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MEDAN URBAN DEVELOPMENT, HOUSING,
WATER SUPPLY AND SANITATION PROJECT

VOLUME IV

HOUSING DEVELOPMENT PROGRAM

PART 2 - KAMPUNG IMPROVEMENT PROGRAM

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ENGINEERING-SCIENCE, INC.
SINOTECH ENGINEERING CONSULTANTS, INC.
A JOINT VENTURE
in association with
PADCO and P.T. DACREA

PREFACE

The feasibility reports emanating from the Medan Urban Development Housing, Water Supply and Sanitation Project were submitted in draft form to the Government of Indonesia (GOI) in February 1980. These reports, together with the earlier master plan reports, were reviewed by GOI in July 1980 and discussed with the Consultant at a series of meetings at that time. The outcome of this review process was that certain changes in content and format were agreed. These changes have been incorporated into the final printed reports.

A result of adopting the new guidelines provided by GOI is that differences occur between the Repelita III investments proposed in the master plan studies and those contained in the first stage program recommendations. The latter incorporate the final adjustments and represent the recommended program for Repelita III.

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ORGANIZATION OF PROJECT REPORTS

The results of investigations carried out in connection with the Medan Urban Development, Housing, Water Supply and Sanitation Project are contained in the following series of reports:

Inception Report for Long Term Urban Development Plan and Feasibility Study on First Stage Housing Development Project

Volume I	Summary
Volume II	Interim Strategic Plan and Feasibility Study
Volume III	Long Range Urban Development Plan
Volume IV	Housing Development Program
	Part 1 - Housing Development Situation and Strategy
	Part 2 - Kampung Improvement Program
	Part 3 - Sites and Services / Low Cost Housing Program
Volume V	Master Plan and First Stage Program for Water Supply and Sanitation
	Part 1 - Master Plan and First Stage Program for Water Supply
	Part 2 - Master Plan and First Stage Program for Wastewater
	Part 3 - Master Plan and First Stage Program for Drainage
	Part 4 - Master Plan and First Stage Program for Solid Wastes

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Note: Parts 1-3 of Volume IV and Parts 1-4 of Volume V are bound as separate report volumes. Appendices to Part 1, Volume V are also bound separately.

LIST OF ABBREVIATIONS

ORGANIZATIONS

BTN	Bank Tabungan Negara
DISP	Distributive Investment Strategy Plan
DKKP	City Solid Waste Department
DPU	City Drainage Department
IKIP	Institute of Teachers Training and Educational Science
KIK	Kredit Investasi Real
KMKP	Kredit Modal Kerja Permanen
PENMAS	Community Education Program
RGDP	Regional Gross Domestic Product
SMP	Junior High Schools
APG	Teachers Education School
UISU	Islamic University of North Sumatra
USU	University of North Sumatra

TECHNICAL

mm	millimetre
m	metre
km	kilometre
sq m	square metre
ha	hectare
sq km	square kilometre
l	litre
cu m	cubic metre
s	second
min	minute
d	day
y	year
m/s	metres per second
l/min	litres per minute
cu m/s	cubic metres per second
cu m/d	cubic metres per day
mg/l	milligrams per litre
l/c.d	litres per capita per day
mg	milligram
g	gram
kg	kilogram
t	tonne (metric)
BOD	5-day, biochemical oxygen demand
TDS	Total dissolves solids
ES	Electrical conductivity
TU	Turbidity units
DO	Dissolved oxygen
TDH	Total dynamic head
LS	Lump sum
ea	each
na	not available or not known
Rp	Indonesian Rupiah

SECTION 1

INTRODUCTION

Repelita III marks the clear recognition of the KIP program as an integral element of national and local government strategy to meet the needs of the low-income urban poor. For the City of Medan, the KIP program offers the potential to:

1. Serve not only the upper range of low income households, but also to reach the lower 20% of the population in need of minimal services (those who cannot afford sites and services plots and low income housing units).

2. Stimulate more development activities by kampung residents thereby mobilizing additional human resources.

3. Cover a large number of persons with minimal essential services.

While KIP programming will vary from kampung to kampung in order to fulfill its potential, the primary focus for Medan should be on the improvement of:

- The household's physical environment (roads and footpaths, drainage, water supply, etc.)

- The household's access to educational, health and nutritional facilities and services

- The household's productivity through vocational training, credit to small-scale home industry, and employment generating activities.

The implementation of KIP in Medan over the period of Repelita III must take account of some significant limitations. The level of financial, technical, and professional resources available to the local government is not comparable to similarly sized cities throughout Indonesia. The Kotamadya of Medan does not now have sufficient budget nor trained staff to carry out a greatly expanded development program. This problem is closely related to the need to significantly upgrade the Kotamadya's annual planning, programming budgeting and services system (see Section 21 - Long Term Urban Development Plan Report). A KIP program that attempted to increase the level of works too quickly could spread both financial and staff resources even thinner and negatively affect the ongoing Kotamadya development activities. These limitations suggest the critical need to carefully integrate KIP within the overall program recommended for

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Kotamadya institutional development over Repelita III. The overall effectiveness of the KIP in coordinating its activities which responsible Kotamadya and provincial agencies will depend on the adequate participation of such agencies at the policy, planning and implementation levels of the KIP in accordance with both their current capacities and responsibilities as well as on the potential to upgrade the same during KIP implementation. The current financial limitations of the Kotamadya when considered in the context of the current consumption levels of Medan's urban poor in the area of water supply and sanitation clearly suggest that the KIP program should give priority consideration to complementing the efforts of the existing public service agencies. This would be done by directly focusing and integrating KIP program development activities with the First Stage Programs for water supply and sanitation, and providing distribution networks, and environmental health services to complement major investments in basic infrastructure provided through the principal entities in Medan responsible for water and sanitation.

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SECTION 2

SELECTION OF KAMPUNGS TO BE IMPROVED

2.1 KAMPUNG TYPES AND CHARACTERISTICS

The identification of types of low-income kampungs (whose households are potential target groups for KIP and SSCH/LCH) is based on the analysis of 1972 aerial photographs for Kotamadya Medan complemented by extensive field work. The criteria used to define the five types of kampung are housing and land use characteristics which best reflect the common physical and socio-economic characteristics and problems associated with each type of kampung. The criteria used are gross residential density; vehicular/pedestrian access, configuration of circulation system, and other land use parameters (lot size, percent coverage of lot by dwelling unit, etc.); and, location with respect to the central commercial and peripheral areas of the Kotamadya.

In general, most of Medan's kampungs are homogeneous with respect to type. However, certain kampungs especially those contiguous to the central commercial district (for example, Kampung Mesjid and Pandau Hilir), are composed of more than one type. The five types identified for Medan can briefly be defined in the following manner:

- Kampung Lama (Old): The Kampung Lama surround the city's central commercial area on the east, south and north. They are also found along the Belawan, Binjei and Singamangaraja Roads, the major arteries radiating from the commercial area. These kampungs have medium to high residential densities (250-650 persons/hectare), with little raw land available for future population growth. Residential land use patterns are characterized by 6-8 m ROW secondary roads at 150-200 m between centre lines. An adequate coverage of public services presently exists along these principal secondary roads. However, due to the large amount of land available between secondary roads, much infill of a lower quality housing has occurred in the interior of these super blocks over the development life of this type of kampung. These interior areas generally have pedestrian access only, and are deficient in the full range of public services. The Kotamatsum are a good example of this type of kampung.

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- Kampung Pinggiran (Peripheral): The peripheral kampungs are found in a broad band surrounding the old kampungs and the middle- and upper-income residential areas of Kecamatan Medan Baru. They are found on the fringe of the Kotamadya's built-up area. Their residential densities are considerably lower than those encountered in the old kampungs (100-200 persons/hectare). Within the peripheral kampungs, much raw land is still available to absorb future population growth. However, due mainly to the advantageous location of certain kampungs with respect to the centre city employement market and land at relatively low prices, the peripheral kampungs have experienced varied growth rates. Several of these kampungs -- Sidorejo, Bantan, Tegal Sari, Sei Agul and Sei Putih Barat -- are presently experiencing population growth rates approximately double the rate for the entire Kotamadya (6 percent) while others have actually lost population over the last ten years. With the exception of larger lot sizes and lower percentage of lot coverage by the dwelling unit, residential land use patterns are similar to thsoe of the old kampungs. However, it is only over the last ten years that the area located off the principal secondary roads has begun to densify. This densification has been stimulated by the improved planning and construction of secondary roads of 4-5 m ROW linking the major secondary roads.

- Kampung Darurat (Temporary): The temporary residential areas of the city which are located along the Babura and Deli Rivers, along the rights-of-way of railways- and in close proximity to many of the city's markets exhibit the worst physical and socio-economic conditions found in the Kotamadya. In msot of these areas adequate sources of drinking water, suitable toiletfacilities and public refuse collection do not exist. Many areas are also subject to periodic flooding. Compared to the rest of Medan, residential densities are very high, reaching approximately 700 persons/hectare along the abandoned rail line in Kampung Mesjid. Access to the areas is primarily by poorly constructed and poorly drained footpaths. Individual lots are poorly defined and very small, with almost the entire area covered by the dwelling unit. Open space and recreational areas are almost non-existant.

- Institutional Kampung: For the purpose of this study, the institutional kampung is composed of those low-income residential areas provided by the military, railroad and other large organizations to their members/employees. The housing provided is usually in the form of 10-15 unit barracks with each family occupying approximately 50 sq m. Most of these areas are served by public water taps and pit latrines. Residential densities range from 250-450 persons/hectare. Access is usually by footpath. While obviously suffering many of the same physical and socio-economic problems of the previously defined kampung types, this type of kampung, due to its special characteristics, must bear the added burden of not being served by many of the city's albeit limited, maintenance and health programs.

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- Semi-rural Kampung: The semi-rural type of kampung contains the low-income residential areas found outside of the built-up areas of Medan and Belawan. They generally take the form of agricultural compounds composed of from 30-50 dwelling units or scattered houses found along the main roads radiating from the built-up areas. Residential densities are very low, usually below 50 persons/hectare. Public services, with the possible exception of electricity, do not exist. The household water supply comes from open, shallow wells. Pit latrines serve the purpose of human waste disposal. In comparison to the peripheral, and especially the old kampung, larger lot sizes provide the semi-rural family with a clean, attractive environment. Sufficient area exists for the proper spacing of latrine and well. The household also has the opportunity to cultivate a small piece of land for its own food supply. Solid wastes are well managed by burning, composting and feeding to animals.

The following Table 2.1 summarizes how Medan's low-income population is distributed among the five types of kampung. It can be seen that as of 1978, 78.6% of Medan's 1.12 million population resided within the five types of low-income kampung. Location of kampungs by type is illustrated graphically in Figure 2.1.

TABLE 2.1

DISTRIBUTION OF MEDAN'S LOW-INCOME POPULATION BY TYPE
1978

Type	1978 Population (persons)	Residential Density (persons/ha)	% of Total Kotamadya Population
Old	344,600	250-650	30.0
Peripheral	279,500	100-200	25.0
Temporary	58,300	250-799 [a]	5.2
Institutional	34,800	250-450	3.1
Semi-rural	160,400 [b]	50 [c]	14.4
Total	877,600		78.6 %

Note: a. Based on a sampling of kampungs contained in this type.
b. Based on the assumption that 75% of the population of Kotamadya Medan that lives in non-built-up areas is low-income.
c. Based on an estimate of occupied areas.

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2.2 LEVELS OF SHORT AND LONG TERM PROGRAMMING

The primary group to be served by Medan's KIP program contains approximately 682,400 persons. This total 1978 population includes those households presently residing in old, peripheral and temporary kampungs.

The success of KIP in providing basic essential urban infrastructure improvements depends on covering a large enough area in a short period of time to avoid "encroachment" or excessive movement of both lower and middle income households who have not received such improvements in their kampungs. However, too large an initial KIP program in Medan could overburden both the Kotamadya's technical and financial resources.

Given the financial and technical limitations which the Kotamadya will initially encounter in the implementation of a city-wide KIP program, it is recommended that a phased program (based initially on national and local government's capacity to sustain the program) be developed. This phased program will be expanded depending on the availability of additional national and local resources and/or financing from an international lending agency.

Table 2.2 indicates the population to be served by those different levels of KIP Repelita III programming which were analyzed during the study period. The first, the Domestic KIP Program already established by Cipta Karya, would cover approximately 200 hectares and be focussed only on physical upgrading investments at a per capita cost of about US$ 20. Additional funds would permit the expansion in both the hectare coverage (350 hectares) and per capita investment (US$ 40) over Repelita III. As shown in Table 2.2, this level would cover approximately 18 percent of the target population with physical, social and economic component services. Level 3, a Maximum Coverage option would cover 750 hectares and a target population of 300,000 persons (43 percent of the target population) by 1984. Per capita spending would be maintained at approximately US$ 40.

Given current conditions, the Maximum Coverage Program would overload the financial and technical capabilities of the Kotamadya*. In addition, the financial contribution required at the national level would exceed by a factor of four the amount allocated for KIP in Medan during Repelita III. Not only would a heavy reliance have to be placed on external financing, but also much of the technical expertise would have to be supplied by non-Kotamadya or Cipta Karya employees.

For the purpose of the present analysis, the Domestic Program combined with Option # 1 is recommended and has been developed as a phased program. The proposed phased program will provide minimal essential levels of basic infrastructure and services to approximately 20 percent of the target population during Repelita III.

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* The Maximum Coverage Program would require a maximum yearly contribution by the Kotamadya of approximately 20 percent of KIP related funds during Repelita III. This contribution would place an excessive burden on the city.

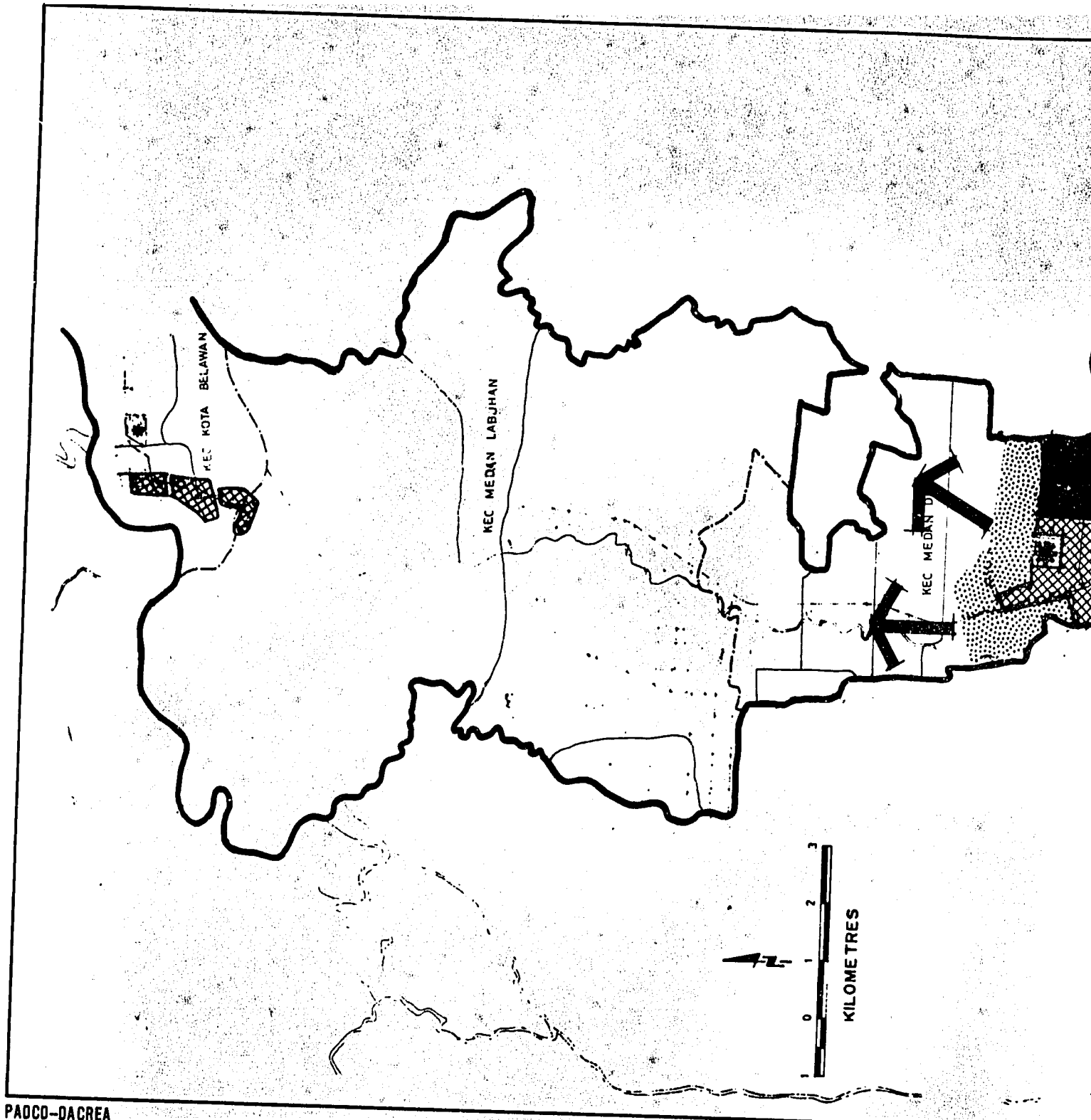

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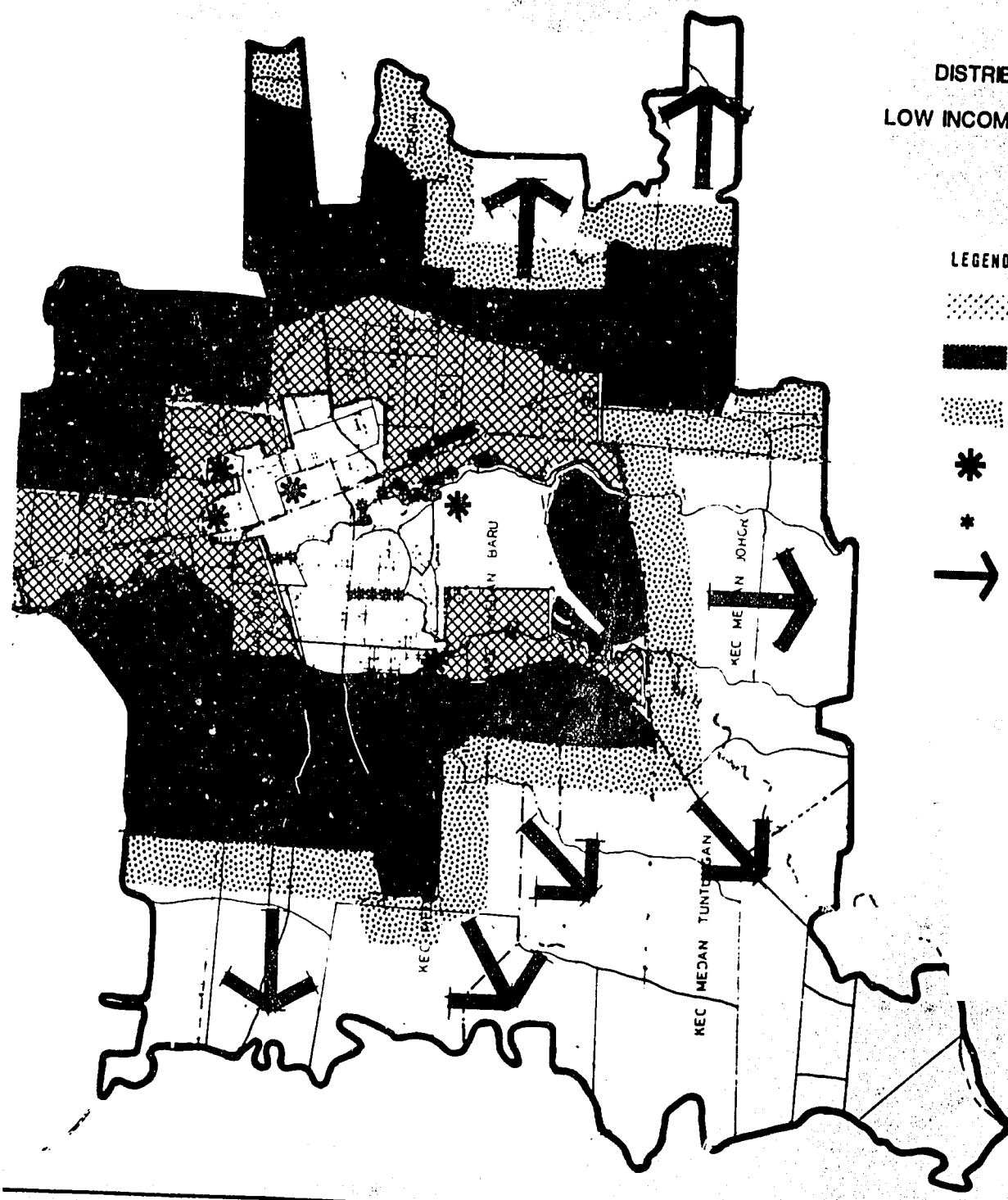
FIGURE



DISTRIBUTION OF MEDAN'S
LOW INCOME POPULATION BY TYPE

LEGEND

- OLD
- PERIPHERAL
- SEMIRURAL
- INSTITUTIONAL
- TEMPORARY
- PRESENT DIRECTION OF GROWTH

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TABLE 2.2

TARGET POPULATION SERVED BY CITY-WIDE K

Program	1979/84	84/89	89/94	94/2000	Total and Percentage of Target Group
1. Domestic Program (200 ha)	80,000 (11%)	80,000 (11%)	80,000 (11%)	80,000 (11%)	320,000 (44%)
2. Option # 1 (350 ha)	140,000 (20%)	210,000 (30%)	245,000 (35%)	245,000 (35%)	840,000 (120%)
3. Option # 2 (750 ha)	300,000 (43%)	400,000 (51%)	245,000 (35%)	245,000 (35%)	1,190,000 (170%)

* Percentages based on a total target population of 700,000 persons.

2.3 CRITERIA/SELECTION OF KAMPUNGS TO BE IMPROVED DURING REPELITA III

In an attempt to standardize the selection process for kampung improvement, the selection criteria recommended by Cipta Karya Directorat Perumahan have been adopted for Medan with slight modifications. These criteria are based on the following general guidelines:

- Physical condition (those areas with the worst conditions should be given priority for improvement).
- Population density (high densities should be given priority).
- Strategic location of kampung with respect to development trends of city.
- Age of kampung (older, well established kampungs should be given priority).
- The Kampung Improvement Program should be city-wide in scope.
- The kampungs selected for improvement -- mainly residential in nature -- should conform to the general land use patterns envisaged in the Master Plan.

The specific criteria used to evaluate the Kotamadya's priority low-income areas for KIP are presented in Table 2.3. These potential KIP areas were analyzed on the basis of existing data and an extensive field survey (see Section 3 on the Existing Situation in the Areas Selected for Kampung Improvement). The results of the application of these criteria and the subsequent ranking of the priority low-income areas are contained in Table 2.4.

TABLE 2.3

KAMPUNG SELECTION CRITERIA FOR KIP

Criteria	Weighting Factor	3 Point	2 Point	1 Point
1. Flooding	(3)	More than 50% of area regularly flooded	0.50% of area regularly flooded	Little or no flooding
2. Water Supply	(3)	Few individual shallow well; poor access to PAM Standpipe	Individual shallow wells; poor access to PAM Standpipe	Individual shallow wells with access to PAM Standpipe
3. Sanitation	(3)	No septic tanks, few individual pit latrines; use of streams and drainage channels	Prevalence of individual pit latrines	Many septic tanks, few individual pit latrines
4. Public Health	(3)	High incidence of disease	Average incidence of disease	Low incidence of disease
5. Present/Proposed Land Use	(1)	Residential	Mixed industrial/ commercial and residential	Industrial and commercial
6. Vehicular/Pedestrian Access	(2)	Poor; dwelling units located along narrow footpath or off of footpath	Fair; some paved secondary streets with much access from footpaths	Good, mainly access along paved secondary roads; little footpath access

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TABLE 2.3--Continued

Criteria	Weighting Factor	3 Point	2 Point	1 Point
7. Kampung Age	(2)	Pre 1945	1945-1960	Post 1960
8. Community Participation	(2)	Good	Fair	Poor
9. Residential Population Density	(2)	Greater than 550 persons/ha	Between 350 and 550 persons/ha	Less than 350 persons/ha
10. Household Income	(2)	Less than Rp.30,000/month	Between Rp.30,000--60,000/month	Greater than Rp.60,000/month
11. Location	(1)	Centre city	Inside Kotamadya boundary	Outside Kotamadya boundary
12. General Condition	(1)	Poor	Fair	Good
13. Housing Layout	(1)	Poor	Fair	Good
14. Public Schools	(1)	None	Poor coverage	Fair coverage
15. Impact or Improvement Program	(1)	High	Average	Low

Source: Cipta Karya, Direktorat Perumahan.

TABLE 2.4

APPLICATION OF KAMPUNG SELECTION CRITERIA TO MEDAN'S PRIORITY LOW-INCOME AREAS

Criteria / KIP Area [b]	1978 Population	Residential Area (ha)	Residential Density (persons/ha)	Point Score [a]															TOTAL
				Flooding	Water Supply	Sanitation	Public Health	Present/Proposed Land Use	Vehicular/Pedestrian Access	Kampung Age	Community Participation	Density	Household Income	Location	General Condition	Housing Layout	Public Schools	Impact of Improvement Program	
1. Kotamatsum I, II, III [c]	46,707	130.4	360	9	9	9	9	3	6	6	4	4	6	3	3	3	2	2	78
2. AUR	3,700	7.7	480	3	9	9	9	3	6	6	6	4	6	3	3	3	3	3	76
3. B. HAMDAN	4,600	9.6	480	3	9	9	9	3	6	6	4	4	4	3	3	3	3	3	72
4. Mesjid	1,400	5.0	280	6	9	9	9	3	6	6	4	2	4	3	3	2	2	3	71
5. TEGAL SARI I	20,600	31.8	650	6	6	6	9	3	6	6	4	6	4	2	3	2	2	2	67
6. SIDORAME BARAT	11,600	42.8	270	9	6	6	6	3	4	6	4	2	4	2	2	2	2	3	61
7. SIDORAME TIMUR	4,800	22.7	210	9	6	6	6	3	4	6	4	2	4	2	2	2	1	2	59
8. SEI KERA HILIR	14,400	41.4	350	6	6	6	6	3	4	6	4	4	4	2	2	2	2	2	59
9. Sei Kera Hulu *[d]	13,600	39.3	350	6	6	6	6	3	4	6	4	4	4	2	2	2	2	2	59
10. Durian	16,300	58.9	280	6	6	6	6	3	4	6	4	2	4	2	3	2	2	2	58
11. SEI KERA HULU	6,400	22.3	290	6	6	6	6	3	4	6	4	2	4	2	2	2	2	2	57
12. Sukaramai I	9,100	42.4	215	3	6	6	6	3	4	6	4	2	4	2	2	2	2	2	54
13. Sidorame Barat *	3,700	16.4	230	3	6	6	3	3	4	4	4	2	4	2	2	2	2	2	49
14. Sidorame Timur *	5,300	25.1	210	3	6	6	3	3	4	4	4	2	4	2	2	2	2	2	49
15. Sei Kera Hilir *	4,700	38.6	120	3	6	6	3	3	4	4	4	2	4	2	2	2	2	2	49
16. TEGAL SARI II	5,100	26.8	190	3	6	6	3	3	4	4	4	2	2	2	2	2	1	3	47
17. TEGAL SARI (MEDAN DENAI)	9,100	39.1	230	3	6	6	3	3	4	2	4	2	4	2	2	2	1	3	47
18. Sidorejo	26,974	175.2	150	3	6	6	3	3	4	2	4	2	4	2	2	2	2	2	47
19. Bantan	23,748	143.4	170	3	6	6	3	3	4	2	4	2	4	2	2	2	2	2	47
20. Tegal Sari I * (Medan Denai)	22,400	141.8	160	3	6	6	3	3	2	2	2	2	4	2	2	2	1	2	42
21. Tegal Sari II *	4,200	25.7	160	3	6	6	3	3	2	2	2	2	4	2	2	2	1	2	42

a. Point score includes the weighting factor shown in Table 2.3.
b. Those KIP areas which are capitalized have been selected for MUDS 250 ha KIP program.
c. KIP area previously selected for Cipta Karya/Kotamadya Medan pilot KIP program.
d. The sign "*" refers to the remaining low-income area contained in kampung selected previously for improvement as part of MUDS KIP.
Source: MUDS based on Cipta Karya criteria.

Based on this analysis of Medan's low-income kampungs, as well as on conversations held with key members of local government, and on discussions with Cipta Karya officials in Jakarta, ± 250 hectares are recommended for a First Stage Improvement Program during Repelita III. The general characteristics of the kampungs are shown in Table 2.5. Figure 2.2 shows their location within Medan.

TABLE 2.5

KOTAMADYA MEDAN AREAS SELECTED FOR KIP
1979

	Kampung	Population 1979	Residential Area (ha)	Residential Density (person/ha)	Major Physical Problems
1.	Tegal Sari	9,100	39.1	230	Streets, Water, Sanitation
	Tegal Sari I	20,600	31.1	650	Solid Waste
	Tegal Sari II	5,100	26.8	190	
2.	Sei Kera Hilir	14,400	41.4	350	Water, Sanitation, Solid Waste
	Sei Kera Hulu	6,400	22.3	290	
3.	Sidorame Barat	11,600	42.8	270	Water, Street Flooding
	Sidorame Timur	4,800	22.7	210	
4.	Aur	3,700	7.7	480	Water, Streets, Sanitation
	Hamdan	4,600	9.6	480	
	Total	80,300	244.2	330	

Source: MUDS

Should a Second Stage Improvement Program prove financially and technically feasible for Medan during Repelita III, the following KIP areas are proposed for improvement (Table 2.6).

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TABLE 2.6

KIP AREAS PROPOSED FOR SECOND STAGE IMPROVEMENT PROGRAM

KIP Area	Population 1979	Residential Area (ha)	Residential Density (persons/ha)
Mesjid	1,400	5.0	280
Sei Kera Hulu *	13,600	39.3	350
Durian	16,300	58.9	280
Sukaramai I	9,100	42.4	215
Total	40,400	145.6	280

* Remainder of kampung's low-income area (less KIP area selected by MUDS for First Stage).

Source: MUDS.

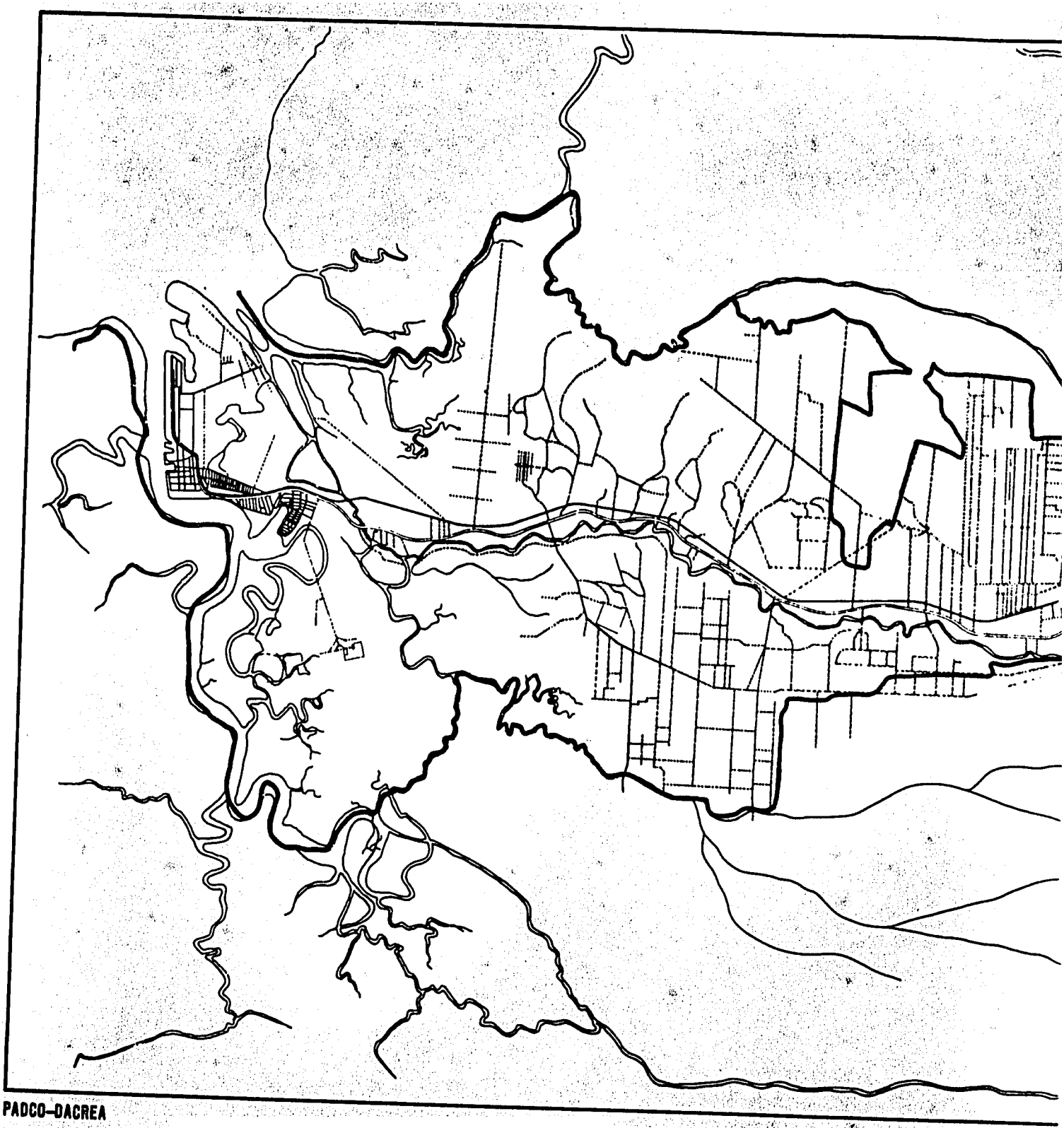

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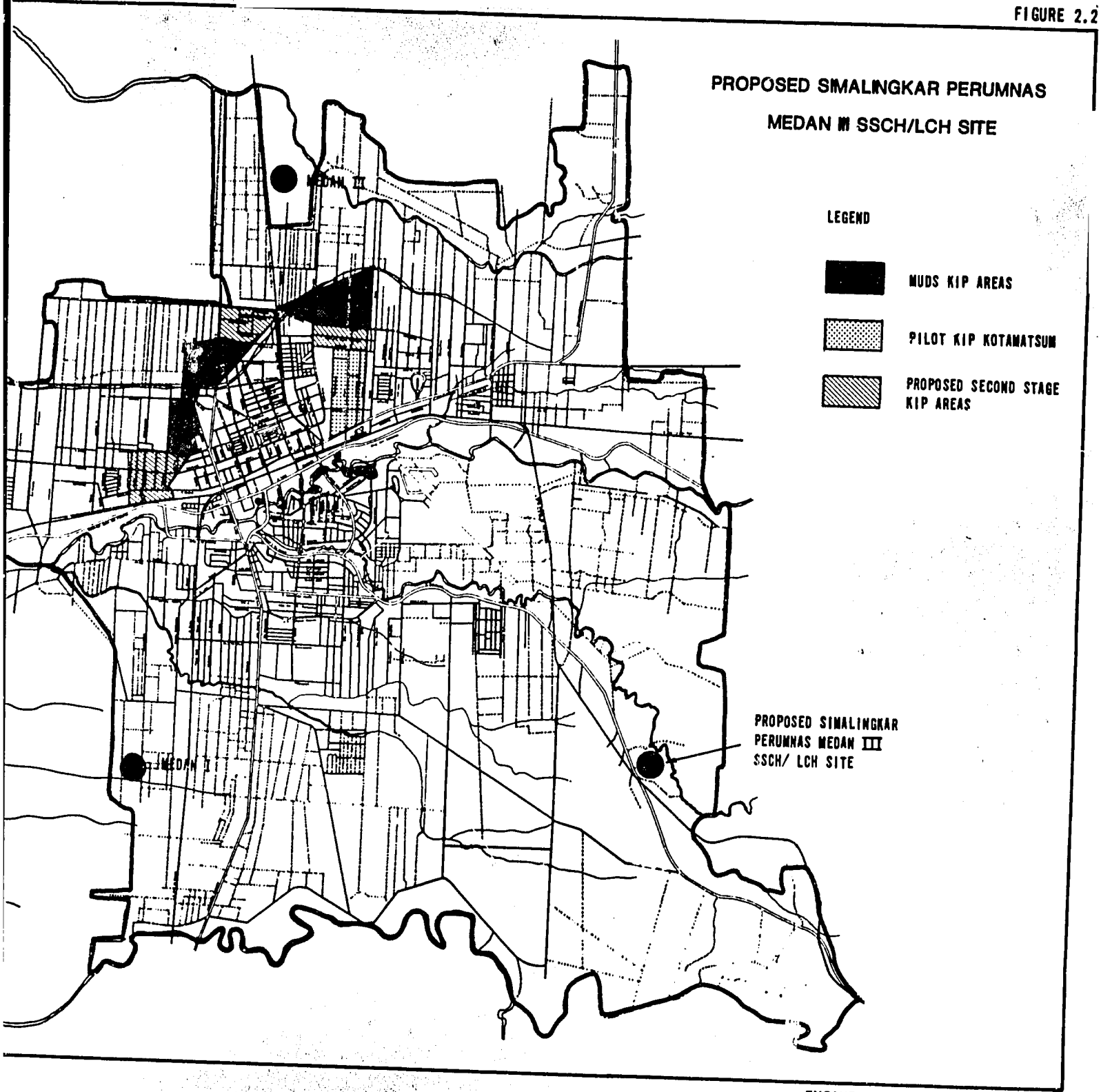
FIGURE 2.2



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SECTION 3

EXISTING SITUATION IN THE AREAS SELECTED FOR KAMPUNG IMPROVEMENT

In order to determine the needs and priorities of the kampungs selected for improvement over Repelita III, the existing physical and socio-economic situation will be investigated. The physical situation will be analysed with respect to:

- Land use patterns
- Housing condition and building materials
- Public infrastructure coverage
- Community facilities

While the following non-physical indicators will be investigated:

- Population and density
- Demographic
- Occupation/employment
- Household expenditure
- Consumption patterns

While an analysis of the selected kampung's existing situation will identify certain broad areas for improvement, it is imperative that the kampung residents themselves - including the head of lorong and kampung - as well as knowledgeable Kotamadya officials be queried as to the basic needs and priorities of the kampung.

Before embarking on the specific analysis of the existing situation in the KIP areas, a brief introduction to the Kotamadya's hierarchy of administrative subdivisions will be presented.

The entire 26,510 hectares of land comprising Kotamadya Medan are subdivided into kecamatans, kampungs and lorongs. Each kecamatan, the largest subdivision, contains a certain number of kampungs which, in turn contain a certain number of lorongs. The entire Kotamadya has 11 kecamatans, 116 kampungs and 1579 lorongs. For example, Kecamatan Medan which contains the central commercial district and many spontaneously developing KIP areas has 22 kampungs and 309 lorongs.

Each administrative subdivision has its corresponding head official. The head of a kecamatan is called a camat. He is appointed by the mayor and reports directly to him. His responsibilities include public security, general city-government functions, kecamatan development activities, collection and compilation of socio-economic and population data, assisting the Agragria department in land registration matters and site acquisition for Government projects, and political activities. The head of each kampung, the kepala kampung, assists the camat. With the guidance of the camat, the kepala kampung is elected by the residents of the kampung. He is primarily concerned with public security and the supervision of the development activities of the various Kotamadya departments and institutions sited within his kampung. He is chairman of L.S.D. (Lembaga Sosial Desa) and vice-chairman of L.M.D. (Lembaga Musyawarah Desa) (see Section 2.2.10 on Community Organizations). The kepala lorong or head of the lorong, assists the kepala kampung in many grass-roots activities. He is directly involved in "gotong royong" (self-help) activities and the collection of the Ipeda and Pajak Rumah Tangga (household) taxes. Historically, he has been the recipient of the few public water taps that have been installed by P.A.M. Tirtanadi. In summary, this administrative system not only provides the organizational structure required to effectively coordinate the various levels of the Kotamadya, but also facilitates the rapid exchange of information between the most remote corner of the Kotamadya and the mayor's office.

3.1 LOCATION OF KAMPUNGS SELECTED FOR KIP (FIRST STAGE)

Figure 3.1 show the location of the recommended first stage KIP areas within the Kotamadya. With the exception of the areas found along the Deli River, all are located on the heavily populated eastern side of the City, in Kecamatans Medan and Medan Timur. The KIP areas are found in a band between the high-density central commercial district and the periphery of the built-up area. All are located within 1-2 kilometers of the city centre.

3.2 POPULATION AND DENSITY

As of mid-year 1978, the population of the kampung areas selected for KIP was estimated to be 80,283. The residential area of this KIP population is 244 hectares*. Average density is 330 person/ha. Table 3.1 details these data for the individual KIP areas, and in addition, presents information relating to number of dwelling units/ha, household size and number of households per dwelling unit.

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* If the area and population of the ongoing pilot KIP program in Kotamatsum I, II and III are included in the Medan city-wide program for Repelita III, the KIP totals approach 350 ha and 120,000 persons. This KIP population represents approximately 18% of the total KIP target population.

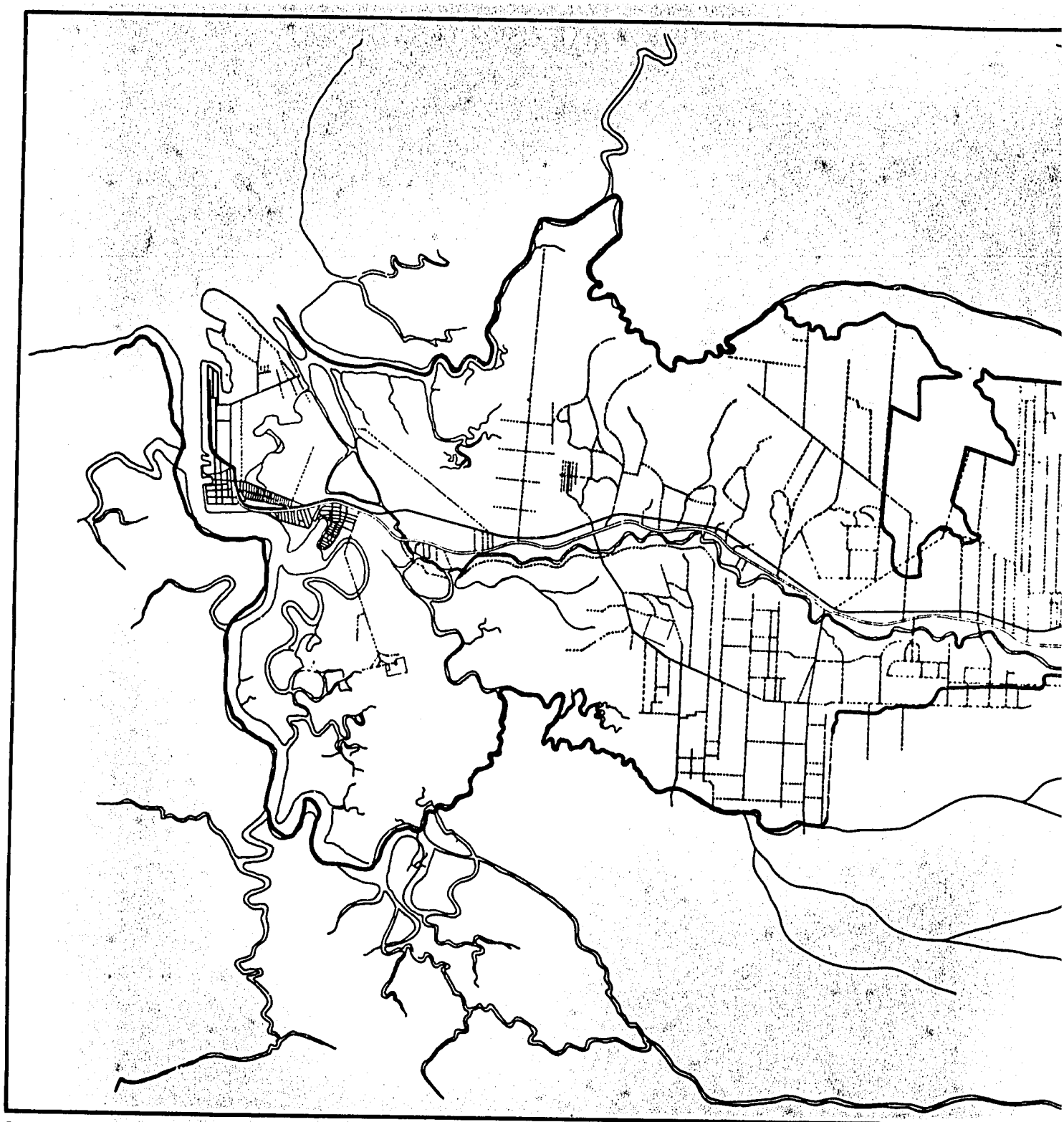

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FIGURE 3.1

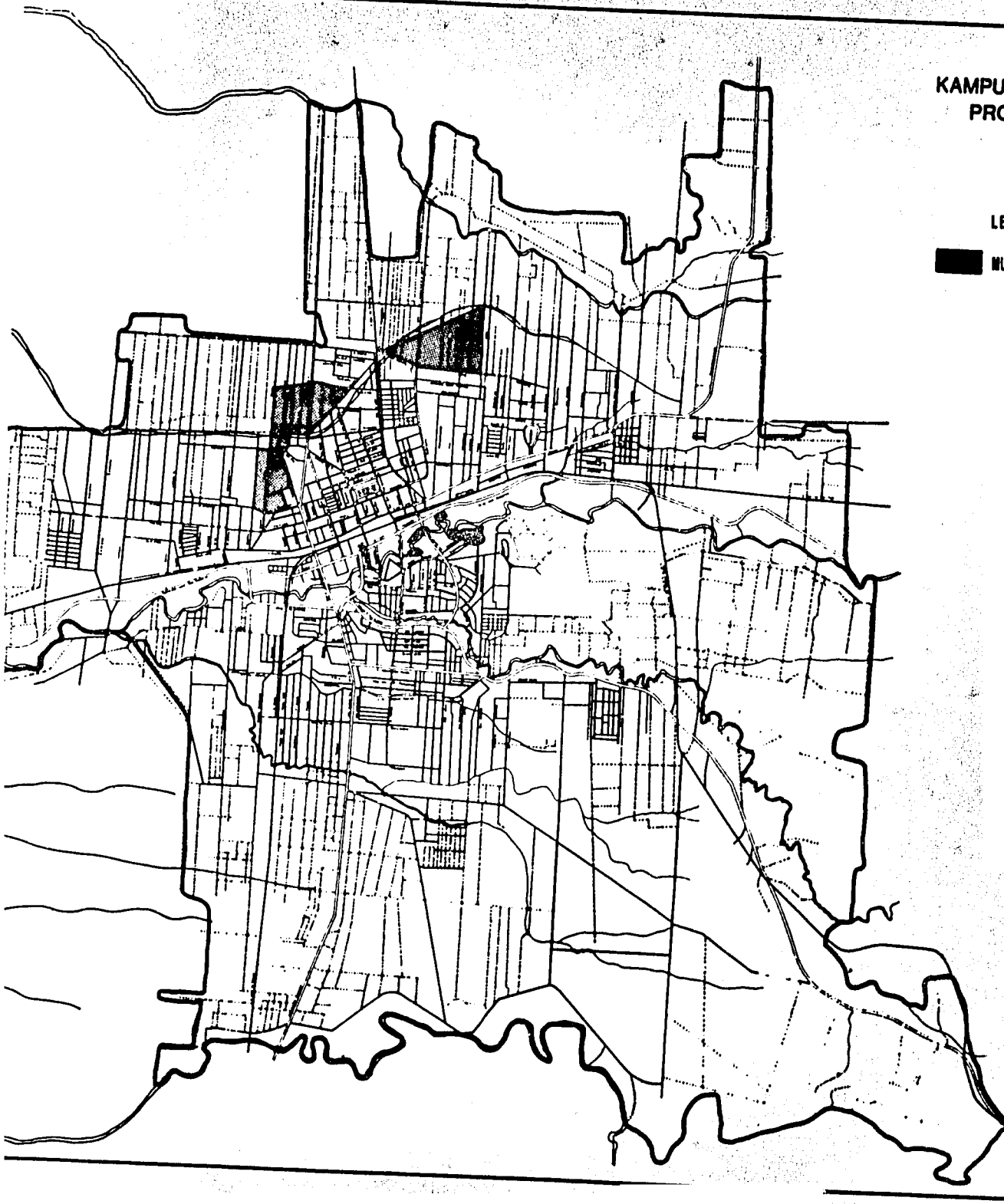

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TABLE 3.1

POPULATION AND DENSITY OF KAMPUNGS SELECTED FOR K.I.P.
MEDAN, 1978

Name of Kampung	Total Kampung Residential Area (Ha)	Partial Kampung Areas (Lorongs) Selected for KIP	Area of Lorongs Selected for KIP (Ha)	Estimated Number of Dwelling Units (D.U.)[a]	Estimated Number of Dwelling Units per Hectare (D.U./Ha)	Estimated Household Size (Persons/Household)[b]	Estimated Number of Households per Dwelling Unit (Households/D.U.)	Estimated Residential Density (Persons/Ha)	Estimated 1978 KIP Population (Persons)[c]
1. Hamdan, Jati, Polonia	29.04	Hamdan: Lorongs I,II, III,IV,V Jati: Lorongs VI,VII,VIII, IX Polonia: Lorong X	9.57	729	76	6.28	1.00	478	4574
2. Aur	20.68	Dalam, Mangkubumi, Lembah, Pantai Burung, Tanjung Meriam	7.67	694	91	4.83	1.09	476	3653
3. Sidorame Barat	73.58	Lorongs VI, VII,VIII,IX, XI,XIII,XIV, XV,XVI,XVII, XVIII,XIX,XX, XXI	42.76	1300	31	6.35	1.41	272	11640
4. Sidorame Timur	47.82	Lorongs: I, II,III,IV,V, VI,VII,VIII, IX,X,XI	22.72	646	29	6.70	1.11	212	4801
5. Sei Kera Hilir	61.60	Lorongs: VII, VIII,IX,X,XI, XII,XIII,XIV, XV,XVII,XVIII, XIX,XX,XXIV, XXVI	41.38	2232	54	5.92	1.09	348	14401

TABLE 3.1—Continued

Name of Kampung	Total Kampung Residential Area (Ha)	Partial Kampung Areas (Lorongs) Selected for KIP	Area of Lorong Selected for KIP (Ha)	Estimated Number of Dwelling Units (D.U.)[a]	Estimated Number of Dwelling Units per Hectare (D.U./Ha)	Estimated Household Size (Persons/Household)[b]	Estimated Number of Households per Dwelling Unit (Households/D.U.)	Estimated Residential Density (Persons/Ha)	Estimated 1978 KIP Population (Persons)[c]
6. Sei Kera Hulu	80.01	Lorongs: I,II, III,IV,V,VI, VII,VIII,IX,X, XI,XII,XIII, XIV,XV,XVI, XVII,XVIII	22.28	953	43	6.49	1.03	286	6369
7. Tegal Sari I	31.75	Lorongs: I,II, III,IV,V,VI, VII,VIII,IX,X, XI,XII	31.75	1975	63	8.26	1.26	648	20555
8. Tegal Sari II	50.38	Lorongs: I,II, III,IV	26.77	849	32	5.88	1.03	192	5141
9. Tegal Sari (Medan Denai)	180.89	Lorongs: V, VIIA,VII,VIII, IX,X,XI,XII, XIII,XIV,XV	39.11	1560	40	5.75	1.02	234	9149
Totals	575.75		244.01	10938	45	6.47	1.13	330	80,283

a. Number of dwelling units estimated by use of 1972 aerial photographs at scale of 1 : 5000.

b. Obtained from Kompilasi Data, Kantor Sensus and Statistik, Propinsi Sumatera Utara, September 1976.

c. Based on population registration figures maintained by Kotamadya Medan Kecamatan Offices.

SOURCE: MUDS elaboration based on information obtained from above-mentioned sources.

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3.3 LAND USE PATTERNS

The present section describes the land use patterns encountered in the areas selected for improvement over Repelita III. No attempt will be made at this time to discuss the land use patterns and trends found at the city-wide level (see Long Term Urban Development Plan, Section 15 for a discussion of this material).

While land use standards such as residential density, street width, distance between vehicular streets, and the percentage of total developed area for circulation vary greatly between the KIP areas, the actual utilization of land is quite similar. For this reason, it is possible to summarize the material contained in Figure 3.2 in the following sections. The KIP areas will be described with respect to the following land uses:

- Residential
- Industrial
- Mixed Industrial/Residential
- Commercial
- Mixed Commercial/Residential
- Government
- Education
- Health
- Religious
- Markets
- Transport Terminals
- Open Space/Sports Fields
- Small-scale Agriculture
- Cemetary
- Vacant Land

Appendix A contains the mapping of the KIP area land uses.

3.3.1 Residential

The Kotamadya's areas selected for KIP area are primarily residential in nature. The great majority of families live in single storey, single family dwelling units which vary greatly in type of construction materials from permanent to temporary. To a greater or lesser extent, these KIP areas have developed along major secondary roads radiating from

the central commercial district. These roads are usually spaced at 150-200 m intervals. Over the years, densification has occurred off these secondary roads along footpaths (1-4 m ROW). The footpaths are found at 50-60 m intervals. On the eastern side of the city, residential densities tend to decrease as one proceeds outward from the central commercial area. The highest KIP area densities of 650 and 475 persons/hectare are found in Tegal Sari I and Aur/Hamdan, respectively. These areas are located on the fringe of the downtown commercial district. The lowest densities of under 200 persons/hectare are found in Tegal Sari II and Tegal Sari (Medan Denai) on the periphery of the built-up area.

Housing condition and coverage of public services tend to decrease as one leaves the secondary roads and enters the interiors of the blocks. Along the secondary roads many permanent dwellings can be found with a full complement of public services. However, in the interiors, lower quality housing (making use of traditional materials such as bamboo and thatch) with a deficiency of public services are commonplace.

3.3.2 Industrial

There is presently very little industrial development to be found in the KIP areas. What does exist is generally very labor - intensive in nature - the wooden container factories in the Tegal Sari's. The one example of a fairly capital-intensive industry is the marquisa bottling plant located in Sei Kera Hulu.

3.3.3 Mixed Industrial/Residential

Once again, with the exception of the home shoe manufacturers, and a few small-scale milling and furniture operations located in the Tegal Sari's, there is little ongoing cottage industry to be found in the KIP areas. By far the best example, the shoe manufacturing, employs approximately only 50 families.

3.3.4 Commercial

As is true of the Kotamadya in general (including the downtown commercial centre), the KIP areas contain very few premises used strictly for commercial purposes. The few examples of commercial use include several large building material suppliers found on the rapidly densifying periphery of the built-up area (Tegal Sari I and II), a printing business loated in Sei Kera Hulu and a movie theater in Tegal Sari II.

3.3.5 Mixed Commercial/Residential

Mixed commercial/residential is the second most prevalent land use found in the KIP areas. Its main purpose is to serve the everyday immediate needs - food, clothing, household items, minor appliance and motorbike repair, etc. - of the KIP area residents, at the same time providing a home for the vendor. Most of these food shops, tailors, repairmen, warungs, etc. are located along the main secondary roads passing through the kampung. To a much lesser extent, they can be found sprinkled along the footpaths of the interiors. The shop itself is located in the front of the house facing the street, with the family's living quarters located in the rear of the dwelling.

LAND USE PATTERNS IN MEDAN
OCTOBER 1979

LAND USE TYPE / KIP AREA	INDUSTRIAL	MIXED INDUSTRIAL AND RESIDENTIAL	RESIDENTIAL	MIXED COMMERCIAL AND RESIDENTIAL	COMMERCIAL	GOVERNMENT	EDUCATION
HAMDAN JATI POLONIA	NONE	NONE	HIGH DENSITY (+675 PERSONS/HA) USAGE DEVELOPMENT ALONG 1-2 M FOOTPATHS LEADING FROM JL MULTATULI 1 ED DWELLING UNITS OCCUPYING ALMOST ENTIRE LOT	MANY SMALL TAILOR, REPAIR, AND FOOD SHOPS ALONG JL MULTATULI ± 20 OTHER FOOD SHOPS DISPERSED ALONG THE FOOTPATHS OF KAMPUNG HAMDAN	NONE (SEE MIXED - COMMERCIAL AND RESIDENTIAL)	HAMDAN KEPALA KAMPUNG OFFICE (NW CORNER OF LORONG I - JL MULTATULI) JATI KEPALA KAMPUNG OFFICE (NW CORNER OF LORONG VI - JL MULTATULI)	(PRIMARY SCHOOL (SD) - LORONG IV KAMPUNG HAMDAN
AUR	MAJOR REPAIR SHOP FOR TRUCKS LOCATED ON MAIN ACCESS TO LORONG TANJUNG MERAN FROM JL BRANDO	NONE	HIGH DENSITY (+675 PERSONS/HA) USAGE ACCESS TO DWELLING UNIT FROM 1-2 M FOOTPATHS ± 90 M² DWELLING UNIT OCCUPYING ALMOST ENTIRE LOT	LORONG MANGKUBUMI - MANY TAILOR, REPAIR, FOOD SHOPS AND SMALL RESTAURANTS FOUND ALONG JL ALMAR LORONG BATANG MERAN - MANY SHOPS LOCATED ALONG MAIN FOOTPATH ACCESS FROM JL KATAMSO (OTHER (LORONGS - SHOPS FOUND ON MAIN FOOTPATHS	NONE (SEE MIXED - COMMERCIAL AND RESIDENTIAL)	NONE	NONE
SIDORAME BARAT	LARGE WOODEN BOX FACTORY LOCATED OFF JL DURIAN (LORONG XIII)	NONE	MANY LARGE MASONRY HOMES (GREATER THAN 100 M²) FOUND ALONG JL LORONG DINO AND KARTO SMALLER HOUSES USING TRADITIONAL MATERIALS LOCATED OFF THESE MAJOR SECONDARY ROADS ALONG 1-3 M FOOTPATHS SOME SPONTANEOUS UPGRADING OF STOCK TO PERMANENT STRUCTURES	INTENSIVE C-R DEVELOPMENT ALONG JL DURIAN CONTAINING MANY SMALL ARTESANS TAILORS, FURNITURE MAKERS & REPAIR SHOPS, FOOD STORES, WARUNGS SIMILAR DEVELOPMENT TO LESSER EXTENT ALONG JL LORONG DINO, KARTO, AND DORONAT	NONE (SEE MIXED - COMMERCIAL AND RESIDENTIAL)	NONE	KINDER GARDEN (TK) PRIMARY (SD) AND JUNIOR - (SMP) BUDAI (LORONG XIII) PRIMARY (SD) P BULTON (LORONG XVI) PRIMARY (SD) AND JUNIOR (SMP) NHBP SIDORAME (LORONG XIX)
SIDORAME TIMUR	NONE	NONE	"SIMILAR TO DEVELOPMENT OF SIDORAME BARAT"	MANY SMALL SHOPS (TAILORS, REPAIR, FOOD AND WARUNGS) ALONG JL RAKYAT AND PERJUANGAN (LORONG SINO) ESPECIALLY AT INTER SECTION OF RAKYAT AND PERJUANGAN	NONE (SEE MIXED - COMMERCIAL AND RESIDENTIAL)	NONE	PRIMARY (SD) 060886 (LORONG II) PRIMARY (SD) 060886 (LORONG I)
SEI KERA HILIR	NONE	NONE	MAINLY SEMI-PERMANENT AND PERMANENT DWELLING UNITS WITH FULL COMPLEMENT OF PUBLIC SERVICES FOUND ALONG MAJOR SECONDARY ROADS (JL YAMIN, BU SALAMAH, BERILLA, ETC) RUNNING EAST-WEST AT INTERVALS OF 100-175 M. LESS PERMANENT DU FOUND IN INTERIORS	SPRINKLING OF SMALL SHOPS (FOOD, REPAIR, TAILORS, WARUNG) FOUND ALONG EAST - WEST SECONDARY STREETS, ESPECIALLY JL YAMIN C-R DEVELOPMENT ALSO FOUND ALONG NORTH - SOUTH JL IBRAHIM UMAR	LARGE PRINTING BUSINESS FOUND ON JL BU SALAMAH (LORONG XIV)	OFFICE OF THE KEPALA KAMPUNG, JL PAMPRAR (LORONG XXVI)	KINDER GARDEN (TK) PRIMARY (SD) JUNIOR (SMP) TAMAN HARAPAN (LORONG VI) (2) PRIMARY (SD) 060877 AND 060874 (LORONG IX) SD BATARA GURU (LORONG VII) SD PUBLIK (LORONG XIV) MADRASAH (LORONG XXVI) SD DHARMA (LORONG XXVI)
SEI KERA HULU	MARBUISA BOTTLING PLANT, JL. LUBUK KUDA (LORONG II)	NONE	MAINLY WELL SERVICED PERMANENT DWELLINGS FOUND ALONG SECONDARY ROADS SUCH AS JL SWAKPERCUT, LUBUK KUDA AND BONTOBA WITH HIGH DENSITY, LESS PERMANENT AND WELL SERVICED DWELLINGS FOUND OFF OF THESE ROADS ALONG 1-2 M FOOTPATHS	MANY SMALL FOOD AND REPAIR SHOPS SPRINKLED THROUGHOUT KAMPUNG WITH GREATEST CONCENTRATION TO BE FOUND ALONG JL YAMIN	BUILDING MATERIALS SUPPLIER LOCATED ON JL YAMIN (LORONG V)	OFFICE OF THE KEPALA KAMPUNG, JL LUBUK KUDA NEAR INTERSECTION WITH JL SENTOSA (LORONG XVIII)	MADRASAH AL ITIHADIYAH (LORONG II) PRIMARY (SD) SENTOSA (LORONG VI)
TEGAL SARI I	LARGE WOODEN BOX FACTORY OFF JL KERETA API (LORONG III)	COTTAGE INDUSTRY OF ABOUT 30 FAMILIES MAKING SHOES, LOCATED OFF JL BAKTI (LORONG V BEHIND SCHOOL)	KOTAMADYA'S HIGHEST DENSITY KAMPUNG WITH RESPECT TO PERSONS/HA. MAINLY SUBURBAN - ALL WELL SERVICED DWELLINGS ALONG MAIN ROADS WITH LESS PERMANENT (HIGHER USE OF TRADITIONAL MATERIALS) DWELLINGS WITH POOR PUBLIC SERVICES FOUND ALONG FOOTPATHS	SUKARAMAI MARKET IS AREA'S MAIN COMMERCIAL HUB MANY SMALL SHOPS (FOOD TAILORS REPAIR WARUNGS) FOUND ALONG JL BAKTI, KERETA API, AND SUTRISNO WHICH RADIATE FROM MARKET	1) BUILDING MATERIALS SUPPLIER , JL BAKTI (LORONG I) 2) BUILDING MATERIALS SUPPLIERS, JL SUTRISNO (LORONG III AND IV)	OFFICE OF THE KEPALA KAMPUNG LOCATED OFF OF JL KERETA API (LORONG II)	(2) PRIMARY (SD) INPRES, (6) PRIMARY (SD) 060804, 060805, 060809, 060828 (LORONG I), PRIMARY (SD) MUHAMADIYAH (LORONG II) PRIMARY (SD) KHAIRUL, BASTI-MAN (LORONG IV), PRIMARY (SD) AL INSLIYAH (LORONG VI) PRIMARY (SD) MUHAMADIYAH (LORONG IV)
TEGAL SARI II	NONE	2 SMALL HOME MILLING OPERATIONS (RICE AND CORN) (LORONG III) SMALL FURNITURE MAKER JL BRONO (LORONG I)	LOWER DENSITY AREA EASTERN PORTION APPROACHING PERIPHERY OF KOTAMADYA BUT PAREA MANY LARGE (GREATER THAN 100 M²) PERMANENT & SEMIPERMANENT DWELLINGS FOUND ALONG FOOTPATHS OF 4-5 M	JL BAKTI AND BRONO ARE THE MAIN AREAS WHERE FOOD AND REPAIR SHOPS WARUNG AND TAILORS ARE FOUND	BUILDING MATERIALS SUPPLIER, JL BAKTI (LORONG I) MOVIE THEATER JL BRONO (LORONG I)	NONE	PRIMARY (SD), JUNIOR (SMP) TEACHERS (PGA) AL ITIHADIYAH (LORONG II), PRIMARY (SD) MUHAMADIYAH (LORONG III) KINDER GARDEN (TK) AISYAH (LORONG IV)
TEGAL SARI (MEDAN DENAI)	SMALL WOODEN BOX FACTORY (LORONG VII A)	2 GROUPS OF 10 AND 12 FAMILIES RESPECTIVELY, MAKING SHOES IN THEIR HOMES (LORONG XII AND III)	NORTH OF JL SUTRISNO, HIGHLY DENSIFIED, SIMILAR IN RESIDENTIAL DEVELOPMENT TO TEGAL SARI I SOUTH OF JL SUTRISNO THE RESIDENTIAL DENSITY BEGINS TO DECREASE UNTIL SE CORNER ALONG JL BRONO IS ALMOST SEMI-RURAL SOUTHERN PORTION ADS POOR COVERAGE OF PUBLIC SERVICES	DUE TO AREAS RAPIDLY DEVELOPING NATURE ON PERIPHERY OF KOTAMADYA, LIMITED EXISTANCE OF SMALL SHOPS AND WARUNGS JL SUTRISNO / DENAI ONLY STREET WITH A LARGE AMOUNT OF C - R ACTIVITY	NONE (SEE MIXED - COMMERCIAL AND RESIDENTIAL)	NONE	PRIMARY (SD) AL MASLIAH (LORONG XV)

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DAN'S KIP AREAS

ATION	HEALTH	RELIGIOUS	MARKETS	TRANSPORT TERMINAL	OPEN SPACE SPORTS FIELD	SMALL SCALE ACRICULTURE	CEMETARY	VACANT LAND
HOOL 3 IV MOAN	1 PRIVATE PUSKESMAS, KAMPUNG MANDAN (LORONG I) JL. MULTATULI 1 POLYCLINIC, KAMPUNG MANDAN (LORONG I) JL. MULTATULI 1 DENTAL CLINIC, KAMPUNG MANDAN (LORONG V) JL. MULTATULI	4 SMALL MOSQUES KAMPUNG MANDAN (LORONG I & V) KAMPUNG JATI (LORONG VII) KAMPUNG POLONIA (LORONG X)	NONE (USE LOCAL VENDORS FROM KAMPUNG OR CENTRAL MARKET)	NONE	ALMOST NON EXISTENT 1 SMALL BADMINTON COURT, KAMPUNG MANDAN (LORONG V)	NONE	NONE	MOST VACANT LAND FOUND ALONG DELI RIVER ON SEVERE SLOPES WITH THREA OF YEARLY FLOODING SOME VACANT LOTS FOUND IN KAMPUNG JATI (LORONGS VII, VIII AND IX)
E	NONE	SMALL MOSQUE FOUND IN EACH OF FOLLOWING LORONGS: MANGKUBUMI, JENGAH, PANTAI BURUNG AND TANJUNG MERIAM	NONE (USE LOCAL VENDORS FROM KAMPUNG OR CENTRAL MARKET)	NONE	NO SPORT FIELD, EACH LORONG CONTAINS SEVERAL ± 50 m² CLEARED, COMPACTED EARTH PIECES OF PUBLIC LAND. APPARENTLY SERVE NO REAL PURPOSE.	NONE	NONE	ONLY VACANT LAND FOUND IN LORONG TANJUNG MERIAM, PROBABLY UNUSABLE DUE TO SEVERE SLOPES.
N (TK) AND JUNIOR - SI (LORONG XIII) P SULTON 1 AND JUNIOR - SIDORAME)	DOCTORS OFFICE (LORONG XVIII) BKIA (LORONG XVI) DOCTORS OFFICE (LORONG XVII)	7 SMALL MOSQUES (LORONGS VI, VII, XI, XII, XIV, XIII, XIX) 3 CHURCHES (LORONGS VI, XIII, XIX)	NONE (RESIDENTS USE DURIAN MARKET)	NONE	NONE	± 460 m² (LORONG XV) ± 680 m² (LORONG IX)	NONE	MANY 300-600 m² LOTS TOTALING APPROXIMATELY 1 HA FOUND ALONG SECONDARY ROADS, AND ALONG FOOTPATHS IN INTERIOR OF BLOCKS
080886 080886	2 DOCTORS OFFICE (LORONGS III AND X)	4 SMALL MOSQUES (LORONGS II, IX, X, XI) 2 CHURCHES (LORONGS I AND V)	NONE (RESIDENTS USE DURIAN MARKET)	NONE	NONE	TWO SMALL PLOTS IN LORONGS X AND IX TOTALING ± 500 m²	NONE	A FEW PARCELS OF VACANT LAND LOCATED MAINLY IN PERIPHERAL LORONGS X AND IX TOTAL AREA ± 2000 m²
EN (TK) JUNIOR (SMP) AN (LORONG VII) (CASE 77 AND 8 IX) IKU (LORONG XII) (ORONG XIV) (ORONG XXIV) (ORONG XXVI)	BERSALIN (MATERNITY CLINIC) (LORONG XIX), BKIA (MOTHER CHILD) (LORONG XI) DOCTORS OFFICE (LORONGS: (2) VII, IX, (2) X, (2) XI, XII, XIV, XVIII, (3) XXIV, XXVI)	LARGE MOSQUE (LORONG IX) SMALL MOSQUES (LORONGS IX, XI, XII, XIII, XVII, XVIII, XIX (3) XVIII, XXVI)	NONE (RESIDENTS USE BENGKOK MARKET)	NONE	NONE	MANY SMALL PLOTS DISPERSED THROUGHOUT KAMPUNG TOTAL AREA ± 3000 M	LARGE MOSLEM CEMETARY LOCATED BEHIND MOSQUE AND SCHOOL JL. BERALLA (LORONG IX)	MANY PLOTS IN RANGE OF 300-250 HA TOTAL AREA ± 1 HA
, TINADYAH 1 SENTOSA	BERSALIN (MATERNITY CLINIC) LORONG I), POLYCLINIC (LORONG II A) DOCTORS OFFICE (LORONGS II, VII, IX, XII, XVII, XVIII)	SMALL MOSQUES (LORONGS II, III, IV, XI, XIII)	NONE (RESIDENTS USE BENGKOK MARKET)	NONE	NONE	NONE	NONE	FEW REMAINING PARCELS OF VACANT LAND, MOST OF THOSE LEFT TO BE FOUND IN LORONGS X, XI AND XV
D) INPRES, (4) 080804, 5, 080828 IMARY (SD) LORONG XI SMAWAL (MAT - IV 1, PRIMARY YSM (LORONG VI) MUHAMADIYAH)	PUSKESMAS AND POLYCLINIC (LORONG I) PUSKESMAS (LORONG XI) DOCTORS OFFICE (2) LORONG I, (2) LORONG II)	LARGE MOSQUE (LORONG I) SMALL MOSQUES (LORONGS I, II, IV (2), V, VI (2), VII, X, XI (2), XII) CHURCH (LORONGS II AND VI) BUDDHIST TEMPLE (LORONGS VII AND IX)	NONE (RESIDENTS USE SUKARAMAI MARKET)	NONE	NONE	SEVERAL SMALL AGRICULTURAL PLOTS TOTALING ± 3000 m² FOUND IN LORONGS V AND VI	NONE	ALMOST NO VACANT LAND NORTH OF JL. SUTARNO AVAILABILITY OF VACANT LAND INCREASES AS ONE PROCEEDS SOUTH OF JL. SUTRENO AND EAST OF JL. SANTI ± 20 PARCELS AVERAGING 300 - 400 m² CAN BE FOUND
, JUNIOR (SMP) A) AL ITHADIYAH IMARY (SD) (LORONG III) (NITK) ONG IV)	BERSALIN (MATERNITY CLINIC) (LORONG II)	LARGE MOSQUE (LORONG II) SMALL MOSQUE (LORONG II) 21 SMALL MOSQUES (LORONG IV) CHURCH (LORONG III)	NONE (RESIDENTS USE SUKARAMAI MARKET)	NONE	NONE	NONE	NONE	SEVERAL FAIRLY LARGE PARCELS (750-800 m²) STILL AVAILABLE INCIDENCE OF VACANT LAND INCREASES AS ONE PROCEEDS EASTWARD THROUGH KIP AREA
) AL MASLIHA	MATERNITY NURSE (BIDAN) BERLIAZAN (LORONG VIII) BKIA (MOTHER/CHILD) (LORONG XII)	SMALL MOSQUE (LORONGS I, II (2), XII, XIII (2), XIV, XVII) CHURCH (LORONG XV)	NONE (RESIDENTS USE SUKARAMAI MARKET)	NONE	NONE	SOUTH OF JL. LAMBAR AS THE PERIPHERY OF THE BUILT-UP AREA IS APPROACHED, THERE STILL IS MUCH AGRICULTURAL AND VACANT LAND AVAILABLE (± 4-5 HA)	NONE	SEE SMALL-SCALE AGRICULTURE"

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3.3.6 Government

With the exception of a few Kepala Kampung offices (Hamdan, Sei Kera Hilir and Hulu, and Tegal Sari I), there are no government offices located in the KIP areas. The Kepala Lorong does not have an official office, but rather works out of his home.

