

Table 4.2
Planning Framework for the Concept Plan Area

	Population	Factories (No.)	Commercial Facilities (No.)
Kg. Melayu Subang	9,800	10	20
Kg. Seri Subang	12,700	650	340
East of Airport	2,000	50	40
West of Airport	10,700	600	300
Total	22,500	660	360

Source: Study Team, Household Interview Survey

5) Selection of Master Plan Area

As a next step, a master plan area has been selected with due consideration to the following (refer to Figure 4.5):

- An area where priority for infrastructure development needs are considered high on the basis of the concept plan and the results of the assessment of local needs;
- An area considered as an integrated community, but it suffers from the adverse effects of urbanization such as land use confusion and environmental problems; and
- An area where the LR method is deemed effective or applicable.

4.1.3 Formulation of Master Plan

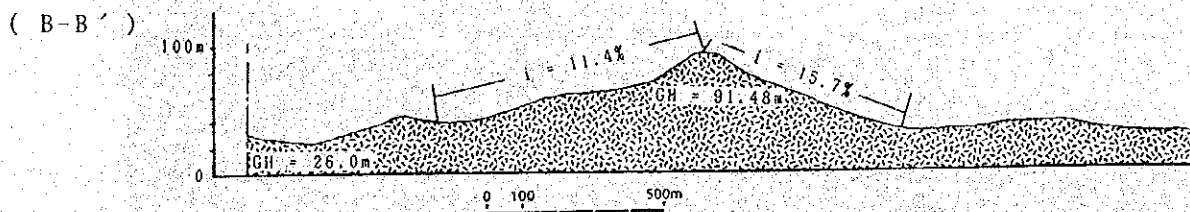
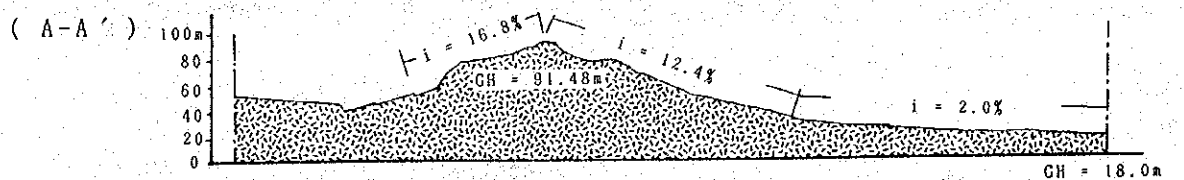
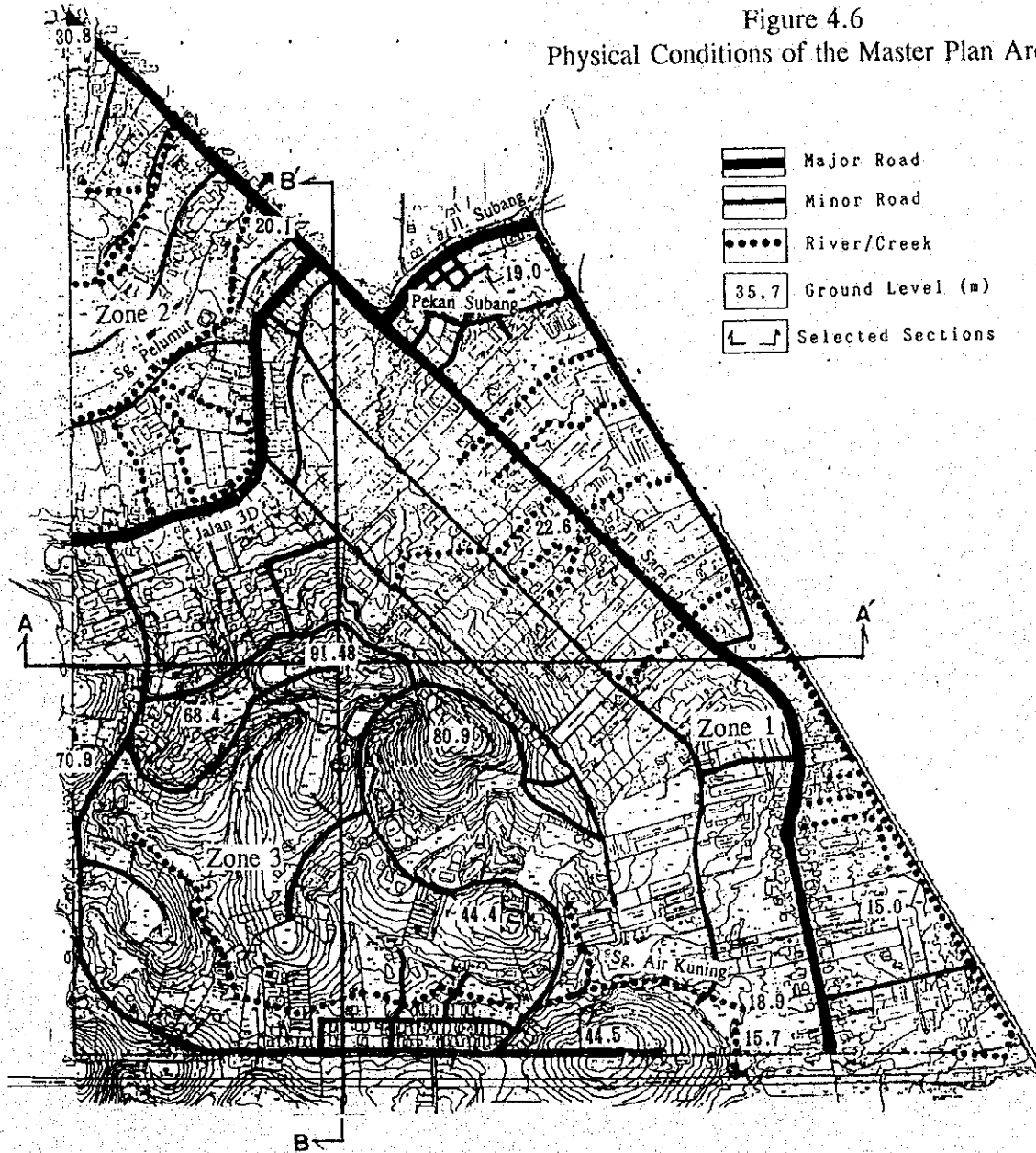
1) Profile of the Master Plan Area

A) Physical Conditions

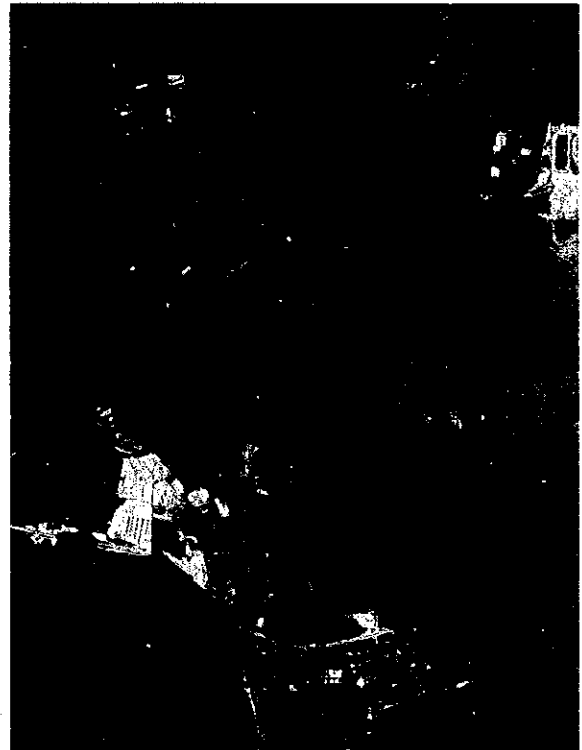
Zonal Characteristics: The master plan area encompasses 332.7 ha, wherein 529 households or 2,332 persons reside. The area is broadly classified into three zones (refer to Figure 4.6). Zone 1 (East), the area adjoining the airport and Jl. Saraf, is characterized as commercial and industrial use. The area is flat to gently sloping. Many settlements are mixed with factories. Zone 2 (North), the area located in the north of Jalan 3D, is dominantly for industrial use, though a mixture of industrial, residential and agricultural uses is also seen. Zone 3 (South West) has not been densely populated yet due to its hilly terrain and poor road network, although there are some factories mixed with housing. Agricultural activities prevail and a relatively large forest area still remains.

Terrain Conditions: In the master plan area, the summit of the central hill has the highest altitude of 91.5 m where the airport radar tower stands, while the lowest is 15.0 m at the southeast corner of the area. As for terrain conditions, the northern and eastern parts of the area are flat with a gradient of 2 - 3% while the southwest is hilly and steep. A few slopes have a gradient of more than 30%. There are some

Figure 4.6
Physical Conditions of the Master Plan Area



Aerial Views of the Case Study Area



Bukit Subang



Jalan Saraaf



places where outflow of soils had been traced to inadequate land development works. This poses a danger during heavy rains.

Roads: The area is served by three types of roads : those more than 12 meters wide around Pekan Subang; those 6-12 meters wide including Jl. Subang, Jl. 3D and Jl. Saraf; and minor roads less than 6 meters wide (refer to Figure 4.6). Public roads are all paved but they are not adequately maintained and existing pavements are not suitable for large vehicles. Private roads such as short access roads to factory areas are mostly unpaved.

Open Space: Even though there are abundant agricultural and undeveloped lands, open spaces planned for disaster prevention and recreational purposes have not been designated, except in Pekan Subang.

Rivers and Drainage: There are two rivers in the master plan area : Sg. Pelumut and Sg. Air Kuning. Both of them meet at Sg. Damansara and eventually join Sg. Kelang. The wastewater from homes and factories is discharged directly into gutters along the streets and flows into the rivers.

B) Social Characteristics and Needs

To identify the social characteristics of residents and establishments in the area and their area-wide improvement needs, an interview survey was conducted by the JICA Study Team between January and February 1994. The number of collected samples were 529 for households and 154 for establishments. The survey results are outlined below:

(a) Profile of the Residents

Socio-economic Profile: The area's population is a mix of Chinese (84.3%), Indian (8.1%), Malay (6.8%) and others (0.8%). In the population composition by age group, the share of the below nine years old groups in the area is very low; only 14.9% compared with the national average of 25.8%. More than half (58%) of the population is self-employed. Average household income is estimated to be RM1,138. The figure is considered to be uncertain compared with other statistical data. The residents own TV sets and video sets; refrigerators and motorcycles are common while air-conditioners are not popular.

Utilities and Public Services: About 88% of the area is provided with piped water, though there are still 13 wells in use. The area is provided with a proper sewerage system and 70% use flushing system while the rest use filtration of privy system. Around 70% of the households have private telephones and 12 coin operated public phones are available. Postal services are mostly provided through delivery, P.O. Box and Poste Restante. Garbage collection is poor with 70% of the area having less than a week's service and 18% no service at all.

Perception of Real Estate: The residents' land ownership is composed of owners occupied with leasehold (45%), followed by T.O.L (28%) and others. They do not mind the physical conditions of their lands since only 55% and 35% of the residents know the area and boundary of their lands, respectively. Some 58% of the residents

pay annual rents and /or assessment taxes. Almost all residents (97%) do not know the land prices where they live.

Housing: The houses are mostly detached (81.5%), followed by semi-detached (8.5%) and terrace houses (7.0%). Sizes vary from one room (8.4%) to five rooms and more (26.5%); the most popular is three rooms (27%). Ages of the houses distribute widely from less than 5 years to more than 30 years, which implies that constant inflow of population has occurred in the area. Houses are made of concrete, timber and brick and timber, which share equal percentage responses. Houses are mostly in good or fair condition.

Activity Area Coverage of Residents: The survey results indicate that the area is rather an independent community. Eighty three percent (83%) of the employed residents work within the area while the remaining commute to Shah Alam/Kelang (5.8%), Petaling Jaya (5.2%), Kuala Lumpur (4.7%), etc. Ninety eight percent (98%) of the students go to school within the area. Daily shopping by residents is made mostly within the area (97%), while occasional shopping within the area is only 58% ; 20% go to Kuala Lumpur and 16% to Petaling Jaya. Transportation modes used for these activities vary. For commuting, 30% walk, 27% use buses, 23% use motorcycles and 20% use cars. For schooling, 93% use buses. For daily shopping, cars are the most used (40%), followed by motorcycles (33%), and walking (23%), while for occasional shopping, the car is the major mode (56%) followed by buses (25%), motorcycles (24%), and walking (10%).

