TOWN
TRANSPORTATION SYSTEM



B - Barangay Unit
G - Zone Facilities
⊗ - Shops and Stores
Overlap Area

Illus. #64



Barangay Facilities
Neighbourhood Centre
Two-way Traffic
One-way Traffic
Neighbourhood Unit

Illus. #65

and at the same time, give a pleasing view to the passers-by.

The zone facilities, the green areas, the shops and the stores along the streets of the Barangay boundaries as shown in Illustration #64 will encourage relationships between adjacent Barangay units.

A total of 36 Barangay units is proposed. Each Barangay land area is approximately 5 hectares, containing more or less 500 dwellings. The total number of dwelling units will be about 18,000, with approximately 123,000 people resettled in the New Town. The land use of the New Town and the subdivision of Barangay units and zones are shown on drawings D-1 and D-2.

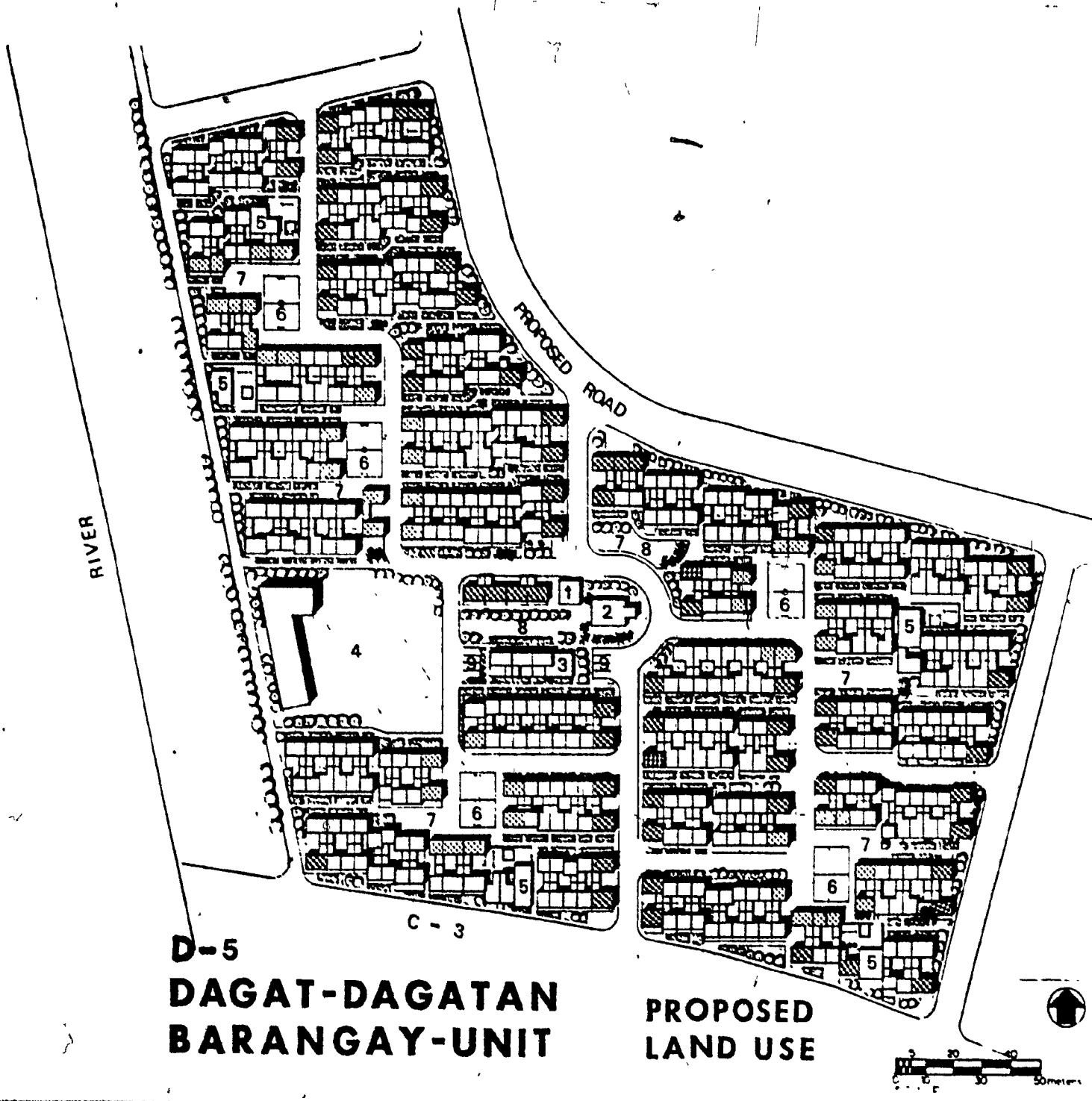
Circulation and Transportation

Jeepney routes and other transportation systems are indicated on drawings D-3 and D-4.

2. The Barangay Unit

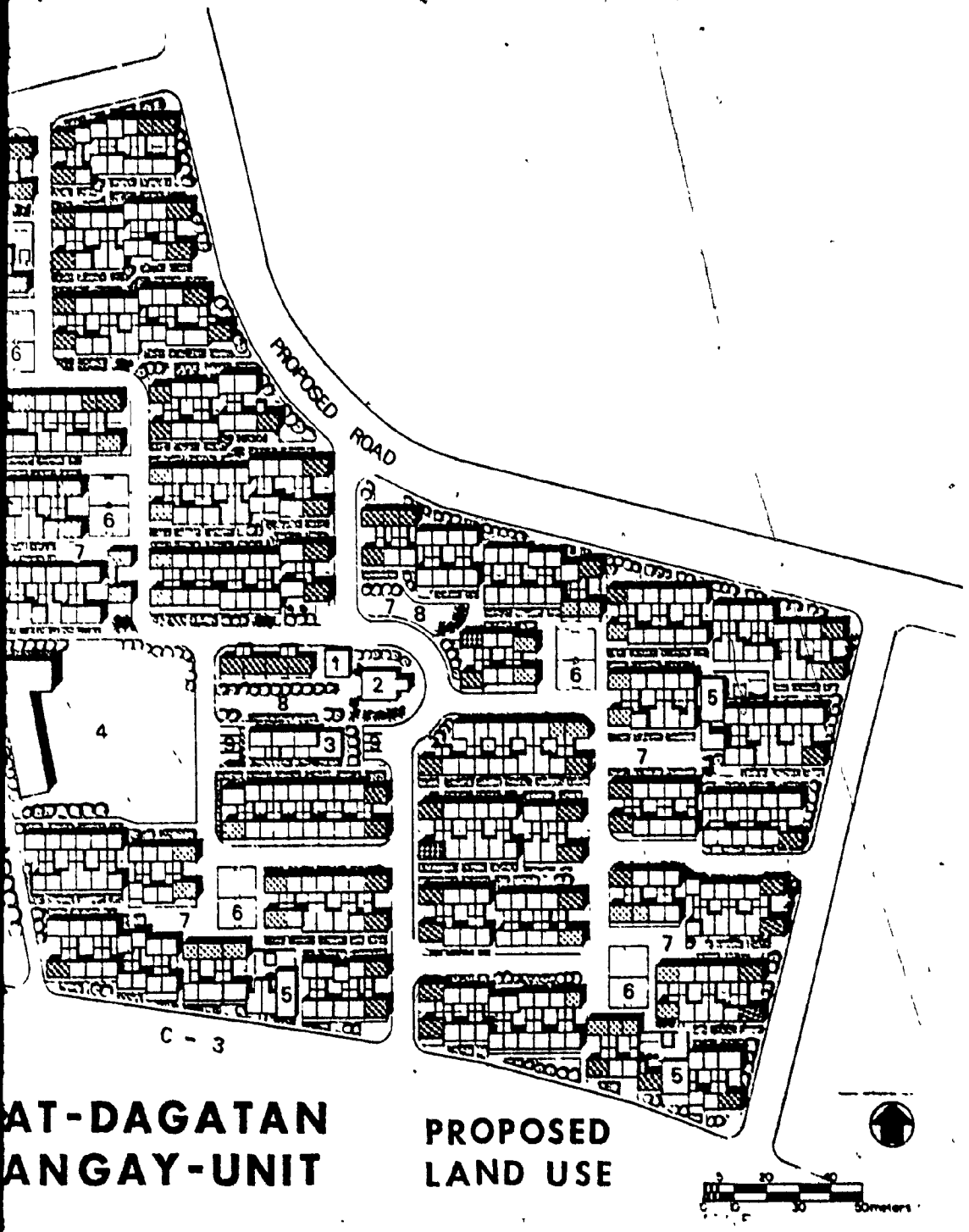
The Barangay unit # 10 (see Drawing D-1) has been chosen as the prototype. This site was also selected as the competition site. The Barangay unit is subdivided into five neighbourhood units, each having a neighbourhood centre. (see Drawing D-6 and Illus. #65).

The community facilities are grouped longitudinally in the middle



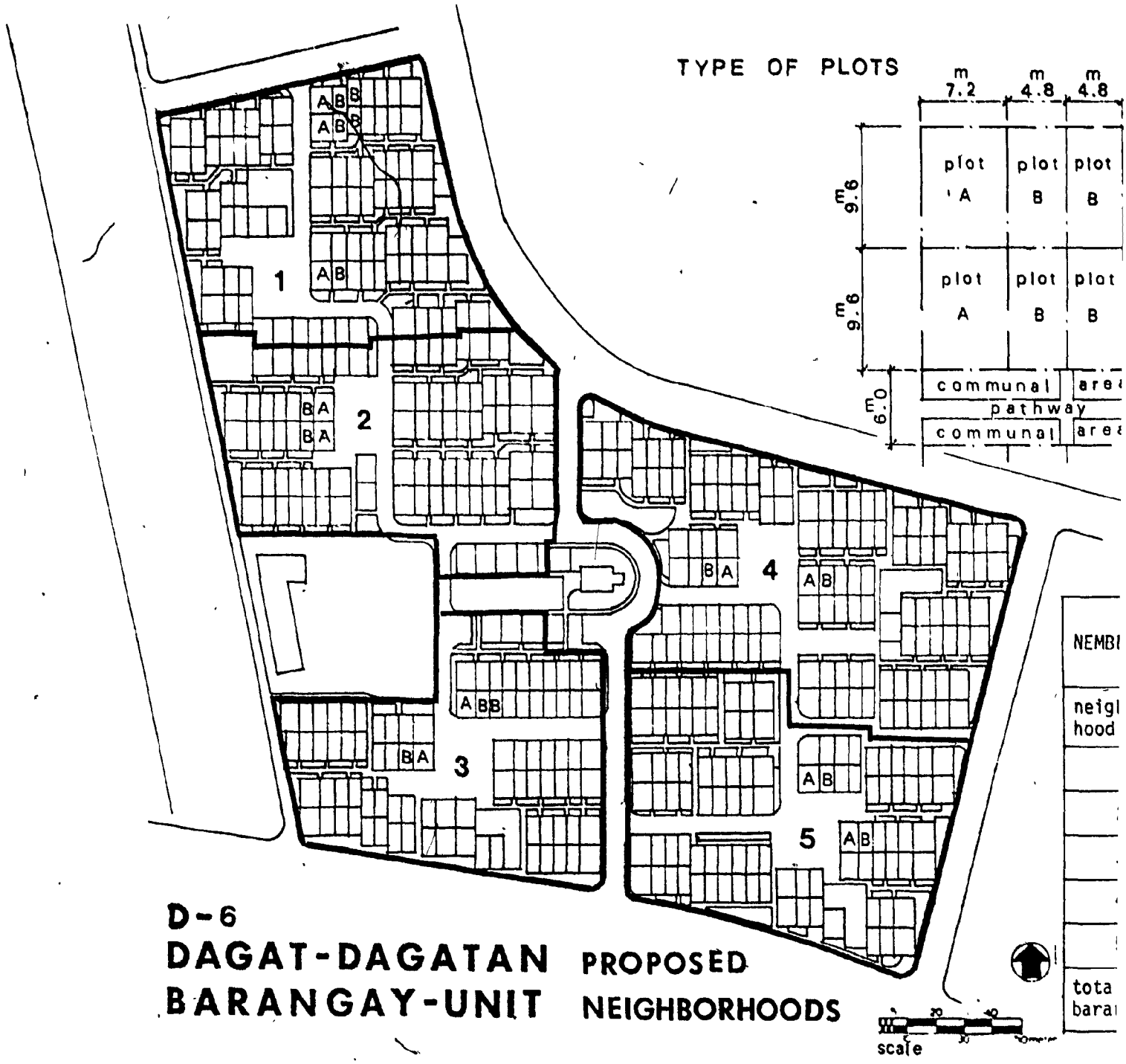
D-5
DAGAT-DAGATAN BARANGAY-UNIT

PROPOSED LAND USE



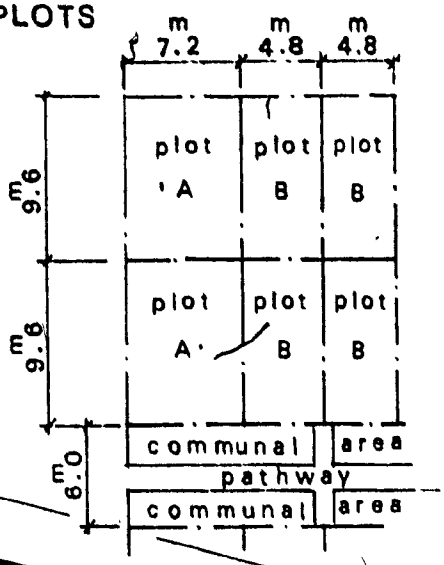
AT-DAGATAN
ANGAY-UNIT

PROPOSED
LAND USE



D-6
DAGAT-DAGATAN BARANGAY-UNIT PROPOSED NEIGHBORHOODS

TYPE OF PLOTS



PLOT AREA	
	m^2
type A	69.12
type B	46.08

T-DAGATAN PROPOSED
NGAY-UNIT NEIGHBORHOODS

scale

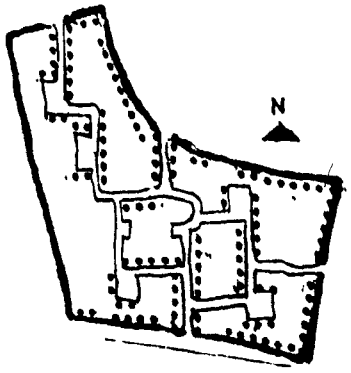
NEMBER OF PLOTS PER NEIGHBORHOOD			
neighbor-hood	type A	type B	total
1	28	64	92
2	32	54	86
3	22	69	91
4	25	102	127
5	23	78	101
total barangay	130	367	497

of the Barangay site.

The main traffic circulation within the Barangay consists of a two-way vehicular road and a few one-way lanes. The two-way traffic road connects the proposed C-3 inter-metropolitan road and the proposed inter-new-town loop road and becomes the main access to this Barangay unit.

Barangay Facilities (See Drawing D-5)

The Barangay Centre (1), Chapel (2) and Health Clinic (3) are located adjacent to each other in the centre of the Barangay. The Chapel, situated on the main road, serves as the focal point of the Barangay Centre. The Barangay Centre and Health Clinic are located at opposite sides of the Chapel. A small park extends towards the Elementary School yard (4). The School yard and the park will be suitable open spaces for festivals and special occasions for the Barangay residents. These facilities will be actively used by the residents.



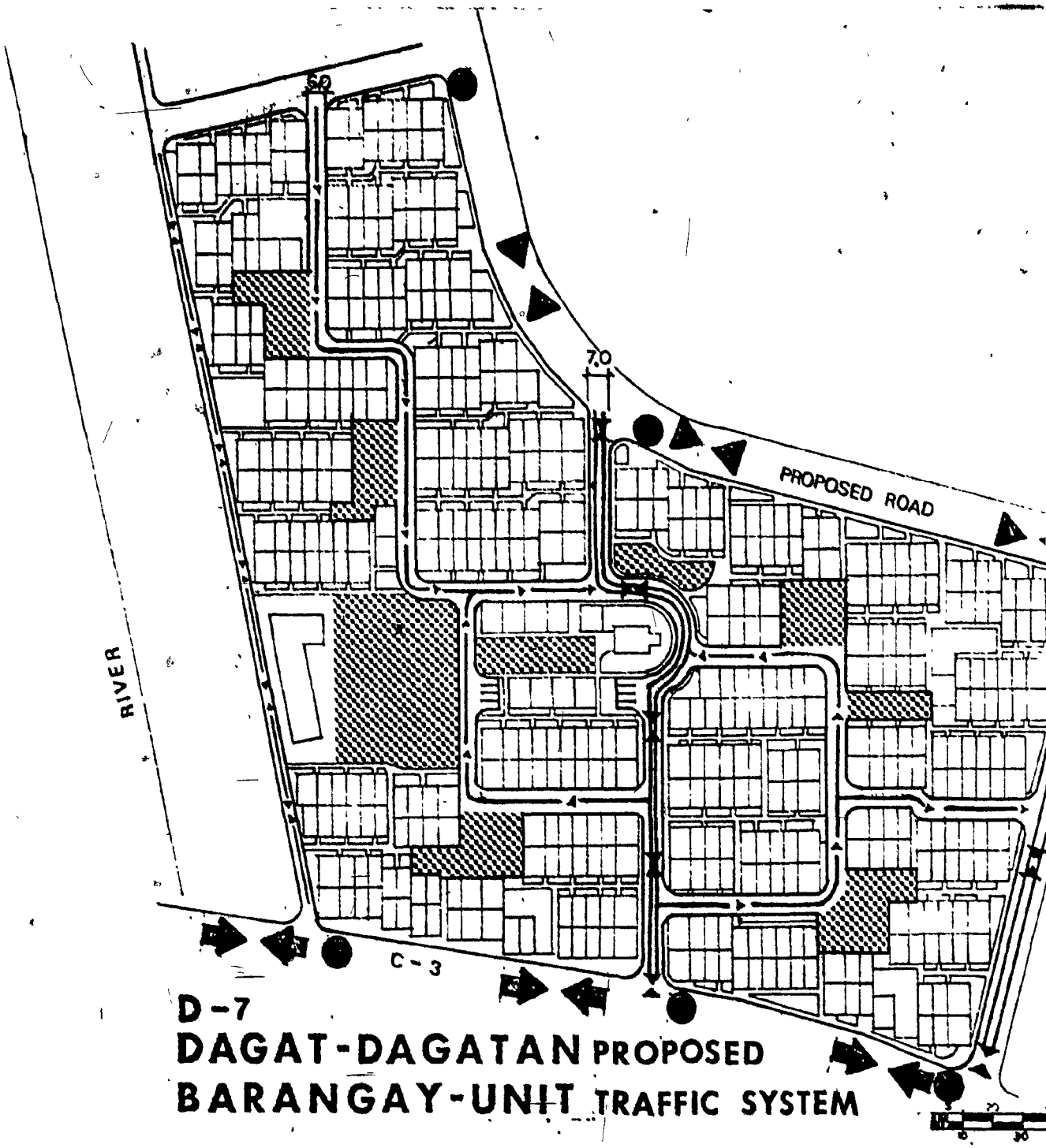
••••• Possible Shops & Stores

Illus. #66

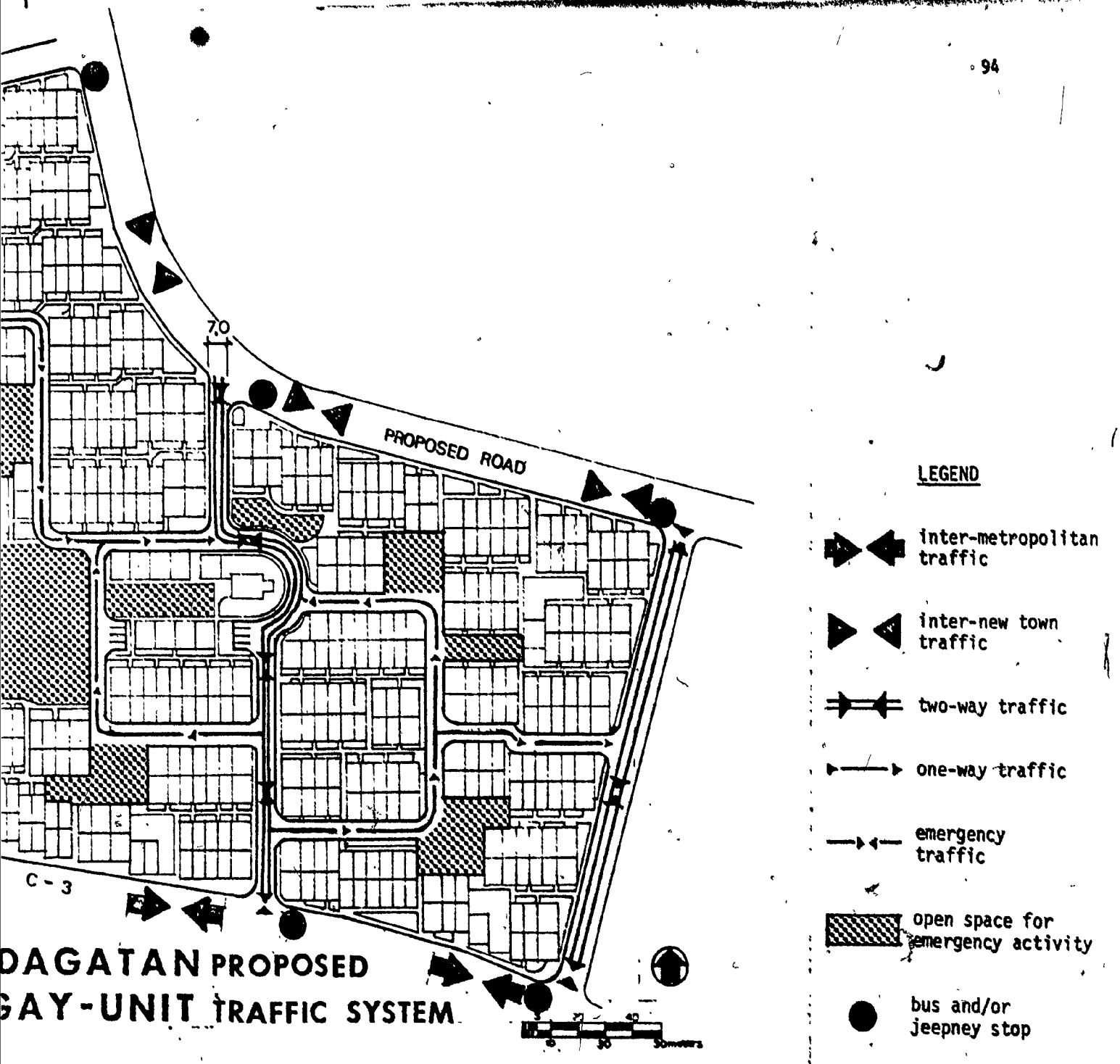
Since car ownership is very low, parking space (9) is limited. The two parking lots are provided for visitors to the Barangay Centre, the school, or for the Health Clinic's emergency use.

Shops and stores will be located along the vehicular roads as parts of the dwelling units (see Illus. # 66).