3.3.7 Education

At first glance, it would appear that most KIP areas are fairly well served by primary (S.D.) schools. Primary schools are found within, or at a short distance (300-400 m) from, all KIP areas. However, upon closer examination and even before considering the schools' total capacity, it is apparent that many of these primary schools are private. Private schools imply costs that in most cases are not affordable by KIP area residents. Therefore, the real access of KIP area children to primary education must be primarily based on the capacity of the area's public primary schools - which according to Indonesian Law are free to absorb the children of primary school age (see Section 3.5 Community Facilities for an analysis of this coverage).

While it is not as crucial for junior (S.M.P.) and senior (S.M.A.) high schools to be located within walking distance of their pupils, and therefore a simple analysis of these schools location within or near the KIP areas would be misleading, it is still obvious that there exists a marked deficiency of these schools in the KIP areas. There are no public junior or senior high schools located in the KIP areas, and only four private junior high schools. In addition, there is a private teacher's high school in Tegal Sari II.

3.3.8 Health

The coverage and access of KIP area resients to health facilities varies greatly. As in the case of educational facilities, health facilities located in close proximity to the KIP areas should also be considered. Private facilities, especially hospitals and doctors' practices, due to their associated costs, would provide limited access to most KIP area residents. One KIP area (Aur) has no medical facilities, while another (Sidorame Timur) has only two doctors' offices. Public maternity clinics (Bersalin) can be found in Sei Kera Hilir and Hulu and Tegal Sari II. Mother/child clinics (B.K.I.A.) are located in Sidorame Barat, Sei Kera Hilir and Tegal Sari (Medan Denai). There are two public puskesmas in Tegal Sari I and polyclinics in Hamdan, Sei Kera Hulu, Tegal Sari I (see Section 3.5.2, Community Facilities, for analysis of health facilities coverage).

3.3.9 Religious

The religious composition of the KIP areas varies greatly. Certain areas such as Sei Kera Hilir and the Tegal Sari are predominantly Islamic in character, while others such as Sidorame Barat and Timur have a large percentage of Christian residents. The northern-most lorongs of Tegal Sari I and the KIP areas located along the Deli River have the largest concentration of Budhist residents. In general terms each of the three

major religious groups identified in the KIP areas are adequately represented with respect to physical facilities (see Section 3.5.3 for a distribution of each KIP areas' religious population as well as an analysis of facilities coverage).

3.3.10 Markets

While there are no large markets within the KIP areas, most residents have easy access to markets in adjacent kampungs or in non-KIP areas of their own kampungs.

3.3.11 Transport Terminals

There are no transport terminals located in the KIP areas. Most transport terminals are located along the Kotamadya's major regional access roads - Jl. Singamangaraja, Jl. Binjei, and the roads to Brastagi and Belawan.

3.3.12 Open Space/Sports Fields

With the exception of an occasional badminton or volleyball court, the KIP areas are completely deficient in open space and sports fields. The total KIP area does not contain one football field.

3.3.13 Small-scale Agriculture

Agricultural plots of any size can be found only near the periphery of the Kotamadya's built-up area (Sidorame Timur, Sei Kera Hilir, and Tegal Sari (Medan Denai). Only the KIP area in Tegal Sari (Medan Denai) has any appreciable quantities of land still dedicated to agriculture.

3.3.14 Cemetary

The only cemetary to be found in the KIP areas is located in Sei Kera Hilir.

3.3.15 Vacant Land

The incidence of vacant land approximates that of agricultural land. The high density KIP areas found along the Deli River and in Tegal Sari I are almost completely devoid of vacant land. One must approach the peripheral areas of Sidorame Barat and Timur, Sei Kera Hilir and Tegal Sari II in order to find many parcels of vacant land.

3.4 HOUSING QUALITY

All of Medan's predominantly low-income kampungs which have developed spontaneously - including the KIP areas - exhibit a wide range of housing quality and use of building materials. In general the worst housing conditions are to be found in the interiors of the "old" kampungs which surround the Kotamadya's downtown commercial district and in the "temporary" residential areas of the city located along the Babura and Deli Rivers, along the rights-of-way of railways and in close proximity to many of the

city's markets. In these areas, individual lots are poorly defined and very small with almost the entire area covered by the dwelling unit.

On the other hand, most of the existing good quality housing is found along the major secondary roads radiating from the Kotamadya's commercial centre. With the exception of the city's peripherial areas, the areas immediately adjacent to these secondary roads have an adequate coverage of public services such as water supply, electricity and storm drainage. Taking into account the fact that the quality of the housing stock varies greatly even within a particular low-income kampung two different methods will be used to evaluate the KIP area housing quality. The first is based on the Kotamadya's Tata Kota classification system. This system defines three classes of housing quality based on type of building material. Permanent structures are constructed with walls of stone, brick or concrete and roofs of asbestos cement or concrete tile while semi-permanent structures are those having walls of wood or wood and brick combinations and roofs of zinc. Temporary buildings are constructed of traditional materials such as bamboo and thatch and/or salvaged materials.

It should be mentioned that this definition relates only to building materials utilized in the construction of the dwelling unit and in no way reflects the residents own perception of anticipated period of occupancy or overall housing condition. In an attempt to better take into consideration the other aspects of the broader definition of housing such as the coverage of public services, the suitability of plot and street network layout and the kampung's overall environmental condition, a series of site surveys were conducted in the KIP areas. Using the above mentioned components of the broader definition of housing - including the condition of the dwelling unit, an admittedly subjective classification of the KIP areas' housing into good, fair and poor was made. A brief locational description of this classification system appears in Table 3.2 and a comparison between housing quality classification is presented in Table 3.3. (see Appendix A for the mapping of the results of the housing condition site surveys).

The results of the comparison of housing quality classifications contained in Table 3.3 indicate that, with few exceptions, more housing is classified as permanent than good on the one hand, and as temporary rather than poor on the other. These results are probably valid given the fact that it is not unusual to find a dwelling unit constructed of permanent materials in an area poorly served by public infrastructure located along a footpath with poor access to secondary roads. The reverse, in the case of temporary dwellings, is also true. Many houses constructed of some combination of traditional materials are often situated in an attractive environment along a secondary road well served by public infrastructure. In conclusion, the classification of housing quality undertaken by the project team probably presents a more accurate picture of the KIP area residents' own perception of the housing quality of their kampung.

LOCATION AND CONDITION

Condition	Hamdan, Jati, Polonia	Aur	Sidorame Barat	Sidorame
Good	Found along Jl. Multatuli, Kp.Jati (Lorongs VII,VIII,IX)		Limited amount of good housing along Jl. Lorong Gino and Jl. Ngalengko	At interse Jl. Lorong and Jl. Ra along part Karto, Per and Gurila
Fair	Greatest percentage of housing in this category; located mainly in interior of the three kampungs between Jl. Multatuli and Deli River	All housing of Lorong Dalam and along the major Access footpaths to the other lorong. For example, Gang Mantri and Kampung Aur (Lorong Lembah); two motor access footpaths (nameless) from Jl. Katamso to Lorong Pantai Burung	Most housing along other secondary roads (Jl.Demokrat, Gereja, Sejati, Mesjid, Dorowati) and along major footpaths (Pelita III Wongso, Kacung, Rejo, Tengah), and most footpaths running in north-south direction from Jl. Ngalengko, Gereja, and Gino	Along most streets (Pe Langgar, Ja footpaths (Sepakat, Tu Sederhana, Mestika, Ta Segar)
Poor	Found mainly along the banks of the Deli River and in some interior sections of Kp. Hamdan (Lorongs II, III, IV)	All housing of Lorong Mangkubumi and along the banks of the Deli River and off major access footpaths in Lorongs Lembah, Pantai Burung, and Tanjung Meriam	Pocket of poor housing usually found between narrow footpaths in poor condition. Major areas; surrounding intersection or Jl.Durian with Jl.Lorong Gino, in Lorong XVIII surrounding Gang Swadamara and Thamrin 2; in Lorong VI between Lorong Gino and Jl. Pelita III and in the interiors of Lorongs XIX, XX, and XXI	Major area i IX off footp Karya Bakti, and Martimba Sei Kera dra channel. Sr pockets in l surrounding Forsea and i interiors of I, II, VII, IX

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TABLE 3.2

:ION OF HOUSING FOUND IN MEDAN'S K.I.P. AREAS

OCTOBER 1979

rame Timur	Sei Kera Hilir	Sei Kera Hulu	Tegal Sari I	Tegal Sari II	Tegal Sari (Medan Denai)
ersection of rong Gino . Rakyat and parts of Jl. Pertemuan rila	Along Jl. Yamin and Ibrahim Umar (Lorong VIII and XII) Short distance along Jl. Ibu Salamah before intersection with Jl.Sentosa-baru. Short section along Jl. Pimpinan	Several sections of good housing along Jl. Sei Kera, Jl. Percut and Jl.Lubuk Kuda	Almost all good housing located in less densely populated areas south of Jl.Langgar (Lorongs I, V and VI)	Only a short strip along north side of Jl. Langgar just before crossing the Sei Kera	Many sections of good housing, especially in Lorong I and II. Other sections of good housing in Lorong III and IV along Jl. Bromo and along paved streets and major footpaths radiating from Jl. Bromo
nost other s (Perjuangan, r, Jati), and ths (Toba 1&2, t, Tukang Besi, ana, Waspada, a, Tanjung,	Vast majority of housing in western section of KIP area (Lorong VII,VIII, X,XII,XIV,XV, and XVII) and along major secondary roads of eastern section	Generally found along the major footpaths which radiate from the secondary roads (Jl.Yamin, Jl. Sei Kera, Jl.Percut and Jl.Lubuk Kuda)	Most all housing north of Jl.Langgar and some sections in Lorongs I,V, and VI	North of Jl.Langgar similar to Tegal Sari I — predominantly fair condition. South of Jl. Langgar roughly 50% fair condition	Generally located along footpaths and roads which run perpendicular to Jl. Bromo and beginning at a distance of ± 100 m north of Jl. Bromo
area in Lorong footpaths Bakti, Perintis ırtimbang, and ıra drainage ıl. Smaller s in Lorong V ınding Gang ı and in the ors of Lorongs VII, VIII and	2 large pockets in Lorongs IX and VIII of western section between Sei Kera and Jl.Ibrahim Umar and between Jl.Pimpinan and Gerilla) Large parts of eastern section, especially off main secondary street (Lorongs XVIII,XIX, and XXIV)	Worst housing found in areas poorly served by footpaths. In particular Lorong III, the northern parts of Lorongs VI and VII, the eastern part of Lorong XI, much of Lorong XV, and Lorong XVIII at the intersection of Jl. Lubuk Kuda and Sentosa	Almost all of northern tip (Lorong VII), a piece along the north side of Jl. Denai (Lorong XI and XII), and pockets of Lorongs I,V, and VI	Most of extreme northern section (Lorong V). Band bordered by Jl. Denai, Jl.Langgar, and Sei Kera with a width of ± 150 m and roughly 50% of newly developing area south of Jl. Langgar	Many small sections of poor housing dispersed throughout the KIP area's 4 Lorongs. Most poor housing found in areas poorly served by footpaths and at some distance from Jl. Bromo

TABLE 3.3

COMPARISON OF HOUSING QUALITY IN MEDAN'S KIP AREAS USING CRITERIA OF BUILDING MATERIAL AND CONDITION
OCTOBER 1979

Kampung	Building Material Classification* (No. of dwelling units)							Condition Classification** (No. of dwelling units)					
	Permanent	% of Kampung Total	Semi Permanent	% of Kampung Total	Temporary	% of Kampung Total	Total No of Dwelling Units	Good	% of Kampung Total	Fair	% of Kampung Total	Poor	% of Kampung Total
Hamdan, Jati, Polonia	31	4	298	41	400	55	729	37	5	510	70	182	25
Aur	14	2	250	36	430	62	694	–	–	382	55	312	45
Sidorame Barat	111	9	446	34	743	57	1300	78	6	1066	82	156	12
Sidorame Timur	142	22	202	31	302	47	646	52	8	510	79	84	13
Sei Kera Hilir	289	13	909	41	1034	46	2232	67	3	1786	80	379	17
Sei Kera Hulu	291	30	207	22	455	48	953	105	11	591	62	257	27
Tegal Sari I	208	11	659	33	1108	56	1975	237	12	1383	70	355	18
Tegal Sari II	266	31	376	44	207	24	849	204	24	552	65	93	11
Tegal Sari (Medan Denai)	137	9	764	49	659	42	1560	31	2	983	63	546	35
Total	1489	14	4111	37	5338	49	10938	811	7	7763	71	2364	22

* Based on a proportional distribution of P.M.D. Kampung-wide data with MUDS KIP area dwelling unit totals.

** Determined from a MUDS field survey.

SOURCE: MUDS elaboration of P.M.D. and field survey material.

3.5 INFRASTRUCTURE

The present section discusses the existing coverage of public service infrastructure in those Kotamadya areas selected for KIP during Repelita III. Tables 3.4-3.9 summarize this coverage and the maps contained in Appendix A present the material in greater detail.

3.5.1 Water Supply

Similar to the other residential areas of Kotamadya Medan, there are three main uses of water in the KIP areas: washing of clothing, bathing and drinking/cooking. However, unlike much of the upper-income areas of Polonia and Medan Baru and the 2-3 storey residential/commercial areas of the central commercial district, KIP area residents often meet their water needs from a combination of sources. Many KIP households obtain water for washing and bathing from one source and water for drinking/cooking from another. Table 3.8 presents a summary of the primary and secondary sources of water supply for KIP area residents and outlines the various sources' present service levels.

The prevalent source of water for washing and bathing in most KIP areas - Sidorame Barat and Timur, Sei Kera Hilir and Hulu, and the Tegal Saris - is individual shallow wells. Only in the high density areas along the Deli River (Hamdan and Aur) does one encounter the residents using the streams or public shallow wells for washing and bathing. In conjunction with an individual shallow well as a primary, relatively accessible, source of water for washing and bathing, many KIP area residents have access to a secondary water supply for drinking/cooking. These sources include the following:

- House-to-house water delivery by vendor.
- Water puchased from a connected neighbor (within 20-30 m) in areas partially served by P.A.M. distribution system.
- Water purchased at a public tap or institution (within 50-60 m) with P.A.M. water connection.

Only in the extreme northern section of Tegal Sari I are house-to-house water deliveries encountered. Due to the good coverage of the P.A.M. distribution system the purchase of water from a connected neighbor is fairly common in Sei Kera Hilir and Hulu. To a much lesser extent, parts of Sidorame Barat and Timur and Lorongs Dalam and Pantai Burung in Kp. Aur are also served in this manner. The KIP areas are poorly served by public water taps. The entire KIP area contains only 16 taps for a population of over 80,000 persons.

Those households without adequate access to one of these secondary sources of water supply are forced to use water from shallow wells for drinking and cooking. Most of the peripheral lorongs of Sidorame Barat and Timur and the Tegal Sari's are found in this category. There is no evidence that KIP area residents are using water from the Deli River for drinking.

TABLE 3.4

WATER SUPPLY AND SEWERAGE COVERAGE IN MEDAN'S KIP AREAS
OCTOBER 1979

Infrastructure Component	Kampung		
	Hamdan, Jati, Polonia	Aur	Sidorame Barat
Drinking Water Supply	Four principal sources of drinking water: P.A.M. Distribution System (along Jl.Multatuli), purchase from neighbor connected to P.A.M. System (within 20-30 m of Jl.Multatuli); from public taps located in Kp.Hamdan (Lorong I, IV, and V) and Kp.Jati (Lorong IX); and from public shallow wells in Kp.Hamdan (Lorongs I,II,III, IV) and Kp.Polonia (Lorong X).	Lorong Dalam - Most dwellings connected to P.A.M. System. Lorong Mangkubumi - Some individual shallow wells with pumps. Most households buy water from several P.A.M. connections on Jl. Alimin. Lorong Lembah - Many houses connected to P.A.M. along main footpaths (Gang Mantri and Kampung Aur); rest buy water from public tap on mosque's property. Lorong Pantai Burung - Most buy water from those households connected along main access footpaths. Lorong Tanjung Meriam - 2 waters and P.A.M. Distribution Line along main Lorong access footpath serve most households.	Most households have individual shallow wells for washing, Bathing and drinking if necessary. P.A.M. System found only along roads and major footpaths. Many large sections of KIP area not within 20-30 m of P.A.M. System (in order to buy from connected neighbor). No public water taps. Households not within easy access of connected neighbor drink from shallow wells (existence of some filters).
Sewerage	No public M.C.K.'s. Very few individual pit latrines due to high density and lot coverage of KIP Area. Most households use easily accessible Deli River. Some houses along Jl.Multatulis have individual septic tanks.	Lorong Dalam - Many indoor toilets piped individually directly to Deli River. Other Lorongs - Same as Hamdan, Jati, Polonia KIP area.	Predominantly individual pit latrines. No M.C.K.'s or other kinds of shared public or private toilets.

TABLE 3.4 — Continued

Infrastructure Component	Kampung		
	Sidorame Timur	Sei Kera Hilir	Sei Kera Hulu
Drinking Water Supply	No public taps. Pool coverage of P.A.M. Distribution System. Many sections of KIP area not within 20-30 m of P.A.M. connection consequently, many households drinking water from shallow wells.	Most households with individual shallow wells. Good P.A.M. System coverage gives many families realitively easy access to connected neighbor. Those sections poorly served by P.A.M. System, thus forcing households to drink from shallow wells, usually located in areas without easy access for pipe installation. KIP area's 1 puclic tap located in Lorong X.	As in case of Sei Kera Hilir, very good P.A.M. coverage. Most households, while having shallow wells, don't have to resort to using them for drinking. Access where water is being drink from shallow wells have very poor access even by footpath (Lorongs IV, V,XI,XII,XV, and XVI). Area's 1 public tap very poorly located in Lorong I next to Sei Kera drainage channel.
Sewerage	" Same as Sidorame Barat "	" Same as Sidorame Barat "	" Same as Sidorame Barat "

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TABLE 3.4 — Continued

Infrastructure Component	Kampung		
	Tegal Sari I	Tegal Sari II	Tegal Sari (Medan Denai)
Drinking Water Supply	Very poor P.A.M. coverage (only major streets, Jl. Kereta Api, Bakti and Langgar have Distribution Lines). High density northern section serbed by water vendors. South of this area most households use shallow wells for drinking water. 6 public taps located in Lorongs I (2), II, III, VI, and X. Water supply priority item.	Fair coverage of P.A.M. Distribution System (Jl. Bakti, Bromo, and major streets running perpendicular off Jl. Bromo). Diminishing P.A.M. coverage as periphery of Kotamadya built-up near is approached in eastern sections. Most households located outside of access area to P.A.M. system will get drinking water from individual shallow wells. 1 public tap located in Lorong IV.	P.A.M. Distribution System almost non-existent in this peripheral KIP area (only ± 150 m of Ø 2" feeder line along Gang Melati) no public taps. Almost entire population gets drinking water from individual shallow wells.
Sewerage	" Same as Sidorame Barat"	" Same as Sidorame Barat "	" Same as Sidorame Barat "

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TABLE 3.5

DRAINAGE & FLOODING AND SOLID WASTE COVERAGE IN MEDAN'S KIP AREAS
OCTOBER 1979

Infrastructure Component	Kampung		
	Hamdan, Jati, Polonia	Aur	Sidorame Barat
Drainage and Flooding	Mostly there are no drainage system such as footpath's side ditch generally building line of houses directly at the edge of footpath width in Lorongs II,III,IV,V of Hamdan there are a few of ditch, poor condition, made of mortar cement. In Lorong VIII of Jati there is channel with fair condition, made of mortar cement. Jl. Multatuli completed with side ditch along aroad, fair condition and made of concrete meterials. There are along river side of Deli River always flooding on rainy season.	In each parts of the area, there are no ditch or channel. Only in Tanjung Meriam, there is a ditch with uncontinous length, made of earth. The area long river side of Deli River, in each parts of kampung are always flooding on rainy season	Several roads are completed with channels or ditches. Jl.Durian and Jl.Gino have a channel on one side, fair condition, made of mortar cement. A few of roads have side ditch, poor condition, made of earth or mortar cement. In Lorongs XV and XVI there is a channel with fair condition, made of concrete. Several footpaths have a side ditch, poor condition, made of earth, such as in Lorongs VI, XI,XV,XVI,XVII,XVIII. There are some places which are flooding on rainy season such as in Lorongs VI up to IX,XI,XV up to XX.
Solid Waste	3 ways disposal of solid waste: To dump on side of Deli River, at open spaces, for occupants along the river. Thrown at side of Jl.Multatuli, sometimes collected by DKKP or burned by occupant along the street. A few of them heap and burned on vacant land off property. In general, disposal of solid waste is off households property due to the density of occupants. On rainy season some solid waste are carried away from sides of river. No containers.	Aur Dalam Aur Lembah Aur P.Burung Aur Tg.Meriam } dumped at side of river along Deli River Aur Mangkubumi: dumped at side of river along Deli River and thrown at side of road off property along Jl. Mangkubumi.	Solid waste disposal on household property, heaped and burned by most of occupants. Some occupant throw at side of road, vacant land or on footpaths to cover up mud/stagnant water. A lot of solid waste thrown at the end of footpaths. No containers.

TABLE 3.5 — Continued

Infrastructure Component	Kampung		
	Sidorame Timur	Sei Kera Hilir	Sei Kera Hulu
Drainage and Flooding	General condition are same as Sidorame Barat. Jl.Gino and Jl. Perjuangan have a channel on one side, fair condition made of mortar cement. A few of rods have side ditch on both side. Fair condition, made of mortar cement, and a few more which has poor condition, made of earth. Only a few of footpaths has a side ditch, poor condition, made of earth places which are flooding on rainy season particularly on south side part such as Lorongs I,III,IV there is Solang Saling River at the east side border.	Side ditch condition in one whole length of each roads may varied of poor and fair. They are made of earth, mortar cement or concrete. This condition encountered on Jl.Perjuangan, Jl.Pimpinan, Jl.Gurila, Jl.Ibrahim Umar, Jl.M.Jacob. Some footpaths has a side ditch such as in Lorongs X,XI,XIII, XVI,XVII,XVIII,XX,XXIV. Ditches material generally are earth, the others are concrete or mortar cement. The condition are varied of poor and fair. Stagnant area are in Lorongs X,XI, XII,XVII,XVIII,XX,XXIV,XXVI	Roads such as Jl.Sentausa, Jl. Sei Kera, Jl.Percut, Jl. Lubuk Kuda has a ditches on both side, fair condition, made of concrete. Footpaths ditches are found in Lorong III up to IX. Generally are made of earth, condition are poor. No flooding area, only stagnant area in Lorong II,III,V, IX,XV,XVII. There is Solang Saling River at the southeast side border.
Solid Waste	For occupant with enough courtyard, solid waste were heaped and burned by themselves, on their own household's property. Also on muddy footpaths or stagnant water, solid waste is used to cover up. On sides of road, solid waste were heaped and burned by occupant if it is not collected by DKKP. Dumped at side of Solang Saling River by occupant along the river. A lot of solid waste thrown at the end of footpaths. No containers	Most occupants heaped and burned solid waste on their own property. A lot of solid waste dumped at sides of river, beside bridge, along Solang Saling River. Occupant along Solang Saling River dumped at side of stream. No containers.	Some occupant dumped at side of Solang Saling River, especially at the end of footpaths and beside bridges. The rest of them heaped and burned on their own property or thrown on side of road footpaths. A specious vacant land at Lorong IV is used for dumping solid waste by occupant around it. No containers.

TABLE 3.5 — Continued

Infrastructure Component	Kampung		
	Tegal Sari I	Tegal Sari II	Tegal Sari (Medan Denai)
Drainage and Flooding	Ditches of some roads and footpaths are made of earth, their condition are poor. Only in Lorong V, there is a mortar cement ditch in fair condition. Flooding or stagnant area is in Lorong XII.	Ditches of some roads and footpaths generally are made of earth, their condition are poor. In Lorong II,III there are a few roads which has mortar cement ditches in fair condition. Flooding or stagnant area are in Lorong I,II, III.	Ditches of some roads and footpaths are made of earth, their condition are poor. Only in Lorong XI, there is a mortar cement ditch in fair condition. Flooding or stagnant area are in Lorong VIII, X,XIII,XV. There is Solang Saling River at the eastside border.
Solid Waste	Housing with high density (along Jl.Bakti, Jl. Kereta Api) throw solid waste at side of road during housewifes goes to the market. For occupant along the channel they throw at side of channel especially on the end of footpaths and on side of bridges. Along Solang Saling River, dumped at side of stream or thrown directly into stream and on rainy season some solid waste are carried away by stream. A lot of solid waste are thrown on footpaths to cover up mud or stagnant water. Some solid waste are thrown on vacant land and burned. The rest of them heap and burn on their own property/ yard. No containers.	" Same as Tegal Sari I "	" Same as Tegal Sari I "

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TABLE 3.6

ELECTRICITY COVERAGE IN MEDAN'S KIP AREAS
OCTOBER 1979

Infrastructure Component	Kampung		
	Hamdan, Jati, Polonia	Aur	Sidorame Barat
Electricity	Fair coverage of electrical distribution system are found in this kampung, except the very poor households, in relation to the cost of electrical connection. Exceptionally for Lorong IX Kampung Polonia, a very poor coverage of electrical distribution system is found. The reasons are: - the difficulty in allowance for electrical connection, due to the land owner (AURI = Indonesian Air Force). - the expenses for electrical connection are increase than normal price. At Lorong II & III's boundary, two illegal street lighting were found used by occupants.	Aur Dalam: A good coverage of electrical distribtuion system, in accordance with their income. Aur Mangkubumi: Very poor electrical coverage, only a few houses along the main road (Jl. Mangkubumi) were connected and some in the inside. Several electrical pole were found in the Kampung. Aur Tg.Meriam: Some houses along the main road and behind it, served by electrical system. Aur P.Burung & Aur Lembah: Electrical distribution system almost fair in this KIP area.	A good electrical distribution along the main roads were found here, nevertheless most occupants in this KIP area are not connected to electrical system due to the expenses for the connection are not attainable. Generally, good permanent dwellings were connected to municipal electrical system. No street lighting were found in this KIP area.

TABLE 3.6 — Continued

Infrastructure Component	Kampung		
	Sidorame Timur	Sei Kera Hilir	Sei Kera Hulu
Electricity	" Same as Sidorame Barat "	Nearly a great part of occupants along the main streets were served by municipal electrical connection. Except for the low income, the expenses for the connection and its maintenance are not attainable. The electrical network has spread through over the KIP area. Houses those are not connected by municipal electrical are occupants of the low income level. No legal street lighting were found here, but illegal street lighting were fit up by occupants on behalf of security (Lorong XI,XXIV,XVII,XVIII).	Municipal electrical network has reached through over the whole Sei Kera Hulu KIP area. Most households located along the main roads are capable to connect their dwellings to municipal electrical distribution. A great part of households located outside of main roads at Lorong IIA to Lorong IX are not capable to connect their dwellings to municipal electrical distribution. Some legal street lighting on the main road at Lorong XVI,XVII,XV. Some illegal street lighting fit up by occupant on behalf of security (Lorong II,III,V,VI,XVII,X).

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TABLE 3.6 – Continued

Infrastructure Component	Kampung		
	Tegal Sari I	Tegal Sari II	Tegal Sari (Medan Denai)
Electricity	Most households along Jl. Bakti and Jl.Kereta Api were served by municipal electrical distribution. Occupants on the west side of this KIP area (Lorong VII, VIII,IX,X,I & II) are good served by electrical connection according to their income (most of them are entrepreneurs). Residents in Lorong VIII, nearly all has electricity. The occupants on the eastside of this KIP area, generally consist of low income level are poorly served, although municipal electrical network has reached the whole KIP area. Good permanent dwellings generally has connection to municipal electrical system. Along Jl.Bakti municipal electrical street lighting has fit up. Some illegal street lighting were fit up by occupants on behalf of security.	For the greater part along Jl.Bakti (Lorong I, Tegal Sari I & Lorong I Tegal Sari II) were served by municipal electrical connection. Occupants on the west side of Tegal Sari (Lorong i & II for Tegal Sari I & II) are more capable to pay the expenses of electrical connection, compared to the east side of Tegal Sari. But the electrical network has reached almost the whole KIP area. In general, houses those are not connected by municipal electrical are occupants of the low income level. Good permanent dwellings generally has connection to municipal electrical system. Along Jl.Bakti municipal electrical street lighting has fit up. Several illegal street lighting were fit up by occupant on behalf of security.	Municipal electrical distribution has reached almost the entire of the Tegal Sari Denai KIP area, but a great numbers of occupants are not served by this, due to the expenses of an electrical connection which is unreachable by the low income resident. Only a few permanent houses which are scattered in Tegal Sari Denai are capable to connect their dwellings to municipal electrical distribution. Some illegal street lighting were fit up by occupant on behalf of security.

TABLE 3.7

ROAD & FOOTPATHS AND TRANSPORTATION COVERAGE IN MEDAN'S KIP AREA
OCTOBER 1979

Infrastructure Component	Kampung		
	Hamdan, Jati, Polonia	Aur	Sidorame Barat
Road & Footpaths	Entire of area coverage by Jl. Multatuli which has a width can be used for two ways system the existing of footpath network generally are reaches houses within the area, except houses on river side along Deli River. Mostly of footpaths has a width approximately 1.5 - 2 m, earth surface, they will muddy on rainy season. A few of them has mix of earth and stone surface. Fair condition particularly at upstream area.	Houses within the area are well served. Either by main roads in downtown area of secondary roads toward each part of kampung in tanjung meriam the footpath network cannot reach houses on river side along Deli River. The same condition are encountered in Mangkubumi and Aur Dalam. Footpaths surface generally are from earth, poor condition muddy on rainy season. Only in Aur Dalam general condition of footpaths are fair.	The existing roads are coverage all houses within the area. Location of several houses are outside of footpath service area such as in Lorongs VI,IX, XI,XIII,XIV,XV,XVI,XVII. Footpaths surface generally are earth or mix of earth and stone muddy on rainy season and fair on dry season. The network of secondary roads and footpaths are forming rectangular grid pattern.
Transportation	Bemos and motorized becaks passing through along Jl.Multatuli, where its location is side by side to kampung's area. Footpaths within the area which has sufficient width can be entered by motorized becaks. According to the regulation of operation time, after 18.00 o'clock pedal becaks can entering Jl.Multatuli, and also footpaths within the area which has acceptable width. No staging area.	Public transportation such as city bus, bemos, motorized becak, mini bus are passing through along several main roads in downtown area which are separating improvement area, such as Jl.Katamso, Jl.Suprapto, Jl. Mangkubumi. Only motorized becaks can entering each part of kampung via access way, also pedal becaks after 18.00 o'clock. No staging area.	Public transportation such as city bus and mini bus are passing through along Jl.Gino and Jl.Durian . Motorized becak and pedal becaks are operating on all streets and footpaths which has acceptable width, within the area. No staging area.

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TABLE 3.7 — Continued

Infrastructure Component	Kampung		
	Sidorame Timur	Sei Kera Hilir	Sei Kera Hulu
Road & Footpaths	Same as Sidorame Barat for secondary roads coverage seve-a ral houses locating out of footpath service area are in Lorongs I,II,V,VI,XI. Footpaths generally has earth surface or mix of earth and stone surface, muddy on rainy season particularly on south-side part the network of secon dary roads and footpaths are forming rectangular grid pattern.	The existing roads are cover-age all houses within the area A few houses locating out of footpath service area are in Lorongs VII up to XIV,IX,XX, XXIV,XXVI. Footpaths condition are fair, earth or mix of earth and stone surface. Rectangular grid pattern of the network of roads and foot-paths.	Same as Sei Kera Hilir for secondary roads coverage several houses locating out of footpath service area are in Lorong II,VI,IX up to XIII,XV,XVI,XVIII. Footpaths surface generally are fair, mix of earth and stone surfaces.
Transporta-tion	City bus and mini bus are passing through along Jl.Rakyat, Jl. Perjuangan, Jl.Gino. Bemos are passing through along Jl.Rakyat. Same as Sidorame Barat for moto-rized and pedal becaks operation. No staging area.	City bus, mini bus, bemo are passing through along Jl.M. Yamin. Mini bus are operating on Jl.Perjuangan, Jl.Pimpinan, Jl.Gurila and Jl.Ibrahim Umar. Motorized and pedal becak's operation are same as Sidorame Barat. No staging area.	City bus, mini bus and bemo's operation are same as Sei Kera Hilir. Mini bus generally are ope-rating on streets within the area. Motorized and pedal becak's operation are same as Sidora-me Barat. No staging area.

TABLE 3.7 — Continued

:ture	Kampung		
	Tegal Sari I	Tegal Sari II	Tegal Sari (Medan Denai)
	The existing roads are coverage all houses within the area several houses locating out of footpath service area are in Lorong III,IV,VII, VIII,IX,X,XI. Footpaths in Lorong VII up to XII are muddy on rainy season. Earth surface, in Lorong II,III,IV generally are better than others Lorong, mix of earth and stone surface, fair condition. Rectangular grid pattern of roads and footpaths network.	Same as Tegal Sari I for secondary roads coverage some houses locating out of footpath service area are in Lorongs I up to IV. Surface condition in one whole length of road or footpath may different. One part is fair further part is muddy and covered by grass, earth surface. Same as Tegal Sari I for roads and footpaths network pattern.	Same as Tegal Sari I for secondary roads coverage some houses locating out of footpath service area are in Lorong V,VIIA,VII,XI up to XV and on river side along Solang Saling River. Surrace condition generally are poor, muddy on rainy season. Earth surface, except in Lorong V,VII,VIIA, VIII,IX, generally are fair because most of them has sandy soil surface. Same as Tegal Sari I for roads and footpaths network pattern.
ıtion	Bemo are operating on Jl. Bakti. Motorized and pedal becaks are operating on all streets and footpaths which has acceptable width, within the area. No staging area.	" Same as Tegal Sari I "	" Same as Tegal Sari I "

TABLE 3.8

EXISTING WATER SUPPLY SYSTEMS IN MEDAN'S KIP AREAS
OCTOBER 1979

Existing Water Supply System / Item	Use of Individual Shallow Wells for Clothes Washing and Bathing in Combination with Additional Water Supply for Drinking			Use of Public Shallow Wells and Streams for Clothes washing and Bathing in Combination with Additional Water Supply for Drinking		Individually Shallow Wells/ Individual Hand Pumps for all Water Needs	Public Shallow Wells for all Water Needs
	House to House Water Delivery by Vendor	Water Purchased from A Connected Neighbor in Areas Partially Served by PAM Distribution System	Public Water Tap or Institution (Mosque or School) with PAM Water Connection	Water Purchased from A Connected Neighbor in Areas Partially Served by PAM Distribution System	Public Water Tap or Institution (Mosque or School) with PAM Water Connection		
MUDS KIP Areas served by Water Supply System	Northern Section of Tegal Sari I	Parts of Sidorame Barat and Timur, and most of Sei Kera Hilir and Hulu	Tegal Sari I and II, Sei Kera Hulu	Parts of Kp.Aur (Lorong Dalam, Pantai Burung, and Mangkubumi)	Parts of Hamdan, Aur (Lorongs Tanjung, Meriam and Lembah)	Part of Tegal Sari I, Parts of Sidorame Barat and Timur, most of Tegal Sari II and Tegal Sari (Denai)	Part of Hamdan and Tegal Sari (Denai)
Present Service Levels	In the few areas served in this manner, all households appear to be buying water from a becak vendor	In most cases, a connected house will sell water to approximately 10 additional households located either along the distribution line or behind the connected house within a distance of 20-30 m (plastic hose often used to transport water)	Irrespective of density, a 1 or 2-faucet tap serves an area with radius of roughly 50-60 m	"Same as under Individual Shallow Wells"	"Same as under Individual Shallow Wells"	With the exception of the low-income, high density kampungs located along the Deli River, most households have their own shallow wells (some with filters) located either inside house or in rear yard	The few public shallow wells in existence serve an area with a radius of roughl 25-35 m

SOURCE: MUDS

TABLE 3.9

ANALYSIS OF EXISTING STREET AND FOOTPATH NETWORK IN MEDAN'S KIP AREA

Kampung	Kampung KIP Area (ha)	Total Length of 2 Way Streets (m)	Total Length of 1 Way Streets (m)	Total Length of Footpaths (m)	Length 2 Way Streets/ KIP Area (m/ha)	Length 1 Way Streets/ KIP Area (m/ha)	Length Footpath/KIP Area (m/ha)
Hamdan	9.57	480	140	2,330	50.2	14.62	243.5
Aur	7.67	330	320	2,255	43.0	41.72	294.0
Sidorame Barat	42.76	1,055	1,545	6,645	24.7	36.13	155.4
Sidorame Timur	22.72	2,075	550	3,775	91.30	24.30	166.2
Sei Kera Hilir	41.38	3,405	0	7,180	82.30	0.00	173.5
Sei Kera Hulu	22.28	580	2,370	3,375	26.00	106.40	151.5
Tegal Sari I	31.75	2,340	2,310	5,830	73.70	72.80	183.6
Tegal Sari II	26.77	1,385	1,025	2,240	51.7	38.3	83.7
Tegal Sari Denai	39.11	1,050	2,930	4,890	26.9	74.9	125.0
Total	244.01	12,700	11,190	38,520	52.1	45.9	157.9

SOURCE: MUDS

3.5.2 Sewerage

In comparison to the varied types and service levels of water supply encountered in the KIP areas, the disposal of human wastes can be grouped into two main categories.

The great majority of KIP area residents have access to individual toilets located either inside the dwelling unit or in the rear yard. Most of these toilets are of the pit latrine variety. Some of the better permanent housing found along the major secondary kampung roads have septic tanks. The KIP areas where the use of pit latrines predominate include Sidorame Barat and Timur, Sei Kera Hilir and Hulu, and the Tegal Sari's. In these areas, public M.C.K.'s, or for that matter any type of shared public or private facility, are almost non-existent.

In those KIP areas found along the Deli River (Hamdan and Aur) high residential densities of approximately 500 persons/hectare, small lot size and almost total lot coverage by the dwelling unit do not permit the use of individual pit latrines. M.C.K.'s or other forms of shared public or private toilets are also not encountered. Due to the proximity and ease of access to the Deli River, most households use it for their human waste disposal requirements.

3.5.3 Drainage and Flooding

It can be seen from the drainage maps contained in Appendix A that good local drainage facilities are only found along certain main secondary roads. Good drainage facilities imply lined, open channels on both sides of the roadway designed for at least a one-year flood return period. The lining is achieved by cementing a drain constructed of brick or stone. This situation is typical to Jl. Multatuli in Hamdan, Jl. Rakyat in Sidorame Timur and Jl. Percut in Sei Kera Hulu. However, the majority of local drains found along secondary roads are in fair or poor condition, and are unable to handle the peak flows for which they were initially designed. Most are of the unimproved earth variety. Problems arise due to a lack of maintenance and the throwing of solid waste into them. In addition, there is no uniformity of condition of the local drains. One section will be well constructed and maintained - perhaps at the initiative of the residents themselves - while another will be clogged with garbage and overgrown with weeds. Finally, certain major secondary roads, Jl. Lorong Gino for example, do not have drains on both sides of the roadway.

While the condition of the drains associated with KIP area secondary roads is fair at best, footpath drains are generally poor to non-existent. The existing ones are constructed of earth. Their size is incapable of handling even a one-year flood flow.

Condition of existing drains and the lack of an integrated local drainage system is the main cause of local flooding and ponding in the KIP areas. Certain areas in Sidorame Barat and Timur, and Sei Kera Hilir are particularly bad in this respect. The KIP areas found along the Deli River face the problem of yearly flooding, but do have sufficient river-bank slopes to assure that they are not confronted during the wet season with perhaps the more serious problem of continual standing water.

3.5.4 Solid Waste

The disposal of solid waste is a serious problem confronting KIP area residents. The regular collection of solid waste by Dinas Kebersihan dan Keindahan Pertamanan (D.K.K.P.) is almost non-existent. As a result, residents are forced to dispose of solid waste as best they can. Those households with a sufficiently large lot might burn or bury their waste. The rest dump or pile their garbage at roadside, around markets, or in streams or drains. Residents of the peripheral areas of Sidorame Barat and Timur, Sei Kera Hilir and the Tegal Sari's generally burn their solid waste on their property or at curbside. Households having easy access to the Deli River or the Solang Saling River and Channel either dump their waste into the river or pile it along the shore to be carried away during the wet season. Residents of the high-density areas of Tegal Sari I and Denai have few alternatives but to throw their garbage at roadside on their way to market. Some vacant land is also used as a receptacle for solid waste. No D.K.K.P. curbside containers were identified in the KIP areas.

3.5.5 Roads and Footpaths

According to Cipta Karya's recommended guidelines for kampung infrastructure contained in "Pedoman Pelaksana Perintisan, Perbaikan Lingkungan, Perumahan Kota"* all Kip area households should live within 100 metres of a one-way road (4-6 m ROW) or 300 metres from a two-way road (6-8 m ROW). In addition, all dwelling units not located on a one-or-two-way road should be within 20 meters of a footpath. These same guidelines also recommend a coverage for one-way roads of 50-100 metres per hectare and for two-way roads of 0-33 metres per hectare. There should also be from 150-200 metres of footpath per hectare. Referring to Table 3.9 it can be seen that generally all KIP areas are quite well served by the combination of one and two-way streets. The coverage of the footpath network is not as good. All KIP areas have small sections which are not within 20 metres of a footpath. In most cases, however, this does not apparently present a problem to the residents. In the KIP areas, streets and footpaths, especially those which are unpaved, are generally in fair or worse condition. (see Tables 3.10 and 3.11). Most have an unimproved earth surface. The combination of the earth surface and the previously mentioned poor local drains have not been able to withstand the extremely wet conditions encountered during the rainy season. The local ponding seen in the KIP areas, in addition to causing severe public health problems, is also mainly responsible for the deterioration of the roadway surfaces. Some KIP area residents, in an attempt to combat these poor conditions, have surfaced individual sections of footpath with rubble from demolished masonry buildings and with small seashells.

3.5.6 Electricity and Street Lighting

As is the case with the P.A.M. water system, most KIP areas are within the existing electrical distribution network. All major secondary

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* Pedoman, Pelaksana Perintisan, Perbaikan Lingkungan, Perumahan Kota, Departemen Pekerjaan Umum, Direktorat Jenderal Cipta Karya, Direktorat Perumahan, Jakarta.

roads are served by electricity. Many of the block interiors are also served by feeder lines. Yet it is estimated that only 20 percent of KIP area residents are legally connected. The main deterrent to a massive electrification program in the KIP areas continues to be the large connection fee charged by P.L.N. Very few KIP residents are able to afford this initial lump sum payment of Rp.200,000 - 300,000.

TABLE 3.10

CONDITION AND LENGTH OF ROADS IN MEDAN'S KIP AREAS (km)

	4 to 6 m wide			Over 6 m		
	Good	Fair	Poor	Good	Fair	Poor
Hamdan	-	-	-	320	-	-
Aur	150	80	-	330	170	-
Sidorame Barat	370	765	240	1,465	-	-
Sidorame Timur	1,065	290	-	1,165	-	550
Sei Kera Hilir	600	-	-	2,805	-	-
Sei Kera Hulu	2,020	260	-	580	-	-
Tegal Sari I	95	1,605	440	1,105	610	785
Tegal Sari II	-	600	85	1,190	535	-
Tegal Sari Denai	-	2,420	510	850	200	-

Source: MUDS

Public street lighting in the KIP areas is almost non-existent. Even most major secondary roads - Jl. Bakti is an exception - have only temporary street lighting. The situation in the interiors of the blocks is even worse. Is most cases the only existing street lighting is provided by a small bulb and a crude reflector attached to the P.L.N. role.

3.5.7 Transportation

Appendix A shows the transportation services available within the KIP areas. With the exception of Jl. Katamso in the case of Aur and Jl. Yamin in the case of Sei Kera Hilir and Hulu, the KIP areas are generally not served by the Kotamadya's public bus routes. However, private sector bemo and mini-bus routes can be found on most secondary roads. Motorized and pedal becaks are the mode of transportation best serving the KIP areas. Depending on weather conditions, they are able to enter most footpaths of greater than 1.5-2 metre width. Becak staging areas can usually be found at the intersections of major secondary roads.

TABLE 3.11

CONDITION AND LENGTH OF FOOTPATHS IN MEDAN'S KIP AREAS (KM)

Kampung	0.5 to 2.0 m wide			2.0 to 3.0 m wide			3.0 to 4.0 m wide		
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Hamdan	370	1,210	515	-	120	-	-	110	-
Aur	-	1,090	710	375	130	-	60	-	-
Sidorame Barat	-	2,090	1,165	-	2,380	230	-	290	-
Sidorame Timur	-	2,015	515	-	885	245	-	330	-
Sei Kera Hilir	-	4,965	-	-	1,105	-	990	120	-
Sei Kera Hulu	-	1,870	-	-	1,300	-	-	365	-
Tegal Sari I	-	1,380	1,350	425	1,010	1,360	-	830	190
Tegal Sari II	-	810	120	-	575	170	-	125	120
Tegal Sari Denai	-	630	735	-	645	1,070	-	865	630

SOURCE: MUDS

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3.6 COMMUNITY FACILITIES

The following sections summarize the existing community facilities - education, health, religious and recreation - found in the KIP areas. This existing coverage will then be compared with Cipta Karya's recommended guidelines for kampung infrastructure which appear in "Pedoman, Pelaksana Perintisan, Perbaikan Lingkungan, Perumahan Kota".

3.6.1 Education

Cipta Karya's only guideline with respect to education facilities states that there should be one primary school for each 6000 persons. On further examination, it was determined that this standard is based on the 1969 publication of the Institute of Research and Education Development, "Standard Plans for School Building"*. While there obviously exists a deficiency of junior and senior high schools in the KIP areas (see 3.2.7 Education in the Land Use Section), no specific reference is made to these types of institutions in Cipta Karya's KIP infrastructure guidelines. For the present, therefore, only the existing coverage of primary schools will be analyzed.

While the Cipta Karya design standard might be appropriate for the planning of a new residential development, its application is quite awkward for purposes of checking the existing coverage of primary school facilities. In its place, we suggest new criteria based on the general premise that each child of elementary school age should have the opportunity to obtain a free education in a school located within his/her residential neighborhood. The specific criteria, in descending order of preference, to judge the adequacy of the KIP area's existing primary educational facilities are the following:

1. The entire primary school age population (roughly 16 percent of the total KIP area population) should be completely served by Government primary schools (S.D. Negeri) located within the KIP area itself (Based on 40 pupils per classroom).

2. The entire primary school population should be served by a combination of Government schools located within the KIP area and Government schools located outside of the KIP area, but ideally within 300-400 metres (a maximum of one kilometer would be acceptable) of the KIP area boundary.

3. The entire primary school population should be served by the above-mentioned combination of Government schools in conjunction with private schools located within the KIP area.

Table 3.12 analyzes the KIP areas based on these criteria. The following paragraphs briefly discuss each of the KIP areas with respect

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* "Standard Plans for School Buildings", Research Center of School Buildings, Institute of Research and Education Development, Bandung, 1969.

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TABLE 3.12

COVERAGE OF KIP AREAS BY GOVERNMENT AND PRIVATE PRIMARY SCHOOLS

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Hamdan, Jati, Polonia	S.D.N. 060904	3	2	394	240	732
(750 m)	S.D.N. 060788	6	2	448	480	
	060903	6	2	464	480	
	060193	6	2	503	480	
	060899	7	2	649	560	
		25	8	2064	2000	
(2000 m)	S.D.N. 060901	6	2	500	480	
	060906	5	2	450	400	
	060896	5	2	477	400	
		16	6	1427	1200	
Aur:						
Lorongs Dalam, Mangkubumi, and Lembah (300 m)	S.D.N. 060902	5	2	311	400	275
	060897	4	2	324	320	
		9	4	635	720	
Lorongs Pantai Burung & Tanjung Meriam (300 m)	S.D.N. 060788	6	2	448	480	310
	060903	6	2	464	480	
	060793	6	2	503	480	
	060899	7	2	649	560	
		25	8	2064	2000	

TABLE 3.12 — Continued

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Sidorame Barat	S.D. Siloam	7	2	150	560	1863
	S.D. Y.P.Gultom	4	1	200	160	
	S.D. H.K.B.P. I	8	1	396	320	
	II	14	1	380	560	
		33	5	1126	1600	
	S.D.N. 060786	4	2	436	320	
(250 m)	060792	4	2	451	320	
		8	4	887	640	
	S.D.N. 060855	6	2	689	480	
(100 m)	060856	6	2	633	480	
		12	4	1322	960	
	S.D.N. 060879	3	2	668	240	
(1000 m)	060868	5	2	675	400	
	060871	8	2	825	640	
		16	6	2168	1280	
	S.D.N. 060966	6	1	248	240	
	060872	4	2	410	320	
	060875	4	2	423	320	
	060879	3	2	250	240	
		17	7	1331	1120	

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TABLE 3.12 — Continued

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Sidorame Barat (Continued)	S.D.Inpres					
	064017	6	1	347	240	
	S.D.N. 060851	3	2	347	240	
(500 m)	060852	3	2	281	240	
	060853	3	2	376	240	
	060803		Moved to S.D. Inpres 064017			
		15	7	1351	960	
	S.D.N. 060869	4	2	565	320	
(500 m)	060867	5	2	676	400	
	060876	6	2	642	480	
		15	6	1883	1200	
	S.D.N. 060860	4	2	400	320	
(550 m)	060865	5	2	450	400	
		9	4	850	720	
Sidorame Timur	S.D.N. 060855	6	2	689	480	769
	060856	6	2	633	480	
		12	4	1322	960	
	S.D. G.K.P.S.	9	2	623	720	

TABLE 3.12 — Continued

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Sei Kera Hilir	S.D.N. 060874	5	2	600	400	2305
	060877	4	2	500	320	
		9	4	1100	720	
	S.D. Publik	3	2	200	240	
	S.D. Harapan I	6	I	639	240	
	II	5	1	506	200	
	S.D. Dharma	6	1	225	240	
	S.D. Bt.Guru	12	1	544	480	
		32	6	1914	1160	
	S.D.N. 060855	6	2	689	480	
(400 m)	060856	6	2	633	480	
		12	4	1322	960	
	S.D. Inpres 064017	6	1	347	240	
	S.D.N. 060851	3	2	347	240	
	060852	3	2	281	240	
(200 m)	060853	3	2	376	240	
	060803		Moved to S.D. Inpres 064017			
		15	7	1351	960	

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TABLE 3.12 — Continued

Kli[illegible] Area	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Sei Kera Hilir (Continued) (800 m)	S.D.N. 060858	6	2	369	480	
	060857	6	2	357	480	
		12	4	726	960	
Sei Kera Hulu	S.D. Sentosa	3	2	140	240	1020
	S.D. Al Itihadyah	5	2	400	400	
		8	4	540	640	
(200 m)	S.D. Inpres 064017	6	1	347	240	
	S.D.N. 060851	3	2	347	240	
	060852	3	2	281	240	
	060853	3	2	376	240	
	060803		Moved to S.D. Inpres 064017			
		15	7	1351	960	
(350 m)	S.D.N. 060854	3	2	323	240	
Tegal Sari I	S.D. Inpres 064958	6	1	250	240	
	S.D.N. 060804	5	2	318	400	3289
	060800	5	2	360	400	
	060821	4	2	356	320	
	060828	4	2	357	320	
		24	9	1641	1680	

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TABLE 3.12 — Continued

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Tegal Sari I (Continued)	S.D.Muhamadiyah 7	4	2	125	320	
	S.D. Al Wasliyah	8	2	322	640	
		12	4	447	960	
(250 m)	S.D.N. 060824	4	2	293	320	
	060816	5	2	447	400	
		9	4	740	720	
(400 m)	S.D.N. 060825	4	2	340	320	
	060811	5	2	539	400	
		9	4	879	720	
(350 m)	S.D.N 060802	3	2	253	240	
	060787	3	2	251	240	
	060789	3	2	247	240	
	060796	4	2	274	320	
	060797	3	2	251	240	
	060798	3	2	251	240	
		19	12	1561	1520	
Tegal Sari II	S.D. Al Itihadiyah	17	1	980	680	823
	S.D. Muhamadiyah	11	1	465	440	
		28	2	1445	1120	

TABLE 3.12— Continued

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Tegal Sari II (Continued) (450 m)	S.D.N. 060824	4	2	293	320	
	060816	5	2	447	400	
		9	4	740	720	
(400 m)	S.D.N 060825	4	2	340	320	
	060811	5	2	539	400	
		9	4	879	720	
(250 m)	S.D.N. 060802	3	2	253	240	
	060787	3	2	251	240	
	060789	3	2	247	240	
	060796	4	2	274	320	
	060797	3	2	251	240	
	060798	3	2	285	240	
		19	12	1561	1520	
(400 m)	S.D.N. 060794	4	2	279	320	
	060791	4	2	432	320	
		8	4	711	640	
Tegal Sari (Medan Denai)	S.D. Al Wash-liyah	5	2	314	400	1464

TABLE 3.12 — Continued

KIP Area[a]	School Identification[b]	Number of Classrooms	Number of Sessions	Estimated Current Attendance	Estimated Ideal Attendance[c]	Estimated Catchment Population For KIP Area[d]
Tegal Sari (Medan Denai) (Continued) (550 m)	S.D.N. 060824	4	2	293	320	
	060816	5	2	447	640	
		9	4	740	960	
(850 m)	S.D.N. 060825	4	2	340	320	
	060811	5	2	539	400	
		9	4	879	720	
(750 m)	S.D.N. 060802	3	2	253	240	
	060787	3	2	251	240	
	060789	3	2	247	240	
	060796	4	2	274	320	
	060797	3	2	251	240	
	060798	3	2	285	240	
		19	12	1561	1520	
(400 m)	S.D.N. 060794	4	2	279	320	
		4	2	432	320	
		8	4	711	640	

a. Below the horizontal dashed line are found the primary schools serving the KIP area, but located outside of it. Within the brackets ( ) is found the distance of the primary school from the KIP area boundary.

b. Schools beginning with the abreviation S.D.N. (Sekolah Dasar Negeri) are Government Schools; all others are private.

c. Estimated total attendance is based on 40 pupils per classroom per session.

d. Estimated catchment population is based on 16 percent of the total KIP area population.

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to the coverage of existing primary school facilities. Finally, Figure 3.3 analyzes graphically the catchment areas (assuming a catchment radius of 400 metres) of the government primary schools serving the KIP areas.

Hamdan

The KIP area of Hamdan, Jati and Polonia has one school to serve its primary school age population of over 730 pupils. This public school is ideally able to accommodate roughly one-third of this population. Within approximately 250 metres of the KIP area boundary and across the Deli River, however, there is a large government complex (four primary schools) with sufficient capacity to easily take care of Hamdan's excess population. In addition, there is another government complex of three primary schools located about two kilometres from the KIP area which presently serves the Hamdan area and can be expected to continue to serve it in the future.

Aur

The five lorongs which comprise the Aur KIP area have no primary schools within their KIP boundaries. However, the relatively small primary school population of 275 pupils in Lorongs Dalam Mangkubumi and Lembah is easily served by a public school located immediately adjacent to Lorong Mangkubumi. The other three lorongs' primary school age population is also easily accommodated in the previously mentioned government complex located on Jl. Katamso at a maximum distance of 300 metres from the furthermost lorong boundary.

Sidorame Barat

The KIP area of Sidorame Barat has no public primary schools. There are three private schools with a total enrollment of over 1100 pupils. While these schools would certainly absorb a certain percentage of the total primary school age population of over 1850 students, Government schools would be expected to play the major role in serving this population. Within 500 metres of the KIP area, there are five Government complexes (14 primary schools) with an enrollment of almost 6300 pupils. Within 1000 metres, there are an additional seven schools with an enrollment of almost 3500 pupils. While these Government schools are located outside of the KIP areas, and thus have their own neighborhood catchment populations to serve, it is felt that they could also provide the classroom space required for Sidorame Barat.

Sidorame Timur

The two Government schools found in Sidorame Timur more than adequately serve the primary school age population of almost 800.

Sei Kera Hilir

It is estimated that in the KIP area of Sei Kera Hilir there are slightly more than 2300 pupils of elementary school age. Of this total, approximately one-half is presently served by two Government schools. There are also four private schools whose total enrollment of over 1900

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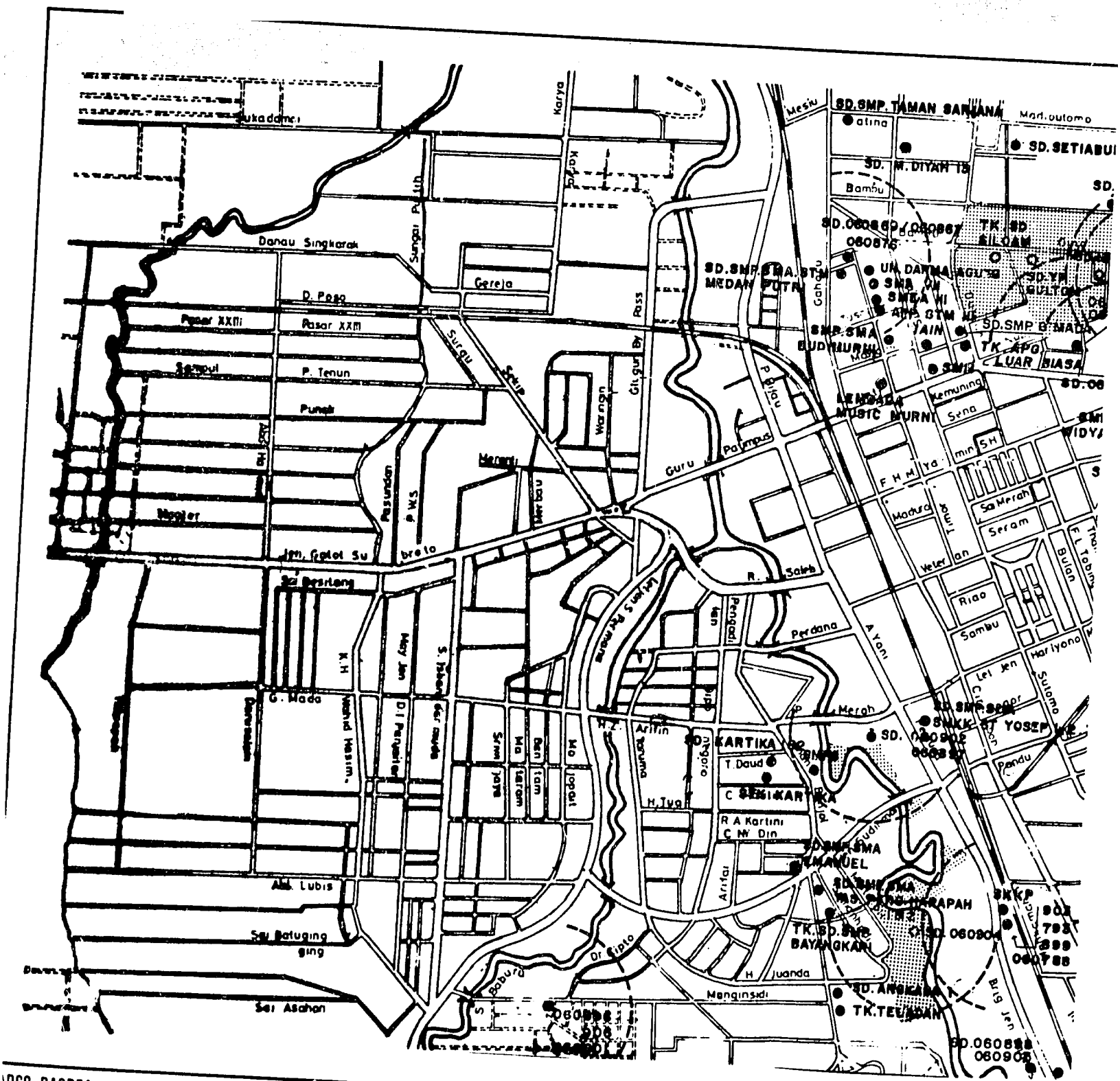
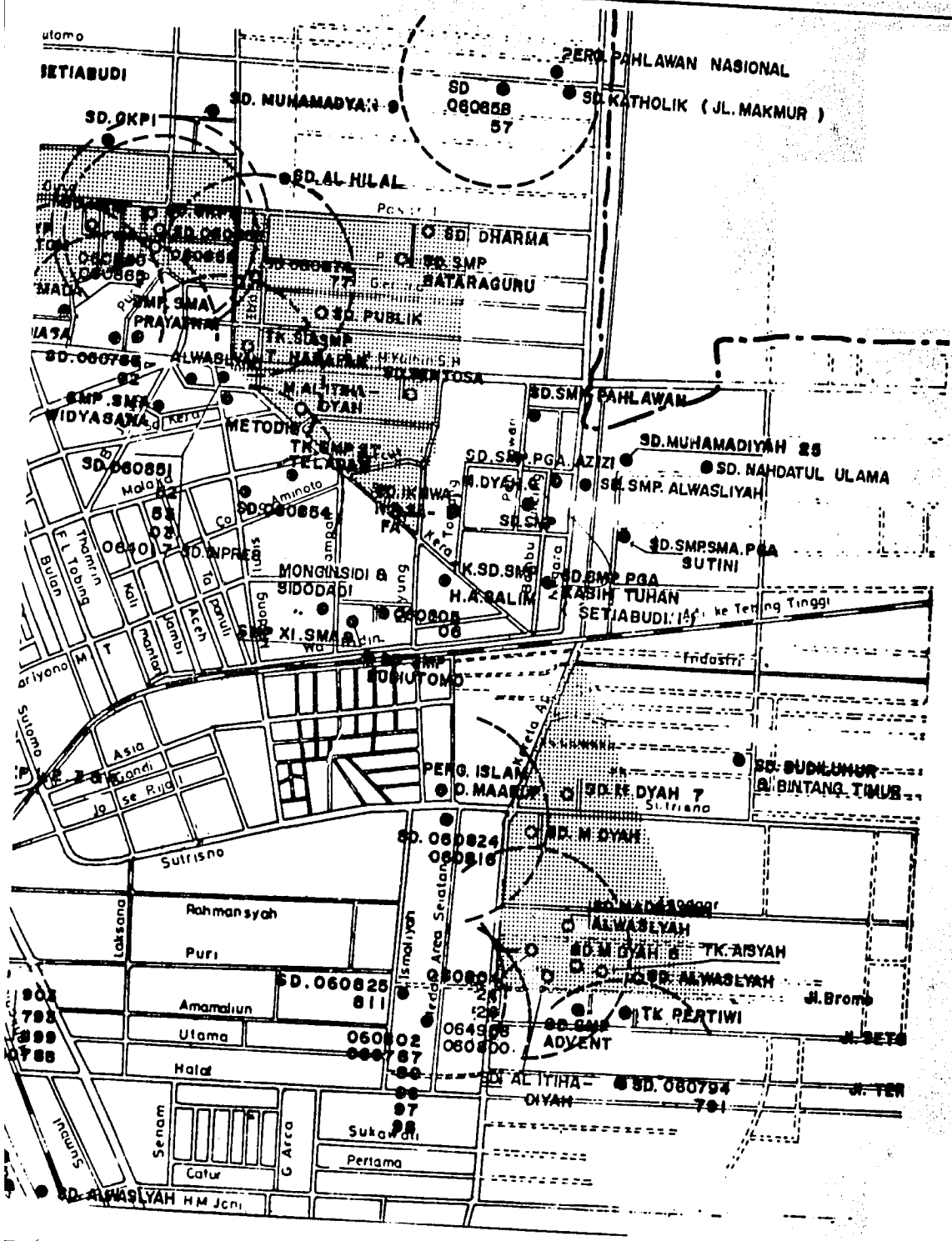


FIGURE 3



LOCATION OF PUBLIC AND PRIVATE SCHOOLS SERVING MEDAN'S KIP AREAS

LEGEND

- KIP AREA
- EDUCATION FACILITY INSIDE KIP AREA
- EDUCATION FACILITY OUTSUDE KIP AREA
- 400 m RADIUS OF CATCHMENT AREA FOR PRIMARY SCHOOLS

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students would theoretically cover the deficit created by the lack of additional public schools. However, it is too much to expect that lower income kampung could afford the costs associated with a private school. Therefore, public schools located outside of this KIP area must be found. The two Government schools (at a distance of 400 metres) in Sidorame Timur offer additional school places after serving strictly their own catchment area needs. There is also a large Government complex containing four primary schools at a distance of 200 metres, and a two-school complex at a distance of 800 metres from the KIP area boundary. It is estimated that the Government schools in and outside the KIP area in conjunction with the KIP area private schools would provide sufficient coverage to meet the primary school demands.

Sei Kera Hulu

The KIP area of Sei Kera Hulu has no Government schools and only two private schools to serve an estimated primary school population of over 1000 pupils. There is a large complex of Government primary schools at a distance of only 200 metres from the KIP area boundary. However, before it is assumed that this Government complex could serve the primary school population of Sei Kera Hulu, it should be noted that these schools must also serve the excess primary school populations from Sidorame Barat and Sei Kera Hilir, plus the enrollment from its own neighborhood catchment area. There is also a small Government school located at a distance 350 metres from the KIP area boundary. Depending on the areas from which the enrollment for these schools is presently drawn, it is possible that the potential pupils from Sei Kera Hulu do not have access to these schools. If this is the case, Sei Kera Hulu is poorly served by Government primary schools.