(b) Profile of the Establishments

There are 149 factories, 82 shop buildings and 43 small stall shops in the case study area. The factories are engaged in timber processing and furniture (39), metal and metal forming (35), workshop and junk (34), machinery (13) and others (food, fibre glass, soap, concrete, etc.). Shop buildings are concentrated in Pekan Subang (69) and in Kg. Seri Subang (13), while open air markets and small stall shops distribute here and there in the area. Most of these establishments have not been operating for long; about 10 years. This indicates that urbanization in the area started late.

(c) Specification of Improvement Needs

A set of questions were asked of the residents on their assessment of the current living environment and public services as well as the establishments in their business environment. The results are briefly described below:

(i) Assessment of the Residents (refer to Figure 4.7)

Infrastructure /Public Services: The respondents are generally satisfied with water and electricity supply, primary education, while not very much satisfied with roads, drainage, public transport, nursery, kindergarten. Dissatisfaction is expressed on park/playground, higher education, garbage collection.

Environmental Conditions: Environmental conditions are not highly appreciated. Except for security and water pollution, residents worry about noise and air pollution, natural environment degradation and sanitary problems.

Figure 4.7
Evaluation of Living Environment (Kg. Seri Subang Area)

CATEGORY	ITEM	Zone 1			Zone 2			Zone 3			Total		
		GOOD	FAIR	BAD	GOOD	FAIR	BAD	GOOD	FAIR	BAD	GOOD	FAIR	BAD
INFRASTRUCTURE AND PUBLIC SERVICE	Roads and Bridges												
	Parks and Playgrounds												
	Water Supply												
	Sewerage												
	Drainage												
	Public Transport												
	Health Care												
	Nursery and Kindergarten												
	Primary Education												
	Higher Education												
	Postal Service												
	Electricity												
	Garbage Collection												
ENVIRONMENT CONDITION	Natural Environment												
	Noise Pollution												
	Air Pollution												
	Water Pollution												
	Sanitary Problems												
	Security												
OTHER SERVICES	Daily Shopping												
	Banking Service												
	Entertainment/Amusement												
	Sports/Recreation												
	Religious Facilities												
	Cultural Facilities												
HOUSING LOT	Lot Space												
	House Space												
	No. of Rooms												
	Structure/Building Materials												
	Lot Shape/Direction and Location												
ECONOMY	Price of Daily Goods												
	Job Opportunity												
NEIGHBOURHOOD	For Children												
	For Housewives												
	For Aged												
ACCESSIBILITY TO AND FROM	Workplace												
	School												
	Shopping												
	Sports/Culture and Recreation												
OVERALL LIVING ENVIRONMENT													

☐ GOOD : Good or Sufficient or No Problem at all
☐ FAIR : Fair or Tolerable
☐ BAD : Bad or Insufficient or Problematic

Source: Study Team, Household Interview Survey

Other Services: Dissatisfaction is shown about amusement and recreation/sport, while daily shopping, and cultural and religious facilities need to be improved.

Housing and Lot Size: Housing conditions and lot size are relatively satisfactory.

Economic Aspect: Job opportunities are satisfactory while price of goods is a concern of the residents.

Neighborhood: Neighborhood environment is more appreciated as a working place than an area of living for children, housewives and aged, especially in Zone 1.

Accessibility: Going to/from school is not a problem while to/from shopping and especially to/from recreation and cultural facilities are considered problematic.

Overall Living Condition: Overall, the residents consider the living conditions in the areas not bad, especially in Zone 2. Main improvement areas are as follows : roads, drainages, garbage disposal, bus transport, secondary and tertiary schools, hospital, street lighting, fire protection, recreational facilities, shopping complex, among others.

(ii) *Assessment of Business Establishments*

Infrastructure/Utility: Highly appreciated are water supply, sewerage, telephone and electricity, while recreational facilities, garbage collection, roads, drainages, parking space, fire service are considered insufficient. Dissatisfaction with public transport and fire service in Zone 3 is eminent.

Environment: Perceived main problems are noise pollution, sanitary problems, air pollution and natural environment. However, their concern on the environment is less critical than of the residents.

Building: Only a few complaints are obtained.

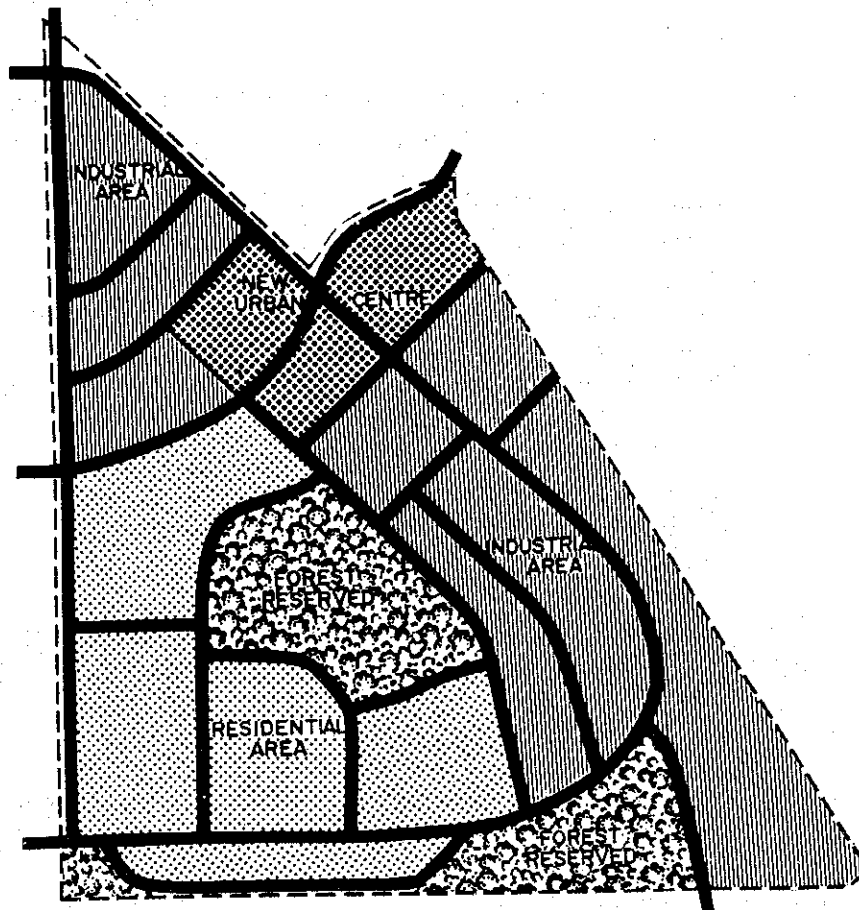
Accessibility: There are some problems with accessibility to/from their facilities.

Overall Assessment: Overall assessment of the business environment is considered quite unsatisfactory in Zone 2, while in other zones it is rather favourable. Specific improvement needs are roads, drainage, fire service, street lighting, hospital, garbage collection, public phone, recreational facility, parking space, etc.

2) Planning Policy and Framework

In accordance with the concept plan, the master plan area is broadly classified into four zones: urban center, industrial area, residential areas, and reserved forests. Considering the impact on airport operation, terrain conditions and accessibility, the urban center and industrial area are placed on the airport side, while the residential areas are on the hill side (refer to Figure 4.8).

Figure 4.8
Land Use Structure in the Master Plan Area



The planning policies for the four zones are set out as follows :

- (a) New Urban Center: A new urban center will be composed of the existing shopping complex, new commercial and recreational complex, parking, open space for open air events, civic center with multi-purpose hall, hospital, primary school and cemetery in order to meet comprehensive needs of residents as well as those in the adjoining influence area.
- (b) Planned Industrial Area: An effective industrial area will be developed with infrastructure improvement and resettlement scheme. Due to the restrictions of the airport, factories emitting smoke and micro waves are unsuitable. Its locational advantage will encourage the locations of cargo distribution centers and warehouses related to the airport.
- (c) Organised Residential Area: The residential area should meet two major types of demand: one from workers of various establishments and the other from the upper-middle income class. The former is met by terrace houses while the latter by detached houses to be located in spacious lots on the hilly terrain.

- (d) Reserved Forests: Massive forests with considerable slopes will be preserved. In the first place, they will be utilised as open space. Only within the negligible range of adverse environmental effects will developments in low density forests be allowed.

To support these developments and future urban activities in the developed area, infrastructure and utilities will be planned based on the following planning policies:

- organise a hierarchical road network;
- prevent through-traffic from entering internal residential area;
- segregate pedestrian from vehicular traffic;
- encourage walking by providing comfortable environment;
- enhance traffic safety and provide enough parking spaces;
- allocate a network of varied open spaces to meet recreational, sports, children's playground and forest and slope preservation;
- improve drainage and construct flood control reservoirs;
- provide adequate sewerage system;
- distribute sufficient piped water and electricity; and
- provide sufficient telecommunication lines.

The area is planned to accommodate a population of 10,700 and provide employment for 9,500 in three broadly categorized land uses (refer to Table 4.3).

Table 4.3
Demographic Framework by Development Area Category

Area Category	Population	Employment
Area for New Urban Center and Daily Center	0	2,000
Area for Industrial Development	0	7,500
Area for Residential Development	10,700	0
Total	10,700	9,500

3) Proposed Layout Plan

(a) Overall Land use Plan

Of the total 333 ha. of land, 144 ha. or 43.3% are allocated for public use consisting of road and road transport facilities (23.5%), parks and open space (9.8%) and rivers and retention ponds (3.5%). The remaining 189 ha. of private use land are divided into residential (20.9%), industrial (30.8%), and commercial/business (3.8%). Under this distribution, the back lanes and side lanes requisite for terrace houses are considered to be a part of terrace house area (refer to Figure 4.9 and Table 4.4).

Table 4.4
Land Use Plan of the Master Plan Area

Land Use			Area	
			ha	(%)
Public Use	Basic Infra-Structure	Road, Public Parking, Bus Terminal	78.2	(23.5)
		Park, Reserved Forest, Buffer	32.5	(9.8)
		River, Waterway, Retention Pond	11.8	(3.5)
	Others	School, Kindergarten	8.7	(2.6)
		Cemetery, Religious Facility	2.7	(0.8)
		Other Public Facilities	10.3	(3.1)
	SUB - TOTAL		144.2	(43.3)
Private Use	Residential	Terrace House (1,540)*	24.3	(7.3)
		Semi-Detached (340)*	13.5	(4.1)
		Detached (250)*	31.6	(9.5)
	Industrial	Small-Scale (470)*	13.9	(4.2)
		Medium-Scale (130)*	87.9	(26.4)
	Others	Medical Welfare	4.8	(1.4)
		Commerce, Business (300)*	12.5	(3.8)
	SUB - TOTAL		188.5	(56.7)
TOTAL			332.7	(100.0)

* : no of lots or units

(b) Residential Area

The residential area will consist of terrace house, semi-detached house and detached house areas. For the terrace house area, accessibility is given priority, while for the rest, more of tranquility. The semi-detached house area will be located on flat or gentle slope, while detached house area on undulating to hilly terrain with less noise impact from the airport (refer to Figure 4.9).

(c) Industrial Area

Industrial development is one of the major moves in urban development. It has been found out that approximately 70% of the establishments, excluding retail shops, have less than 10 employees and this is the common trend in zone 1).

The project provides two types of lots (refer to Figure 4.9):

- i) Medium-scale lots: 110' - 160' by 220' -360' (33m - 48m by 67 - 110m) in size and for the use of Class A industry, warehouse, construction and transport industry.

- ii) Small-scale lots: 30' by 80' (9m - 24m) in size for the use of service industry.

The detailed classification of Class A industry and service industry is shown in Appendix 4.1.^{3/} When existing irregular shape of lots with narrow frontage is standardized, the utility will increase substantially.