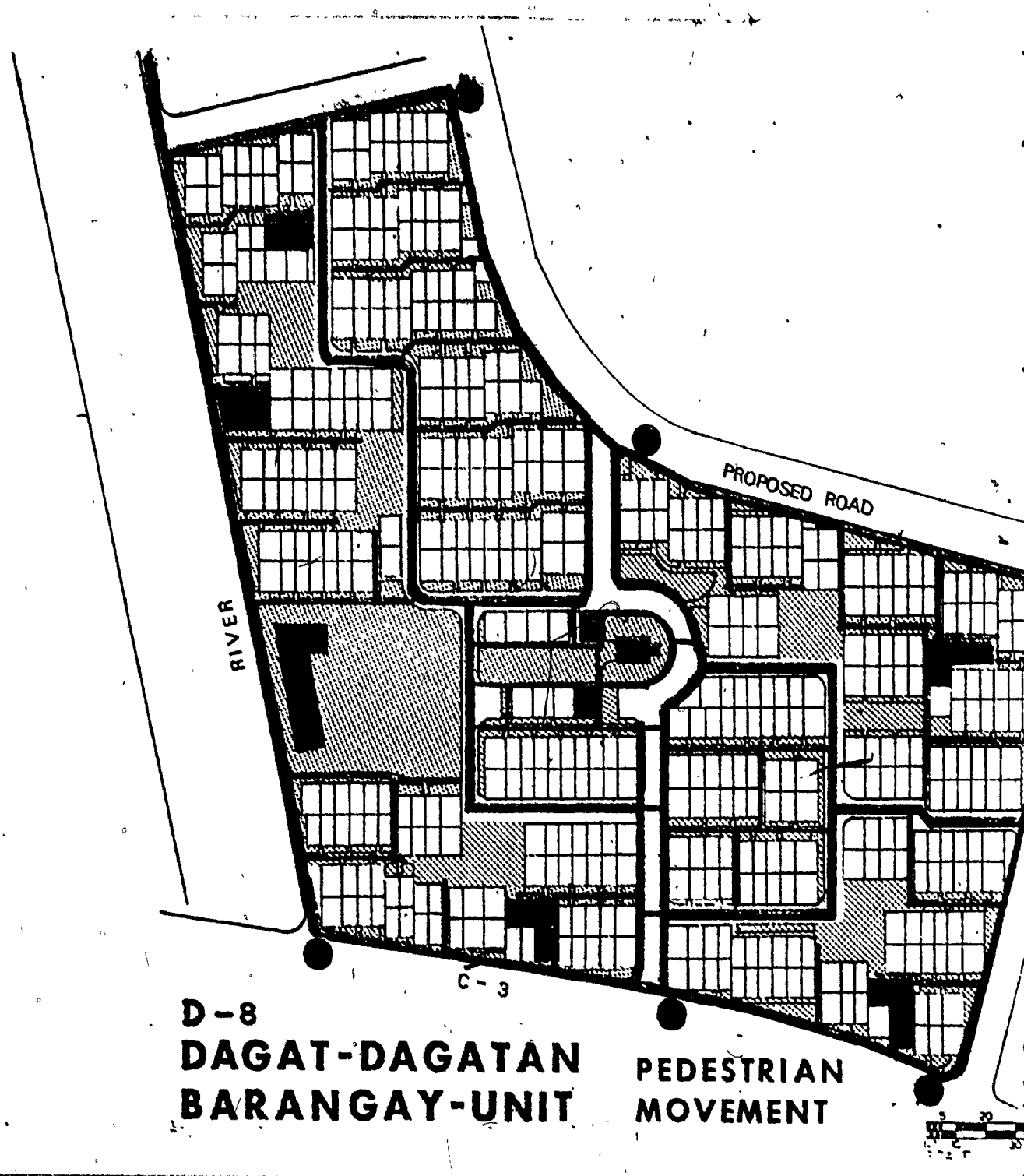
Typical neighbourhood facilities are shown in Illustration # 67. The centre of a neighbourhood unit is the basketball court



D-7
DAGAT-DAGATAN PROPOSED BARANGAY-UNIT TRAFFIC SYSTEM

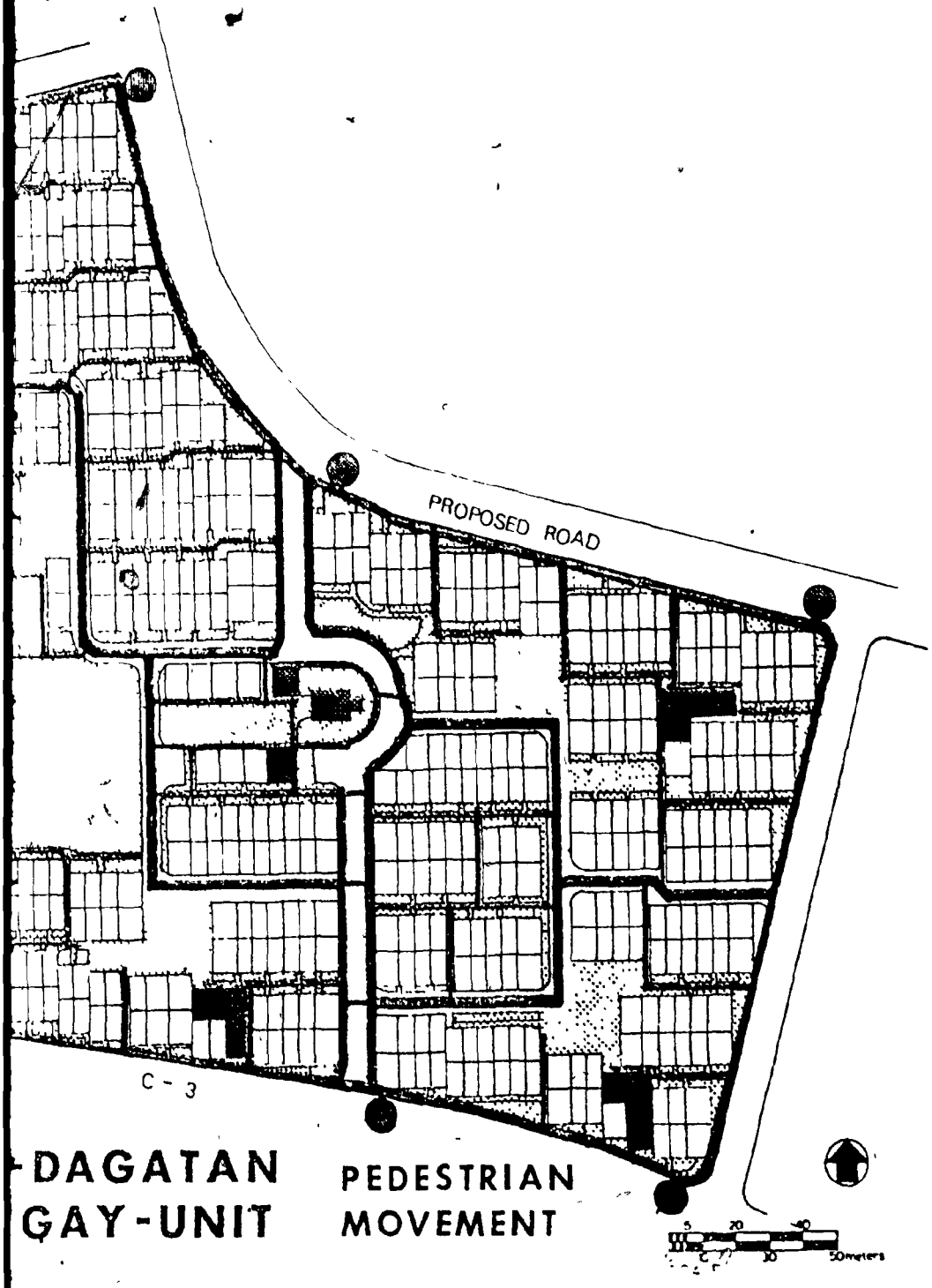


DAGATAN PROPOSED
GAY-UNIT TRAFFIC SYSTEM



D-8
DAGAT-DAGATAN BARANGAY-UNIT

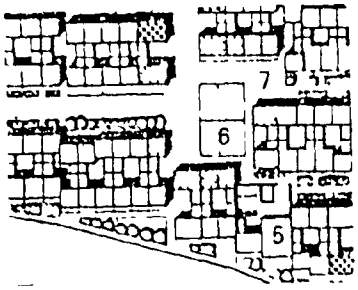
PEDESTRIAN MOVEMENT



LEGEND

- pedestrian path
- main pedestrian path
- green area and open space
- community facility
- bus and/or jeepney stop

2 of 2



Neighbourhood Facilities
Illus. #67

(playground) (6). The dwellings around the basketball courts may include sari-sari stores as shown. Open space is reserved for a temporary open market (7) near the playgrounds. Nursery Schools (5) are also located near the centre of the neighbourhood, but protected from older childrens' and adults' activities.

Circulation and Transportation (see Drawing D-7 and D-8)

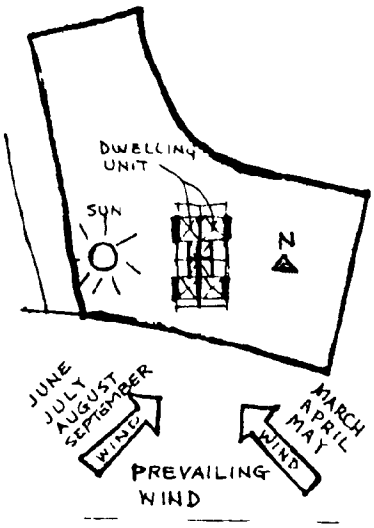
Only one two-way vehicular traffic road is proposed for access to the Barangay facilities from the two major traffic roads. The road is not designed to act as a by-pass between the two major roads. A semi-circular section at the Chapel will reduce traffic speed and serve to provide the impression of a cul-de-sac.

Pedestrian side-walks are provided at both sides of the two-way road for safety. One-way vehicular access is made possible from the south end of the Barangay. This road passes through neighbourhoods (1) and (2) to the two-way road. Two other one-way routes are proposed; one to pass through neighbourhood (3), and another to pass through neighbourhoods (4) and (5).

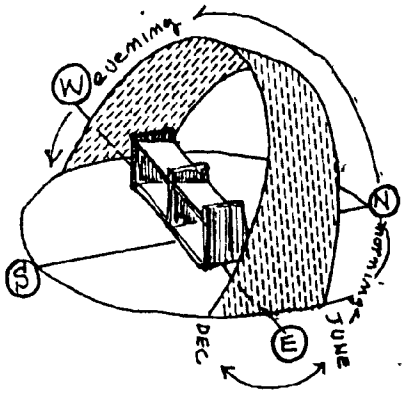
These one-way roads will be used for local deliveries, and for shipping of merchandise to or from the stores and shops along the roads.

From the author's observation of the present Tondo Foreshore Community, small stores (including the sari-sari stores) and

workshops do not require delivery and shipping services by cars. Therefore, these one-way vehicular roads will have limited vehicular traffic, and will be used predominantly by pedestrians. Besides the vehicular roads, many pedestrian path-ways inter-connect groups of dwelling units as mentioned earlier.



Illus. #68



Sun's Path

Illus. #69

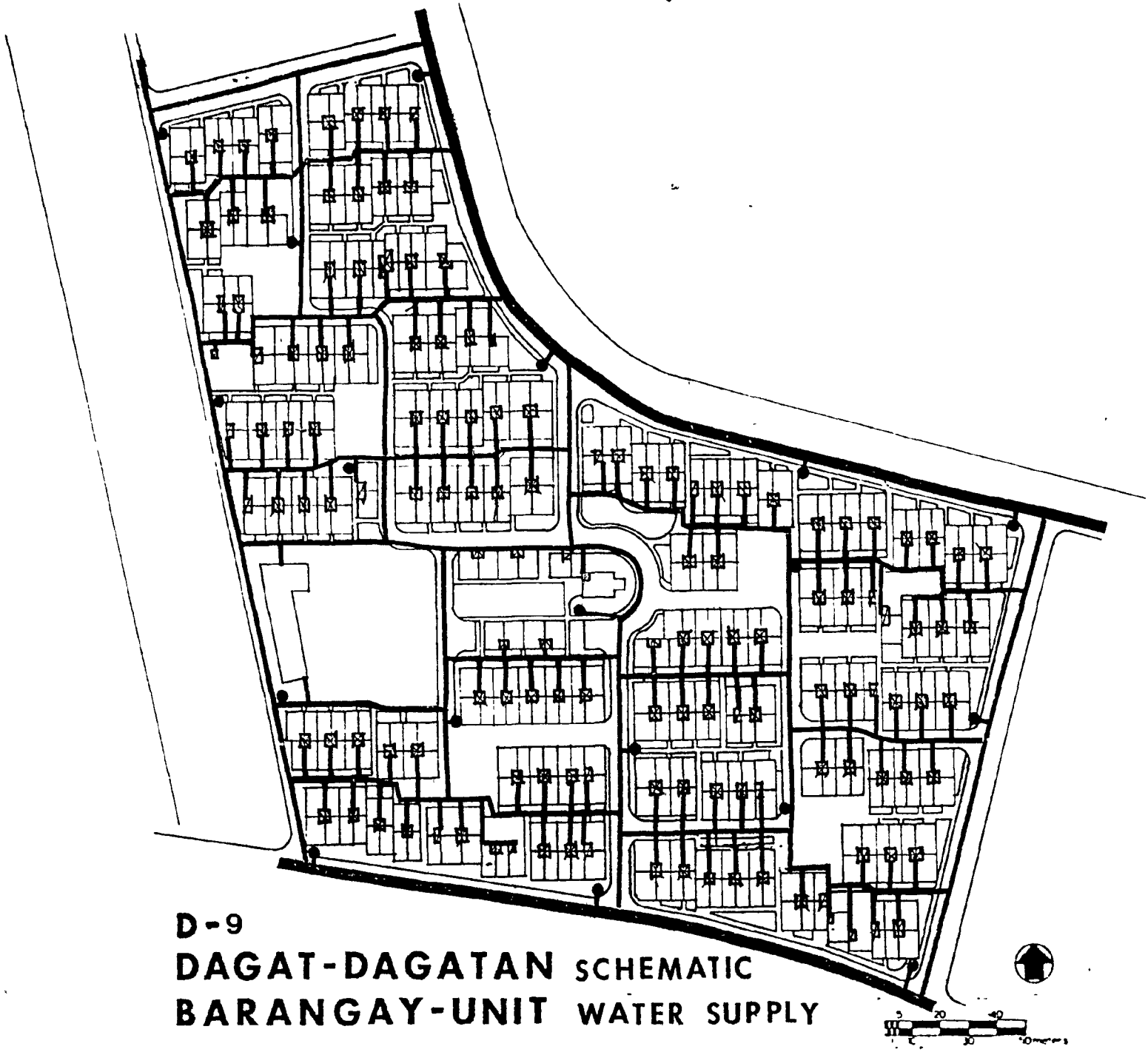
The public transportation system is not designed to enter the Barangay. Proposed bus and/or jeepney stops on the perimeters are indicated on Drawing D-7.

Protection/Security (see Drawing D-7)

All vehicular roads are used for police protection, fire-fighting and other emergency activities. The road along the river, for pedestrian use primarily, may be open for emergency use, if necessary. The playgrounds of neighbourhood units may also be used in case of emergency. The proposed locations of fire hydrants are shown on Drawing D-9.

Climatic Considerations (see Illus. #68 and #69)

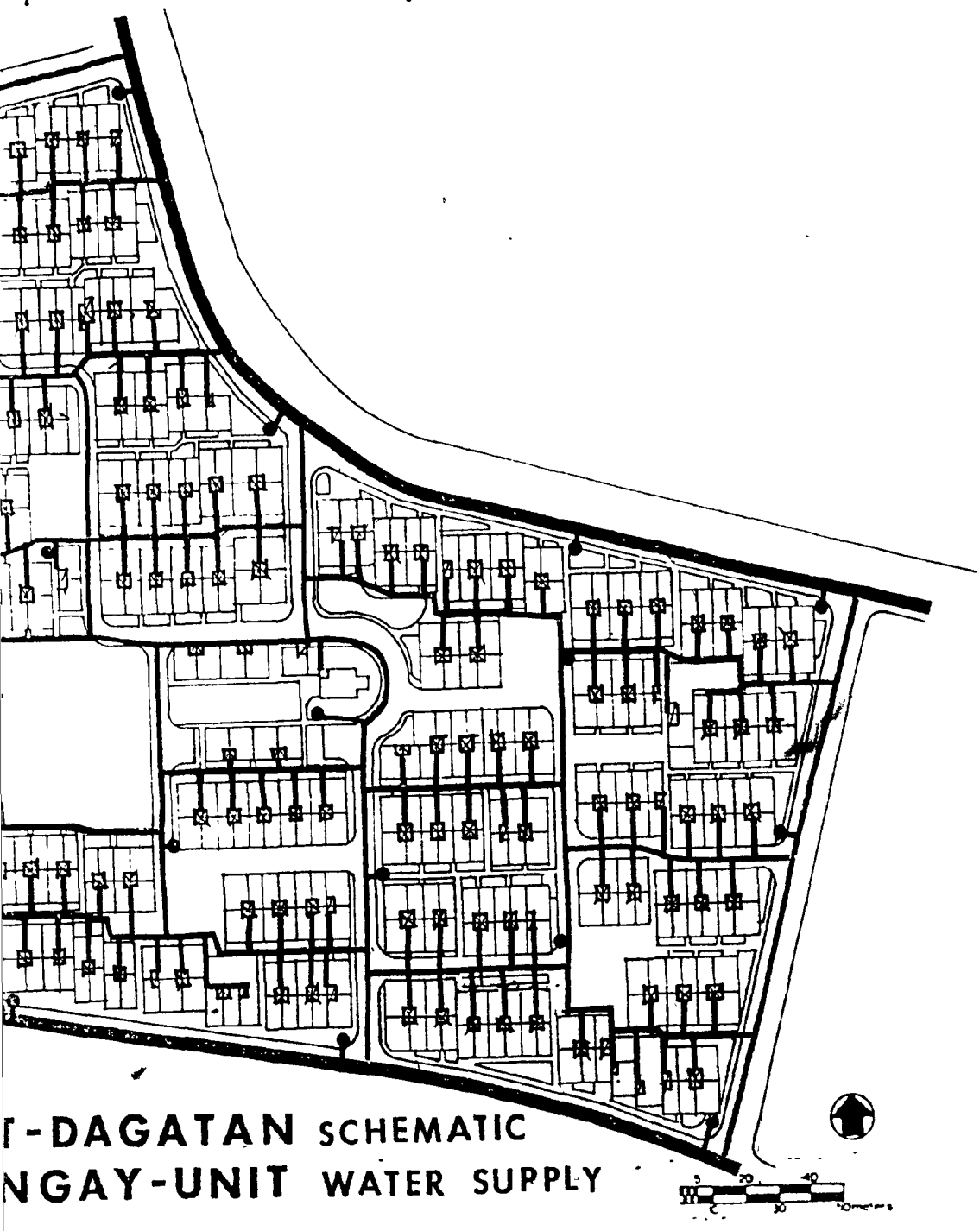
All the dwelling units are oriented on a south to north axis. This orientation considers prevailing wind directions and prevention of direct sunlight into dwelling units. The prevailing wind during March, April and May (the summer and dry seasons) is from the southeast. June through September is the rainy season in which the mean daily temperature is above 26 C; 37.6 C may be registered during a southwesterly



D-9

DAGAT-DAGATAN SCHEMATIC

BARANGAY-UNIT WATER SUPPLY

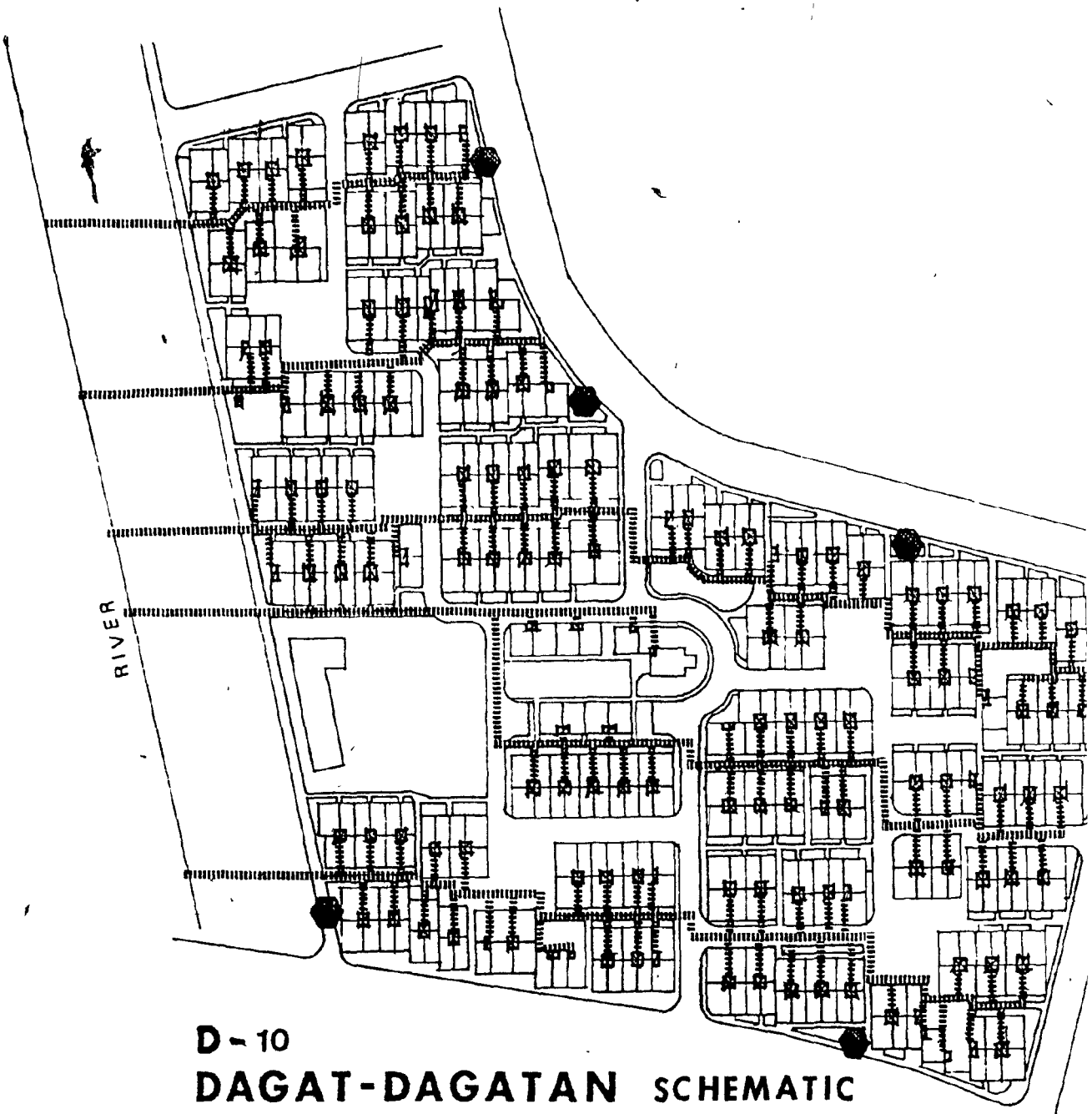


LEGEND

- water line (main)
- water line
- (4) - core units
- fire hydrant

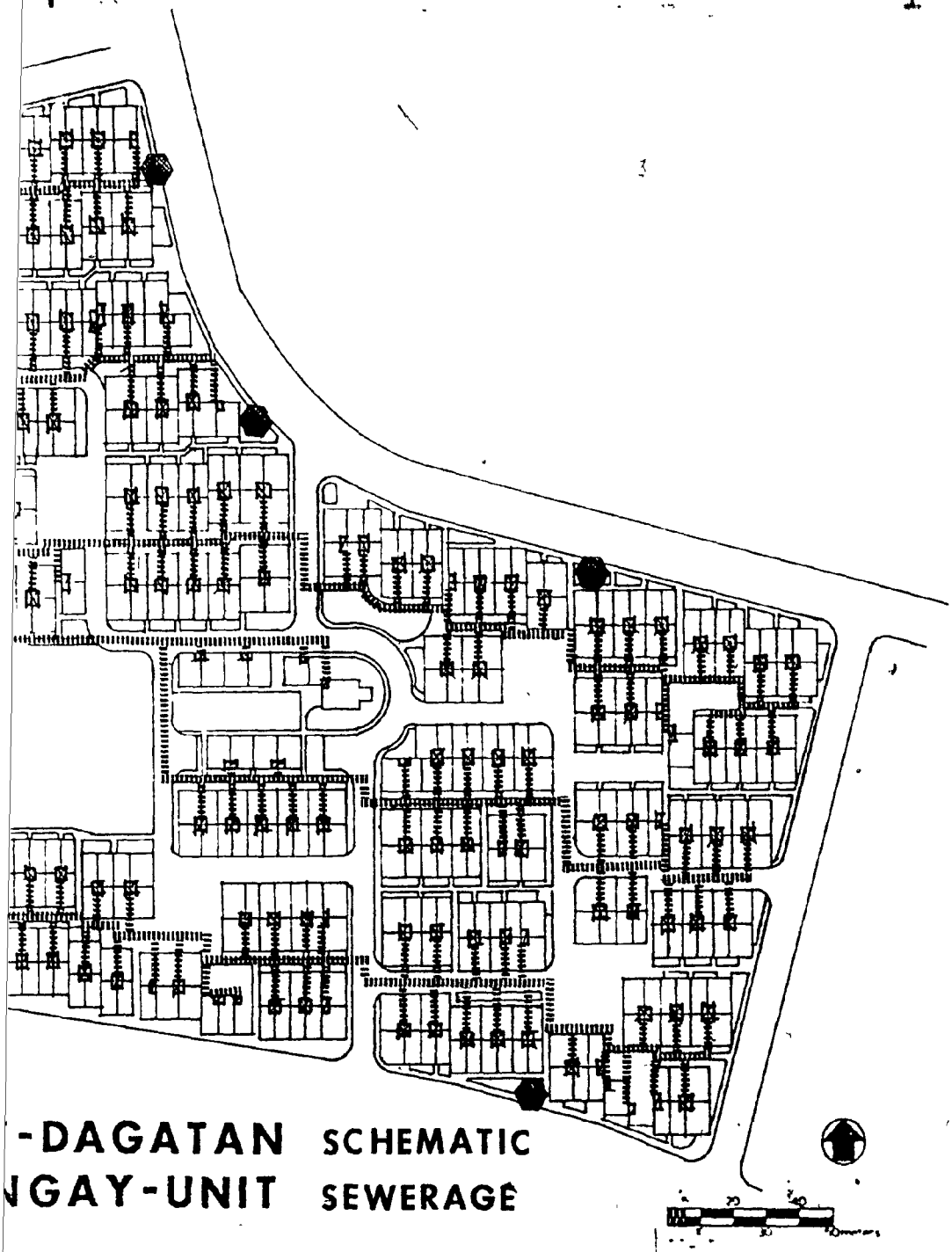
T-DAGATAN SCHEMATIC
NGAY-UNIT WATER SUPPLY

2 of 2



D-10

DAGAT-DAGATAN SCHEMATIC BARANGAY-UNIT SEWERAGE



-DAGATAN SCHEMATIC
NGAY-UNIT SEWERAGE

LEGEND

sewerage line

garbage collection center

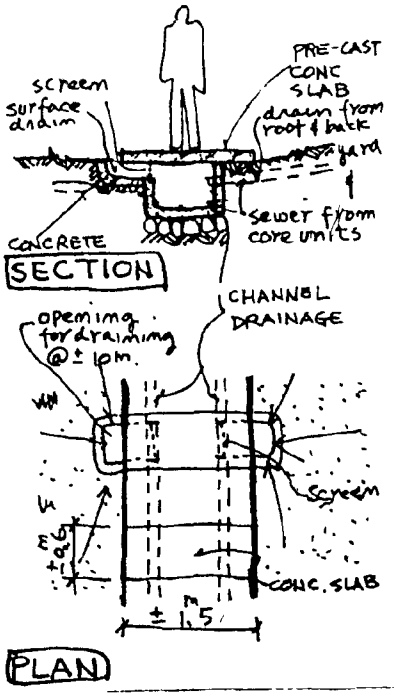
2 of 2

wind. (See Appendix for climatic information).