Tegal Sari I

Tegal Sari I - the entire kampung falls within the KIP area - is served by a large Government primary school complex. These five Government schools serve approximately one-half the kampung's pupils of primary school age. Two small private schools make up some of this deficit. However, it is very doubtful that the three Government school complexes (all located to the west towards the central commercial area) located within a distance of 400 metres of the KIP area would be able to completely erase this deficit at the same time serving their own neighborhood catchment populations. The high density northern and the peripheral eastern sections of the kampung are especially poorly served by public primary schools.

Tegal Sari II

Primary school coverage in general, and Government coverage in particular, decrease noticeably as the periphery of the built-up area is approached. Tegal Sari II is a good example of this decreasing coverage. There are no Government schools and only two private schools to serve a primary school age population of almost 850 pupils. While these two private schools could theoretically provide the enrollment capacity for this population, matriculation fees would probably prohibit this solution. The four Government complexes located within 500 metres of the KIP area boundary would obviously erase some, but probably not all, of this deficit.

Tegal Sari (Medan Denai)

The KIP area of Tegal Sari (Medan Denai) is the most poorly served KIP area with respect to primary school coverage. There are no Government schools and only one small private primary school to serve an estimated school age population of almost 1500. To make matters worse, the available Government schools within a kilometre of the KIP area boundary are all located to the south and west of the KIP area. These schools, which barely provide enough capacity for their own neighborhood catchment areas, would generally not alleviate much of the KIP area's deficit, especially in the northern and eastern peripheral areas.

3.6.2 Health

Cipta Karya's guidelines for kampung health care facilities call for one public health clinic (Puskesmas) for each 30,000 residents. According to the Kotamadya Health Office, a health centre should offer the following health care services: medical examination, dental care, family planning, and mother/child care. Based on the KIP area average density of 330 persons/hectare and assuming a circular catchment area, this planning standard signifies that each kampung resident should live within approximately 550 metres of a public health centre. Figure 3.4 shows the catchment areas for the Puskesmas located within or close to the KIP areas.

Given the prescribed catchment population of 30,000 persons, the KIP areas can be divided into four groups for a brief analysis of health facilities' coverage. For the purposes of this analysis, it will be assumed that one health centre offers adequate service for the catchment population and that the KIP residents can afford the services offered.

Hamdan and Aur

Health care facilities accessible to residents of the KIP areas found along the Deli River are very poor. There are no health centres within the recommended catchment radius. Residents of Hamdan and Aur would have the option of travelling approximately 1.5 kilometres to the Puskesmas located in Kotamatsum II and Teladan, or more likely, they would make the almost three kilometre journey to the general hospital (Rumah Sakit Umum Pringadi) located on Jl. Jati.

Sidorame Barat and Timur

The KIP areas of Sidorame Barat and Timur do not contain a health centre. Pringadi General Hospital does, however, serve a substantial portion of the KIP area within the recommended service radius. Only the northern sections of both KIP areas fall outside of the catchment area. The entire KIP area of Sidorame Barat and Timur is found within 1100 metres of the General Hospital.

Sei Kera Hilir and Hulu

Similar to the case of the neighboring KIP area of Sidorame Barat and Timur, the KIP areas of Sei Kera Hilir and Hulu do not contain a health

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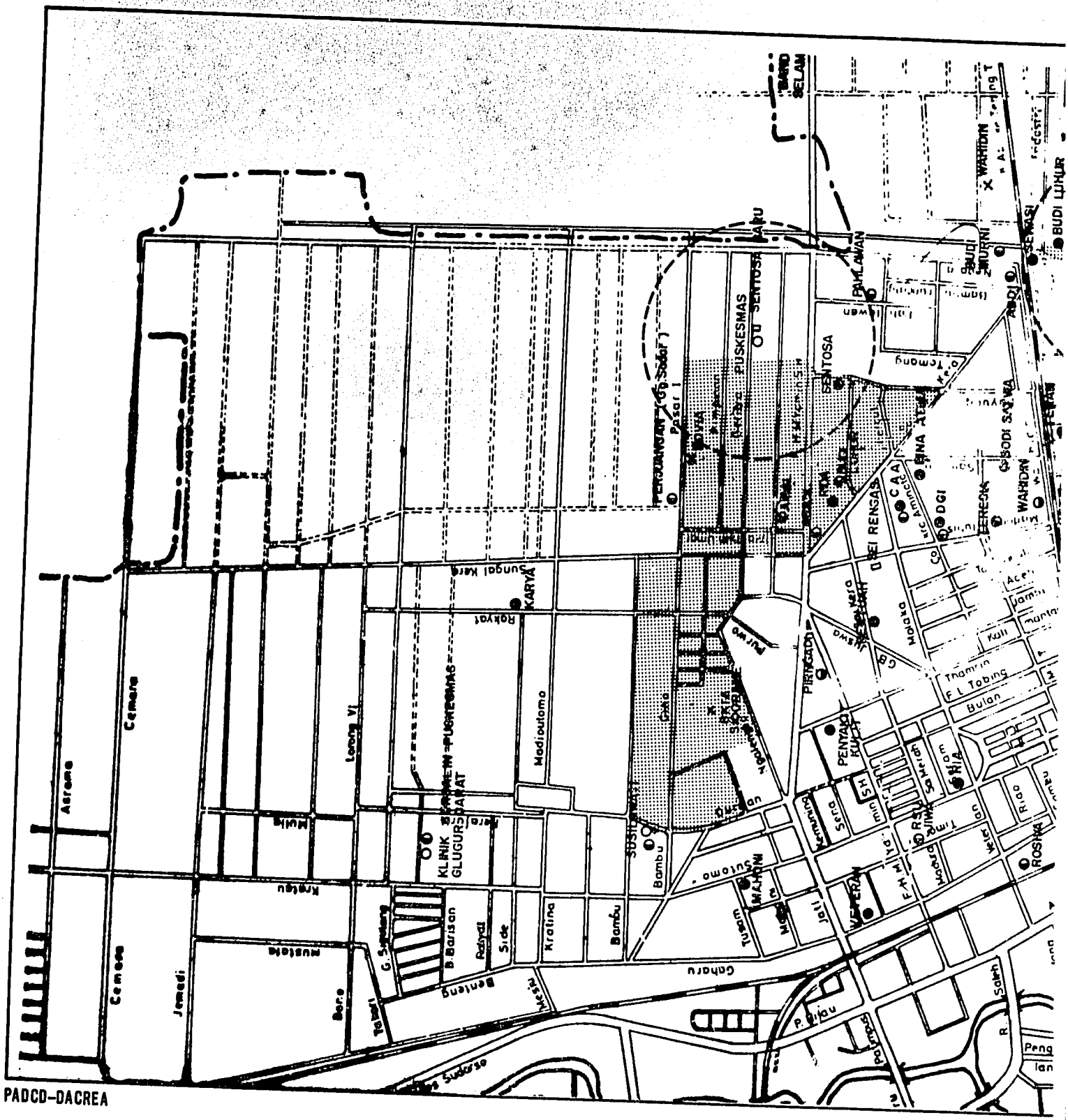

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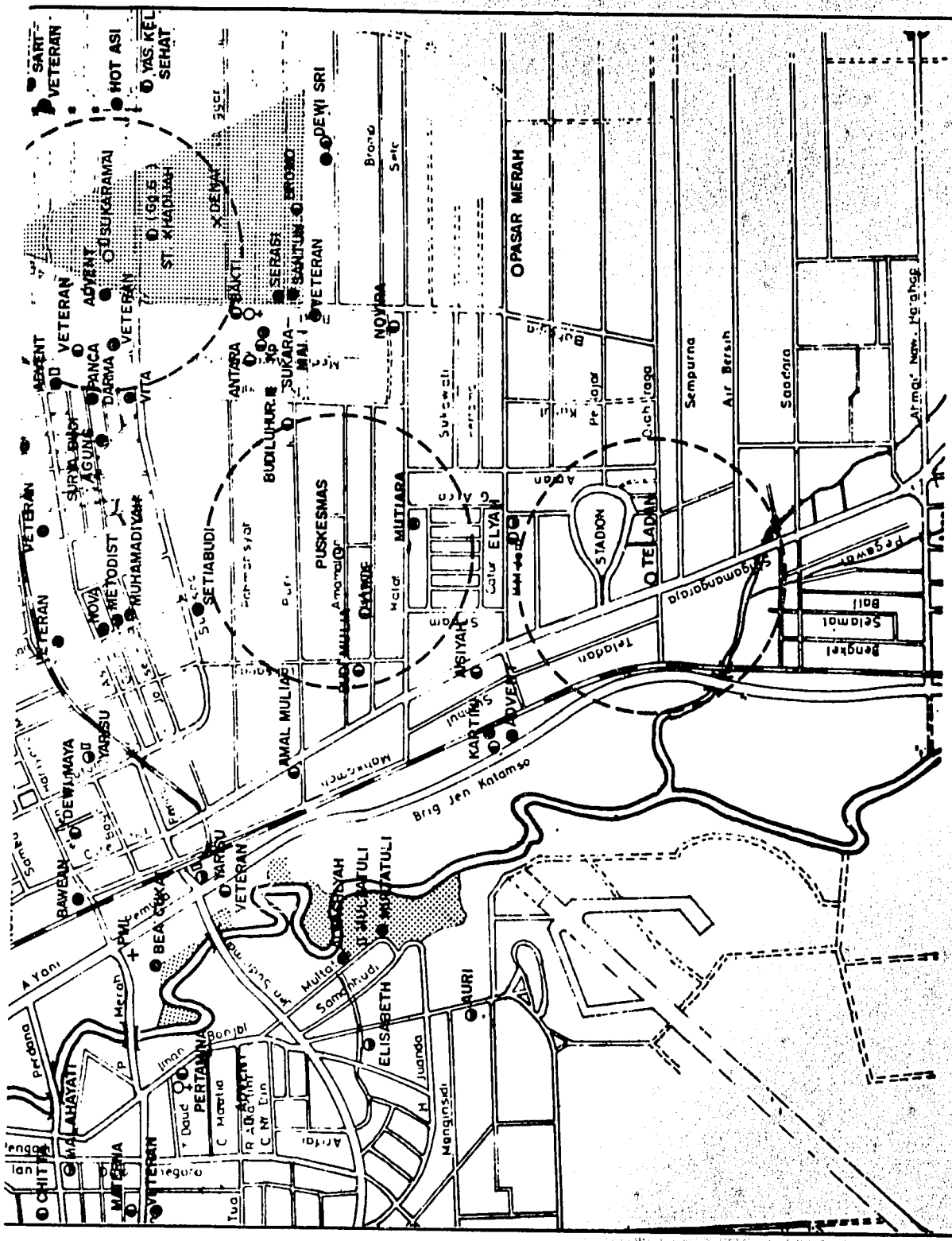

LOCATION OF HEALTH FACILITIES SERVING MEDAN'S KIP AREAS

LEGEND

- KIP AREA
- HOSPITAL
- PUSKESMAS
- POLYCLINIC
- DENTAL CLINIC
- FAMILY PLANNING CLINIC
- MOTHER & CHILD CLINIC
- MATERNITY CLINIC
- 550 m RADIUS OF CATCHMENT AREA FOR PUSKESMAS

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centre within their boundaries. However, there is one located immediately adjacent which serves all but the extreme western and southwestern sections of the KIP area within the guidelines established by Cipta Karya.

Tegal Sari I, II and Medan Denai

The Tegal Sari's, with the exception of the southern-most sections of Tegal Sari II and Tegal Sari (Medan Denai) are well served by the health centre located in Tegal Sari I on Jl. Kantil.

3.6.3 Religious

Cipta Karya guidelines for community facilities call for one religious facility for each 750-1750 followers of a particular religious group. Table 3.13 summarizes the coverage of religious facilities within the KIP areas. It can be seen from the table that all KIP areas are well served by facilities of the Islamic faith. The Christian population is also generally well served. Only in Hamdan and Sei Kera Hilir and Hulu does there exist a Christian population of greater than 750 persons which is not served by at least one church. The Buddhist population, being quite small in most KIP areas, would not be able to support a separate facility in most cases. Tegal Sari I which has a substantial Buddhist population of greater than 2400 persons is served by two temples. Only the relatively large Buddhist population of Tegal Sari Medan Denai (1258) is not served by a temple. However, the location of this population in the extreme northern section of the KIP area provides it with easy access to the two temples of Tegal Sari I.

3.6.4 Recreation

As previously mentioned in 3.2.12 Open Space/Sport Fields in the section on Land Use Patterns, the KIP areas are almost completely devoid of public open space and sports fields. With the exception of an occasional badminton or volley-ball court, the youth of the KIP areas is forced to play either in the street or in a vacant lot. A more detailed analysis is certainly not required to further highlight this fact.

3.7 DEMOGRAPHIC PROFILE

Tables 3.14 through 3.18 present a demographic profile of the KIP area residents with respect to the following five indicators:

- Sex distribution
- Age distribution
- Nationality
- Net population change
- Level of education

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TABLE 3.13

COVERAGE OF RELIGIOUS FACILITIES IN MEDAN'S KIP AREAS
OCTOBER 1979

KIP Area	Estimated 1978 Population [a]			Number of Religious Facilities [b]			Number of Persons per Each ± 100 m^2 Religious Facility		
	Islam	Christian	Buddhist	Islam	Christian	Buddhist	Islam	Christian	Buddhist
Hamdan, Jati, Polonia	2590	1307	581	4	-	-	648	-	-
Aur	2046	723	884	4	-	-	512	-	-
Sidorame Barat	7057	4346	70	7	3	-	1009	1449	-
Sidorame Timur	2495	2306	-	4	2	-	624	1153	-
Sei Kera Hilir	12388	1154	775	12	-	-	1033	-	-
Sei Kera Hulu	4162	1747	461	5	-	-	833	-	-
Tegal Sari I [c]	14137	1624	2423	12	2	2	1179	812	1212
Tegal Sari II	4535	605	-	4	1	-	1134	605	-
Tegal Sari (Medan Denai)	6117	1776	1258	9	1	-	680	1776	-

a. The KIP area religious population composed of Moslems, Christians and Buddhists does generally not sum to the total population presented in Figure 3.3 due to other small religious groups not being included in the analysis.

b. It will assumed that each religious facility measures 100 m^2 in area.

c. Tegal Sari I contains approximately 2370 persons of the Hindu religion. There are no Hindu Temples in this KIP area.

SOURCE: MUDS elaboration of P.M.D. data.

TABLE 3.14

AGE DISTRIBUTION OF THE POPULATION OF MEDAN'S KIP AREAS, 1978

KIP Area / Range of Age	Hamdan, Jati, Polonia		Aur		Sidorame Barat		Sidorame Timur		Sei Kera Hilir		Sei Kera Hulu		Tegal Sari I		Tegal Sari II		Tegal Sari (Medan Denai)		Total	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
0 - 5	1189	26.0	386	10.6	2273	19.5	701	14.6	1709	11.9	883	13.9	3063	14.9	560	10.9	1317	14.4	12081	15.1
6 - 15	1119	24.5	828	22.7	2380	20.4	1330	27.7	1315	9.1	1662	26.1	5756	28.0	1514	29.4	3160	34.5	19064	23.7
16 - 25	829	18.1	771	21.1	2660	22.9	1090	22.7	2046	14.2	1274	20.0	4932	24.0	1084	21.1	2461	26.9	17148	21.4
26 - 55	752	16.4	1430	39.1	2794	24.0	1498	31.2	7241	50.3	1669	26.2	6084	29.6	1099	21.4	1699	18.6	24266	30.2
56 +	685	15.0	238	6.5	1533	13.2	182	3.8	2090	14.5	881	13.8	719	3.5	884	17.2	512	5.6	7724	9.6
																			80,283	100.0

SOURCE: MUDS Elaboration of P.M.D. Material

TABLE 3.15

SEX DISTRIBUTION OF THE POPULATION OF MEDAN'S KIP AREAS, 1978

KIP Area / Sex	Hamdan, Jati, Polonia		Aur		Sidorame Barat		Sidorame Timur		Sei Kera Hilir		Sei Kera Hulu		Tegal Sari I		Tegal Sari II		Tegal Sari (Medan Denai)		Total	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Male	2335	51.0	1846	50.5	5504	47.3	2604	54.2	7334	50.9	3278	51.5	9459	46.0	2374	46.2	4497	49.2	39,231	48.9
Female	2239	49.0	1807	49.5	6136	52.7	2197	45.8	7067	49.1	3091	48.5	11096	54.0	2767	53.8	4652	50.8	41,052	51.1
																			80,283	100.0

SOURCE: MUDS Elaboration of P.M.D. Material

TABLE 3.16

NATIONALITY OF THE POPULATION OF MEDAN'S KIP AREAS, 1978

Nationality Category \ KIP Area	Hamdan, Jati, Polonia		Aur		Sidorame Barat		Sidorame Timur		Sei Kera Hilir		Sei Kera Hulu		Tegal Sari I Tegal Sari I		Tegal Sari II Tegal Sari II		Tegal Sari (Medan Denai)		Total	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Native Born	2096	57.4	3916	85.6	11137	95.7	4753	99.0	13502	93.8	5355	84.1	16831	81.9	5135	99.9	7891	86.2	70616	88.0
Naturalized	1014	27.8	378	8.3	337	2.9	47	1.0	649	4.5	576	9.0	1416	6.9	6	0.1	484	5.3	4907	6.1
Foreign	543	14.9	280	6.1	166	1.4	1	0.0	250	1.7	438	6.9	2308	11.2	-	0.0	774	8.5	4760	5.9
																			80,283	100.0

SOURCE: MUDS Elaboration of P.M.D. Material

TABLE 3.17

NET POPULATION CHANGE IN KAMPUNGS CONTAINING KIP AREAS, 1976–1978*

Change in Population \ KIP Area	Hamdan, Jati, Polonia			Aur			Sidorame Barat			Sidorame Timur			Sei Kera Hilir			Sei Kera Hulu			Tegal Sari I			Tegal Sari II			Tegal Sari (Medan Denai)		
	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978
Increases:																											
Births	56	23	21	60	78	42	88	97	5	110	115	120	176	189	225	105	68	81	18	23	21	N.A.	18	23	41	60	86
Immigrants	201	133	67	120	433	81	97	129	113	160	170	180	298	338	211	157	142	171	21	18	19	N.A.	N.A.	N.A.	167	124	278
Decreases:																											
Deaths	36	34	24	87	107	54	106	115	109	50	55	60	110	154	418	73	161	63	N.A.	N.A.	N.A.	N.A.	47	52	317	217	159
Immigrants	116	73	45	317	397	249	612	670	425	175	260	204	483	643	98	348	564	281	7	6	17	N.A.	N.A.	N.A.	515	375	515
Net Population Change	+55	+49	+19	+224	+7	-180	-533	-559	-356	+45	-30	+36	-119	-270	-80	-159	-515	-92	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	-624	-408	-310

* Due to a lack of KIP area population for the years 1976 and 1977, the present table shows population change for the entire kampung, not just the selected KIP area. It is felt, in most cases, however, that the kampung's net population change also reflects the situation in the KIP area.

SOURCE: MUDS Elaboration of P.M.D. Material.

TABLE 3.18

LEVEL OF EDUCATION ATTAINED BY THE POPULATION IN MEDAN'S KIP AREAS, 1978

Level Attained \ KIP Area	Hamdan, Jati Polonia		Aur		Sidorame Barat		Sidorame Timur		Sei Kera Hilir		Sei Kera Hulu		Tegal Sari I		Tegal Sari II		Tegal Sari (Medan Denai)	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
No School	472	10.3	283	7.7	2888	24.8	962	20.2	2478	17.2	N.A.	N.A.	205	1.0	100	1.9	N.A.	N.A.
Unfinished Primary School	2210	48.3	866	23.7	1783	15.3	1409	29.4	3069	21.3	N.A.	N.A.	1970	9.6	552	10.7	N.A.	N.A.
Finished Primary School	912	20.0	1007	27.6	3793	32.6	616	12.8	3381	23.5	N.A.	N.A.	8894	43.3	1638	31.9	N.A.	N.A.
Finished Junior High School	471	10.3	941	25.8	1834	15.8	780	16.2	2597	18.0	N.A.	N.A.	5572	27.1	1489	29.0	N.A.	N.A.
High School Diploma	440	9.6	552	15.1	1257	10.8	862	18.0	2826	19.6	N.A.	N.A.	3871	18.8	1340	26.1	N.A.	N.A.
University Degree	69	1.5	4	0.1	85	0.7	172	3.6	50	0.4	N.A.	N.A.	43	0.2	22	0.4	N.A.	N.A.

SOURCE: MUDS Elaboration of P.M.D. Material

The profile that emerges of the KIP areas and their residents can be summarized in the following manner:

- A very young population - 60.2 percent of all KIP area residents are 25 years old or younger.

- An overwhelmingly Indonesian population - 93.9 percent of the KIP area population is either a native born or naturalized Indonesian citizen.

- A poorly educated population - in all the KIP areas where information is available (with the exception of Tegal Sari II) over 50 percent of the residents have only a primary school education or less.

- A stable or slightly decreasing population - with the exception of the KIP areas where information is available are presently experiencing slight population decreases of approximately one percent or less per annum.

3.8 HOUSEHOLD EXPENDITURE DISTRIBUTION AND CONSUMPTION PATTERNS

At the level of the KIP area, there is presently no information available on household income/expenditure or consumption patterns. Due to lack of time, budget and the dubiousness of the resultant survey information, no attempt has been made to collect primary source data on household income or consumption patterns. The household expenditure distributions for the KIP areas presented in this section are estimated by using a methodology based on aerial photographic interpretation*. This methodology makes use of the linkage between monthly rents presently being paid for various types of housing and total monthly household expenditure. A distribution of housing types for each KIP area has been established on the basis of the following three parametres:

1. Size of dwelling unit.

2. Roofing material of the dwelling unit (concrete or clay tile, galvanized zinc or asbestos cement, and thatch).

3. Accessibility to the dwelling unit by becak.

By means of a small field survey, a rental value is identified for each different housing type - i.e. a 60 square metre unit with a zinc roof and access by becak rents for Rp.6250 per month. A corresponding household expenditure distribution curve can then be constructed for each KIP area by assuming a percentage of monthly income spent on rent.

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* Methodology for Aerial Photo Interpretation in Policy Formulation and The Indentification and Design of Housing Projects for the Urban Poor of Developing Countries", CITRUD, Washington, D.C., 1978.

The information presented on household consumption patterns is extracted mainly from the 1968-1969 Cost of Living Survey for Medan* and the more recent 1975 Medan Household Income Survey**.

3.8.1 Monthly Household Expenditure

Using the previously mentioned aerial photographic methodology and assuming that 10 percent of monthly expenditures go to rent, a median monthly household expenditure of approximately Rp.48,000 was estimated for the entire KIP area population (see Table 3.19). There exists a certain amount of variation between the KIP areas with respect to median household expenditure. As might be expected, the KIP areas located along the Deli River (Hamdan and Aur) have the lowest median expenditure levels. All of the other KIP areas, with the exception of Tegal Sari II, have median household expenditures ranging from Rp.46,000 to Rp.53,000 per month. The case of Tegal Sari II is somewhat puzzling. The monthly household expenditure for this area has been estimated at greater than Rp.75,000. This KIP area is presently located on the periphery of the Kotamadya's built-up area, a fact which implies a deficiency in most public services. Apparently many middle and upper-income families (as indicated by the types of new dwelling units being constructed) will accept these deficits in public services in order to be able to acquire a large parcel of land at a relatively low cost. In fact given the financial capacity of these residents, many problems confronted by the areas's low-income residents - lack of water supply, disposal of human waste, transportation, etc. - can be overcome by their wealthier neighbors through the use of septic tanks, electric pumps attached to shallow wells, and the automobile.

Table 3.20 shows the estimated median household expenditures for the nine KIP areas, while Table 3.21 presents the estimated expenditure distributions for these areas.

3.8.2 Household Consumption Patterns

The following breakdown of the KIP areas' household expenditure budget is estimated from the two previously mentioned source:

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* Based on the estimated median monthly household expenditure of Rp.48,300

** Expenditure on housing includes rents or home owner's costs; water electricity and cooking fuels, and household equipment and operation.

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TABLE 3.19

ESTIMATED MONTHLY HOUSEHOLD EXPENDITURE DISTRIBUTION FOR KIP AREAS, 1978

Household Expenditure Category (Rp/Month)	Number of Households (#)	Percent of Total Households (%)	Cumulative Percent of Total Households (%)
Less than 10000	88	0.7	0.7
10,001 - 20,000	796	6.4	7.1
20,001 - 30,000	1542	12.4	19.5
30,001 - 40,000	1996	16.1	35.6
40,001 - 50,000	2145	17.3	52.9
50,001 - 75,000	2988	24.1	77.0
Greater than 75,000	2852	23.0	100.0
Total	12408	100.0	

SOURCE: MUDS

TABLE 3.20

ESTIMATED MEDIAN MONTHLY HOUSEHOLD EXPENDITURES FOR INDIVIDUAL KIP AREAS, 1978

KIP Area	Estimated Median Monthly Household Expenditure (Rp/Month)
Hamdan, Jati, Polonia	37,150
Aur	27,500
Sidorame Barat	50,200
Sidorame Timur	51,850
Sei Kera Hilir	52,750
Sei Kera Hulu	46,050
Tegal SAri I	45,950
Tegal Sari II	75,000 +
Tegal Sari (Medan Denai)	49,400
Total	48,300

SOURCE: MUDS

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TABLE 3.21

ESTIMATED DISTRIBUTION OF MONTHLY EXPENDITURE OF KIP AREA HOUSEHOLDS, 1978

KIP Area / Monthly Expenditure (Rp)	Hamdan, Jati, Polonia		Aur		Sidorame Barat		Sidorame Timur		Sei Kera Hilir		Sei Kera Hulu		Tegal Sari I		Tegal Sari II		Tegal Sari (Medan Denai)		Total	
	# of Households	% of Total	# of Households	% of Total	# of Households	% of Total	# of Households	% of Total	# of Households	% of Total	# of Households	% of Total	# of Households	% of Total	# of Households	# ot Total	# of Households	% of Total	# of Households	% of Total
Less than 10,000	0	0.0	88	11.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0:0	0	0.0	88	0.7
10,001-20,000	97	13.3	152	20.1	45	2.5	54	7.5	52	2.1	30	3.1	229	9.2	14	1.6	123	7.7	796	6.4
20,001-30,000	145	19.9	185	24.4	203	11.1	74	10.3	238	9.8	113	11.5	335	13.5	56	6.4	193	12.1	1542	12.4
30,001-40,000	171	23.5	156	20.6	308	16.8	94	13.1	331	13.6	206	21.0	415	16.7	75	8.6	240	15.1	1996	16.1
40,001-50,000	185	25.4	109	14.4	350	19.1	107	14.9	377	15.5	234	23.8	444	17.8	83	9.5	256	16.1	2145	17.3
50,001-75,000	103	14.1	67	8.9	490	26.7	164	22.9	801	32.9	163	16.6	643	25.8	167	19.1	390	24.5	2988	24.1
Greater than 75,000	28	3.8	0	0.0	437	23.8	225	31.3	634	26.1	236	24.0	423	17.0	479	54.8	390	24.5	2852	23.0
	729	100.0	757	100.0	1833	100.0	718	100.0	2433	100.0	982	100.0	2489	100.0	975	100.0	1592	100.0		

SOURCE: MUDS

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Expenditure Item	Percent of Total Budget (%)	Monthly Household Expenditure*
Food	55	Rp.26,550
Housing**	15	7,250
Clothing and Personal Effects	9	4,350
Transportation	7	3,400
Medical and Personal Care	6	2,900
Recreation, Tobacco, etc.	5	2,400
Education	3	1,450
		Rp.48,300

3.9 OCCUPATIONS AND EMPLOYMENT

The only information on occupations and employment available at the level of the KIP areas comes from Pembangunan Masyarakat Desa (P.M.D.). Table 3.22 tabulates this information for the nine KIP areas. The accuracy of this data is questionable, however. For example, the table fails to show a single person employed as a vendor or becak driver, two known sources of employment in the KIP areas. Perhaps this is due to the fact that vendors have been enumerated as merchants and becak drivers as laborers. In addition, the employment totals for each KIP area bear little constant relationship to the corresponding total KIP area population between the ages of 16 and 55 - the prime employment years (see Table 2.17). Given all the drawbacks with the data, however, it is still interesting to note that the three major sources of employment are the same for all KIP areas. The categories of government employee, merchant and laborer contain, by far, the great majority of KIP area residents.

3.10 LAND TENURE

Information on the tenure of land holdings in the KIP areas is almost nonexistent. A certain percentage of the residents, undoubtedly 20-25 percent , are renting. The great majority of the rest of KIP area residents claim to own their land and dwelling unit. However, few residents have land title certificates. In many cases, the lack of clear title documentation is justified on the basis of the land registration fee which can not be afforded. The problem is further complicated by the fact that much of the land found in the old part of the Kotamadya - along the Deli River and in and adjacent to the central commercial district - is/was owned by the Sultan Deli's family. Many households still pay a nominal monthly fee to the Sultan's family. The situation also exists in certain KIP areas (for example, Kp. Aur, Lorong Mangkubumi) where

TABLE 3.22

TYPE OF OCCUPATION OF MEDAN KIP AREA POPULATION, 1978

Type of Occupation / KIP Area	Hamdan, Jati, Polonia	Aur	Sidorame Barat	Sidorame Timur	Sei Kera Hilir	Sei Kera Hulu	Tegal Sari I	Tegal Sari II	Tegal Sari (Medan Denai)
Gov't Employee	314	24	211	79	292	301	2611	199	N.A.
Private Sector Employee	-	-	-	-	-	-	-	-	-
Military	-	-	-	-	-	-	-	-	-
Merchant	251	235	1121	9	977	709	822	506	667
Vendor	-	-	-	-	-	-	-	-	-
Farmer	-	-	39	-	34	-	-	3	8
Laborer	934	141	980	128	853	1733	4763	N.A.	-
Becak Driver	-	-	-	-	-	-	-	-	-
Student	-	-	-	-	-	-	-	-	-
Fisherman	-	-	-	-	-	-	-	-	-
Live Stockman	-	-	-	-	-	-	-	-	-
Repairman	-	-	-	-	-	-	-	-	-
Artisan	-	-	13	28	11	2	-	-	15
Industrial Worker	-	13	1	-	-	18	978	-	7
Doctor	2	-	7	2	6	5	9	2	1
Nurse	1	-	5	-	4	1	5	2	1
Health Worker	1	-	-	-	-	-	3	-	1
Reporter	1	-	10	2	9	1	7	1	2
Teacher	10	4	40	50	35	30	61	17	-
Lawyer	-	-	2	-	1	1	-	1	
Accountant	-	-	-	-	-	-	-	-	
Barber	-	1	-	4	-	8	23	-	
Tailor	9	4	19	5	17	14	795	113	21
Carpenter	3	3	17	24	15	22	68	28	20
Metal Worker	-	-	2	-	1	-	123	-	-
Midwife	-	-	11	-	10	-	1	1	-
Gardener	-	-	-	-	-	-	-	-	-

SOURCE: P.M.D.

improvements by the Kotamadya have not been undertaken in the past due to questions regarding illegal occupancy by the residents. If one thing is clear with respect to the land tenure question, it is that a much better understanding of the existing situation must be ascertained before Medan KIP proceeds much further.

3.11 COMMUNITY ORGANIZATIONS

Many community organizations can be found within the KIP areas. Two of these organizations, the Kampung Social Organization (Lembaga Social Desa) and the Kampung Decision Making Organization (Lembaga Musyawarah Desa) were organized by Government decree under the auspices of the community Development Organization (P.M.D.). The purpose of these organizations, respectively, is to discuss internally both the physical and non-physical needs of the kampung and then to push for implementation of recommended projects and aciivities which will benefit the development of the area. Since the resources for running these organizations must come from the residents themselves, the L.S.D. and L.M.D. located in the KIP areas constantly face the common problem of insufficient funds to realize program goals.

In addiiion to the formally decreed kampung area organizations, many other organizations also exist at the kampung level - some formal, others informal - which provide services to various segments of the KIP area's population. These organizations can be briefly summarized as follows:

- Community Self-help Organization (Serikat Tolong Menolong) helps kampung residents who have suffered an accident or death in the family.

- Woman's Club (Pertiwi) holds discussions on family planning and organizes small sewing and handicraft classes.

- Youth Club (Karang Teruna) functions as an orgnizer of sports and cultural events, and as well, works to deter juvenile delinquency among school dropouts.

- Pemuda Pancasila, Pemuda Ansor, and Angkatan Muda Islam Indonesia used to serve as the youth affiliates for national political and religious movements. Today, while formal ties no longer exist, these organizations still place a heavy political/religious emphasis on their current sports and cultural activities.

- Housewife Group (Arisan) meets once a month for purely social purposes. A decision is taken at each meeting regarding who will host the succeeding month's meeting. A small donation is also made to help to defray costs.

- Islamic Recitation Group (Perwiridan) is composed of men and women who meet sach Thursday evening to read from the Koran.

- Boyscouts/Girl Guides

For the purpose of the present KIP study, it is interesting to note that a permanent community organization involved in the undertaking of physical self-help projects or kampung maintenance apparently does not exist. When these types of activities are required, the kepala kampung will organize them on a purely ad hoc basis.

3.12 PRIORITIES FOR IMPROVEMENT

Given the fact that the needs of the KIP areas are great while the funds for improvement are limited, one of the single most important elements to be determined in any analysis of the existing situation is the priorities for improvement. In the case of Medan's KIP areas, priorities for improvement were ascertained on the basis of responses by the residents themselves as well as from observations by members of the MUDS team. Figure 3.5 presents, in descending order of priority, the combined results of this survey of priorities.

PRIORITY ITEMS F

AUR					HAMDAN	JATI
DALAM	MANGKUBUMI	LEMBAH	PANTAI BURUNG	TANJUNG MERIAM		
1. OPEN SPACES. 2. RETAINING WALL FOR FLOOD RISK 3. FOOTPATH DRAIGE IMPROVEMENT.	1. LAND STATUS / LAND TENURE. 2. RETAINING WALL FOR FLOOD RISK. 3. PUBLIC TAP. 4. BETTERMENT ON FOOTPATH. 5. SOLID WASTE COLLECTION. 6. M.C.K.	1. PUBLIC TAP. 2. BETTERMENT ENVIRONMENT. 3. SOLID WASTE COLLECTION. 4. M C K.	1. PUBLIC TAP. 2. OPEN SPACE. 3. EDUCATION FACILITY. 4. SOLID WASTE COLLECTION. 5. M C K. 6. BETTERMENT ENVIRONMENT.	1. PUBLIC TAP. 2. ROAD IMPROVEMENT. 3. SOLID WASTE COLLECTION. 4. M C K.	1. PUBLIC TAP. 2. EDUCATION FACILITY. 3. OPEN SPACE. 4. SEWAGE. 5. SOLID WASTE COLLECTION. 6. M C K.	1. PUBLIC TAP 2. EDUCATION F 3. SEWAGE. 4. SOLID WAST COLLEC 5. M C K.

PADCO–DACREA

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)R IMPROVMENT IN MEDAN'S KIP AREAS

OCTOBER 1979

	POLONIA	SEI KERA HILIR	SEI KERA HULU	SIDORAME BARAT	SIDORAME TIMUR	TEGAL SARI I	TEGAL SARI
ICILITY. E TION.	1. PUBLIC TAP. 2. BETTERMENT ENVIRONMENT. 3. OPEN SPACE. 4. SEWAGE. 5. SOLID WASTE COLLECTION.	1. PUBLIC TAP WITH WATER PRESSURE 2. DRAINAGE BETTERMENT. 3. FOOTPATH BETTERMENT. 4. ELECTRICITY IN THE INTERIOR. 5. EDUCATION FACILITY FOR SMP & SLA. 6. HEALTH CENTER (BETTERMENT FACILITY). 7. PLAY GROUND FOR CHILDREN. 8. CEMETARY.	1. PUBLIC TAP WITH WATER PRESSURE. 2. FOOTPATH BETTERMENT. 3. DRAINAGE BETTERMENT. 4. EDUCATION FACILITY (SD.SLP & SLA). 5. ADDITIONAL HEALTH CENTER. 6. ELECTRICITY IN THE INTERIOR & ALONG THE ROAD. 7. GARBAGE COLLECTION. 8. PLAYGROUND.	1. FOOTPATH. & ROAD. BETTERMENT. 2. RIOLEERING / DRAINAGE. 3. ELECTRICITY ALONG ROAD & POOTPATH. 4. PUBLIC TAP. 5. SOLID WASTE COLLECTION. 6. SPORT FIELD.	1. PUBLIC TAP. 2. FOOTPATH. & ROAD. BETTERMENT. 3. SANITATION. 4. GARBAGE COLLECTION. 5. DRAINAGE. 6. ELECTRICITY ON THE INTERIOR & ALONG THE ROAD.	I M C K 2. REPAIR & IMPROVE DRAINAGE SYSTEM 3. EDUCATION FACILITY (SLP&SLA 4. ELECTRICITY 5. 10 PUBLIC TAPS	1. ROAD & FOOTPATH BETTERMENT 2. IMPROVING DRAINAGE 3 DIGGING & CLEANING BALING CHANEL 4. ELECTRICITY 5. EDUCATION FACILITY (SLP & SLA)
						TEGALSARI II 1. ROAD & FOOTPATH BETTERMENT 2 DRAINEGE BETTERMENT 3 PUBLIC TAP 4 ELECTRICITY ALONG THE ROAD & FOOTPATH 5 SOLD WASTE COLLECTION	

SECTION 4

RECOMMENDED KIP PROGRAM COMPONENTS

4.1 INTRODUCTION

The present chapter discusses the recommended physical and non-physical components of the Kampung Improvement Program (KIP)*. A brief summary of the existing situation, the recommended program and program design criteria will be presented for the following components:

Physical Components

- Water Supply
- Human Waste Disposal
- Streets and Footpaths
- Drainage
- Solid Waste
- Community Facilities

Non-Physical Components

- PENMAS Educational Program
- Community Health Program
- Loans to Small Business
- Land Registration Program

The final two sections of the chapter will present a summary of unit costs and an estimate of total project costs.

The recommended program components are underpinned to the following four items:

- The Cipta Karya standards for KIP contained in "Pedoman Pelaksanaan Perintisan Perbaikan Lingkungan, Perumahan Kota"**

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* In the areas of water supply, drainage, wastewater and solid waste, much of the design criteria is based on information presented elsewhere (in the Master Plans Vol.V). It is reproduced in the present section in order to maintain continuity.

** Pedoman, Pelaksanaan Perintisan, Perbaikan Lingkungan, Perumahan Kota, Departemen Pekerjaan Umum, Direktorat Jenderal Cipta Karya, Direktorat Perumahan, Jakarta.

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- The Master Plans developed by MUDS for water supply, wastewater, drainage and solid waste.

- The Kotamadya and National Government's capacity to pay for a KIP program.

- The analysis of the existing situation in the KIP areas (see Section 3).

The cited Cipta Karya document presents guidelines and standards for the improvement of a KIP area's physical environment. In addition, it suggests supporting governmental, non-physical programs with potential funding sources which serve to improve the family's productivity and its access to health and educational services.

The Master Plans developed by MUDS for water supply, sewerage, drainage and solid waste outline broad incremental improvements in consumption levels by consumer group to the year 2000. Each proposed incremental improvement will include associated physical standard(s) to be achieved over the period. The application of the physical goals and standards proposed in the Master Plans to the site specific KIP program will be examined in the light of the existing situation identified at the kampung level. Refinements in the broad proposals will be made based on this examination. In sectors not directly covered by the Master Plans, for example streets and footpaths, health and education, guidance as to ongoing programs and alternative improvements have been obtained from the appropriate Kotamadya Dinas and Cipta Karya.

The recommended physical and non-physical elements of the program form an integrated KIP package which addresses not only required environmental and community facilities improvements, but also the educational and health service needs of the KIP residents. Both types of programs serve to complement and supplement each other; each is required in order that KIP fulfill its potential in Medan.

4.2 KAMPUNG IMPROVEMENT PROGRAM COMPONENTS (KIP)

4.2.1 Physical Components

The following sections present the recommended physical components of the KIP. Each section presents a summary of the existing situation, the recommended program component and the design and planning criteria adopted. The relationship of KIP to the city wide sectoral programs is summarized in Figures 4.18 - 4.21.

4.2.1.1 Water Supply

Access to a minimum supply of potable water has been identified by both the National Government and the KIP area residents themselves as one of the priorities for Medan KIP during Repelita III.

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Existing Situation

KIP area residents often meet their water needs for washing and bathing from one source and water for drinking/cooking from another. The prevalent source of water for washing and bathing in most KIP areas is open, shallow wells. In conjunction with an open, shallow well, some KIP area residents have access to a secondary, potable water supply for drinking/cooking (see Table 4.1 for a description of Indonesian Water Quality Standards). These sources include the following:

- House-to-house water delivery by vendor
- Water purchased from a neighbour with water connection (within 20-30 m) in areas partially served by P.A.M. distribution system
- Water purchased at a standpipe or from an institution (within 50-60 m) with a P.A.M. water connection.

Those households without adequate access to one of these secondary sources of potable water supply are forced to use water from open, shallow wells for all water needs. There is no evidence that KIP area residents are using water from the Deli River for drinking.

Recommended Improvement Program

With few exceptions, all of the KIP areas are located within the P.A.M. distribution network. The goal, therefore, of the water supply component of the present KIP program during Repelita III will be to strengthen the previously mentioned two-tier water supply system through the consolidation of the existing P.A.M. coverage. The consolidation will be undertaken through the installation of additional local distribution lines and the provision of 106 public standpipes. The proposed increase in service levels will provide all KIP area residents with access to a minimum of 35 l/c.d from the municipal system.

Design Criteria

Public Standpipes and Private House Connections

The existing system whereby a certain number of KIP area residents obtain potable water either from a public standpipe or a neighbour with a private P.A.M. house connection will be built upon. From field surveys undertaken as part of the present study, it is estimated that households living within 20-30 m of a private P.A.M. house connection will purchase drinking water from these dwellings. Each private connection can serve as many as 10 additional households. During Repelita III, it will be assumed that those KIP area residents who presently meet their potable water needs through direct connections and standpipes.

The entire KIP area of over 244 hectares presently contains only 16 public standpipes. Due to easy accessibility to open, shallow wells, it has been determined from the field surveys that most households will only walk from 50-60 m to obtain water from a public standpipe. Assuming a circular service area and an average KIP area density of 330 persons per

TABLE 4.1

INDONESIAN WATER QUALITY STANDARDS

No.	Component		Unit	Drinking Water Recommended Limits	
	I. Physical				
1.	Temperature		°C	-	Air Temp
2.	Colour		Unit	-	50
3.	Odour		-	-	-
4.	Taste		-	-	-
5.	Turbidity		Unit	-	25
	II Chemical				
6.	Acidity	(pH)	-	6.5	9.2
7.	Total Solid		mg/1	-	1500
8.	Organic Substances	($KMnO_4$)	"	-	10
9.	Carbon Dioxide	(CO_2)	"	-	0.0
10.	Hardness		°D	5.0	10
11.	Calsium	(Ca)	mg/1	-	200
12.	Magnesium	(Mg)	"	-	150
13.	Iron	(Fe)	"	-	1.0
14.	Manganese	(Mn)	"	-	0.5
15.	Copper	(Cu)	"	-	1.5
16.	Zinc	(Zn)	"	-	15
17.	Chloride	(Cl)	"	-	600
18.	Sulfate	(SO_4)	"	-	400
19.	Sulfide	(H_2S)	"	-	0.0
20.	Fluoride	(F)	"	1.0	2.0
21.	Ammonium	(NH_4)	"	-	0.0
22.	Nitrate	(NO_3)	"	-	20.0
23.	Nitrite	(NO)	"	-	0.0
24.	Phenolic	(Phenol)	"	-	0.002
25.	Arsenic	(As)	"	-	0.05
26.	Tin	(Pb)	"	-	0.10
27.	Selenium	(Se)	"	-	0.01
28.	Chromium	(Cr)	"	-	0.05
29.	Cyanide	(CN)	"	-	0.05
30.	Cadmium	(Cd)	"	-	0.01
31.	Mercury	(Hg)	"	-	0.001

SOURCE: Kotamadya Kesehatan

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hectare, it can be calculated that each standpipe serves approximately one hectare, or 50 households. These established norms will serve as the basis for the expanded program.

Standpipe service should be viewed as a means whereby Government can meet its obligations to provide the minimum of potable water essential for health to the very lowest income groups of the population. In the present KIP program, each household presently not served by a neighbour having a house connection or from a standpipe will be provided access to a public standpipe. Figure 4.1 shows a typical design for a standard 2-tap standpipe. In those areas where pressures in the municipal system are not adequate to enable standpipes to function satisfactorily, it is recommended that a storage tank, fitted with a floatvalve and an inexpensive type of cover to prevent pollution be provided (see Figure 4.2). The outlet tap should be designed to minimize wastage. It is recommended that each standpipe be metered since a commercially run water authority should be able to at least recover its cost of providing water.

The feeder lines which supply the public standpipes have been designed to enable a certain number of individual private house connections.

Water Demand

It is proposed that the network of public standpipes be designed for an average daily demand of 35 l/c.d. This estimated water demand does not include unaccounted for water. The following multipliers are proposed:

Maximum daily demand = 1.15 x total average daily demand

Peak hour demand = 1.70 x maximum daily demand

For the case of the KIP area, the water demand at each standpipe is estimated accordingly:

Estimated number of houses per tap	=	45 units
Estimated population per tap	=	330 persons
Per capita water consumption	=	35 litres/day
Estimated average daily demand	=	11,550 litres
Estimated maximum daily demand	=	13,283 litres
Estimated peak hour demand $\frac{1.4 \times \text{maximum daily demand}}{86{,}400 \text{ seconds/day}}$	=	0.26 litres/second
Estimated peak hour demand per tap (2-tap standpipe)	=	0.13 litres/second

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FIGURE 4.1

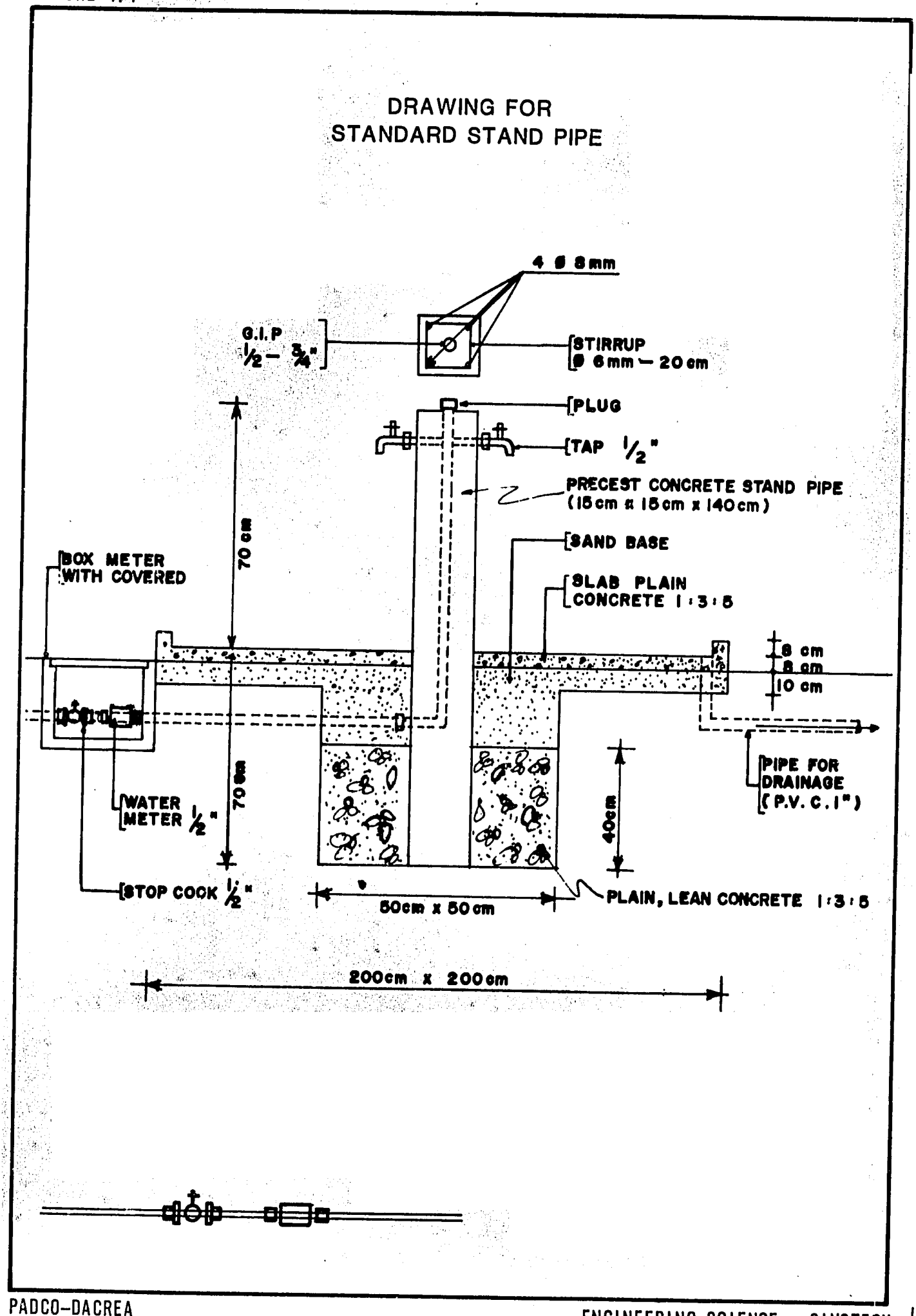
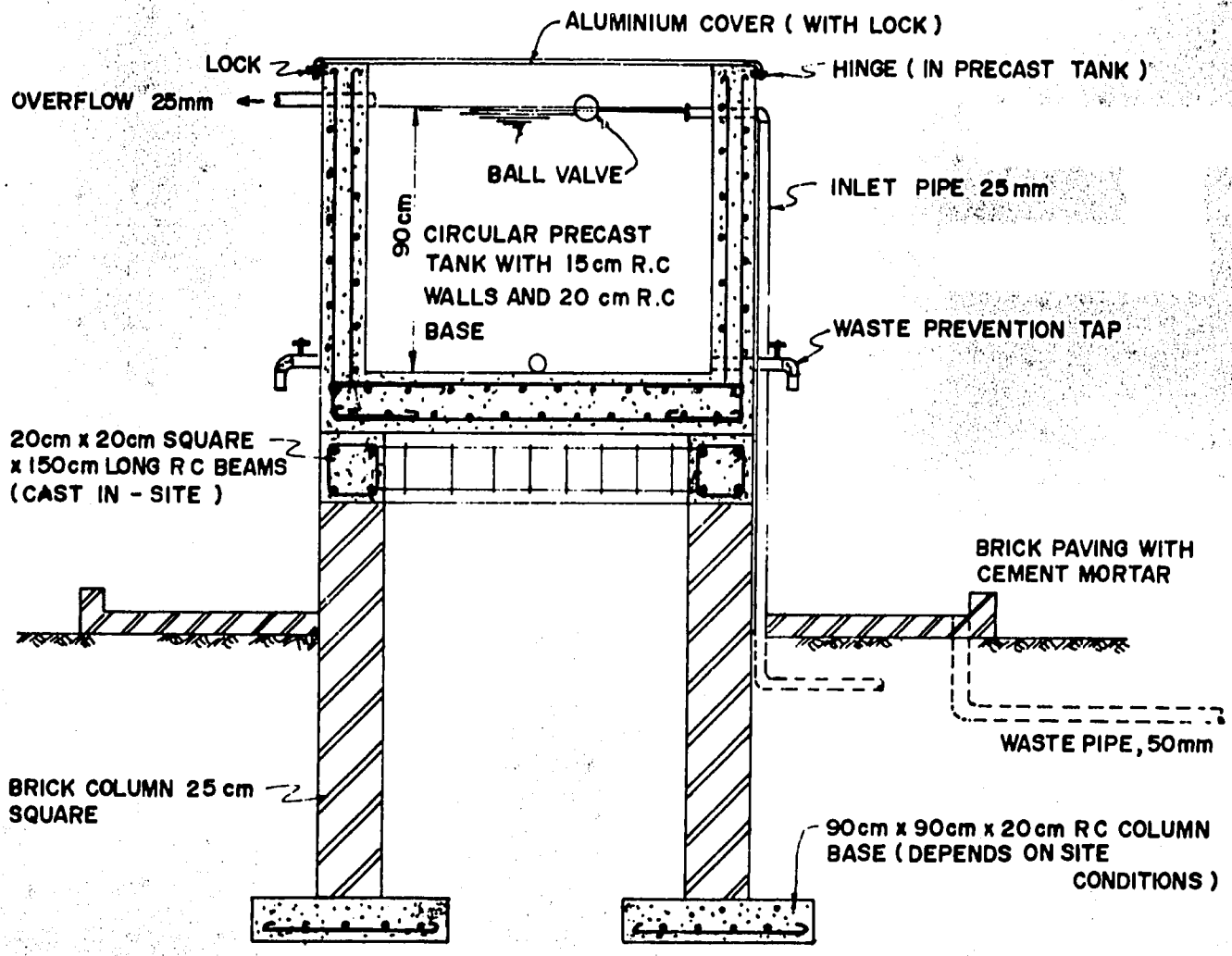
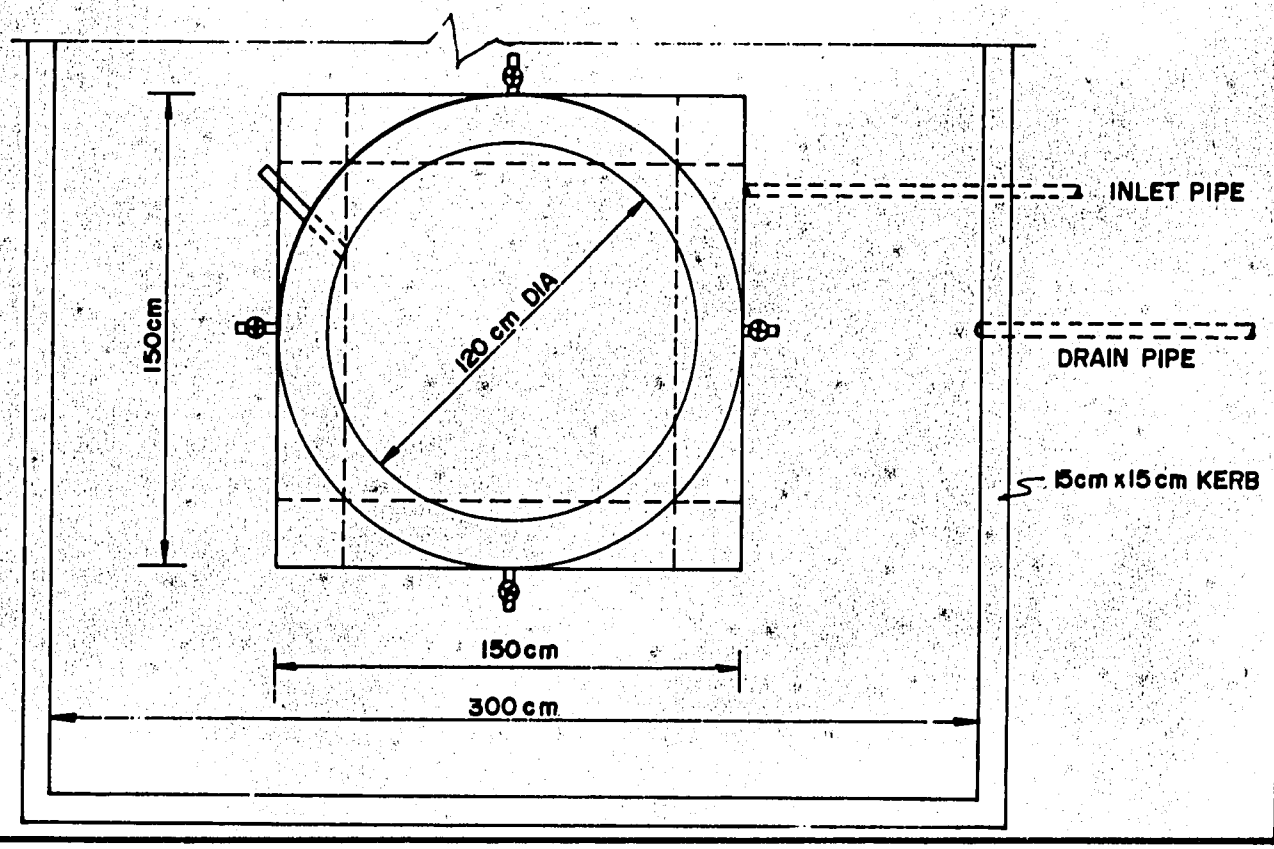

DRAWING FOR
STANDARD STAND PIPE
4 Ø 8mm
G.I.P
1/2 – 3/4"
STIRRUP
Ø 6mm – 20cm
PLUG
TAP 1/2"
PRECEST CONCRETE STAND PIPE
(15cm x 15cm x 140cm)
SAND BASE
SLAB PLAIN
CONCRETE 1:3:5
BOX METER
WITH COVERED
70 cm
8 cm
8 cm
10 cm
PIPE FOR
DRAINAGE
(P.V.C.1")
WATER
METER 1/2"
70 cm
40cm
STOP COCK 1/2"
50cm x 50cm
PLAIN, LEAN CONCRETE 1:3:5
200cm x 200cm

FIGURE 4.2

CISTERN-STAND PIPE FOR LOW-PRESSURE AREAS





Fire Hydrants

Fire hydrants are proposed only where existing pressures are adequate or are projected to be adequate by the end of Repelita III

Distribution

The Hazen-Williams formula with suitable 'C' values depending on the age and condition of the pipes has been used in calculating the sizes of distribution pipes. The Hazen-Williams formula used is the following:

$$Q = 0.094\ Cd^{2.63}\ i^{0.54}$$

where Q = discharge in cu m/s

C = Hazen-Williams roughness coefficient using PVC pipes, a value of C = 130 will be used

d = pipe diameter in meters

i = hydraulic gradient in m fall/m length.

There are no major differences in elevation in the service area, and hence there is no need for pressure zones. The allowance for fire protection has been limited to 180 l/s in commercial areas and 45 l/s in other areas. A few selected nodes in the distribution network will be capable of these flows, enabling one major fire to be dealt with at a time. It is assumed that there would be a reduction in pressure in the domestic supplies during the fire-fighting period.

In the case of new feeder lines, the smallest diameter used in the KIP area, with a few exceptions, will be 80 mm. The minimum residual pressure at ground-level for services was taken as 15 metres, which could drop to 5 metres during a fire. A maximum residual pressure of 75 metres was assumed. This is compatible with the maximum allowable pressure of the different makes of pipes likely to be used in the network.

The storage available in the system is negligible. At the present time, there is no perceptible "peak" in the pattern of consumption. A consumption pattern is certain to be established when an adequate supply is provided and a factor suitable for Medan can only be obtained by comparison of consumption patterns in other cities with similar social and climatological conditions. A peak factor (ratio of peak hour flow to average flow) of 1.7 has been adopted with a maximum day/average day rate of 1.15.

Another important feature in a distribution network is the provision and location of valves. The ideal arrangements is one that permits the isolation of any single line between two junctions for repairs. This would require a very large number of valves of large and small diameter, with an accompanying high initial capital outlay. The provision of valves should therefore be done in a manner so that a reasonably sized but limited area may be isolated.

Ordinary gate valves should be used for smaller diameter pipes. The use of butterfly valves should be given serious consideration for the large diameters as these, in addition to performing the function of a gate valve, are less expensive.

The type of pipe that should be used will be in accordance with present practise in the Republic in general and in Medan in particular.

80 mm - 200 mm - Asbestos cement pipe or unplasticized PVC pipe.

200 mm and larger - Asbestos Cement Pipe.

All joints, including PVC pipe joints, should be of a generally accepted design of the flexible type. High quality rubber rings are an absolute necessity for prevention of leaks at the joints.

The velocities will range between 0.75 m/s in small pipes to approximately 2.5 m/s in the larger.

4.2.1.2 Wastewater Disposal

The goal of the Government of Indonesia KIP program is to provide improved human waste disposal systems for families which are not presently, and will not in the near future, be served by a sewerage system.

The guidelines of the World Health Organization (W.H.O.) with respect to systems for the disposal of human waste are the following:

- Surface soil should not be contaminated
- Groundwater which may enter open, shallow wells should not be contaminated.
- Surface water should not be contaminated
- Excreta should not be accessible to flies or animals
- Fresh excreta should not be handled
- Odors and unsightly conditions should not occur
- Recommended method should be simple and inexpensive in construction and operation.

Existing Situation

There are three basic ways in which human waste is presently disposed of in the KIP areas:

- Septic tank
- Pit Latrine
- River or stream

Some of the better constructed, permanent dwelling units found along the main secondary kampung roads have septic tanks. A septic tank is a closed settling tank in which the wastes are digested through decomposition by bacterial action. The liquid effluent, after a period in the tank, is discharged to a disposal/absorption field or seepage pit.

A septic tank, to be effective, requires considerable quality control during construction to ensure that the tank will remain water tight during its life. In addition a drain field is required. The required area depends on the number of users and the permeability of the soil.

Septic tanks require periodic inspection and maintenance. Pumping is required every 2-4 years.

The great majority of KIP area residents have access to individual toilets located either adjacent to the dwelling unit or in the rear yard. Most of these toilets are of the pit latrine variety. The dry or wet pit method consists of a hole in the ground with sufficient volume to handle the design wastes for about a 5-year period. At present, a small number of the pits are sealed with a simple reinforced concrete squatting plate and water seal.

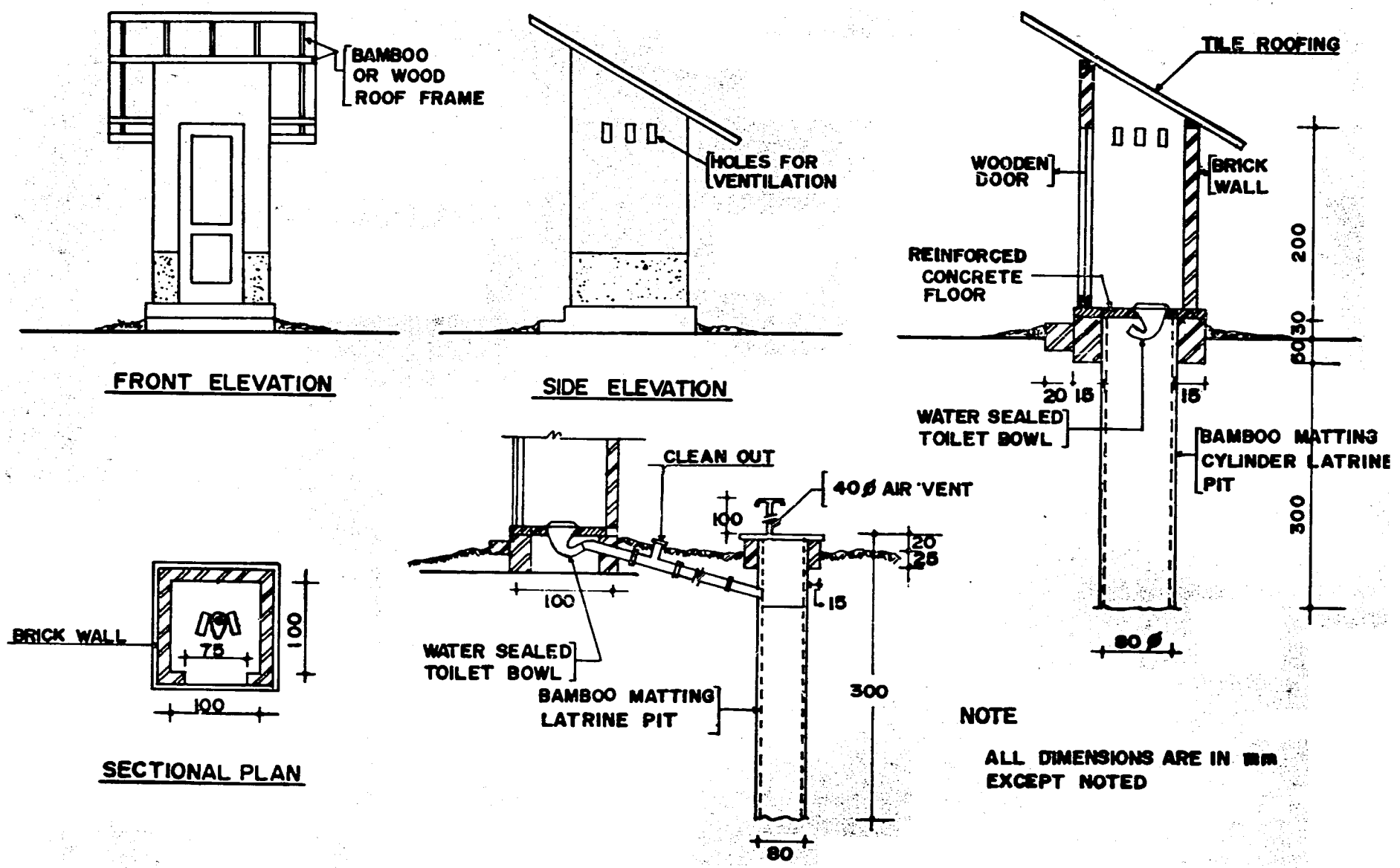
A properly constructed pit latrine can satisfy most of the W.H.O. requirements under a wide range of soil conditions and ground water levels. Even if the ground water should be within 2-3 metres of the natural surface, a pit can function effectively. It is desirable that the pit be located at least 15 metres from any existing shallow wells in order to reduce the danger of ground water contamination to the open shallow wells.

In those KIP areas found along the Deli River, high residential densities of approximately 500 persons per hectare, small lot size and almost total lot coverage by the dwelling unit do not permit the use of individual pit latrines. Due to the proximity of the Deli River, most households use it for their human waste disposal requirements.

Recommended Improvement Program

The recommended improvement program for human waste disposal includes two components:

WATER-SEALED LATRINE



NOTE

ALL DIMENSIONS ARE IN mm EXCEPT NOTED

FIGURE 4.3

- Water-sealed slabs for existing individual pit latrines
- MCK program in those areas presently not served by individual pit latrines.

Water-sealed Latrines

Since 1975, approximately 4300 water-sealed slabs have been provided to kampung residents in an ongoing program administered by the Medan Public Health Department. The goal of the present KIP program is to substantially increase this program in order to serve approximately one-half of all KIP area dwelling units presently using individual pit latrines. It is estimated that an additional 4750 KIP area dwelling units will take advantage of this program. Given the existing high densities and small plot sizes, it is not considered feasible to recommend a system of individual toilets for those KIP households living along the Deli River.

Public acceptance of and demand for these water-sealed slabs is high. Many people who are unable to obtain a slab from the Health Department have constructed their own latrines of this type from available materials. A survey of areas where several of these slabs have been installed shows them to be generally free from odor and in good condition. The lack of excreta on the ground indicates that their availability and use has resulted in significantly improved conditions.

MCK Program

In the 17 hectares of KIP area located along the Deli River in Kampungs Hamdan and Aur, a public toilet with washing and bathing facilities (MCK) is proposed. The present program recommends the construction of 29 MCKs.

Design Criteria

Water-sealed Latrine

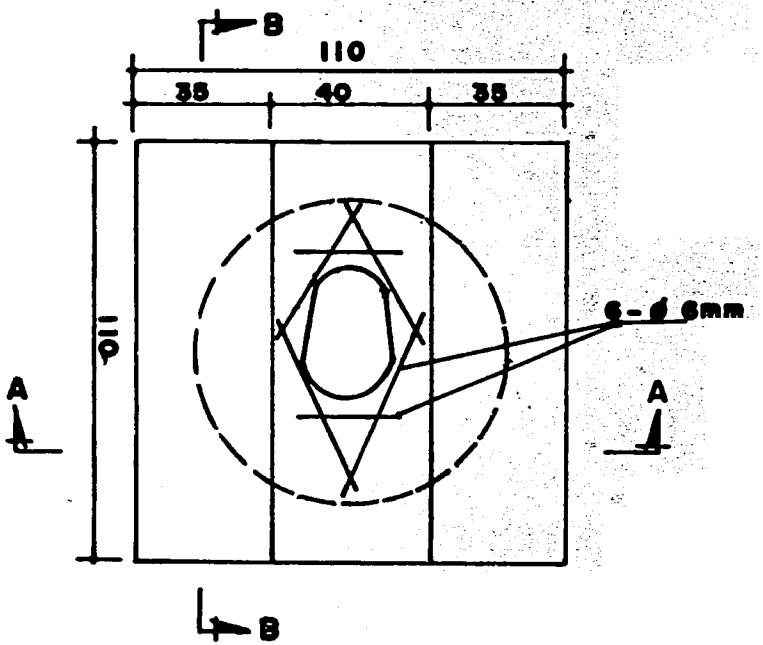
The principal unit provided is a concrete slab in which a squatting type plate is integrated with a water-sealed opening. The slab is usually placed directly over a pit or vault which is constructed by the individual households, as are curbs and shelters enclosing the latrine. These slabs may also be installed indoors with a discharge pipe leading to an outdoor pit or vault. Figures 4.3 and 4.4 show the recommended designs for the water-sealed latrine program.