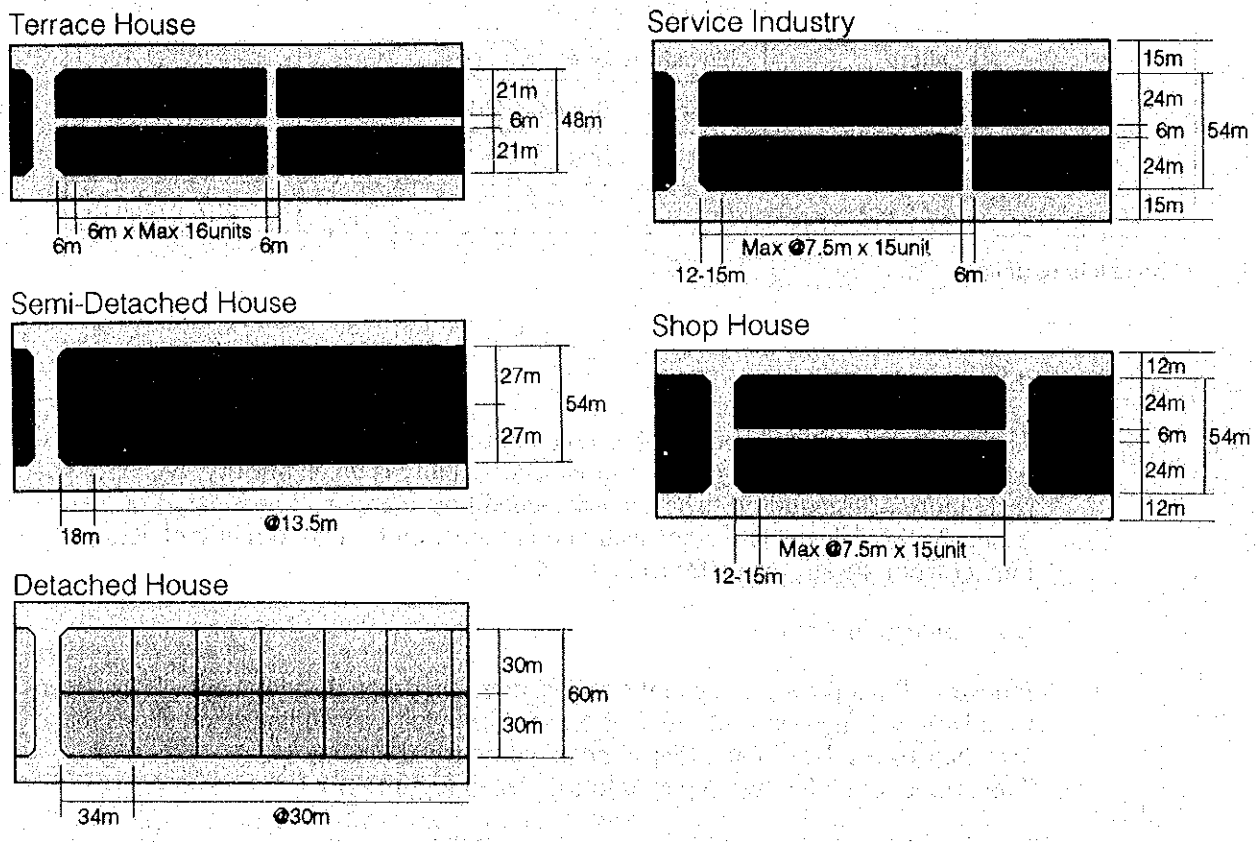
(d) Commercial Area

Existing Pekan Subang will be expanded and modernized to meet the demands of the increasing population of the project area as well as the adjoining area by providing more shophouses, a site for shopping complex and transport facilities. It is expected that Pekan Subang will function more as a comprehensive urban center. In addition, two small-scale commercial areas in the residential area and one in the industrial area will be located to satisfy daily needs (refer to Figure 4.9).

(e) Medical Welfare Area

There are, at present, a home for the aged and a sanatorium for the mental diseased. Since development in Bukit Subang area is restricted due to terrain conditions and the existence of an airport radar, the area is more adequately designated for additional similar facilities.

Figure 4.9
Standard Block Design for Housing, Industry and Shop House



^{3/} Recently launched projects also of this category include Prime Subang Light Industrial Park (300 units), Subang International Light Industrial Park (450 units), Subang Airport North Industrial Park and Subang Hilir Industrial Park (303 units) mainly providing 1½ story industry terrace with average lot size of about 200 m².

(f) Open Space

In order to prevent environmental degradation as well as natural disaster and to enhance communities, the master plan area will be provided with a network of abundant open spaces and parks. The types of open spaces and parks are characterised as follows (refer to Figure 4.11):

- A sports park with 4.7 ha. and estimated greenery coverage of 30%.
- Seven small community parks with areas between 5,000 m² and 13,000 m² will be provided with estimated greenery coverage of about 50%.
- Reserved forests will be located in three areas including Bukit Subang area.
- Greenery buffer is provided according to JPBD planning standard between residential and industrial areas. For Class A industry and service industry⁴⁾, one chain buffer (20 meters) and half chain buffer (10 meters) are provided, respectively.

(g) Other Public Facilities

Aside from such public facilities as roads, rivers, parks and open spaces, lands for a wide range of services have been allotted for educational facilities, community hall, clinic, police station, fire station, post office, telephone exchange station, water tank, electric substation, sewerage treatment plant and religious facility (refer to Table 4.5).

(h) Layout Plan

The proposed layout plan of the master plan area is shown in Figure 4.10. In this area, a variety of commercial and public facilities will be necessary in order to meet various living and industrial needs. They are specified in Figure 4.11.

Table 4.5
Public Facilities Provided in the Project Area

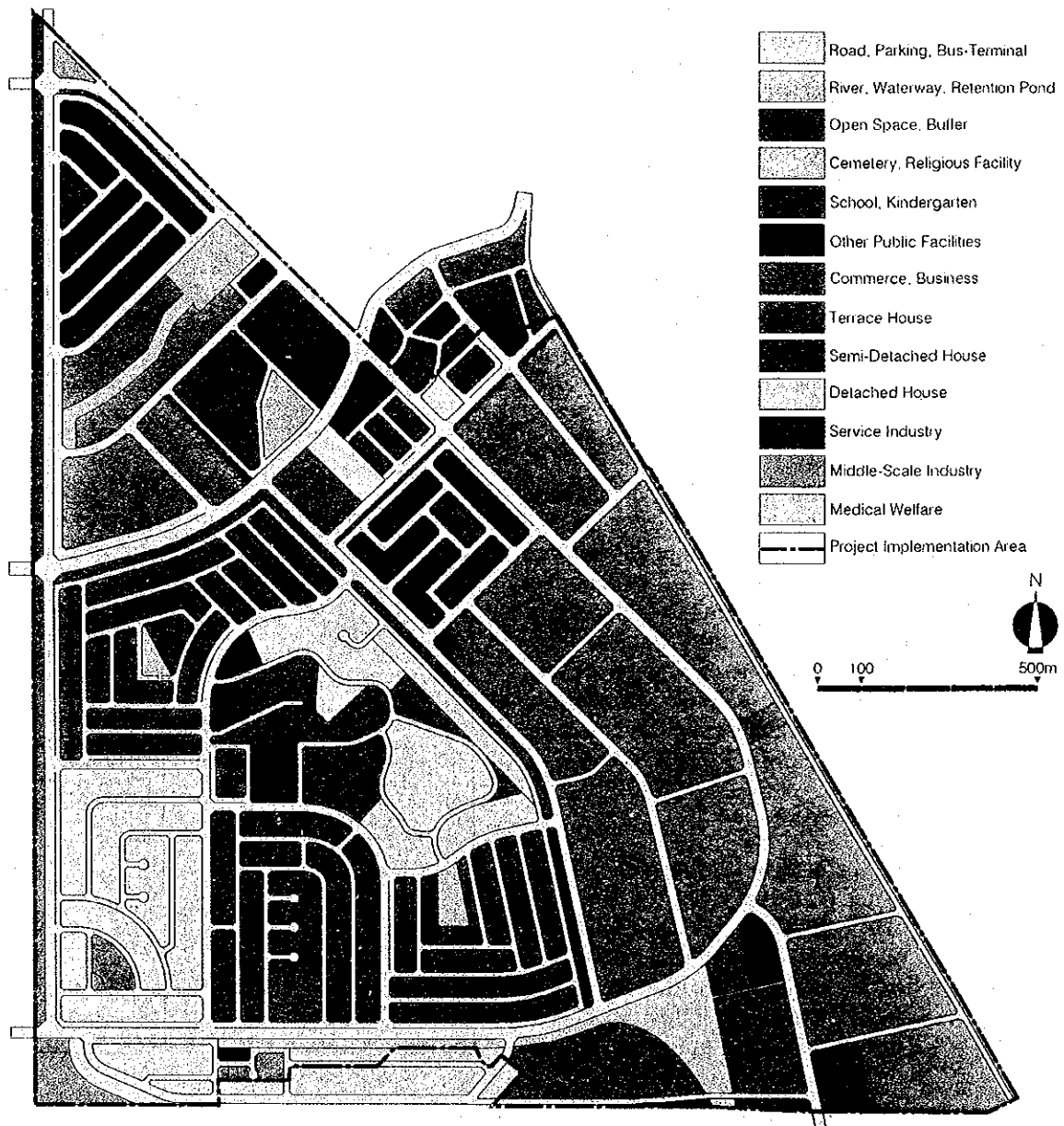
Type	No.	Area
1) Educational		
- kindergarten	5 (new)	1,000 - 2,000 m ² /place
- primary school	1 (new)	2.6 ha
	1	expansion (1.1 ha to 2.3 ha)
- secondary school	1 (new)	3.7 ha
2) Community Hall		
- multi-purpose	1 (new)	0.9 ha
- community halls	2 (new)	0.2 ha and 0.3 ha
	2 (new)	0.3 ha each
3) Clinic	1	existing (1.1 ha)
4) Police Station	1	0.7 ha
5) Fire Station	1 (new)	1,400 m ²
6) Post Office	1 (new)	8,300 m ²
7) Tel. Exchange Station	1 (new)	7,500 m ²
8) Water Tank	1 (new)	2.0 ha
9) Electric Substation		
- transmission intake	1 (new)	6,200 m ² , 2,600 m ²
- distribution intake	2 (new)	4,700 m ² , 11,100 m ²
10) Sewerage Treatment Plant	2 (new)	
11. Religious Facility		
- Cemetery	1	existing (13,300 m ²)
- temple	1	existing (5,000 m ²)
- religious facility	1 (new)	5,000 m ²

4) Determination of the LR Project Area

The concept plan and master plan formulations guarantee an adequate overall development direction and framework for the area. The following aspects have been further taken into account in specifically determining the project area with 319 ha. shown in Figure 4.10.

⁴⁾ Refer to Appendix 4-1 for definition of Class A and service industries.