Utilities (see Drawings D-9 and D-10)

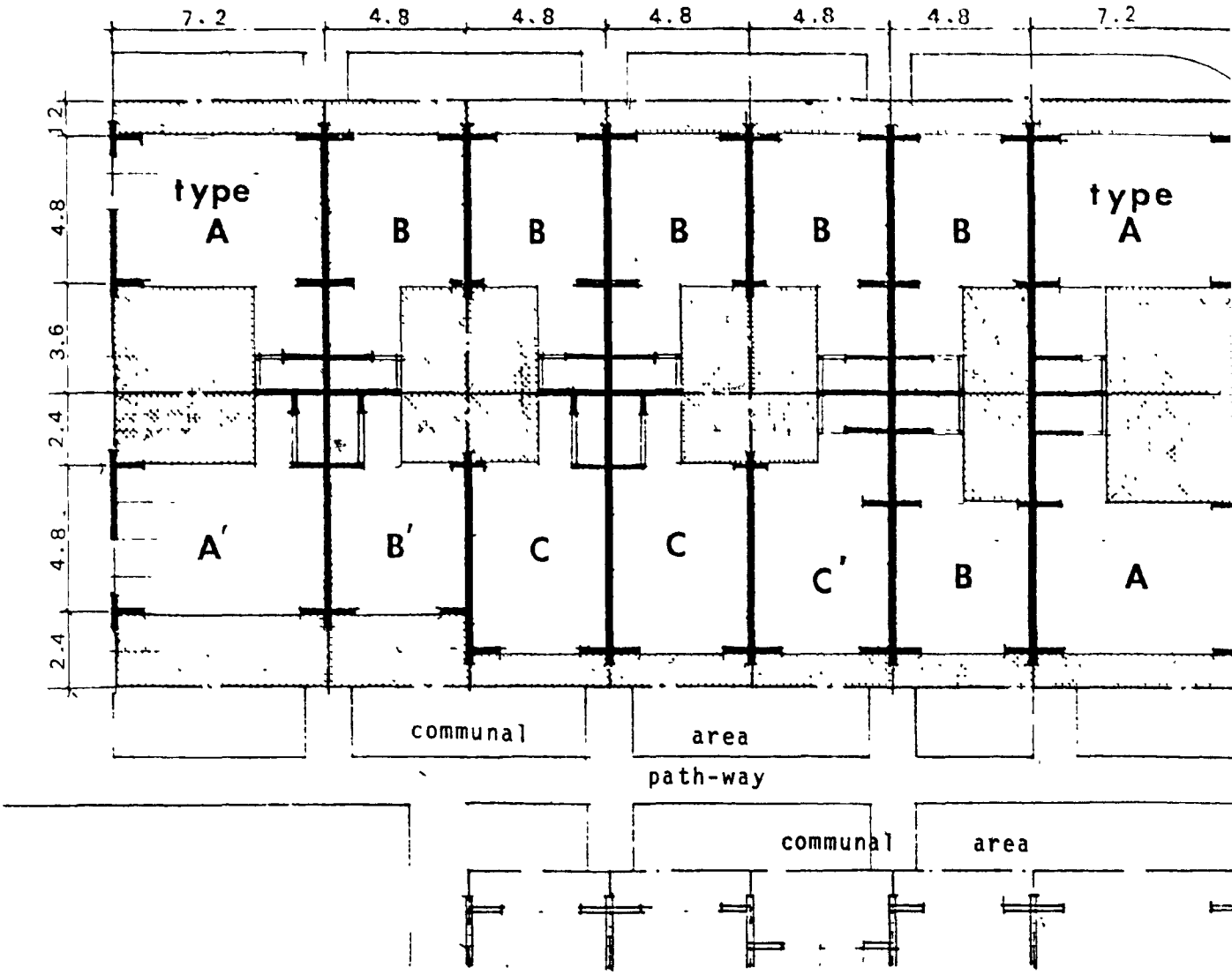
Waterlines run under each alternate pathway and branch to each utility core serving four houses as shown on Drawing D-9.

Branch sewer lines are provided from each septic tank to a trunk sewer, installed under the pathways, and thence to the river as shown on the drawing.



Drainage & Path
Illus. #70

Typhoons (occuring more than ten times a year) and heavy rains cause flooding in the Manila area. A proper storm drainage system is essential to control flooding. The proposed drainage system is combined with a pedestrian pathway. (see Illus. # 70). Channel-shaped baked clay tile sections will be placed in the ground to form drains. Precast concrete slabs will be placed on top of the drainage channel. The precast slabs form the pathway as well as a covering for the drain. The core unit drain will discharge into the channel drain. Cleaning and maintenance of the drain will be easy as access is provided through each cover station. This drainage system will lead to the river. In the future, when the government provides a sanitary sewerage system and disposal unit, the sanitary piping can be laid within the channel drain sections and the channel itself may still be used for storm drainage. When the sewerage system is installed, toilets in the core system will be connected to the sanitary piping.

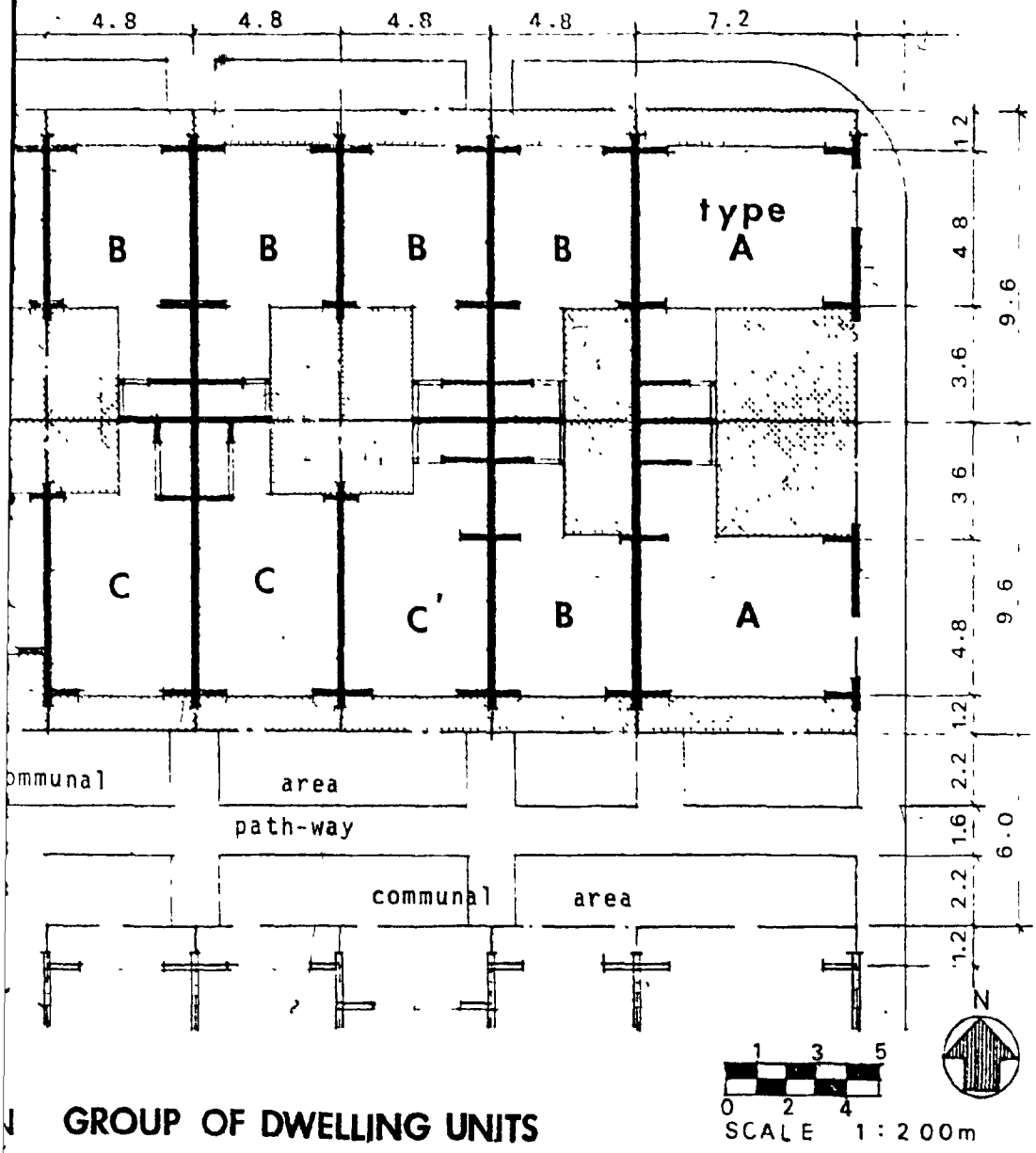


D - 11

DAGAT - DAGATAN GROUP OF DWELLING UNITS

PROPOSED PROTOTYPE HOUSING BUILDING TYPES

1 3
0 2
SCALE



PLOT AND FLOOR AREA		
type	plot area	ground FL. area
A	69.12 m²	43.20 m²
A'	69.12	40.32
B	46.08	31.68
B'	46.08	28.80
C C'	46.08	34.56

LEGEND

property line

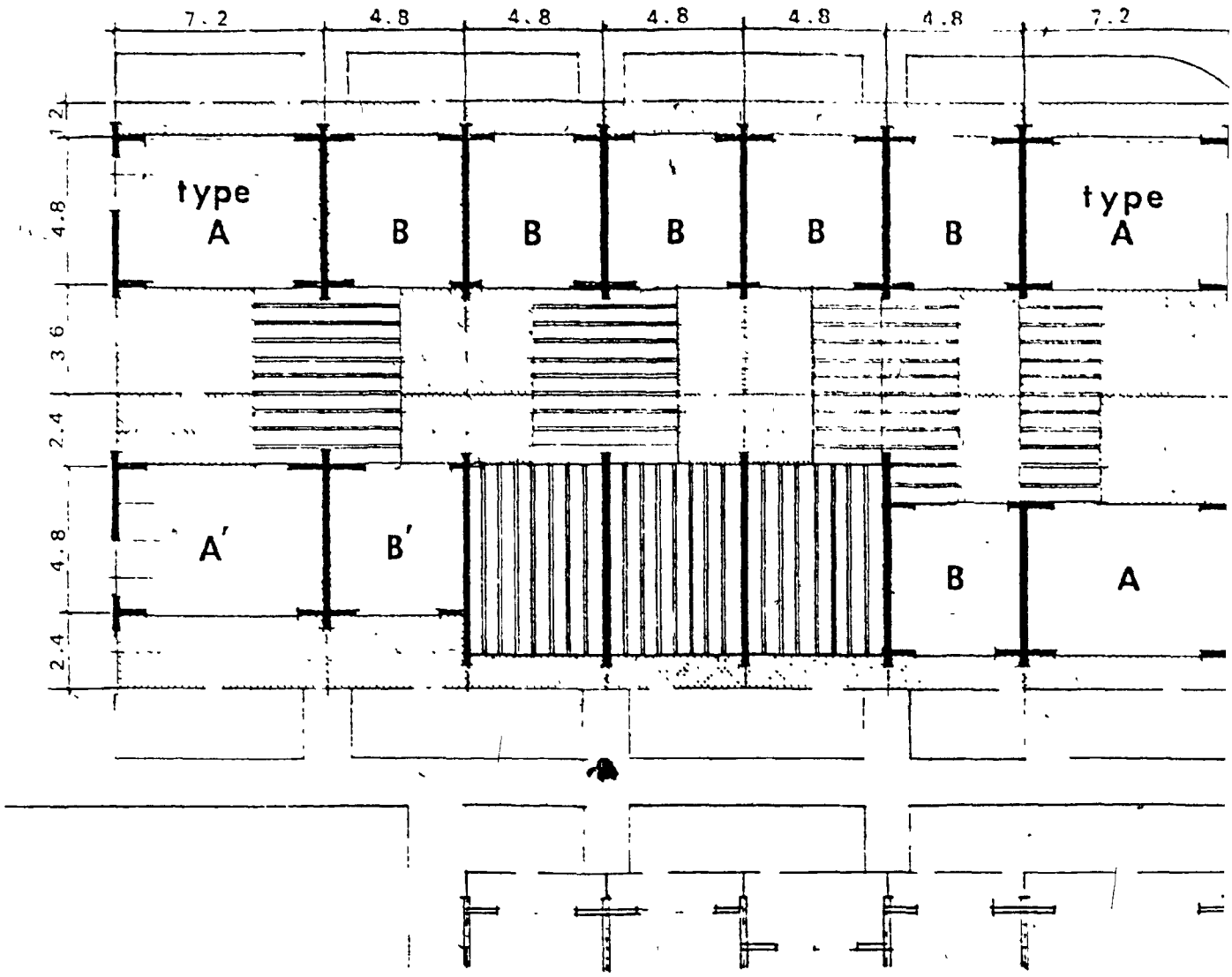
masonry walls between units

front and back yards

GROUP OF DWELLING UNITS

YPE HOUSING BUILDING TYPES

GROUND FLOOR PLAN

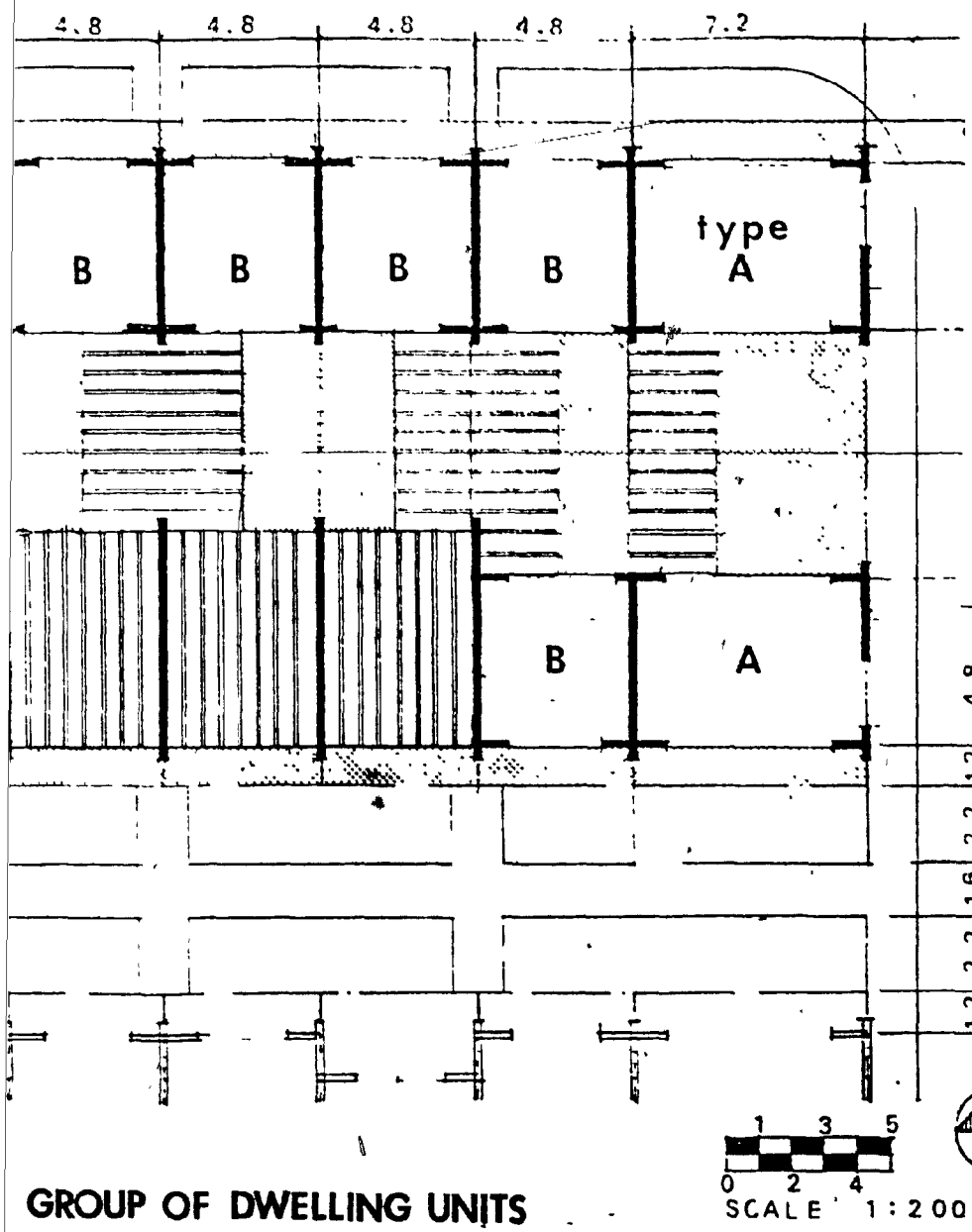


D-12

DAGAT - DAGATAN **GROUP OF DWELLING UNITS**

PROPOSED PROTOTYPE HOUSING BUILDING TYPES

0 1 2 3 4
SCALE



102

FLOOR AREA			
type	Gnd FL. area	2nd FL. area	total FL. area
	m^2	m^2	m^2
A	43.20	34.56	77.76
A'	40.32	34.56	74.88
B	31.68	23.04	54.72
B'	28.80	23.04	51.84
C C'	34.56		34.56

LEGEND

- property line
- masonry walls between units
- front and back yards
- roof of ground floor

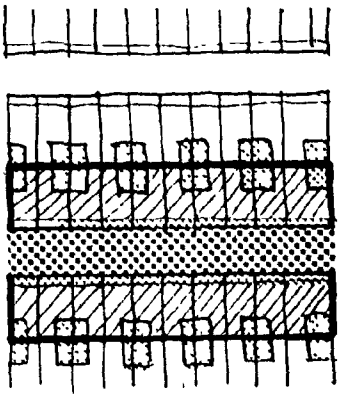
GROUP OF DWELLING UNITS

PE HOUSING BUILDING TYPES

SECOND FLOOR PLAN

2 of 2

The garbage collection centres are proposed to be placed along the major road (C-3) and the proposed inter-town road as shown on drawing D-10. One or two persons in a neighbourhood may be appointed on a part-time basis to collect the garbage from each house and deposit it in the collection centre. They would be responsible for the maintenance and cleanliness of the collection centre. Waste paper and other recycleable waste may be salvaged and sold by the collectors.



Communal Space & Pathway

Front & Backyards

Group of Dwelling Units

Illus. #71

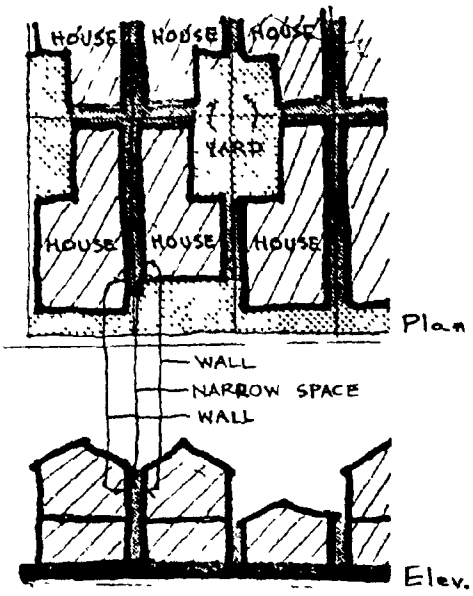
Group of Dwelling Units (see Illus. #71 and drawings D-11, D-12)

Approximately 20 dwelling plots are grouped longitudinally along a 6 meter wide open space. This space acts as a communal area for the group of families as well as a pathway. The use of the communal space may reveal interesting characteristics of the people. For instance, the area in front of stores may be partially or completely paved for the convenience of the shoppers; one part of the space may be planted with trees and flowers; another part may become a children's playground; one space may have a bench for housewives to sit and chat and to do such common tasks as preparing vegetables or knitting; spaces may become temporary extended workshops or even a temporary casino. The provision of this space allows family groups to create their own intimate communal place.

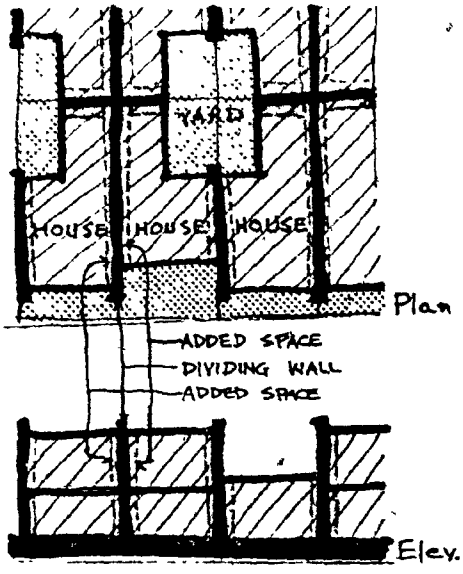
Groups of plots are also arranged back to back, and this arrangement tends to create neighbourliness among the residents.

Bingo Game on the Pathway

Illus. # 72



Single Detached House



Row Houses

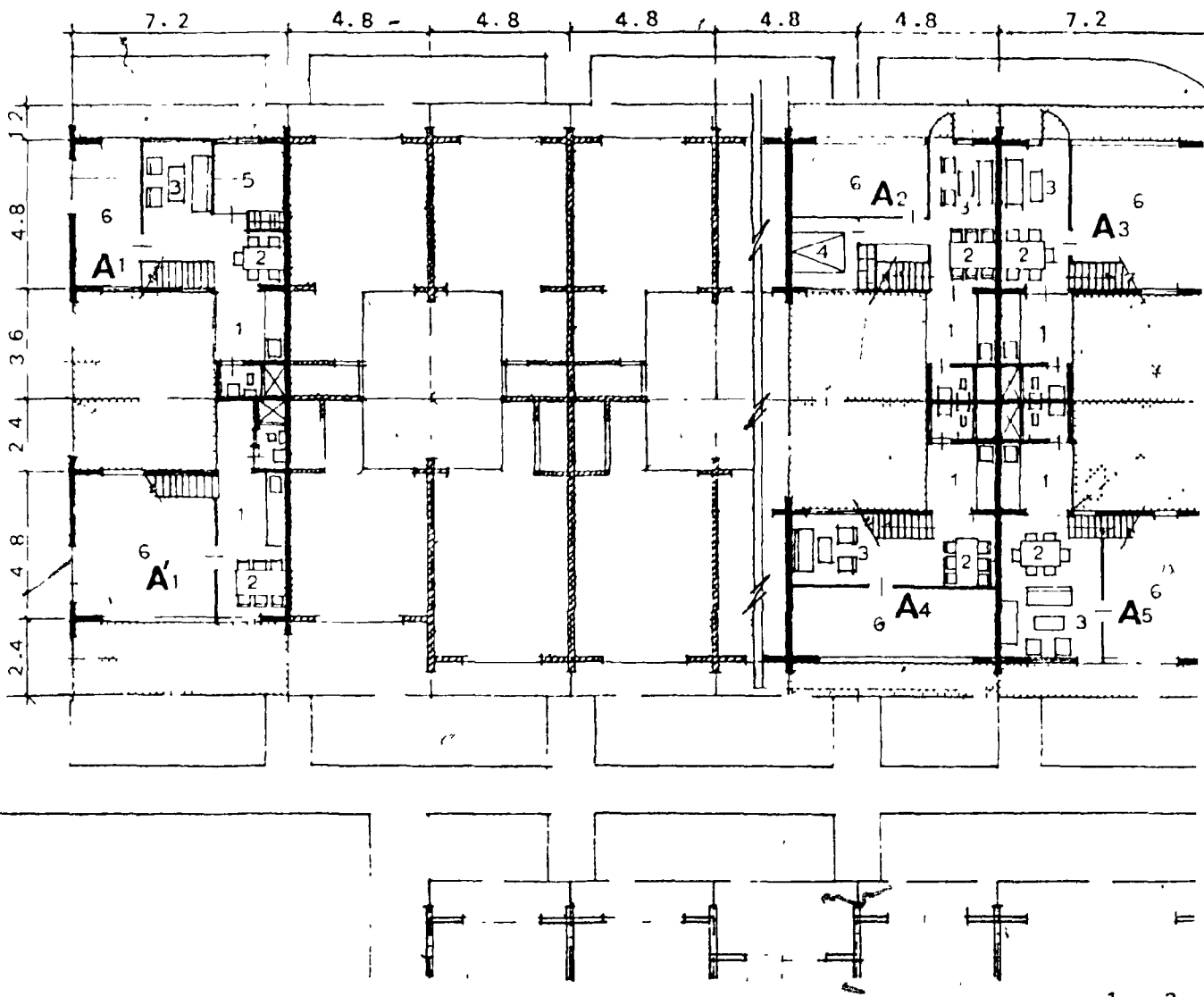
Illus. #73

3. Housing Units

Row Houses

With a density of 100 units per hectare, the size of each plot is therefore limited. (See drawing D-6 for sizes of plots). In such a small plot, the most efficient and economic space use must be employed.