MCK

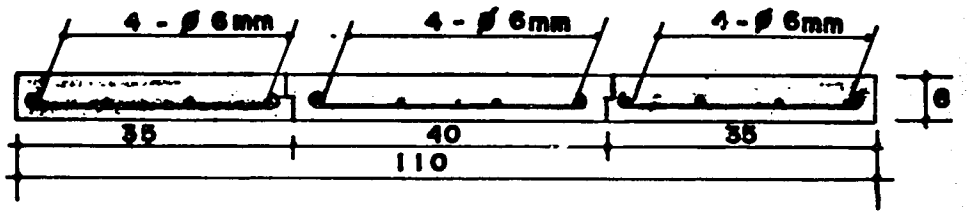
In order to successfully compete with the highly accessible Deli River, it is recommended that approximately two four-place public toilets (MCK) with facilities for washing and bathing be constructed per hectare in the KIP areas of Aur and Hamdan. Given an estimated residential density of 475 persons per hectare and assuming a circular service area, each MCK would serve roughly 240 persons or 45 households*. Each dwelling unit would be within 25-30 metres walking distance of a MCK. The

*Assumes a weighted average household size of 5.5 persons per household for the KIP areas of Hamdan and Aur.

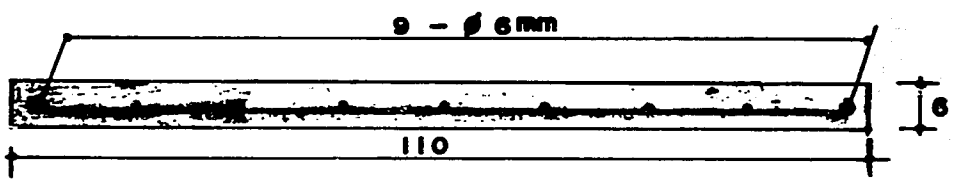
WATER-SEALED LATRINE SLAB AND DETAILS



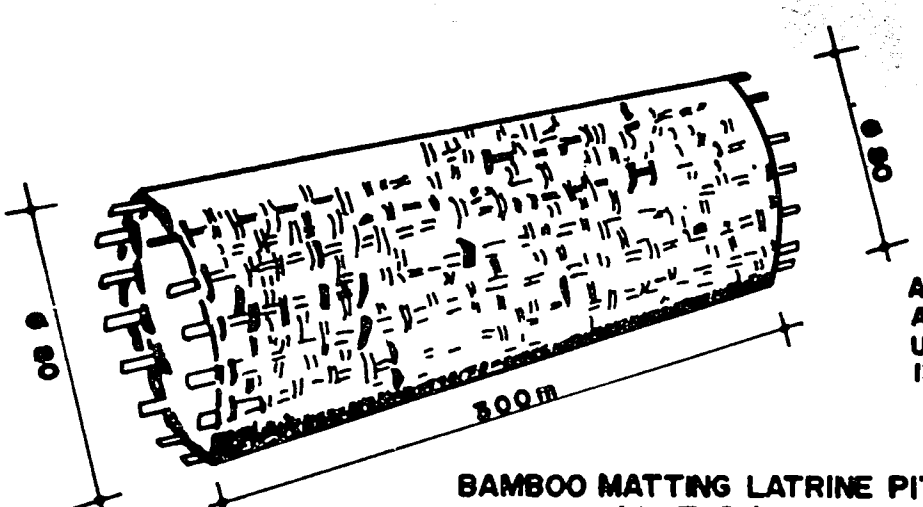
RINFORCED CONCRETE FLOOR
SCALE = 1 : 20



SECTION A – A
SCALE = 1 : 10



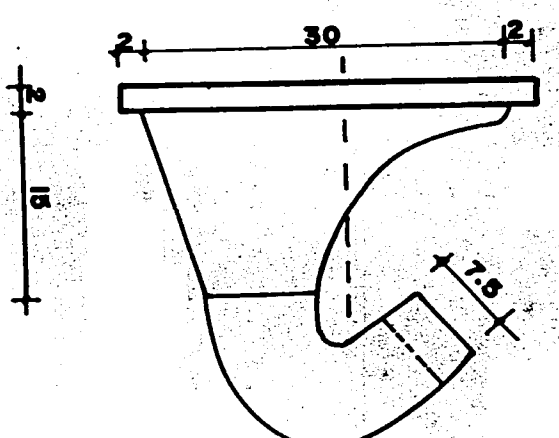
SECTION B – B
SCALE = 1 : 10



BAMBOO MATTING LATRINE PIT
(N.T.S.)

NOTE

ALL DIMENSIONS SHOWN ARE IN CENTIMETRES UNLESS OTHERWISE INDICATED



WATER - SEAL TOILET BOWL
(N.T.S.)

FIGURE 4.4

water source for each MCK would come from the P.A.M. municipal distribution system. Depending on the particular needs of the KIP area sector, a public 2-tap standpipe will also be provided.

Due to high densities and poor soil conditions, a septic tank for disposal of human waste is not recommended for the present MCK program. Rather, a holding tank for human waste is proposed. In the short-term, the effluent from the holding tank would discharge directly to the Deli River by the use of 100 mm P.V.C. pipe. The proposed method certainly is not an optimal solution. It would be better to pump the effluent to a D.K.K.P. tank truck -- assuming the effluent could be discharged to an oxidation pond. However, because of the lack of vehicular access in these particular KIP areas, most of the MCKs will not be able to be serviced by tank truck. If and when the proposed wastewater collection system is put into service, it will be possible to pump the effluent directly into an adjacent collector. For the present, however, the proposed MCK program is certainly an incremental improvement in that it removes the KIP area residents from direct contact with the highly polluted Deli River. Figure 4.5 illustrates the proposed 4-place toilet/ bathing unit.

The present use of the Deli River by the KIP area residents presents a difficult barrier to overcome. The unsanitary conditions linked with this usage are certainly undeniable. However, from the perspective of the KIP area resident, the river does have the advantage of easy access. Any proposed solution must take into consideration more than just the number of W.C.'s per MCK or the coverage of MCK's per hectare. An educational program on the use and benefits of the MCK must accompany the purely physical construction of the units. (See Section 5.4 on Community Participation).

4.2.1.3 Streets and Footpaths

A properly designed and functioning circulation network is very much interrelated with the other proposed KIP area improvements. The condition of streets and footpaths is to a great extenta function of the existing drainage situation. A program recommending upgrading and new construction for the KIP areas' local drainage system will be discussed in the next section. The combined pavement and drainage system will prevent runoff from ponding on the road surface or from stagnating in the side drain. The prompt removal of runoff will retard the penetration of water into the roadway's surface and base courses. A failure free street and footpath network will provide easy access to public standpipes and MCKs, as well as to the gerobaks and trucks used in the removal of solid waste.

Existing Situation

Generally all KIP areas are quite well served by the combination of one and two-way streets. Most households live within 100 metres of a one-way street (4-6 m ROW) or 300 metres from a two-way street (6-8 m ROW). The planning guideline that all dwelling units not located along a one or two-way street be located within 20 metres of a footpath is met, with few exceptions, in all but the rapidly expanding peripheral KIP areas.

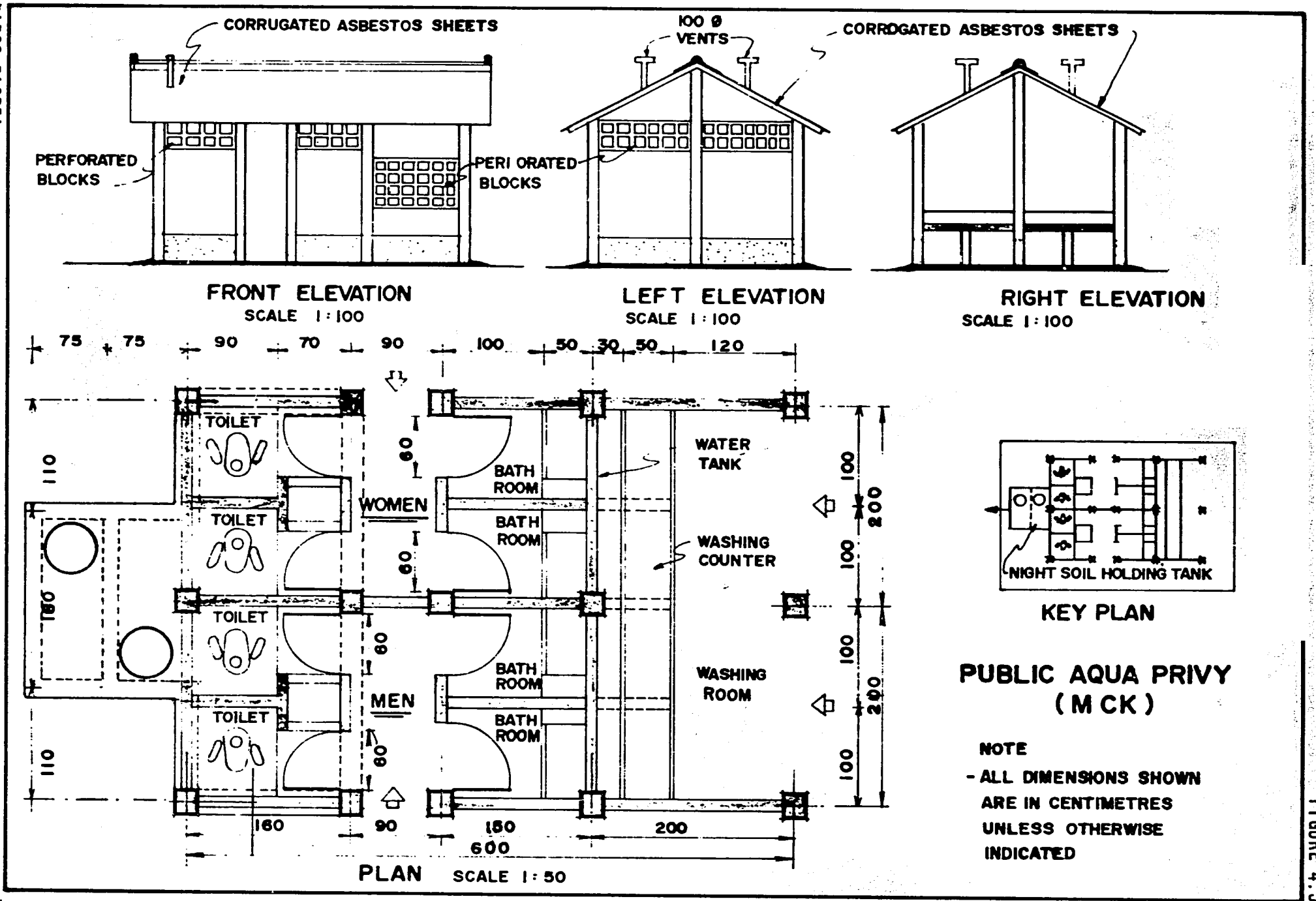

CORRUGATED ASBESTOS SHEETS
PERFORATED BLOCKS
PERI ORATED BLOCKS
FRONT ELEVATION
SCALE 1:100
100 Ø VENTS
CORRUGATED ASBESTOS SHEETS
LEFT ELEVATION
SCALE 1:100
RIGHT ELEVATION
SCALE 1:100
75
75
90
70
90
100
50
30
50
120
TOILET
TOILET
TOILET
TOILET
WOMEN
MEN
BATH ROOM
BATH ROOM
BATH ROOM
BATH ROOM
WATER TANK
WASHING COUNTER
WASHING ROOM
110
110
160
90
150
200
600
PLAN SCALE 1:50
NIGHT SOIL HOLDING TANK
KEY PLAN
PUBLIC AQUA PRIVY
(MCK)
NOTE
- ALL DIMENSIONS SHOWN ARE IN CENTIMETRES UNLESS OTHERWISE INDICATED

FIGURE 4.5

This good coverage of roads and footpaths in the KIP areas is shown in Table 4.2. This Table summarizes the application of the circulation network coverage guidelines for specific KIP areas of 50 - 100 metres per hectare of one-way streets, 0-33 metres per hectare of two-way streets and 150-200 metres per hectare of footpaths.

While the coverage of the street and footpath network is quite good in the KIP areas, the condition of these streets and footpaths is generally fair at best. The best conditions are found on the wider, paved secondary roads. Most of the other streets and footpaths are of unimproved earth. The unimproved earth streets, and especially the footpaths, are almost impassable during the rainy season.

Recommended Improvement Program

Using the following general planning guidelines that:

- all streets should be planned for light, local traffic and not through traffic
- all streets with an adequate right-of-way for two-way traffic should have a pavement design capable of supporting the corresponding loading; and
- all footpaths should provide ease of access to pedestrians, becaks, motorbikes and bicycles;

and the analysis of the existing condition of the circulation network in the KIP areas, a hierarchy of four types of streets and footpaths was identified that will serve as the basis for upgrading the existing network* to the Kotamadya Pekerjaan Umum Standards:

1. Secondary street (Class III) with right-of-way greater than 6 m
2. Residential street (Class IV) with right-of-way from 4 to 6 m.
3. Main footpath (Class V) with right-of-way from 2 to 4 m.
4. Footpath (Gang) with right-of-way less than 2 m.

Design Criteria

Streets and Footpaths

All four classes of KIP area street and footpath that presently have an unimproved earth surface will be reconstructed to the design standards contained in Table 4.3. All streets with an existing asphalt surface will either be improved or resurfaced depending on the present condition. An improved surface will entail overlaying with 6 cm of compacted crushed stone and 2 cm of asphalt. A resurfacing will consist of 2 cm of asphalt. Figures 4.6 and 4.7 present the recommended pavement design corresponding to the four types of streets and footpaths.

* Due to the existing good coverage of roads and footpaths in the KIP areas, no new construction is recommended.

TABLE 4.2

ANALYSIS OF EXISTING STREET AND FOOTPATH NETWORK IN MEDAN'S KIP AREA

Kampung	Kampung KIP Area (ha)	Total Length of 2 Way Streets (m)	Total Length of 1 Way Streets (m)	Total Length of Footpaths (m)	Length 2 Way Streets/ KIP Area (m/ha)	Length 1 Way Streets KIP Area (m/ha)	Length Footpath/KIP Area (m/ha)
Hamdan	9.57	480	140	2,330	50.2	14.6	243.5
Aur	7.67	330	320	2,255	43.0	41.7	294.0
Sidorame Barat	42.76	1,055	1,545	6,645	24.7	36.1	155.4
Sidorame Timur	22.72	2,075	550	3,775	91.3	24.3	166.2
Sei Kera Hilir	41.38	3,405	0	7,180	82.3	0.0	173.5
Sei Kera Hulu	22.28	580	2,370	3,375	26.0	106.4	151.5
Tegal Sari I	31.75	2,340	2,310	5,830	73.7	72.8	183.6
Tegal Sari II	26.77	1,385	1,025	2,240	51.7	38.3	83.7
Tegal Sari Denai	39.11	1,050	2,930	4,890	26.9	74.9	125.0
Total	244.01	12,700	11,190	38,520	52.1	45.9	157.9

SOURCE: MUDS

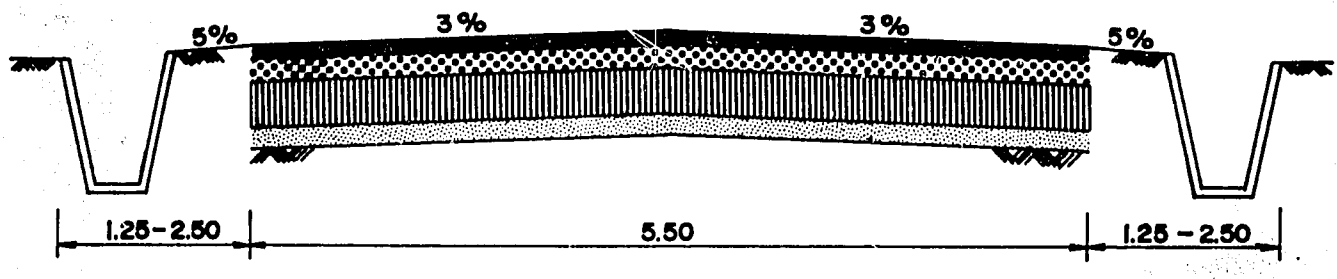
TABLE 4.3

RECOMMENDED IMPROVEMENTS FOR KIP AREA STREETS & FOOTPATHS

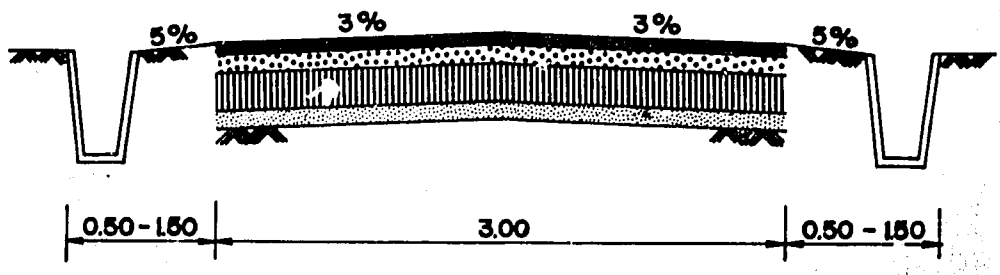
Type of Street/Footpath	Kotamadya P.U. Improvement Class	Right-of way (m)	Pavement Width (m)	Pavement Design (cm)		Design Loading (ton)
Secondary Street	III	Greater than 6 m	4 - 6 m	5 cm Sub-Grade 20 cm Sub-Base 6-8 cm Base 2-3 Surface	Sand Cobblestone Crushed Stone Asphalt	6
Residential Street	IV	4 - 6 m	2.5-4 m	5 cm Sub-Grade 15 cm Sub-Base 6-8 cm Base 2-3 Surface	Sand Cobblestone Gravel Asphalt	4
Main Footpath	V	2 - 4 m	2 - 3 m	25 cm Base 2 cm Surface	Gravel Asphalt	
Footpath	Gang	Less than 2 m	1-1.5 m	15 cm Base 2 cm Surface	Gravel Asphalt	

SOURCE: Kotamadya Pekerjaan Umum

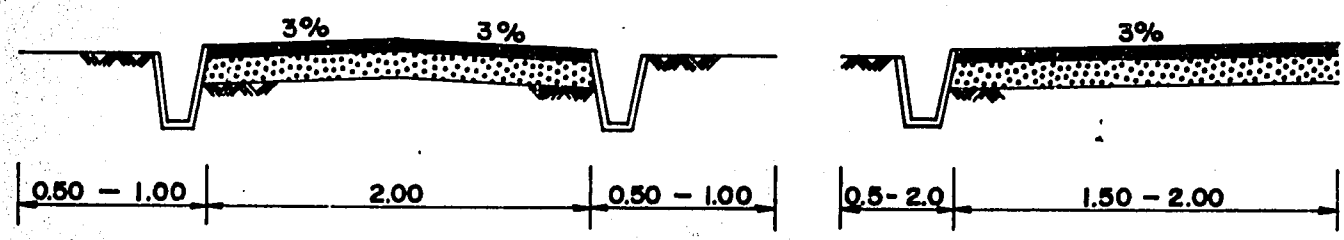
RECOMMENDED STREET AND FOOTPATH CROSS SECTION



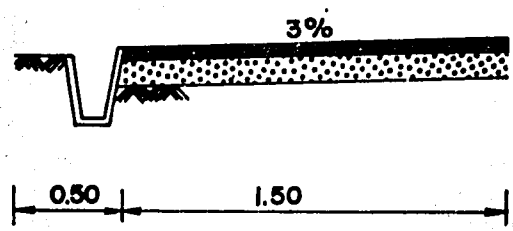
SECONDARY STREET



RESIDENTIAL STREET



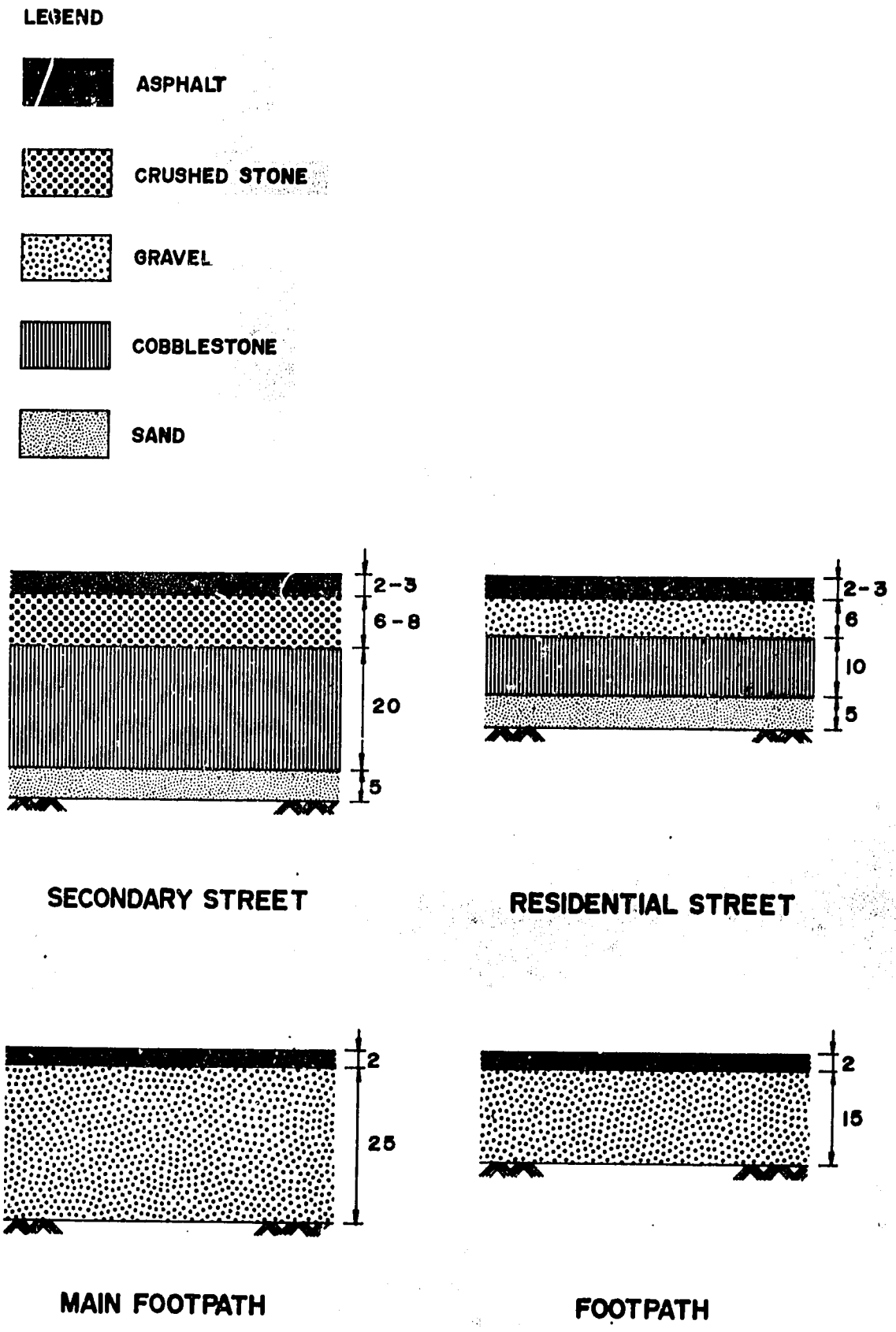
MAIN FOOTPATH



FOOTPATH

FIGURE 4.7

RECOMMENDED STREET AND FOOTPATH SECTIONS



Bridges

Two foot bridges and three road bridges are proposed as part of kampung improvement for the peripheral areas of Tegal Sari I, II and Medan Denai. Their main function would be to provide greater access across an existing sub-main drainage channel which bisects the KIP area from north to south. Figures 4.8 and 4.9 show typical designs for the two types of proposed bridges.

4.2.1.4 Drainage

Improvement to the stormwater drainage system of East Medan is a high priority item during Repelita III. All the KIP areas, with the exception of those located along the Deli River, are found within the Kera River drainage area, the main drainage area of East Medan. Regular flooding occurs extensively throughout the Kera River watershed. Flooding is attributable to both overbank flow and to local ponding caused by deficiencies in local drains. While clearing, cleaning and dredging of the existing channels will significantly increase the level of flood protection, preliminary analysis indicates that frequent flooding could still be expected. Therefore, in the Kera Basin, there is little option to improve flood control by means other than increasing capacity.

Existing Situation

The general condition of the existing local drains found long KIP area streets and footpaths is poor. A small percentage are lined either with cast-in-place concrete or plastered brick. However, the great majority are of the unimproved earth variety*. Often drainage ditches have insufficient cross sectional area to carry the generated runoff. Weeds and solid wastes thus further reduce capacity resulting in more frequent flooding than would otherwise occur. In addition, many of the original drain designs were not adequate to handle present runoff loads.

Recommended Improvement Program

Considering both the relative damage caused by flooding in the East Medan KIP areas and a realistic appraisal of the level of service which is economical to provide, a lined, open channel with a minimum design flood frequency of one year is recommended for all KIP area streets and footpaths. Depending on the adequacy for right-of-way, drains will be designed for a two-year flood frequency return period. This improved standard can be justified on the basis that drain costs increase dramatically with improved channel type - i.e., buried conduit versus open channel, while the relative increase in unit costs of providing increased flood protection is less marked. (See Figure 4.10).

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* Many sectors found within the KIP area are unserved by stormwater drains.

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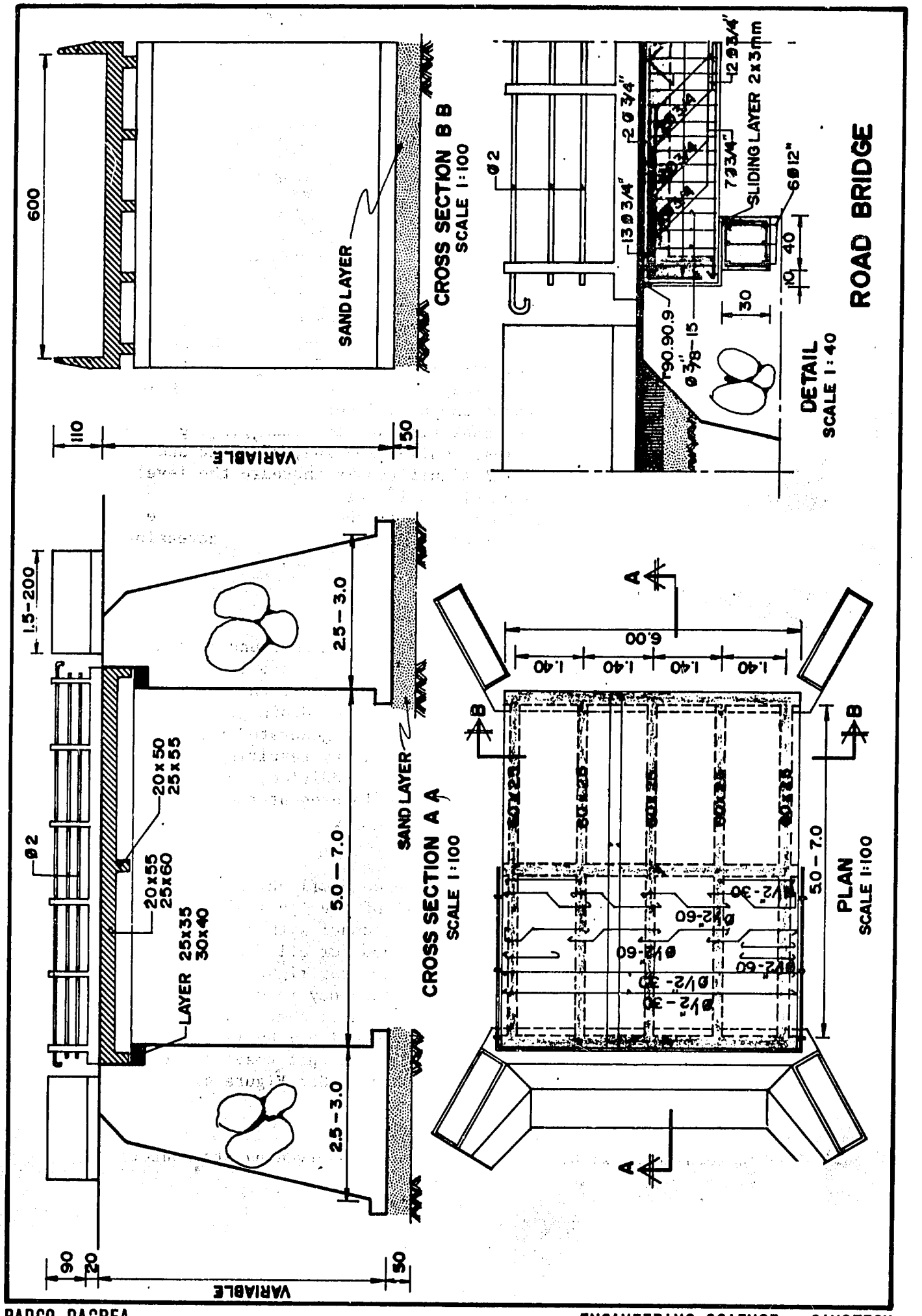
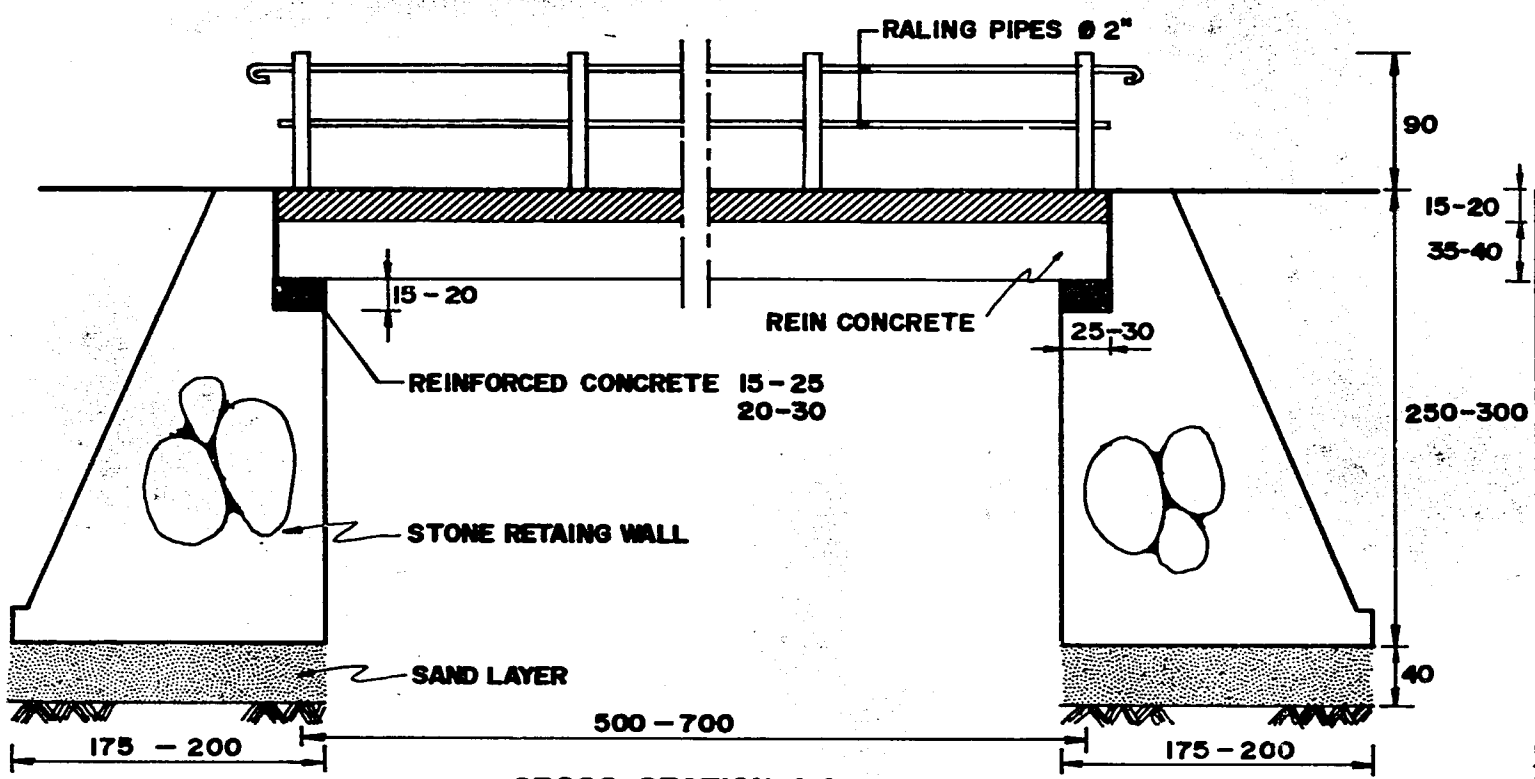
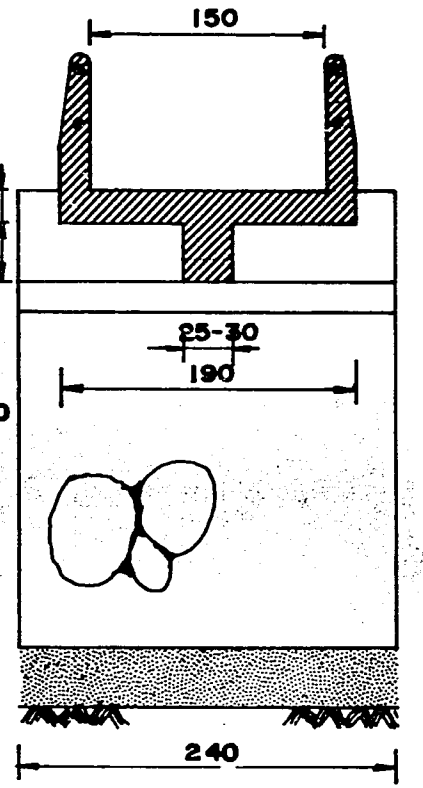
FIGURE 4.8

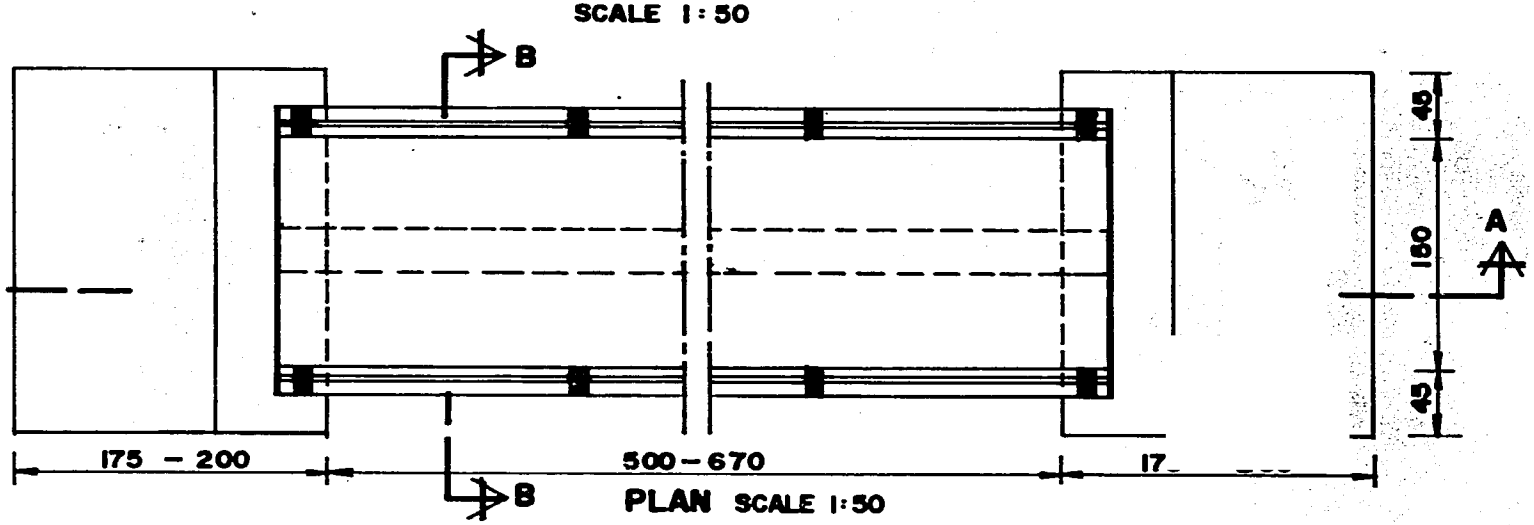

600
SAND LAYER
CROSS SECTION B B
SCALE 1:100
110
VARIABLE
50
Ø2
13 Ø 3/4"
2 Ø 3/4"
12 Ø 3/4"
7 Ø 3/4"
SLIDING LAYER 2x3mm
6 Ø 12"
40
30
90.90.9
Ø 3/8"-15
DETAIL
SCALE 1:40
ROAD BRIDGE
1.5-200
2.5-3.0
20x50
25x55
20x55
25x60
25x35
30x40
LAYER
5.0-7.0
SAND LAYER
CROSS SECTION A A
SCALE 1:100
90
20
VARIABLE
50
A
B
6.00
1.40
1.40
1.40
1.40
Ø 1/2-30
Ø 1/2-60
5.0-7.0
PLAN
SCALE 1:100



CROSS SECTION A A
SCALE 1:50



CROSS SECTION B B
SCALE 1:50

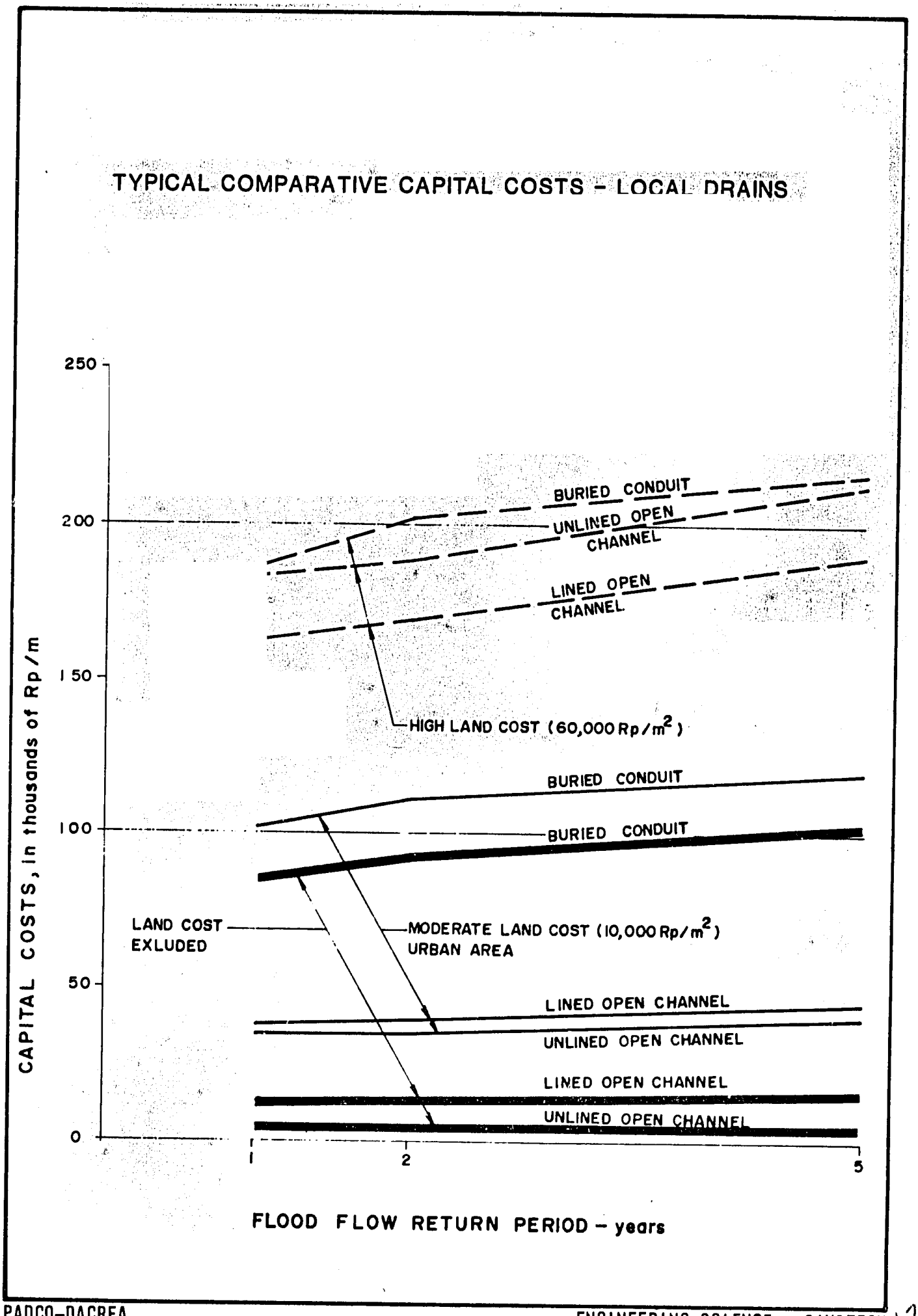


PLAN SCALE 1:50

FOOTPATH BRIDGE

FIGURE 4.9

FIGURE 4.10


TYPICAL COMPARATIVE CAPITAL COSTS - LOCAL DRAINS
250
200
150
100
50
0
CAPITAL COSTS, in thousands of Rp/m
BURIED CONDUIT
UNLINED OPEN CHANNEL
LINED OPEN CHANNEL
HIGH LAND COST (60,000 Rp/m²)
BURIED CONDUIT
BURIED CONDUIT
LAND COST EXLUDED
MODERATE LAND COST (10,000 Rp/m²) URBAN AREA
LINED OPEN CHANNEL
UNLINED OPEN CHANNEL
LINED OPEN CHANNEL
UNLINED OPEN CHANNEL
1
2
5
FLOOD FLOW RETURN PERIOD - years

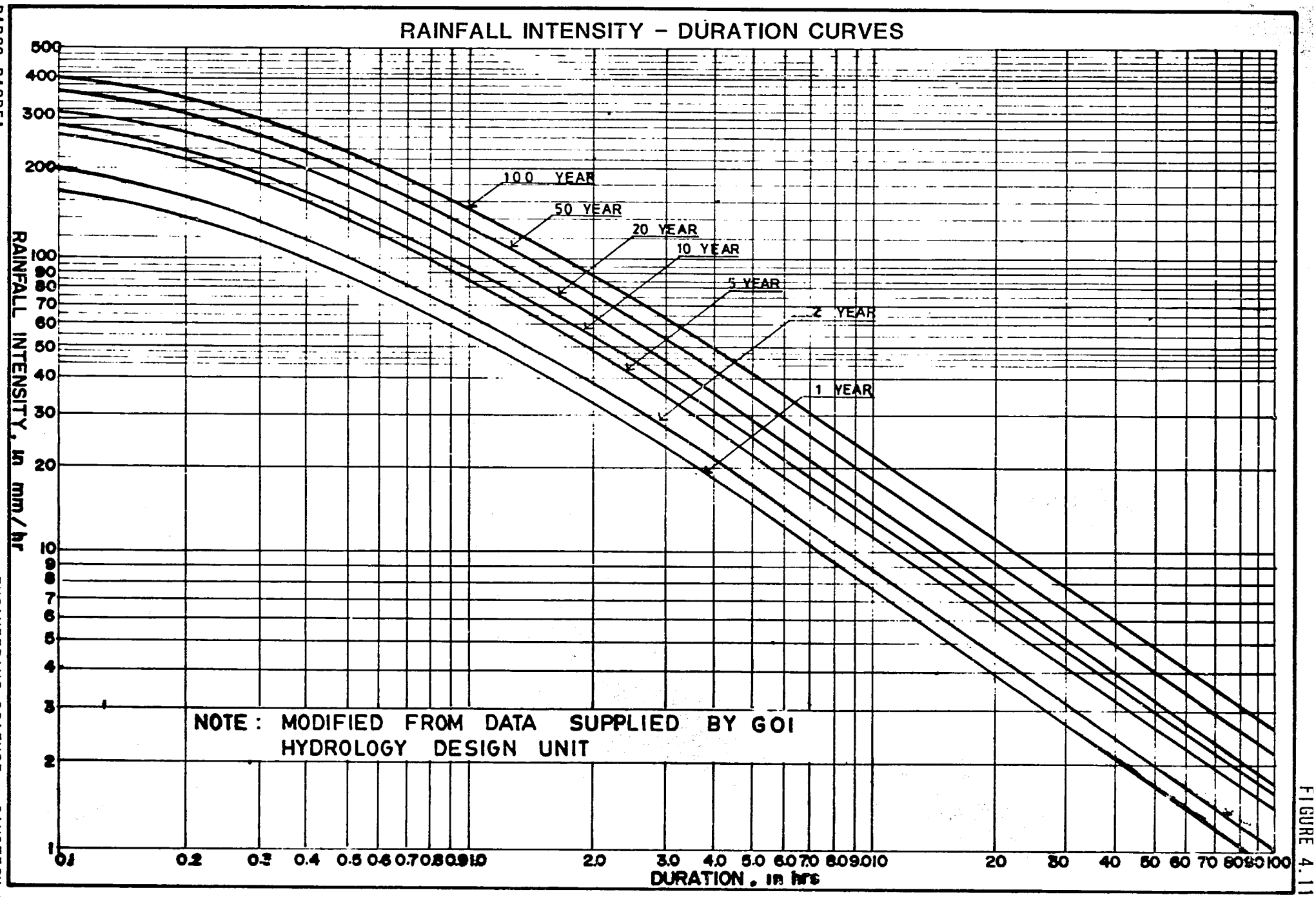

RAINFALL INTENSITY - DURATION CURVES
RAINFALL INTENSITY, in mm/hr
DURATION, in hrs
100 YEAR
50 YEAR
20 YEAR
10 YEAR
5 YEAR
2 YEAR
1 YEAR
NOTE: MODIFIED FROM DATA SUPPLIED BY GOI
HYDROLOGY DESIGN UNIT

FIGURE 4.11

All existing local drains will be upgraded to this design standard; all new drainage construction will be undertaken at this standard. The design, costing and construction of major drains located within the KIP areas will not be included as part of the KIP program preliminary design. (See Master Plan and First Stage Program, Vol.V, Part 3 for discussion of this subject). The upgrading of existing drains and the construction of new drains will be undertaken in conjunction with improvements to the existing street and footpath network. The appropriate drain dimensions and location on one or both sides of the roadway will depend on the circulation network classification presented in the preceeding section.

Design Criteria

Probable Rainfall

Rainfall data have been analyzed by Public Works' Hydrology Design Unit. They have prepared rainfall intensity duration and frequency curves for Medan using Horner's Formula:

$$i = \frac{A}{(t + d)^n}$$

where: i = rainfall intensity, in mm/hour

t = rainfall duration time, in hours

A, d and n are regional coefficients and exponents

The regional coefficients and exponents used to characterize the rainfall intensity for 2, 5, 10, 20, 50 and 100 year return periods are shown below, and the rainfall intensity duration curves are shown in Figure 4.11.

Return period, t (years)	Rainfall intensity, i (mm/h)
2	$i = \frac{83}{(t + 0.28)\ 0.95}$
5	$i = \frac{101}{(t + 0.28)\ 0.95}$
10	$i = \frac{115}{(t + 0.30)\ 0.93}$
20	$i = \frac{134}{(t + 0.31)\ 0.95}$
50	$i = \frac{161}{(t + 0.34)\ 0.95}$
100	$i = \frac{187}{(t + 0.36)\ 0.95}$

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Runoff Analysis

The runoff coefficient represents the proportion of the rainfall that runs off the land surface and into drainage facilities. The value of the coefficient - which can vary from 0 to 1 - depends on a number of factors including the permeability of the surface, surface roughness and slope, and the intensity and duration of rainfall. At the beginning of rainfall, water soaks into the ground and then fills small depressions in the surface. As the ground saturates and the surface depressions are filled, the water begins to flow over the surface and the coefficient increases in value. The runoff coefficient for any area can be considered as a combination of impervious and pervious areas. The variation of c, the composite runoff coefficient, and t, the rainfall duration in minutes, for various percentages of impervious areas is shown in Figure 4.12.

Percentages of impervious area for various land use classifications are the following:

Land Use	Percentage of Impervious Area
Commercial	95
Residential	65
Industrial	60
Institutional	35
Open Area	0

Runoff Rates

The rational method was used to determine the stormwater flows for the KIP area local drains:

$$Q = 0.00278\ c\ i\ A$$

where: Q = runoff from the tributary area, cu m/s

c = runoff coefficient

i = rainfall intensity, mm/hour

A = tributary drainage area, hectares

It should be noted that the values for c and i depend on the selection of a rainfall duration. Maximum runoff will occur when the rainfall duration is equal to the time required for water falling on the furthest point in the tributary area to travel to the point where the runoff is to be calculated.

Hydraulic Design

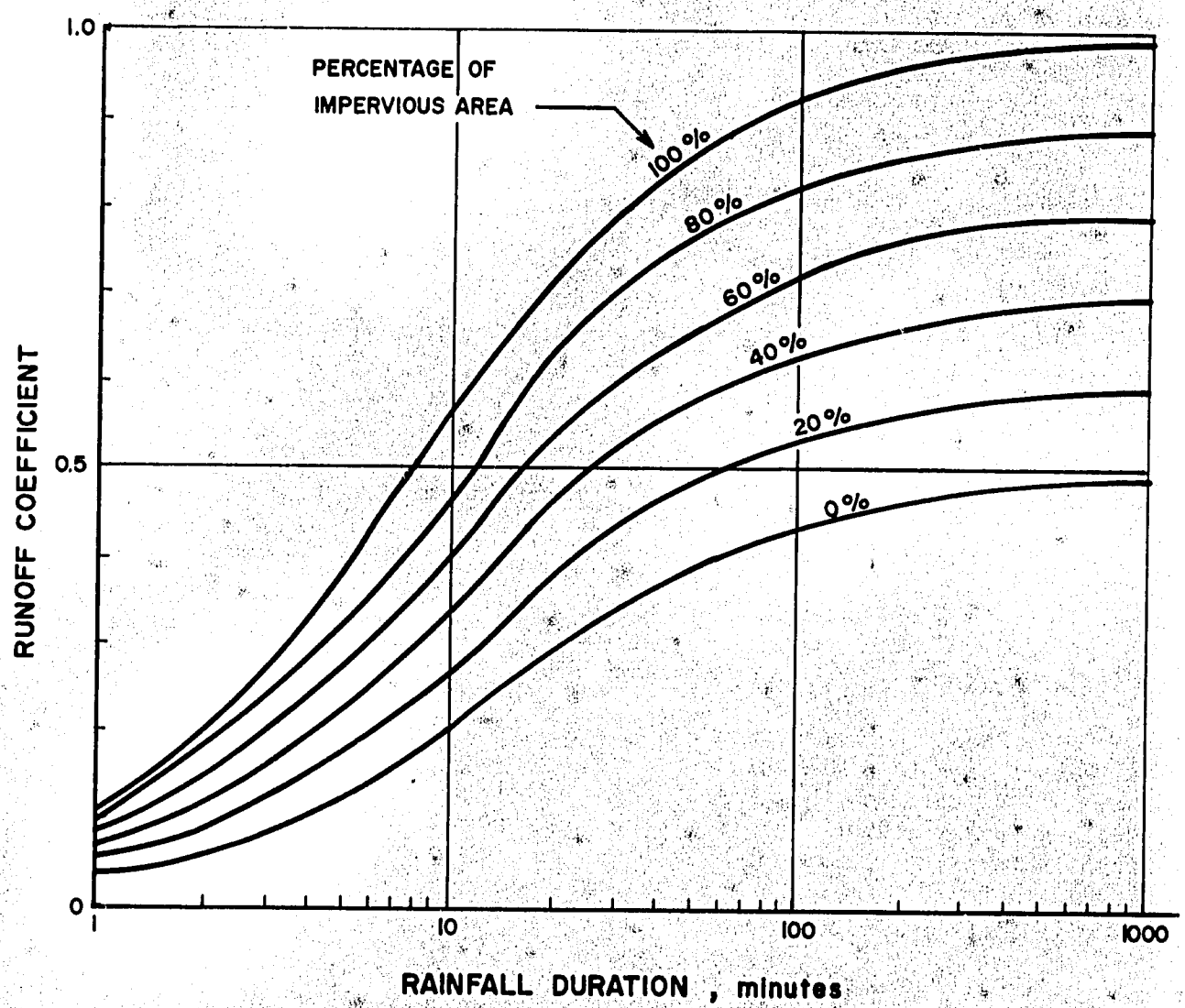
The required capacity of the lined, open drain was determined from Manning's Formula:

$$Q = \frac{1.0}{n} A\, r^{2/3}\, s^{1/2}$$

123

FIGURE 4.12

RUNOFF COEFICIENTS AS A FUNCTION OF RAINFALL DURATION AND PERCENTAGE OF IMPERVIOUS AREA



where: Q = flow in the drain, cu m/s

A = cross-sectional area of drain sq m

r = hydraulic radius, m

s = hydraulic gradient

n = friction factor

Due to the flat topography of Medan, natural ground slopes were assumed to be 0.001. The friction factors for lined and unlined channels were taken as 0.015 and 0.025, respectively.

From the assumed friction factors, it can be seen that a lined channel has a higher hydraulic capacity than an unlined channel of the same cross-section and slope. Lined channels have a second advantage over unlined ones in that lining prevents erosion which allows lined channels to be designed for much higher flow velocities than unlined channels. Velocities in unlined channels are usually limited to a maximum of one metre per second. Lined channels are often designed for peak velocities of four to five metres per second. This level of velocity greatly reduces the required cross-sectional area. This is often desirable for asthetic, economic and environmental reasons.

Typical Cross-sections

As mentioned previously, it is proposed that all existing streets and footpaths be served by a system of local drains. As discussed in Section 7 of the Master Plan and First Stage Program, Vol.V, Part 3, the proposed drainage system will function in the following manner. Stormwater from the individual streets, footpaths and adjacent properties would be collected by the local street and footpath drains. This stormwater, in turn, would flow into a relatively small number of sub-main drains located along the major secondary roads. This accumulated flow would be carried to the main drains and major rivers. For the purpose of preliminary KIP design, only the local street and footpath drain will be designed and costed.

In an analysis of cast-in-place concrete versus plastered brick drains for the same cross-sectional area, it was determined that brick drains are approximately 25 percent cheaper per lineal metre than cast-in-place concrete. For that reason, plastered brick drains will serve as the design material in the present study.

One of the critical issues encountered in the design of local drains is the lack of adequate right-of-way in the KIP areas. All typical cross-sections which are presented have been calculated using the hydraulic formula and approximate actual field conditions as closely as possible. However, due to the lack of adequate space and accurate contour maps, certain modifications in cross-section will obviously be required during detailed design.

The following sections will recommend the appropriate local drain which corresponds to the previously described street and footpath improvements.

Secondary Street Drains

It is proposed that all secondary streets (greater than 6 m ROW) have drains on both sides of the roadway. Depending on hydraulic conditions, the top width would vary from 85-95 cm, with a 30 cm invert width on side slopes of 1 : 2. Figures 4.13 and 4.14 show the typical cross-section for a secondary street drain and for all subsequently discussed local drains.

Residential Street and Main Foothpath Drains

It is proposed that all residential streets (4-6 m ROW) have drains on both sides of the roadway. The typical top width would vary from 60-70 cm, with a depth ranging from 70-80 cm on side slopes of 1 : 4.

Main footpaths (2-4 m ROW) would have a similar cross-sectional drain as the residential streets. However, due to the restricted right-of-way, a certain percentage of main footpaths - namely those with right-of-way approaching 2 m - would have drains only on one side of the roadway

Footpath Drain

The footpath provides the minimum level of circulation within the KIP areas. With a right-of-way of less than 2 m, it can support a smaller cross-sectional drain on one side of the roadway. The proposed drain measures between 45-55 cm at the top and has a depth of 35-45 cm. Side slopes would be 1 : 4. In certain very restricted areas, the side walls might have to be constructed vertically in order to fit between the roadway and the existing building line.

4.2.1.5 Solid Waste

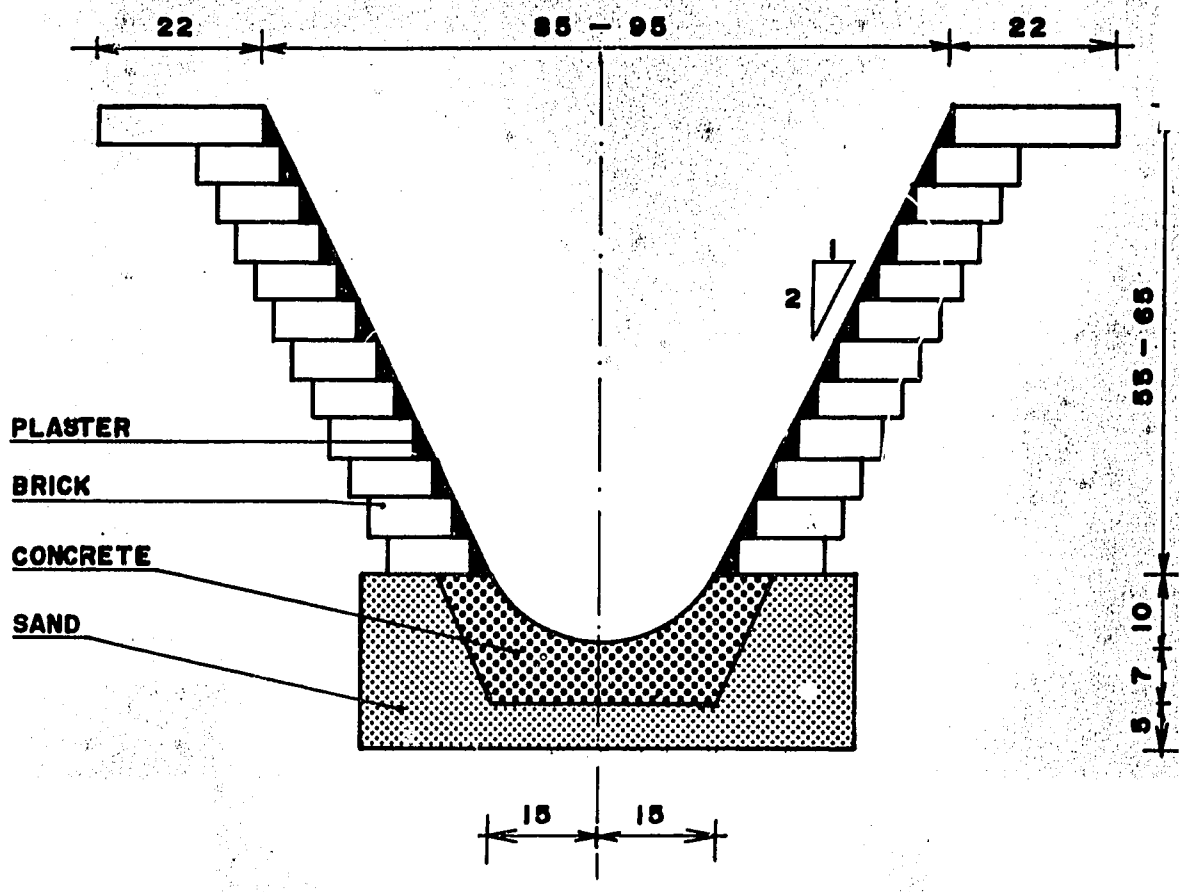
Adequate solid waste collection and disposal is of prime importance in Medan's KIP areas not only for the obvious aesthetic and public health reasons but also because a high percentage of all solid waste disposed of eventually finds its way into the area's streams and stormwater drains. The latter reason is one of the prime causes of local flooding and ponding.

The existing solid waste management system requires substantial expansion to:

- increase the quantity of solid wastes collected
- provide a minimum level of service to the Kotamadya's low-income areas.
- provide for the adequate disposal of collected solid waste.

RECOMMENDED STREET AND FOOTPATH DRAIN

CROSS - SECTION

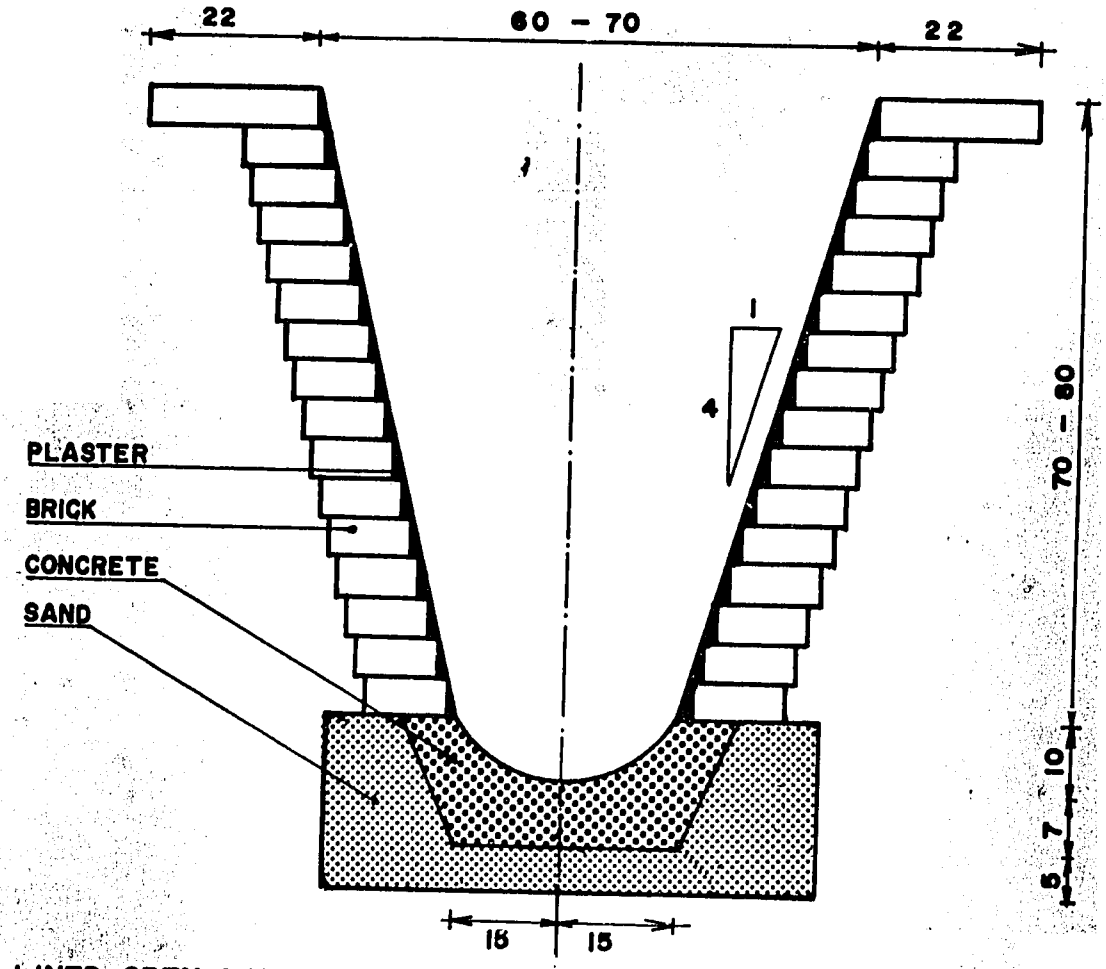


LINED OPEN CHANNEL FOR SECONDARY ROAD

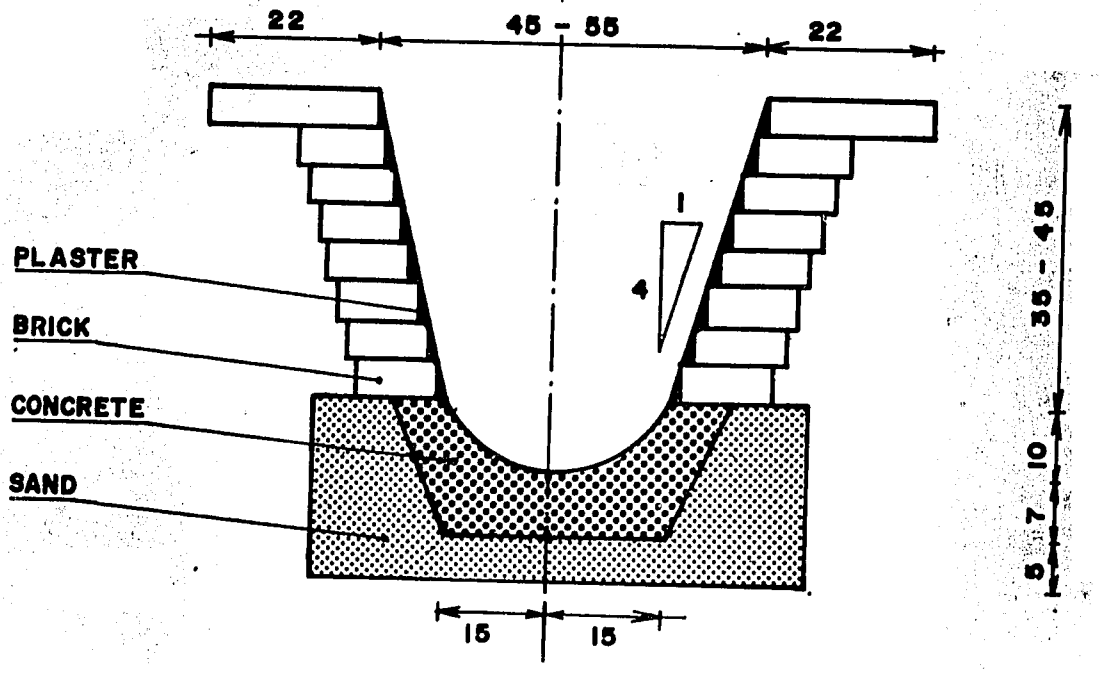
UNIT Cm

FIGURE 4.14

RECOMMENDED STREET AND FOOTPATH DRAIN CROSS - SECTION



LINED OPEN CHANNEL FOR RESIDENTIAL ROAD & MAIN FOOTPATH
UNIT Cm



LINED OPEN CHANNEL FOR FOOTPATH
UNIT Cm

Existing Situation

The regular collection of solid waste by Dinas Kebersihan Keindahar Pertamanan (D.K.K.P.) is almost non-existent in the KIP areas. As a result, the residents are forced to dispose of their solid waste as best they can. Those households with a sufficiently large lot burn or bury their waste. The rest dump or pile their solid waste at roadside, around markets or in streams or drains.

Recommended Improvement Program

The recommended program for solid waste collection and disposal is based on a communal collection system whereby the residents deliver their wastes to a centrally located, community storage facility from which the wastes are regularly removed for off-site disposal. A hand-cart or gerobak would serve as the community facility. In order to empty the gerobak, it would be taken from the interior of the KIP area to a transfer site located along a secondary or residential road. At this transfer site, the wastes would be removed from the gerobak to a truck for disposal out of the KIP area. In order to provide an additional factor-of-safety to the system by better approximating the present disposal patterns of KIP area residents, curbside containers will also be provided along main secondary and residential streets*.

A joint 1978 study on solid waste by the Governments of Indonesia and the Netherlands identified a set of guidelines which were used in the design of the recommended communal system:

- Inadequate street and footpath rights-of-way limit the access of large vehicles in many areas and preclude the use of all 4-wheeled vehicles in most high-density areas
- Delays in emptying community container facilities result in overfilling and spillage which creates additional environmental sanitation problems
- Importance of the selection of adequate container size in relation to access within high-density, low-income areas
- Container durability and the availability of replacement units and parts
- Maintenance of vehicles and availability of spare parts
- Ease of container unloading

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* Those residents who live between the generally centrally located gerobak loading sites and the secondary roads, and who might be reluctant to venture further into the block interiors to dispose of their solid wastes, could dump their wastes in the proposed curbside containers on their way to market.

- Availability of sites to locate community containers
- Public participation and education.

Design Criteria

Projected Unit Generation Rates

The projected unit solid wastes generation rates adopted for purposes of developing the Master Plan solid wastes program are as follows:

Category	Unit	Unit Rate			
		Present	1985	1990	2000
Domestic*	kg/cap/d	0.50	0.56	0.62	0.75
Commercial Institutional Industrial	kg/ha/d	0.2	0.2	0.2	0.2
Markets and Parks		Projected on the basis of total production in proportion to total domestic production			

* Projected at a 2 percent increase per year.

Solid Wasted Composition

There is little available information on the composition of solid wastes in Medan. In an effort to obtain an indication of the general character of the wastes several pool sites and disposal facilities were visited and estimates were obtained of the composition of materials salvaged. The results are summarized in Table 4.4.

TABLE 4.4

ESTIMATED SOLID WASTE COMPOSITION

Component	Composition as a percentage of total weight (including moisture)			
	Pool Medan Mentawai	Pool Medan Petisah	Medan Disposal Site	Medan Composting Plant
Paper	2.7	0.2	0.2	2.2
Plastic	0.5	1.2	[illegible].0	12.3

130

TABLE 4.4--Continued

Component	Composition as a percentage of total weight (including moisture)			
	Pool Medan Mentawai	Pool Medan Petisah	Medan Disposal Site	Medan Composting Plant
Glass	0.2	0.1	2.5	4.2
Metal	0.2	0.5	2.5	8.8
Rubber	0	0	0.5	1.8
Leaves & food wastes	96.4	98.0	90.3	70.7

Moisture content was reported to vary from 65 to 90 percent at the composting plant.