Figure 4.10
Layout Plan for Kg. Seri Subang



Before LR Project



After LR Project

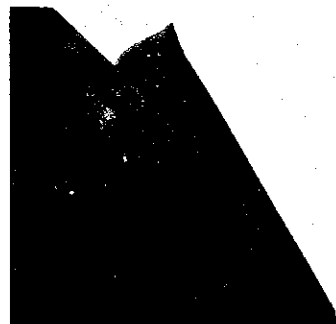
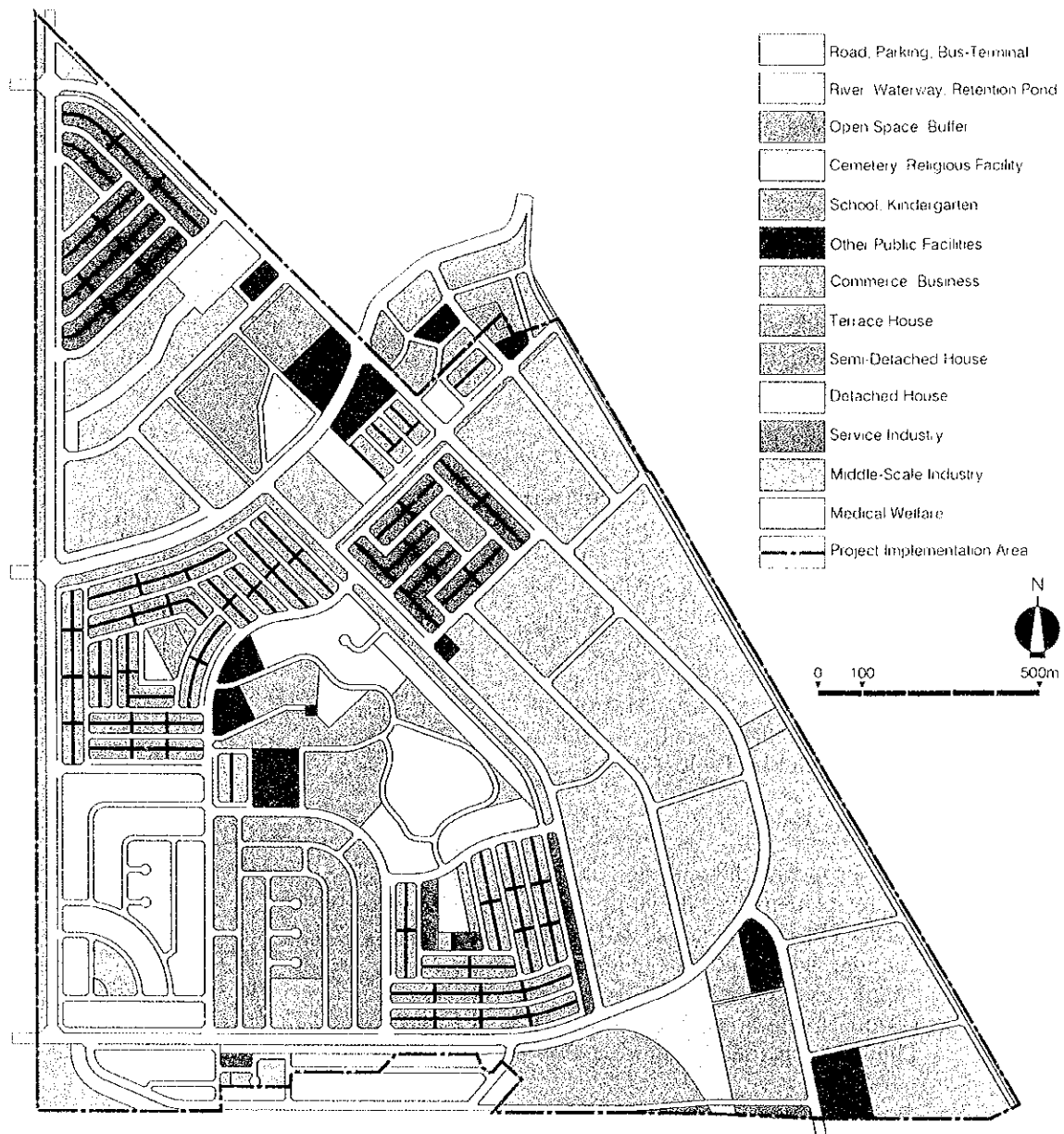


Figure 4.10
Layout Plan for Kg. Seri Subang



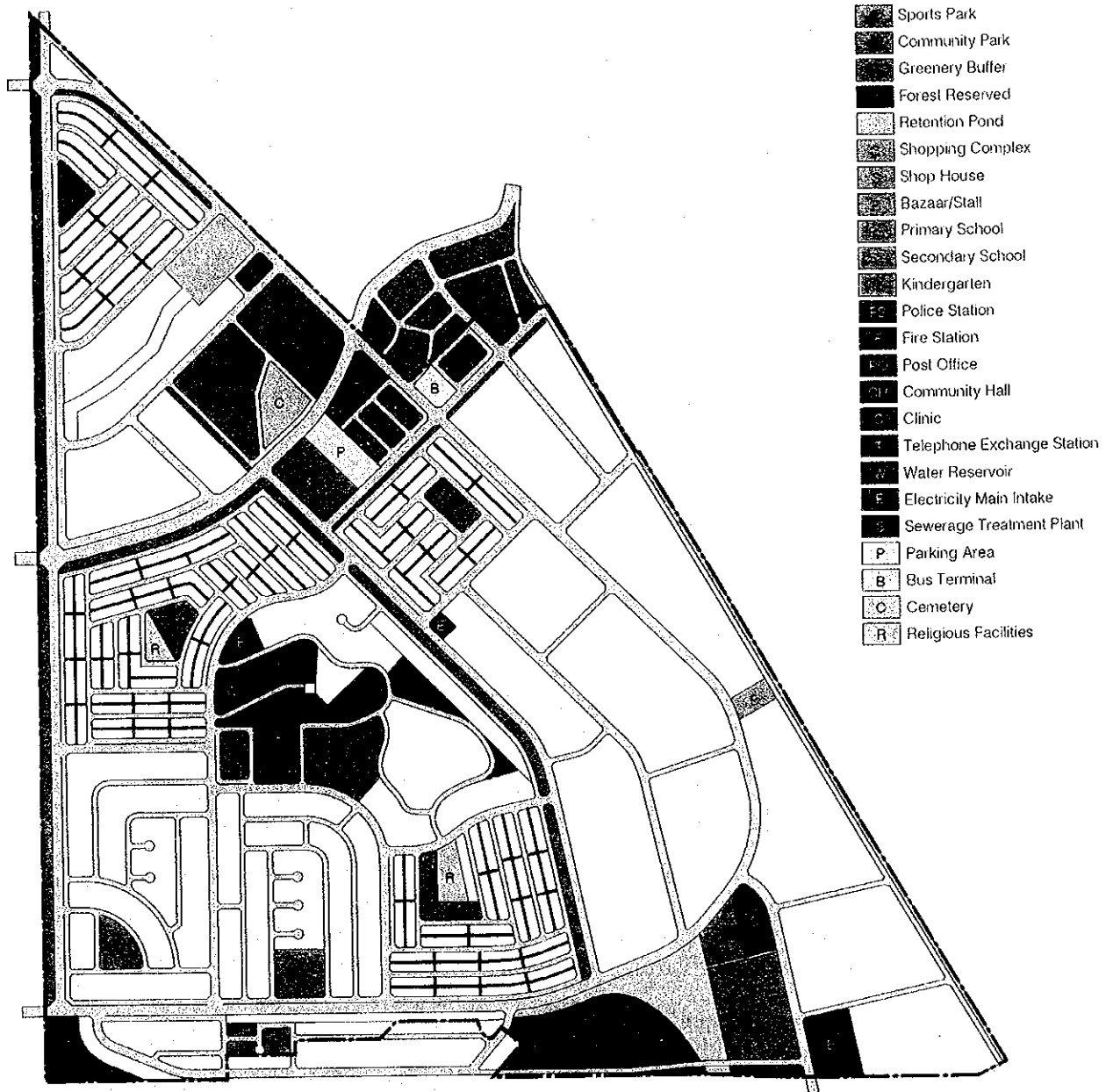
Before LR Project



After LR Project



Figure 4.11
Layout Plan for Open Space
and Commercial/Community Facilities

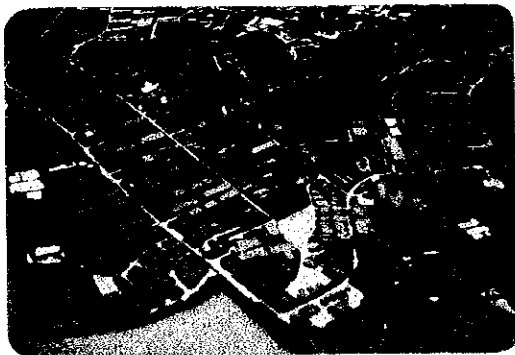
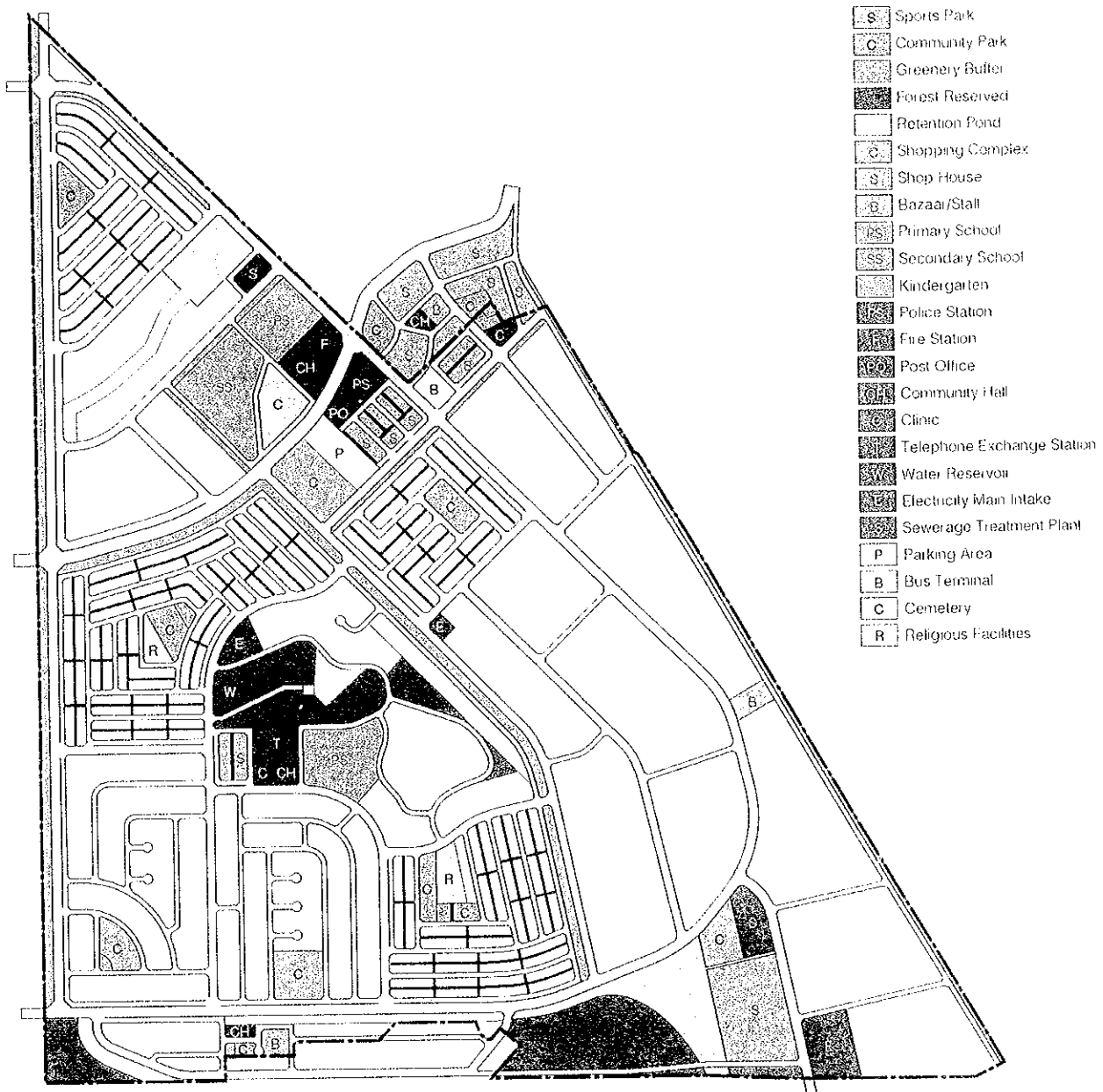


Before LR Project



After LR Project

Figure 4.11
Layout Plan for Open Space
and Commercial/Community Facilities



Before LR Project



After LR Project

- More or less, the same area as the master plan area has been selected to maximize the effects of a fully integrated development. The only excluded area is a part of Pekan Subang where an official layout plan was prepared by JPBD Selangor for implementation, and an existing 67 lot housing scheme in fair condition which was developed in the early 1980s.
- Although the size of the project is considered physically large compared with standard practices in Japan (40 to 100 ha.), the above city planning aspect was given more importance and it is considered manageable in terms of number of landowners with relatively large size of individual lands. However, consideration was also given that the entire area could be developed in two to three phases when necessary.

It should be noted that the total project area recorded in the land registry is 3,240,856 m² as against the actual area measured of 3,190,600 m² based on the topo-map prepared in this study.

4.1.4 Formulation of LR Engineering Plan

1) Profile of the Project Area

The following sections briefly describe the characteristics of the project area:

(a) Existing Land Use

The 319 ha. project area is inhabited by 2,600 residents and provides space for employing 3,000 in industry and commerce.

The existing land use (actual is extremely mixed with residential, industrial, commercial, agricultural, etc.) is presented in Figure 4.12. Its characteristics are as follows:

- Although industrial land (124 lots with 86 ha.) and residential land (89 lots with 48 ha.) are the main land uses, it is feared that the existence of a large amount of agriculture, cleared and undeveloped land (218 lots with 138 ha.) would further accelerate its controlled developments.
- Average size of lots is considerably large for all land use types, ranging between 5,400 m² and 6,900 m².
- Reconnaissance survey indicates that some lots include different types of building use, e.g., a factory and a restaurant, a factory and several houses, etc.