The majority of people prefer to live in single detached houses. Usually the detached house is, of necessity, built very close to the lot lines, thereby leaving small unuseable areas between the houses. It also implies "double" wall construction

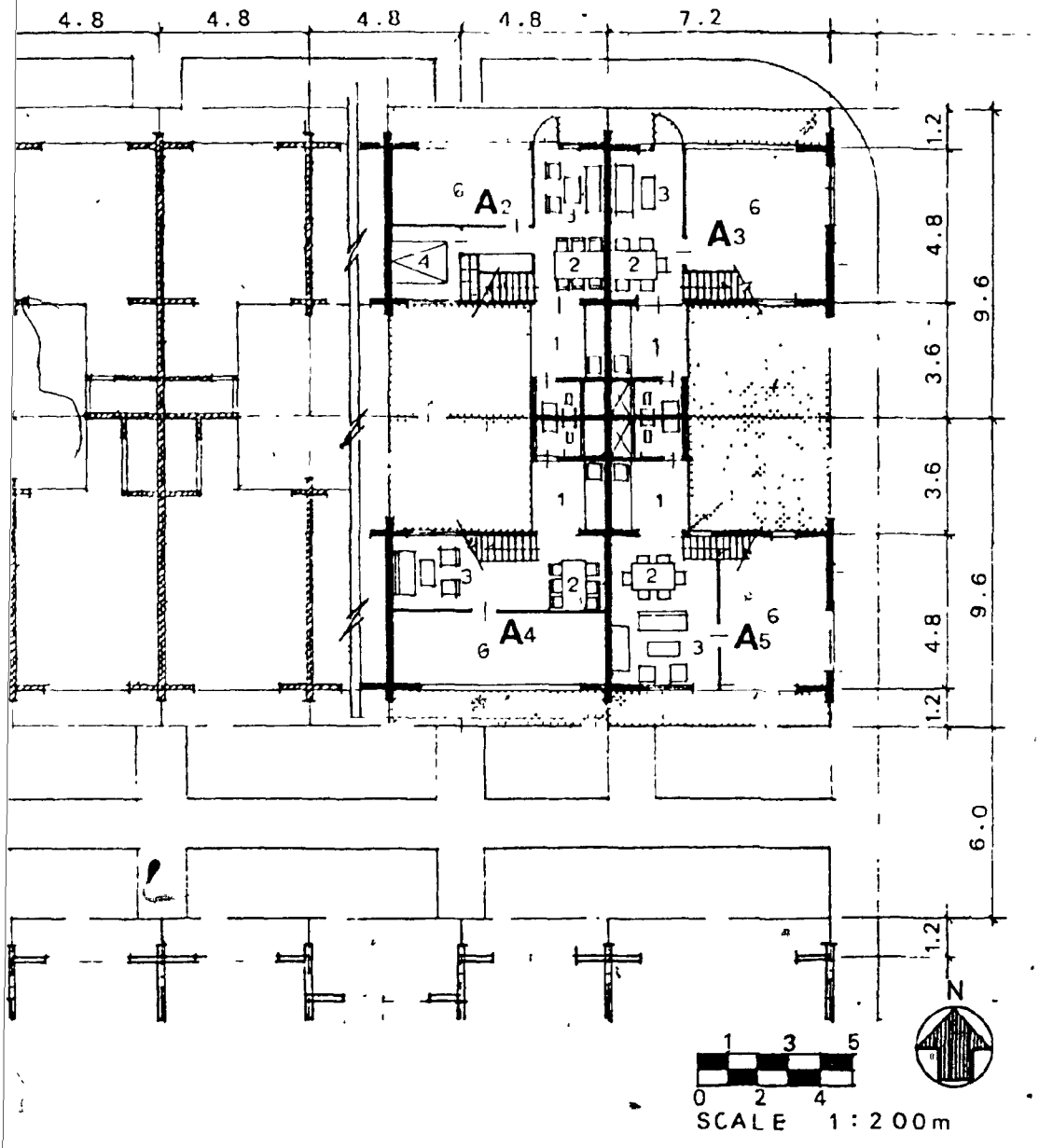


D - 13

DAGAT - DAGATAN

SCALE 1 0 2 3

PROPOSED PROTOTYPE HOUSING TYPE 'A' ALTERNATIVE

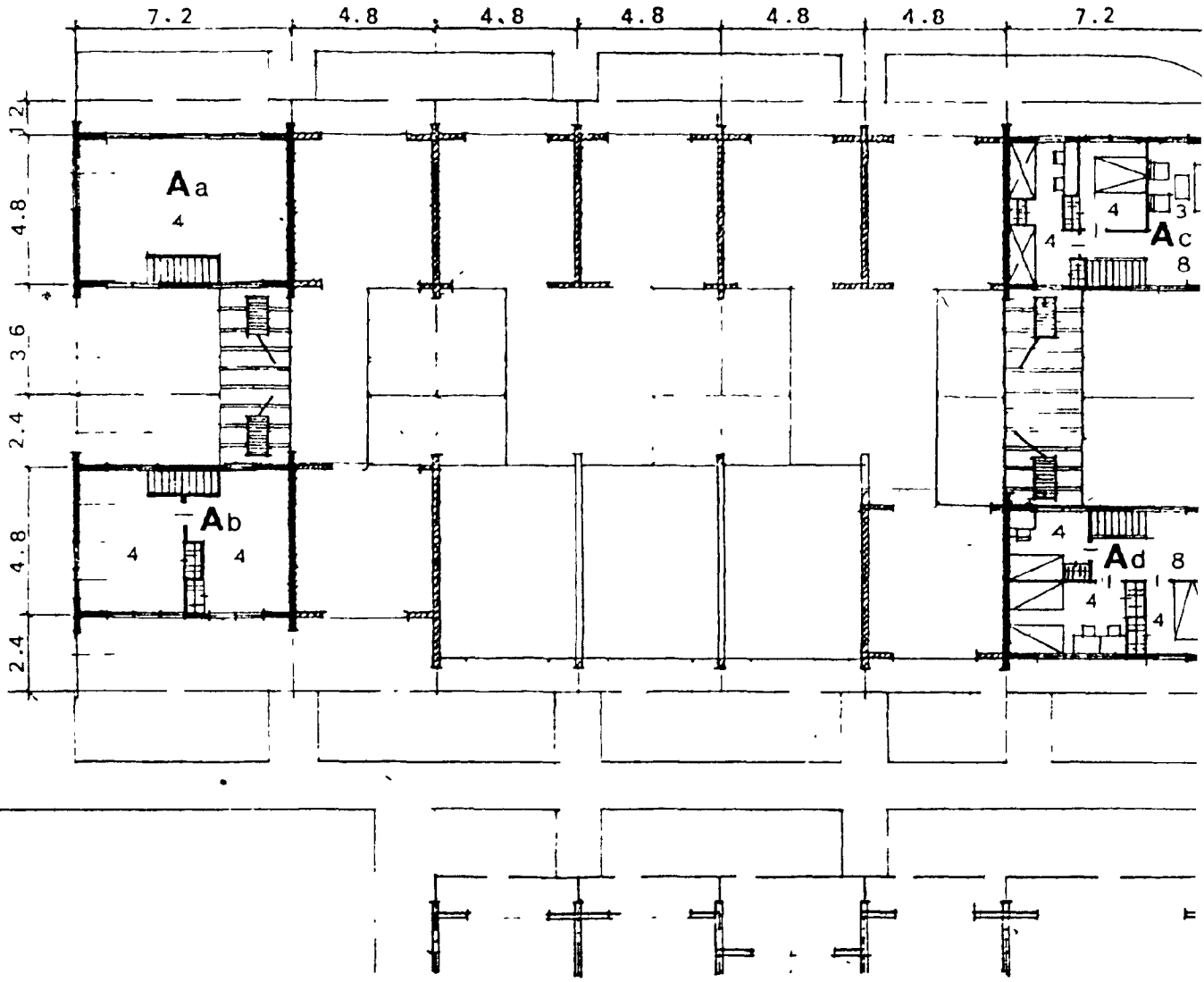


LEGEND

1. kitchen
2. dining room
3. living room
4. bed room
5. bed room with wood floor
6. work-shop or (sari-sari) store
7. covered open space
8. hall

PE HOUSING TYPE 'A' ALTERNATIVE PLANS GROUND FLOOR

2 of 2



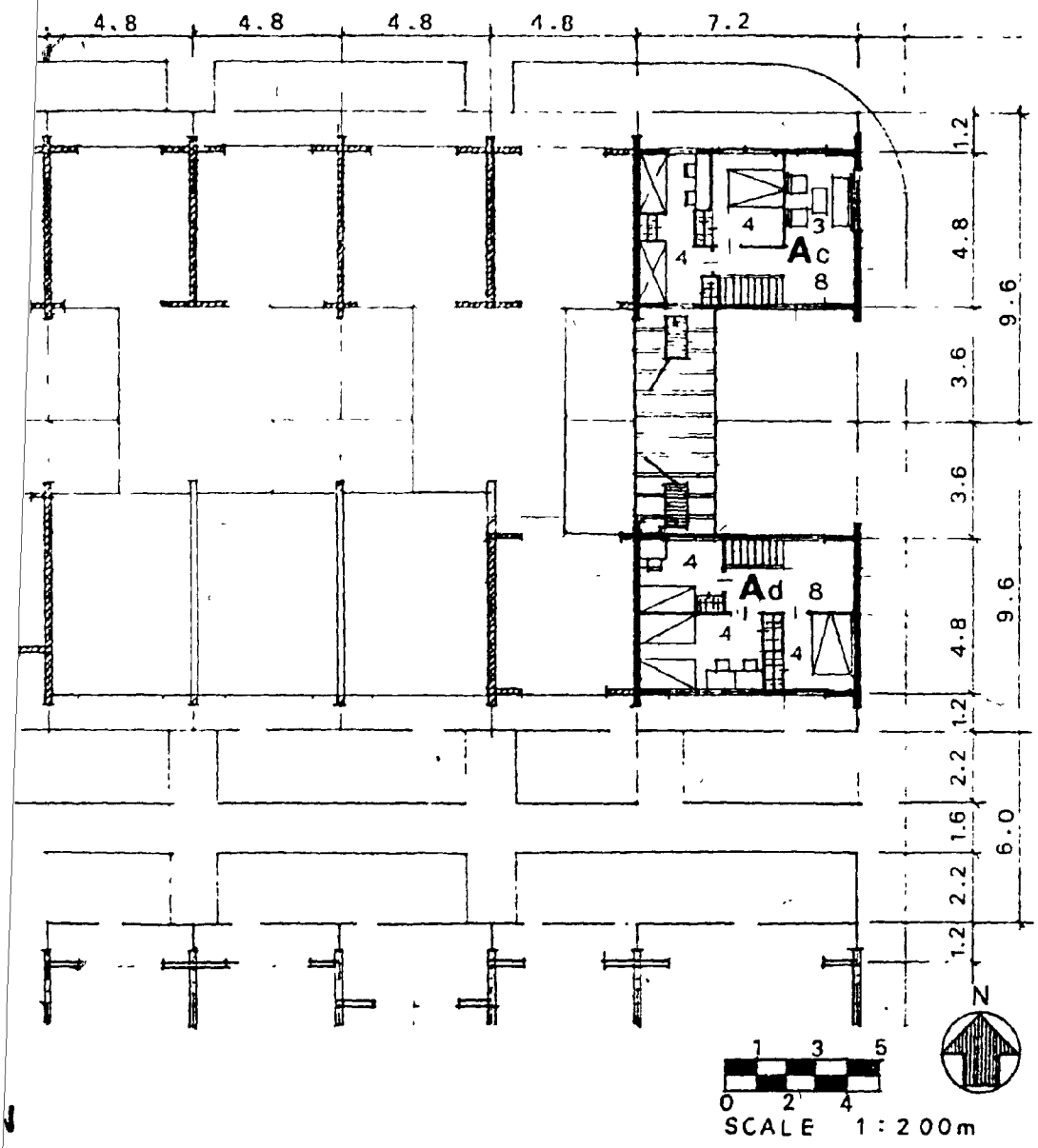
D- 14

DAGAT - DAGATAN

PROPOSED PROTOTYPE HOUSING TYPE 'A' ALTERNATIV

1 3
0 2
SCALE

V.bf



SECOND FLOOR OPTIONS

A_a - A_d

for any type of

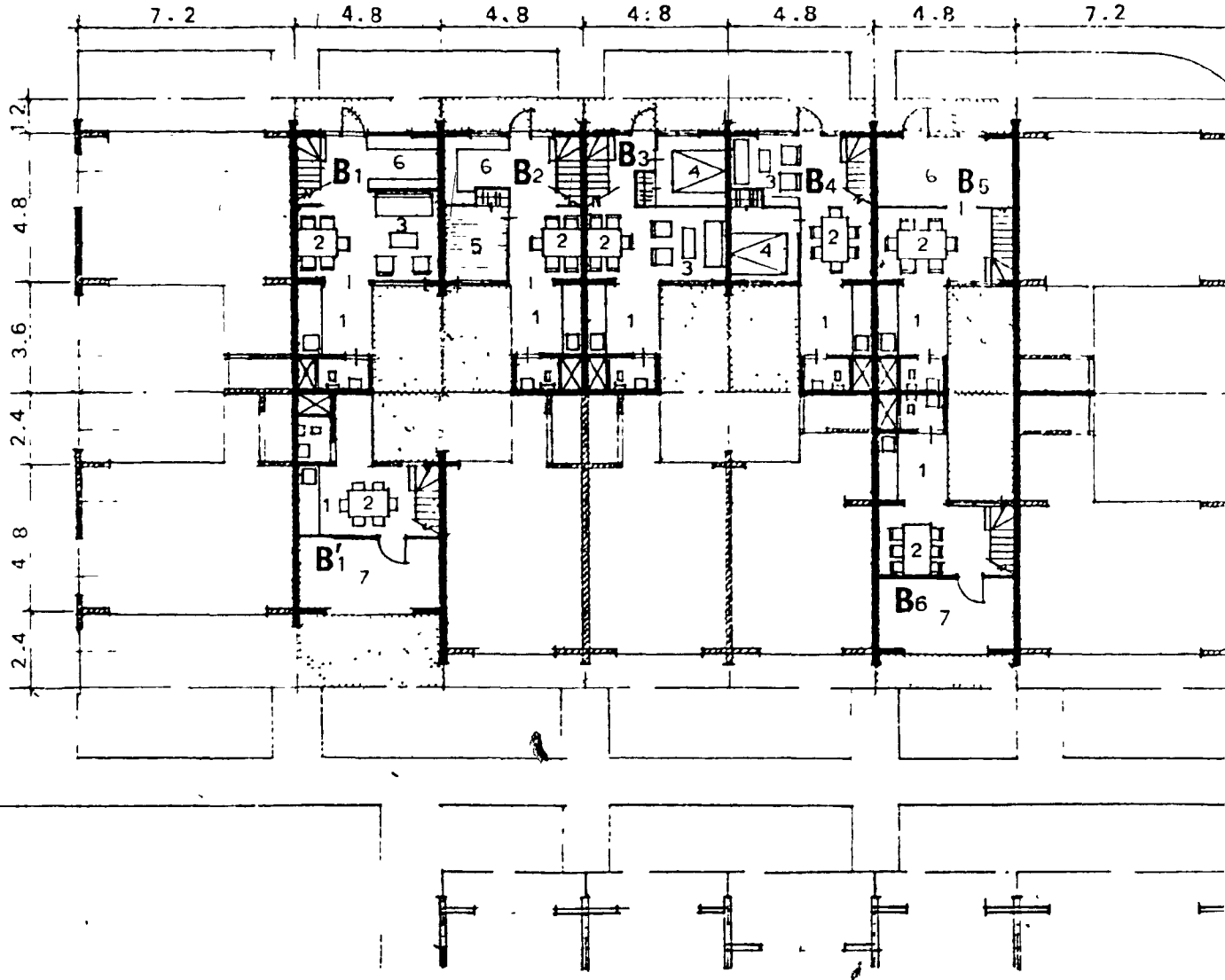
A_1 - A_5 ; A'_1

LEGEND

1. kitchen
2. dining room
3. living room
4. bed room
5. bed room with wood floor
6. work-shop or (sari-sari) store
7. covered open space
8. hall

YPE HOUSING TYPE 'A' ALTERNATIVE PLANS : SECOND FLOOR

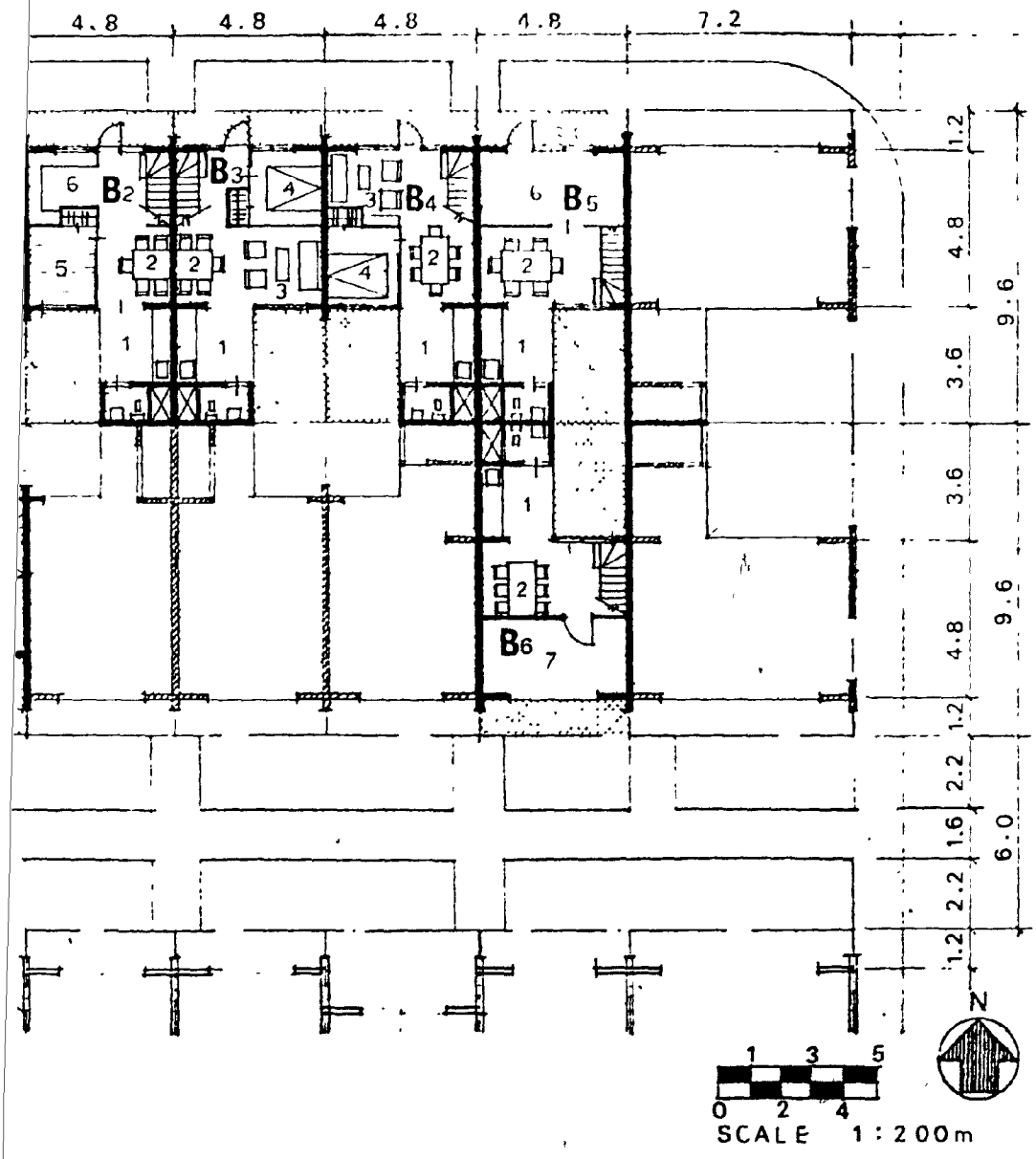
2 of 2



D-15

DAGAT - DAGATAN

PROPOSED PROTOTYPE HOUSING TYPE 'B' ALTERNATIVE



SECOND FLOOR OPTIONS

B_a - B_g

for any type of

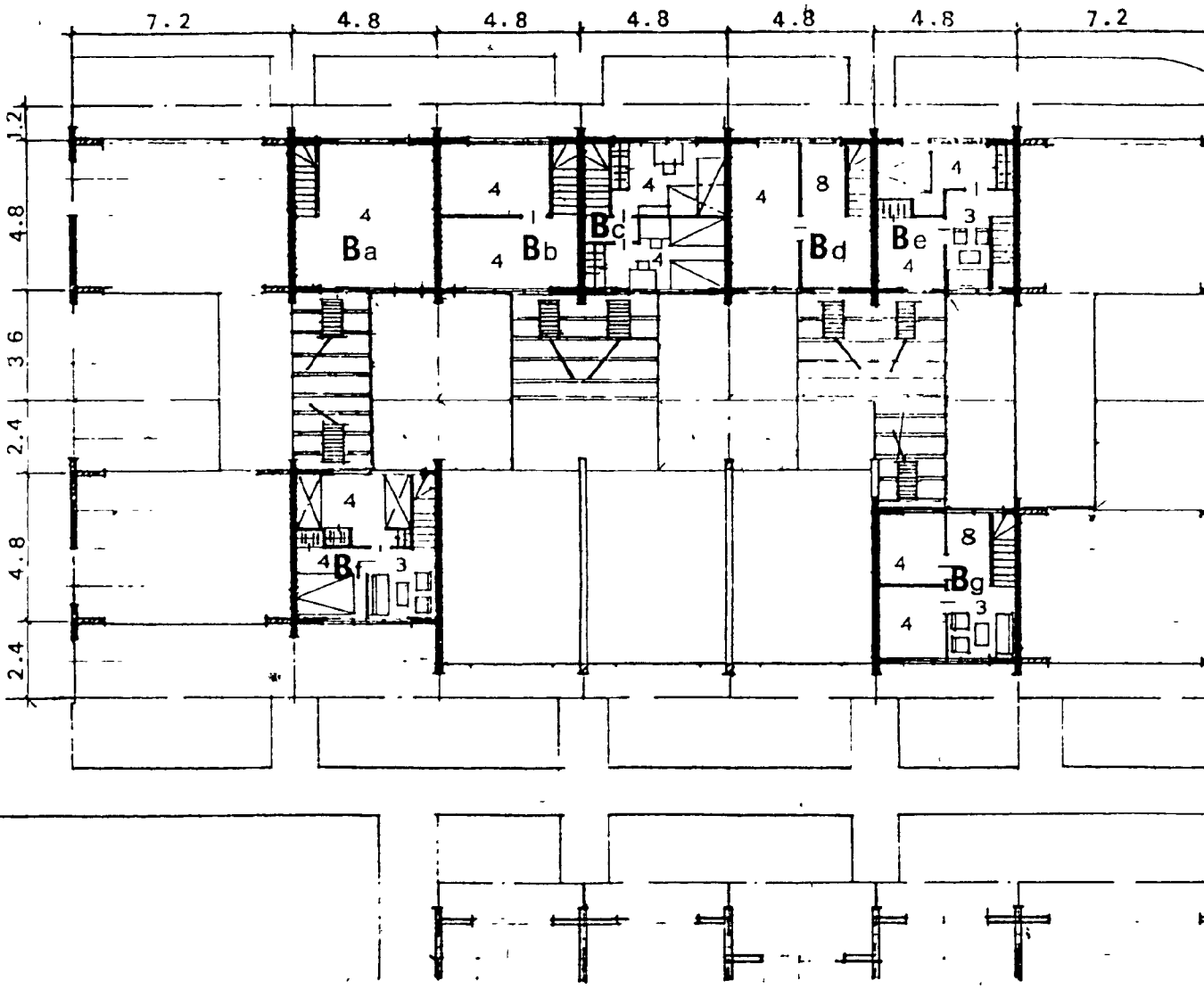
B_1 - B_6 ; B'_1

LEGEND

1. kitchen
2. dining room
3. living room
4. bed room
5. bed room with wood floor
6. work-shop or (sari-sari) store
7. covered open space
8. hall