The density of domestic solid wastes as estimated by the GOI/Netherlands program was approximately 280 kg/cu m.

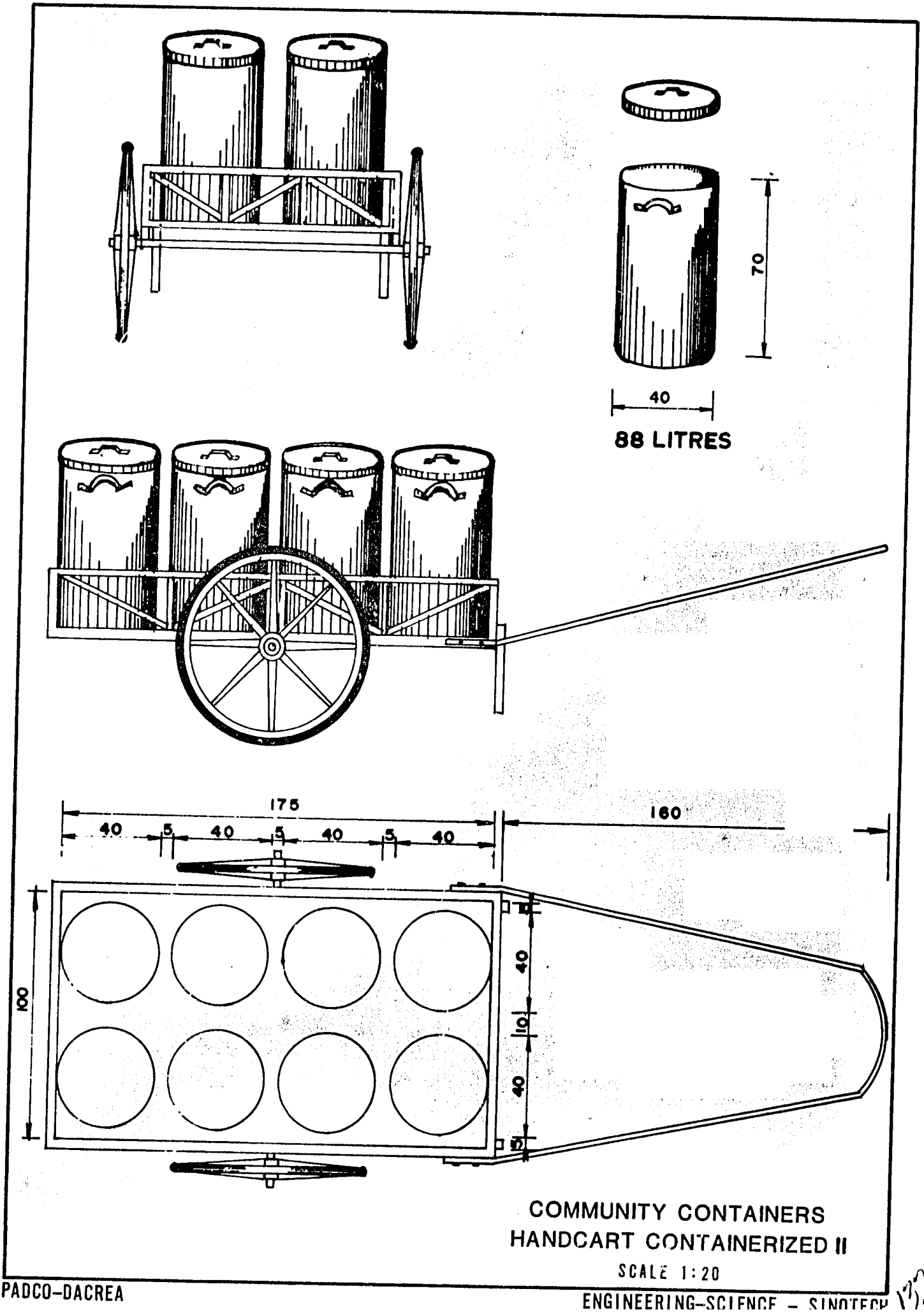
Assuming a solid waste generation rate of 0.50 kg/c.d and an average KIP area household size of 6.47 persons/household, each household would generate 3.2 kg of solid waste per day. This amount represents approximately 11.5 litres/household/day or about 80 litres per week.

Design Components

A 1.75 m x 1.00 m handcart or gerobak containing eight 88 litre cans is proposed for the community solid waste collection site (See Figure 4.15). Each collection site would normally be located along a main footpath or footpath and would comprise one handcart. Experience in Medan has shown that a 0.7 cu m handcart can be conveniently handled by a two-man crew. The collection sites would be spaced throughout the KIP areas at intervals of 100 to 150 metres so that the containers are filled to capacity during the time between collections. There would be approximately one community loading site (one gerobak) for each two hectares. It is anticipated that each KIP area resident would be within 75-100 metres walking distance of a community facility.

The collection task carried out by each worker would consist of pulling the full handcart to a small, secondary transfer facility or "loading station". Each loading station would be located along a secondary or residential street within 100 to 125 metres of the community facility. The full plastic containers from the gerobak would be unloaded by hand to a truck with a 4-ton payload (See figure 4.16). This relatively small truck would have access to all KIP area secondary and residential streets. The emptied handcart would be returned by the worker to its community collection location. There would be no storage of solid wastes

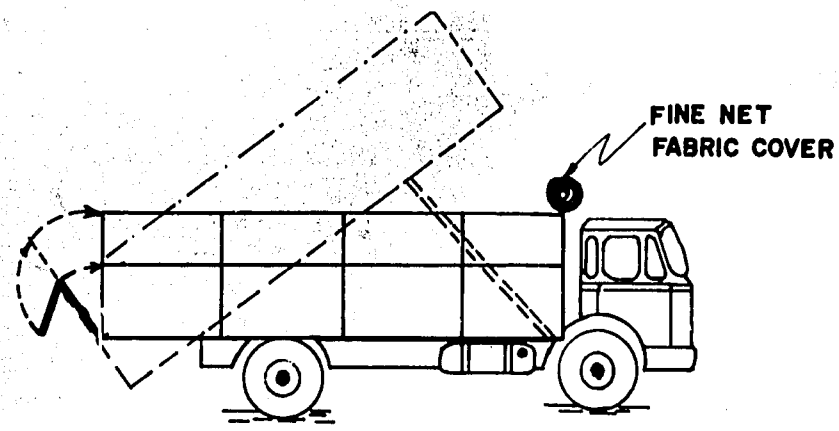
FIGURE 4.15



COMMUNITY CONTAINERS
HANDCART CONTAINERIZED II
SCALE 1:20

COLLECTION TRUCK

MANUAL REAR LOADING

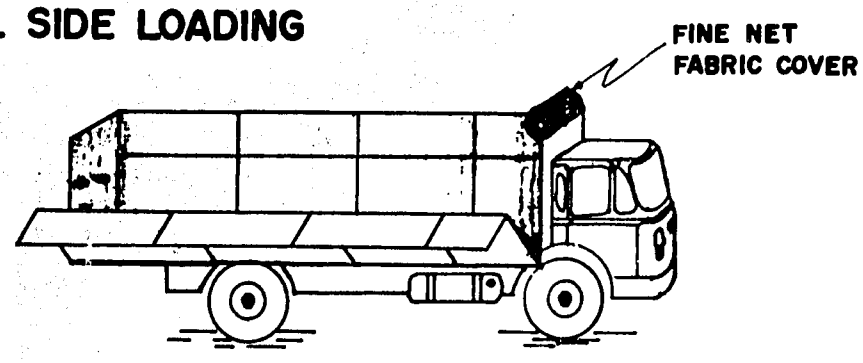


SPECIAL DESIGN OF TRUCK, USED AT THE TRANSFER STATION, LOADING METHOD FROM THE REAR OF TRUCK

BODY DIMENSIONS

LENGTH	: 4,3 m
WIDTH	: 2,5 m
DEPTH	: 1,3 m
VOLUME	: 14 m^3
MAX PAYLOAD	: 5 T (COMMERCIAL SOLID WASTES AT 360 Kg/m^3)

MANUAL SIDE LOADING



SPECIAL DESIGN OF TRUCK, USED AT THE TRANSFER STATION, LOADING METHOD FROM THE SIDE OF TRUCK AND FOR MANUAL SIDE OFF LOADING (HYDRAULIC DUMP SYSTEM OPTIONAL FOR OFF LOADING)

at these small transfer sites. The truck would then continue on to the next transfer site along its collection route. When full, it would proceed to the disposal site. It is estimated that each truck would make three trips to the disposal site per day. Collection of solid wastes from the community facilities would be carried out on a daily basis. The capacity of the community gerobaks have been designed with a 50 percent factor-of-safety in order to compensate for short-term variations in generation rates and minor irregularity in collection.

As mentioned previously, the community facility system will be reinforced with curbside containers in order to take into consideration the prevailing idiosyncrasies in the KIP area residents' disposal habits. The community curbside container will be located at roughly 150 metre intervals along main secondary and residential streets. Figure 4.17 presents the proposed design of this container.

4.2.1.6 Community Facilities

Education

Existing Situation

For the total KIP area population of approximately 80,000 persons there are 10 public elementary schools serving a primary school age population of 12,850 children. These ten elementary schools presently accommodate 4450 pupils. There are also 20 private schools consisting of 16 elementary schools, 2 kindergardens and 2 junior high schools and accommodating 6750 pupils. In addition, there are 20 public elementary schools located near the KIP area boundary which will also serve the KIP areas. It is estimated that all of these schools serve 80 percent of the total primary school age population. The remainder attend schools at distances greater than 500 metres from the KIP area boundaries (See Table 4.5).

Field surveys have shown that almost all of these schools presently conduct double sessions (first session from 8.00 a.m. to 13.00 p.m. and second session from 14.00 p.m. to 18.00 p.m.). The ratio of pupils per classroom exceeds the allowable Education Department standard of 40. These crowded conditions indirectly decrease the level of education.

Most schools also lack a sufficient budget for rehabilitating their existing plants. The present budgets are allocated through the Inpres Program. In 1978/79, Medan received a school rehabilitation budget totalling Rp. 106 million. This budget served only 17 percent of Medan's elementary schools. Approximately 47 percent of KIP area elementary schools were constructed more than 10 years ago, while 43 percent were constructed within the last five years. Of the existing number of elementary schools, 4 percent have been rehabilitated, 43 percent have received light improvements, and 53 percent have received no improvements.

Most schools found in the KIP area have no municipal water or electrical supply. Most schools have shallow wells on their grounds. However, in many cases the hand pumps provided by the Government have been vandalized resulting in the use of contaminated water by the pupils. Lack

COMMUNITY CONTAINERS

FIXED TYPE

SCALE 1:20

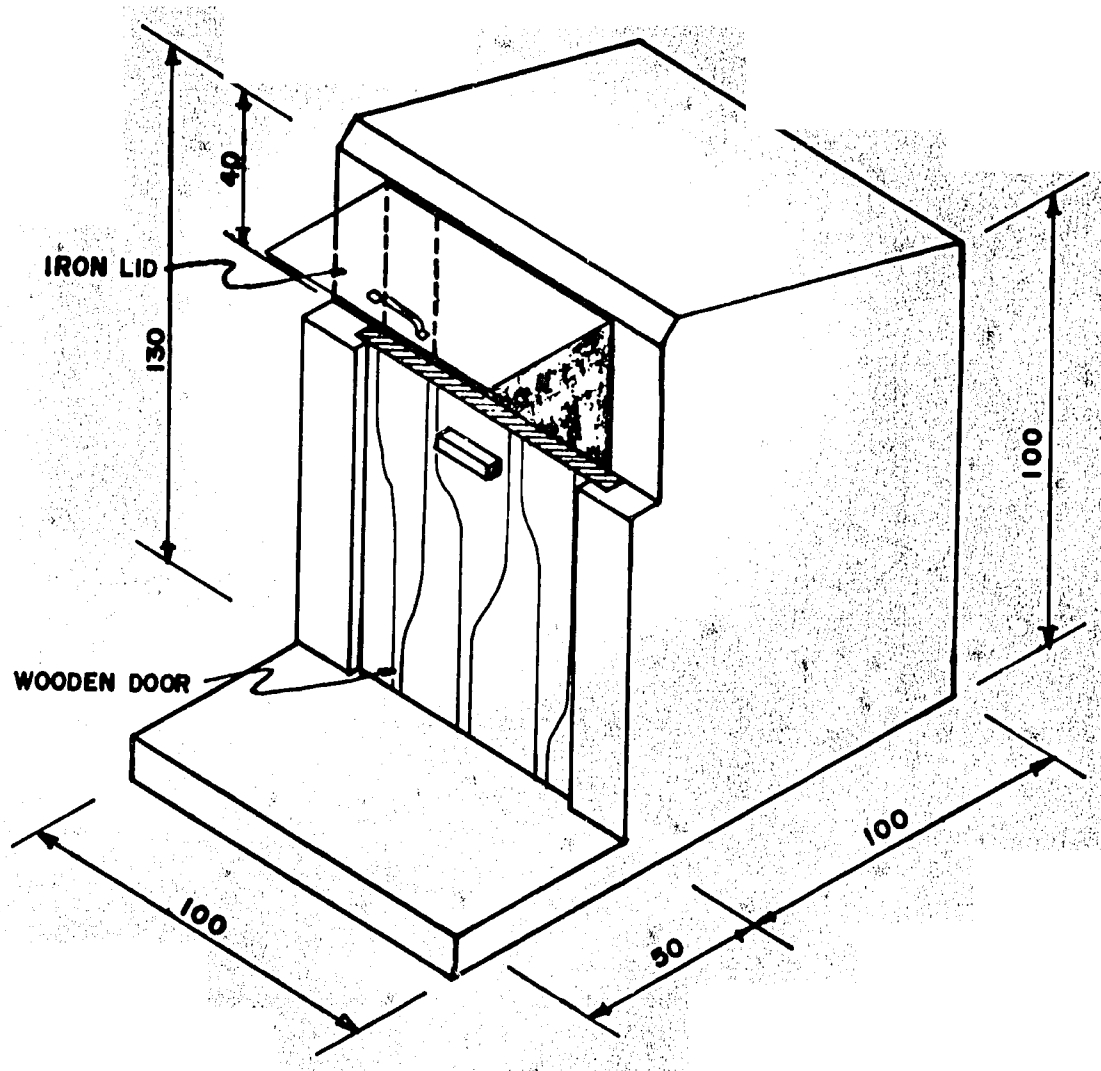
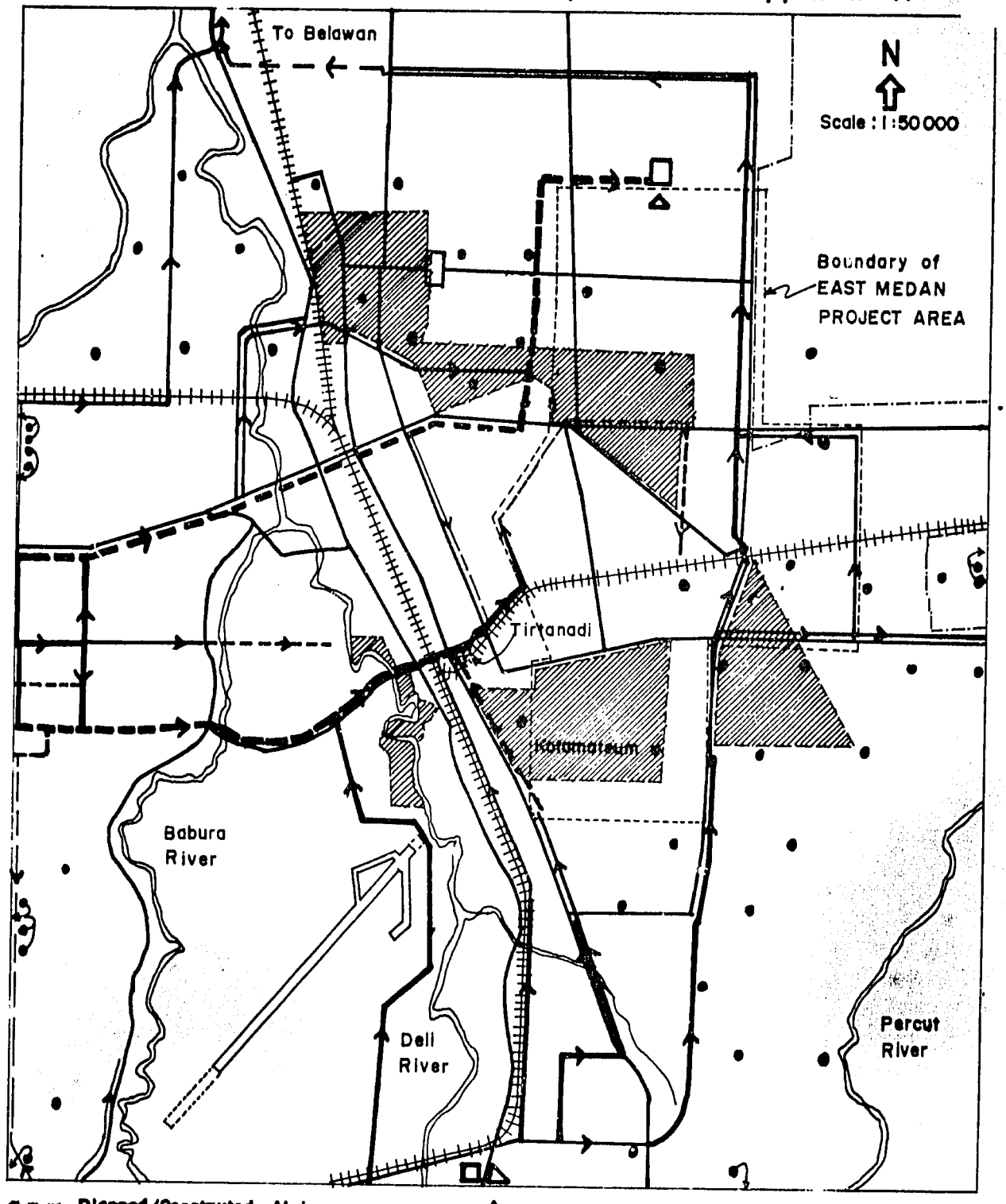


FIGURE 4.18

FIRST STAGE WATER SUPPLY PROJECTS IN MEDAN CITY AND KAMPUNG IMPROVEMENT AREAS

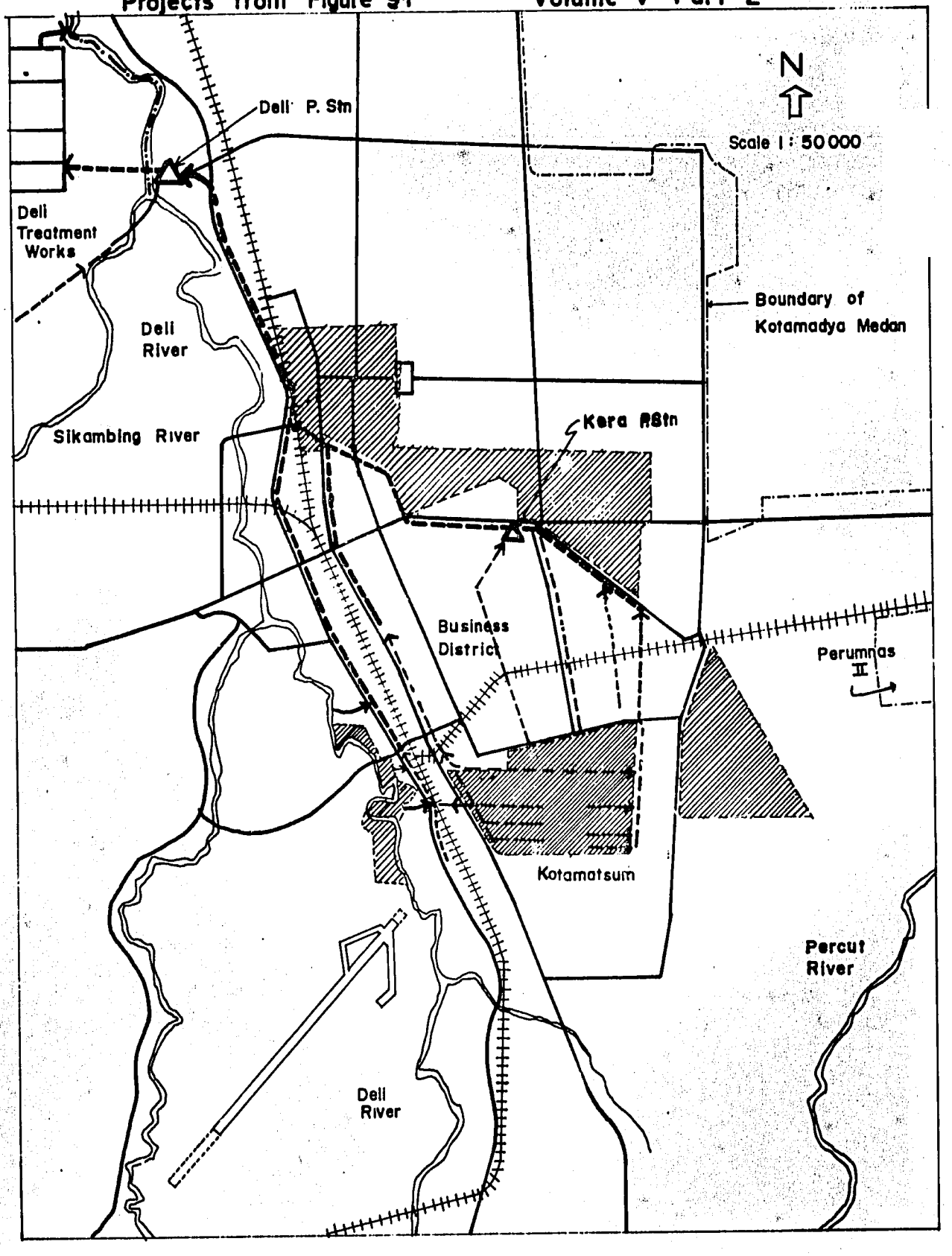
Projects from Figure 9.3 in Volume V, Part 1 and Appendix A



- Planned/Constructed Mains
- MUDS Mains, 500-600mm
- Mains, 400-450mm
- Mains, 250-350mm
- Pump Stations
- Reservoirs
- Wells
- Kampung Improvement Program

FIRST STAGE SEWERAGE PROJECTS IN MEDAN CITY AND KAMPUGN IMPROVEMENT PROGRAM AREAS

Projects from Figure 9.1 Volume V Part 2



Major Sewer or Force Main, 500– 1200mm

Minor Sewer, 300– 450mm

Sewage Pumping Stations

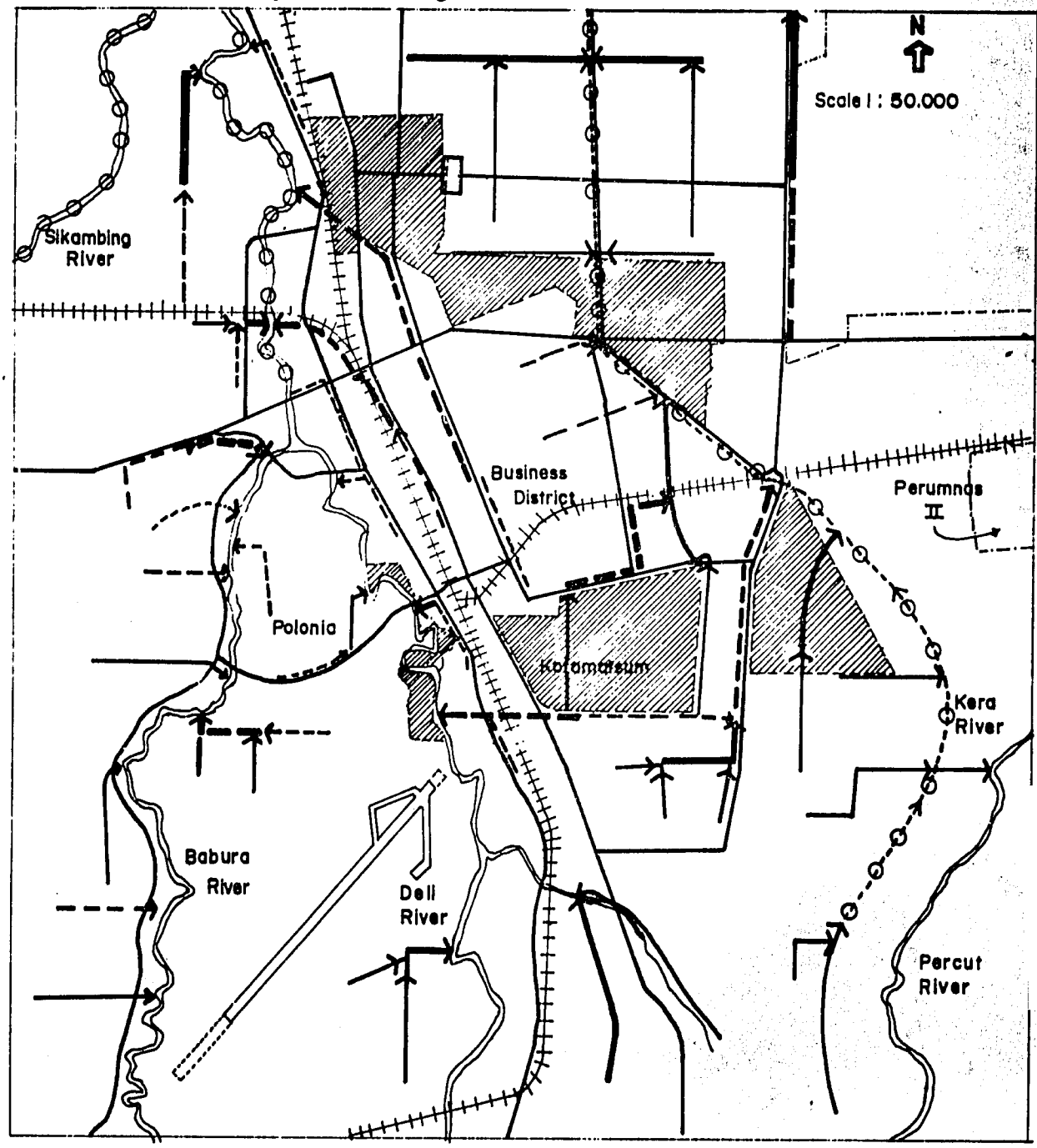
Kampung Improvement Area

FIGURE 4.20

FIRST STAGE DRAINAGE PROJECTS

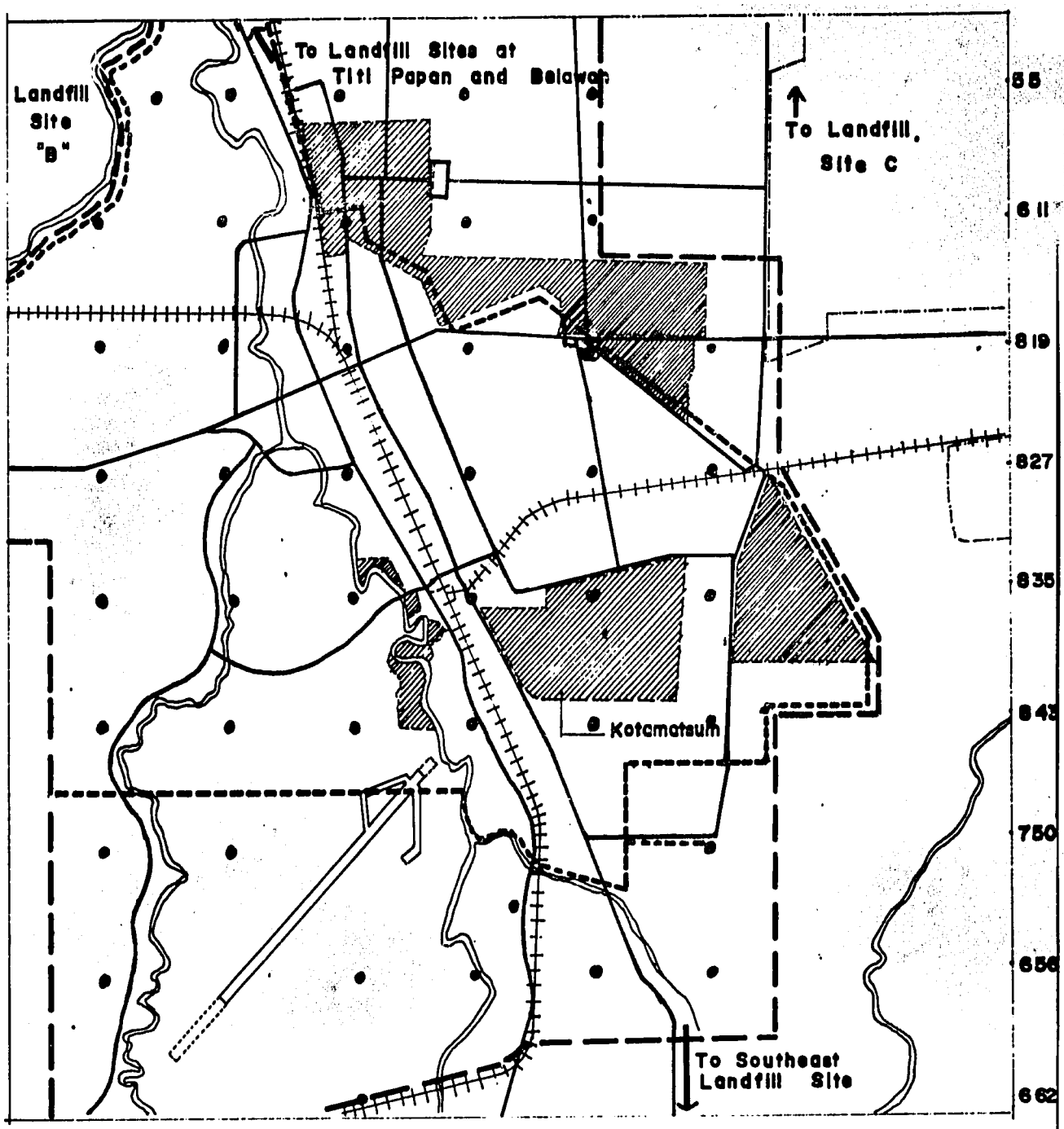
IN MEDAN CITY AND KAMPUNG IMPROVEMENT AREAS

Projects : Volume V, Part 3, Figure 9·6



Minor Submain, Closed Conduit
Major Submain, Closed Conduit
Minor River Cleaning
Minor Submain, Open Channel
Major Submain, Open Channel
Major River Cleanig

FIRST STAGE SOLID WASTE PROJECTS IN MEDAN CITY AND KAMPUNG IMPROVEMENT AREAS



Primary Area Boundary
Secondary Area Boundary
Area from Figure 9-1, Volume, V Part 4
Loading Stations (One/sq km)
Kampung Improvement Program Area

TABLE 4.5

EXISTING ELEMENTARY SCHOOL CAPACITY IN KIP AREAS

Locality	Estimated School Age Population*	Estimated Existing School Capacity** (Number of Pupils)	Estimated Deficit/Surplus (Number of Pupils)
Kp. Hamdan	732	900	+ 168
Kp. Aur	584	720	+ 136
Kp. Sidorame Barat	1,863	1,288	- 575
Kp. Sidorame Timur	769	1,392	+ 623
Kp. Sei Kera Hilir	2,305	1,788	- 517
Kp. Sei Kera Hulu	1,020	848	- 712
Kp. Tegalsari I	3,289	2,277	- 1,012
Kp. Tegalsari II	823	720	- 103
Kp. Tegalsari (Medan Denai)	1,464	448	- 1,016
KIP Area	12,849	10,381	- 2,468

* Based on 16% of total population.

** Schools outside the KIP area, but still within allowable catchment radius, have been taken into account.

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of electricity lessens the effectiveness of the double-session program. The provision of watchmen for the school grounds was also recommended in order to decrease vandalism.

A similar situation also exists in the KIP area private elementary schools. Most school buildings are in poor condition, without municipal water or electrical supply. Most of the equipment of these schools also needs repair or replacement. The present policy of the Government is to support the development of private schools, especially in those areas located outside of the catchment areas of the existing public schools. Government assistance would include upgrading of teachers' skills, provision of text books and laboratory equipment and additional teaching aids.

At the secondary level, there are two private junior high schools located in the KIP areas. It is estimated that these two schools serve only 9 percent of the corresponding school age population. Adjacent to the KIP areas, there are two public junior high schools and two public senior high schools, and 10 private junior and 5 senior high schools serving the KIP area. Since most of these private schools impose relatively high education fees, it is expected that the access of KIP low-income residents to secondary schools is low.

Figure 3.2 shows the service areas of the elementary schools serving the KIP areas*. This map clearly shows the KIP areas which are poorly served by elementary schools. These areas include the northern part of Sidorame Barat, the eastern parts of Sei Kera Hilir and Hulu and the northern parts of Tegal Sari I. In addition, the eastern peripheral sections of Tegal Sari Medan are also poorly served. The development of new public elementary schools should be encouraged in those areas which are presently poorly served.

The following conclusions can be drawn from the previous discussion:

- Most of the existing elementary schools need to be rehabilitated in order to perform their functions effectively.
- Most public and private elementary schools presently conduct double sessions in overcrowded classrooms.
- Most schools lack the basic utilities of water supply and electricity.
- Access of KIP population to secondary schools is low.
- The role of the private elementary school in areas presently not served by Government schools is important.

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* Based on a recommended service radius of 300 to 400 metres.

Recommended Improvement Program

The following guidelines will be used to structure the physical component of the KIP education program:

Elementary Schools

- Give more emphasis to the rehabilitation of existing Government school buildings.
- Where feasible, give priority to the construction of additional classrooms in the existing schools in order to maximize land utilization and to increase pupil enrollment.
- Construct new schools in areas presently beyond the service areas of the existing scholls.
- Give more attention to the possibility of rehabilitating/upgrading the existing KIP area private schools, especially those beyond the public schools' service areas.
- Equip existing school buildings with adequate municipal water and electrical supplies.
- Provide a means for protecting the school buildings from vandalism.

Secondary Schools

- Give more attention to the construction of a new secondary school and the rehabilitation of existing secondary schools serving the KIP areas.

The recommended physical education program will consist of four components:

1. Rehabilitation of the existing elementary schools located within the KIP areas.
2. Development of additional classrooms in the existing school complexes.
3. Development of new schools.
4. Development of Sanggar Kegiatan Belajar (SKB) building for non-formal (PENMAS) educational activities.

Program Components

Rehabilitation

The recommended program involves the rehabilitation/upgrading of 18 public and 10 private elementary schools. (See Table 4.6). Components of the program are as follows:

TABLE 4.6

REHABILITATING/UPGRADING EXISTING SCHOOLS

Locality	Type of Rehabilitation/ Upgrading Needed[1] 1	2	3	4	5	Estimated Cost per School (In Million Rp)	Estimated Cost per Kampung (In Million Rp)
Kp. Hamdan							
SD 060904	*	*	*		*	5.05	5.05
Kp. Aur							
SD 060902	*	*	*	*		3.60	
SD 060897	*	*	*	*		6.48	10.08
Kp.Sidorame Barat							
SD 060860	*	*	*			4.45	
060865		*	*	*	*	4.45	
SD HKBP	*	*	*			4.15	11.27
Kp.Sidorame Timur							
SD 060860	*	*	*			0.89	
060865		*	*	*	*	0.89	
060855	*	*	*		*	3.64	
060856	*	*	*		*	3.64	9.06
Kp.Sei Kera Hilir							
SD 060874	*		*		*	3.64	
060877	*		*		*	4.72	
Public	*	*				1.80	
Sentosa	*	*				2.01	
Batara Guru	*	*				4.50	
SD 060851	*	*	*			1.25	
060852	*	*	*			1.25	
060853	*	*			*	0.75	
064017	*	*				1.80	21.72
Kp.Sei Kera Hulu							
SD 060851	*	*	*			1.25	
060852	*	*	*			1.25	
060853	*	*			*	0.75	
064017	*	*				1.80	
Sentosa	*	*				2.00	7.05

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TABLE 4.6 — Continued

Locality	Type of Rehabilitation/ Upgrading Needed [1] 1	2	3	4	5	Estimated Cost per School (In Million Rp)	Estimated Cost per Kampung (In Million Rp)
Kp. Tegalsari I							
SD 060824	*	*	*	*	*	3.60	
060816	*	*	*	*	*	4.70	
060804	*	*	*	*		4.70	
060821	*	*	*	*	*	4.70	
060828	*	*	*		*	4.70	
064958	*	*	*	*	*	5.26	
060800	*	*	*			5.26	
Muhammadyah		*				0.70	
Alwaslyah	*	*				1.05	34.67
Kp. Tegalsari II							
SD Muhammadyah 8	*	*				4.08	4.08
Kp. Tegalsari							
SD Alwaslyah	*	*	*			2.00	2.00
Total Cost							105.00

Note: 1) The number corresponding to the type of rehabilitation recommended means the following:

1. rehabilitation of the existing classrooms
2. rehabilitation/replacement of necessary equipments
3. installation of water supply and electricity
4. construction of a guard house
5. construction of toilets

SOURCE: Report of each school master and MUDS estimates

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- rehabilitation of existing classrooms
- repair or replacement of equipment such as tables, chairs, blackboards, etc.
- connection to municipal water and electricity supplies
- construction of watchman's post
- construction of toilet facilities.

Additional Classrooms

The program covers the construction of 13 additional classrooms. These additional classrooms will provide additional capacity for 1040 pupils (assuming double-sessions) or approximately 42 percent of the existing deficit. The program includes the construction of the new classrooms and the purchase of the required equipment (see Table 4.7).

TABLE 4.7

ADDITIONAL CLASSROOM CONSTRUCTION

KIP Area/School	Number of Additional Classrooms	Estimated Cost (In Million Rps)	Estimated Cost By KIP Area (In Million Rps)
Kp. Sidorame Timur			
SD 060860	1 (54 sq m)	4.05	4.05
Kp. Sei Kera Hilir			
SD 060874	1 (54 sq m)	4.05	
SD 060851	1 (54 sq m)	4.05	
SD 060853	1 (54 sq m)	4.05	12.15
Kp. Tegalsari I			
SD 060824	3 (162 sq m)	12.15	
SD 060828	3 (162 sq m)	12.15	24.30
Kp. Hamdan			
SD 060904	3 (162 sq m)	12.15	12.15
Total Cost			52.65

Source: Report of each school head and MUDS estimates.

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New Schools (Elementary)

This component involves the construction of six new six-classroom elementary schools. Program costs include construction and equipment and the installation of water and electricity (see Table 4.8).

TABLE 4.8

NEW ELEMENTARY SCHOOL CONSTRUCTION

Locally	Number of Schools Constructed*	Estimated Cost (In Million Rps)
Kp. Sidorame Barat	1	Rp. 24,600
Kp. Sei Kera Hilir	1	Rp. 24,600
Kp. Tegalsari I	2	Rp. 49,200
Kp. Tegalsari (M.Denai)	2	Rp. 49,200
Total Cost		Rp. 147,600

* Each school consist of 6 classrooms.

SCURCE: MUDS estimates and discussions with Education Department.

New Schools (Secondary)

This program will consist of the construction of one junior and one senior high school. It is recommended that both schools be constructed in Tegal Sari Medan Denai. The total program cost will cover the construction of the new buildings, the provision of teaching aids equipment and the stocking of a library and laboratory.

SKB Building for Non-formal Education

In conjunction with the non-formal education program (Penmas) which is to be expanded in the KIP areas, construction of a SKB building is necessary to accommodate the program activities. The recommended building location is in Sei.Kera Hilir. The program covers the cost of the building and the provision of equipment and supplies.

Health

Existing Situation

Based on Kotamadya Health Department records on the incidence of disease, it is evident that the level of health in the KIP areas is still low. Some diseases which are still prevalent and have shown steady

increases over the last few years include ascaris, hepatitis, bacillary dysentery, hookworm, cholera and tuberculosis.

Poor sanitary conditions and lack of knowledge regarding health hazards have contributed to the high incidence of disease. These two factors have produced a pattern of disease which has not significantly changed during the last five years. The level of public health of the majority of Medan's population has not improved greatly during this period.

There are four types of health facility serving the KIP areas: Puskesmas (Health Center), Policlinic, BKIA (Mother and Child Clinic) and Maternity Clinic. The Puskesmas offers the highest level of service in the KIP areas. It delivers basic health service such as medical, maternal and child care, nutrition, communicable disease control, midwife service, laboratory services, disease statistics and health education. Due to a shortage of budget, personnel and building space, some of these functions have as yet to be realized in all Puskesmas. Presently there are two Puskesmas located either in or adjacent to the KIP areas. They are Puskesmas Sentosa Baru in Kampung Sei Kera Hilir and Puskesmas Sukaramai in Kampung Tegal Sari I. Using Cipta Karya and Health Department standards, certain KIP areas are seen to be deficient in this type of health facility. These areas include Hamdan, Aur, Sidorame Barat and Timur, the western part of Sei Kera Hilir and the southern part of Tegal Sari II.

Field surveys of existing Puskesmas show the following common problems:

- shortage of space; the existing space is not sufficient to accommodate all the services offered
- lack of basic utilities such as water and electricity
- shortage of medical and non-medical equipment
- lack of medicine.

There are five policlinics located in the KIP areas; two in Tegal Sari II, one in Tegal Sari I and two in Sei Kera Hulu. Areas not served by these policlinics include Sei Kera Hilir, Sidorame Barat and Timur, Hamdan and Aur. Most of the existing policlinics do not own their building.

There are three BKIA located in the KIP areas - Sidorame Barat, Sei Kera Hilir and Tegal Sari Medan Denai. The remaining KIP areas are beyond the service areas of the existing BKIA.

There are five maternity clinics located in the KIP areas. All are private organizations. These maternity clinics are clustered in Sei Kera Hulu and Tegal Sari I and II. For the entire Kotamadya, there are only two public maternity clinics compared to over 60 private ones. This imbalance supports the development of new public maternity clinics in the KIP areas.

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The following conclusions can be drawn from the previous discussion:

- The level of health of the KIP population is low.
- Some of the KIP areas such as Hamdan, Aur and Sidorame Barat and Timur are poorly served by health facilities.
- There exists a general lack of health education among the KIP area residents.
- There is a grave shortage of public maternity clinics.
- Shortage of building space, personnel and operation budget curtail many of the Puskesmas services.

Recommended Improvement Program

The following guidelines will be used to structure the physical component of the KIP education program:

- Increase the access of the low-income KIP population to health facilities through the construction of new health facilities in areas beyond the service areas of the existing facilities.
- Emphasize the development of new Puskesmas which would offer a full range of health services.
- Encourage the development of new maternity clinics.
- Expand the Kotamadya Health Department's ongoing school and home program of health education.
- Initiate a pilot project for the training of community workers whose function it would be to increase the awareness of KIP area residents to the potential for health improvements through the principle of community self-reliance and self-help.
- In high density kampungs where sites for new health facilities are difficult to obtain - i.e., Kampungs Aur and Hamdan, special emphasis would be placed on a "mobile health program", an intensified home visitation program and special health education program in the schools.

The recommended physical health program will consist of two components:

1. Rehabilitation/upgrading of existing Puskesmas.
2. Construction of new health facilities.

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Program Components

Rehabilitation

This program will involve the rehabilitation/upgrading of two Puskesmas,Puskesmas Sentosa Baru in Sei Kera Hilir and Puskesmas Sukaramai in Tegal Sari I. The components of the program will include the rehabilitation of the existing buildings, the expansion of the existing buildings, the provision of medical and non-medical equipment and the installation of water, electricity and telephone.

New Facilities

Based on the coverage of existing health facilities, the following new construction is recommended:

- One Puskesmas in each of the KIP areas of Sidorame Barat, Sei Kera Hilir and Tegal Sari Medan Denai
- One maternity clinic for Sidorame Barat
- One Puskesmas Pembantu for Sei Kera Hulu.

The components of the program will include the construction of the buildings, the provision of medical and non-medical equipment and the installation of water, electricity and telephone.

4.2.2 Non-physical Components

The following sections present the recommended non-physical components of the KIP program.

4.2.2.1 Health

The main component of the non-physical health program will be the training and setting up of community workers. The prime objective of the community worker will be to support the implementation of the KIP program. Perhaps the most important area of concern of the community worker will be in public health education and preventive health programs. The goal will be to increase the level of health among KIP area residents by making them more aware of disease prevention methods.

The following are other objectives to be achieved by the program:

- To assist the various Kotamadya and National government agencies in the rational and coordinated implementation of the KIP program
- To assist in the initial location of KIP physical components such as public standpipes, MCKs and solid waste gerobaks
- To assist in monitoring the development of the KIP areas after the completion of the program

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- To assist the community in organizing to ensure the maintenance of facilities constructed by the KIP program (schools, health clinics, and water and sanitation facilities).

In order that the selected community workers perform their duties satisfactorily, a training program undertaken through the coordinated efforts of the various agencies involved in KIP is recommended. These agencies would include the Kotamadya Health Department, the Sub-Directorate of PMD, the Sub-Directorate of Housing Cipta Karya, PAM Tirtanadi, DKKP and Penmas. Through the training program, the community worker would receive an overall orientation in the objectives, plans and programs of KIP and instruction in the particular role that he/she would play in the implementation of the program. Instruction in the following areas is proposed for the training curriculum:

- Health: Health policy, disease statistics, family health education/family planning, personal hygiene
- Environmental sanitation
- Water supply and sanitation: Operation, management and maintenance of public standpipes, MCKs and solid waste facilities.
- Community development
- Penmas program
- Monitoring of program objectives

For the present KIP program, the program proposes training 54 community workers. Suitable candidates for community worker will be selected from the KIP areas by representatives from LSD, the kampung and lorong head, and the KIP unit. After completing their training, the community workers will be officially part of the KIP unit although in many cases they will be assigned supportive functions within other agencies. In such cases direct supervision and day to day control would be excercised by the specific agency.

The overall management of the entire community worker program will be the responsibility of the KIP unit. The KIP unit will be responsible for the preparation of the training curriculum, the provision of teaching materials, the required intra-agency coordination and the placement of the community workers within the KIP areas, and/or participating agencies.

4.2.2.2 Education

Existing Situation

The non-physical educational component of the KIP program is based on the expansion of the ongoing Penmas program in the KIP areas. The objective of the Penmas program is to increase the capacity of the program participants in the areas of practical knowledge and basic skills.

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Presently the Penmas program in Medan, especially in the low-income kampungs, is still limited in scope. In 1978/79, only Rp. 1.6 million was allocated by the Central Government to train 577 persons. The education cost per capita equalled approximately Rp. 3000. In 1979/80, the budget allocation was increased to Rp. 5.8 million. This increased budget will cover 2300 trainees at a reduced cost per capita of Rp. 2500. Table 4.9 shows the program's coverage for the years 1978/79 and 1979/80 in the four kecamatans where the KIP areas are located.

TABLE 4.9

PENMAS ACTIVITIES IN KIP AREAS

	No. of Kampung	1979/80			
		No. of Courses	No. of Persons Trained	No. of Courses	No. of Persons Trained
M. Kota	22	5	69	12	240
M. Baru	15	3	42	13	260
M. Timur	12	4	70	11	220
M. Denai	9	5	60	12	240
Total		17	241	48	960

SOURCE: Kotamadya Education Dept.
PENMAS Section

The emphasis of the ongoing Penmas program is on adult literacy. (more than 60 percent of students enrolled in this type of course). The other main programs are family planning, languages, cooking and sewing. Based on discussions with Penmas functionaries, a need for additional basic skills and pre-vocational training programs was established. Penmas officials realize that there still exists a gap between the type of training offered and a graduate's opportunities for using this training to secure better employment.

Among the problems presently confronting Penmas are the lack of operational budget, the lack of workshop equipment and teaching aids, low teacher salaries, difficulties in obtaining training centers, and the lack of administrative and transportation budget for program operation. Presently, kampung offices and schools are used for the training programs.

Recommended Program

In an assessment done by Penmas instructors, it was estimated that there are 4000 KIP area residents, mostly school dropouts, who would potentially serve as the target population for an expanded Penmas program (See Table 4.10). The courses offered should be expanded to include not only cooking, sewing and literacy, but also carpentry, engine repair and office and business adminstration. The equipment required to institute these new programs would have to be purchased as part of program design.

Based on the needs of an expanded Penmas program in the KIP areas, the construction and equipping of one Sanggar Kegiatan Belajar (SKB) building is recommended (See Section 4.2.1.6 Community Facilities). This building would function as a training center and serve, not only the KIP areas, but the entire target population of Kecamatan Medan Timur, Kota and Denai. Considering Penmas' present capacity, it is estimated that the entire KIP area target population would be served in three years. The total program cost would include a teacher training program and teacher salaries for the first three years of the program.

TABLE 4.10

KIP AREA TARGET POPULATION
POTENTIALLY SERVED BY THE PENMAS PROGRAM

Locality	Number of				
	Illiterate Population	Elementary School Dropouts	Junior High School Dropouts	Senior High School Dropouts	Total
Kp. Hamdan	50	75	100	90	315
Kp. Aur	-	-	12	1	13
Kp. Sidorame Barat	122	153	268	561	1104
Kp. Sidorame Timur	-	50	65	125	240
Kp. Sei Kera Hilir	137	70	42	100	349
Kp. Sei Kera Hulu	115	184	269	176	744
Kp. Tegalsari I	28	34	21	19	102
Kp. Tegalsari II	1	288	75	53	417
Kp. Tegalsari (Medan Denai)	275	265	140	90	770
Total	723	1,119	992	1,215	4,054

SOURCE: Kantor P and K, Bagian PENMAS

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4.2.2.3 Credit for Small Scale Enterprises

If Medan is to fulfill its role as the commercial/industrial center of North Sumatra, it will be important to enable small and medium sized businesses to develop their potential in order to contribute to local economic growth. While the small number of small scale enterprises located in the 244 hectare KIP area would not justify the development of a separate program to serve only these areas, it is recommended that this area and all low-income kampungs be given special emphasis within the city-wide assistance program recommended for the Kotamadya (See Appendix B on Small Scale Enterprise requirements in Medan). The recommended program would contain the following elements:

- Assistance to small and medium scale enterprises in the form of a credit program and technical assistance to improve existing business operations, marketing, product quality control and business management and planning. In addition, the program would provide credit for the formation of new businesses, particularly in the industrial sector.

- A local training program for bank staff would be initiated so that the program could be administered locally. As part of this training program, greater emphasis should be placed on cutting administrative costs, monitoring repayments and obtaining prompt debt collection. The existing tight restrictions on granting loans would be relaxed somewhat.

KIK (small investment credits) and KMKP (permanent working capital credit) are the Government's ongoing programs for credit to small scale enterprises. These two programs have been in existence since 1974. While the amount of credits has remained at a fairly low level (due to the perceived risk factors on the part of banks), it is envisaged that the amount loaned will increase in the future. The Government is currently planning to introduce additional credit facilities which would raise the debt ceiling for loans and extend credit to economically weak activities and sectors.

4.2.2.4 Land Registration

In order to regularize land tenure and provide security of land tenure through developing a method of safeguarding land titles, the Government of Indonesia passed the Basic Agraria Law of 1960 which requires that the Government (through the Department of Agraria) should register land holdings in both urban and rural areas. Under Article 19 of that law, land registration consists of the following procedures:

1. Registration of lands by taking their real measurements and drawing them on maps.

2. Registration of certain titles on land, and

3. Issuance of certificates as evidence of registration of titles to land.

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The benefits to KIP households of registering their land rights are enormous, both to them and to the city as well. It provides them with secure, legally recognized tenure which can be used as a basis for collateral for loans from the formal banking sector for business or private uses. Once clear ownership is established, residents then have the security necessary to encourage them to invest in improvements on their property. The household income being spent in rent can be diverted to other purposes. Finally, land registration provides a more equitable basis for the Kotamadya to apply IPEDA taxes and to, in turn, invest in improving kampungs.

However, registration of land requires manpower and equipment, and often, due to disputes over land ownership rights and inefficiencies in registration the process can be lengthy. Thus the Kotamadya Department of Agraria in Medan has only been registering about 100 certificates a month.

To increase the rate of land registration, the Government of Indonesia through the Department of Agraria with assistance from the World Bank launched a land registration program in Surabaya and other cities which speeds the land registration process through interpretation and mapping of aerial photographs of urban areas. As a result, the Department of Agraria is now registering about 500 hectares or 2,500 parcels a year in Surabaya.

The process follows the basic steps outlined in the Basic Agraria Law, however instead of field surveys, relies on aerial photographs and maps at 1:1000 scale interpreted from the aerial photographs to identify land holdings. From those aerial photo maps, field surveys are conducted in kampungs to determine precise boundaries and establish ownership rights, if any, to land parcels identified by the aerial photo maps. Once the aerial photo mapping and identification of land ownership rights has occured, kampung residents can register their holdings and gain certificates showing the type of ownership at a much reduced cost*.

In 1972, the Department of Agraria conducted an aerial photographic survey of Medan and from those aerial photos developed maps at 1:1000 of the urban area. However, it did not complete the other components of the land registration process. Since there has been little change in land use patterns within kampungs which were urbanized in 1972, these aerial photo maps can still be used for land registration within KIP kampungs.

Since the aerial photographic work has already been done, estimates of the costs of conducting detailed mapping and identification of ownership rights within KIP areas are shown in Table 4.11.

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* Under Law Number 96 of 1971, the fees for obtaining a hak milik certificate are set at Rp.5,000 if clear ownership rights to the land have been previously established. Currently, the Kotamadya Department of Agraria in Medan charges about Rp.20,000 to also cover the charges of surveying the parcel and the certificate. These survey charges vary according to the size of parcel surveyed.

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TABLE 4.11

COST ESTIMATES OF LAND REGISTRATION WITHIN KIP AREAS IN MEDAN

Item	Estimated Cost per Hectare (Rupiah)	Number of Hectares in KIP Areas	Total Costs (Million of Rupiah)
1. Detailed mapping of KIP areas from 1972 aerial photo maps	8,000	244.01	2.0
2. Identification of Ownership rights and property boundaries	14,000	244.01	3.4
3. Total Costs**.			5.4

** Excluding the costs of providing certificates showing ownership rights which individual households must pay. Also excludes the costs of acquiring land in KIP areas if households do not have any form of land ownership rights and must prove those rights.

These total costs average about Rp.491 per household for performing land registration in KIP areas. Thus the total costs of the program can be recovered through the certificate fees paid by individual households which average about Rp.5,700.

Land Tenure in KIP Areas in Medan

The Kotamadya Department of Agraria estimates that practically none of the households living in KIP areas have registered their land holdings with Agraria. This failure to comply with the Basic Agraria Law is due to the fact that most of the households are living on land which was formerly owned by the Sultan of Medan and is now owned by absentee land owners. Many of these absentee owners received their basic rights to the land through "Grant Sultan" or inheritance of "Grant Sultan' rights*. These were traditional land grants made by the Sultan.

Many of the KIP area househoulds do not pay land rents to the absentee owners even though they do not have formal rights to the land they are occupying. If they do pay rents to the Sultan's family, they tend to be token payments. It is also doubtful that much tax revenue is being gained on these properties in KIP areas since the Kotamadya does not keep accurate tax records and many owners do not live in Medan.

* The actual conditions of ownership and size of holdings can not be determined until land registration in KIP areas is performed.

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However, since much of the land in the KIP areas is owned through 'Grant Sultan', a unique opportunity exists to provide formal land tenure to KIP area households who do not have land ownership rights. If these 'Grant Sultan' rights are held over parcels of urban land greater than 10 bau (one bau equals 0.7 hectares) as the Kotamadya Department of Agraria indicates they maybe, under the Land Reform Law, Act Number 1 of 1958, and subsequent Land Reform Policy Regulations of 1973, the Government through the Department of Agraria can declare those holdings public land without payment of compensation. Once declared public land, under Article 3 of Law Number 1 of 1975, these public lands can be sold to KIP area households at reduced costs.[a] Based on the rates set by the Kotamadya of Medan for buying public land[b] an estimate of the average costs of acquiring these land holdings by individual KIP households is shown in Table 4.12.

Initially, these costs may be too high for many KIP households to afford in one lump sum since they average up to Rp. 465,680 including the costs of surveying and providing a hak milik certificate as currently being charged by the local Agraria. However, if a revolving fund were established, and the cost of selling the plots were ammortized at a commercial annual interest rate of 14.25 percent over eight years with a 20 percent downpayment, practically all KIP households could afford to acquire ownership of their present holdings as the minimum qualifying income for such a program would range between Rp. 3,500 and Rp. 31,000 per month, all below the 15th percentile of Medan household incomes.[c] These affordability analysis are shown in Table 4.13.

A commercial banking institution such as BTN which already has experience in administering housing mortgage loans should be designated to administer the revolving fund. Such a fund could be established through loans from the Government and savings deposits. For example, if savings deposits of Rp. 150 million were matched with annual loans from the Bank of Indonesia at 7.85 percent over 25 years with five years grace, 2,000 average size loans of Rp. 125,000 could be made in the first year. Similar expenditure in the second year would allow an additional 2,000 loans to be made in the second year. However, by the fifth year, the fund would no longer require loans from the Bank of Indonesia and could rely entirely on savings deposits and revenues from beneficiary repayments due to the cash which would be generated by the loan repayments from the beneficiaries. Furthermore by the end of the fifth year, the fund would have assisted all of the KIP households in buying their plots, and could either cease functioning or could assist other low income households in buying their plots. Table 4.14 briefly outlines the cash flow of the first ten years of such a fund.

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a. The article sets the costs of acquiring public land by using the following formula: The area of the parcel of land times 60/100 times the price for acquiring public land established by the local Kabupaten/Kotamadya.

b. Basic land prices in Medan for acquiring public land were set in the decision by the Mayor number 751 of 1978.

c. Qualifying incomes for acquisition of these parcels at market prices would be much higher, but still many low income households could benefit from the program.

TABLE 4.12

COST OF ACQUIRING KIP AREA LAND RIGHTS

Name of Kampung	Area of Kampung Selected for KIP	Estimated Number of Dwelling Units	Average Area of Plots Assuming 12 Percent of Area is Circulation	Average Land Values (Rp./sq m)[1]	Estimated Cost of Acquiring Public Land (Rupiah)[2]	Cost of Hak Milik Certificate[3]	Total Costs
1. Hamdan, Jati, Polonia	9.57	729	115.50	2,400	166,320	20,000	186,320
2. Aur	7.62	694	96.60	2,400	139,104	20,000	159,104
3. Sidorame Barat	42.76	1300	289.50	2,400	416,880	20,000	436,880
4. Sidorame Timur	22.72	646	309.50	2,400	445,680	20,000	465,680
5. Sei Kera Hilir	41.38	2232	163.00	2,400	234,720	20,000	254,720
6. Sei Kera Hulu	22.28	953	205.70	2,400	296,208	20,000	316,208
7. Tegal Sari I	31.75	1975	141.50	600	50,940	20,000	70,940
8. Tegal Sari II	26.77	849	277.50	600	99.900	20,000	119,900
9. Tegal Sari (Medan Denai)	39.11	1560	220.60	600	79,416	20,000	99,416

1. Set by Keputusan Walikota Kepala Daerah Tk.II Medan, Nomor 751 of 1978.
2. Established by Department Dalam Negeri, Republic Indonesia, Peraturan Menteri Dalam Negeri, Nomor 1 of 1975.
3. Current costs of surveying and sertificate fees charge by Agraria.

TABLE 4.13

AFFORDABILITY ANALYSIS OF ACQUIRING RIGHTS TO LAND PARCELS IN KIP AREAS (1979 COSTS)

Name of Kampung	Estimated Number of Dwelling Units	Average Cost of Acquiring Public Land Per Plot (Rp)	Estimated Total Cost To KIP Households of Acquiring Land (Rupiah Millions)	Estimated Monthly Payment if Revolving Fund for Land Acquisition is Established (Rp)	Minimal Income Required to Afford Monthly Payment (Rp)
1. Hamdan	729	166,320	121.2	2330	11,651
2. Aur	694	139,104	96.5	1949	9,745
3. Sidorame Barat	1300	416,880	541.9	5841	29,205
4. Sidorame Timur	646	445,680	287.9	6245	31,222
5. Sei Kera Hilir	2232	234,720	67.2	3289	16,443
6. Sei Kera Hulu	953	296,208	282.2	4150	20,751
7. Tegal Sari I	1975	50,940	100.6	713.8	3,569
8. Tegal Sari II	849	99,900	84.8	1400	6,999
9. Tegal Sari (Medan Denai)	1560	79,416	123.9	1113	5,564
Total	10938		1706.2		

* The fund would onlend to KIP households at a proposed annual interest rate of 14.25 percent over eight years with a 20 percent downpayment.

TABLE 4.14

CASH FLOW ANALYSIS OF A REVOLVING FUND ASSISTING KIP HOUSEHOLDS ACQUIRE THEIR PLOTS

Year	1	2	3	4	5	6	7	8	9	10
Sources of Funds										
Cash Balance from previous Year	-	(2.5)	29.2	65.7	105.4	153.5	201.7	244.1	398.4	261.4
Savings Deposits	150	150	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
Government Loan	100	100	100.0	100.0	100.0	-	-	-	-	-
Repayment from Beneficiaries	-	54.4	108.7	169.4	238.0	315.3	381.2	457.7	489.0	575.6
Total Sources	250	301.1	387.9	485.1	593.4	618.8	732.9	851.8	1037.4	987.0
Applications of Funds										
Number of Loans Made	2000	2000	2233	2525	2843	2428	2813	3152	4387	
Amount of Loans	250	250	279.2	315.7	355.4	303.5	351.7	394.1	548.4	411.4
Interest on Savings	-	20.2	40.5	60.8	81.0	101.3	121.5	133.0	185.1	216.9
Debt Repayment	-	-	-	-	-	9.3	12.1	27.7	37.0	46.2
Operating Costs	2.5	2.5	2.8	3.2	3.5	3.0	3.5	3.9	5.5	4.1
Total Applications	252.5	272.8	322.2	379.7	439.9	417.1	488.8	453.4	766.0	678.6
Net Cash Flow	(2.5)	29.2	65.7	105.4	153.5	201.7	244.1	398.4	261.4	308.4

Notes:
1. Loans from the Government would be at 7.85 percent over 25 years with five years grace.
2. Interest on savings deposits is 13.5 percent simple interest.
3. Loans to beneficiaries are assumed to average Rp.156,000 be financed up to 80 percent of the loan amount at 14.25 percent ot cover the institution's costs in servicing these loans and to generate additional capital.
4. Funds from savings deposits have been treated as loans with eight years grace in repayment.

Detailed analysis of the financial and economic aspects of such a program have not been included since such a program would require changes in current banking regulations which prohibit commercial banks from granting loans for only land purchases. Also the extent of the program and number of KIP households which could benefit under the program cannot be determined until basic land registration mapping and identification of ownership rights are performed in KIP areas. The program shown in Table 4.14 is however indicative of how such a revolving fund could operate and demonstrates that if the fund were properly managed on a commercial basis it would become a viable enterprise and could become self sufficient of government assistance.

Implementation of land Registration in KIP Areas

The Director of Land Registration of the Directorate General of Agrarian Affairs of the Department of Interior would be primarily responsible for implementing the land registration program in Medan. However, the actual mapping and identification of ownership would be performed by the North Sumatra Provincial Department of Agraria under supervision from the Directorate General since the latter has performed similar programs in other Indonesian cities.

Funds for the program would be allocated to the budget of the Director of Land Registration of the Directorate General and would then pass to the North Sumatra Provincial Department for actual implementation. Once actual mapping and ownership rights were established, the Kotamadya Department of Agraria would be responsible for initial processing of application for certificates and receipt of fees for certificates from the KIP households. Actual processing of the certificates would continue to be performed at the provincial level as is the current practice.

If it proves feasible to establish a program to assist KIP area households in acquiring their plots, the funds would be handled by a commercial bank such as the BTN. However, actual land prices would be determined by the local department of Agraria in accordance with instructions established by the Kotamadya and previously quoted national legislation.

Full details of the proposed land tenure program and revolving fund should be studied by the proposed Land Resources and Regulations Study Team. (See Long Range Urban Development Plan, Vol.II, Appendix A).

4.3 UNIT COST ESTIMATES

Table 4.15 and 4.16 summarize the current unit prices (year end 1979) for local materials, labor and for the recommended KIP program components. A ten percent contractors overhead and a ten percent allowance for contractors profit have been added to all applicable items. No provision is included for supervision and taxes.

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TABLE 4.15

GENERAL MATERIALS AND LABOR UNIT COSTS

Description	Unit	Unit Cost (Rp)
Labor		
Unskilled labor	day	700
Skilled labor		
Mason	day	1,200
Carpenter	day	1,400
Assistant to skilled labor	day	800
Foreman	day	1,250
Material (delivered to site)		
Sand for filling	cu m	1,400
Sand for mortar	cu m	1,700
Sand for concrete	cu m	2,000
Gravel for concrete	cu m	2,900
Broken stone	cu m	3,400
Sirtu (sandy stone)	cu m	2,400
Crushed stone	cu m	3,900
Brick	100 pcs	1,850
Portland cement (Cibinong)	40 kg	2,100
Lime	100 kg	3,500
Asphalt	100 kg	9,000
Reinforcement steel	kg	300
Earthworks		
Excavation by hand		
0-1 metre	cu m	500
0-2 metres	cu m	600
Soil transport by pikulan		
Over max. distance of 50-100 m	cu m	200
Back filling	cu m	250
Sand filling	cu m	1,500
Loading and unloading of truck using man-power	cu m	250
Trench excavation up to depth of 1.5 m	cu m	550
Filling including compaction (each layer 20 cm)	cu m	1,250

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TABLE 4.15 — Continued

Description	Unit	Unit Cost (Rp)
Masonry		
Stone masonry	cu m	19,500
Plastering	cu m	750
Concrete mixed in place 1 : 3 : 5	cu m	18,000
Concrete mixed in place 1 : 2 : 3	cu m	23
Reinf. steel including binding and placing	100 kg	45,000
Timber formwork for concrete	cu m	57,000
Housing material		
Paint		
Wall paint	3,5 litres	6,900
Wood paint	1 litre	2,750
Roof		
Cement roof tile	pcs	100
Corrugated asbestos cement 14 x 4 mm x 5 feet	sheet	2,200
Asbestos cement roof 4 mm x 1 m x 2 m	sheet	2,360
Floor		
P.C. Tile 20 x 20	pcs	45
P.C. Tile 30 x 30	pcs	160
Glass (transparant)		
t = 3 mm	sq m	3,500
t = 5 mm	sq m	5,750
Wood - depending on quality (1 top - 1,35 cu m)	ton	40,000 to 115,000

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TABLE 4.16

RECOMMENDED KIP PROGRAM UNIT COSTS

Description	Unit	Unit Cost (Rp)
Water Supply		
Regular public standpipe incl. water meter	No.	40,000
Storage type public standpipe incl. water meter	No.	165,000
Fire hydrant	No.	90,000
Water Meter	No.	12,000
P.V.C. pipe incl.valves		
Ø 100 mm	m	9,500
Ø 80 mm	m	5,450
Ø 51 mm	m	3,300
Ø 38 mm	m	2,250
Ø 25 mm	m	1,500
Wastewater Disposal		
1.10 m x 1.10 m reinforced concrete water-sealed latrine slab	No	6,000
Public MCK (4 place)	No	1,250,000
P.V.C. Ø 100 mm discharge pipe	m	6,600
Streets, Footpaths & Bridges		
Secondary Street (greater than 6 m ROW)		
Asphalt construction	sq m	3,900
Asphalt improvement	sq m	1,600
Asphalt resurfacing	sq m	850
Residential Street (4-6 m ROW)		
Asphalt reconstruction	sq m	2,500
Asphalt improvement	sq m	1,600
Asphalt resurfacing	sq m	850
Main Footpath (2-4 m ROW)		
Asphalt reconstruction	sq m	1,850
Asphalt improvement	sq m	1,600
Asphalt resurfacing	sq m	850

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TABLE 4.16 — Continued

Description	Unit	Unit Cost (Rp)
Footpath (Less than 2 m ROW)		
Asphalt reconstruction	sq m	1,200
Street Bridge (5.0 m Span)	No.	6,650,000
Footpath Bridge		
5.0 m Span	No.	850,000
6.0 m Span	No.	1,300,000
Drainage		
Secondary Street Drain		
Plastered brick drain (60 cm depth and 90 cm width)	m	9,600
Concrete Intersection Conduit (Ø 500 mm)	m	350
Concrete Footpath Conduit (Ø 500 mm)	m	400
Residential Street Drain		
Plastered brick drain (75 cm depth and 65 cm width)	m	10,350
Concrete Intersection Conduit (Ø 600 mm)	m	400
Concrete Footpath Conduit (Ø 600 mm)	m	825
Main Footpath Drain		
Plastered Brick Drain (75 cm depth and 65 cm width)	m	10,350
Footpath Drain		
Plastered Brick Drain (40 cm depth and 50 cm width)	m	6,600
Solid Waste		
Containerized Handcart (0.7 cu m capacity)	No.	80,000
Plastic Container for Handcart (88 liter)	No.	2,000
Concrete Curbside Container (1.0 cu m capacity)	No.	30,000
4 - Ton Collection Truck	No.	10,000,000

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TABLE 4.16 — Continued

Description	Unit	Unit Cost (Rp)
Community Facilities		
Education		
Rehabilitate/upgrade existing schools	By type of improvement	Varies
Construct additional 54 sq m		
Classroom including furniture and equipment	No.	4,050,000
Construct 6 classroom elementary school (S.D.) including furniture and equipment	No.	24,600,000
Construct Junior-Senior secondary school including furniture and equipment (2475 sq m @ Rp.79,500/sq m)	No.	196,400,000
Construct and equip Sanggar Kegiatan Belajar (SKB) Building (250 sq m @ Rp.139,000/sq m)	No.	34,900,000
Health		
Rehabilitate/upgrade Existing Puskesmas	By type of improvement	Varies
New Construction		
Puskesmas	No.	29,700,000
Maternity Clinic	No.	27,300,000
Puskesmas Pembantu	No.	9,200,000

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4.4 SUMMARY OF PROJECT COST ESTIMATES

Table 4.17 summarizes the costs of each of the KIP program components.