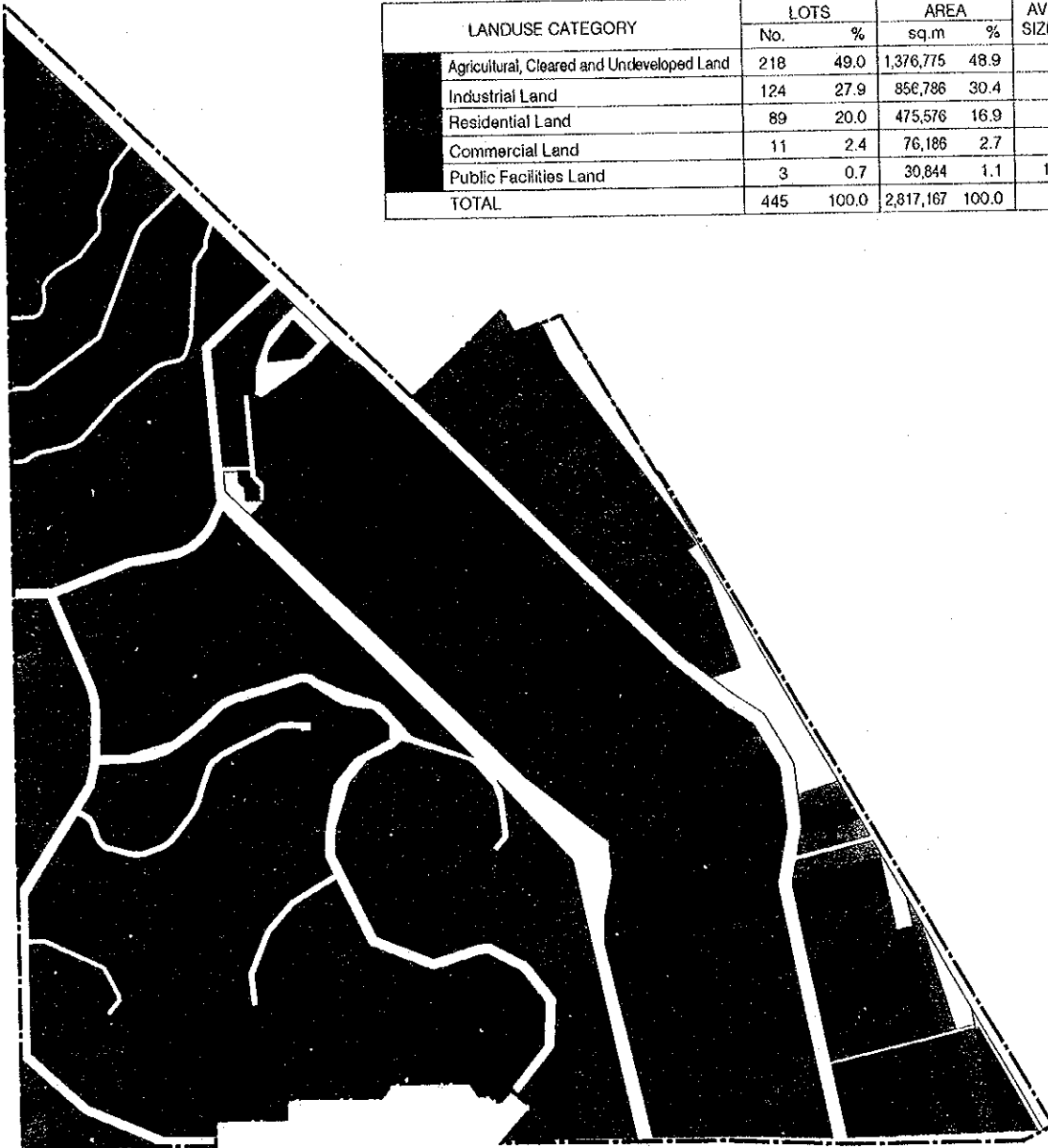
(b) Existing Conditions of Lands

Classification of Lands: The project area includes three types of lands: state land⁵⁾, reserved land and alienated land. An intensive title survey was conducted by the Study Team with the help of a local consulting firm. One of the difficulties encountered

⁵⁾ "State Land" is defined in NLC Sec. 5 as all lands located in the state other than a) alienated land, b) reserve land, c) mining lands, and reserved forest.

Figure 4.12
Existing Land Use in
Kg. Seri Subang Project Area

LANDUSE CATEGORY	LOTS		AREA		AVERAGE SIZE (sq.m)
	No.	%	sq.m	%	
Agricultural, Cleared and Undeveloped Land	218	49.0	1,376,775	48.9	6,315
Industrial Land	124	27.9	856,786	30.4	6,910
Residential Land	89	20.0	475,576	16.9	5,355
Commercial Land	11	2.4	76,186	2.7	6,926
Public Facilities Land	3	0.7	30,844	1.1	10,281
TOTAL	445	100.0	2,817,167	100.0	6,331



was determining if some public facilities lands are state land or reserved land.⁶⁾ Distribution of lands by classification is shown in Figure 4.13 and Figure 4.14 and is summarized below:

- The area is mostly alienated land (85.7%) with dominance of agriculture purpose. The agriculture lands number 342 lots or 71.2% of the total land. Agri/building lands share 7.2%.
- Only six lots are under "industry" of alienated lands, while 124 lots are actually used for industrial purpose.
- The state land shares only 12.9% comprising road, river and airport area.⁷⁾ Roads occupy most of the state land.
- Reserved land including school, police station, cemetery, etc. shares only 1.4% of the total land.

Table 4.6
Classification of the Lands

Classification		Area		No. of Lot
		sq.m	(%)	
State Land	Road	310,285	9.5	-
	River	7,801	0.2	-
	Other	107,401	3.3	-
	Sub-Total	425,487	13.9	0
Reserve Land	School	17,019	0.5	1
	Police Station	13,825	0.4	1
	Cemetery	8,934	0.3	1
	Rader Site	400	0.1	1
	Sub-Total	40,178	1.3	4
Alienated Land	Agriculture	2,315,723	71.3	342
	Agri/Building	231,870	7.2	40
	Building	190,911	5.9	52
	Industry	45,278	1.4	6
	Sub-Total	2,783,762	85.7	440
Total		3,249,447	100.0	342

Source : Study Team Land Title Survey, 1994

⁶⁾ In this case, these lands are classified in this study as reserve land.

⁷⁾ Cadastral map indicates that actual airport area is located within the project area beyond the existing boundary fence.

Lease Period of Alienated Land: The lease period of the private land alienated in 440 lots ranges from 30 years to 99 years. Its main characteristics are as follows:

- Lands with 30-year lease period share 35% of the total lots and 32% of the registered area, while those with 99 years share 40% and 53%, respectively. The remaining 25% is with 60 years lease period (refer to Table 4.7).
- Lease period of 6 lots has expired already and 142 lots have remaining lease period of less than 16 years. Most of the 30-year leasehold lands are to be renewed between 2000 and 2010. (refer to Table 4.8 and Figure 4.16).

Table 4.7
Lease Period of Alienated Land

Lease Period Years	No. of Lots	Registered Area
	No. (%)	sq.m. (%)
30	155 (35.2)	881,208 (31.7)
50	1 (0.2)	4,047 (0.1)
60	110 (25.1)	428,716 (15.4)
99	174 (39.5)	1,469,791 (52.8)
Total	440 (100.0)	2,783,782 (100.0)

Source : Study Team Land Title Survey, 1994

- Lands with 30 year lease period are located mostly on flat area in the project area while those with 99 years are on hilly areas (refer to Figure 4.15).

Table 4.8
Remaining Lease Period of Alienated Land

- There are two lots with lease periods that had expired but subsequently renewed to 99 years, for unknown reasons.
- Since 1989, 30-year leasehold lands in Chinese New Villages have been entitled for renewal to 60-year leasehold by way of surrender and alienation. 19 lots with 11.6 ha. benefitted from this policy (refer to Figure 4.18).

Remaining Lease Period (yrs.)	Lots	Registered Area
	No. (%)	sq.m. (%)
Already Expired	6 (1.4)	26,305 (0.9)
by 2000 (0-6)	37 (8.4)	232,918 (8.4)
by 2010 (7-6)	105 (23.9)	603,940 (21.6)
by 2020 (17-26)	6 (1.4)	26,103 (0.9)
by 2030 (27-36)	45 (10.2)	181,124 (6.5)
by 2040 (37-46)	25 (5.7)	10,920 (0.4)
by 2050 (47-56)	20 (4.5)	130,640 (4.7)
by 2060 (57-66)	23 (5.2)	120,630 (4.3)
by 2070 (67-76)	160 (36.4)	1,344,179 (48.3)
by 2080 (77-86)	11 (2.5)	89,866 (3.2)
by 2090 (87-96)	2 (0.4)	17,057 (0.6)
Total	440 (100.0)	2,783,762 (100.0)

Source : Study Team Land Title Survey, 1994

Lands with Encumbrances/Restrictions: Of 440 lots, 36 lots with 24.6 ha. involve "charge", while 24 lots with 16.3 ha., "caveat"⁸⁾ (refer to Figure 4.17).

Compulsory Land Acquisition Practised in early 1980s: Although the details are not known, compulsory land acquisition was gazetted in the early 1980s for 40 lots. However, this was lifted later (refer to Figure 4.19).

⁸⁾ There are two types of caveat: registrar's caveat and private caveat. Once a caveat takes effect, land transaction is prohibited.