YPE HOUSING TYPE 'B' ALTERNATIVE PLANS GROUND FLOOR

2 of 2

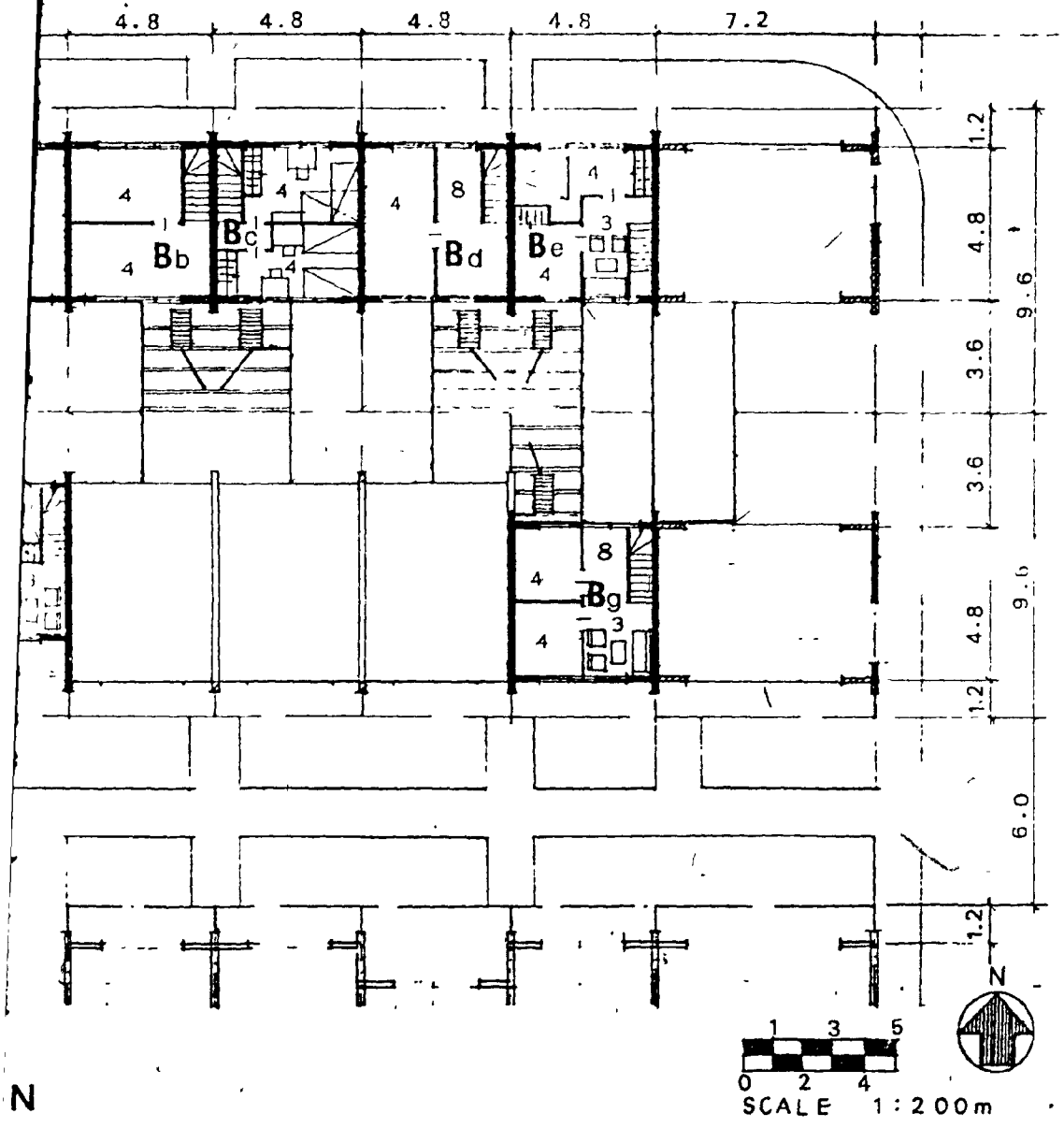


D-16

DAGAT-DAGATAN

1 3
0 2
SCALE

PROPOSED PROTOTYPE HOUSING . TYPE 'B' ALTERNATIV



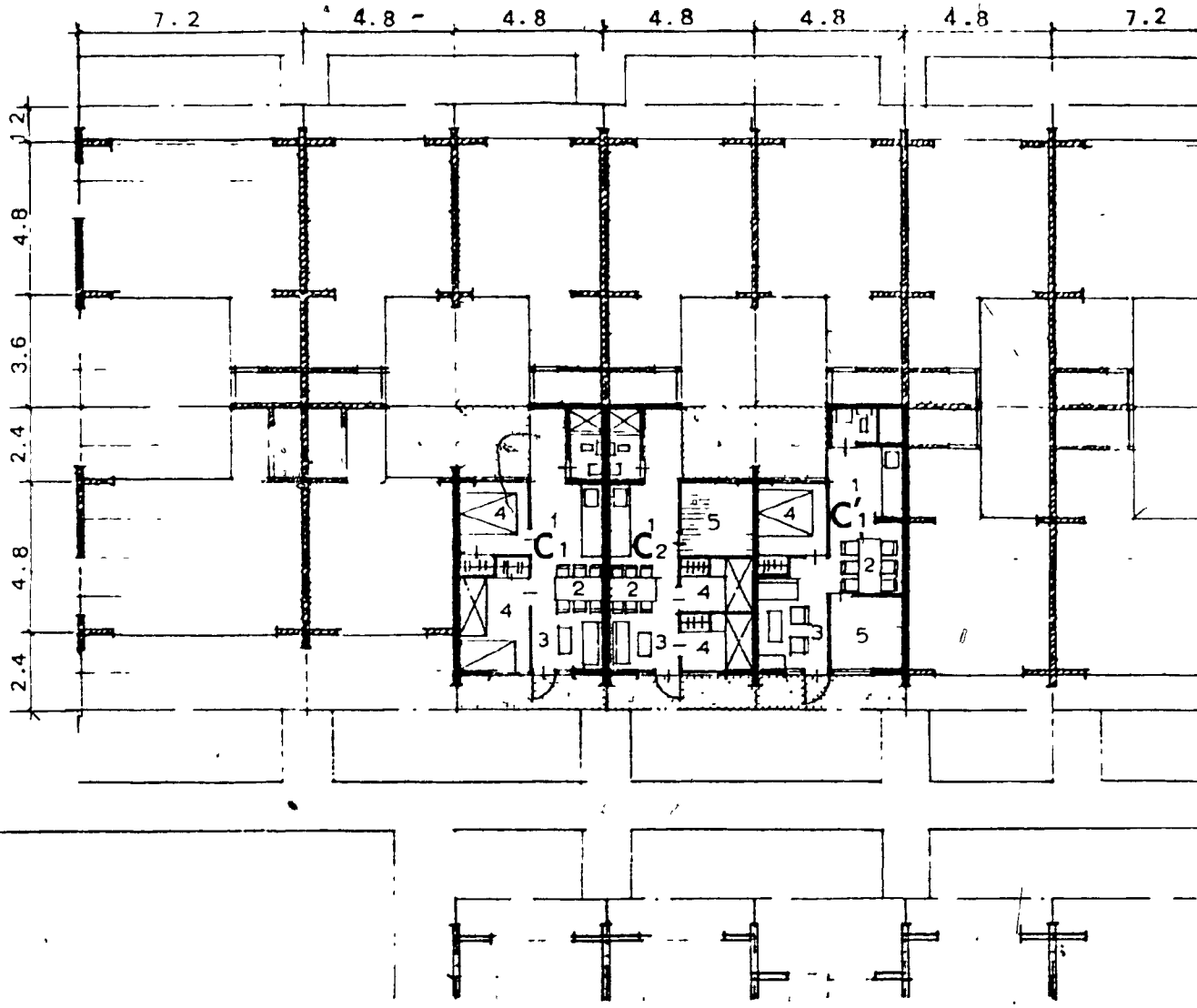
LEGEND

1. kitchen
2. dining room
3. living room
4. bed room
5. bed room with wood floor
6. work-shop or (sari-sari) store
7. covered open space
8. hall

N

TYPE HOUSING TYPE 'B' ALTERNATIVE PLANS SECOND FLOOR

2 of 2

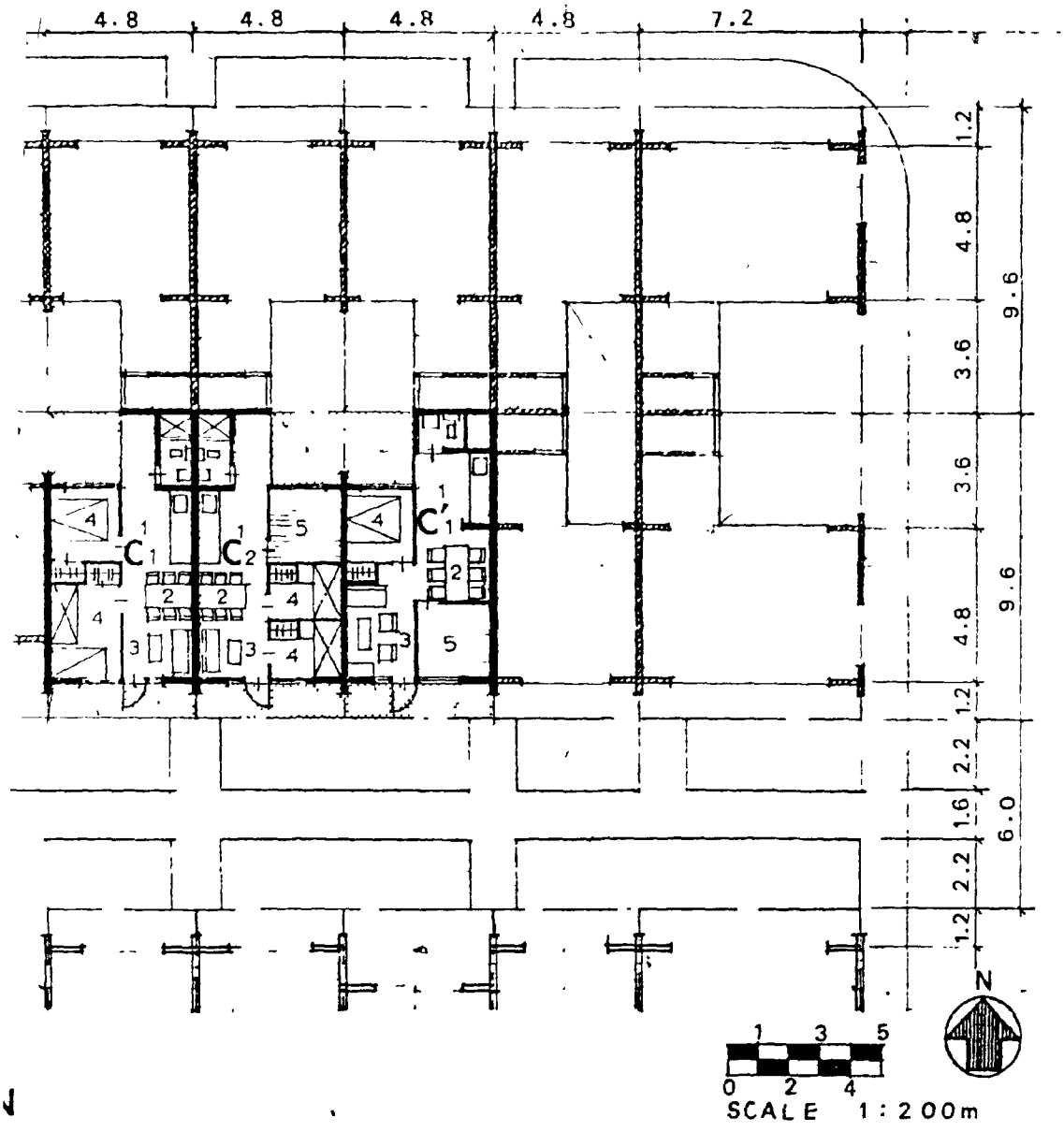


D-17

DAGAT - DAGATAN

PROPOSED PROTOTYPE HOUSING TYPE 'C' ALTERNAT

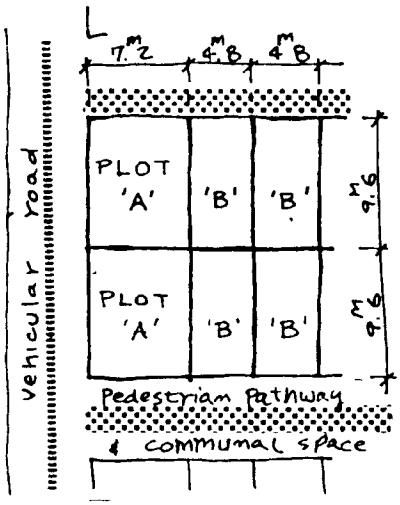
1
0
SCA



LEGEND

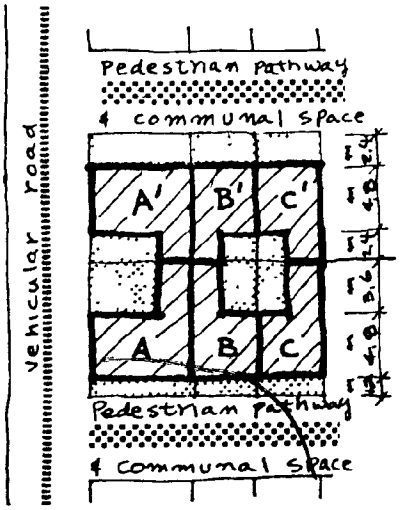
1. kitchen
2. dining room
3. living room
4. bed room
5. bed room with wood floor
6. work-shop or (sari-sari) store
7. covered open space
8. hall

YPE HOUSING TYPE 'C' ALTERNATIVE PLANS GROUND FLOOR



Choice of Plot

Illus. #74



Choice of Dwelling Types

Illus. # 75

as against the single or common wall construction in multiple or row house dwellings. The common dividing wall system, utilizing the total land area allotted also creates additional floor space within each house. (See Illus. #73).

Therefore, in consideration of the above, row housing with common dividing walls is proposed as the most economical to build.

Choice of Plot

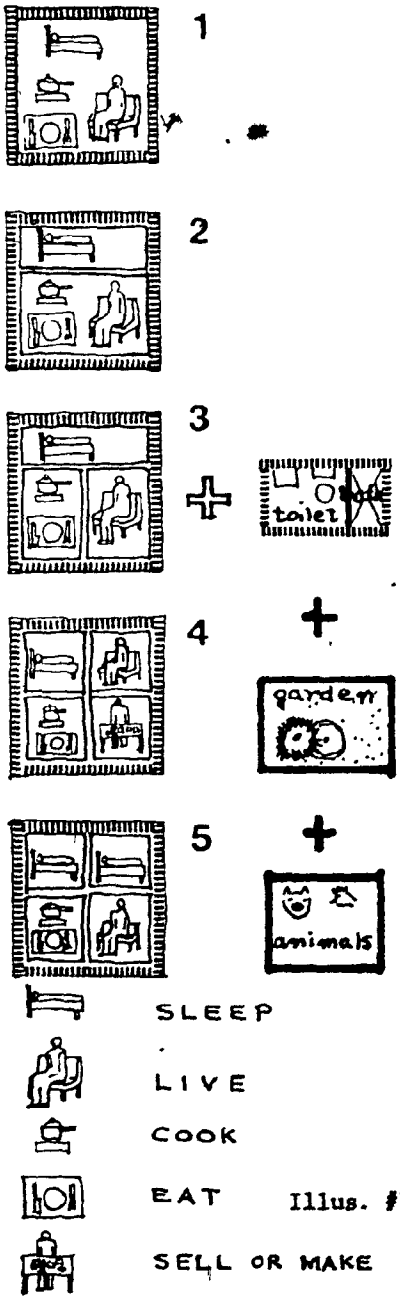
Two different sizes of plots are proposed (See D-6, Illus. # 74) Plot size A has a land area of 69.12 square meters. This type of plot is located along the vehicular traffic roads. Plot size B had a land area of 46.08 square meters. The majority of the plots size B are located away from the vehicular traffic roads.

A household may select its plot and location from the available lots.

Choice of Prototype Housing (See Drawings D-11, D-12, Illus. #75

Six prototype housing units are proposed. Housing types A and A' may be built on plot type A only. A portion of each house of these types may be used for stores and workshops.

Housing types B, B', C and C' may be built on type B plots



Illus. #76

only. Housing types B and B' are designed as two-storey units. Housing types C and C' are designed as one storey units. Each household may select a type of unit according to the family requirements and financial circumstances.

Choice of Space Use

The use of dwelling space differs according to the family size, life-style, social status, and economic condition. The space use selected by the inhabitants and their requirements must be considered in the design of the housing.

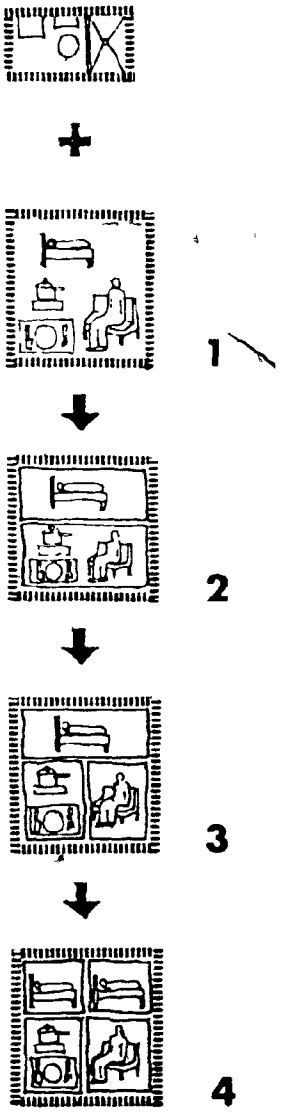
The activities of the inhabitants within their dwelling and their relation to space use is analysed in Illustration # 76.

(1) indicates all the activities within a dwelling that occur in one living space.
(2) to (5) indicate possible separation of spaces and the activities taking place within each of the spaces.

Besides these space uses, a sanitary facility (bath and toilet) is essential.

Gardens or animal quarters may be added as optional spaces.

Drawings D-13 to D-17 show the proposals for the prototype housing units. Each prototype dwelling may be separated into spaces for various uses as shown.



Illus. #77

The ground floor of types A1 through A5 and A'1 may be combined with any second floor plan type Aa, Ab, Ac, and Ad. Similarly, the ground floor plans, B1 through B6 and including B'1 may be combined with any type of second floor plan Ba through Bg.

Stages of Creating Spaces

The economic conditions of some families may not allow them to have a full dwelling at the beginning. In such cases, space may be created in incremental stages, in accordance with their economic improvement.

In dense urban conditions, people must have bathrooms, cooking facilities and the use of public utilities. These are the first priorities for upgrading and betterment of the squatter population.

Illustration #77 shows the various stages of amenities in conjunction with economic improvements.

The first stage may be to require the inhabitants to perform all activities in one living space (for example type A or type B drawing D-11).

The second stage, resulting from economic betterment, allows divided spaces - the use of the second floor space Aa or Ba on drawing D-14 and D-16.

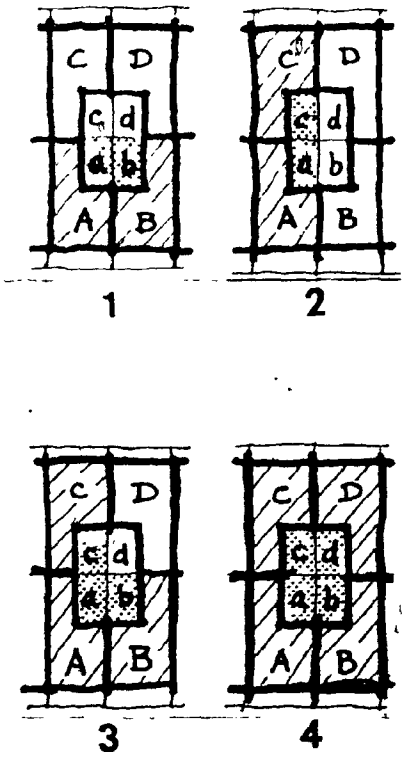
Successive stages would permit further divisions of the living spaces as shown in A1 through A5 on drawing D-13, and B1 through B6 on drawing D-15. These drawings indicate how living spaces may be made more pleasant and comfortable as the inhabitant's economic condition is bettered and is based on the principle that sanitary facilities and large (maximum) undivided space is first provided. This is less expensive than adding complete additions to primary facilities.

Use of Backyards

The backyard of each unit may be used as a vegetable garden, for drying laundry or for keeping animals. It may also become a storage area for commercial operations. The use of the backyard may be extended in accordance with relationships existing between each of the adjacent neighbours. Illustration #78 shows the relationship of residents and the use of the backyard space.

In Example (1), the family living in dwelling A and the family living in dwelling B are blood relatives, therefore the backyards (a) and (b) may be used as a common area for both families.

Examples (2) (3) and (4) show similar relationships and use of the backyards.

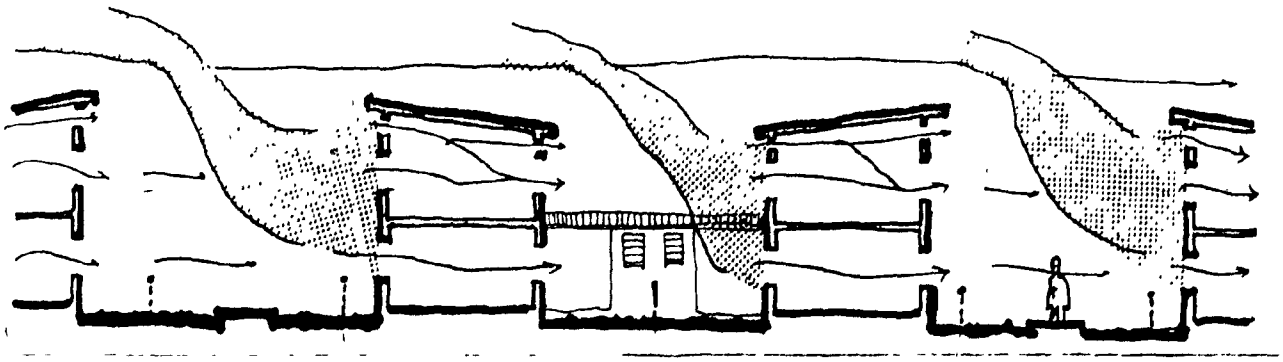


Backyard Relations
Illus. #78

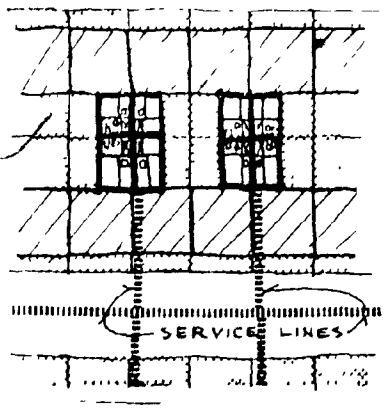
Ventilation

The orientation of the dwelling unit to take advantage of the prevailing winds has been mentioned in the section on the Barangay unit, under climatic considerations page 97.

Ventilation grills are proposed below each roof, (See drawing D-20). Windows at the front and back give cross ventilation, as shown in Illustration #79. The interior partitions traditionally do not reach to the ceiling in order to allow the free passage of air.



Illus. #79



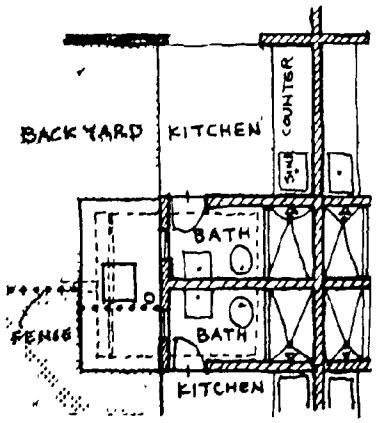
4 - Utility Cores
Illus. #80

Utilities

A utility core system is proposed to economise on infrastructure costs. A bathroom and a kitchen are placed in the back of each unit as a core unit and four cores are grouped together. Access and outlets for water and sewer connections, to and from the four core units are made possible from one point. (See drawings D-9, D-10; Illus. #80).

Bathrooms (see Illus. #81 and drawing D-18)

The bathroom includes a shower, a toilet bowl and a basin. The shower is an overhead spray nozzle, with two control valves, one for city water and one for rain water. Below the overhead nozzle, a water faucet is provided.



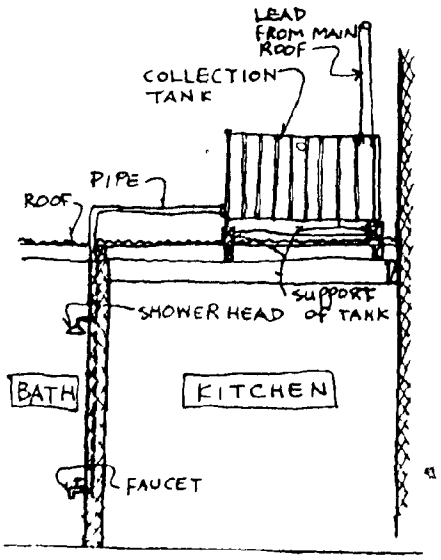
Bathroom & Kitchen
Illus. #81

Kitchens

The kitchen is located between the main structure and the bathroom as a part of the core unit. A sink and counter-top are provied.