TABLE 4.17

SUMMARY OF PRELIMINARY KIP DESIGN COST ESTIMATED EXCLUDING ENGINEERING DESIGN AND CONTINGENCIES

Component	Quantity*	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
Regular public standpipe including water meter	95	40,000	3,800
Storage type public standpipe including water meter	11	165,000	1,815
Fire hydrant	44	90,000	3,960
Ø 100 mm P.V.C. pipe	489 m	9,500	4,646
Ø 80 mm P.V.C. pipe	13506 m	5,450	73,608
Ø 51 mm P.V.C. pipe	859 m	3,300	2,836
Ø 38 mm P.V.C. pipe	1375 m	2,250	3,094
Ø 25 mm P.V.C. pipe	358 m	1,500	537
Sub-total	-	-	94,296
Wastewater Disposal			
1.10 m x 1.10 m reinforced concrete water-sealed latrine slab	4759	6,000	28,554
Public MCK (4 place)	29	1,250,000	36,250
Ø 100 mm P.V.C. discharge pipe	1301 m	6,000	8,587
Sub-total	-	-	73,391

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TABLE 4.17--Continued

Component	Quantity*	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Streets, Footpaths & Bridges			
Secondary Street (greater than 6 m ROW)			
Asphalt reconstruction	12888 sq m	3,900	50,263
Asphalt resurfacing	38246 sq m	850	32,509
Residential Street (4-6 ROW)			
Asphalt reconstruction	19014 sq m	2,500	47,535
Asphalt improvement	4488 sq m	1,600	7,181
Asphalt resurfacing	11604 sq m	850	9,863
Main Footpath (2-4 m ROW)			
Asphalt reconstruction	22788 sq m	1,850	42,158
Asphalt improvement	520 sq m	1,600	832
Asphalt resurfacing	2467 sq m	850	2,097
Footpath			
Aspahlt reconstruction	35002 sq m	1,200	42,002
Street Bridge (5.0 m span)	3	6,650,000	19,950
Footpath Bridge			
5.0 m span	1	850,000	850
6.0 m span	1	1,300,000	1,300
Sub-Total	-	-	256,540
Drainage			
Plastered Brick Drain Both Sides of Secondary Street	10505 m	20,000	210,100
Plastered Brick Drain Both Sides of Residential Street	11349 m	22,000	249,678
Plastered Brick Drain One Side of Residential Street	125 m	11,000	1,375
Plastered Brick Drain Both Sides of Main Footpath	7519 m	20,650	155,268

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TABLE 4.17--Continued

Component	Quantity*	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Plastered Brick Drain One Side of Main Footpath	5090 m	19,350	52,682
Plastered Brick Drain One Side of Footpath	23534	6,600	155,324
Single Drain (Same Cross-Section as Secondary Street Drain) not Paralleling Street of Footpath	1265	9,600	12,144
Sub-Total			836,571
Solid Waste			
Containerized Handcart (0.7 cu m capacity)	145	80,000	11,600
Plastic Container for Handcart (88 liter)	1160	2,000	2,320
Concrete Curbside Container (1.0 cu m capacity)	115	30,000	3,450
4-Ton Collection Truck	4	10,000,000	40,000
Sub-Total		-	57,370
Penmas Building			
Construct and Equipment Sanggar Kegiatan Belajar (SKB) Building (250 sq m @ Rp.139,600/sq m)	-	34,900,000	34,900
Health			
Rehabilitate/Upgrade Existing Puskesmas	2	Varies	29,500
New Construction			
Puskesmas	3	27,700,000	89,100
Maternity Clinic	1	27,300,000	27,300
Puskesmas Pembantu	1	9,200,000	9,200
Sub-Total	-	-	189,000

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TABLE 4.17--Continued

Component	Quantity*	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Land Acquisition	19580 sq m	10,000	195,800
Penmas Education Program	4000 persons	10,200	40,800
Land Registration	244 ha	22,000	5,400
Education			
Rehabilitate/Upgrade Existing Public and Private Elementary Schools	35	Varies	106,760
Construct and Equip Additional 54 sq m Classrooms	13	4,050,000	52,650
Construct and Equip 6 Classrooms Elementary School (S.D.)	6	24,600,000	147,600
Construct and Equip Junior - Senior Secondary School (2475 sq m @ Rp.79,500/sq m)	1	196,400,000	196,400
Sub-Total	-	-	503,410
Community Worker Program	54 workers	660,000	35,640
Total			539,050

Total Cost		2,288,200
Total Cost per Capita (US $)	US$	45.96
Total Cost per Hectare (US $)	US$	15,125

Note: * Quantities are in number of items unless otherwise specified.

SECTION 5

PRELIMINARY KIP PROGRAM DESIGN AND COSTS

5.1 INTRODUCTION

The present section details the recommended preliminary design for the KIP program. The global KIP program components and costs presented in the previous section will be distributed by KIP area. A four-year, phased investment program required to undertake the recommended program will be presented in conjunction with the organizational and community participation requirements. Finally, the program personnel requirements will be discussed.

Base Maps

The preliminary KIP design - as well as the previously discussed existing situation - were mapped on prints of uncontrolled aerial photographs at a 1:1000 scale. These prints have been produced from enlargements of a series of aerial photos taken of the Kotamadya at a scale of 1:5000. While these photos date from August 1972, the selected KIP areas, with the exception of the peripherally located Tegal Sari II and Tegal Sari Medan Denai, have developed slowly during the intervening years. In an attempt to partially compensate for the age of the photos, a limited amount of updating has been undertaken through information gathered from field surveys.

Location of Physical KIP components

Sites for all the recommended physical KIP components, with the exceptition of the new elementary and secondary schools, have been located on the base maps. Preliminary sites were selected from the aerial photos and checked through field visits. For the purposes of preliminary design, the initial criteria for siting the various components confirmed to established design criteria and actual "fit" of the components on the sites. Detailed design work must verify these physical locations. Details of the recommended physical facilities for KIP are presented in Appendix A at a scale of 1:1000 and in Figures 5.1 through 5.16 at a 1:5000 scale.

5.2 RECOMMENDED KIP COMPONENTS AND COSTS BY KIP AREA

Tables 5.1 through 5.9 detail the recommended KIP program and costs for the nine KIP areas. Table 5.10 then summarizes the total KIP program costs on the basis of the individual KIP areas. Per capita and hectare KIP expenditures for each KIP area are also shown.

TABLE 5.1

KIP PROGRAM COSTS : SIDORAME BARAT

Kecamatan : Medan Timur
Population : 11640 persons
Improvement Area: 42.8 ha
Density : 270 persons/ha

Component Lorongs: VI-IX, XI, XIII-XXI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 80 mm Feeder Line	2133 m	5,450	11,625
2. 38 mm Feeder Line	118 m	2,250	266
3. 25 mm Feeder Line	60 m	1,500	90
4. Regular Standpipe including meter	11 m	40,000	440
5. Storage Type Standpipe including meter	2	165,000	330
6. Fire Hydrant	6	90,000	540
			132,917
MCK's & Water Sealed Toilet Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water-Sealed Latrine Slab	650	6,000	3,900
			3,900
Roads & Footpaths			
1. Resurface > 6 m ROW Secondary Road	10622 sq m	850	9,029
2. Reconstruct 4-6 m ROW Residential Road	3270 sq m	2,500	8,175
3. Improve 4-6 m ROW Residential Road	2295 sq m	1,600	3,672
4. Reconstruct 2-4 m ROW Main Footpath	5888 sq m	1,850	10,893
5. Reconstruct 1-2 m ROW Footpath	6332 sq m	1,200	7,598
			39,367

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TABLE 5.1--Continued

Component Lorongs: VI-IX, XI, XIII-XXI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Drainage			
1. Drain Both Sides of Secondary Streets	2136 m	20,000	42,720
2. Drain Both Sides of Residential Streets	1985 m	22,000	43,670
3. Drain Both Sides of 60% Main Footpaths	1766 m	20,650	36,468
Drain One Side of 40% Main Footpaths	1178 m	10,350	12,192
4. Drain One Side of Footpaths	4421 m	6,600	29,179
5. Section of Drain Running N-S Between Jln. Gereja and Jln. Lorong Gino	130 m	9,600	1,248
			165,477
Solid Waste			
1. Gerobak	20	80,000	1,600
2. Plastic Containers for Gerobak @ a per Gerobak	160	2,000	320
3. Community Curbside Container	24	30,000	720
4. 14% (Based on Total KIP Area Population) of Cost of Required Trucks	0.56	10,000,000	5,600
			8,240
Health			
1. Construct and Equip New Puskesmas	1	29,700,000	29,700
2. Construct and Equip New Maternity Clinic	1	27,300,000	27,300
			57,000
Land Acquisition			
1. Land for 13 Public St (5 sq m/standpipe)	m	10,000	650
2. Land for 1 New Puskes	m	10,000	6,250
3. Land for 1 New Maternity Clinic	625 sq m	10,000	6,250
4. Land for 1 New Elementary School	1500 sq m	10,000	15,000
			28,150

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TABLE 5.1--Continued

Lorongs: VI-IX, XI, XIII-XXI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Penmas	1089	10,200	11,108
			11,108
Land Registration	42.76 ha	22,000	941
			941
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	3 schools	Varies	13,050
2. Construct and Equip New Elementary School	1	24,600,000	24,600
			37,650
Community Workers Program (1 c.w./1500 KIP Area Residents)	8	660,000	5,280
			5,280
Total Cost			370,404

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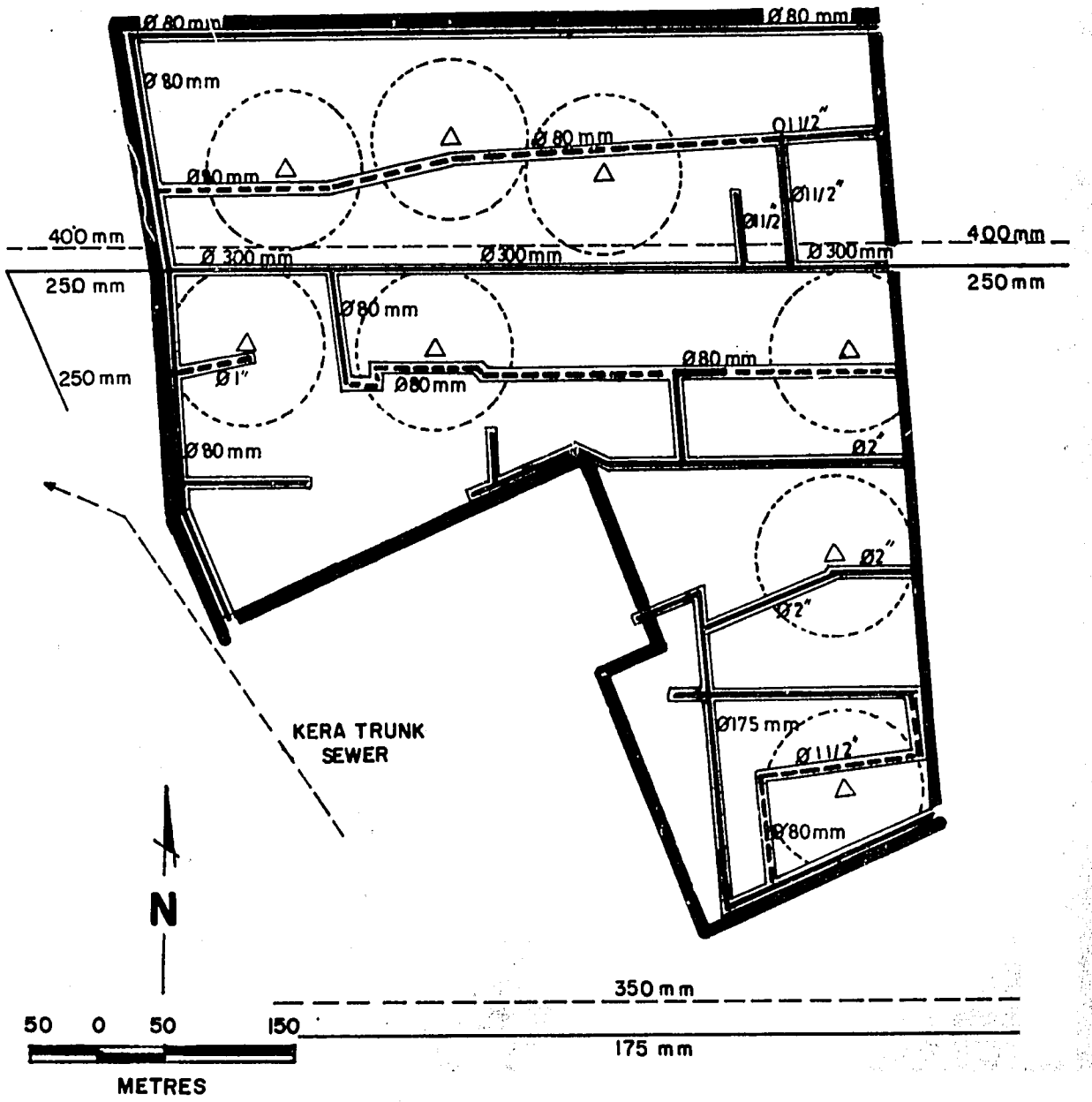
FIGURE 5.1



KAMPUNG IMPROVEMENT PROGRAM (KIP)

PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP

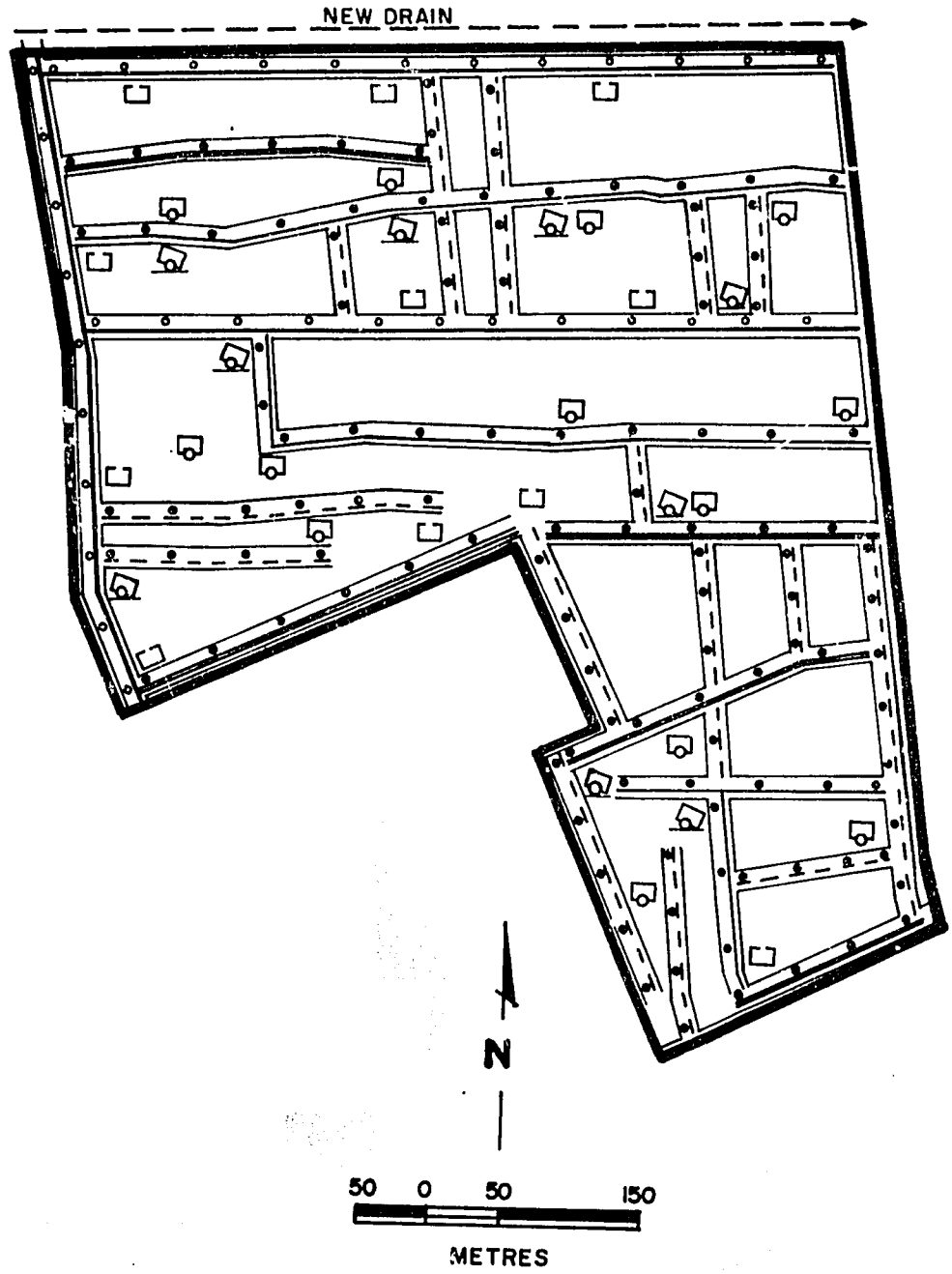
NAME OF KAMPUNG

SIDORAME BARAT

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60 m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENTION — Ø 2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- NEW SEWER

FIGURE 5.2



KAMPUNG IMPROVEMENT PROGRAM

(K I P)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

SIDORAME BARAT

LEGEND

PROPOSED STREET AND FOOTPATH IMPROVEMENT

- SECONDARY STREET
- RESIDENTIAL STREET
- MAIN FOOTPATH
- FOOTPATH

- RECONSTRUCT ●●●●
- IMPROVE ⊖⊖⊖⊖
- RESURFACE ○○○○

PROPOSED BRIDGES

- STREET BRIDGE
- FOOT BRIDGE

EXISTING MAIN DRAIN

PROPOSED SOLID WASTE FACILITIES

- LOCATION OF SOLIDWASTE CONTAINER
- LOADING STATION
- CURBSIDE CONTAINER

KAMPUNG BOUNDARY

KIP AREA BOUNDARY

TABLE 5.2

KIP PROGRAM COSTS : SIDORAME TIMUR

Kecamatan : Medan Timur
Population : 4800 persons
Improvement Area: 22.7 ha
Density : 210 persons/ha

Component Lorongs: I-XI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 80 mm Feeder Line	1956 m	5,450	10,660
2. 38 mm Feeder Line	74 m	2,250	167
3. Regular Standpipe including Meter	5	0,000	200
4. Storage Type Standpipe including Meter	1	5,000	165
5. Fire Hydrant	6	0,000	540
			11,732
MCK's & Water-Sealed Toilet Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water-Sealed Latrine Slab	323	6,000	1,938
			1,938
Roads & Footpaths			
1. Reconstruct > 6 m ROW Secondary Road	2211 sq m	3,900	8,623
2. Resurface > 6 m ROW Secondary Road	4263 sq m	850	3,624
3. Reconstruct 4-6 m ROW Residential Road	888 sq m	2,500	2,220
4. Improve 4-6 m ROW Residential Road	1518 sq m	1,600	2,429
5. Resurface 4-6 m ROW Residential Road	780 sq m	850	663
6. Reconstruct 2-4 m ROW Main Footpath	1918 sq m	1,850	3,548
7. Reconstruct 1-2 m ROW Footpath	3234 sq m	1,200	3,881
			24,988

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TABLE 5.2--Continued

Component Lorongs: I-XI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Drainage*			
1. Drains Both Sides of Secondary Streets	1665 m	20,000	33,300
2. Drains Both Sides of Residential Streets	760 m	22,000	16,720
3. Drains Both Sides 60% of Main Footpaths	575 m	20,650	11,874
Drain One Side 40% of Main Footpaths	384 m	10,350	3,974
4. Drain One Side of Footpaths	2156 m	6,600	14,230
			80,098
Solid Waste			
1. Gerobak	11	80,000	880
2. Plastic Containers for Gerobak @ 8 per Gerobak	88	2,000	176
3. Community Curbside Container	16	30,000	480
4. 6% (Based on Total KIP Area Population) of Cost of Required Trucks	0.24	10.000.000	2,400
			3,936
Land Acquisition			
1. Land for 6 Public Standpipes (5 sq m/standpipe)	30 sq m	10,000	300
			300
Penmas (See Table 4.10)	237	10,200	2,417
			2,417
Land Registration	22.72 ha	22,000	500
			500

* Improvement costs to 473 m of Sei Kera Channel not included.

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TABLE 5.2--Continued

Component Lorongs: I-XI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	4 schools	Varies	9,060
2. Construct and Equip Additional Classrooms	1	4,050,000	4,050
			13,110
Community Workers Program (1 c.w./1500 KIP Area Residents)	3	660,000	1,980
			1,980
Total Cost			140,999

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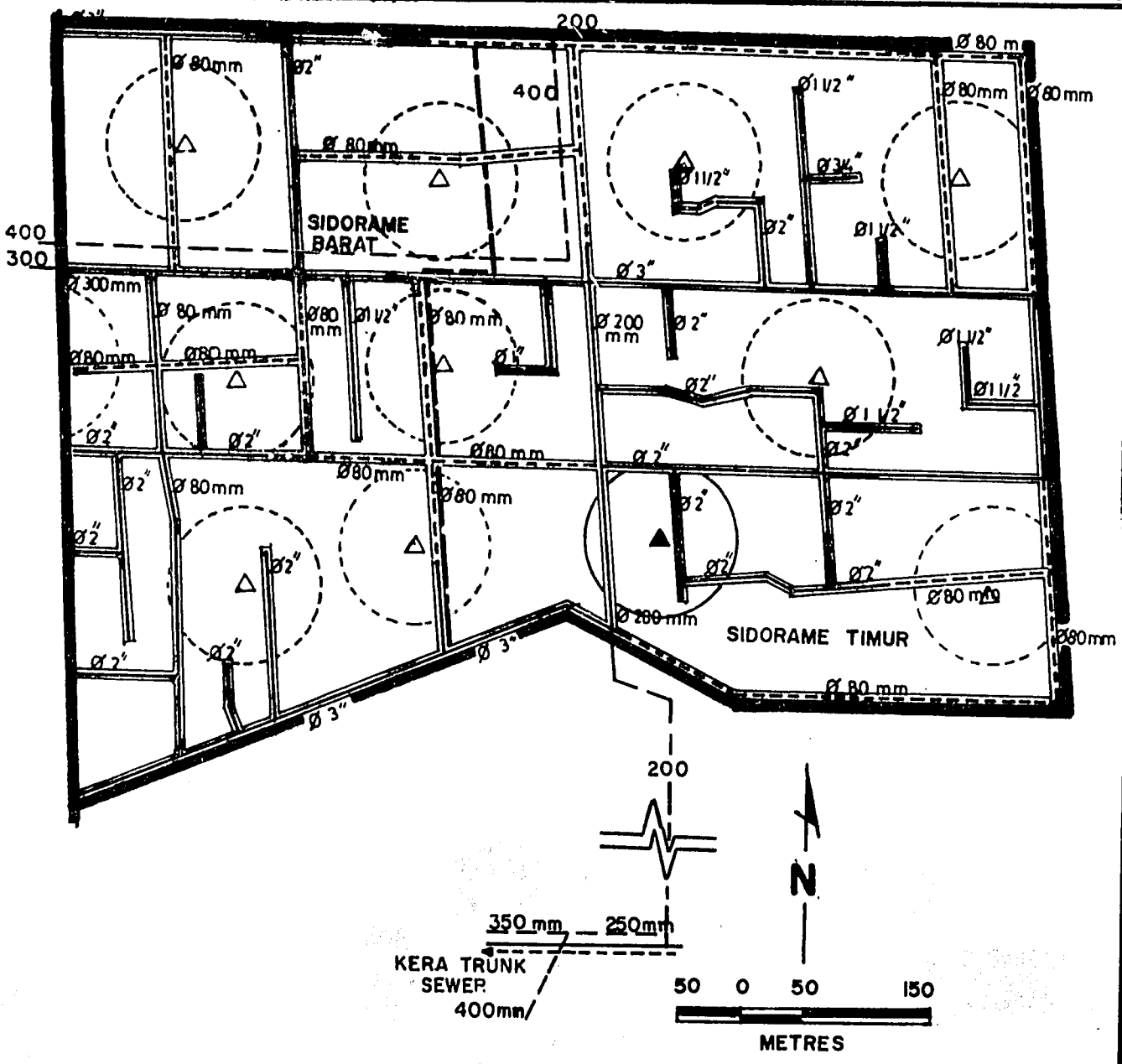
FIGURE 5.3



KAMPUNG IMPROVEMENT PROGRAM (KIP)

PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP

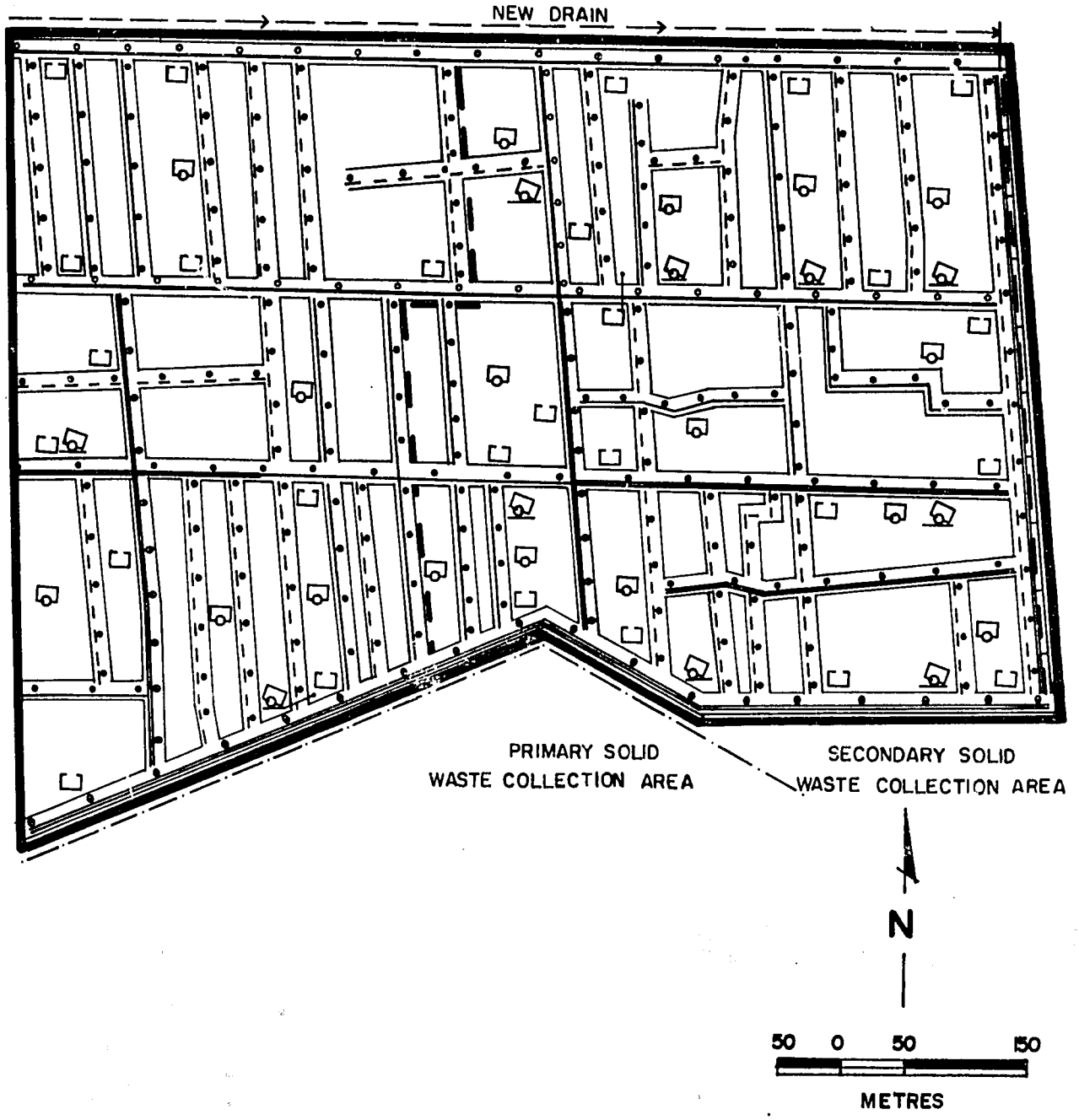
NAME OF KAMPUNG

SIDORAME BARAT & TIMUR

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENSION — Ø2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- NEW SEWER

FIGURE 5.4



KAMPUNG IMPROVEMENT PROGRAM

(K I P)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

SIDORAME BARAT & TIMUR

LEGEND

PROPOSED STREET AND FOOTPATH IMPROVEMENT

SECONDARY STREET	———	RECONSTRUCT	●●●●
RESIDENTIAL STREET	═══	IMPROVE	⊖⊖⊖⊖
MAIN FOOTPATH	———	RESURFACE	○○○○
FOOTPATH	– – –		

PROPOSED BRIDGES

STREET BRIDGE — FOOT BRIDGE

EXISTING MAIN DRAIN

PROPOSED SOLID WASTE FACILITIES

LOCATION OF SOLID WASTE CONTAINER

LOADING STATION

CURBSIDE CONTAINER

KAMPUNG BOUNDARY

KIP AREA BOUNDARY

TABLE 5.3

KIP PROGRAM COSTS : SEI KERA HILIR

Kecamatan : Medan Timur
Population : 14400 persons
Improvement Area: 41.4 ha
Density : 350 persons/ha

Component Lorongs: VII-XV, XVII-XX, XXIV, XXVI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 80 mm Feeder Line	423 m	5,450	2,305
2. 38 mm Feeder Line	162 m	2,250	365
3. Regular Standpipe including Meter	6	40,000	240
4. Storage Type Standpipe including Meter	1	165,000	165
5. Fire Hydrant	-	-	-
			3,075
MCK's & Water-Sealed Latrine Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water Sealed Latrine Slab	1116	6,000	6,696
			6,696
Roads & Footpaths*			
1. Resurface > 6 m ROW Secondary Road	11845 sq m	850	10,069
2. Reconstruct 4-6 m ROW Residential Road	525 sq m	2,500	1,313
3. Resurface 4-6 m ROW Residential Road	2068 sq m	850	1,758
4. Reconstruct 2-4 m ROW Main Footpath	1158 sq m	1,850	2,882
5. Reconstruct 1-2 m ROW Footpath	7629 sq m	1,200	9,155
			25,177

* 640 m of Jln. Yamin not included for improvement.

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TABLE 5.3--Continued

Component Lorongs: VII-XV, XVII-XX, XXIV, XXVI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Drainage*			
1. Drains Both Sides of Secondary Streets	2484 m	20,000	49,680
2. Drains Both Sides of Residential Streets	1094 m	22,000	24,068
3. Drains Both Sides of 60% Main Footpaths	467 m	20,650	9,644
Drains One Side of 40% Main Footpaths	312 m	10,350	3,229
4. Drain One Side of Footpaths	5086 m	6,600	33,568
			120,189
Solid Waste			
1. Gerobak	22	80,000	1,760
2. Plastic Containers for Gerobak @ 8 per Gerobak	176	2,000	352
3. Community Curbside Container	24.5**	30,000	735
4. 18% (Based on Total KIP Area Population)of Cost of Required Trucks	0.72	10,000,000	7,200
			10,047
Health Facilities			
1. Rehabilitate/Upgrade Existing Puskesmas Sentosa Baru	1	13,300,000	13,300
2. Construct and Equip New Puskesmas	1	29,700,000	29,700
			43,000
Penmas Building			
1. Construct and Equip Sanggar Kegiatan Belajar (SKB) Building to Support Penmas Program	1	34,900,000	34,900
			34,900

* Improvement Costs to 655 m of Sei Kera Channel not included.
** Sei Kera Hilir shares community curbside containers with Sei Kera Hulu Along Jln. Yamin.

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TABLE 5.3--Continued

Component Lorongs: VII-XV, XVII-XX, XXIV, XXVI	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Land Acquisition			
1. Land for 7 Public Standpipes	35	10,000	350
2. Land for 1 New Puskesmas	625	10,000	6,250
3. Land for (SKB) Penmas Building	625	10,000	6,250
4. Land for 1 New Elementary School	1500	10,000	15,000
			27,850
Penmas	344	10,200	3,509
			3,509
Land Registration	41.38 ha	22,000	910
			910
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	9 schools	Varies	21,720
2. Construct and Equip Additional Classrooms	3	4,050,000	12,150
3. Construct and Equip New Elementary School	1	24,600,000	24,600
			58,470
Community Workers Program (1 c.w./1500 KIP Area Residents)	10	660,000	6,600
			6,600
Total Cost			340,423

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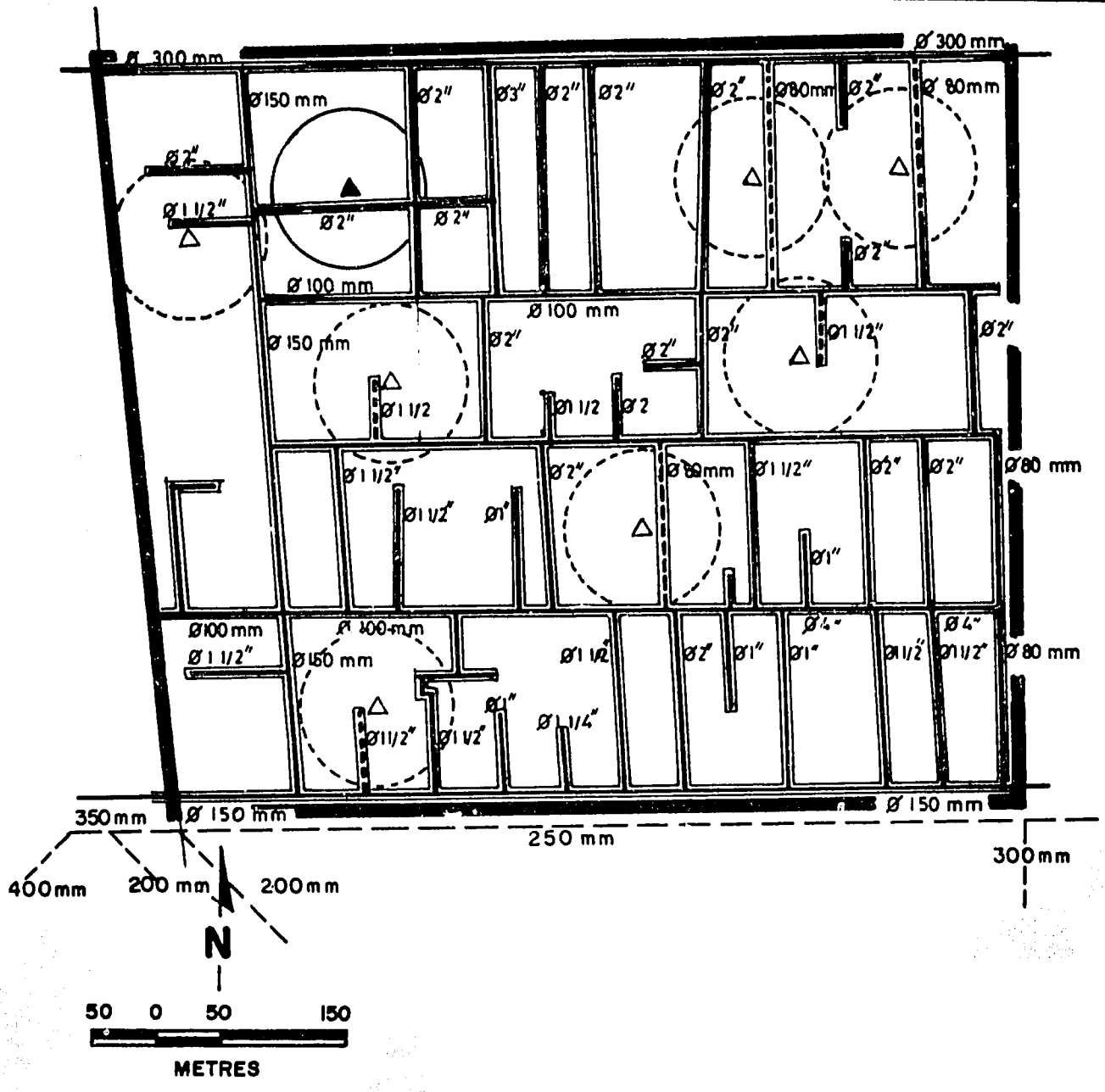
FIGURE 5.5



KAMPUNG IMPROVEMENT PROGRAM (KIP)

PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP

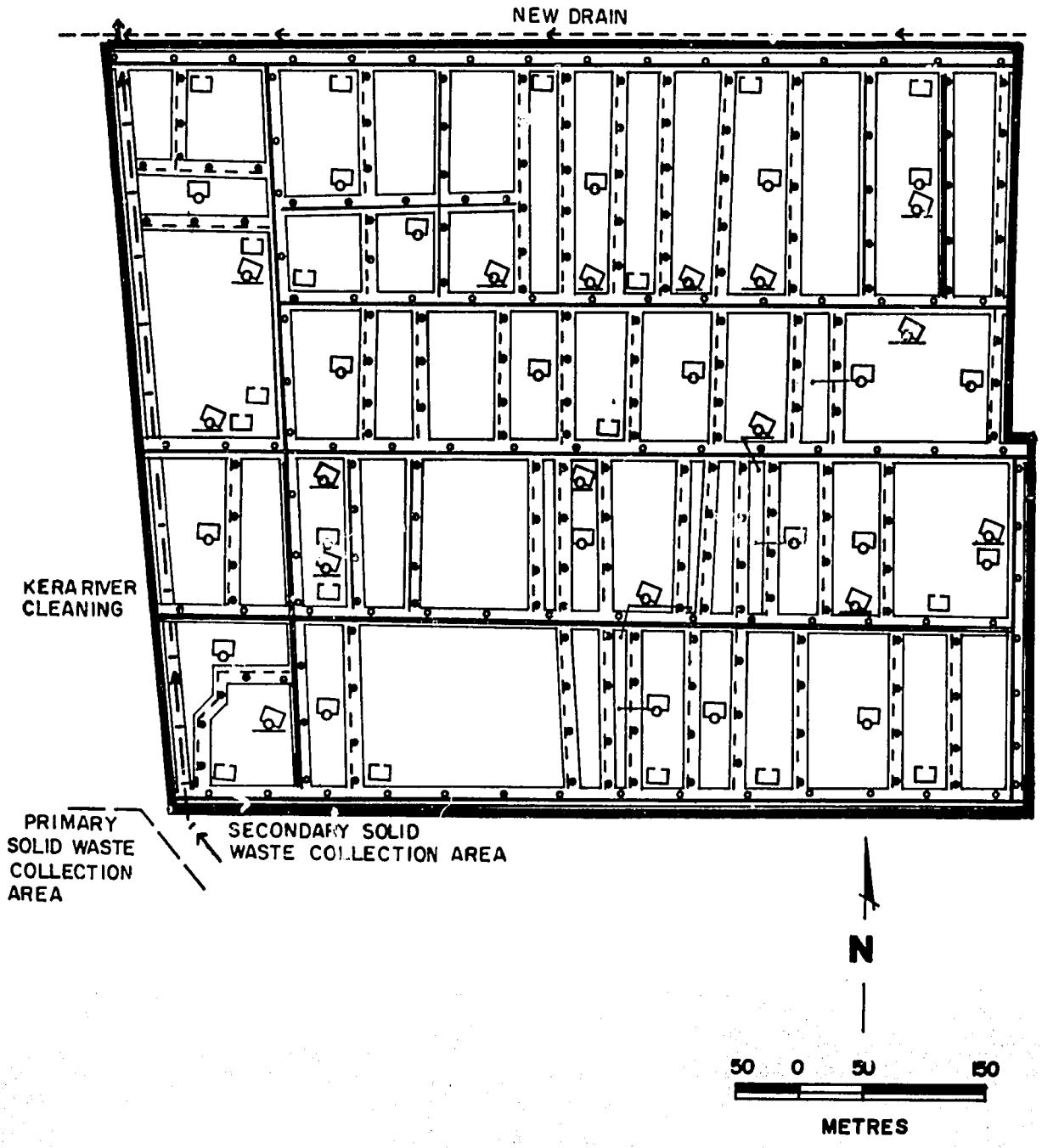
NAME OF KAMPUNG

SEI KERA HILIR

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60 m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENSION — Ø2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- PROPOSED 100 mm P.V.C DISCHARGE PIPE

FIGURE 5.6



KAMPUNG IMPROVEMENT PROGRAM

(KIP)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

SEI KERA HILIR

LEGEND

PROPOSED STREET AND FOOTPATH IMPROVEMENT

- SECONDARY STREET
- RESIDENTIAL STREET
- MAIN FOOTPATH
- FOOTPATH

- RECONSTRUCT
- IMPROVE
- RESURFACE

PROPOSED BRIDGES

- STREET BRIDGE
- FOOT BRIDGE

EXISTING MAIN DRAIN

PROPOSED SOLID WASTE FACILITIES

- LOCATION OF SOLID WASTE CONTAINER
- LOADING STATION
- CURBSIDE CONTAINER

KAMPUNG BOUNDARY

KIP AREA BOUNDARY

TABLE 5.4

KIP PROGRAM COSTS : SEI KERA HULU

Kecamatan : Medan Timur
Population : 6400 persons
Improvement Area: 22.3 ha
Density : 290 persons/ha

Component Lorongs: I - XVIII	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1 38 mm Feeder Line	162 m	2,250	365
2. 25 mm Feeder Line	26 m	1,500	39
3. Regular Standpipe including Meter	3	40,000	120
4. Storage Type Standpipe including Meter	1	165,000	165
5. Fire Hydrant	-		-
			689
MCK's & Water Sealed Latrine Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water-Sealed Latrine Slab	477	6,000	2,862
			2,862
Roads & Footpaths*			
1. Reconstruct 4-6 m ROW Residential Road	570 sq m	2,500	1,425
2. Resurface 4-6 m ROW Residential Road	5307 sq m	850	4,511
3. Reconstruct 2-4 m ROW Main Footpath	2214 sq m	1,850	4,096
4. Reconstruct 1-2 m ROW Footpath	3681 sq m	1,200	4,417
			14,449

* 585 m of Jln. Yamin not included for improvement

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TABLE 5.4--Continued

Component Lorongs: I - XVIII	Quantity	Unit Cost	Total Cost (Rp. Thousand)
Drainage*			
1. Drains Both Sides of Residential Streets	1779	22,000	39,138
2. Drains Both Sides of 60% Main Footpaths	664	20,650	13,712
Drains One Side of 40% Main Footpaths	443	10,350	4,585
3. Drain One Side of Footpaths	2454	6,600	16,196
			73,631
Solid Waste			
1. Gerobak	13	80,000	1,040
2. Plastic Containers for Gerobak @ 8 per Gerobak	104	2,000	208
3. Community Curbside Container	11.5**	30,000	345
4. 8% (Based on Total KIP Area Population) of Cost of Required Trucks	0.32	10,000,000	3,200
			4,793
Health Facilities			
1. Construct and Equip Puskesmas Pembantu	1	9,200,000	9,200
			9,200
Land Acquisition			
1. Land for 4 Public Standpipes (5 sq m/Standpipe)	20 sq m	10,000	200
2. Land for 1 New Puskesmas Pembantu	200 sq m	10,000	2,000
			2,200
Penmas	734	10,200	7,487
			7,487

* Improvement costs to 830 m of Sei Kera Channel not included.
** Sei Kera Hulu shares 5 community curbside containers with Sei Kera Hilir along Jln. Yamin.

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TABLE 5.4--Continued

Component Lorongs: I - XVIII	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Land Registration	22.28 ha	22,000	490
			490
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	5 schools	Varies	7,050
			7,050
Community Workers Program (1 c.w./1500 KIP Area Residents)	4	660,000	2,640
			2,640
Total Cost			125,491

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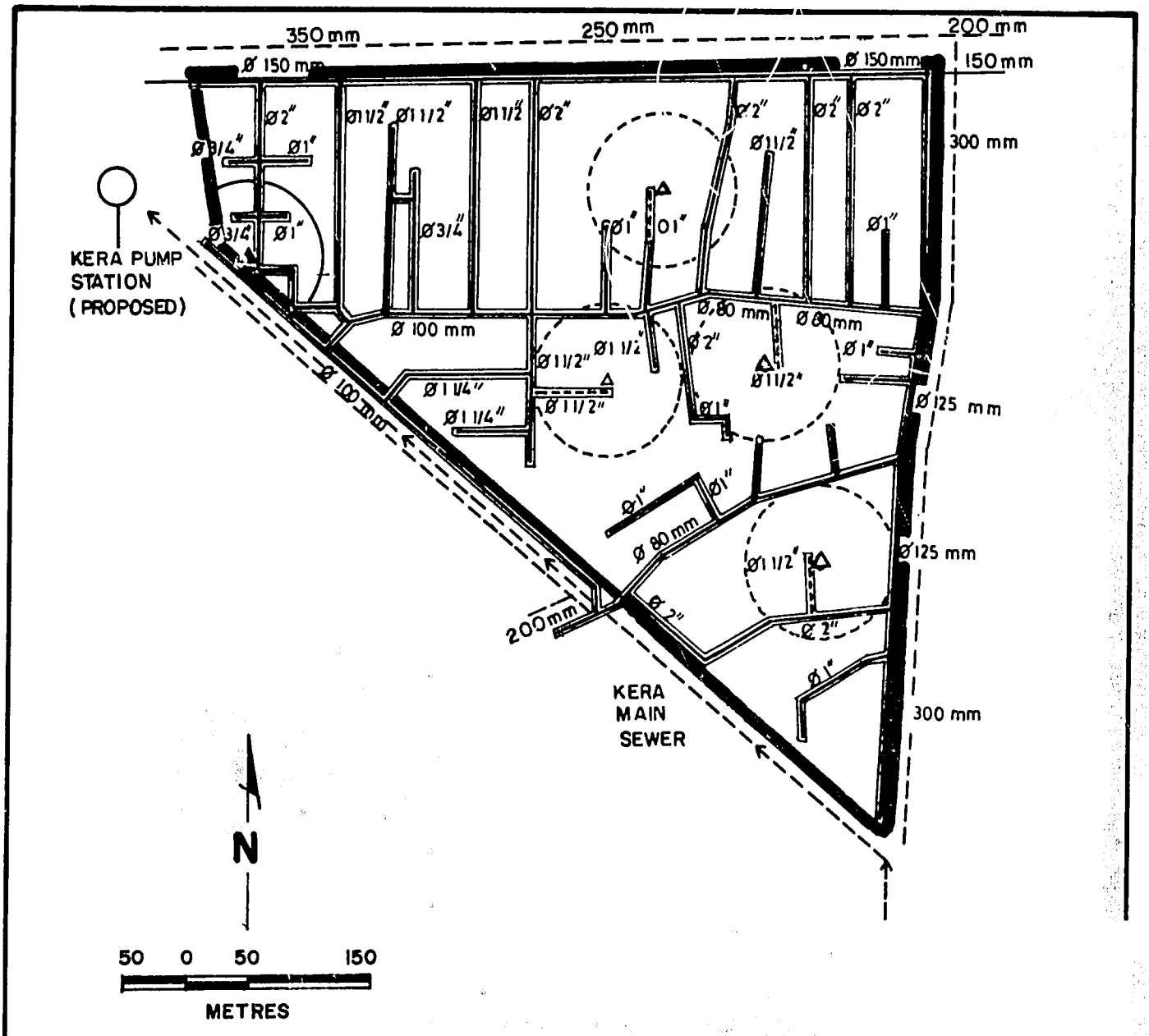
FIGURE 5.7



KAMPUNG IMPROVEMENT PROGRAM (KIP)

PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP

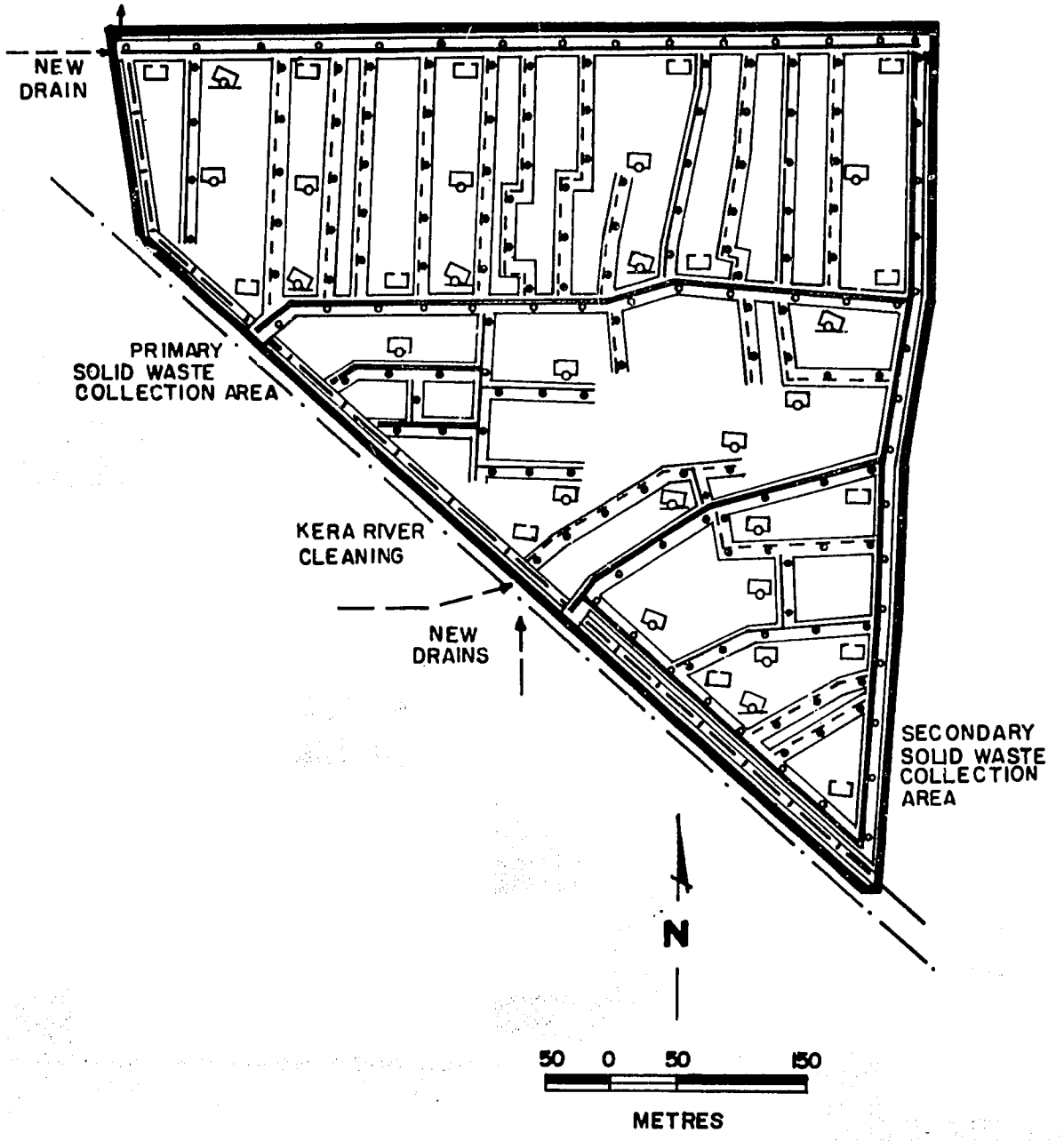
NAME OF KAMPUNG

SEI KERA HULU

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENTION — Ø 2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- NEW SEWER

FIGURE 5.8



KAMPUNG IMPROVEMENT PROGRAM

(KIP)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

SEI KERA HULU

LEGEND

PROPOSED STREET AND FOOTPATH IMPROVEMENT

- SECONDARY STREET
- RESIDENTIAL STREET
- MAIN FOOTPATH
- FOOTPATH

RECONSTRUCT ●●●●
IMPROVE ⊖⊖⊖⊖
RESURFACE ○○○○

PROPOSED BRIDGES

- STREET BRIDGE
- FOOT BRIDGE

EXISTING MAIN DRAIN

PROPOSED SOLID WASTE FACILITIES

- LOCATION OF SOLID WASTE CONTAINER
- LOADING STATION
- CURBSIDE CONTAINER

KAMPUNG BOUNDARY

KIP AREA BOUNDARY

TABLE 5.5

KIP PROGRAM COSTS : TEGAL SARI I

Kecamatan : Medan
Population : 20,600 persons
Improvement Area: 31.8 ha
Density : 650 persons/ha

Component Lorongs: I - XII	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 100 mm Feeder Line	140	9,500	1,330
2. 80 mm Feeder Line	2744	5,450	4,955
3. 51 mm Feeder Line	319	3,300	1,053
4. 38 mm Feeder Line	106	2,250	239
5. Regular Standpipe including Meter	18	40,000	720
6. Storage Type Standpipe including Meter	2	165,000	330
7. Fire Hydrant	10	90,000	990
			19,527
MCK's Water-Sealed Latrine Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water-Sealed Latrine Slab	988	6,000	5,928
			5,928
Roads & Footpaths*			
1. Reconstruct > 6 m ROW Secondary Road	6925 sq m	3,900	27,008
2. Resurface > 6 m ROW Secondary Road	3012 sq m	850	2,560
3. Reconstruct 4-6 m ROW Residential Road	4053 sq m	2,500	10,133
4. Resurface 4-6 ROW Residential Road	2019 sq m	850	1,716
5. Reconstruct 2-4 m ROW Main Footpath	2666 sq m	1,850	4,932

* 580 m of Jln. Kereta Api and 550 m of Jln. Bakti not included for improvement.

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TABLE 5.5--Continued

Component Lorongs: I - XII	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
6. Improve 2-4 m ROW Main Footpath	520 sq m	1,600	832
7. Resurface 2-4 m ROW Main Footpath	1077 sq m	850	915
8. Reconstruct 1-2 m ROW Footpath	4221 sq m	1,200	5,065
			53,161
Bridges			
1. 5 m span Footbridge	1	850,000	850
2. 5 m span Roadbridge	1	6,650,000	6,650
			7,500
Drainage*			
1. Drains Both Sides of Secondary Streets	1813 m	20,000	36,260
2. Drains Both Sides of Residential Streets	2024 m	22,000	44,528
3. Drains Both Sides of 74% Main Footpaths	1499 m	20,650	30,954
Drain One Side of 26% Main Footpaths	533 m	10,350	5,517
4. Drain One Side of Footpath	2814 m	6,600	18,572
5. Section of Drain Running Roughly N-S	747 m	9,600	7,171
			143,002
Solid Waste			
1. Gerobak	30	80,000	2,400
2. Plastic Containers for Gerobak @ 8 per Gerobak	240	2,000	480
3. Community Curbside Container	14	30,000	420
4. 26% (Based on Total KIP Area Population) of Cost of Required Trucks	1.04	10,000,000	10,400
			13,700

* Improvement Costs to 110 m of Sei Kera Channel not included.

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TABLE 5.5--Continued

Component Lorongs: I - XII	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Health Facilities			
1. Rehabilitate/Upgrade Existing Puskesmas Sukaramai	1	15,200,000	15,200
			15,200
Land Acquisition			
1. Land for 20 Public Standpipes (5 sq m/standpipe)	100 sq m	10,000	1,000
2. Land for 2 New Elementary Schools (1500 sq m/school)	3000	10,000	30,000
			31,000
Penmas	101	10,200	1,030
			1,030
Land Registration	31.75 ha	22,000	699
			699
Education			
1. Rehabilitate/Upgrade Existing Elementary School	9 schools	Varies	34,670
2. Construct and Equip Additional Classrooms	6	4,050,000	24,300
3. Construct and Equip New Elementary School	2	24,600,000	49,200
			108,170
Community Workers Program (1 c.w./1500 KIP Area Residents)	14	660,000	9,240
			9,240
Total Cost			408,157

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TABLE 5.6

KIP PROGRAM COSTS: TEGAL SARI II

Kecamatan : Medan Timur
Population : 5100 persons
Improvement Area : 26.8 Ha.
Density : 190 persons/Ha.

Component Lorongs: I - IV	Quantity	Unit Cost (Rp)	Total Cost (Rp. Thousand)
Water Supply			
1. 80 mm Feeder Line	1365	5,450	7,439
2. Regular Standpipe including Meter	6	40,000	240
3. Storage Type Standpipe including Meter	1	165,000	163
4. Fire Hydrant	4	90,000	360
			9,202
MCK's & Water-Sealed Latrine Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water-Sealed Latrine Slab	425	6,000	2,550
			2,550
Roads & Footpaths *			
1. Reconstruct >6 m ROW Secondary Road	2899 sq m	3,900	11,306
2. Resurface >6 m ROW Secondary Road	4386 sq m	850	3,728
3. Reconstruct 4-6 m ROW Residential Road	2166 sq m	2,500	5,415
4. Reconstruct 2-4 m ROW Main Footpath	1478 sq m	1,850	2,734
5. Reconstruct 1-2 m ROW Footpath	1631 sq m	1,200	1,957
			25,140

* 195 m of Jl.Bakti not included for improvement.

194

TABLE 5.6 — Continued

Component Lorongs: I - IV	Quantity	Unit Cost (Rp)	Total Cost (Rp housand)
Bridges			
1. 6 m Span Footbridge	1	1,300,000	1,300
			1,300
Drainage			
1. Drains Both Sides of Secondary Streets	479 m	20,000	29,580
2. Drains Both Sides of Residential Streets	722 m	22,000	15,884
3. Drains Both Sides of 61% Main Footpaths	443 m	20,650	9,148
Drain one Side of 40% Main Footpaths	296 m	10,350	3,064
4. Drain One Side of Footpaths	1087 m	6,600	7,174
5. Section of Drain Running Roughly N-S to Join Main Sei Kera Channel	225 m	9,600	2,160
			67,010
Solid Waste			
1. Gerobak	10	80,000	800
2. Plastic Containers for Gerobak @ 8 per Gerobak	80	2,000	160
3. Community Curbside Container	7	30,000	210
4. 6% (Based on total KIP Area Population) of Cost of Required Trucks	0.24	10,000,000	2,400
			3,570
Land Acquisition			
1. Land for 7 Public Standpipe (5 sq m/standpipe)	35 sq m	10,000	350
			350
Penmas	411	10,200	4,192
			4,192

195

TABLE 5.6--Continued

Component Lorongs: I - IV	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Land Registration	26.77 ha	22,000	589
			589
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	1 school	varies	4,080
			4,080
Community Workers Program (1 c.w./1500 KIP Area Residents)	3	660,000	1,980
			1,980
Total Cost			118,963

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TABLE 5.7

KIP PROGRAM COSTS : TEGAL SARI

Kecamatan : Medan Denai
Population : 9100 persons
Improvement Area: 39.1 ha
Density : 230 persons/ha

Component Lorongs: V, VIIa, VII-XV	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 100 mm Feeder Line	349	9,500	3,316
2. 80 mm Feeder Line	3807	5,450	20,748
3. 51 mm Feeder Line	125	3,300	413
4. Regular Standpipe including Meter	25	40,000	1,000
5. Storage Type Standpipe including Meter	3	165,000	495
6. Fire Hydrant	14	90,000	1,260
			27,232
MCK's & Water-Sealed Latrine Program			
1. 1.10 m x 1.10 m Reinforced Concrete Water-Sealed Latrine Slab	780	6,000	4,680
			4,680
Roads & Footpaths			
1. Reconstruct 6 m ROW Secondary Road	853 sq m	3,900	3,327
2. Resurface 6 m ROW Secondary Road	4118 sq m	850	3,500
3. Reconstruct 4-6 m ROW Residential Road	6597 sq m	2,500	16,493
4. Resurface 4-6 m ROW Residential Road	1080 sq m	850	918
5. Reconstruct 2-4 m ROW Main Footpath	6082 sq m	1,850	11,252
6. Reconstruct 1-2 m ROW Footpath	2475 sq m	1,200	2,970
			38,460
Bridges			
1. 5 m Span Roadbridge	2	6,650,000	13,300
			13,300

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TABLE 5.7--Continued

Component Lorongs: V, VIIA, VII-XV	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Drainage*			
1. Drains Both Sides of Secondary Streets	928 m	20,000	18,560
2. Drains Both Sides of Residential Streets	2559 m	22,000	56,298
3. Drains Both Sides of 60% Main Footpaths	1825 m	20,650	37,686
Drain One Side of 40% Main Footpaths	1216 m	10,350	12,586
4. Drain One Side of Footpaths	1650 m	6,600	10,890
5. Section of Drain Running Roughly N-S to Join Main Sei Kera Channel	163 m	9,600	1,565
			137,585
Solid Waste			
1. Gerobak	23	80,000	1,840
2. Plastic Containers for Gerobak @ 8 per Gerobak	184	2,000	368
3. Community Curbside Container	8	30,000	240
4. 11% (Based on Total KIP Area Population) of Cost of Required Trucks	0.44	10,000,000	4,400
			6,848
Health Facilities			
1. Construct and Equip New Puskesmas	1	29,700,000	29,700
			29,700
Land Acquisition			
1. Land for 28 Public Standpipes (5 sq m/standpipe)	140 sq m	10,000	1,400
2. Land for 1 New Puskesmas	625 sq m	10,000	6,250
3. Land for 2 New Elementary Schools (1500 sq m/school)	3000 sq m	10,000	30,000
4. Land for 1 New Secondary School	6000 sq m	10,000	60,000
			97,650

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TABLE 5.7--Continued

Component Lorongs: V, VIIA, VII-XV	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Penmas	760	10,200	7,752
			7,752
Land Registration	39.11 ha	22,000	860
			860
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	1 school	Varies	2,000
2. Construct and Equip New Elementary School	2	24,600,000	49,200
3. Construct and Equip New Junior-Senior Secondary Schools	1	196,400,000	196,400
			247,600
Community Workers Program (1 c.w./1500 KIP Area Residents)	6	660,000	3,960
			3,960
Total Cost			615,627

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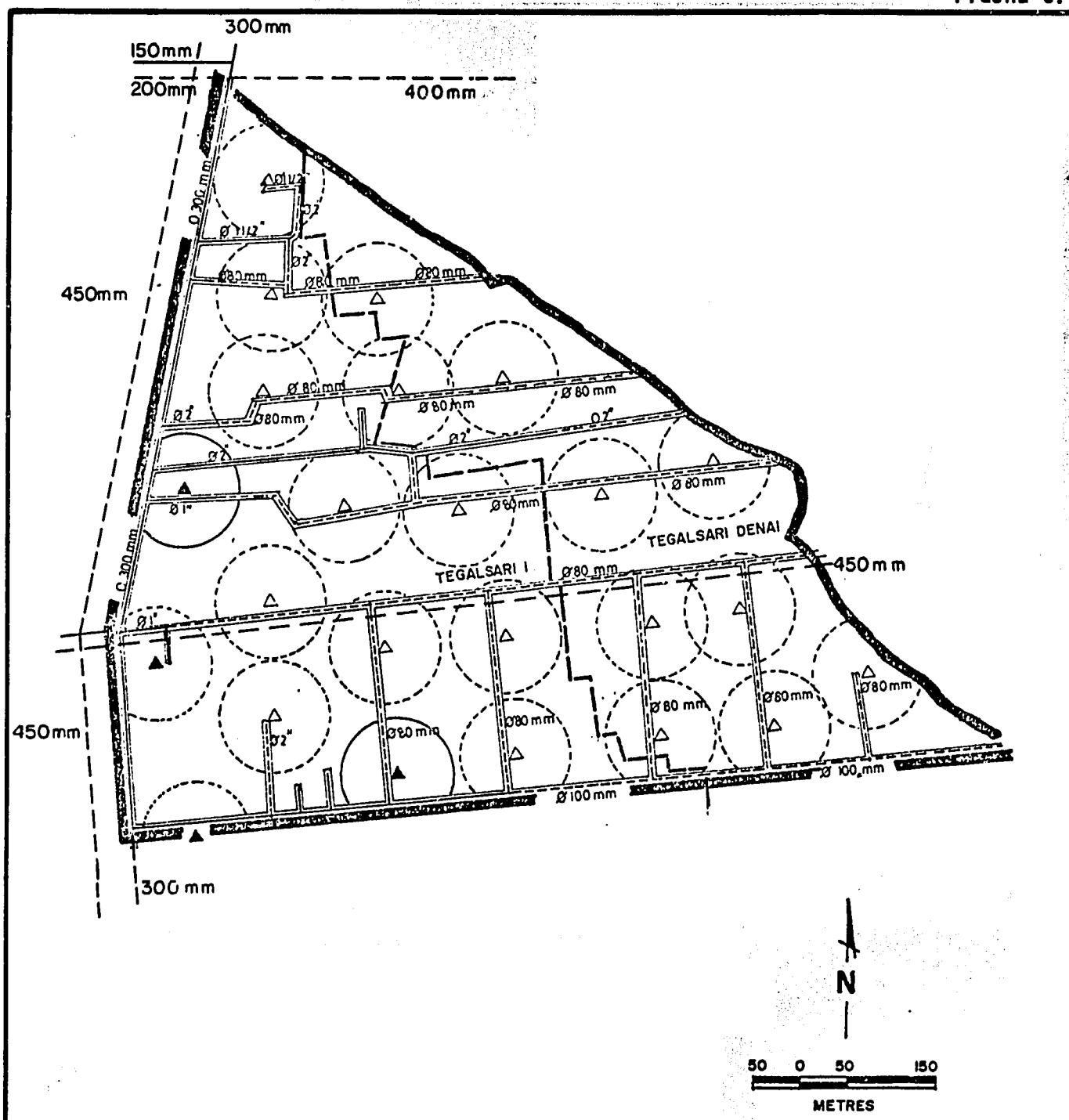
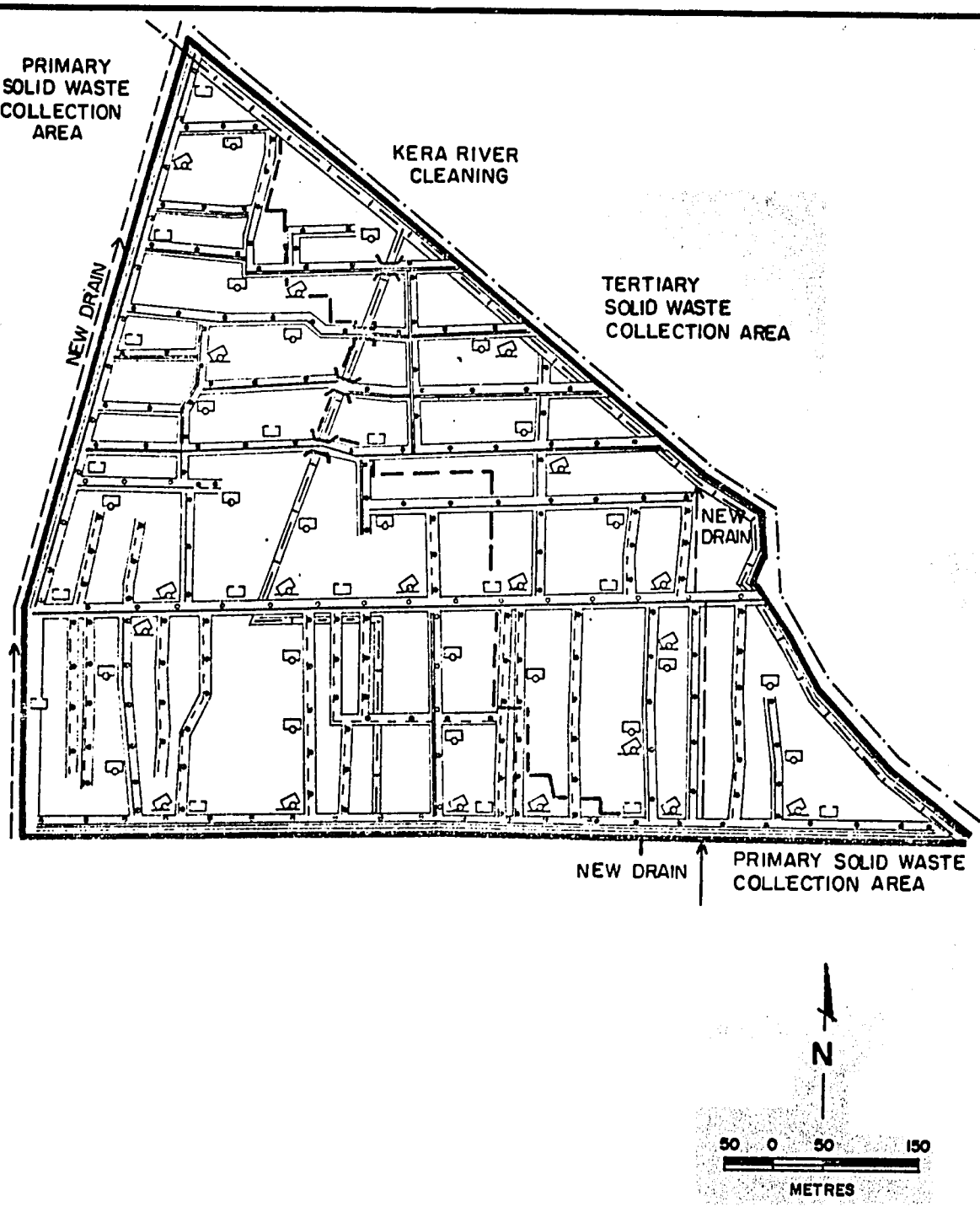
FIGURE 5.9