Figure 4.13 Distribution of State Land and Reserve Land

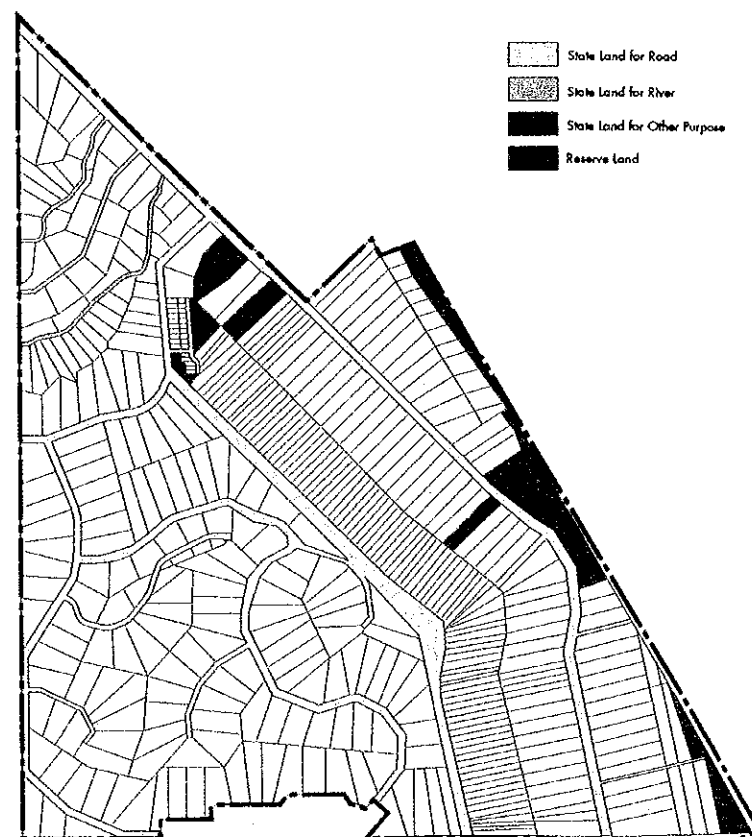


Figure 4.15 Lease Period of Alienated Land



Figure 4.17 Land Title with Encumbrances



Figure 4.14 Designated Use of Alienated Land

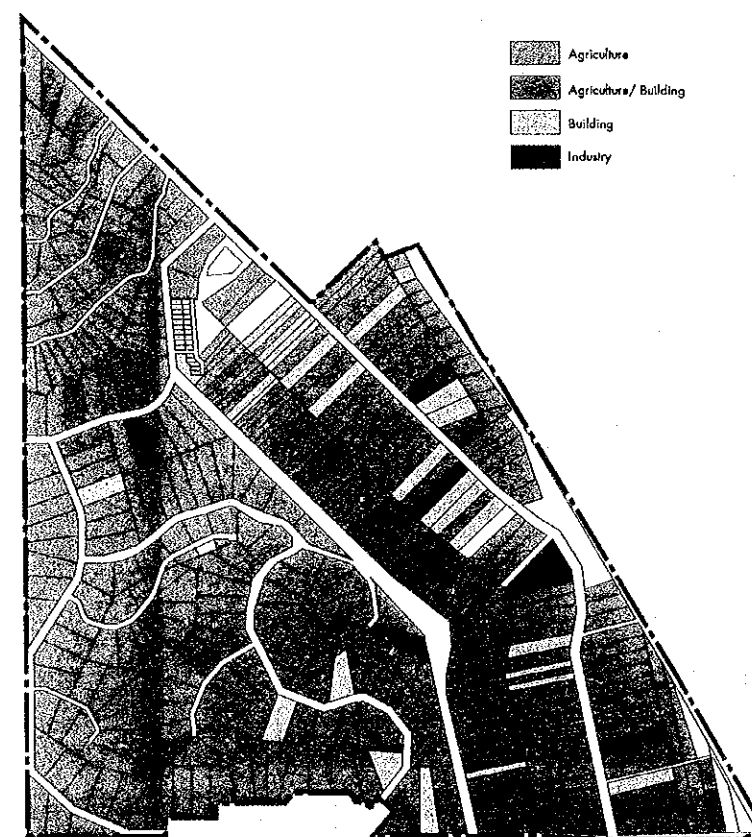


Figure 4.16 Remaining Lease Period

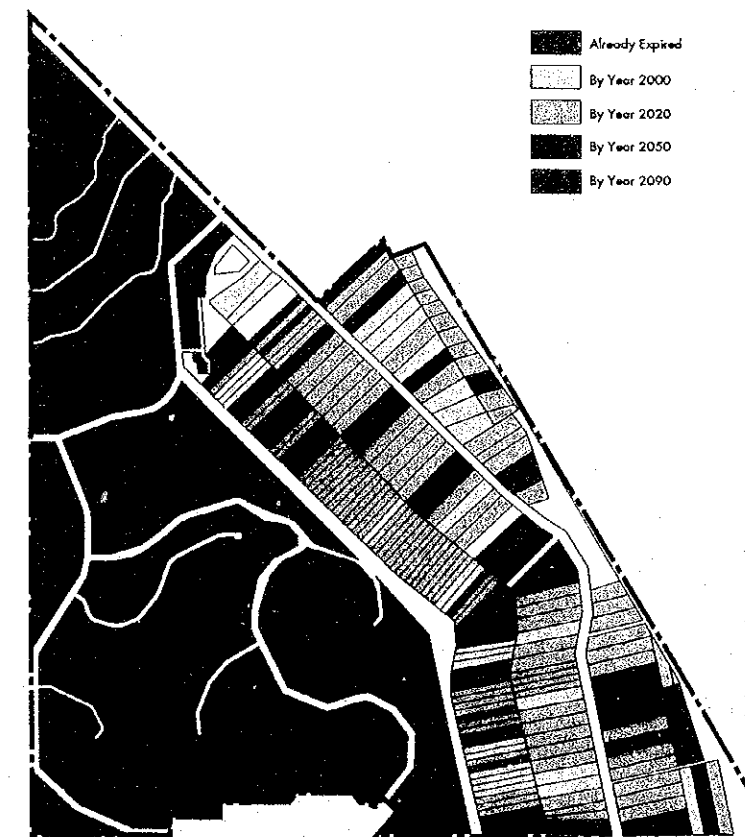


Figure 4.18 Land Surrender and Alienation was Practised

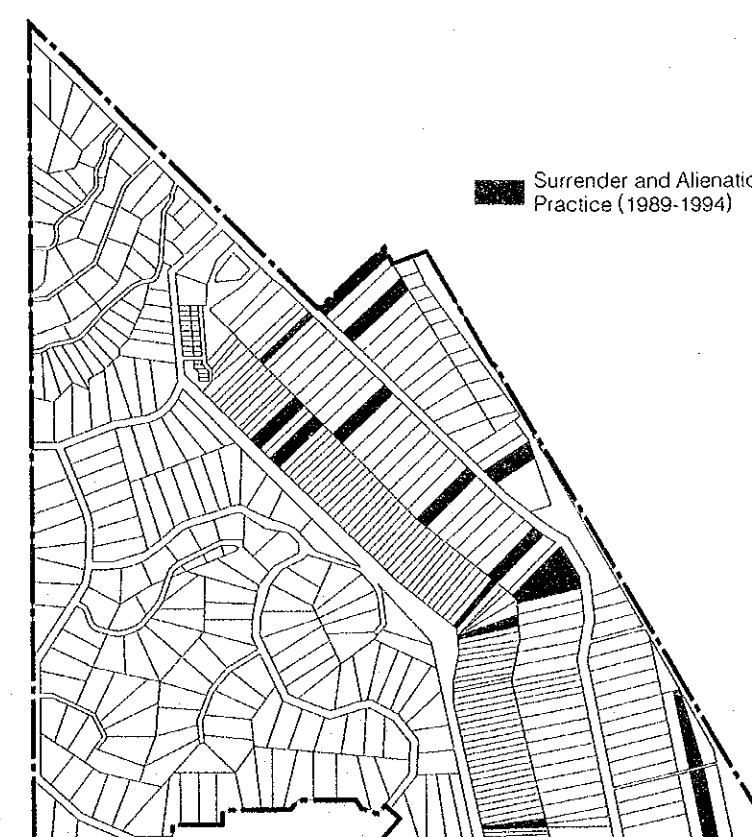


Figure 4.19
Lands Once Covered by Compulsory Acquisition

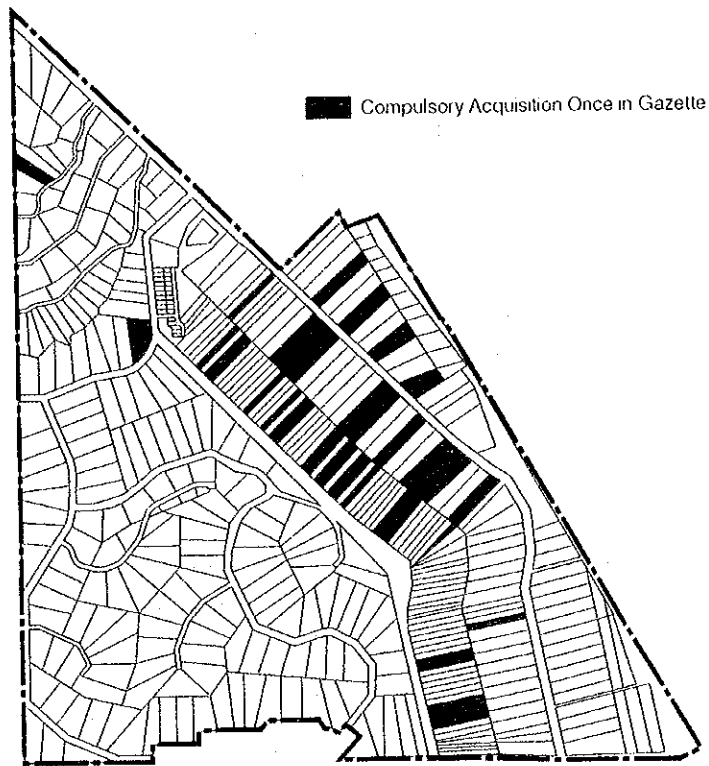
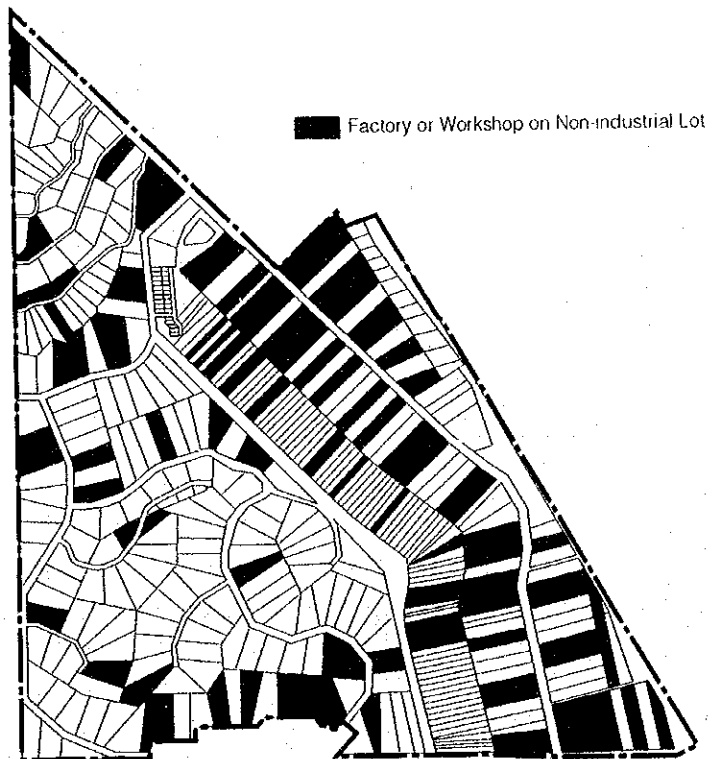


Figure 4.20
Distribution of Illegally Erected Factories/Workshops



(c) Building

A Building Survey conducted by the Study Team identified the condition of 1,515 structures and an inventory was prepared. Of the total, 1,080 buildings were considered worth examining. Main characteristics are as follows:

- Design standards and conditions of the buildings vary considerably, ranging from those with quality structure on solid foundation and private drainage to those with poor structure located on swampy area or dangerous slopes with substandard access roads and drains.
- Lots used for manufacturing and poultry raising include a number of buildings with different purposes.
- Factory buildings have relatively large floor areas (refer to Table 4.9).

Table 4.9
Existing Buildings

Use	No.	Floor Area (sq.m.)	
		Total	Average
Residence	555	130,186	235
Retail Shop	2	177	89
Restaurant	18	4,600	256
Office	23	13,582	591
Factory	187	197,626	1,057
Workshop	42	14,007	334
Warehouse	48	21,061	439
Animal Shed	131	51,508	317
Garage	74	17,391	235
Total	1,080	440,138	3,553

Source: Study Team, Building Survey 1994

On 120 lots or 81 ha. of lands under agriculture purpose, factories and workshops have been illegally constructed, of which 75 lots are on the flat land adjoining the airport where leasehold period is mostly 30 years (refer to Figure 4.20). The past policy of the State Authority against these illegal factories was either to demolish the existing structures and issue new titles under the previous category of land use, or to issue new titles under the category of "industry".

2) **LR Design of Infrastructure and Public Facilities**

(a) LR Design Considerations

The primary objective of LR design is to work out concrete engineering plans on which basis needed infrastructure/public facilities are effectively constructed, the proposed layout plan is realized and the LR scheme is implemented. In preparing various physical plans for the project area, the following points have been duly considered and incorporated accordingly:

- Compliance with existing planning standards and guidelines currently practised: Relevant agencies consulted about various aspects of the planning are JBPD, JKR, JBA, JPS (DID), Tenaga Nasional, Telekom Malaysia, etc.
- Facilitation of effective construction work: Although the project is planned as an integrated urban area, the plan is also made to facilitate phased development of the project by taking into account drainage/sewerage system, road network, earth work, etc.
- Consideration of LR scheme: To facilitate effective implementation of the project under LR, buildings/structures/facilities that will remain are given careful attention in preparing the layout plan.

(b) Land Use Plan

As the project area is more or less the same as the master plan area (refer to Figure 4.10), modifications in the layout plan were basically unnecessary. Further study made in this planning phase resulted in the slightly revised land use plan as shown in Table 4.10.

Table 4.10
Land Use Plan in the Project Area

Land Use			Area	
			ha	(%)
Public Use Land	Basic Infra-Structure	Road, Public Parking, Bus Terminal	81.6	(25.5)
		Park, Reserved Forest, Buffer	31.6	(9.9)
		River, Waterway, Retention Pond	12.0	(3.8)
	Others	School, Kindergarten	9.2	(2.9)
		Cemetery, Religious Facility	2.7	(0.9)
		Other Public Facilities	9.9	(3.1)
	SUB - TOTAL		147.0	(46.1)
Private Use Land	Residential	Terrace House	20.7	(6.5)
		Semi-Detached	13.5	(4.2)
		Detached	27.3	(8.6)
	Industry	Small-Scale	12.5	(3.9)
		Medium-Scale	87.4	(27.4)
	Others	Medical Welfare	4.8	(1.5)
		Commerce, Business	5.9	(1.8)
	SUB - TOTAL		172.1	(53.9)
TOTAL		319.1	(100.0)	

(c) Road Network

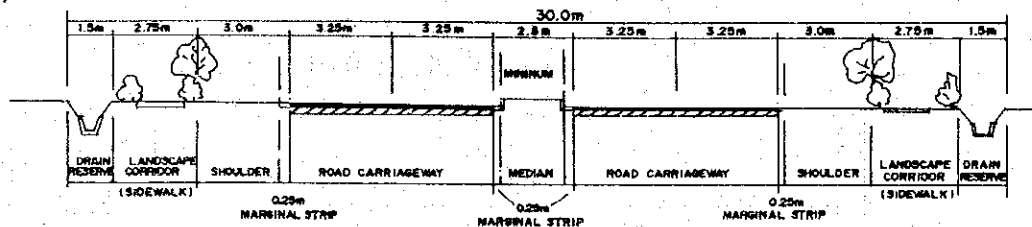
The project area's road network will be integrated with the regional network to provide adequate links with the existing Batu Tiga - Sungai Buloh road, which will be upgraded to six lanes, another six-lane planned road between Kg. Seri Subang and Sungai Buloh, and the existing two-lane road connecting to Subang International Airport which will be upgraded to four lanes.