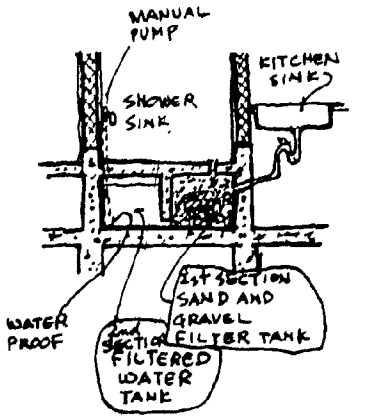
The backyard side of the kitchen may be open or closed. The kitchen may be used for the drying of laundry and clothing during the rainy season.

For cooking purposes, liquid bottled gas is, from the author's observations the most recommendable fuel, albeit expensive. A 12.5 gallon tank at 16 pesos (1974) lasts



Rain Water Collection

Illus. #82



Water- recycling

Illus. #83

approximately one month on the average. Wood and kerosene are difficult to handle and are apt to be fire hazards.

The process of producing methane gas from human waste has yet to reach the stage of practical application; much further experimentation is still required.

Water Supply

Well water from this site is not classified as potable, therefore potable water must be provided as a public service by the Metropolitan Water and Sewerage System of Manila.

A simple rain water collection system is proposed. An empty 55 gallon drum is placed on each kitchen roof. A lead gutter is connected to the tank from the roof of the main structure to collect the rain water. One pipe is led from the tank to the shower head and faucet combination. Rain water will be used only for taking a shower or washing clothes and the like. (See Drawing D-20 and Illus. #82).

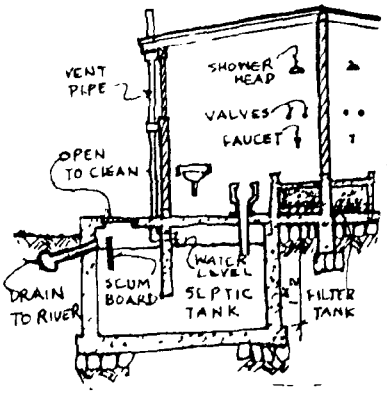
Also suggested is a water-recycling system. (See Illus. #83). In the bathroom, the shower floor is raised 45 to 60 centimeters. The part underneath the shower floor is divided into two sections. The first section has a simple filter. Used water from bathing, washing and from the kitchen is filtered in this section.

The filtered water is stored in the second section. The

water can be pumped from the storage section with a simple manual pump. This recycled water can be used for washing and flushing the toilet.

Sewer System

At present the government is not inclined to provide a central sewerage system for this settlement. The government's proposal is to have the sewerage discharged in the nearby river, incidentally without treatment.



Septic Tank

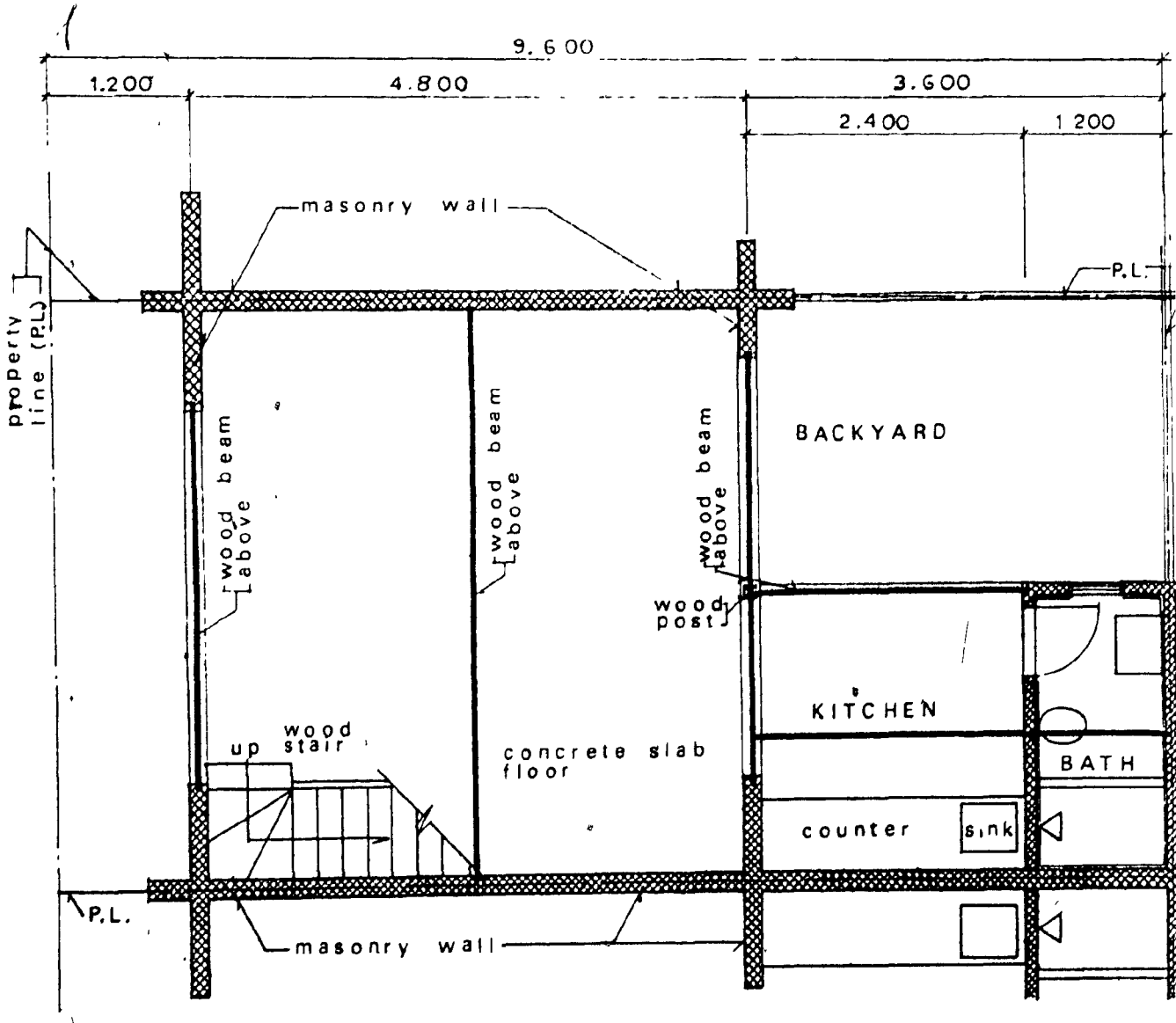
Illus. #84

It is strongly recommended, however, that the government provide a proper sewerage system and treatment plant for this area - as the people's health and well-being should be paramount. A proper system will serve to eliminate or at least severely curtail the existing and future pollution of the rivers adjacent to the settlement.

For interim service until a proper waste disposal system is installed, a simple water sealed septic tank, in which toilet flushing is accomplished by a pail of rain-water or recycled water, is proposed as shown in Drawing D-20 and Illus. #84.

Drainage

Water from the roof of the main structure (i.e. excess water from the rain water collection tank) and from the roof of the core unit will drain to the proposed channel drainage

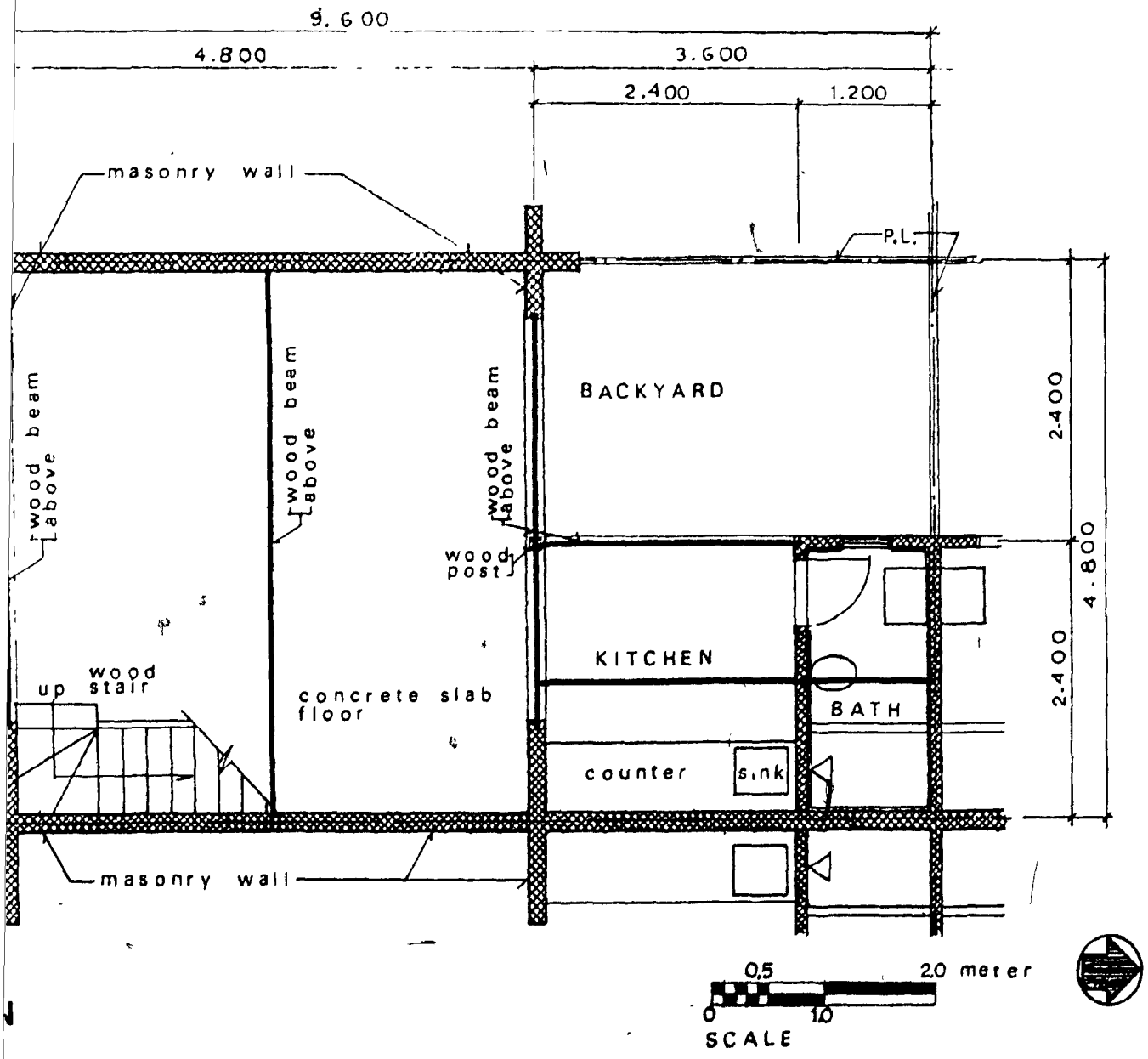


D-18

DAGAT - DAGATAN

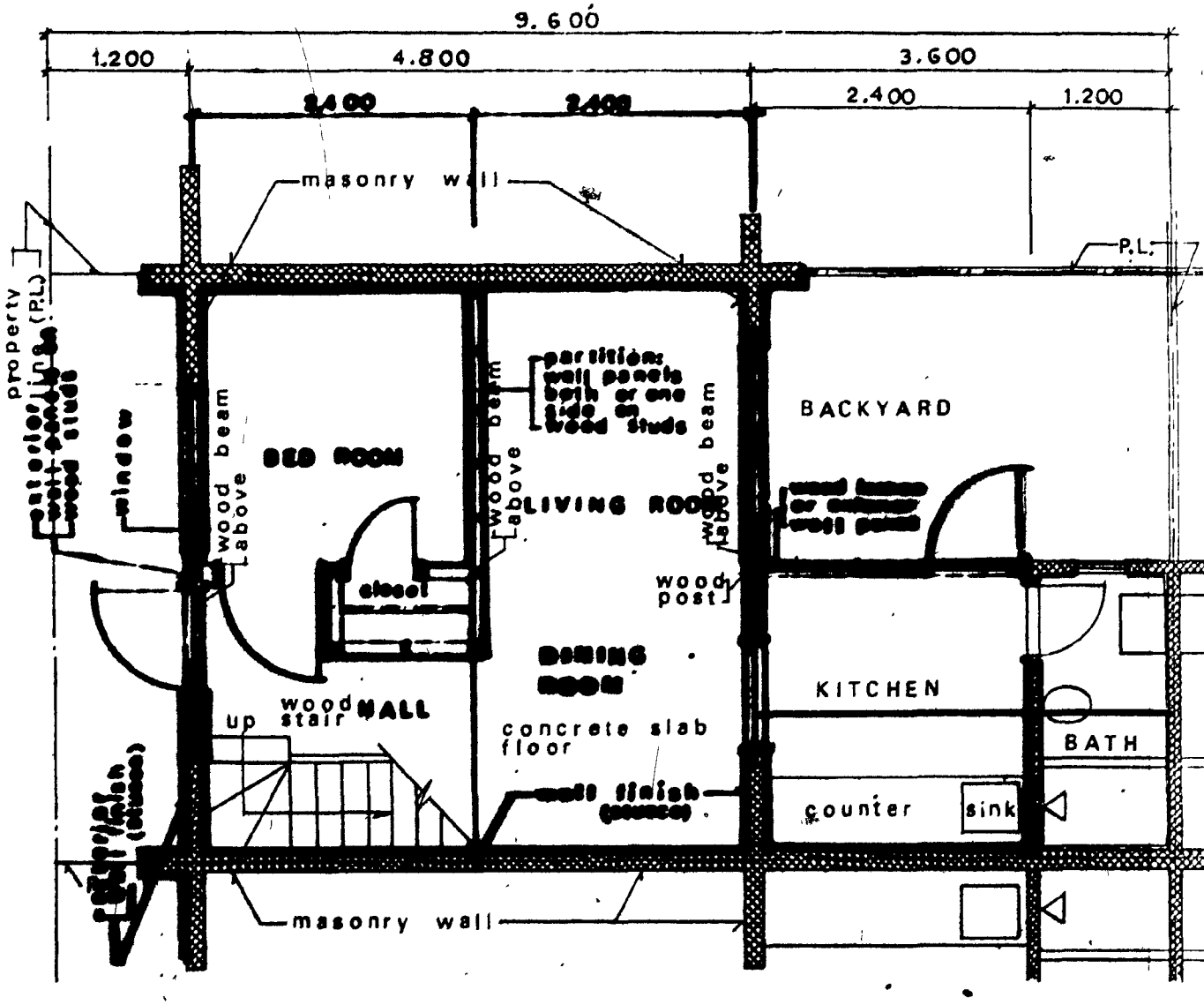
PROPOSED PROTOTYPE HOUSING UNIT

PLAN



YPE HOUSING UNIT

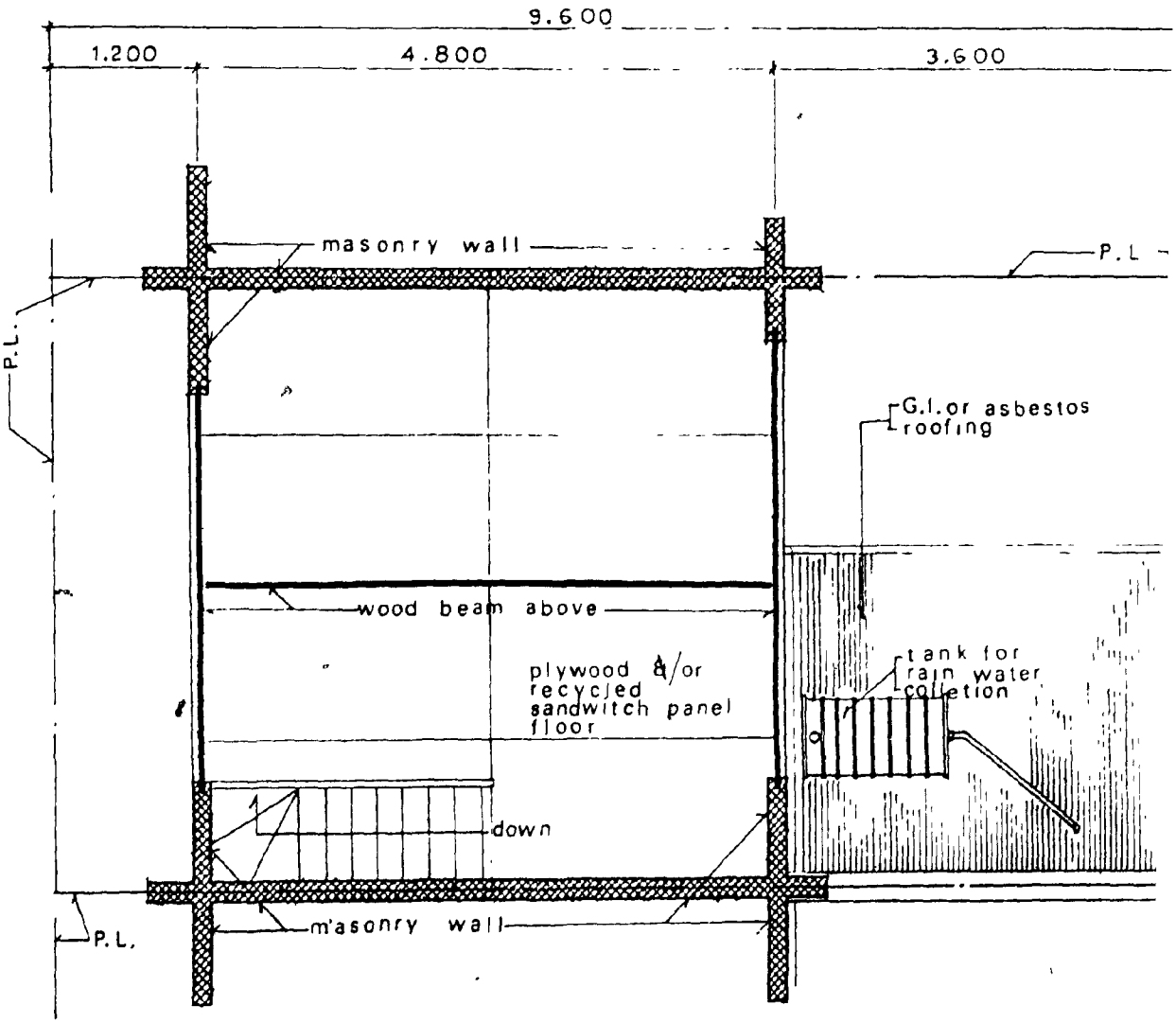
PLAN GROUND FLOOR



D-18'

DAGAT - DAGATAN

PROPOSED PROTOTYPE HOUSING UNIT **OPTION** **PLAN**



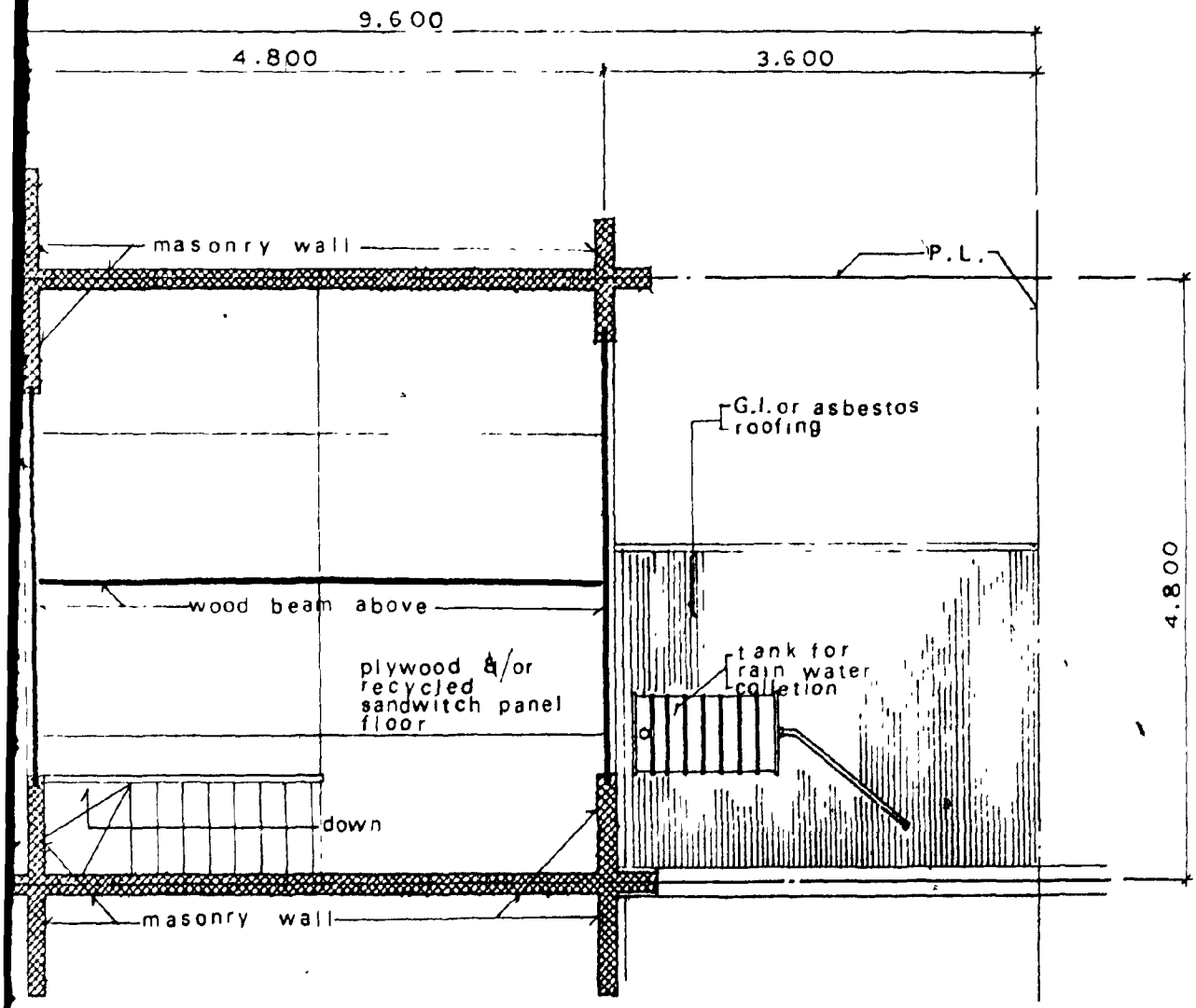
D-19

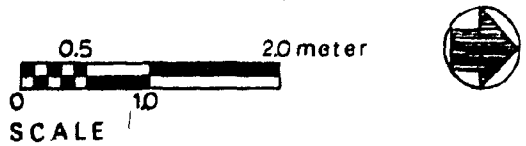
DAGAT - DAGATAN

PROPOSED PROTOTYPE HOUSING UNIT

0.5
0 1.0
SCALE

PL

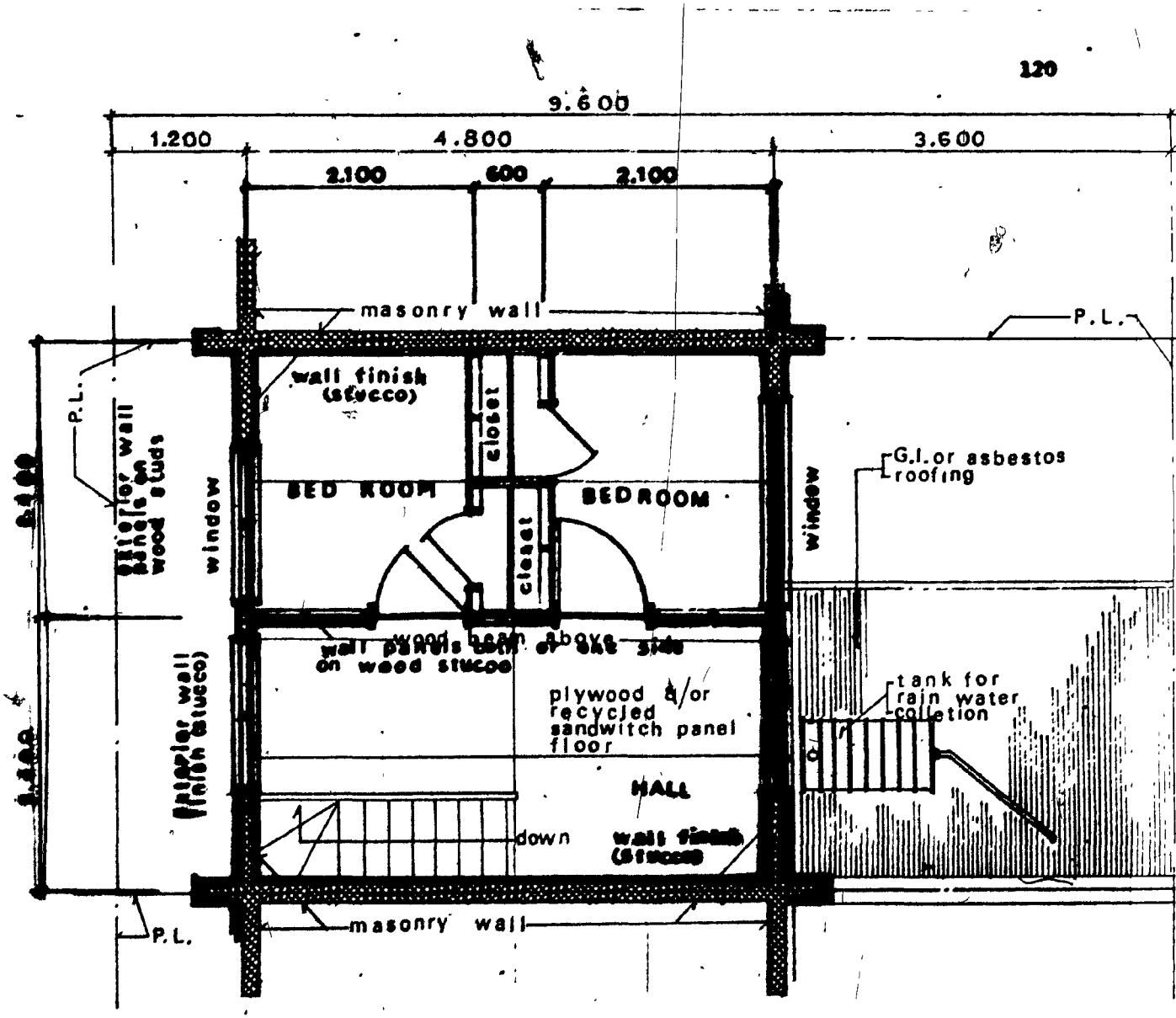




N

TYPE HOUSING UNIT

PLAN SECOND FLOOR



D-19.