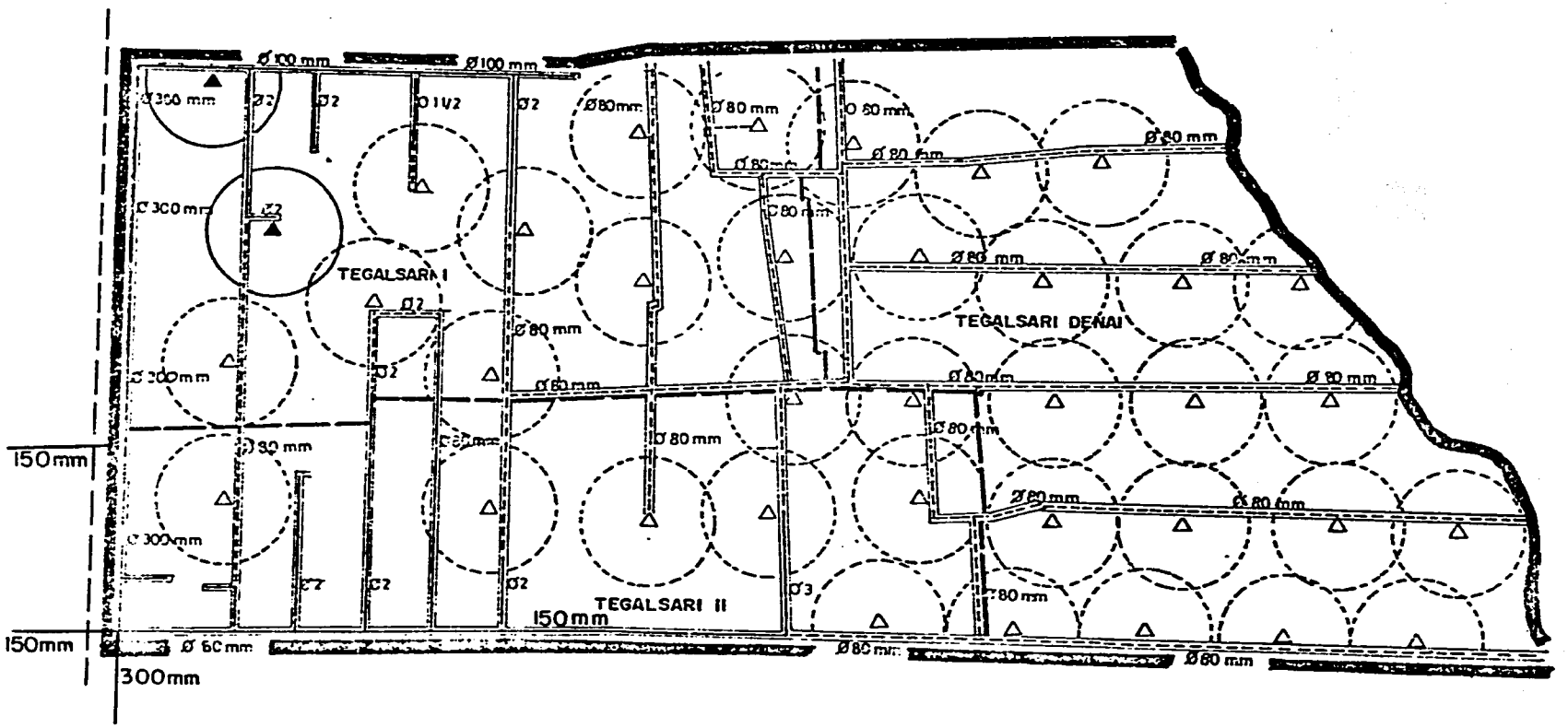


KAMPUNG IMPROVEMENT PROGRAM (KIP) **PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP**	**LEGEND** KIP AREA BOUNDARY KAMPUNG BOUNDARY EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø 2" EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60 m) PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENSION — Ø 2" PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m) PROPOSED MCK & PUBLIC TAP PROPOSED MCK PROPOSED 100mm P.V.C DISCHARGE PIPE
NAME OF KAMPUNG **TEGALSARI I & TEGALSARI DENAI**	

FIGURE 5.10



KAMPUNG IMPROVEMENT PROGRAM (KIP) PRELIMINARY KIP DESIGN	LEGEND PROPOSED STREET AND FOOTPATH IMPROVEMENT SECONDARY STREET — RECONSTRUCT ●●●● RESIDENTIAL STREET ═ IMPROVE ●●●● MAIN FOOTPATH — RESURFACE ○○○○ FOOTPATH - - - PROPOSED BRIDGES STREET BRIDGE — FOOT BRIDGE EXISTING MAIN DRAIN —I—I— PROPOSED SOLID WASTE FACILITIES LOCATION OF SOLID WASTE CONTAINER LOADING STATION CURBSIDE CONTAINER KAMPUNG BOUNDARY — — — — KIP AREA BOUNDARY ═══
NAME OF KAMPUNG TEGALSARI I & TEGALSARI DENAI	



KAMPUNG IMPROVEMENT PROGRAM
(KIP)

PRELIMINARY WATER SUPPLY
AND MCK DESIGN MAP

NAME OF KAMPUNG

TEGALSARI I , TEGALSARI II
TEGALSARI MEDAN DENAI

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60 m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- PROPOSED 100 mm P.V.C DISCHARGE PIPE

N

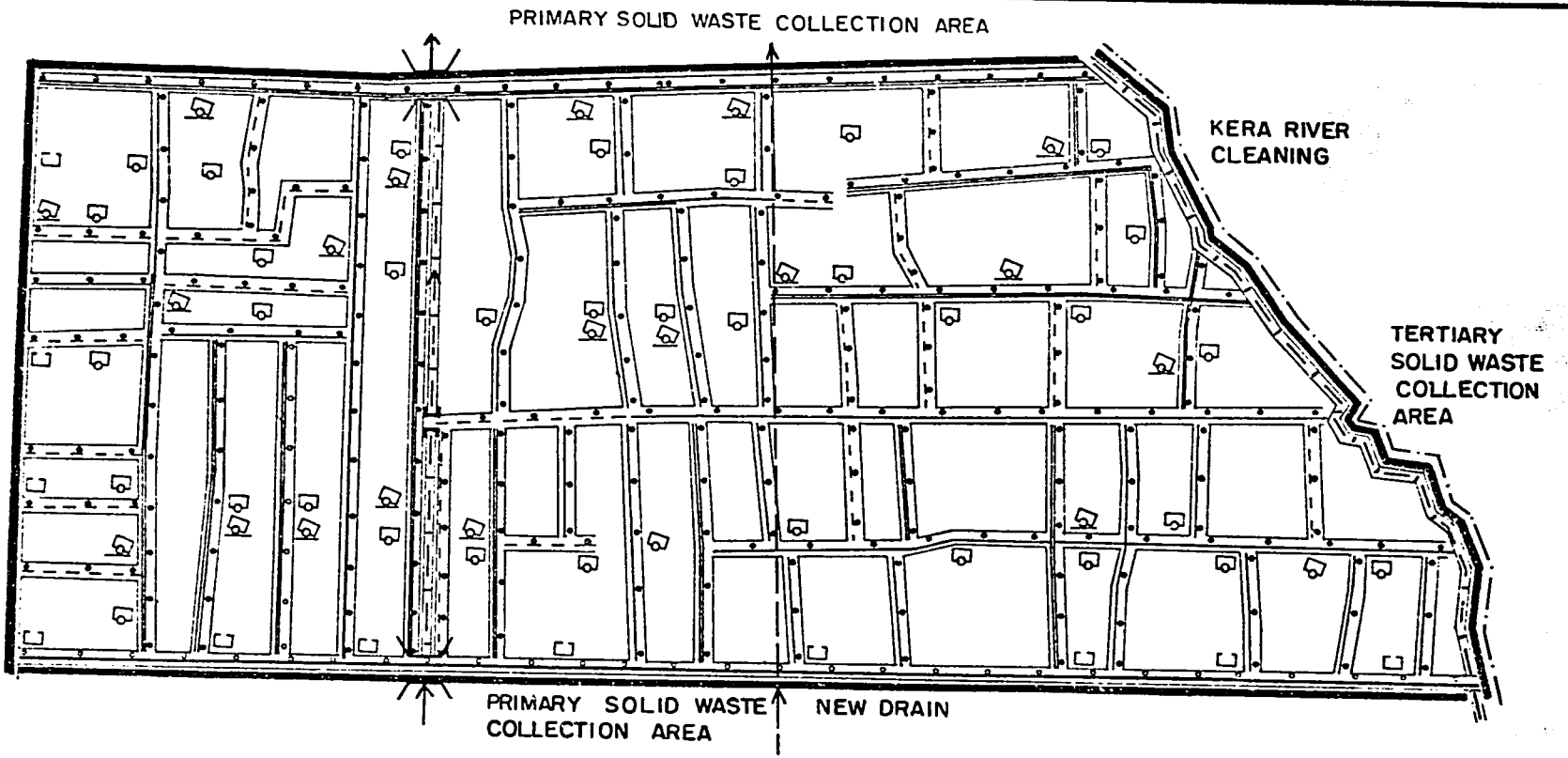
50 0 50 150
METRES

FIGURE 5.11

PADCO-DACREA

ENGINEERING-SCIENCE - SINOTECH

FIGURE 5.12



KAMPUNG IMPROVEMENT PROGRAM

(KIP)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

TEGALSARI I, TEGALSARI II
TEGALSARI MEDAN DENAI

LEGEND

PROPOSED STREET AND FOOTPATH IMPROVEMENT

- SECONDARY STREET
- RESIDENTIAL STREET
- MAIN FOOT PATH
- FOOT PATH
- RECONSTRUCT
- IMPROVE
- RESURFACE

PROPOSED BRIDGES

- STREET BRIDGE
- FOOT BRIDGE

EXISTING MAIN DRAIN

PROPOSED SOLID WASTE FACILITIES

- LOCATION OF SOLID WASTE CONTAINER
- LOADING STATION
- CURBSIDE CONTAINER

KAMPUNG BOUNDARY

KIP AREA BOUNDARY

N

50 0 50 150

METRES

TABLE 5.8

KIP PROGRAM COSTS : AUR

Kecamatan : Medan Baru
Population : 3700 persons
Improvement Area: 7.7 ha
Density : 480 persons/ha

Component Lorongs: Dalam, Mangkubumi, Lembah, Pantai Burung, Tanjung Meriam	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 80 mm Feeder Line	367 m	5,450	2,000
2. 51 mm Feeder Line	415 m	3,300	1,370
3. 38 mm Feeder Line	62 m	2,250	140
4. 25 mm Feeder Line	69 m	1,500	104
5. Regular Standpipe including Meter	13	40,000	520
6. Fire Hydrant	2	90,000	180
			4,314
MCK's & Water-Sealed Toilet Program			
1. MCK	14	1,250,000	17,500
2. P.V.C. 100 mm to Discharge Effluent	421 m	6,600	2,779
			20,279
Roads & Footpaths			
1. Reconstruction 4-6 m ROW Secondary Road	945 sq m	2,500	2,363
2. Resurface 4-6 m ROW Secondary Road	350 sq m	850	298
3. Reconstruct 2-4 m ROW Main Footpath	544 sq m	1,850	1,006
4. Resurface 2-4 m ROW Main Footpath	1390 sq m	850	1,182
5. Reconstruct 1-2 m ROW Footpath	2799 sq m	1,200	3,359
			8,208

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TABLE 5.8--Continued

Component Lorongs: Dalam, Mangkubumi, Lembah, Pantai Burung, Tanjung Meriam	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Drainage			
1. Drains Both Sides of 70% Residential Streets	291 m	22,000	6,402
Drain One Side 30% Residential Streets	125 m	11,000	1,375
2. Drains Both Sides of 36% Main Footpaths	280 m	20,650	5,782
Drains One Side of 64% Main Footpaths	508 m	10,350	5,258
3. Drain One Side of Footpaths	1866 m	6.600	12,316
			31,133
Solid Waste			
1. Gerobak	9	80,000	720
2. Plastic Containers for Gerobak @ 8 per Gerobak	72	2,000	144
3. Community Curbside Container	5	30,000	150
4. 5% (Based on Total KIP Area Population) of Cost of Required Trucks	0.20	10,000,000	2,000
			3.014
Land Acquisition			
1. Land for 13 Public Standpipes (5 sq m/standpipe)	65 sq m	10,000	650
2. Land for 14 MCK's (25 sq m/MCK)	350 sq m	10,000	3,500
			4,150
Penmas	13	10,200	133
			133
Land Registration	7.67 ha	22,000	169
			169

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TABLE 5.8--Continued

Component Lorongs: Dalam, Mangkubumi, Lembah, Pantai Burung, Tanjung Meriam	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Education			
1. Rehabilitate/Upgrade Existing Elementary Schools	2 schools	Varies	10,080
			10,080
Community Workers Program (1 c.w./1500 KIP Area Residents)	3	600,000	1,980
			1,980
Total Cost			83,460

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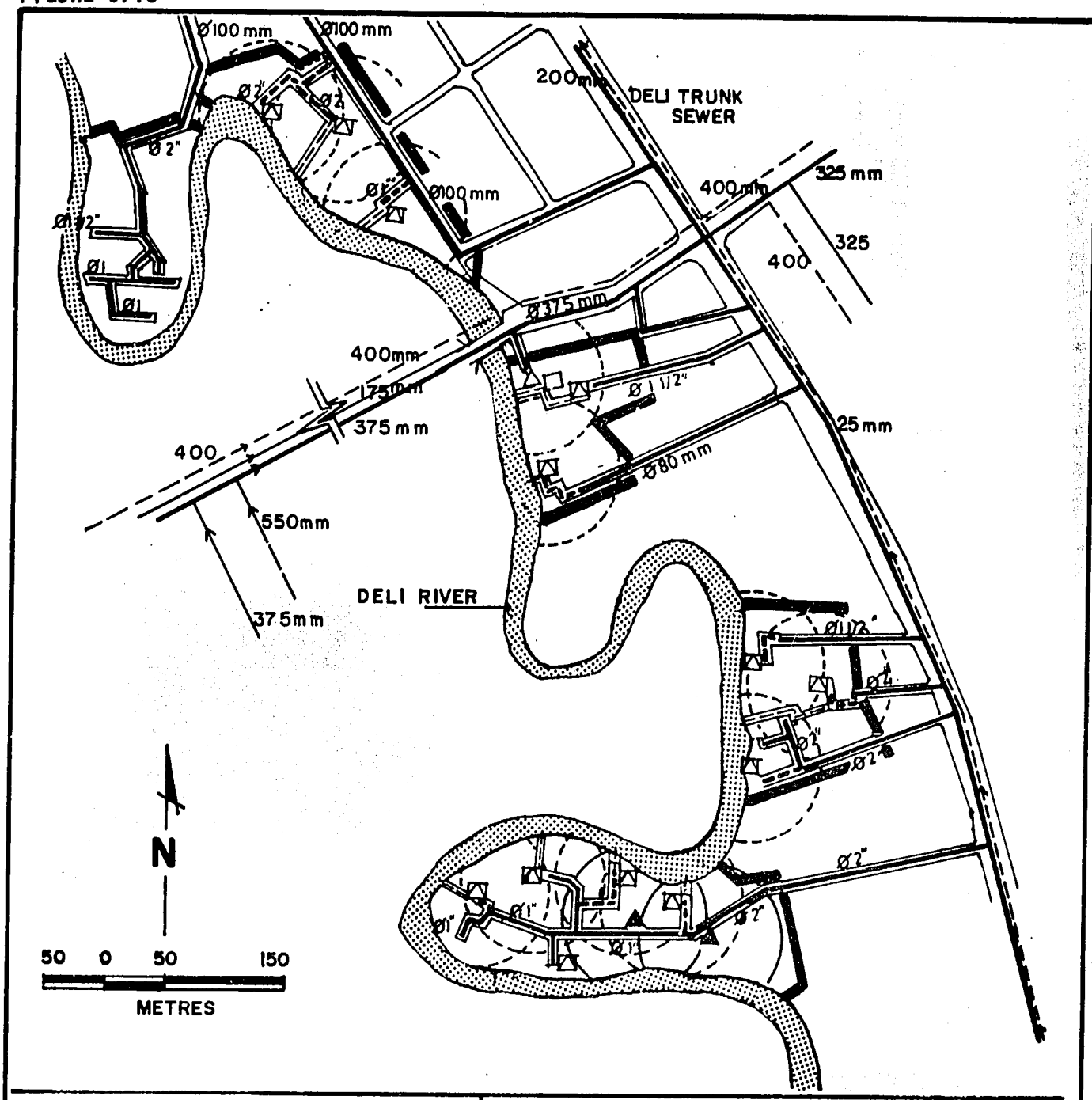
FIGURE 5.13



KAMPUNG IMPROVEMENT PROGRAM (KIP)

PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP

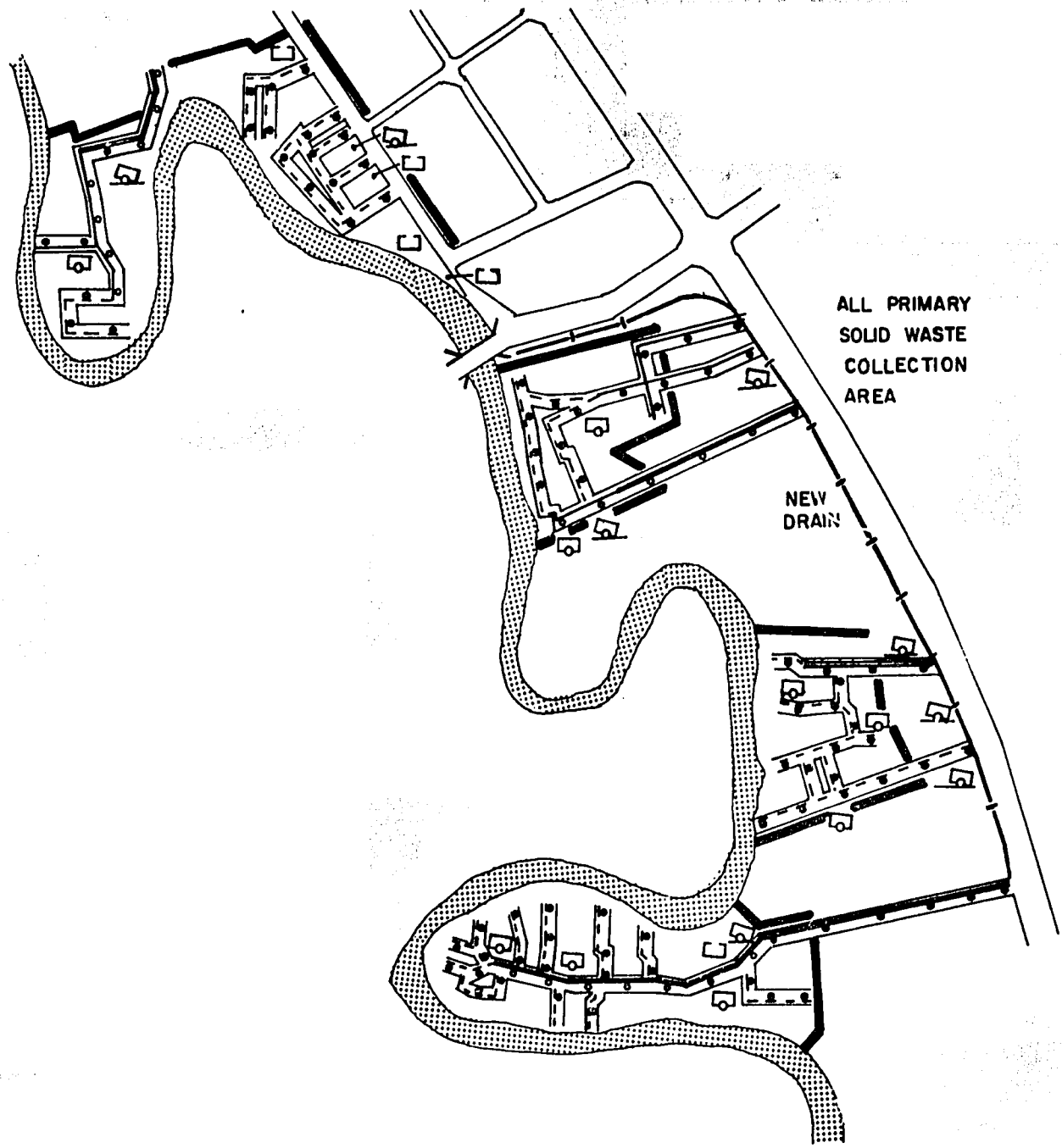
NAME OF KAMPUNG

AUR

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENTION — Ø 2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60 m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- PROPOSED 100 mm P.V.C DISCHARGE PIPE

FIGURE 5.14



KAMPUNG IMPROVEMENT PROGRAM

(KIP)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

AUR

LEGEND

PROPOSED STREET AND FOOT PATH IMPROVEMENT

SECONDARY STREET	———	RECONSTRUCT	●●●●
RESIDENTIAL STREET	═══	IMPROVE	⊖⊖⊖⊖
MAIN FOOT PATH	———	RESURFACE	○○○○
FOOT PATH	- - -		

PROPOSED BRIDGES

STREET BRIDGE	⋊	FOOT BRIDGE	⋊

EXISTING MAIN DRAIN —|—|—

PROPOSED SOLID WASTE FACILITIES

- LOCATION OF SOLID WASTE CONTAINER
- LOADING STATION
- CURBSIDE CONTAINER

KAMPUNG BOUNDARY — — — —

KIP AREA BOUNDARY ━━━━

TABLE 5.9

KIP PROGRAM COSTS : HAMDAN, JATI, POLONIA

Kecamatan : Medan Baru
Population : 4600 persons
Improvement Area: 9.6 ha
Density : 480 persons/ha

Component Lorongs: Hamdan : I-V Jati : VI-IX Polonia: X	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Water Supply			
1. 80 mm Feeder Line	711	5,450	3,875
2. 38 mm Feeder Line	691	2,250	1,555
3. 25 mm Feeder Line	203	1,500	305
4. Regular Standpipe including Meter	8	40,000	320
5. Fire Hydrant	2	90,000	180
			6,235
MCK's & Water-Sealed Toilet Program			
1. MCK	15	1,250,000	18,750
2. P.V.C. 100 mm to Discharge Effluent	880 m	6,600	5,808
			24,558
Roads & Footpaths			
1. Improve 4-6 m ROW Residential Road	675 sq m	1,600	1,080
2. Reconstruct 2-4 m ROW Main Footpath	440 sq m	1,850	814
3. Reconstruct 1-2 m ROW Footpath	3000 sq m	1,200	3,600
			5,494
Drainage			
1. Drains Both Sides of Residential Streets	135 m	22,000	2,970
2. Drain One Side of Main Footpaths	220 m	10,350	2,277
3. Drain One Side of Footpath	2000 m	6,600	13,200
			18,447

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TABLE 5.9--Continued

Component Lorongs: Hamdan : I-V Jati : VI-IX Polonia : X	Quantity	Unit Cost (Rp)	Total Cost (Rp.Thousand)
Solid Waste			
1. Gerobak	7	80,000	560
2. Plastic Containers for Gerobak @ 1 per Gerobak	56	2,000	112
3. Community Curbside Container	5	30,000	150
4. 6% (Based on Total KIP Area Population) of Cost of Required Trucks	0.24	10,000,000	2,400
			3,222
Land Acquisition			
1. Land for 8 Public Standpipes (5 sq m/standpipe)	40 sq m	10,000	400
2. Land for 15 MCKs (25 sq m/MCK)	375 sq m	10,000	3,750
			4,150
Penmas	311	10,200	3,172
			3,172
Land Registration	9.57 ha	22,000	211
			211
Education			
1. Rehabilitate/Upgrade Existing Elementary School	1 school	Varies	5,050
2. Construct and Equip Additional Classrooms	3	4,050,000	12,150
			17,200
Community Workers Program (1 c.w./1500 KIP Area Residents)	3	660,000	1,980
			19,180
Total Cost			84,669

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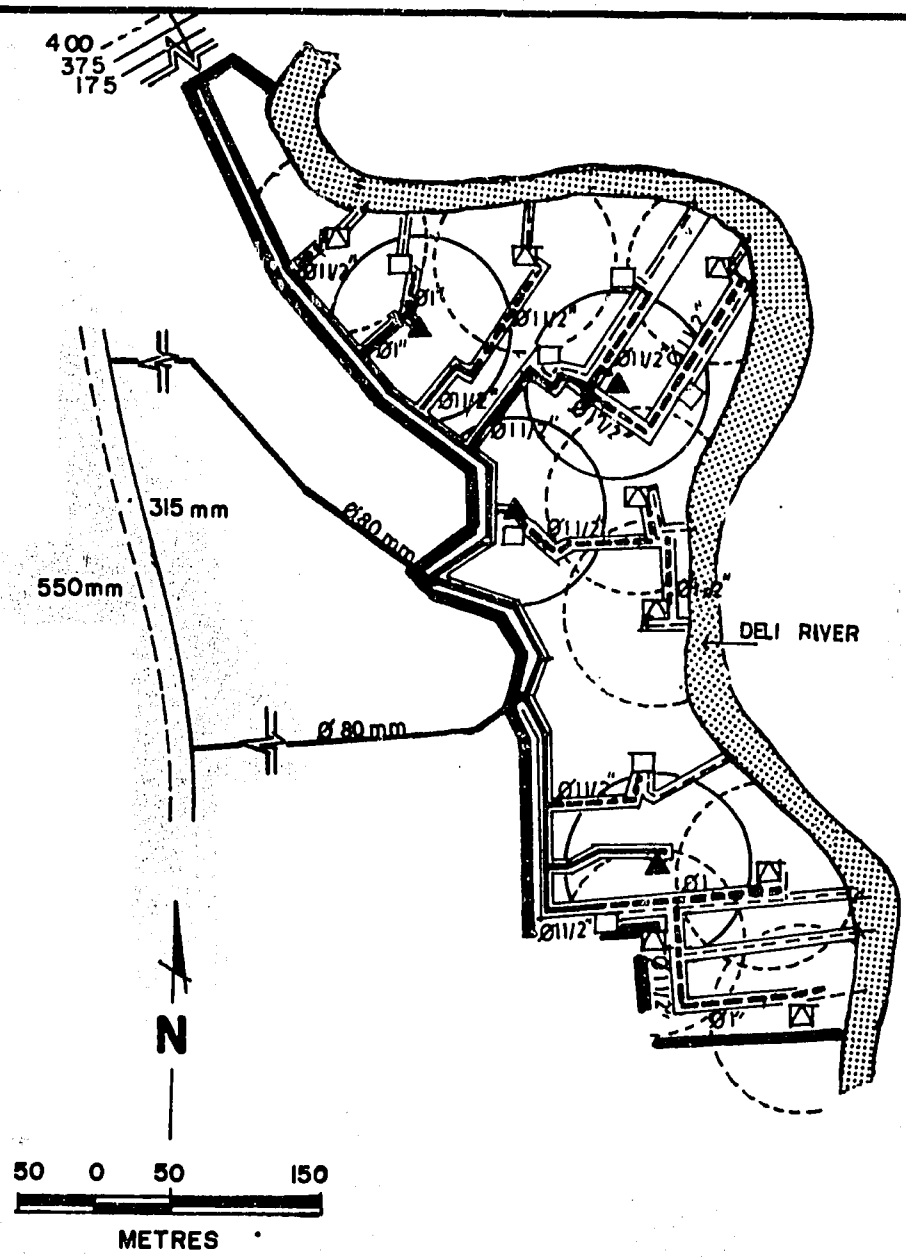
FIGURE 5.15



KAMPUNG IMPROVEMENT PROGRAM (KIP)

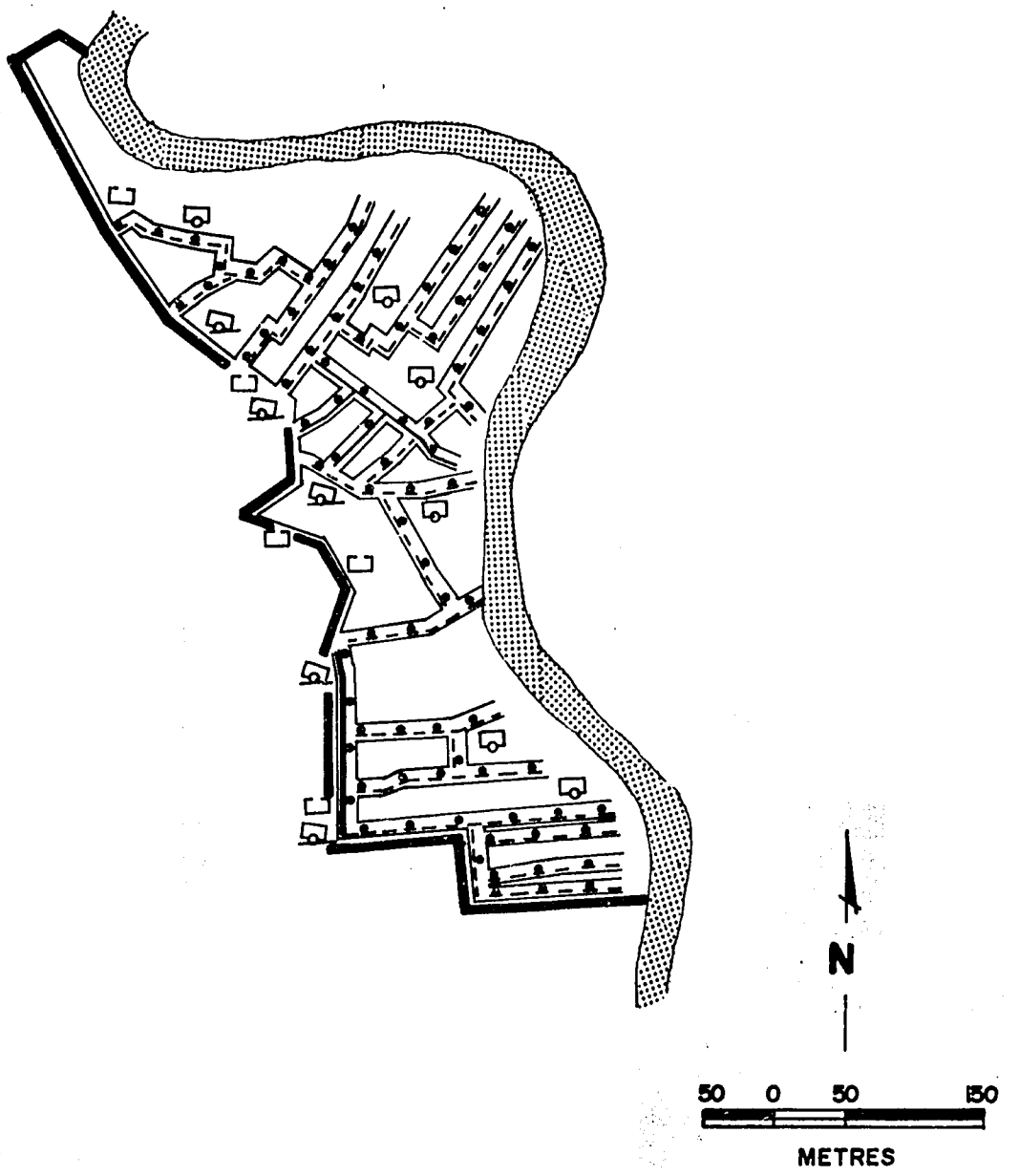
PRELIMINARY WATER SUPPLY AND MCK DESIGN MAP

NAME OF KAMPUNG

HAMDAN

LEGEND

- KIP AREA BOUNDARY
- KAMPUNG BOUNDARY
- EXISTING WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- EXISTING PUBLIC WATER TAP & CATCHMENT AREA (60 m)
- PROPOSED ADDITION TO WATER DISTRIBUTION LINE & DIMENSION — Ø 2"
- PROPOSED LOCATION OF PUBLIC WATER TAP & CATCHMENT AREA (60m)
- PROPOSED MCK & PUBLIC TAP
- PROPOSED MCK
- PROPOSED 100 mm P.V.C DISCHARGE PIPE



KAMPUNG IMPROVEMENT PROGRAM

(K I P)

PRELIMINARY KIP DESIGN

NAME OF KAMPUNG

HAMDAN

LEGEND

PROPOSED STREET AND FOOTPATH IMPROVEMENT

- SECONDARY STREET
- RESIDENTIAL STREET
- MAIN FOOTPATH
- FOOTPATH
- RECONSTRUCT
- IMPROVE
- RESURFACE

PROPOSED BRIDGES

- STREET BRIDGE
- FOOT BRIDGE

EXISTING MAIN DRAIN

PROPOSED SOLID WASTE FACILITIES

- LOCATION OF SOLID WASTE CONTAINER
- LOADING STATION
- CURBSIDE CONTAINER

KAMPUNG BOUNDARY

KIP AREA BOUNDARY

TABLE 5.10

SUMMARY OF TOTAL KIP PROGRAM COSTS BY KIP AREA

Kampung \ Item	KIP Area (Ha)	Est. Kip Area Population	Est. Total KIP Costs (Rp.Million)	Est. Total KIP Costs Per Capita (US$)	Est. Total KIP Costs Per Hectare (US$)
Hamdan, Jati, Polonia	9.6	4600	84.7	29.7	14,250
Aur	7.7	3700	83.5	36.4	17,500
Sidorame Barat	42.8	11600	370.4	51.5	13,950
Sidorame Timur	22.7	4800	141.0	47.4	10,000
Sei Kera Hilir	41.4	14400	340.4	38.1	13,250
Sei Kera Hulu	22.3	6400	125.5	31.6	9,100
Tegal Sari I	31.8	20600	408.2	32.0	20,700
Tegal Sari II	26.8	5100	119.0	37.6	7,150
Tegal Sari (Medan Denai)	39.1	9100	615.6	109.1	25,400
Totals	244.2	80300	2288.3	46.0	15,100

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5.3 PHASING OF THE INVESTMENT PROGRAM

The summary of total project costs as presented in Table 5.11, and the subsequent phasing of the investment program to cover these costs (Table 5.12) are based on the assumption that foreign financing would not be available before 1981/82. For the year 1980/81, or until foreign financing is available, it is recommended that domestic funds (Cipta Karya and Kotamadya) be used to undertake high priority items from the proposed KIP program. These expenditures would then be included retroactively as part of the overall KIP loan.

The successful completion of the KIP program will depend to a large extent on the proposed phasing and realization of the First Stage Programs, especially in the areas of water supply, drainage and solid waste. The First Stage Programs will provide new or improved trunk or main services to which the corresponding KIP components will be integrated. Within a specific KIP area, the construction of the water supply, drainage and wastewater disposal components must be finalized before street and footpath improvements can begin.

5.4 INSTITUTIONAL ARRANGEMENTS

5.4.1 Basic Considerations on Institutional Development

Three major factors have been considered in recommending an organizational structure to implement the Medan KIP program:

1. The main objective of KIP is to raise the standard of living of the low income people by improving their living environment, while encouraging and stimulating public and private initiatives and participation in Kampung upgrading and development. Particular attention must therefore be given to organizational formats which facilitate the effective mobilization and integration of government and community resources and potential within KIP.

2. Guidelines have been developed by the Directorate of Housing, Cipta Karya and Directorate of Urban Development of the Ministry of Interior on institutional arrangements for KIP. The guidelines provide that the KIP Organization should be a separate agency so as to be able to determine plans and programs, to exercise budgetary control over all funds appropriated for KIP projects, and to administer and execute the program. It should also have power to appoint personnel and to coordinate all agencies related to KIP in order to create an integrated development program at the kampung level.

3. KIP involves social, economic and physical components. The scope of KIP works includes setting priorities for KIP site selection; establishing criteria and standards; preparing detailed engineering; and social, economic and financial planning, plan execution, management, maintenance and development. While the typical scope of work can be divided into

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TABLE 5.11

KIP PROJECT COSTS - 244 HECTARES
CONSTANT 1980 PRICES - RP. MILLION

Item	Foreign			Local	Total
	Direct	Indirect	Total		
A. MAIN KIP					
Roads	-	6	6	141	147
Footpaths	-	6	6	81	87
Bridges	-	1	1	21	22
Drainage	-	42	42	795	837
Water Supply	9	4	13	81	94
MCKs and Water Sealed Slabs	-	21	21	52	73
Solid Wastes	-	33	33	24	57
Land Acquisition and Registration	-	-	-	201	201
Sub-Total	9	113	122	1396	1518
B. COMPLEMENTARY KIP					
Health and Medical	31	6	37	117	154
Penmas	7	1	8	67	75
Elementary and Secondary Schools	100	20	120	383	503
Community Workers Program	-	-	-	36	36
Sub Total	138	27	165	603	768
C. TOTAL (A + B)	147	140	287	1999	2286[a]
D. ENGINEERING DESIGN AND SUPERVISION[b]	15	14	29	173	202
E. PHYSICAL CONTINGENCY[c]	23	23	46	316	362
F. TOTAL (C + D + E)	185	177	362	2488	2850

a Total differs to Table 5.10 due to rounding.
b Engineering design and supervision is based on 10% of civil works.
c Physical contingency is based on 15% of the sub-total of land, civil works and engineering design and supervision.

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TABLE 5.12

PHASING OF KIP PROJECT COSTS
FOREIGN AND LOCAL COMPONENTS - RP. MILLION

Item		1980/1981	1981/1982	1982/1983	1983/1984	Total
Main KIP	F	6	37	42	37	122
	L	127	441	459	369	1396
Complementary KIP	F	8	51	58	48	165
	L	27	191	211	174	603
Engineering	F	2	9	9	9	29
		8	52	61	52	173
Physical Contingency	F	2	14	16	14	46
	L	24	99	106	87	316
Sub Total	F	18	111	125	108	362
	L	186	783	837	682	2488
Price Contingency*	F	-	14	26	30	70
	L	13	185	326	356	880
Total (including Price Contingency)		217	1093	1314	1176	3800

* In order to take account of likely price escalation, the following contingency percentages are added to the total cost of the KIP program: program:

	1980	1981	1982	1983	1984
Foreign	8	8	7	6	6
Cumulative factor	(0.040)	(0.123)	(0.207)	(0.285)	(0.363)
Local	15	15	10	10	8
Cumulative factor	(0.075)	(0.236)	(0.389)	(0.528)	(0.664)

SOURCE: MUDS

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three stages (pre-construction, construction and post-construction, it is clearly meant to be a continuous permanent Kotamadya activity aimed at progressive improvements in the well being of Kampung residents.

4. There is a need to reorganize and reinforce the Kotamadya's planning programming and budgeting system as an integral part of the Medan DISP implementation program for Repelita III, in order to facilitate the more effective mobilization, coordination and utilization of existing and potential resources.

These four factors, particularly the last of them, suggest that the organization of the KIP Unit in Kotamadya Medan is particularly important not only to the implementation of the KIP program itself, but also because of its potential positive impact on the energizing and strengthening of the Kotamadya's overall urban planning and implementation structure. The effective mobilization and utilization of both community and agency resources, the multi-year planning and programming requirements, the need to establish and identify permanent internal financial resources as rapidly as possible, all suggest that an effective KIP could have a major positive impact on the Kotamadya's planning programming and budgeting process. In like manner, the effectiveness of KIP over the short and long term will depend also on the successful revitalization of the Kotamadya's annual planning and budgeting structure.

5.4.2 Criteria for Indentification of the KIP Organization

The following criteria have been utilized in identifying the appropriate KIP organization for Medan (see Figure 5.17):

1. The organization should be simple in form, as well as in structure, in order to provide clear direction and responsibility. It should conform to the overall guidelines set by the Directorate of Urban Development, Ministry of Interior on institutional development for KIP and the proposed Kotamadya planning and budgeting structure (see Section 20.2 of the Long Term Urban Plan Report).

2. The organization should be capable of providing continuous access to kampung level organizations and households during the planning, implementation and evaluation stages in order to obtain more effective participation and optimum contribution and coordination from participating agencies.

3. The organization should have direct access to the proposed Deputy Mayor for Development so that he can monitor the ongoing KIP directly (see Section 20.2.4.1 the Long Term Plan Report).

4. The organization should be structured in such a way that the project manager is able to coordinate other agencies related to KIP, while making use of the KIP Unit's community development program to increase the effectiveness of their services through the identification and implementation of new intervention strategies.

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PROPOSED KIP ORGANIZATION

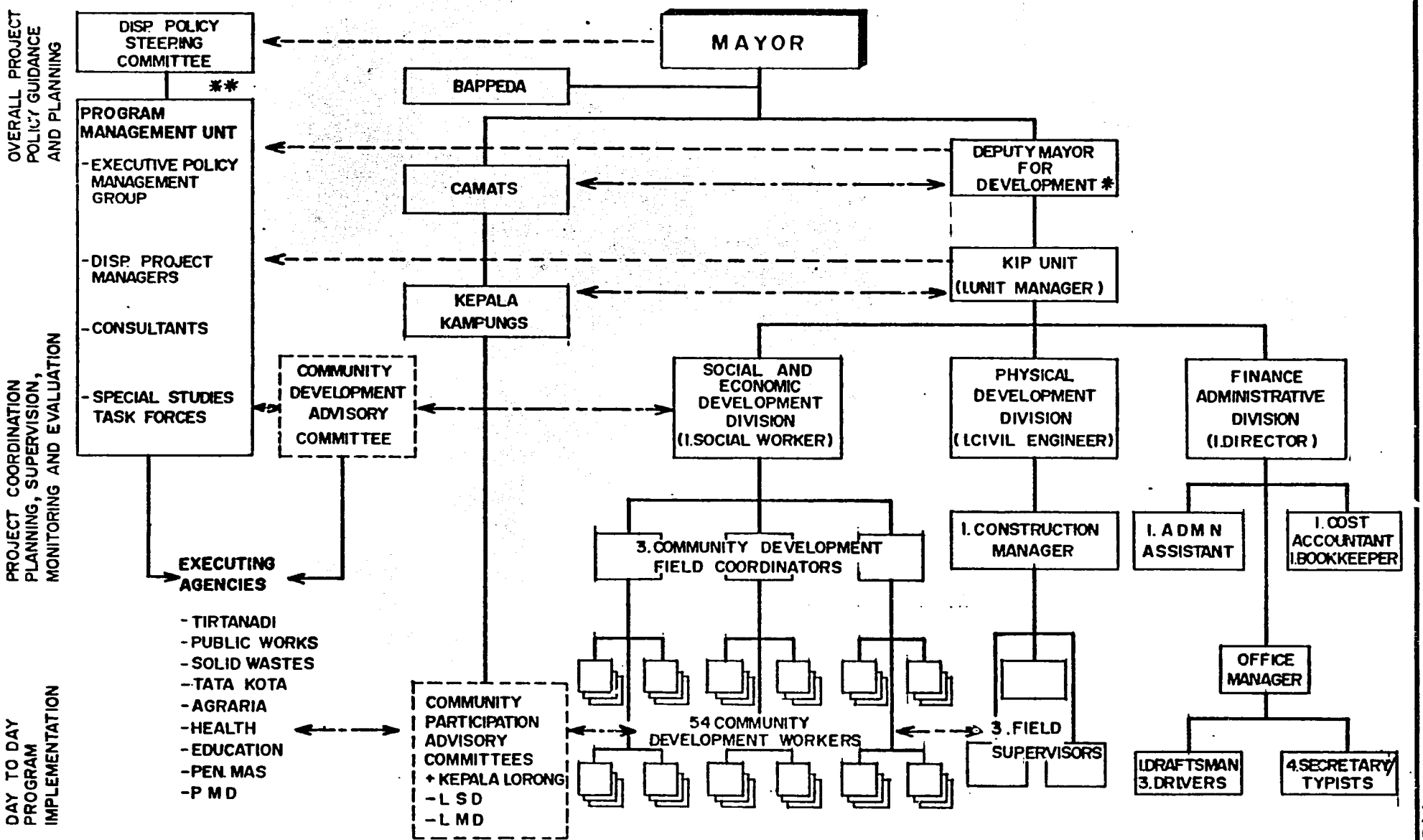

FIGURE 5.17

5.4.3 KIP Project Management and Coordination

The coordination of KIP with other related urban projects, as well as its coordination with the existing hierarchy of Kotamadya Medan administrative officials will be critical to effective mobilization of the limited available resources and consequently to the ultimate success of the program. The interagency coordination for Medan KIP will be achieved through a variety of both formal and informal mechanisms.

5.4.3.1 Inter-departmental Steering Committee

In order to facilitate Kotamadya policy formulation, program development, resource allocation and management for KIP, the proposed Deputy Mayor for Development (responsible for the overall policy and planning guidance of KIP within the Kotamadya) will act as the permanent chairman of a Inter-departmental Steering Committee of all Kotamadya departments and agencies operating kampung improvement related physical and socio-economic activities. These entities will be convened by the Deputy Mayor as required for the effective planning and implementation of KIP. This procedure is expected to be the most effective mechanism for integrating KIP planning and programming within the simultaneous efforts directed towards the development of a true annual planning, programming and budgeting system during Repelita III. It will be particularly important to the ongoing efforts of the City to establish development priorities and upgrade the revenue and tax base to meet such needs in as much as the KIP is expected to become one of the City's most important instruments to guide and manage urban development.

5.4.3.2 DISP Program Management Unit

The DISP Program Management Unit will be an integral part of the overall management and coordination of KIP. The Program Management Unit will have the responsibility for overall coordination, supervision and guidance of the integrated implementation of the DISP Action Program for Repelita III. Both the Deputy Mayor for Development and the KIP Program Manager will form part of this unit. It is anticipated that much of the coordination required for KIP will be provided as part of the ongoing activities of many of the Kotamadya's departments represented on the Program Management Unit. This is particularly true of the coordination required with respect to the physical development components.

5.4.3.3 The KIP Program Unit

The Kotamadya should establish a KIP unit headed by a qualified and experienced senior professional as unit manager. The Unit Manager would be directly responsible for all KIP activities and report directly to the proposed Deputy Mayor for Development. He would also represent the Kampung Improvement Project as a member of the DISP Program Management Unit (see Section 20.2.2 of the Long Term Urban Plan Report). The KIP Unit should have full responsibility on behalf of the Kotamadya for the planning and implementation of all KIP sectoral programs and projects. The Unit should be comprised of three major divisions:

1. The Physical Development Division.

2. The Social-economic Development Division.

3. The Finance and Administration Division.

The Physical Development Division

A senior experienced civil engineer should be appointed to head this section which would be responsible for the planning, detailed engineering, tendering and construction supervision required by KIP. It is recommended that final design work for the various physical development components be carried out by local consultants under contract to the KIP Unit. Construction of infrastructure and facilities would also be contracted to private firms or handled by government institutions as required. This section would be responsible for drawing up the terms of reference for the work to be done, supervising tendering and monitoring work performance. Overall assistance in the management of these functions would be available through the DISP Program Management Unit. The minimum supportive staff required to carry out these functions is indicated in Figure 5.17 and further specified in Section 5.5, Personnel Requirements.

The Social and Economic Development Division

This section should be headed by an experienced social worker or urban sociologist and would be responsible for the planning, programming and monitoring of the social and economic services to be inaugurated or expanded under the KIP together with responsible executing agencies. Primary importance must be placed on the responsibility of this section to plan and implement a pilot community development effort within the target Kampungs which is to be fully integrated with the physical upgrading efforts. This program will require the recruitment training and employment of 54 community workers from among the low-income residents of the kampung communities to be served. Although employed by the KIP Unit, these community workers would be recruited and trained in conjunction which other participating, executing agencies such as the Health Department, PMD, Pemmas, the kampungs/lorongs etc. Once trained, many of them will be assigned functions within reach of efforts of such agencies. A full description of this most important pilot effort of the Medan KIP is presented in Section 5.4, Community Participation. The Social and Economic Development Section would also be responsible for assuring the orderly phased assumption of operation and management functions by responsible agencies once construction of basic infrastructure and facilities has been completed.

The Finance and Administration Section

This section will be responsible for administrative support of all KIP activities as well as the administrative and budgetary control of all contracts. The budgetary control of all funds allocated for KIP projects will be carried out under the direction of the KIP Manager and the overall policy and administrative guidance of the proposed Kotamadya Deputy Mayor for Finance, as well as the DISP Program Management Unit.

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5.4.3.4 Community Development Advisory Committee

Because of its importance to the success of KIP, the Social and Economic Development Division should organize an Advisory Committee for Community Development. Its membership would include those agencies providing out-reach services to the kampungs in the areas of health, education (formal and informal) and community organization. Representatives of the Kotamadya health and education systems, Penmas, PMD, and the appropriate Camats should be appointed to this committee. This Advisory Committee would be responsible, together with the Division Head, for organizing the KIP Community Development Program. As mentioned previously in the description of the recommended KIP program, 54 kampung residents served by the initial program will be recruited, trained and assigned functions as community workers/facilitators within the various project components being carried out by KIP. The specific purposes, strategies and activities of this high priority KIP program are discussed in Section 5.4.

5.4.3.5 Coordination with Kotamadya Medan Administrative Hierarchy

In order to fully realize its objectives during the planning and implementation phases of KIP, the proposed KIP project Management and Coordination organization should coordinate its activities within the various levels of the Kotamadya administrative hierarchy. It has previously been mentioned that the proposed Deputy Mayor for Development would form an integral part of the Inter-departmental Steering Committee, the appropriate Camats would sit on the Community Development Advisory Committee. The Kepala Kampungs of the designated nine KIP areas would work directly with the KIP Unit Manager on overall coordination, planning supervision and monitoring of the KIP program. The Kepala Lorongs, together with the representatives of LSD and LMD, will coordinate with the KIP Unit field personnel (community workers and field construction supervisors) on the day-to-day implementation of the program and the involvement of the community where appropriate. It will be the responsibility of each level of the KIP Unit to work closely with his/her corresponding Kotamadya administrative official in the planning and implementation of the KIP program.

5.5 COMMUNITY PARTICIPATION AND DEVELOPMENT

5.5.1 The Existing Situation

The results of previous efforts directed at achieving fuller participation of Medan's kampung residents in the development process have been extremely limited when compared to the needs. Although a wide variety of community organizations exist and a variety of government agencies provide programs and services within the Kampungs, all lack adequate financial and manpower resources to meet priority community needs. Ineffective coordination has greatly restricted the potential positive impacts of the limited resources invested, while successful coordinated efforts have been largely sporadic. Furthermore, information on successful community development and self-help efforts by individual community groups in particular kampungs is not generally available and disseminated to other kampung groups to stimulate participation and development.

Government agencies providing services in the kampungs generally do not effectively coordinate their efforts except in very unique situations. In most cases both new and older agency programs oriented toward the community tend to treat their target populations as their exclusive domain, frequently competing with one another in order to gain hegemony. In other cases the construction of new facilities and the inauguration of new programs in a kampung area is not followed by extensive outreach efforts designed to inform the community and to stimulate the most effective use and maintenance of these services and facilities. Frequently, the community and its organizations are only marginally related to the development process and are required to plan, finance and implement their own projects and activities to meet priority needs without sufficient assistance from relevant government institutions.

In summary, the current level of community participation either through community organizations themselves, or in conjunction with outreach efforts of responsible service agencies is wholly inadequate to meet the needs. Given the limited levels of existing and projected resources to assist the kampungs this situation is not very cost efficient. In the Medan KIP a major pilot demonstration effort to stimulate the more effective participation of the community will be required in order to ensure that the improvements in basic essential infrastructure and services result in the maximum benefits to the households and communities to be served.

This pilot project will be focused on a major inter-agency effort to recruit, train and effectively utilize a cadre of kampung residents as KIP community development workers in order to:

1. Increase the overall effectiveness of the proposed KIP physical, social and economic development components through the effective coordination and linkage of services, planning and delivery systems with the target kampung communities.

2. Stimulate the identification and effective utilization and integration of the potential resources of the individuals, households and community groups within the KIP planning and programming process.

3. Expand the pool of trained and experienced "para-professionals" available for KIP community development activities in Medan.

A description of the potential areas of activity of the KIP Community Participation/Development effort and its organization is briefly outlined below.

5.5.2 Potential Areas of Activity Proposed for Community Participation/ Development in KIP

5.5.2.1 Promotion of Overall KIP Program

If improvement in water supply and sanitation, health, education and skills training projected under KIP area is to have a sustained beneficial impact, they must be understood and supported by the members of the kampung low-income households. Communal environmental sanitation,

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personal hygiene, alertness to the onset of health problems and the seeking of early treatment, as well as the proper maintenance of newly constructed infrastructure and facilities, all must become a part of daily routine for households, groups of households and community groups residing in the kampung areas. This will require substantial information and promotion of the overall KIP activities at the grass-roots level of each kampung included in the proposed KIP. Substantial use must be made of local mass media for such promotion. Local community leaders such as the lorong head and community organizations, as well as agency field personnel should be engaged as early and as fully as possible in: (1) diseminating information about the proposed programs to be implemented, (2) preparing for the fullest possible community participation in the detailed planning and actual implementation, (3) monitoring and evaluating KIP progress, and (4) the operation and maintenance of newly constructed infrastructure facilities and services.

5.5.2.2 Water Supply and Sanitation

In water and sanitation the opportunities will be focused on the establishment and use of existing community organizations such as LSD and LMD to carry out systematic programs in street cleaning, drainage maintenance, garbage and the collection of and disposal of human wastes. This will help to avoid the maintenance problems often associated with the previous KIP physical improvements carried out in Jakarta and other urban areas of Indonesia.

In the planning stages of KIP, the community worker could provide assistance to the lorong head, his/her community, and service agencies in the resolution of many importants tasks such as determining the location of standpipes, MCK's and garbage bins, etc. Potential areas for community participation in the construction or preparation for the construction of new facilities will need to be identified. The costs and charges to the consumer and collection proceedures for newly expanded services will need to be based on consultation with specific kampung community groups. Finally, as mentioned earlier, assistance will be provided to community organizations in developing continuous maintenance programs for newly constructed infrastructure and facilities.

5.5.2.3 Environmental Health and Health Services

Because of the difference in cultural habits, educational levels and physical environments, the projected investments in water supply and sanitation in the different kampungs of Medan may not yield equal health benefits. Complementary actions in health training, systematic maintenance, as well as in training and related fields, can increase the health benefits of the capital expenditures in water and sanitation significantly. In order to assure the maximum positive impact of the proposed program it will be most important to combine such efforts with community education in the use and maintenance of public standpipes, MCK's and private and communal latrines. A considerable effort will be necessary to convince adults to change their habits and effectively use and maintain new facilities in a sanitary condition.

Investments in health services through the Kampung Improvement Program should be seen as productive investments. Better preventive health services when combined with the proposed water and sanitation investments can help to reduce the need for expensive periodic curative treatment. Moreover, good health should be considered a basic social goal of KIP because of its importance to the realization of the full potential of an individual in all aspects of life.

The expansion of the conventional Puskesmas general curative services in a selective way through the KIP is an important part of the overall program designed to improve health services. However, more immediate, as well as long term, benefits for the low-income Kampung residents are likely to be achievable through improvements in preventive services. The basic preventive services in KIP will require regular health surveillance, regular dissemination of information on desirable health measures and the health services available, innoculation and vaccination, introduction in personal hygiene, nutrition, mother and child care and family planning. Only limited staffing of such services is routinely taken care of by the Health Department in the newly constructed facilities. In KIP areas, expanded levels of services would be delivered in conjunction with the community worker program both through the clinics as well as home and community visits. It is anticipated that the KIP community workers can be trained and use efficiently to link health services with the community as well as to provide field support of relatively specialized areas of preventive medicine-for example, innoculation and vaccination, personal hygiene, nutrition, mother and child care and family planning. Expanded curative services will be provided largely in conjunction with preventive services through the Puskesmas and Policlinics. With proper training and guidance from the health department the KIP Community Workers can assist in the treatment of minor injuries, gastro-intestinal problems, colds and similar ailments that do not require highly specialized facilities.

In order for either preventive or curative services to reach the lowest-income households on a sustained basis, education and the proper dissemination of information will be essential project components of the KIP. Flows of information must be in two directions - with Kampung residents properly informed of the services available and the procedures for taking advantage of those services, and with the service agencies properly informed of the health of their target populations. Moreover, it will not be sufficient to increase the supply of health services alone, but also to ensure that low-income groups take advantage of the expanded services. The further decentralization of Puskesmas and Policlinics through KIP must be complemented by motivating all household members to take appropriate preventive measures themselves and to seek treatment early after the onset of health problems. The KIP Community worker, once appropriately trained, can play a major role in greatly expanding the effectiveness of the health system.

5.5.2.4 Non-Formal Education

Non-formal education could well be the most important component of the proposed KIP program. Kampung residents need basic information about child care, the preparation of food, disease prevention and treatment, the protection of water and the disposal of human and other wastes.

Community education campaigns concerned with mass vaccination, environmental sanitation, rat extermination, and other related programs can help to develop new attitudes about health and encourage individuals to improve health standards. Informal education in household management and budgeting can help kampung households to more effectively use their limited incomes.

Education in civic participation under KIP could include a wide range of types of non-formal education designed to bring the Kampung community into full productive community participation. PMD has been working with the LSD and LMD kampung organizations to participate actively in the development process. Penmas has non-formal education for school-drop-outs. Under the KIP Community Participation/Development Program, these previous efforts would be expanded. The KIP Community workers will work with PMD, Penmas and community organizations to make it possible to provide civic information along with information on basic health care and employment opportunities as well as information on a wide range of possible community improvement opportunities. Education could be provided in co-operative techniques, self-help housing construction, family budgeting and the use of financial institutions, consumer information, public safety information and other information necessary for life in Medan.

The media channels available for community education include household visits, community and religious meetings, advertisements in public places within the kampung and mass media. Fuller utilization of and involvement of community leadership, as well as members of the kampung communities, will be possible through the proposed KIP Community Worker program and will potentially greatly increase the acceptance of programs and expand the potential impact of the limited resources available.

5.5.2.5 Self-Help Training

The KIP self-help training can utilize employment-oriented action programs such as Penmas and KIK/KMKP as an instrument for awakening productive community participation. The principal objectives are to develop local skills and talents and to help organize home industries to produce income and employment where none or little exists. They also would be aimed at nurturing self-reliance through self-employment. Training, by definition, is likely to be a relatively slow yielding activity, especially when it is undertaken outside on-going enterprises. It can, however, provide an opportunity to reach well down the income scale and assist previously unemployable people to become employed.

5.5.2.6 Cooperative Development

Support for cooperatives may also be a particularly useful form of project support for establishing mechanisms for sustaining momentum for self-improvement provided for by the initial KIP projects and activities in almost all of the sectors.

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5.5.3 The Organization of the KIP Community Worker Program

5.5.3.1 The General Approach

Given the current limited level of inter-institutional and agency-community coordination within Medan's kampungs, it is proposed that the primary institutional responsibility for the overall KIP Community Worker Program not initially be divided among the participating agencies (with each one recruiting, training and utilizing their own community workers). Rather, a pilot project should be organized and administered through the Social and Economic Development Division of the KIP Unit. A Policy and Program Management Coordinating Committee for KIP Community Development/ Participation composed of the principal service agencies operating within the KIP as well as the relevant Camats would be organized by the Kotamadya. This committee would function under the coordination of the Head of the Division and be responsible for:

1. The Designs of the overall guidelines and operating principles for the program.

2. Recruitment and Overall Training of Community Workers.

3. The determination of the specific sectoral assignments of the Community Workers.

4. The monitoring and evaluation of the continuing program.

While the general approach proposed envisages the assignment of trained community workers under the direct management and supervision of participating agencies, it specifically requires joint agency efforts in the recruitment and training of the total pool of Community Workers in order to ensure that each worker, irrespective of his/her specific assignment, has the broadest possible background on:

1. The overall goals, purposes and implementation strategies and programs of the total Medan DISP.

2. The specific goals, objectives and implementation schedules of the KIP sectoral projects.

3. The functioning of the physical, social and economic delivery system in Medan, relevant services and facilities.and

4. Basic Service Methodologies and Techniques: Community Development; Environmental Health; Health and Nutrition; and Informal education.

Participating agencies, once assigned workers, will be responsible for a more intense level of training focused on their specific sector activities. The extent of such assignments and training will be decided by the Coordinating Committee in conjunction with the respective participating agencies. The possibilities would include both more permanent long term agency assignments as well as short term "revolving" agency roles and tasks.

5.5.3.2 Participating Agencies

It is recommended that representatives of the following agencies by intially appointed to the KIP Community Development/Participating Committee: Health, Education, Penmas, PMD, and the Camats (in whose areas KIP is being implemented).

It is anticipated that many of these agencies, once the pilot project is under implementation will recognize the need and potential for creating or augmenting the permanent positions within their agencies for kampung based community workers.

5.5.3.3 The KIP Community Worker

A total of 54 Community Workers will be recruited and trained to serve as the basic community link in the KIP implementation program. These will be about one Community Worker for each two lorongs, or every 200-300 families.

The KIP Community Worker will, to the maximum extent possible, be stationed in and preferably reside in the area he or she serves. He should be integrated into the local social structure so that he can identify problems without waiting for contacts to be initiated. Wherever possible he should make periodic house visits. In each Kampung he will enlist the support of the local lorong head and the LSD and LMD organizations in maintaining continual surveillance of community health and environmental conditions.

Under the proposed system of Community Workers, it should be possible to achieve an appropriate level of demand for services as well as an appropriate supply. The activities of these workers, once trained by the participating agencies, could be supervised by the more specialized professionals at each level in the hierarchy of the participating agencies who are capable of delivering more sophisticated services or technical assistance. To use such a staffing strategy effectively it is likely to be necessary to establish procedures according to the policies of each participating agency or institution as to the level and type of service which the Community Worker would be trained to provide, as well as the back-up support which their system can provide for such workers.

In health, for example, the Community Worker would receive brief training in the treatment of the most common diseases. Training in clinical skills would be very limited, complicated cases would be referred to the Puskesmas, etc. The limitation on the curative skills of the community worker will also ensure that he has adequate time for environmental and preventive work. He would be taught the fundamentals of maternal and child care, and the monitoring of nutritional and other problems prevalent in the growth of young children living in the Medan kampungs.

The KIP Community Worker will also be trained and be responsible for organizing community efforts in environmental health; water supply and sanitation under overall guidance of the KIP Unit, and in conjunction with PMD and other community organizations.

5.5.3.4 Implementation Schedule

The organization of the KIP Community Participation/Development Committee detailed program design and the recruitment and training of Community Workers should begin as soon as possible after project approval and funding. Their effective intervention will be required at the community level during the earliest planning stages in order to prepare the community for full and active participation in the upgrading and development of their communities.

5.6 PERSONNEL REQUIREMENTS

Based on the recommended organization for the KIP Unit presented in Section 5.5, the following staff requirements are foreseen:

Permanent Local Staff	
KIP Unit Manager	1
Physical Development Division	
Civil Engineer	1
Construction Manager	1
Field Construction Supervisors	3
Social and Economic Development Division	
Social Worker	1
Community Development Field Supervisors	3
Community Workers	54
Finance/Administrative Division	
Administrative Director	
Administrative Assistant	
Cost Accountant	
Book-keeper	
Office Manager	
Secretary/Typist	
Technical Assistances	
Design Engineer/Construction Manager (12 manmonths)	1
Construction Cost Accountant (12 manmonths)	1
Community Development Specialist (experienced in the provision of socio-economic services-12 manmonths)	1
Penmas Curriculum/Job Development Specialist (6 manmonths)	1
Health Planner Trainer (6 manmonths)	1

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It is envisaged that the local KIP Unit staff would be hired on a permanent basis so that it would be available to proceed with future stages of kampung improvement. It is anticipated that the project will be implemented over a period of about four years. In order to complete the project within this period, Cipta Karya, with the cooperation of the Kotamadya, should as soon as possible begin to staff the proposed KIP Unit. The staff consultants should be contracted during this start-up period in order that they can participate in this most important organizational phase. Each consultant, according to his area of expertise, would be assigned to work directly with the corresponding KIP Unit division. It is not anticipated that the staff consultants would be on site continuously during the implementation of the project. Rather, it is proposed that they would make periodic visits to the project during the key organizational phase of the KIP Unit, review periods of final program design, start-up of the construction phase and other key review periods thereafter.

SECTION 6

FINANCIAL AND ECONOMIC ANALYSES

6.1 INTRODUCTION

The recommended KIP program has been developed on the basis of providing improvements in public service infrastructure within the KIP areas and increased access by the KIP area residents to health and education facilities and services. The chief objective has been to prepare the most cost effective solution, combining the physical components of drainage, water supply, solid waste disposal, MCK's and improvements to streets and footpaths with the socio-economic components of health and education. In assessing the costs and benefits of the program from the point-of-view of quality of life, personal inconvenience, public health improvement, increased production and productivity and community benefits, the importance of individual program components was evaluated through an allocation of points system. This allocation was arrived at through the previously mentioned KIP field survey, discussions with kampung residents and officials and experience in other parts of the world.

The program components of drainage and water supply have been given the highest priority. Drainage was selected on the basis of the poorly functioning existing system, a fact which results in extensive flooding and ponding in many KIP areas during the rainy season. The presence of standing water is probably the number one environmental and public health problem confronting the KIP areas. The second greatest expressed need is for access to an adequate supply of potable water whose use would replace the widely polluted open shallow well. Potential health benefits would accrue to the entire community as a result of these types of improvements.

The program's three other physical components are given slightly less importance regarding benefits. The disposal of human wastes is of prime public health importance. The MCK program to be implemented in those KIP areas found along the Deli River will greately decrease the resident's exposure to human excreta. The recommended water-sealed slab program meets the guidelines set by the World Health Organization (W.H.O.) for human waste disposal systems.

The collection of solid waste is of importance throughout Kotamadya Medan. Collection and disposal service will be provided to the KIP areas as part of the city-wide program.

With the exception of providing better access to kampung facilities, the upgrading of streets and footpaths is felt to provide less of a benefit to the community

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In addition to the physical civil works program, considerable benefits will be derived from the health, Penmas and community workers programs. While some physical construction is included in these components, most of the benefits will derive from the non-physical aspects of these programs. In terms of obtaining value per rupiah allocated to the KIP program, it is considered that the non-physical components are well worth the funds spent and without them the benefits from infrastructure investment will be greately diminished.

In conjunction with the provision of physical infrastructure, an associated educational program for both adults and children is necessary. This program would instruct the kampung residents in the consequences of drinking polluted water, of not properly maintaining their pit latrines or of throwing their solid waste into the drains and streams of the kampung. They also need to be taught improved standards of hygience, how best to use the new public standpipes and MCK's, how the community should maintain its new facilities and very importantly, what price they should be paying for the new services offered.

The benefits arising from the health and education program components will be evidenced by the increased earning capacity of the students who complete further education as compared with those who do not, and the increased productivity due to improved health. The Penmas program, which will train dropouts form the educational system, is seen as particularly important.

One other important component of the proram is the land registration survey. At the present time, the Agraria Department gives kampung residents the opportunity to obtain full freehold rights to their land (Hak Milik) at a price of Rp.5,000 per square metre lot instead of the usual cost of Rp.40,000. This difference has been entered as a measure of the benefits obtained. The benefits which flow from the land registration program should accrue to the Kotamadya, as well as the individual residents, in the form of improved and increased IPEDA property tax collection.

6.2 FINANCIAL ANALYSIS

6.2.1 Project Costs

The KIP project costs have been summarized in Tables 5.11 and 5.12. The total cost of the proposed program at January 1980 prices, including engineering costs and physical contingencies, is Rp.2850 million. This increases to Rp.3,800 after allowing for price escalation at rates suggested by the Asian Development Bank. The overall foreign component (direct and indirect) is only 11%.

6.2.2 KIP Funding Sources

This sub section has been amended following discussions held in July 1980 with GOI officials when reviewing the MUDS draft reports. The amendments reflect very recent changes which have been made in GOI's thinking in respect of KIP funding. The assumptions now incorporated are as follows:

- Cipta Karya accepts a target of Rp.6.0 million per hectare as the basis for providing KIP funds. It is willing to provide half of this target with the local government (municipal and/or provincial) providing the balance.

- To the extent that Rp.6.0 million per hectare is inadequate to cover the costs of the proposed program, contributions from individual sectoral programs (e.g. water supply, drainage) should be sought.

- Where the KIP contains complementary programs (e.g. in health and education), INPRES and Departmental funds should be allocated.

The application of the above principles is considered below and the results summarized in Table 6.1.

TABLE 6.1

KIP FUNDING SOURCES
RP MILLION (CURRENT PRICES)

Source	Amount
Cipta Karya (GOI)	976
Local Government	976
Sectoral Programs	824
Complementary Programs	1024
Total	3800

6.2.2.1 Cipta Karya (GOI)

The area covered by the proposed KIP is 244 hectares; at Rp.6 million per hectare this gives Rp.1464 million. After allowing for inflation over the program period, this increases to Rp.1,952 million, half of which (Rp.976 million) would be contributed by GOI through Cipta Karya.

6.2.2.2 Local Government

A contribution equal to that of Cipta Karyas would be required from local government, that is, from Kotamadya Medan and the North Sumatra provincial government. How the Rp.976 million is apportioned between these authorities depends on their respective budgetary positions but funds should be made available from both sources.