Since the existing roads in the master plan area are entirely substandard in terms of width as well as pavement, they will be totally redesigned to meet the planned land use. The new road system will be composed of a hierarchy of the following roads (refer to Figure 4.21 and Figure 4.22):

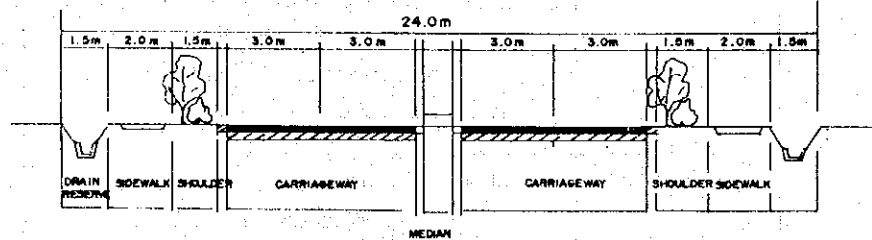
- Major road (U4 : 30 meters width, with 4 lanes and total length of 988 meters);
- Collector Road (U3 : 24 meters, 4 lanes, 6,507 meters);
- Major Local Road (U2 : 20 meters, 2 lanes, 10,074 meters);
- Minor Local Road of service industry area (U1 : 15 meters, 2 lanes, 4,000 meters);
- Minor Local Road (U1 : 12 meters, 2 lanes, 24,130 meters); and
- Backlane and Sidelane (6 meters, 10,267 meters).

Figure 4.21
Types of Proposed Roads

Major Road



Collector Road



Major Local Road

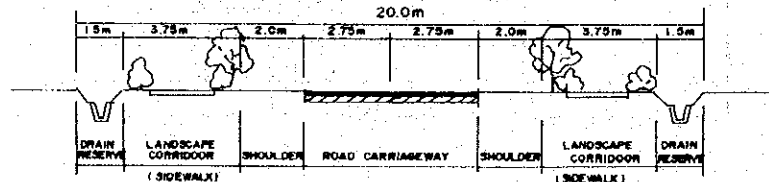
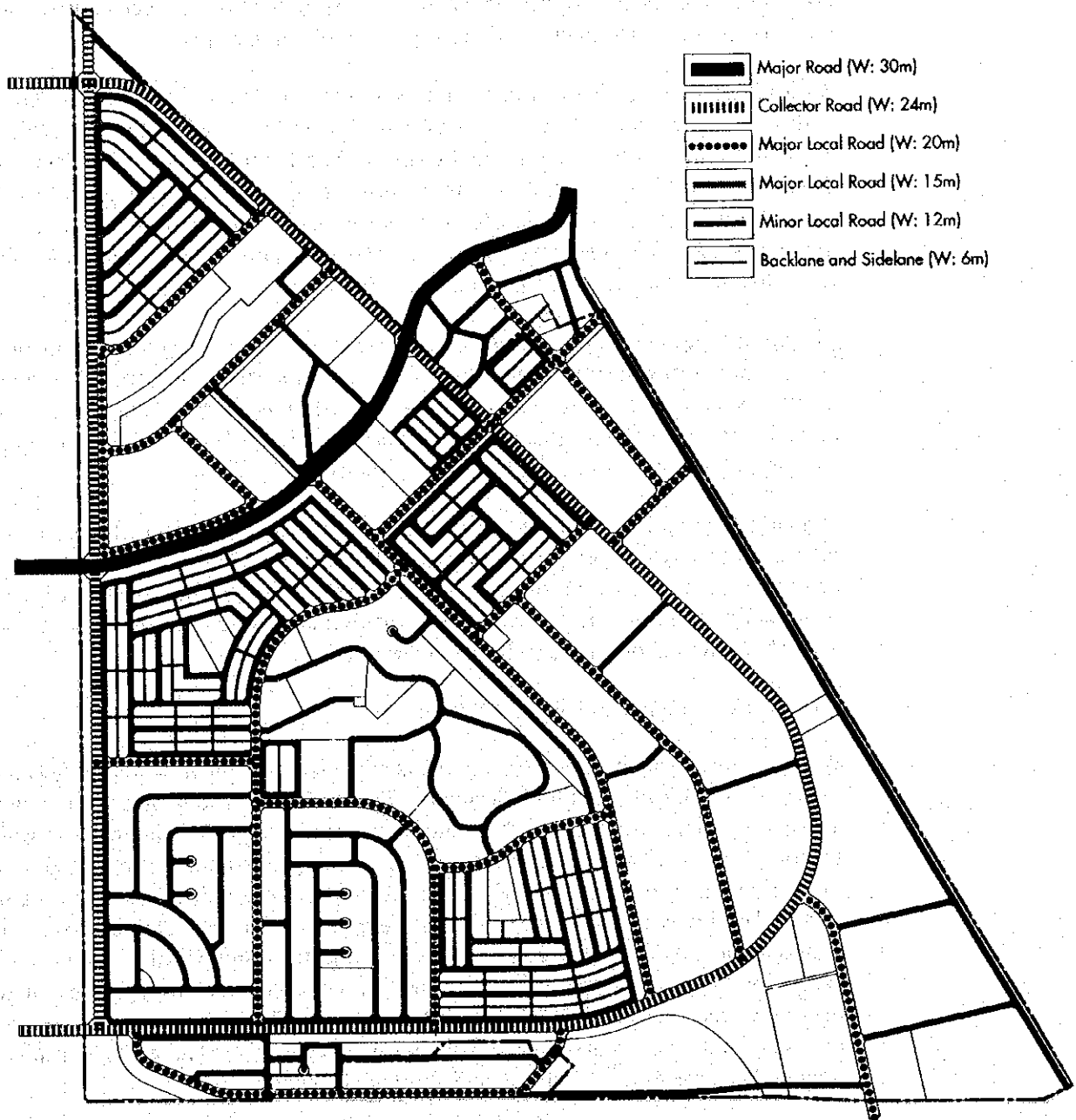


Figure 4.22
Road System Plan



(d) Flood Protection System

For the management of storm water, plans were prepared for river improvement, retention pond development, and drainage system improvement.

River Improvement: There are two river systems: Sg. Pelumut and Sg. Air Kuning with catchment areas of 603 hectares and 526 hectares, respectively. With the estimated future average runoff coefficient of 0.35 for the former and 0.56 for the latter, the rainfall intensity for 100 year's return period, and other related factors, the peak river flow volume was estimated for relevant points of the design section (refer to Figure 4.23). A 10-meter wide river reserve was also provided on each side of the riverbank according to DID planning standards.

Retention Pond Development: Retention ponds have been designed to control the outflow of additional storm water due to the project so as not to cause flooding in the downstream areas. A retention pond is provided for each river system with a size of 2.2 ha. for Sg. Pelumut (maximum volume of 41,800 m³) and 3.8 ha. for Sg. Air Kuning (92,700 m³). (These are shown in Figure 4.24).

Drainage System Improvement: A drainage system has been planned to cope with the rainfall of 5-year return period intensity. Three drain types of different sizes are provided: block drains on local roads, U-drains within the right-of-way of major roads, and box culverts in the areas where the drainage system needs to cross roads and other physical obstacles (refer to Figure 4.25).

(e) Water Supply and Disposal System

Water Supply System: The project area is provided with piped water by Selangor Water Works Department (TBA Selangor). Sg. Damansara is a main source with an intake installed near Batu Tiga. The water is treated by a purification plant at Bukit Jelutong and sent to a distribution reservoir via a pumping station both located in the Malaysian Air Force Base (UTM). The distribution reservoir is installed on a hill next to the southeast edge of the area, 76 meters above sea level. The reservoir, with a capacity of one million gallons (4,546 m³), distributes water among the consumers in Kg. Seri Subang, Kg. Melayu Subang and their environs. However, it is estimated that the water loss rate is 30% of the JBA's supply. The high rate of loss is due to the use of old pipes, road damage from heavy vehicles, etc. Therefore, consumers frequently suffer from suspension and shortage of water.

The existing water supply system in the area should be entirely renovated in order to meet increasing demand due to the development of the project area. A new distribution reservoir will be built at Bukit Subang in place of the existing one and the existing pipes will be replaced (refer to Figure 4.26).

Future water demand was estimated based on existing guidelines for different uses, such as domestic (5 persons per unit with per capita consumption of 273 liters/day), commercial (equivalent population of 3 per 100 m² gross area), industrial (no JBA guideline but 20 m³/hectare/day assumed). Assuming that the current water loss of

30% will be reduced to 10% in the future, the total daily average water consumption is estimated to be 6,836 m³ of which 43% and 38% are consumed for residential and industrial uses, respectively.

The proposed reservoir is designed to store 2,667 m³ or 30% of the daily maximum water consumption. Considering a depth of 3 m and a setback of 10 m, a minimum area of 0.27 hectare is required. The distribution system consist of a network of pipes with different sizes between 100 mm and 300 mm which will be installed in the right-of-way of roads. 250 mm to 450 mm diameter pipes will be also installed to supply the water from the existing reservoir to the adjoining areas.

Sewerage Disposal System : The septic tank is the most popular system for domestic wastewater. The effluent is discharged into surface drainage or waterways and finally flows into Sg. Pelumut and Sg. Air Kuning. Many factories and animal farms discharge their effluents in the same manner without proper treatment. This practice causes a foul smell and uncleanliness.

A sanitary sewer separated from storm water disposal is necessary in the urban area. Two sewerage treatment plants with an oxidation ditch system will be provided. The sewerage demand was estimated to be 80% of water consumption. A concrete sewer with 200 mm to 450 mm diameter will be installed under the streets and alleys (refer to Figure 4.27).

The plants will be surrounded by at least 20 meter buffer with proper landscaping. The area needed for the plants is 4,500 m² along Sg. Pelumut and 9,100 m² along Sg. Air Kuning.⁸⁾

Electricity: Electricity is supplied by Tenaga Nasional Berhad (TNB). The distribution main intake (33kv/11kv) located at the Military Air Force Base (TUDM) covers the area through 24 substations (11kv/433kv) and 29 privately-owned substations (11kv/433kv) for industrial use. Frequent power outages take place due to the rapidly increasing number of factories. It is obvious that the existing system would no longer be able to satisfy future demand. Thorough improvement is necessary, including a transmission main intake (requiring an area of 125 x 125 meter flat land), two distribution main intakes (minimum 46 x 46 meter flat land), and several distribution substations in residential areas. For the industrial area, distribution substations are installed privately (refer to Figure 4.28).

⁸⁾ If an oxidation pond were to be provided, a total of 36,700 m² would be required.