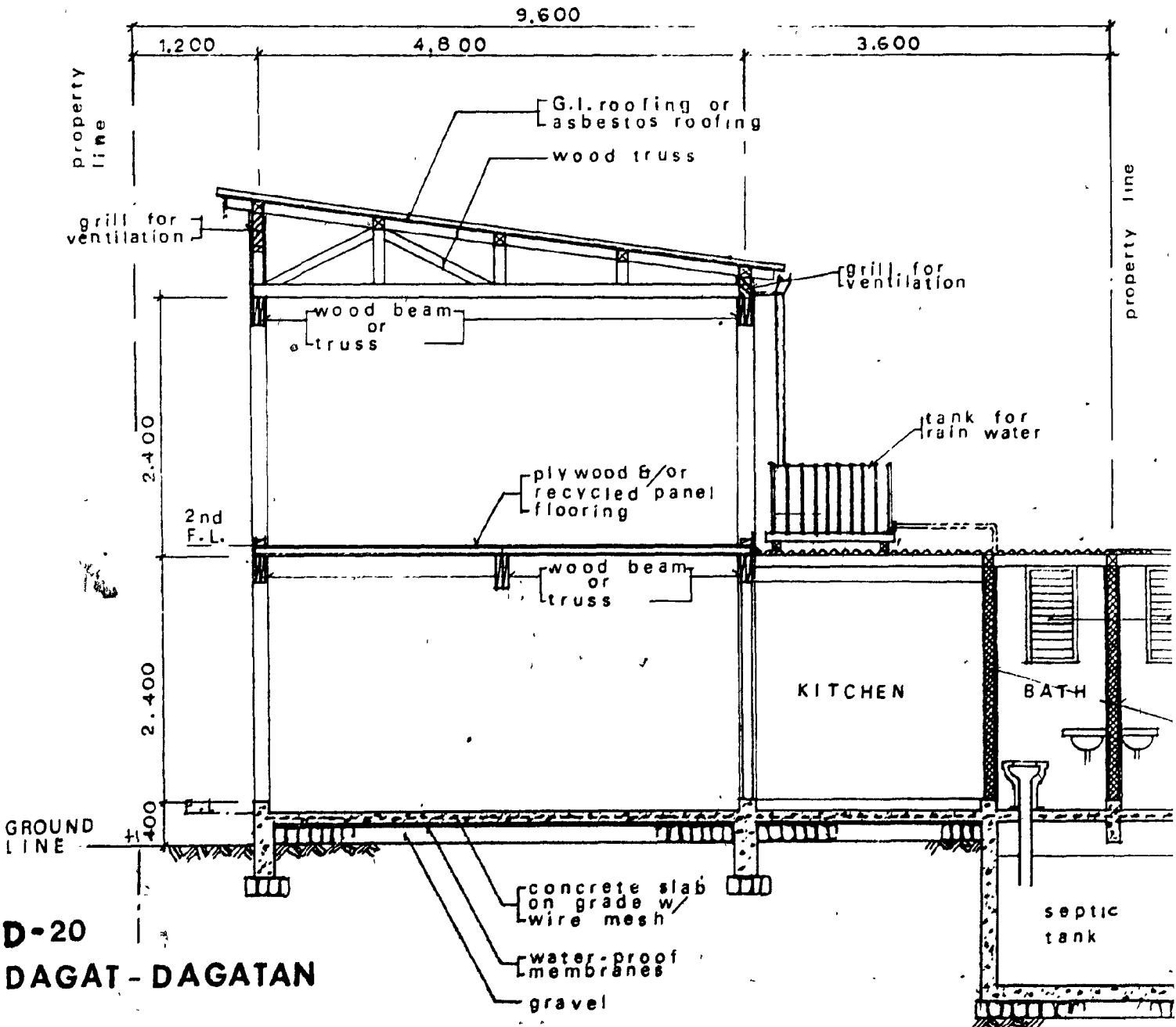
DAGAT - DAGATAN

PROPOSED PROTOTYPE HOUSING UNIT

0 0.5 1.0 2

SCALE

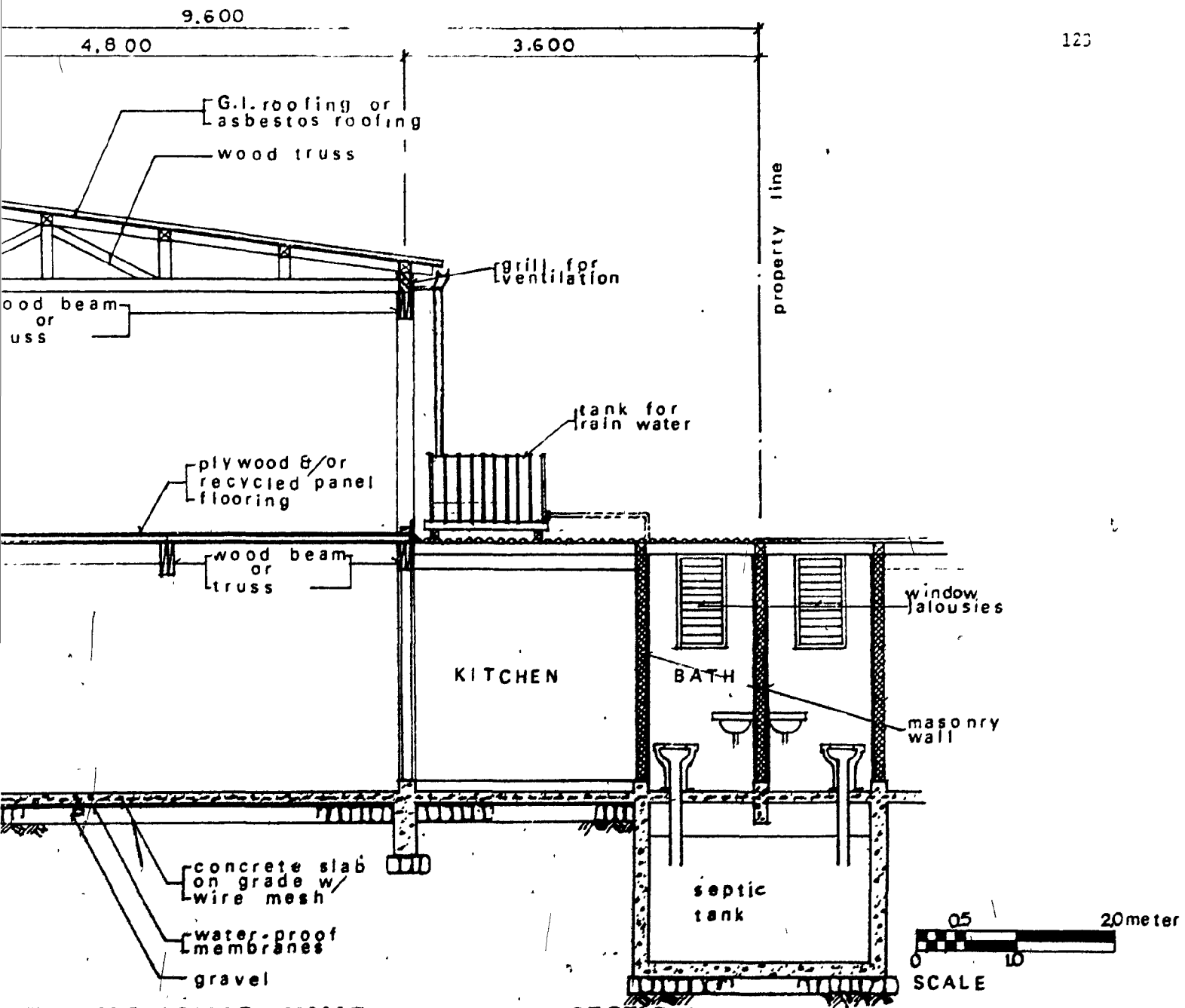
OPTION PLAN



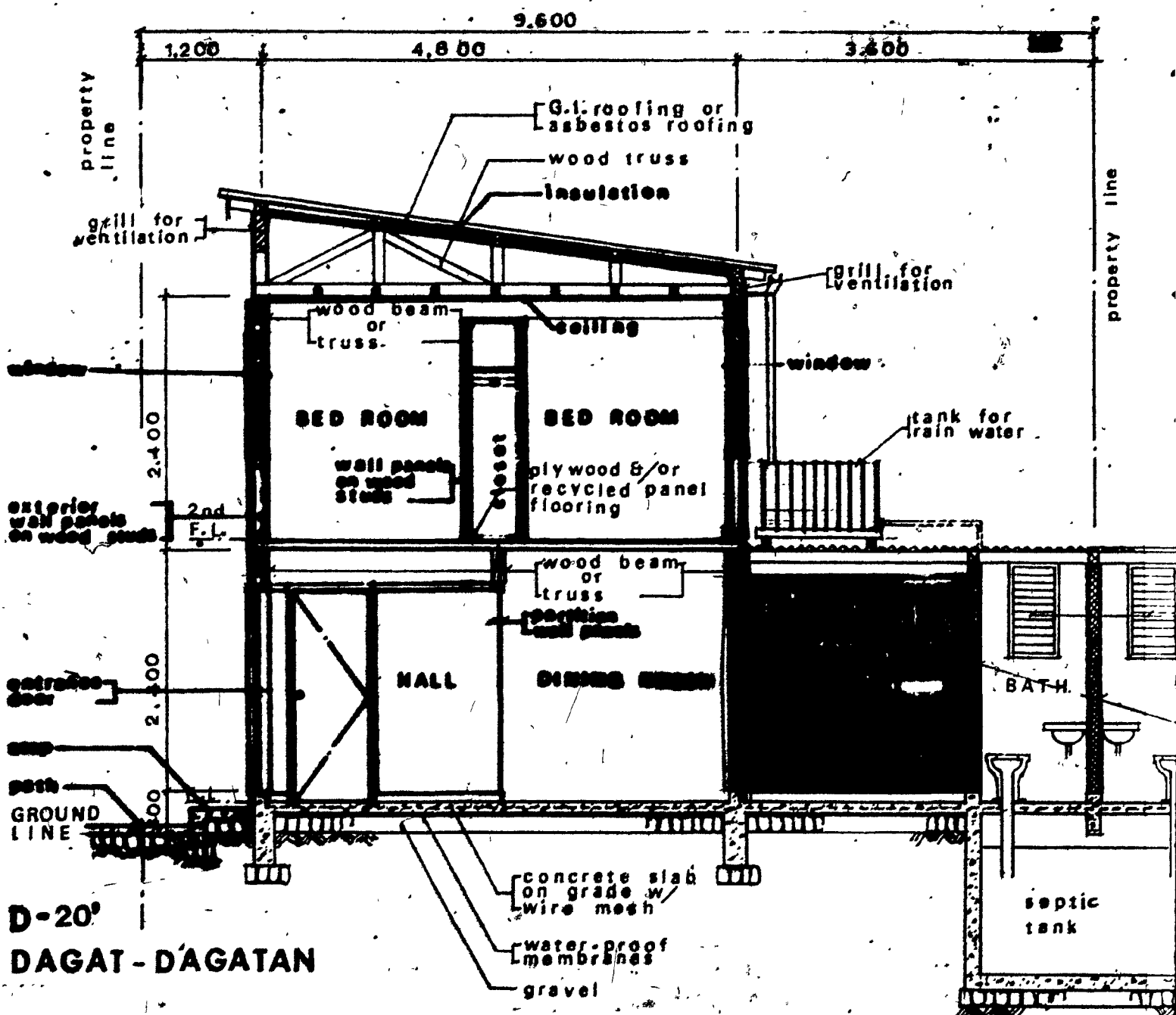
D-20

DAGAT-DAGATAN

PROPOSED PROTOTYPE HOUSING UNIT SECTION



YPE HOUSING UNIT SECTION



D-20'

DAGAT-DAGATAN

PROPOSED PROTOTYPE HOUSING UNIT - OPTION SECTION

system.

A surface drain should be provided in the backyard connected to the channel drainage system. The frontyard surface water will drain directly to the channel drainage system through surface drains. See illustration # 11.

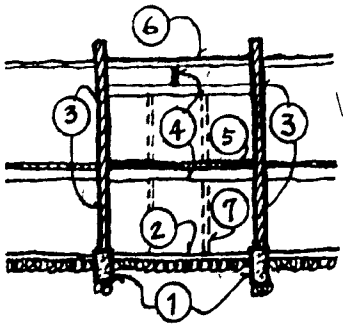
Electricity

Electricity of 220 volts or 110 volts will be provided as a public utility service. Lighting fixtures and outlets may be provided as required by the residents.

Structure and Materials

The detailed structure is shown on Drawings D-18 through D-20. The main structure of the prototype includes (See Illus. #85):

concrete foundation (1)
concrete slab on the ground (2)
masonry walls (3) between units and partial exterior walls, which act as bearing walls supporting the roof and the second floor load, and as fire and sound barriers, and also provide earthquake resistance.
beams or trusses (4) for second floor and roof
second floor panels (5)
roof (6)
posts (7)



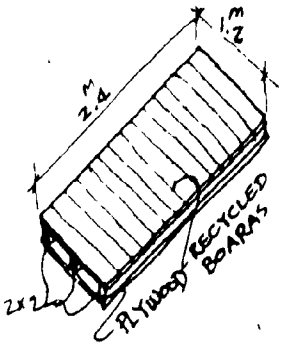
Main Structure

Illus. #85

The construction of the main structure, plus the utility core is predetermined for all units and all parts are standardized. Other exterior walls and interior partitions are optional and are proposed to be installed by residents.

The selection of building materials is one of the most difficult concerns of the project. With considerations of cost, durability, fire and weather resistance, the choice of existing available materials is limited. Possible new materials, such as coconut fiber board and blocks, sulphur blocks, or sand blocks, require further experimentation. Other new materials may be studied exclusively for this project.

The recycling of wood boards, and other lumber is suggested. The materials used for the present squatter houses can be recycled for the new housing. The sandwich floor panel as shown in Illustration #86 is one proposal for using recycled wood boards. Old lumber can be converted into truss beams or posts. The list of materials proposed is shown on the chart on page 127.



Sandwich Floor Panel

Illus. #86

Windows and doors may be prefabricated in a factory specially established for the project. (See section Production of Materials page 128.)

Jalousie windows (in wood and sometimes in glass) are new and popular; traditional hinged windows are also suitable for the climate. Both types prevent direct sun light and at the same time, facilitate the flow of fresh air.

Windows and doors should be produced in various sizes, types and materials, although some standardization here could mean further cost reduction.

Provision of other fixtures and furniture necessary for the inhabitants will be discussed in the following section.

LIST OF MATERIALS

	I. Materials for Basic Construction	II. Alternatives to Column I	III. Materials for Optional Construction
Roof	asbestos cement roofing	galvanized iron sheets	paint finish
Masonry Walls	concrete hollow blocks	- coconut fiber cement blocks - sulphur blocks	- plaster finish - cement mortar finish - waterproofed mortar finish(exterior & bathroom) - sulphur mortar finish
2nd Floor Flooring	sandwich panels of recycled boards and plywood		
1st Floor Flooring	concrete slab		
Exterior Wall Panels (to be provided by tenants)			- asbestos cement sheets - concrete blocks(1st Fl.) - waterproofed plywood - coconut fiber boards w/ waterproof treatment - wood board siding - recycled wood panels
Interior Partitions(to be provided by tenants)			- plywood - sawali - coconut fiber boards

Illus. #66

3. IMPLEMENTATION

The means by which this housing proposal is implemented is extremely important. Implementation can be broken down into four basic parts: scheduling, production of building materials and furnishings, construction and financing.

Scheduling

Scheduling of the *Dagat-Dagatan* resettlement project is related to the schedules and phases of two projects: the International Harbour and the Roxas Boulevard extension in the Tondo Foreshore Land. In order to avoid confusion at the time of resettlement, proper scheduling is required. The following (Illus. #87) is a proposed schematic procedure for the resettlement project.

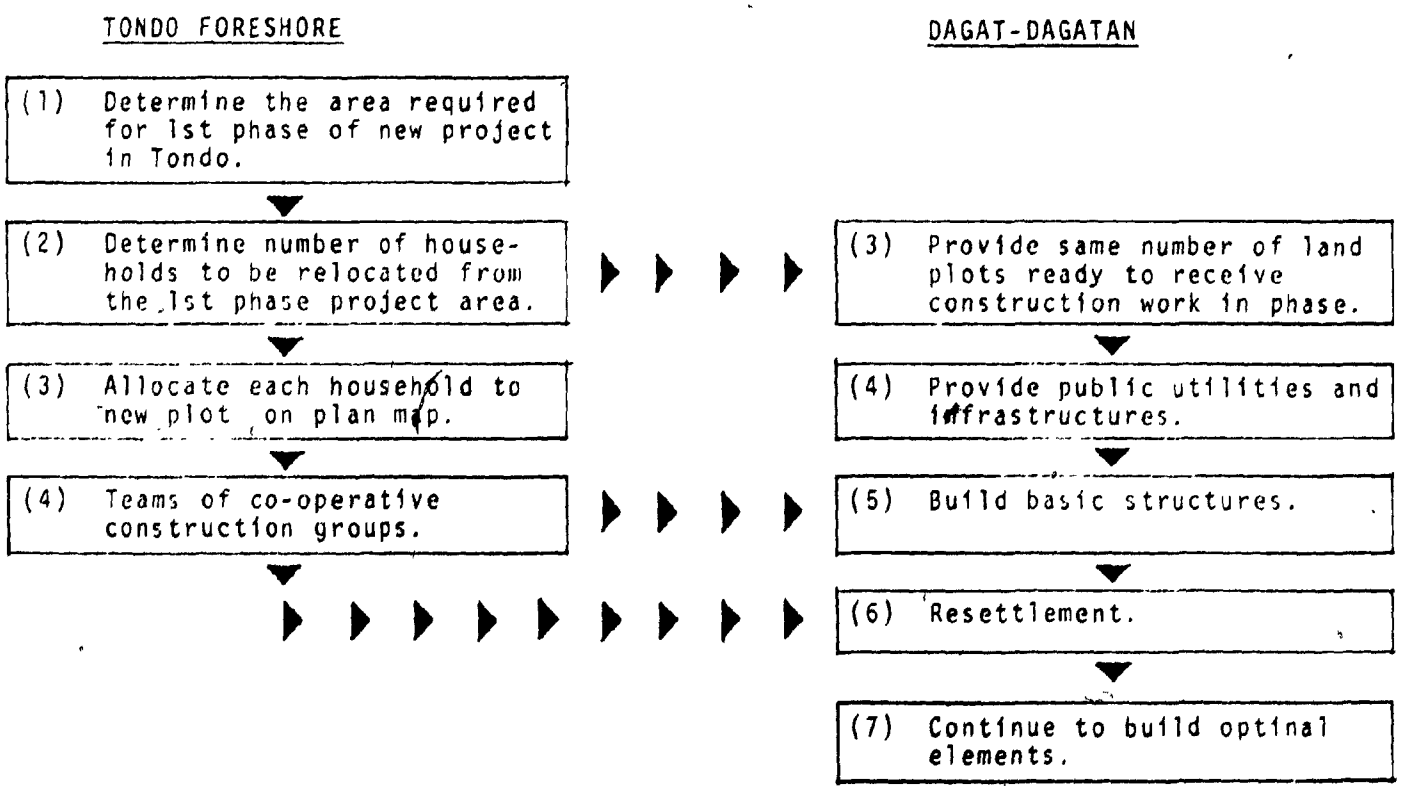
Production of Building Materials and Furnishings

An integrated housing industry in the form of an on-site factory could be established for the production of both experimental and conventional housing materials. Illustration #88 shows a schedule for the production of building materials.

A Housing Research Centre may be established for research and experimentation with new materials, to design pre-fabricated building elements and to provide empirical analysis of products under field conditions over a sufficient period of time.

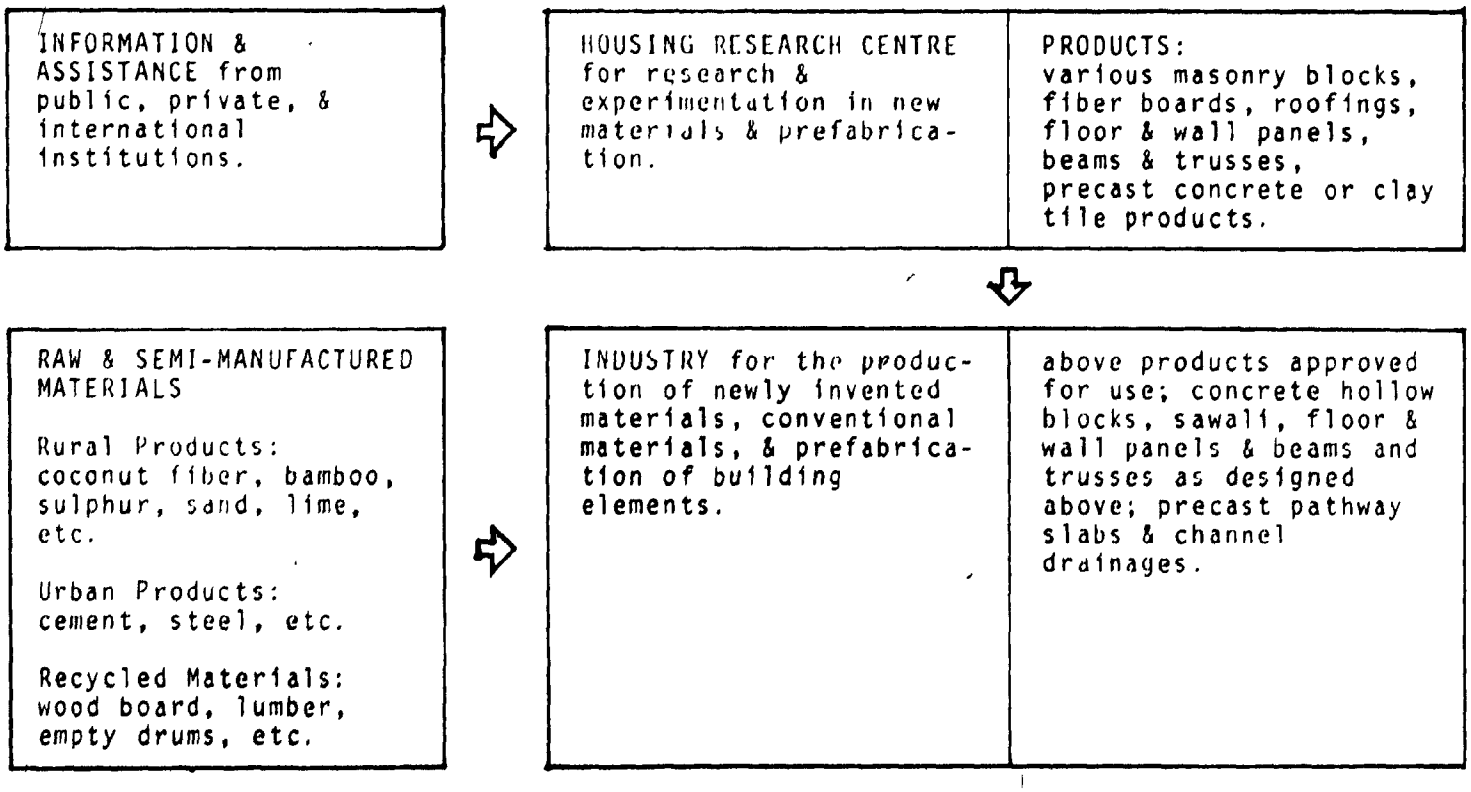
Information and assistance may be obtained through public, private

SCHEMATIC PROCEDURE FOR DAGAT-DAGATAN RESETTLEMENT



Illus. #87

PROCESS SHEDULE FOR PRODUCTION OF BUILDING MATERIALS



Illus. #88

and international sources.