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6.2.2.3 Sectoral Programs

As the proposed program is in excess of Rp.6 million per hectare, additional financing will be required from the city-wide sector programs. A very substantial part of the total KIP costs is represented by drainage. The proposed KIP drainage investment is Rp.837 million (before the addition of contingencies and engineering) out of a total of Rp.2,286 million, that is, 37%. After including contingencies and engineering, the drainage investment becomes Rp.1,411 million in current (inflated) prices.

It is suggested that Rp.824 million of this investment (58%) is provided by the city-wide drainage sectoral program. This figure represents the difference between the sum of the Cipta Karya, local government and complementary program (see 6.2.2.4 below) contributions and the total program costs, that is, Rp.3,800 million less Rp.2,976 million. It is not necessary that the entire Rp.824 million be borne by the drainage sector. Part of this amount could be passed to the city water supply and/or solid waste programs but as these are relatively small items in the KIP program (under 7% combined), the major portion would fall on the drainage sector.

6.2.2.4 Complementary Programs

About one-third of the KIP expenditure is represented by complementary programs, principally in health and education. The specific KIP activities proposed in these fields should be incorporated into the local health, education and other programs as necessary.

6.2.3 KIP Funding Mechanisms

The discussion above concentrates on the immediate sources of funds for KIP by indicating the instituational or program source. Of critical importance, however, is whether the money will be available from these institutions and how they will obtain it. In respect of Cipta Karya (DIP funds) and the complementary programs (INPRES and departmental budget funds), it can be assumed that the money would be made available by GOI if a commitment is made to the KIP program. The local governments, however, would need to provide funds, as far as possible, from their own resources. As has been discussed in detail in Section 21 of the Long-Term Urban Strategy report, Kotamadya Medan's capacity to contribute to new investments in Repelita III will be extremely limited, even if the recommendations for improving budgetary control and revenue generation and collection are implemented. However, if priority is given to KIP investments in order to maximise the matching contribution from Cipta Karya, Medan should be able to contribute Rp.850 million over Repelita III. The balance of Rp.126 million required to make up the local government contribution should be obtained from the provincial government. This is a very small part of total program costs and should place no strain on the provincial budget.

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The sectoral program contribution, if concentrated on drainage, would be derived from a combination of INPRES, local tax revenues and department funds (e.g. sub-directorate of village development). A very substantial increase over the current levels of funds from these sources will be required to meet the city-wide first stage program investments proposed (see Drainage Master Plan and First Stage Program Report). The KIP program element will increase this requirement further. This may not impose an undue burden, however, if funds from an external funding agency are available. So far, no mention has been made of the funds it is hoped will be available from the Asian Development Bank. It has been suggested that up to 50% of the total KIP costs could be available from this source. This would be in the form of a loan to GOI who would then feed the money through some, or all, of the channels discussed above. In view of the large city-wide drainage component in the First Stage Program, it might be suitable to meet a significant proportion, or all, of the KIP drainage requirement from the external funds. As drainage is part of the municipal administration, this would mean making the funds available to Kotamadya either as a grant (INPRES) or a loan to Kotamadya Medan. If it were provided as loan finance on reasonable terms (for example, a 25-year repayment period, a five year grace period and interest at 8%), the municipal finance analysis indicates that the debt service commitments could be met.

6.2.4 Summary of KIP Funding

It is clearly a question for GOI to decide on the preferred method for channelling funds to KIP but given the size of the program and assuming ADB participation, the program appears financially feasible.

In Table 6.2, a possible funding program has been summarized. This assumes ADB funds are made available initially to the sectoral and complementing programs (Rp.1,848 million). Assuming that ADB lends to GOI 50% of total costs (Rp.1,900 m), this would leave a balance of Rp.48 million. This would be made available to Cipta Karya to cover the direct foreign exchange costs of the program.

This is only one of many possible permutations; ADB funds would be potentially available to all programs and GOI may not wish to concentrate these so heavily on the complementary and sectoral programs. What is indicated, however, is that a viable funding program could be readily formulated.

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TABLE 6.2

POSSIBLE KIP FUNDING ARRANGEMENT

Program	Original Source	Distributing Agency	Distributed as	Rp.Million
A. Nationally Sponsored (Rp.6.0 m/ha)	GOI Funds ADB Funds	Cipta Karya	DIP	976
	Local Funds	Kotamadya Medan		850
	Provincial Funds	Provincial Government		126
B. Sectoral	ADB Funds	GOI to Kotamadya Medan or Government Departments	INPRES or Loan	824
C. Complementary	ADB Funds	GOI to Kotamadya Medan or Government Departments	INPRES	1,024
Total				3,800

6.2.5 Operating, Maintenance and Replacement Costs

KIP is a way of accelerating imporvements to low-income areas where the coverage of public services is below desired levels. After completion of the physical components of the program, it will be important to ensure that regular maintenance and replacement are undertaken as required. These tasks should be jointly shared by the Kotamadya and its agencies on the one hand, and by the recipient KIP areas themselves on the other. Replacement costs should be included in the Kotamadya budget.

KIP area residents also have a role to play in maintaining their kampungs. No self-help component has been explicitly included in the KIP implementation phase, however, it is hoped that kampung residents will help to maintain their improved kampungs, especially around their own houses. One of the purposes of the proposed pilot community worker component will be to assist participating kampung communities in organizing and maintaining maintenance activities.

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6.3 ECONOMIC ANALYSIS

No Kampung Improvement Program (KIP) has yet been completed in Medan. Therefore, data concerning actual changes in either land values or rentals resulting from an improvement program was not available. However, KIP results in other Indonesian cities have been noted. Accordingly, use has been made of the difference in rentals between kampungs already enjoying partial improvement and those not as yet improved in order to yield a measure of the beneficiaries' willingness to pay for incremental physical, social and economic improvements. Rental values, therefore, will be taken as a surrogate for benefits which will accrue to KIP area residents as a result of improvements to physical infrastracture, educational opportunities and public health.

6.3.1 Economic and Social Benefits

6.3.1.1 Infrastructure Benefits

As previously mentioned in the introduction to this section, the selected method of calculating the economic benefits of improvements in kampung infrastructure is to distribute the total program benefits among the various program components. This allocation was based on conversations with KIP area residents, and on the MUDS team experience. This allocation was further subdivided on the basis of access to the dwelling unit; the dividing line being whether or not the unit has access by becak. The results of this distribution are shown below:

Item	Allocation of Total Program Benefits (%)	Beneficiaries without Becak Access (%)	Beneficiaries with Becak Access (%)
Drainage	30	15	15
Water Supply	28	22	6
MCK's	18	18	0
Solid Waste	16	8	8
Street and Footpaths	8	5	3
Total	100	68	32

At the present time, even dwelling units along major secondary streets - e.g. those with excellent access - enjoy only partial services; these households too will gain much from KIP. In summary, all KIP residents are considered to benefit equally from drainage (a high priority improvement) and solid waste disposal improvements. The public standpipe program which generally is sited along footpaths in the kampung interior will bring greater benefits to those households with poorer access. Houses along secondary streets already have good access to the KIP area circulation system and would therefore benefit less from the proposed improvement program. MCK's will only be located in selected KIP areas found along the Deli River.

The comparison of benefits was based on a field survey of dwelling unit rental values undertaken in mid-1979. Using the available aerial photographs, it was possible to structure the survey on the basis of three physical characteristics discernible from the photos. The three characteristics are the following:

- Size of dwelling unit (for simplicity, the units were classified as large or small depending on whether they were more or less than 60 square metres)

- Roofing material of the dwelling unit (concrete or clay tile, galvanized zinc or asbestos cement, and thatch)

- Accessibility to the dwelling unit by becak.

These three indicators were used as a proxy for a "rentability factor" for the KIP areas' dwelling units. It is argued that higher rents in "better" areas reflect, in part, a better coverage of public services.

Summarizing the results of the survey, the weighted average rental value for housing with becak access was Rp.88,000 per year, compared to Rp.51,000 per year for housing without becak access. The difference of Rp.37,000 per year was taken as a partial estimate of the benefits that would result from KIP improvements. This sum would underestimate the total benefits accruing to those dwellings with becak access, especially with respect to drainage and solid waste, because many of the units used as a standard of comparison do not enjoy such services at present either. In order to compensate for this underestimation, it was assumed that approximately one-third of the KIP program's benefits would accrue to areas with becak access and two-thirds to those without (in line with the allocation of benefits). Further examination was made of the range of rents within the category of dwellings with becak access, on the assumption that higher rents within each class reflect, in part, a higher level of public services. Depending on the coverage of public services, rents for similar types of dwelling units tended to vary by approximately 30 percent. A similar rent differential was also observed in adjacent, slightly more developed areas. Therefore, estimated rents have been increased by 30 percent to reflect this potential benefit from an improvement program.

Regarding dwelling units in areas without becak access, the difference in rent between those houses with a full complement of amenities and those without is approximately 25 percent. Accordingly, present rentals have been augmented by this percentage in order to reflect the sizeable benefits, particularly those attributable to drainage and solid waste disposal, not yet included. Once again, this was based on the assumption that at least 25 percent of benefits that would result from implementation of the program had not been included in the first estimation of benefits.

This analysis gives the following total benefits for each class of access:

Areas with becak access	=	Rp.28,000 (based on 32 percent of the average rental value of Rp.88,000)
Areas without becak access	=	Rp.50,000 (based on the Rp.37,000 benefit differential between becak and non-becak access plus 25 percent of the average rental value of Rp.51,000).

Applying these unit benefits per class of access to the entire KIP area housing stock yields the following results. Total benefits of Rp.145.6 million will accrue to approximately 5200 dwelling units with becak access, while Rp.285.0 million will accrue to 5700 units without becak access. The total for the entire housing stock equals an increase of Rp.430.6 million in the form of notional rental values.

6.3.1.2 Education and Health Benefits

A certain streams of benefits would potentially accrue to the participants in the Penmas program through increased earning capacity. While the proposed scope of the program in the KIP areas is small (4000 participants) it is estimated that a small increase in earnings (Rp.300/day) would accrue to program participants for a period of five years after completing their training. All 4000 participants should be served within three years.

Because of the difficulties of estimation, both the costs and benefits associated with the provision of new schools have been omitted.

The health component comprising rehabilitation, new construction and health education will provide improvements to public health in the form of increased access by KIP area residents to health facilities and services. However, due to the extreme difficulty in measuring these benefits, no separate estimate of benefits has been assumed for the health component of the KIP program.

6.3.1.3 Land Registration Benefits

Until KIP area residents acquire a more secure type of land tenure, there exists little incentive to improve the physical quality of their dwelling units. During the peirod of aerial photo mapping and identification of land ownership rights, kampung residents can register their holdings and gain certificates showing the type of ownership at a very reduced cost. If clear ownership rights to the land have been previously established, a freehold title (Hak Milik) can be obtained from the Kotamadya Agraria Department for Rp.5000 instead of the customary Rp.40,000. For the purposes of the present analysis, it will be assumed that 50 percent of all KIP area holdings will be registered at this reduced fee. Benefits have been calculated accordingly.

These estimated benefits from an improvement program are approximate and in no way account for the full benefits directly derived from an upgraded environment. Additional benefits would certainly accrue in the form of improved health, increased productivity and a general improvement in the quality of life. One additional consequence of a general improvement in an area's infrastructure, particularly if accompanied by a regularization in land tenure, is to stimulate additional private sector investment in housing. Other studies suggest that over a period of years this added investment could reach 20 percent of the initial infrastructure investment.

6.3.2 Economic Costs

In calculating costs and benefits, certain simplifications have been introduced. Firstly costs and benefits have been shown over a 12-year period. This period represents the years after construction before replacements become important. Accordingly, a residual value based on the remaining expected life of the assets is shown as follows:

- Streets and footpaths : one-half depreciated
- Drainage channels : one-half depreciated
- Public standpipes : one-third depreciated
- P.V.C. pipe : one-third depreciated
- Fire hydrants : one-quarter depreciated
- MCK's : one-third depreciated
- Reinforcement concrete water-sealed latrine slabs : one-half depreciated
- Solid waste trucks, handcarts and curbside containers : four-fifths depreciated
- Rehabilitated and newly constructed community facilities : one-third depreciated
- Street and foot bridges : one-third depreciated

Operation and maintenance costs have been assessed at 1.5 percent of civil works in each year.

6.3.2.1 Material Costs

In calculating the economic costs, adjustments have been made to reduce tradeables to their border prices by deducting customs duty. Sales tax, as appropriate, was removed from both imported and domestic materials. Most materials used in the KIP program can be obtained locally. However, in the case of cement, although it is produced locally, Indonesia is a net

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importer. Since it is anticipated that this situation will continue during Repelita III, cement has been treated as an import item throughout the analysis. See Table 6.3 for a comparison of KIP program economic and financial costs.

6.3.2.2 Land Registration

The costs included in the land registration program cover only the required mapping and identification of ownership rights in the KIP areas.

6.3.3 Economic Internal Rate of Return

The proposed KIP program has been planned according to a predetermined budget. The goal was to obtain the best mix of physical and socio-economic programs given the total funds available. Given the fact that the estimated benefits certainly do not fully measure the total benefits that would be derived from the implementation of the program, an economic internal rate of return (EIRR) of 28.8 percent has been calculated for the program (see Table 6.4). Based on this estimate, the project appears economically feasible, especially given the social purposes of the program.

TABLE 6.3

SUMMARY OF KIP PROJECT COSTS - FINANCIAL AND ECONOMIC
(Rp. Million)

Item	FY 1980/81	FY 1981/82	FY 1982/83	FY 1983/84	Total
Financial Costs [a]					
Civil Works	75.4	452.1	527.6	452.2	1,507.3
Engineering Design and Supervision	75.3	37.6	30.2	7.6	150.7
Land Acquisition	66.7	76.7	41.2	11.2	195.8
Physical Contingency	32.6	84.9	89.8	70.8	278.1
PENMAS Program	-	18.3	14.3	8.2	40.8
Land Registration	-	5.4	-	-	5.4
Total	250.0	675.0	703.1	550.0	2,178.1
Economic Costs [b]					
Civil Works	74.5	446.9	521.4	446.9	1,489.7
Engineering Design and Supervision	75.3	37.6	30.2	7.6	150.7
Land Acquisition	66.7	76.7	41.2	11.2	195.8
Physical Contingency	32.3	84.1	88.9	70.1	275.4
PENMAS Program	-	18.3	14.3	8.2	40.8
Land Registration	-	5.4	-	-	5.4
Total	248.8	669.0	696.0	544.0	2,157.8

a Financial costs differ slightly to those shown in Tables 5.11 and 5.12 as new school costs have been omitted.
b Economic costs were estimated on the basis of deducting custom duties and sales tax from both foreign and domestic materials.

Source: MUDS eleboration of information obtained from Departemen Keuangan, Direktorat Jenderal Pajak.

TABLE 6.4

KIP ECONOMIC COSTS & BENEFITS

Year	Economic Costs			Economic Benefits				Net Benefits
	Investment Costs	Operating and Maintenance	Total Costs	Rental Benefits	House/Land Registration	PENMAS	Residual Salvage Value	
1. FY 1980/81	248.8	-	248.8	-	-	-	-	- 248.8
2. 1981/82	669.0	1.1	670.1	43.1	-	-	-	- 627.0
3. 1982.83	696.0	7.8	703.8	107.7	190.8	121.7	-	- 283.6
4. 1983/84	544.0	15.6	559.6	193.8	-	248.1	-	- 117.7
5. 1984/85	-	22.3	22.3	301.4	-	374.5	-	+ 653.6
6. 1985.86	-	22.3	22.3	430.6	-	374.5	-	+ 782.8
7. 1986/87	-	22.3	22.3	430.6	-	374.5	-	+ 782.8
8. 1987/88	-	22.3	22.3	430.6	-	252.8	-	+ 661.0
9. 1988/89	-	22.3	22.3	430.6	-	126.4	-	+ 534.7
10. 1989/90	-	22.3	22.3	430.6	-	-	-	+ 408.3
11. 1990/91	-	22.3	22.3	430.6	-	-	-	+ 408.3
12. 1991/92	-	22.3	22.3	430.6	-	-	792.8	+1201.1
Total	2,157.8	202.9	2,360.7	3660.2	190.8	1,872.5	792.8	

EIRR: 28.8 %

Source: MUDS

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APPENDIX A

KAMPUNG IMPROVEMENT PROGRAM
PRELIMINARY DESIGN

(This Appendix consists of 170
85 cm x 55 cm sheets and is
bound separately for convenience)

APPENDIX B

SMALL SCALE HOME INDUSTRY AND VOCATIONAL TRAINING IN MEDAN

APPENDIX B

SMALL SCALE HOME INDUSTRY AND VOCATIONAL TRAINING IN MEDAN

B.1 THE EXISTING SITUATION

B.1.1 EMPLOYMENT IN MEDAN

B.1.1.1 Labour Force Characteristics

The Medan Labor Force was estimated at 31 percent of total population in 1978. This is now defined as the population aged 10 and over after deducting students, mothers, and retired and other unemployable persons. The Labor Force growth between 1974 and 1979 according to figures published in Repelita III, is shown in Table 1, but the margin of error is likely to be considerable.

TABLE B.1

MEDAN LABOR FORCE, 1974 TO 1979

Year	Number (Thousands)	Index (1974 = 100)
1974	320.2	100.0
1975	329.2	102.8
1976	338.4	105.7
1977	347.9	108.7
1978	357.6	111.7
1979	367.6	114.8
Average annual growth rate		

Source: Repelita III Daerah Tingkat II Kotamadya Medan
Buka II (Draft) U.S.U.

A survey in 1978/79 of young persons in the work force showed that the labor force comprises approximately two-third of all eligible males and one-third of females in the population. The labor force broken down by age-group is shown in Table 2. The most striking feature is that 31 percent of the labor force is aged under 25, and 18 percent is under the age of 20. The number of young women working is also quite high.

TABLE B.2

COMPOSITION OF LABOR FORCE BY AGE GROUP, 1978
(POPULATION IN THOUSANDS)

	Total	Percentage	Males	Percentage	Females	Percentage
10 - 14	6.6	6.6	1.8	1.1	3.9	3.8
15 - 19	56.6	15.8	29.8	11.7	26.8	26.3
20 - 24	69.7	19.5	46.5	18.2	23.2	22.7
25 - 29	50.3	14.1	37.5	14.7	12.8	12.5
30 - 39	71.7	20.1	58.6	33.9	13.1	122.8
40 - 49	56.5	15.8	43.7	17.1	12.8	12.5
50 - 59	31.2	8.7	24.6	9.6	6.6	6.5
60 +	15.0	4.2	12.3	4.8	2.7	2.6
Total	357.6	100	255.7	100	101.9	100

Source: Survey Tenaga Kerja Muda di Kotamadya Medan 1978/79

B.1.1.2 Employment Characteristics by Sector

The main area of employment is the broadly defined service sector. Most persons within it are employed in commercial activities, largely wholesaling and retailing, and in very small enterprises. Comparison with an earlier year is difficult because at the time of the 1971 census, Medan Lama (Old City). Nevertheless the proportion of total employment in industry has increased from about 8.5 percent to 13 percent.

At present, about one quarter of the 15 to 24 age groups are employed in industry, but the large majority are absorbed by the service sector. As regards the pattern of female labor, the very young (under 15) are employed equally in industry, commerce, unspecified services and government, prpbably at a low level. The proportion employed in agriculture appears to have remained the same since 1971 at 9 percent. Table 3 shows employment by sector of activity.

TABLE B.3

ESTIMATED EMPLOYMENT BY SECTOR 1978
(POPULATION IN THOUSANDS)

Sector	Total	Percentage	Males	Percentage	Females	Percentage
Agriculture	29.1	9.2	21.2	9.1	7.9	9.6
Industry and Handicrafts	41.6	13.2	29.5	12.7	12.5	15.2
Construction[a]	16.0	5.0	16.0	6.9	-	-
Commerce, Hotels and Restaurants	59.2	16.6	32.2	13.8	20.0	24.4
Transport	26.2	8.3	25.0	10.7	1.2	1.5
Government	45.4	14.4	33.7	14.5	11.6	14.1
Other Services[b]	74.1	23.5	55.2	23.7	18.9	23.0
Unspecified Activities[c]	30.7	9.7	30.7	13.2	110.0	12.0
Total	315.1	100.0	233.3	100.0	182.1	100.0

a Adjusted because of sampling deficiency.
b Mining, banking insurance etc.
c Teachers, doctors, laundries, barbers, garages, accounting, repairs etc.

SOURCE: Survey Tenaga Kerja Muda di Kotamadya Medan 1978/79.

B.1.2 SMALL SCALE ENTERPRISES (SSE) IN MEDAN AND NORTH SUMATRA

Repelita III policy is directed towards employment creation through the active encouragement of small scale enterprises (SSE) with especial emphasis on indegeneous owned establishments*, in the industrial, agricultural, trade and service sectors.

B.1.2.1 Industrial Enterprises

The total number of enterprises in North Sumatra is not known, though establishments are required to register, the lists are very imperfect. However, the following estimate for industrial establishments in North Sumatra and Medan has been made for 1974 and 1976 (See Section 4).

* An indigeneous person is defined as one descended from the ethnic group with origins in the Indonesia Archipelago.

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Because of the dubious accuracy of the data few valid conclusions are possible. However, it appears that roughly one-third of the Province's industrial establishments are located in Medan and that there is a preponderance of small firms with fewer than 20 employees. Data obtained for 1978 in a different form for North Sumatra only indicated that the total number of establishments registered were 21,000 of which 79 percent were indigenous owned, and 98.9 percent of those indigenous owned firms were in the handicraft sector comprising various small manufactures and crafts. This figure compares with the total of 97 percent of establishments in the small and cottage industry classification in Table 4 in 1976. It is understood that the split between indigenous, non-indigenous and foreign owned establishments in Medan is similar to North Sumatra as a whole, though there is a strong Chinese population, namely:

Firms Chinese indigenous ownership	:	78 percent
Firms under non-indigenous ownership	:	20 percent
Firms under foreign ownership	:	2 percent

From a survey carried out in 1977/78 of indigenous business men in seven North Sumatra cities it was established that, outside of the handicraft and textile sectors, indigenous owned enterprises were poorly represented accounting for only 15 percent of the number of enterprises in light manufacturing, and 15 percent of the chemical industry enterprises.

TABLE B.4

ESTIMATE OF INDUSTRIAL ESTABLISHMENT IN NORTH SUMATRA AND MEDAN 1974 AND 1976

	North Sumatra		Medan		Percent of North Sumatra
	No.	Percent	No.	Percent	
Large Firms					
1974	59	0.3	38	0.6	64
1976	61	0.3	39	0.7	64
Medium Firms					
1974	213	1.2	120	1.9	56
1976	339	1.9	150	2.5	44
Small Firms					
1974	1,985	11.2	662	10.3	33
1976	1,905	10.5	884	14.8	46

TABLE B.4--Continued

	North Sumatra		Medan		Percent of North Sumatra
	No.	Percent	No.	Percent	
Cottage Industry					
1974	15,560	87.5	5,580	87.2	36
1976	15,870	87.3	4,903	82.0	31
Total					
1974	17,790	100.0	6,400	100.0	38
1976	18,175	100.0	5,976	100.0	33

Notes to Table

1. Definition of size of firm adopted in the census of industry has been used:

Large firm	:	Employing 100 persons or more.
Medium firm	:	Employing 20 to 99 persons.
Small firm	:	Employing 5 to 19 persons (SSE).
Cottage industry	:	Home-based activity Employing less than 5 persons

2. Earlier definition of small firm (SSE) was established with 1-4 employees having power equipment and those with 5 - 9 employees without.

SOURCE: Census industry 1974/75.
Perkiraan Pendapatan Regional - North Sumatra.
Hasil penelitian intensitas tenaga kerja dan productivitas industri di Sumatra Utara 1977.
Repelita II Propinsi daerah tingkat I - Sumatra Utara (Vol.II).

In terms of capital investment, while no figures are available for the handicraft sector, it appears that only 2 percent of capital invested in the chemical sector is indigenous, and only one percent of the heavy business sector, though in both instances indigenous business men own between 10 and 20 percent of the establishments. Thus, overall indigenous business is under represented in the chemical and heavy industries and very weak regarding capital investment, but relatively strong in the textile field, though outside of Medan.

B.1.2.2 Trade and Service Enterprises

The total number of service and trade establishments in North Sumatra is not known, but in 1977, it was estimated that some 11,000 licensed enterprises were operating in the municipality of Medan, and one-third were included in a survey in 1977*. Of the number surveyed, 40 percent of the sectors enterprises were indigenous owned. The sector was classified into distribution, wholesale and retail, and it was found that the classification equated with large medium and small sized firms where they are defined as follows:

Large : Establishment with 10 employees or more

Medium : Establishment with 5 to 9 employees and

Small : Establishment with fewer than 5 employees.

Indigenous ownership in the sample was as follows:

Distributor (large) : 69 percent

Wholesale (medium) : 43 percent

Retail (small) : 30 percent

Total sector : 40 percent

In the trade and service sectors indigenous business is dominant in the distribution field, relatively well represented at the wholesale level, but somewhat weaker at the retail level.

B.1.2.3 Business Activity in Medan

The survey of business men in seven cities in North Sumatra included 81 businesses located in Medan, nearly half of which were interviewed in depth, so enabling a profile of businesses to be compiled. The activities of the Medan respondents is shown below:

TABLE B.5

PERCENTAGE DISTRIBUTION OF MEDAN BUSINESSES BY ACTIVITY

Trade		Service		Industry	
Food	20.2	Contractor, broker	3.6	Light	2.4
Clothing	4.8			Handicraft	34.5
		Transport	6.0		

* Economics and finance in Indonesia by Handa Yasin and Alan Smith. Vol. 26, No. 2, June 1978.

TABLE B.5--Continued

Trade		Service		Industry	
Housing	6.0			Textile	0
		Trailers	9.5		
Vehicles,Sparepart	1.2	Other	5.9	Other	0
Other	6.0				
Total trade	38.1	Total service	25.0	Total industry	36.9

The sample surveyed is broken down according to product or type of service in Table 6.

The table highlights that in the distributive trades (large firms with 10 or more employees) indigenous business men own over 60 percent of all enterprises by type of product, while in the wholesale trade (medium firm with 5 to 9 employees), more than 50 percent is owned in only three fields, building supplies, contracting and travel bureaus and consulting, and in the retail sector (small firms with under 5 employees) only the latter is more than 50 percent indigenous owned.

B.1.3 CHARACTERISTICS OF INDIGENOUS BUSINESS IN MEDAN AND NORTH SUMATRA

From the survey of seven cities certain characteristics typical of indigeneous business can be distinguished. It appears that the majority of indigineous businesses were set up some eight to twelve years ago, with an average initial capital investment of Rp. 3 million at 1978 prices. Annual sales in 1978 averaged Rp. 30.7 million, with profit level around 13 percent of net sales. The average number of employees is estimated at 18 in industry; 13 in the service sector and 4 in trade.

Indigeneous firms are largely owned and operated by one man, and are generally family businesses employing other members of the family. Over half of entrepreneurs interviewed were between thirty and fifty years old and, though he buys on credit, and gives credit, he is unlikely to have obtained a bank loan.

The survey showed that entrepreneurs tend to set up in fields in which they have some previous experience, and set up on their own mainly to be their own boss, and also because they thought they would make more money that way, or easier money, and frequently could make daily money as compared with government employees who get paid monthly. Another motive for setting up in business was failure to find alternative work.

TABLE B.6

PERCENTAGE INDIGENOUS OWNED ENTERPRISES
IN SERVICE SECTOR BY PRODUCT OR SERVICE

	Distribution (Large)	Wholesale (Medium)	Retail (Small)
50% and Over Indigenous Owned			
Food	81	-	-
Clothing	60	-	-
Vehicles, Spareparts	77	-	-
Building Supplies	72	52	-
Contractors, Brokers	66	70	-
Travel, Consulting	-	52	67
20% - 49% Indigenous Owned			
Food	-	23	24
Clothing	-	-	38
Books Office Supplies	-	39	31
Vehicles, Spareparts	-	-	22
Building Supplies	-	-	25
Medicines (Jamu)	46	-	39
Contractors	-	-	39
Other Services	-	21	35
Under 20% Indigenous Owned			
Clothing	-	15	-
Furniture	0	14	19
Vehicles, Spareparts	-	13	-
Medicines (Jamu)	-	19	4
Bankers, Handressers	0	9	14

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Planning and Market Avenue

It was apparent that at least half the entrepreneurs took little account of prevailing market conditions, or demand levels, or opportunities, other competition, or further expansion potential. Enterprises engaged in providing daily necessities assumed that in itself constituted demand and guaranteed market. There was a tendency to sit back and wait for cleants to show up, rather than actively engage in marketing or selling goods. It was equally apparent that there were little incentive to expand, through stock might be increased if sales were rising. However, before setting up in business several respondents did plan their capital, labor and physical requirements, though when they started operations they had often not reached the planned target, particularly as regards capital accumulation.

The initial capital available to respondents when setting up is shown in Table 7.

As to business operations, many of the entrepreneurs were found to have a good idea of how their business was doing. though they are unlikely to have written accounts, or keep a regular inventory and tended to purchase stocks only as they run out of supplies. They also tended to use public transport for delivery of supplies and stocks.

The lack of marketing ability is a major weakness in the operation of the business, the entrepreneur plays a passive role when compared with his non-indigenous competition.

On the whole the majority of businesses deal adequately with bureaucracym though the industrial sector was notably weak. Payment of taxes was slack. Many enterprises never paid any taxes and some owners refused to pay. Tax rates were felt to be set arbitrarily high, but were open to negotiation.

Financial management was weak in terms of written records or forward planning. Book-keeping was often non-existent or rudimentary. Records were rarely totaled but were maintained on a daily basis. Family expenditures were frequently not separated from the busoness, using cash as required. Yet many business could estimate profits and these figures together with average sales are shown in Table 8.

It will be seen that sales figures vary quite widely, trade appears to have a higher turnover, though in terms of profitability food, relies typically on a quick turnover and low profit. Sales levels in the service sector appear either very low, or as in the case of contractors, over Rp. 100 million a year. In general services claimed the highest rate of profit at over 17.5 percent.

Industry turnover was the lowest overall, no product sector having sales of over Rp. 50 million a year, and light industries and handicrafts only Rp. 10.6 million on average, though apparently making a 20 percent profit.

TABLE B.7

INITIAL CAPITAL INVESTED BY TYPE OF INDIGENOUS BUSINESS IN NORTH SUMATRA 1978 PRICES

	Trade	Services	Industry
Under Rp. 500,000 (US$ 8.00)	Vehicles, spareparts	-	-
Rp. 500,001-1,000,000 (US$ 800 - 1.600)	Clothing Housing	Tailors Repair shops, Hotels, etc.	dicrafts
Rp.1,000,000-10,000,000 (US$ 1,600 - 16,000)	Food Flowers, books Fertilizer, Office, Supplies, traditional medicines etc.	Contractors	-
Over Rp.10,000,001 (US$ 16,000)		Transport (Rp. 18 m)	-
Average - all enterprises		Rp.3,314,000 (US$ 8,000 at pre-devaluation exchange rate)	

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In view of the practice of including personal incomes in profit, and taking profit as a percentage of net sales these figures are low. Little money is left for financing any expansion or reinvestment. It is understood that regular savings were an uncommon feature of business. Over 80 percent of respondents claimed their business was short of capital, but only 35 percent had borrowed from a bank, and many respondents believe the procedure would be too complicated for them.

With respects to loans, industry is again lagging behind other sectors.

TABLE B.8

1978 ANNUAL SALES AND PERCENTAGE PROFIT BY TYPE OF PRODUCT SERVICE-SEVEN CITIES

	Net Sales (Rp. 000)	Profit (Percent)
Annual Sales		
Under Rp. 10 million (US$ 24,000)		
Trade	-	-
Service		
Tailors	7,373	17.5
Other (repair shops, hotel etc)	7,859	20.7
Industry		
Other (fertilizer plants etc.)	2,275	23.9
Annual Sales		
10 million - 25 million (US$ 24,000 - 60,200)		
Trade		
Clothing	14,765	9.9
Vehicles, spare parts	15,124	7.7
Other (flowers books, office supplies, traditional medicines etc.)	23,502	16.0
Service		
Transport	18,975	28.4
Industry		
Light	13,590	18.9
Handicrafts	10,628	19.6

TABLE B.8--Continued

	Net Sales (Rp. 000)	Profit (Percent)
Annual Sales		
Rp. 25 million - Rp. 50 million (US$ 60,200 - 120,500)		
Trade		
Housing supplies	26,463	10.8
Service	-	-
Industry		
Textiles	46,728	9.1
Annual Sales		
Over Rp. 50 million (US$ 120,500)		
Trade		
Food	94,210	2.6
Service		
Contractor, broker	112,642	19.3
Industry	-	-
Average - all enterprises	30,318	13.0

1. Calculated as income less expenditure.
2. Pre-devaluation exchange rate used US$ 1.00 = Rp. 415.

TABLE B.9

PERCENTAGE OF SAMPLE WHICH HAD RECEIVED A BANK LOAN

	KIK/KMKP	Near KIK/KMKP	Both	Neither
Trade	16 %	14 %	8 %	62 %
Service	18 %	16 %	5 %	61 %
Industry	22 %	0 %	4 %	74 %
All enterprises	18 %	11 %	6 %	65 %

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One interesting feature is that many of the business in the trade and industrial sectors considered their premises inadequate, being either too small or out of date, but had made no attempt to improve them or move to new premises, partly because the majority of business men owned their own place of business.

In terms of business efficiency, it appears that there is little centralization of the business process production levels. Wastage or quality improvements were mostly due to the introduction of new equipment or machinery, and increased skill due to experience. Innovation, or the introduction of new techniques are rare. Where businesses use outside labour in the trade sector, employees do not appear to stay long or have any loyality to the firm, nor do they receive much training. They receive low wages and are easily replaced. The situation is somewhat better in the service or industrial sector, though management functions are nearly always kept within the family.

In general, performance in many firms was weak, due in the main to: a lack of active marketing, competition being restricted to pricing a lack of organisation as regards resource allocation and planning, lack of systematic management and lack of creativity and innovation.

One important element affecting enterprises is the business climate in which they operate. This is determined by the relationships between businesses, between indigenous firms and indigenous with non-indigenous, and the relationship between business and government and its officials, as well as the physical environment in which they operate. As regards the first there is a marked lack of cooperation between indigenous businesses, a reluctance to trust each other and come together formally or informally. This is in contrast to non-indigenous enterprises. The relationship between indigenous and non-indigenous enterprises is based on necessity, the former often depending on the latter for supplies or wholesale services and credit, but there appears to be resentment between them. One problem is that the indigenous entrepreneur lacks power and because he has no organisation to back him up he cannot exert any pressure when he feels disadvantaged or unfairly treated.

The relationship with government also causes resentment and is considered time consuming. Complex laws,regulations and procedures appear confusing and inhibiting to development. Basic infrastructure is frequently lacking. Finally, requests for illegal payments at each stage and for most transactions stultifies growth - not only for small enterprises - and discourages effort and risk taking.

The small entrepreneur like his larger counterparts is trying to operate under difficult physical circumstances and has to contend with the poor existing infrastructure, bad roads, inadequate water, interrupted power supply and poor communications.

In conclusion, indigenous enterprises have to contend with many problems which discourage entrepreneurship and are a disincentive to economic growth. Chief among these must be restrictions on access to credit and lack of know-how.

B.1.4 PRINCIPAL EXISTING PROGRAMS

B.1.4.1 Vocational Training

The principal existing sources of vocational training include provincial level programs run by the Department of Manpower, Penmas and the Department of Industry. These are briefly described below.

B.1.4.1.1 Department of Manpower

The Department of Manpower is responsible for the implementation of four training programs: (1) B.L.K.I., (2) Integrated Training for Dropouts, (3) V.P.K.K., and (4) PLM.

heir characteristics are summarized below:

- Vocational Training by B.L.K.I.

a. The purpose

This institute runs the training programs for job-seekers and workers which provide specific types of technical skills. It is expected that, after training, the job-seekers will be able to find jobs in industrial enterprises, and the already employed workers will increase their technical skills so that they will be able to imrpove efficiency, productivity and income when the go back to the enterprises where they work.

b. Target Groups

Job-seekers and workers of the enterprises.

c. Budget

Training for the job-seekers is financed by Central Government (Department of Manpower), whereas employed workers training is financed by the enterprise which sends them to the institute. The training financed by the Central Government for the period 1975-1980 is shown as follows:

Period	No. of Trainers	Cost of Training
1975/76	120	Rp. 25,495,500
1976/77	100	21,500,000
1977/78	50	10,500,000
1978/79	60	13,731,000
1979/80	188	43,120,000
	518	Rp.114,346,500

Source: Kanwil Ditjen Bina Guna Departement Tenaga Kerja dan Transmigrasi Propinsi Sumatra Utara.

d. Program Coverage

The job-seekers or the workers are trained in the workshop for 4-10 months to have particular types of skills in:

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- Automobile repairs and services
- Electrical installment and repairs
- Welding
- Metal works
- Wood and metal construction
- Pipeline and sanitary installment and repairs
- Particular metal welding.

2. Integrated Training Program for Dropouts

a. The purpose

This program is set up to provide dropouts of junior and senior high schools with particular skills before they enter the labor market.

b. Target Groups

Dropouts of secondary and high schools of all districts (Kabupaten and Kotamadya) in North Sumatra.

c. Budget

This program is financed by the Provincial Government (APBD). The total budget for 1979/80 is Rp. 75,000,000.- of which Rp. 30,000,000 is allocated to Department of Manpower. The balance, amounting to Rp. 45,000,000 is allocated to other agencies such as: Department of Industry, Agriculture, Social Affairs, Education. These Departments will also perform training for the dropouts.

d. Program Coverage

This program is financed and coordinated by the Provincial Government. A committee chaired by the Chief of the Public Welfare Bureau of the Governor's Office has been established consisting of representatives from agencies which are involved in this training program.
The number of dropouts who will be trained under the Department of Manpower is 400. They will be trained in BLKI for 4 months.
The type of skills provided in this program are:

- Tailoring/embroidering
- Carpenter
- Shoes-making
- Automobile and motorcycle repairs and services
- Welding
- Lathe-works
- Radio and T.V. repairs and services
- Battery Services
- Bamboo handicraft
- Animal husbandary
- Cigar-making

- Cloth-wearing
- Pandan handicraft
- Brick-making
- Ceramic handicraft
- Rubber sortage
- Cracker processing
- Sulphur processing
- Cycle repairs
- Coroseries painting
- Machineries repairs

3. Vocational Training through UPKK Program

a. Purpose

The UPKK program is aimed at training the job-seekers within enterprises in North Sumatra.
Enterprises participate in this project by receiving the job-seekers to be trained for a period of 4-6 months. After training the trainees are to be accepted to work in such enterprises.

b. Target Group

Job-seekers.

c. Budget

The cost of training comes from Department of Manpower (APBN). The trainees will pay the cost back (10% of their salaries each month).
The number of trainees and cost of training are shown as follows:

Period	No. of Trainee	Cost of Training
1975/76	50	Rp. 5,499,995
1976/77	123	7,269,000
1977/78	125	12,321,000
1978/79	300	30,275,680
	598	Rp.55,365,675

d. Program Coverage

Thus far, the apprenticeship training opportunities have provided skills in:

- Automobile repairs and services
- Machinery repairs and services
- Confectionary works
- Shoe-making
- Furniture making
- Tailoring/embroidering

- Fez-making
- Bag-making
- Wood-carving
- Motor-cycle repairs and services
- Radio/TV repairs and services
- Battery services
- Aluminium

4. Vocational Training by P.L.M.

a. The purpose

This institute provides management training to upgrade the skill of economically weak employers in order to improve efficiency and productivity in their firms.

b. Target Group

Economically weak employers.

c. Budget

This training program is financed either by Central Government (Department of Manpower) or the enterprises that sponsor the trainees.
The training financed by Central Government is shown below:

Period	No. of Trainee (employer)	Cost
1976/77	75	Rp. 8,239,150
1977/78	25	2,744,000
1978/79	50	3,736,035
1979/80	25	2,480,000
	175	Rp.17,199,185

Economically weak employers are also trained for 1-3 weeks to have additional knowledge in management. This program also provides followup guidance to the enterprises for 3-10 months.

B.1.4.1.2 Penmas

Non Formal Education (Penmas) Program

a. The purpose

The Penmas program, sponsored by the Ministry of Education, seeks to create and increase the non-formal learning opportunities available outside of the formal school programs at minimal cost.

b. Target Groups

The target groups include both youth and adults (age between 7-45 years) with special priority given to groups between 10-24 years old. Within those age groups the program seeks to serve school dropouts, illiterate people, unemployed and partly unemployed persons, unpaid and low income people, and unhealthy people.

c. Budget

The Penmas program is financed by Central Government. Regional allocation are based on the number of illiterate people served, population number, and real program coverage. The national budget of Penmas in 1979/80 is Rp. 6.0 billion (including foreign loan/assistance). The budget for North Sumatra in 1978/79 was Rp. 30.0 million and it was increased to Rp. 100.0 million in 1979/80. From this budget, only about Rp. 1.7 million and Rp. 5.8 million were allocated to Medan for 1978/79 and 1979/80, respectively. The cost of training program is based on the following unit costs which are set by Central Government (before November devaluation):

Type of Training	Duration	Number of Participants	Cost
Literacy Program	3 months	10	Rp. 29,000
Workshop training	180 hours	20	" 200,000
Basic Skills Training	180 hours	20	" 200,000
Office/Administratives	144 hours	20	" 150,000
Language	144 hours	20	" 100,000
Special Skills Training	144 hours	20	" 100,000
Family Educations	144 hours	20	" 58,000
Tutor of Literacy	12 days	10	" 70,000
Tutor for Family Education	100 hours	20	" 250,000
Other Tutors	100 hours	20	" 70,000

d. Program Coverage

In 1978/79 a total of 577 Medan people were trained by Penmas: 47% in literacy program, 21.8% in tutor training, 23% in family education, 34% in English language, 4.8% in basic and pre-vocational training. The 1979/80 program plans to cover 2,300 people with the following distribution: 55% in literacy program, 26% in family education, 5.2% in basic skills, 7.8% in workshop training, 6% in language and administrative training. Education cost per trainee was Rp. 2,902 in 1978/79 and Rp. 2,502 in 1979/80. Three types of training were given: 1) "Magang" system in which trainees are placed in the firm or workshops; 2) training by local resources; and 3) training in which external resources is used.

e. Problems and Potential

Among the problems which limit the effectiveness of the Penmas operation are: shortage of budget (the unit costs may be too low); lack of equipment and teaching aids; low payment for tutors (presently is less than Rp. 500 per hour); difficulties in getting places for conducting the courses; reduced skills and pre-vocational training components. In 1979 Penmas, North Sumatra received assistance from the World Bank. The purpose of the World Bank's assistance is to strengthen the Penmas institution so it can perform its functions more effectively. Components of the World Bank's assistance are:

- Construction of Balai Penmas (Penmas office) in Medan
- Provision of office equipment and vehicles
- Training/courses for officers, instructors
- Development of learning materials
- Program development (learning fund, supervision, evaluation and monitoring)
- Technical assistance (further studies for Penmas officers in local universities and abroad)
- Project management.

The assistance will be completed in 1983/84. The assistance budget allocated for 1979/80 is Rp. 200 million.

B.1.4.1.3 The Department of Industry - North Sumatra

BIPIK

a. Purpose and Target Groups

The vocational training program (BIPIK), run by the Department of Industry, trains managers or labourers from small industries, - particularly in production methods for improving the quality of their products as well as in administrative aspects such as marketing, book-keeping etc. The specific target groups are:

1. Small industry managers/owners and labourers.
2. Schoop dropouts.

b. Budget

The BIPIK program is financed by Central Government (APBN) and annual allocations are based on the D.I.P. proposed by Industrial Department (BIPIK Section). The national budget for BIPIK program in North Sumatra in 1977/78 and 1978/79 was Rp. 47 million. For 1979/80 and 1980/81 the budget proposed to Central Government was Rp. 31.9 million.

c. Program Coverage

Generally, the Industrial Department (BIPIK Section) has sufficient staff to perform the training, especially in production method. As necessary, they invite trainers from other departments in North Sumatra, particularly in administrative aspects including marketing. From 1977/78 to 1978/79, 75 people had been trained. Approximately 30 percent out of them were from Medan. The costs were approximately Rp. 30 million (including materials used). Beyond specific training focussed on the marine industry (boat building), shoe-making, rattan and handicrafts, the Department of Industry has built a number of services centers for small industries which produce rattan furniture, ceramics and shoes. Efforts are being made to mobilize and organize cooperatives among the specialized crafts served by these centers. Additionally, the Department of Industry inaugurated a small program in the above mentioned sectors to send the owners of small industries to other towns and districts in order to that they might learn from the experiences of similar types of enterprises.
The projects proposed for 1979/80 and 1980/81 include the following:

Type of Training	Duration	Number of Participants	Cost
Rattan Processing	20 days	30	Rp.3,000,000
Motivation Training	30 days	25	" 9,000,000
Trainer Training	2 months	20	" 2,000,000
Trainer Field Trips	900 mandays	n.a.	" 2,700,000
Shoe making	20 days	20	" 4,000,000
Rattan Production Management	20 days	20	" 4,000,000
Follow up Technical Assistance to small industries	1,800 mandays	n.a.	" 7,200,000

d. Problems and Potential

Apart from the major constraints imposed by its limited budget, the BIPIK program has encountered a number of problems which it is taking steps to resolve. Thus, far program participants, although enthusiastic about the training, have been extremely reticent to lose income for days not worked during the training period. Also, some participants have been unable to implement the skills which they received during training because of their inability to purchase required equipment and facilities. In order to help to resolve these problems, the Industrial Department has inaugurated a joint effort with Medan Banks in order to facilitate trainee participation in the KIK and KMKP credit programs.

B.1.4.2 Credit Facilities for Small Scale Enterprises

The KIK (small investment credits) and KMKP (permanent working capital credit) were set up in 1974 by the Government of Indonesia to try to redress the imbalance of capital intensive investment and encourage small scale investment and job creation. While the program has had some success, problems have developed. These include poor debt collection and a reluctance on the part of banks to extend the schemes because of the inherent risks. Thus far Medan has not been included in a technical assistance programme to help SSE's who are KIK and KMKP beneficiaries. Currently KIK and KMKP loan conditions permit a maximum loan of Rp. 10 million which can be extended to establishments in any sector whose assets do not exceed Rp. 40 million and where annual turnover is below Rp. 15 million. The interest rates are subsidised 10 1/2 percent for KIK and 12 percent for KMKP.

Both programs remain small in North Sumatra, and the condition processing procedures may deter small business from applying.

A third program, the credit Mini program, is only operated by the one bank with funds lent from the Bank of Indonesia at concessionary terms. Loans range from Rp. 10,000 to Rp. 100,000 and attract an annual interest of 12 percent over one to three years. Although the program is flexible regarding repayment schedules, it has had only fair success as default rates are high.

The North Sumatra programme is less than 3 percent of the National Programme. Medan receives nearly 30 percent of KIK funds in the province and nearly 40 percent of KMKP funds. If the figures for total credit are deflated by the General Cost of Living Index, the following set of figures are obtained for the allocation of these funds at January 1977 and July 1979.

	1973 Rp.	1977 Rp. Current	1978 Rp. Constant
Total Credit Outstanding	50,466	164,272	81,082

Total credit in real terms increased 60 percent over five years or 10 percent a year. If the total KIK and KMKP program for North Sumatra is taken from January 1977, and a rough estimate of price increases made to July 1979 (full data is not yet available), the programme would still have doubled in real terms in the year and half period.

However, sectoral distribution is more significant than the number of loans, which will vary according to the time of the year. For example, there appears to be an increase in loans to commercial enterprises which will not necessarily be productive, and could include doctors, lawyers and offices.

Although KIK and KMKP have only been in operation for five years, the government is currently planning to introduce additional credit facilities, though details of these schemes are still not firm. Two schemes are being introduced which will aim to extend a larger credit facilities than KIK and KMKP.

The first scheme will be administered by Bapindo (Bank Pembangunan Indonesia, - the Development Bank of Indonesia), in collaboration with the Regional Development Banks, to encourage investment in manufacturing. The source of funds will be international agencies and Bank Indonesia. Details are not yet available, but the scheme should be introduced in 1980 in selected Provinces, almost certainly including North Sumatra. It is understood that the scheme will operate in a similar manner to KIK but the ceiling for loans will be Rp. 50 million compared to Rp. 10 million for KIK. The other credit plan, - credit kelayakan - will be introduced in late 1979 and is designed to extend credit to economically weak activities and sectors. In particular, this credit program will be used to finance the production of export commodities; the production and distribution of nine basic foodstuffs, and DIP and INPRES projects and other activities mentioned in KEPRES No. 14 - 1979.

The credit limit will be Rp. 75 million per loan, and the loan will not need to be secured against high levels of collateral, but rather against an appraisal of future potential and profitability.

Other conditions of the loan will be similar to existing credit schemes, and it will be reserved for Indonesian enterprises only. The interest rate will be 12 percent, loaned over five years, and up to 90 percent of required finance can be borrowed. All state banks are understood to be participants in the scheme.

B.2 PROPOSED PROGRAMS AND ACTIVITIES

B.2.1 THE ROLE OF PROJECTS DESIGNED TO INCREASE EMPLOYMENT AND PRODUCTIVITY IN MEDAN

An increase in employment and/or productivity in Medan is clearly a prerequisite for any major improvement in low-income household consumption assets when these improvements are to be achieved in the market place. In many cases it is also a prerequisite for continuing improvements in public services if Medan's low-income households are to be charged economic or near-economic prices for such improved services*.

At least four possible purposes should be borne in mind in undertaking projects to increase the employment and productivity of the city's low income groups: (1) increased employment, (2) increased productivity and income, (3) increases in the supply of consumption goods and assets that meet the specific needs of low-income groups, and (4) achievement of a sense of purpose and a capacity for subsequent self improvement as well as a sense of a hope in the low-income participants in such projects, whether they be labourers or low income entrepreneurs.

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* In Medan, however, it should be possible to achieve increases in consumption by decreasing, rather than increasing, the unit costs of services for the poor -- in the water supply, for example, where low income households previously have had to buy water from private vendors and no longer need to do so, or where the number of connected private household vendors is increased, thus potentially increasing available supply and lowering the market price to such low income groups.

A continuing demand for the outputs of projects designed to increase employment for low-income groups will be required to sustain such projects. Such increased demand may be external or internal. Changes in the productivity of Medan's low income individuals will also result from the proposed improvements in water and sanitation, health and education which increase productivity directly, or for those and other changes (the availability of credit, price changes or proposed changes in taxation which benefit the poor) which increase motivation and thus influence productivity indirectly.

Some of the most important instruments to increase employment and/or productivity will be basic policies which affect levels of demand, and individual productivity (i.e., export and import policies, labor policies, domestic credit policies, policies concerning user charges for public services, basis taxation policies and policies concerning the delivery of services to the Medan's low income households). While some of these policies are national in nature and are not easily controlable in Medan, many of the policy changes recommended in support of the proposed immediate action projects (i.e. water connection changes and rate structures, tax assessment levels and procedures, integrated multi-sectoral KIP programming etc.) will be at least as important as (often a prerequisite for) achievement at the project level.

Those high priority policy changes necessary to support the proposed housing and water and sanitation projects are described in the respective volume of the MUDS reports. The recommendations in this section are limited to the role and potential of those current government efforts in the field of employment and productivity through training and assistance to individuals and small scale industry in Medan. As implied in Section 1 of this appendix, current efforts are quite minimal despite a recognition of their importance. Medan is clearly still in an incipient stage of development.

Efforts are small in scale, bot in terms of numbers and financing. At present, virtually no coordination exists between the principal responsible agencies. The problem is not just a question of additional financial resources (although more resources are required), but rather the need to more effectively mobilize and coordinate all available resource under a broad strategy and implementation framework which makes maximum effective utilization of the existing limited resources while setting the basis for augmenting and improving existing levels of vocational training and assistance efforts progressively over time as additional funds become available.

B.2.2 GUIDELINES FOR DEVELOPING PROJECTS WITH POTENTIALLY HIGH IMPACTS

The different types of projects that are worth considering can be grouped in three categories* each of which requires somewhat different types of government action, although they also have many elements in common: (1) support for individual private enterprises; (2) support for cooperatives; and (3) projects designed to increase the productivity of individuals directly through training or other assistance outside (although not necessarily independent of specific enterprises).

* A fourth, direct government hiring of labor is not covered in this Appendix.

In each category, each sector will have very specific project requirements that are too numerous to be described here. Project indentification and preparation usually will require specialized skills for each sector. All that will be attempted here is to suggest types of projects that will be capable of sustaining or building up their own momentum after initial governmental support has been provided.

B.2.2.1 Support for Individual Enterprises

If Medan is to fulfil its role as a growth centre as designated by Central Government policy then it will be important to enable small and medium sized businesses to develop their potential and expand so as to contribute to local economic growth. Current support for private enterprise through the Departments of Manpower and Industry as well as KIK and KMKP, although extremely limited in coverage, does attempt to provide both credit and technical assistance to individual enterprises.

These efforts must be better coordinated at all levels under a common inter-agency policy framework. A strategy to support private enterprise through such assistance should be concerned with the creation of new entrepreneural activity and job opportunities that would be unlikely to be available without support (for example, where initial support gives potential small-scale entrepreneurs the confidence and capacity to launch new enterprises that they could not undertake alone, or where it induces in established entrepreneurs a willingness to expand labor-intensive activities or launch new product lines that they would not otherwise risk). It should be concerned also with the reinforcement of existing entrepreneural activity to measure productivity as well as open up additional job opportunities in existing types of activity. In the latter area, for example, it often will be desirable to encourage rather than discourage the joint use of space for both residential and small manufacturing, trade or service functions.

The distribution of credit and technical assistance by sector should ensure that loans go to sectors which will generate real growth, and satisfy those areas of increasing demand. If the overall commercial demand is not increasing, the number of supplies may reduce each enterprises value added. It might be advisable to give certain types of loans a priority rating. The manufacturing sector is perhaps the best-recognized area of opportunity for such project assistance, but other sectors may have a frequently-overlooked potential also.

Small-scale retailing, even down to the scale of "informal sector" street vending, is a large employer in Medan's economy. Indeed, vending and similar activities are often mistakenly regarded as "marginal" and "nuisance" activities to be discouraged as much as possible. A more constructive approach would recognize the long-term role of small-scale trade and service activity in Medan and the opportunities for intermittent income-supplementing employment, as well as principal employment they provide. To assist rather than discourage such activity, it may be useful to provide minimal infrastructure (such as dry, paved spaces for vending, public water supply, basic night lighting and adequate refuse collection); it may be possible also to provide credit support to supplant private borrowing of working capital at exorbitant interest rates.

The construction sector normally could be expected to provide growth and relatively great ease of entry at a small scale. It is not uncommon in Medan to find even low-income households paying small contractors to build basic housing for them.

However, the construction sector's contribution to Medan's economy has been unspectacular. It provides only about 5 percent of Medan's employment and only 4.8 percent of Regional Gross Domestic Product. Within the Medan region (Region A-WPU-A), the generation of new housing, a primary component of construction, has accounted for only 3.4 percent of the regional growth, which is less than the sector's contributing to North Sumatra's growth, 4.3 percent. The total volume of construction has been small due in large part to a lack of finance for new projects and the high costs of the finance. As mentioned, short term interest for construction financing can equal up to 15 percent of total project costs.

Despite its limited role in the Medan economy, the development of specific new programs for the construction sector seems unwarranted. However, labor productivity in this sector could be increased and the quality of the product delivered to the low-income household improved, through credit technical assistance for small-scale contractors provided through the KIK and KKMP programs. Perumnas might also play a supportive role by providing specialized technical assistance to its small scale contractors on the Medan III project. The type of assistance likely to be especially useful include assistance in costing, materials purchasing, work scheduling, construction techniques and especially credit financing. In addition to direct support for small contractors, there are opportunities to upgrade the quality of construction and increase employment and productivity through direct hiring in the public sector; opportunities for this within the proposed housing and water supply and sanitation projects are identified in their respective volumes of the MUDS Report.

Because of the variety of types of projects that might be undertaken, the only generalization that can be made about the time likely to be required for beneficial impacts on the poor to be felt is that it may range from "almost immediately" to several years. The provision of new credit for small and/or labor intensive enterprises may swell employment very quickly when that credit is used for working capital. On the other hand, the introduction of improved construction techniques may take a year or more.

The variety of project opportunities available suggests that many target groups among the urban poor are likely to be able to benefit in terms of increased employment and productivity if projects are well conceived. However, projects of this type may have little or no impact on those who are relatively unemployable because they are especially deficient in skills and/or motivation -- perhaps as a result of inherent personnel limitations or because they have been at a subsistence level for so long that they have lost hope of being able to improve their condition. Problems of these types may require special support measures that cannot easily be provided assistance to private enterprises alone.

The following assistance program for individual enterprises in the private sector is, however, recommended as a appropriate.

1. Assistance to small and medium scale enterprises in Kotamadya Medan in the form of a credit programme and technical assistance to improve existing business operations, focussing on marketing, product quality and business management and planning, as well as to provide credit for the formation of new businesses, particularly in the industrial sector.

2. Special emphasis within this program should be placed on extending credits and assistance to businesses located within the kampung areas selected for KIP.

3. A small pilot scheme should be initiated to encourage the development of SSE's at the Medan III housing estate. This will be located some 10 kms along the Brastagi road. Though outside the centre of Medan it is close to much commercial activity should be a suitable area to develop a sub-centre. This scheme should focus on the creation of new enterprises or maybe help business transfer to the new site. Initially, enterprises connected with the production and supply of housing materials and construction would appear to have promising possibilities as the core houses will require extensive work. Second, at the Medan I site spontaneous growth of commercial activities is evident though not all the commercial lots have been filled and not much new small manufacturing activity appears to have developed, this could be encouraged at the Medan III.

   One problem that is foreseen is that if self-employed person or persons wanting to set up in business cannot obtain a housing loan because preference is given to families where the wage earner has been in steady employment for ten years. If such is the case, then the scheme would be restricted to second wage earners, or persons starting on subsidiary business activity. On the 160 hectare site approximately 8,400 housing units are planned, which should give scope for a pilot scheme of 500 loans.

4. In addition, a local training program for bank staff and technical assistance to aid beneficiaries would be required, so that the scheme could be administered locally. Emphasis should be placed less on strictness in granting loans but much more on cutting administrative costs and on monitoring repayments and on prompt debt collection, so as to avoid businesses getting into arrears. Careful monitoring of the development of the business during the grace period could help businesses to establish themselves on a second basis.

B.2.2.1.1 <u>Potential Beneficiaries</u>

The potential beneficiaries for the program if operated on a city-wide basis would be drawn from the estimated number of 4,800 indigeneous

industrial enterprises and some 4,500 indigenous trade and service operations - giving a total of 9,300 establishments, of which cover 90 percent could be classified as SSE's - if defined as enterprises with less than 20 employees.

As of July 1979, there were in Medan, 425 businesses benefiting from KIK program loans, and 1,549 receiving KMKP credit, or only 2,274 persons in all. The total value of loans in Medan in July 1979 stood at Rp. 6.7 million, under one percent of the total for the country. It is considered that over a 2 year period, credit for another 2,000 loans should be made available for Kotamadya Medan, of which 250 would be allocated to KIP residents and 500 to the Medan III housing estate.

At present each loan is on average Rp. 3.5 million for KIK and Rp. 2.7 million for KMKP but it is envisaged that the amount borrowed will increase to say Rp. 4 million for KIK and Rp. 3.5 for KMKP. Also, the proportion of KIP to KMKP loans may increase. Thus if an average of Rp. 3.5 million is taken for loans, the total loan program would be Rp. 7.0 billion or US$ 11.2 million. It is recommended that the potential of business schemes should be evaluated and that a scrupulous monitoring system be introduced so that advice can be given if trouble develops with the business. It is recognized that credit loans to small businesses are inherently risky, which makes the need for advisory and support services more important. Insurance through ASKINDO (P.T. Asuransi Kredit Indonesia) would go part of the way to meeting this risk.

B.2.2.1.2 Employment Creation

The capital/labor ratios of jobs created in North Sumatra through KIK/KMKP is not known. A sample analysis by sector in 1975/76 of KIK/KMKP receipts gave the following results:

- Rp. 500,000 per job in the trade sector
- Rp. 530,000 per job in industry
- Rp. 1.9 million per job in transport
- Rp. 1.5 million per job in small hotels and other services or approximately Rp. 1 million on average. Furthermore, the fixed asset per employee ratio will be very much less for SEE's than for large firms, probably about one tenth.

While maybe only 40 percent of the loans would go to new enterprises, many of the existing enterprises should be enabled to expand. Unit job creation should exceed the number of loans, though initially in Medan it may be more important to improve methods of production through the purchase of new equipment and machinery than the create jobs. Emphasis should be placed on loans for small manufacturing, export creation and private service establishments which would help with marketing, exporting and expansion of distribution for manufacturing units.

B.2.2.2 Support for Cooperatives

Support for cooperatives in Medan may be a particularly useful form of project support for achieving the fourth objective mentioned at the beginning of this section -- the establishment of a mechanism for

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sustaining momentum for self-improvement -- as well as the other three. Significantly, very few effective cooperatives have been developed in Medan. As mentioned earlier, the Department of Industry has built a number of service centers for small industries and efforts are being made to mobilize and organize cooperatives among the specialized crafts served by these centers.

Kampung groups such as the Lembaga Masyarakat Desa (LMD) and Lembaga Sosial Desa (LSD) have been effective in planning and implementing projects of limited scope as construction of drains, installation of street lights and construction of small public buildings. However, these organizations have not been used in saving schemes, nor have they engaged in long term program such as would be required to form a housing cooperative.

Housing cooperatives could probably not be successfully established in Medan since local level organizations such as the LMD or LSD do not have the management capabilities to run them, nor are they organised for such purposes. They could, however, be used in new housing projects and in KIP areas to provide maintenance of public areas and possibly to construct public buildings. Such activities might from the basis for the development of consumer and credit cooperative as communities develop their capabilities.

Efforts of the proposed KIP community workers should, at least in part, be focussed on the development of cooperatives to meet such needs (see Section 5.4 Community Participation). The ongoing efforts of the Department of Industry for Medan should also be expanded as additional funds become available and closely coordinated with the KIP.

As in the case of individual enterprises, the variety of types of project that might be supported is so great that the time required for benefits to be felt will vary greatly.

The range of types of activity that can be supported is such that many target groups can benefit from projects based on cooperative structure. The exceptions are likely to be of those who have not property rights, thos who are only in transit in their present residential areas and/or jobs. Households and individuals in these categories may well lack the commitment to a locality or work group that seems to provide part of the base needed for effective cooperative organization.

The types of assitance needed are likely to include all of those indicated for assistance to individual enterprises, often with a special emphasis on the purchasing of materials and the marketing of products to take full advantage of the cooperative form of organization. In addition, special attention is likely to have to be given to technical assistance and training in management and finance, including an inculcation of the rights and responsibilities associated with cooperative membership.

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B.2.2.3 Projects Designed to Increase the Productivity of Individuals

As mentioned earlier, there must be a real demand if any employment oriented project is to have sustained success*. Provided that demand exists, other types of projects may focus on the supply side -- that is, on increasing the productivity of individuals directly so that they can take advantage of existing or new demand. Such productivity-oriented projects can be classified in two broad categories:

1. Projects intended to increase worker productivity generally.

2. Projects intended to increase productivity for a specific skill or a specific range of skills.

The purpose MUDS immediate action projects are of the first type and incorporate such things as water supply, sanitation, nutrition, personal health care and literacy. Projects of the second type are designed to develop a specific set of skills; they often need to have projects of the first type undertaken with them if they are to be fully successful.

The projects of the first type will be basic ingredients of the Kampung Improvement Programs and the overall water and sanitation projects. A word of caution is in order on projects of the second type. Training, by definition, is likely to be a relatively slow yielding activity, especially when it is undertaken outside ongoing enterprises. It can, however, provide an opportunity to reach well down the income scale and assist previously unemployable people to become employable.

Thus far, however, government policy on skill formation and worker training is not fully implemented. While the need for training is recognized in Repelita III, programs are small, inadequately organized and their budgets are low. Training is entrusted to more than one agency or department and they tend to operate undependently. As a result, responsibilities overlap. Most programs appear to be directed at the cottage industry level covering handicrafts, tailoring, shoemaking, etc., and a few to learning a basic skill, but they cater to only a few persons each year. The future development and productivity in manufacturing will depend on workers acquiring appropriate skills. Some method of encouraging firms to provide training or, providing greater technical training through coordination of municipal or central government programs must be found.

Until this is accomplished more fully than presently, the rapid expansion of current vocational training efforts, is not recommended despite the merits of some current individual agency efforts.

Rather, as actions are being taken to remedy the institutional and administrative base for training, efforts should be directed at the need to make low income individuals particularly youth more employable through

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* Specific actions to be taken to stimulate economic growth and consequently demand are outlined in Section 2.2 and Appendix A2 and A3 of Volume III, The Long Term Urban Development Plan Report.

basic skills training and pre-vocational training programs carried out at the Penmas. The recommended primary target groups for an expansion of such programs are the residents of the low income kampungs to be upgraded during the first stage of KIP. An estimated 4,000 KIP area residents mostly school dropouts, would form the target population for an expansion of the Penmas programs in Medan. Particular efforts should be made to identify and design specific training projects to increase local income and employment through the development of basic skills such as carpentry, masonry, sewing, engine repair, office and business administration etc., and through support for home industries which can be organized into cooperatives.

The proposed Penmas project, designed to increase productivity outside specific enterprises, is likely to be most beneficial for the unemployed. Properly designed, they should be able to reach a wide variety of types of unemployed individuals, including women with continuing family responsibilities who can undertake only part-time employment.

Further, the Penmas employment oriented action program should be fully integrated with efforts to awake productive community participation. Its principal objectives are to develop local skills and talents while participating in broader KIP efforts to identify and organize home industries to produce income and employment where none presently exists.

The program would increase the knowledge and skills of its participants, subsequently increase their productivity and income, reduce youth deliquency, encourage the development of small scale industries and reduce unemployment, particularly in high density areas. It would provide graduates of the program with certificates valid for entering vocational training programs. To do so, the program would have the following components:

- Expansion of the existing PENMAS program to cover 4,000 school dropouts and 2,000 secondary school dropouts,
- Recruitment and training of tutors and to participate in the program,
- Local technical assistance for PENMAS in tutors training programs,
- Construction of a training center, including the provision of equipment and supplies.

The construction and equiping of a "resource center" is recommended based on the needs of an expanded Penmas program in the KIP areas. This building would function as a training center and serve, not only the KIP areas, but the entire target population of Kecamatan Medan Timur, Kota and Denai. Considering Penmas' present capacity, it is estimated that the entire KIP area target population would be served in three years. The total program cost (including a teacher training program and teacher salaries for the first three years of the program) would be Rp.75.5 million.

Central PENMAS will be responsible for providing technical assistance for curriculum development, design of the training center, equipment and supplies.

The local PENMAS will be responsible for administering and coordinating the training program, local technical assistance for tutor training, selection of tutors and trainees.

The Provincial Public Works and Cipta Karya will supervise the construction of new facilities.

B.2.3 INSTITUTIONAL DEVELOPMENT

As mentioned earlier, the activities of the principal Institutions involved in Vocational Training and assistance to small scale Enterprises in North Sumatra such as Department of Industry, BINA GUNA, PENMAS, Department of Commerce, Bank Indonesia etc. are not well coordinated.

At the Provincial level these institutions sometimes share information about their respective activities in training and credit assistance but there is no followup cooperative work among them.

In the process of planning, for example, Department of Industry receives proposals from lower level of the Department/Dinas namely from its branches at the Kabupaten and Kotamadya level. In this process it is expected the Bupati or Mayor had sinchronized the activities planned in his area including vocational training. This is seldom the case. No compehensive manpower training and employment policy and program for Medan exists, either at the Kotamadya or the provincial level, which could provide the basis for such coordination. Furthermore, no effective mechanism has as yet been developed to achieve the integrated annual planning and inplementation of the government's programs and projects to increase employment and productivity of Medan's population.

Based on this fact, in 1979/80 a Training Coordination Body was organized by the Governor of North Sumatra to coordinate the inter-agency efforts on a special training program for dropouts. It consists of the provincial Bappeda, Bank Indonesia, the Manpower Department, and the provincial departments of Commerce and Cooperatives, Agriculture, Community Development, the Economic Bureau, as well as the Research Institute of U.S.U. While the purpose of this Coordinating Committee is limited to one particular program, and it is too early to evaluate its performance, it is recommended that consideration be given to assigning this Committee broader responsibilities. These would include responsibility for:
1) Review and evaluation of all ongoing efforts in the manpower and employment field as well as the relevant action proposals contained in the MUDS Study Report, 2) Development of Integrated Manpower Training and Employment Policies and the Annual Planning, programming and financial mechanising necessary to implement them, 3) Provide ongoing Policy and Management Guidance to the respective agencies responsible for implementing specific action studies, programs and projects, to include ongoing efforts,

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as well as those proposed as part of the MUDS Study, and 4) Development of a regorous monitoring and evaluation system as an integral component of the global manpower training and employment program in order to evaluate the efficiency of each program component as well as to identify the social and economic impact of the program on participants and their communities.