Sources of materials required for factory production will be established prior to implementation of manufacturing. Natural raw materials may be available from rural areas and manufactured materials from urban centres. Materials may be cultivated in rural areas or indigenous produce collected by the local people. Manufactured materials may be purchased, in large quantities, directly from the factories at wholesale prices. The collecting of materials for recycling may be done within the Tondo Foreshore settlement and other parts of Manila. Recycling centres could be established to expedite handling and efficiency. The production of newly invented products and conventional materials, and prefabrication of tested building elements can be done through the establishment of a product industry. Factory workers may be selected and trained for production tasks from among the resettled Tondo residents.

Instead of adopting conventional fittings and furniture available from conventional markets, it may be possible to introduce new and inexpensive products for the new residents. A manufacturing source for new fixtures and furniture could be established as part of the building material factory or as a separate industry.

Fixtures such as toilets, basins and kitchen sinks may be standardized and produced.

Furniture such as tables, sofas, chairs, beds, wardrobes, cabinets,

drawers and book shelves may be produced in various designs using both new and recycled materials. For example, wardrobe cabinets and bookshelves may be designed to form a partition between rooms, a bed and drawers may be combined as one piece or a living room couch may be converted into a bed.

A Housing Research Centre combined with a factory, once established, could operate on a permanent basis, since housing shortages and the high cost of building materials are continuous and national in scope.

Construction

Housing units are designed to be built on a co-operative self-help basis. Mass construction may be achieved more effectively through co-operative effort than through the individual family. To achieve the most effective results from community self-help projects, the following three factors must be considered:

1) the organizing of the community so as to realize the greatest benefits from co-operative work,
2) the necessity of continuing trusted leadership, initiating projects and maintaining progress.
3) the establishing of necessary technical assistance and training programmes to perform the actual construction.

As mentioned earlier, it is imperative to maintain the existing community organization as a fundamental base for co-operative feeling.

In the transition from the existing squatter community living areas to the new settlement, some rearrangement of present neighbourhood associations will naturally evolve within the community group. This will also result in plot selection processes which should enhance the close knit community relationships. As outlined on page 129 the number of workers in "Group Dwelling" co-op teams should be in proportion to the number of housing units.

In a hierarchical organization, leaders of the Barangay community, the neighbourhoods and the groups of dwelling units should cope with problems occuring within their own units. Leadership seminars designed to assist local leaders should be provided periodically by the government.

A self-help construction project of this magnitude obviously requires technical assistance. Although, some of the residents in the Tondo Foreshore settlement have acquired some construction skills, such as carpentry, welding and painting.

Before and during the actual self-help construction, the government should operate a training centre. The professionals and semi-professionals in the Tondo settlement could be re-educated for this particular construction project, and other residents, who desire to obtain construction skills, could also be trained in the centre. The training centre courses could specialize in carpentry, masonry, plumbing, welding and electricity. As part of the program, prototype housing units could be constructed to provide on site experience for

the trainees. These prototype units could be exhibited for the Dagat-Dagatan resettlers to familiarize them with their future residences.

Workers graduating from the training centre could be sent to the actual construction site to instruct and assist groups of people working on co-operative projects.

Financing

Finding financial means for the project is a critical problem for both the government and resettlers.

Overall Financing

A comprehensive discussion of financing is beyond the scope of this project. The following sketch outline is based on information provided by the Tondo Foreshore Urban Renewal Project Office, August 1st, 1974 and is included to give the reader an idea of the scope of the problem.

The total estimate for both the Dagat-Dagatan Resettlement Project and the Tondo Foreshore Land Area Renewal Project was approximately 800 million pesos (115 million U.S. dollars). (1)

(1) 1 U.S. Dollar = 7 pesos

The following (Illus. #89) shows a basic analysis.

OVERALL FINANCING CHART

	TONDO FORESHORE	DAGAT-DAGATAN	TOTAL
PROJECT LAND AREA (in hectares)			
Residential	78*	200*	278*
Industrial & commercial	35*	115*	150*
Total	113*	315*	428*
NUMBER OF FAMILIES TO BE HOUSED	9000	17,000	26,000
PROJECT COST (in million pesos)			
1. Earth Work		110.22	110.22
2. Site and Service			
Roads(w/curb & gutter)	42.50	90.21	132.71
Utilities	50.42	106.38	156.80
Bridge		4.50	4.50
Open Space	2.62	2.97	5.59
Community Facilities	8.89	32.74	41.63
3. Expropriation	9.49	15.75	25.21
Sub Total	113.89	362.77	476.66
4. Housing			
Row House(70% of total units)	57.93	214.63	272.56
Complete Duplex(30% of total units)	33.36	45.53	78.89
(Alternative Duplex)	(17.86)**	(24.38)**	(42.24)**
Grand Total	205.18	622.98	828.11
	(189.68)**	(601.78)**	(791.46)**

* indicates the area planned as of August 1 1974.

** indicates the alternative cost estimate of duplex as a slab with toilet facility only.

Illus. #89

In order to finance the proposed housing project, the government would need the following international and national assistance.

International assistance - 30 million U.S. dollars from the World Bank. Approximately 210 million pesos.
National assistance - 100 million pesos from such sources as the Social Security System (SSS), the Development Bank of the Philippines (DBP), the Government Social Insurance System (GSIS), the Veterans Bank (VB), and the Philippine National Bank (PNB).

A deficit of 500 million pesos is expected to be met by the Asian Development Bank, grants from a West German religious group to one community organization in the Tondo Foreshore Area, (2) domestic loans and flotation of bonds by agencies of the Philippine Government.

(2) The Zone One Tondo Organization (ZOTO) was promised a grant of 1 million U.S. dollars by the Protestant Central Agency for Development Aid of West Germany.

Financing of Housing Units

A recent study emphasizes that the cost of houses for low-income families should not exceed their paying capacity. (3) The United Nations standard indicates that housing should not cost more than 25 times the occupant's annual salary. The estimated costs for proposed housing units are shown in Illustration #90.(4) Based on the United Nations standard, squatters earning more than 435 pesos per month (32%) can afford Type A houses (see drawing D-11, D-12); those earning between 325-435 pesos per month (13%) can afford Type B (see Drawing D-11, D-12). Those earning between 255-325 pesos per month (11%) can afford Type C (see D-11,D-12); and the remaining 44% are unable to afford any of the proposed types. The need for subsidy by the government is apparent.

(3) William J. Keyes, S.J., Maria C.R. Burcroft, Non-conventional Approaches to Housing Finance Preliminary Draft, (Quezon City: I.P.C. Ateneo de Manila University, 1975), Unpublished.

(4) See appendix for detailed costs.

ESTIMATED COST OF HOUSING UNITS

Type	Service Core	Basic Structure	Optional Exterior Walls	Labour(5%)	Total
A	2647.0(pesos)	7573.0(pesos)	2330.0(pesos)	511.0(pesos)	13,061.0(pesos)
B	2647.0	5257.0	1446.0	395.2	9,745.0
C	2647.0	3804.0	742.0	327.0	7,610.0

Notes

1. Service core, basic structure and optional exterior walls provide maximum floor area utilization with minimal cost.
2. The Service core includes a rain-water collection tank and a water recycling tank.
3. Building materials used in estimate are in the list of materials in column I (page 127).
4. Material costs are derived from wholesale prices as of May 23, 1975 in "Architectscope" and other sources obtainded in Manila.
5. The Material used for optional exterior walls is plywood on wood studs, wood door and windows providing minimum protection.
6. The labour cost in Manila is approximately 20% of material cost. Through self-help, more than 75% of the labour cost will be reduced. 5% of material costs for service core and basic structure is estimated as labour cost for technical assistance.
7. Estimated reduced labour cost (by means of use of self-help): Type A - 1999.0 pesos; Type B - 1474.8 pesos; Type C - 1129.6 pesos.

Illus. #90

Housing should be subsidized according to income levels and buildin types. For example, those in the lowest income levels earning less than 250 pesos per month should be subsidized up to 50% of the cost of the housing unit on a grant basis. A graduated system of interest free loans on a term basis should be also implemented for those at higher income levels.

Housing payment could be integrated with employment in both public and private industry through withholding and incentive programs. These could provide both job security and the necessar long term financing.

Assuming adequate job security and incentive financing, it might be possible to establish a costing of individual units. For example: a minimum wage earner, who earns 8 pesos per day or 200 pesos a month, will be able to pay 40 pesos monthly. (5) He occupies a Type C housing unit costing 7610 pesos. With the government subsidy of 50%, the balance, 3805 pesos, will be payed in less than 8 years. The increase in wages may be allocated to housing improvement rather than increasing the loan payment.

The government subsidy should be set for each family according to its income and conditions by a special review committee of both government and community people. While these proposals suggest the minimum requirements for financing in this particular urban context, they do not include all the resettlers whose income does not reach the standard of payment for the Type C housing units. such families, even greater subsidies will be needed.

(5) Based on the maximum housing expenditure i.e. 20% of monthly income, recommended by the United Nations.

PART IV

CONCLUSION

APPENDICES

BIBLIOGRAPHY

1. CONCLUSION

What, then, is the solution to the problem of housing and planning in the developing world? Is there a solution? As seen here, the problem is far from simple. One aspect of the problem in the Philippines in particular is the lack of individual incentive for the improvement of housing conditions. Shelter is one of the essential requirements for human existence, but the favorable climatic conditions in the Philippines makes it less important to provide proper housing for the poor. Therefore obtaining food, which is the very basic requirement for existence, takes priority over housing. Even those who are slightly better off, once they have attained the minimum housing for their needs, apply their concern to education for their children or to other investments. However, the overall development of a country is not achieved without improvement to the people's way of life which must include their housing. The development of a country is mainly dependent upon industry, and industry is dependent upon labour. The economy of a country is ultimately dependent upon a healthy labour force and a healthy labour force is not produced without the existence of proper housing. The acquisition of proper housing or the improvement of conditions leading towards better housing is dependent upon the stability of the income of the individual which in turn is dependent upon industry. Thus, housing reflects the economy of both individuals and the country and forms a cycle: provision of housing - healthy labour - industrial production - stable individual income and healthy national economy - improvement of housing. The cycle must be initiated and developed by the Government, yet sustained by the people, because proper housing is essential and beneficial to both the Government and people. Unless a viable symbiotic relationship exists between the Government, industry and the people,

proper housing and planning for the urban poor will never be accomplished.

Several insights into potentially successful strategies for community development may be found in the squatter communities themselves. One of the most positive resources in the development of housing is the squatters' concept of social stability as reflected in their housing. Whereas the western concept of class housing implies acquiring physical proximity to economic peers, the Philippine concept puts emphasis on maintaining established community associations above any improvement in economic status. Therefore existing homes are usually improved in accordance with the owner's economic progress, thus maintaining community relationships. Perhaps the lack of this very fundamental human need for community may be the basic reason for the deterioration and alienation found in most of the large cities in the so-called developed countries.

This strong community bond is perhaps the very instrument required to evoke an awareness of the housing problem and to provide the opportunity to improve housing through co-operative self-help projects.

The design solution presented in this paper represents the result of several completed reworkings of the author's original study to accommodate not only economic considerations but also the more vital concern of social and cultural factors. Indeed, if any one thesis can be proven, it is that while much can be done to improve housing conditions for low-income people, there is little likelihood that there will ever be a truly low-cost housing solution for squatters, or those with no source of income.

Proper housing cannot be achieved overnight. The process has to follow the cycle of economic progress of individuals and the country. It is an evolutionary rather than a revolutionary process.

2. APPENDICES

Sample Questionnaire

SOCIO-ECONOMIC AND PHYSICAL SURVEY

BARANGAY NO. 14 15 18 20 74 Interviewer: _____

Date of Interview: _____

House No. _____

I. SOCIO-ECONOMIC SURVEY

A. Household Head

1. Name: _____ 2. Age: _____
3. Sex: Male _____ Female _____
4. Status: Married _____ Single _____ Others _____
5. Final Education: _____
6. Language: _____
7. Occupation: _____
8. Income (monthly): _____
9. Place of Work: _____
10. Hobbies: _____

B. Household Members

Member	1	2	3	4	5	6
1. Relation to H.H. Head						
2. Age & Sex						
3. Final Education						
4. Occupation, School & Side Job						
5. Income						
6. Income Contribution to Family						
7. Hobbies						

H.H. Head Name:_____

II. HOUSING SURVEY

A. Existing Conditions

1. Type of Housing: a) 1 storey on ground _____
b) 1 storey raised floor _____
c) 2 storey_____
d) 3 storey or more _____

1. Single _____ 2. Duplex _____ 3. Accessoria _____
4. Apartment _____

2. Structure: 1. Wood ____ 2. Hollow Block _____
3. Steel _____

3. Age and Condition : _____

4. Number of Households/unit: _____

5. Number of Rooms/unit _____ 6. Number of rooms/ family ____

7. Size of Rooms: 1. Sala: _____
2. Bedroom: _____
3. _____
4. _____

8. Facilities: 1. Kitchen: a. inside house _____
b. outside _____
c. shared _____

2. Water: a. piped in house _____
b. private well (pumped) _____
c. others _____
distance to fetch water _____ meters

9. Building Materials:

a. Floors _____ b. Walls _____
c. Roofs _____ d. Ceiling _____
e. Doors _____ f. Windows (type) _____

10. Cost of the house when it was built _____
Present Value _____

11. Ownership of House

a. Owned _____ b. Rented _____

12. Expenditure for Maintenance _____

13. Future Housing:

1. Do you prefer to have your house built by the Government or by yourself? _____

2. What concerns you most about your house? _____
_____

3. Are you willing to share facilities with other families?

a. kitchen _____ b. bathroom _____
c. toilet _____ d. laundry space ____
3. laundry drying space _____

4. Which do you prefer to live in:

a. detached house b. highrise apartment c. row house

Reasons: _____
_____

5. Which do you prefer to sleep on:

   a. floor (wood, bamboo) ___ b. bed _____

6. How much can you spend for housing per month? _____

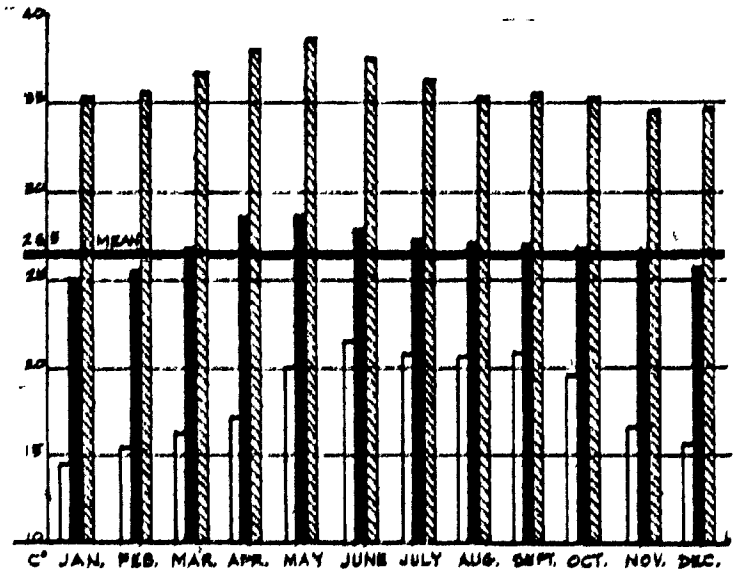
III. OTHER ASPECTS

1. Do you have any animals at home? _____
   a. What kind? _____
   b. How many? _____
   c. Purpose: a. pet _____ b. for food _____ c. to sell ____

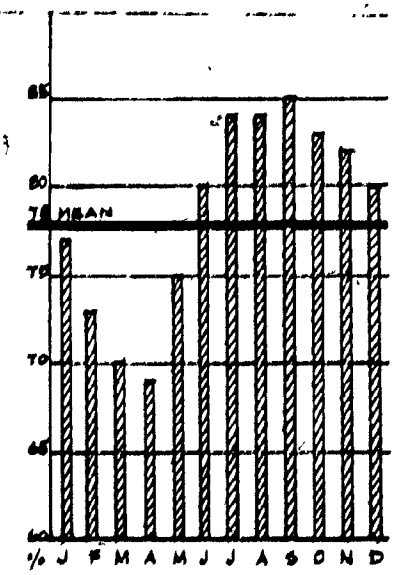
2. Do you have planting space around your house? _____

   a. How many M^2_____
   b. What kind of plants? _____
   c. Purpose: a. to eat _____ b. income _____
      c. decoration _____

APPENDIX CLIMATE IN MANILA



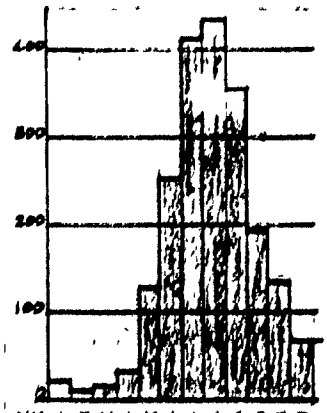
MEAN MONTHLY TEMPERATURE



MEAN MONTHLY HUMIDITY (R.H.)

MANILA CENTRAL OFFICE

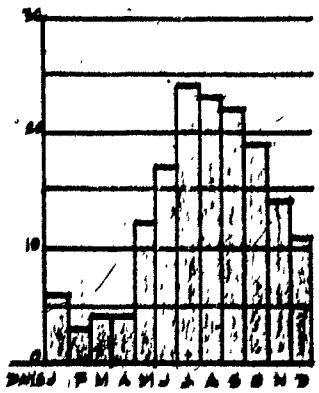
LATITUDE	14°35' N
LONGITUDE	120°59' E
ELEVATION	16.0 METERS



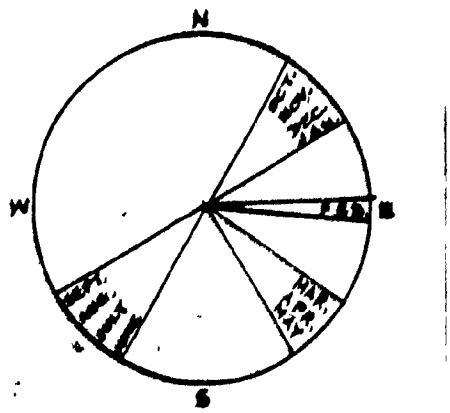
ANNUAL 2068.7 MM

MAX. (24 HOURS) 336.0MM

MEAN MONTHLY PRECIPITATION



NUMBER OF DAYS PRECIPITATION



PREVAILING WIND DIRECTION

SOURCE : WORLD SURVEY OF CLIMATOLOGY V.8

Estimation of Housing Costs

1. Unit Cost of Elements

	Detail		Pesos/unit (1)
Foundation	gravel concrete 1/2" ϕ steel bar 1/4" ϕ steel bar		34.0/m
Slab	concrete waterproofing wire mesh gravel earthfill		40.6/m^2
Concrete Hollow Block Walls	Load Bearing Concrete Hollow Block 1/2"ϕ steel bar concrete	6.0m high 3.2m high 2.65m high	148.0/m 78.0/m 64.0/m
Roofing	corrugated asbestos 1/4" x 1m x 2.1m (2)		35.0/sheet
Trusses			125.0/truss
Sandwich floor panel	(1/2" x 1.2m x 2.4m plywd.)		84.0/panel
Staircase			125/staircase
Posts	125cm x 125cm x 2.4m		20.5/post
Gutter			6.8/m
Down spout			4.4/m
Flashing			6.9/m

(1) U.S. 1 dollar ≒ 7 pesos

Material costs are based on wholesale prices as of May 23, 1975 in "ARCHITECTSCOPE" Newspapers and price lists in APPENDIX 2, "The International Design Competition for the Urban Environment of Developing Countries Focused on Manila" and other sources obtained in Manila.

(2) In Manila, both English and Metric Systems are often combined in measuring a single unit.

Soil pipe	elbow 4" ϕ	9.9/piece
	pipe 4" ϕ	40/m
G.I. pipe	1" ϕ	9.7/m
	1/2" ϕ	5.2/m
	elbow 1/2" ϕ	2.3/piece
	tee 1/2" ϕ	2.5/piece
	check valve 1/2" ϕ	10.5/piece
	floor drain 4" x 4"	6.0/piece
Empty drain	55 gallon	60/drum
Water closet	manual flush complete	310.25/set
Lavatory	complete	152.30/set
Kitchen sink	complete	63.0/set
3/4" plywood	1m x 2.4m (Lauan)	52.0/sheet
Lumber		1.7/bd.ft
Electrical	ceiling outlet	62/set
	convenience outlet	95/set
Window	0.9 m x 1.2 m wood jalousies w/jamb	87.0/window
	0.6m x 0.6 m wood jalousies w/jamb	39.0/window
Door	0.9m x 2.1m wood door w/jamb & hinges, knob	210.0/door
	0.7m x 2.1m	170.0/door

2. Cost of Service Core

	Pesos
Foundation	156.0
Slab	292.0
C.H.B Walls	378.0
Roofing	245.0
Roof Structure	70.0
Window (wd. jalousies w/jamb)	39.0
Door (wd. w/jamb Hinges and Knob)	170.0
Water Closet	310.0
Lavatory	152.0
Kitchen sink complete	63.0
Kitchen counter	83.0
Shower	30.0
Floor drain	15.0
Drainage pipe (soil)	220.0
Water pipe (G.I.)	68.0
Finish	100.0
Ceiling electric outlet	62.0
Gutter	25.0
Down spout	11.0
Rainwater Collection Tank	78.0
Water Recycling Tank	80.0
Total	2,647.0

Septic Tank (optional) 580.0 pesos

3. Cost of Typical Houses:

TYPE A

(1) Service Core

(2) Basic Structure

	Pesos
Foundation	768.0
Slab	1403.0
C.H.B. Walls	1391.0
Roof	892.5
Roof Structure	744.0
2nd. flr. Structure	404.0
2nd. flr. panels	924.0
Staircase	125.0
Posts	164.0
Gutter	50.0
Down Spout	11.0
Flashing	100.5
Ventilation	125.0
Electric Outlets	471.0
TOTAL	7,573.0

(3) Optional Exterior Walls

	Pesos
1st. Floor	
Window - 5	435.0
Door - 1	208.0
3/4" plywd. walls	291.0
2"x2" studs	132.0
Sub-total	1,066.0
2nd. Floor	
Window - 8	696.0
3/4" plywd. walls	416.0
2"x2" studs	152.0
Sub-total	1,264.0
TOTAL	2,330.0

TOTAL	2,647.0	
(4) Labour Cost for technical services	[(1) + (2)] x 0.05	511.0 pesos
Total (1) + (2) + (4) =		10,731.0 pesos
Total (1) + (2) + (3) + (4) =		13,061.0 pesos

A septic tank which is also optional, depending on municipal services would cost an additional 580.0 pesos.

TYPE B

(1) Service Core		(2) Basic Structure		(3) Optional Exterior Walls	
			Pesos		Pesos
		Foundation	510.0	1st. Floor	
		Slab	935.5	Windows	
		C.H.B. Walls	1213.0	(0.9x1.2)-3 (0.6x0.6)-1	300.0
		Roof	577.5	Door - 1	208.0
		Roof Structure	516.0	3/4" plywd. walls	156.0
		2nd. flr. Structure	245.0	2"x2" studs	78.0
		2nd. flr. panels	588.0	Sub-total	742.0
		Staircase	125.0		
		Posts	20.5	2nd. Floor	
		Gutter	33.5	Windows - 4	348.0
		Down Spout	11.0	3/4" plywd. walls	249.0
		Flashing	100.0	2"x2" studs	107.0
		Ventilation	68.0	Sub-total	704.0
		Electric Outlets	314.0		
TOTAL	2,647.0	TOTAL	5,257.0	TOTAL	1,446.0

(4) Labour Cost for technical services [(1) + (2)] x 0.05 395.2

Total (1) + (2) + (4) = 8,299.2

Total (1) + (2) + (3) + (4) = 9,745.2 pesos

Optional septic tank 580.0 pesos

TYPE C

(1) Service Core		(2) Basic Structure		(3) Optional Exterior Walls	
			Pesos		Pesos
		Foundation	310.0	Windows	
		Slab	935.0	(0.9x1.2)x3	
		C.H.B. Walls	1018.0	(0.6x0.6)x1	300.0
		Roof	577.5	Door - 1	208.0
		Roof Structure	473.0	3/4" plywd. walls	156.0
		Posts	20.5	2"x2" studs	78.0
		Gutter	33.5		
		Down Spout	1.5		
		Flashing	100.0		
		Ventilation	68.0		
		Electric Outlets	157.0		
TOTAL	2,647.0	TOTAL	3,894.0	TOTAL	742.0

(4) Labour Cost for technical services $[(1) + (2)]$ x 0.05 327.0

Total (1) + (2) + (4) = 6,868.0 pesos

Total (1) + (2) + (3) + (4) = 7,610.0 pesos

Optional septic tank 580.0 pesos

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