Figure 4.23 River Improvement (Typical Cross Section)

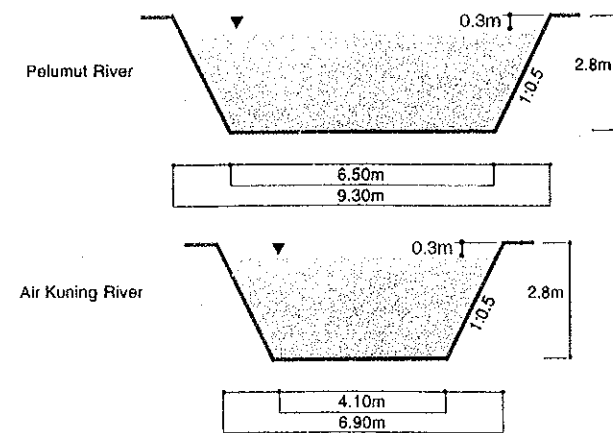


Figure 4.24 Cross Section of Retention Pond

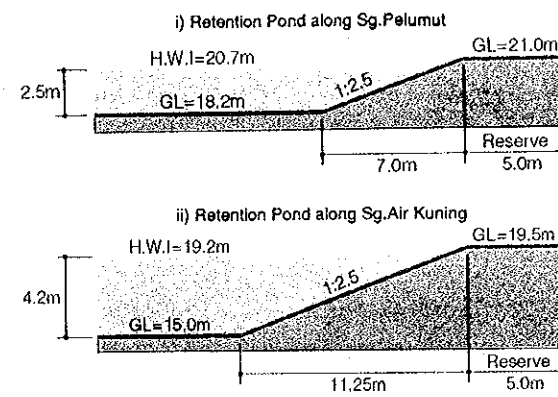
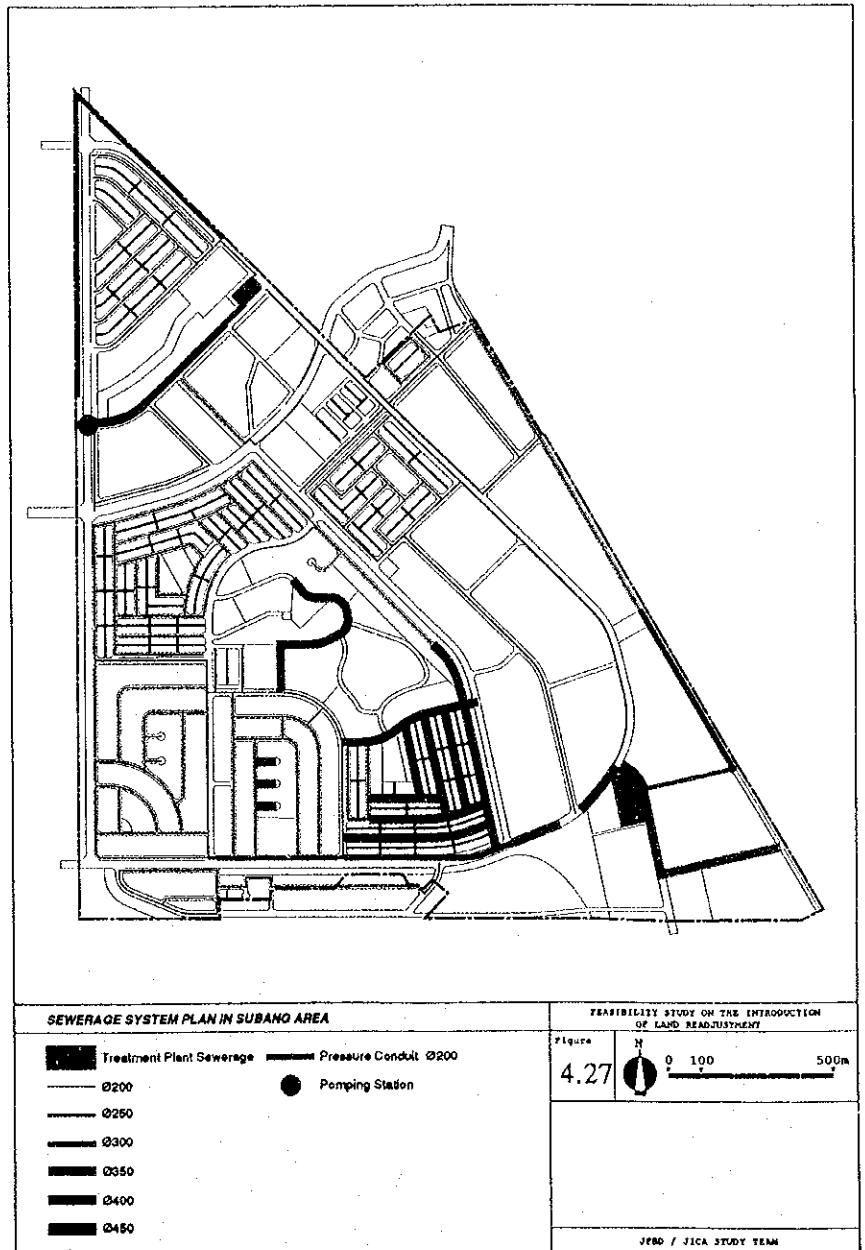
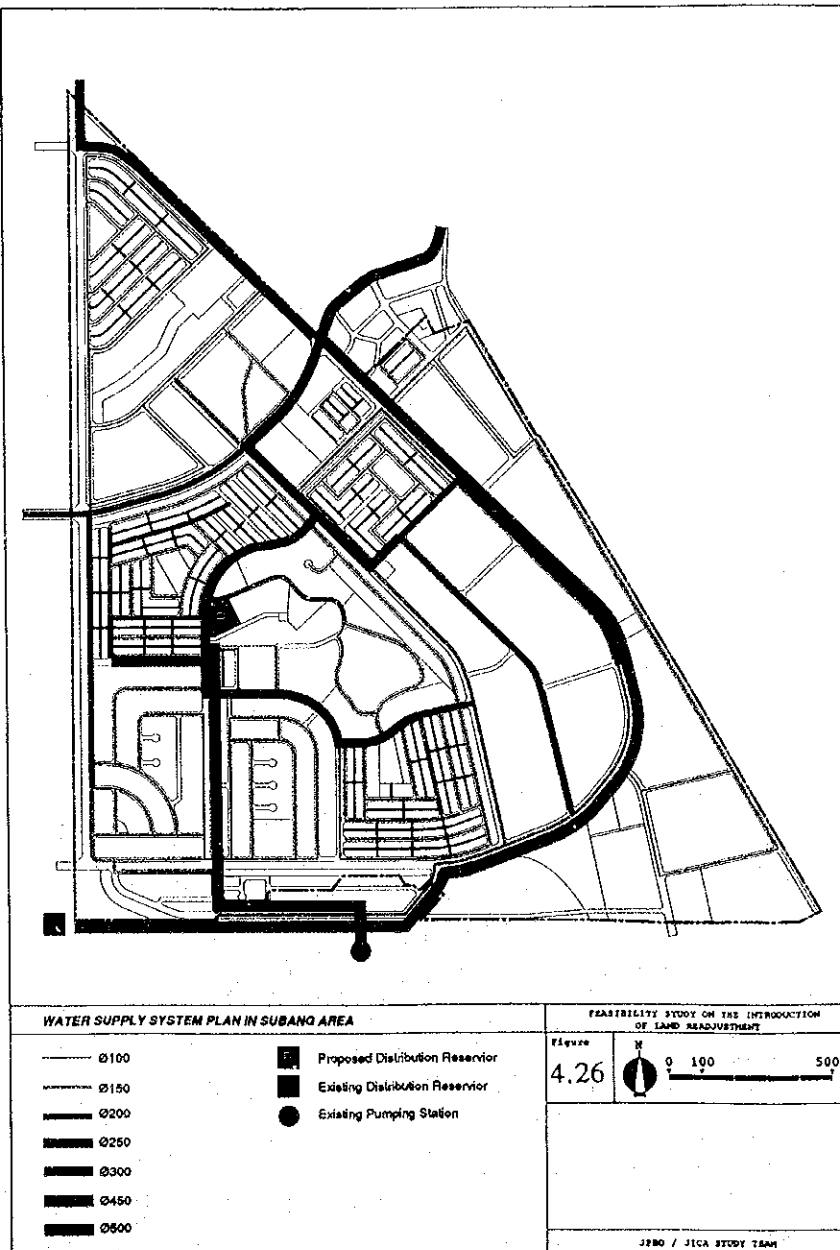
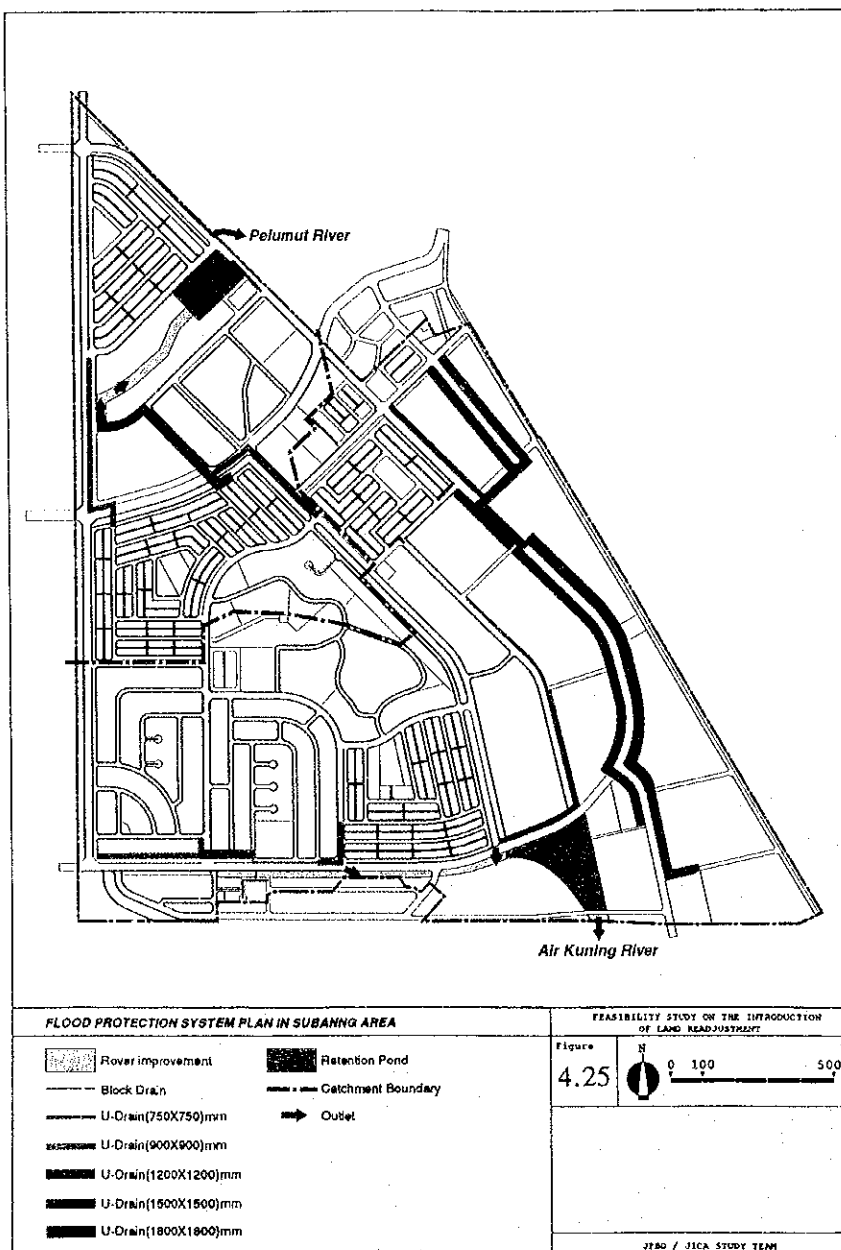
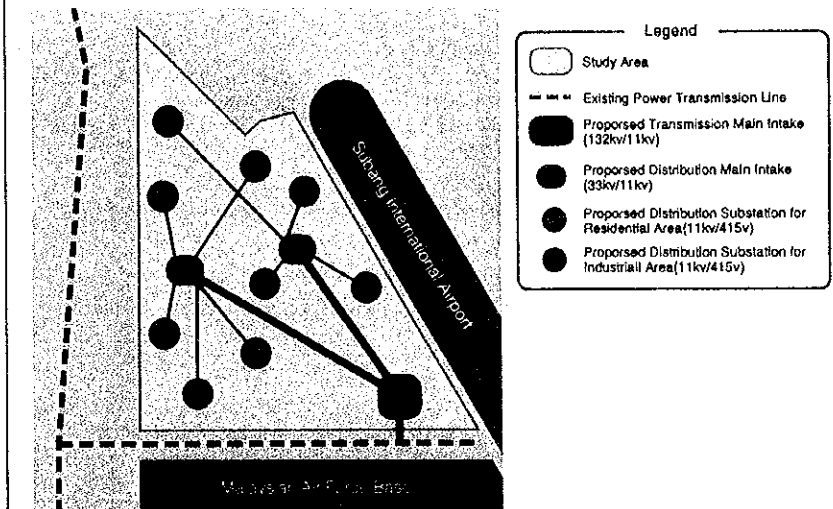
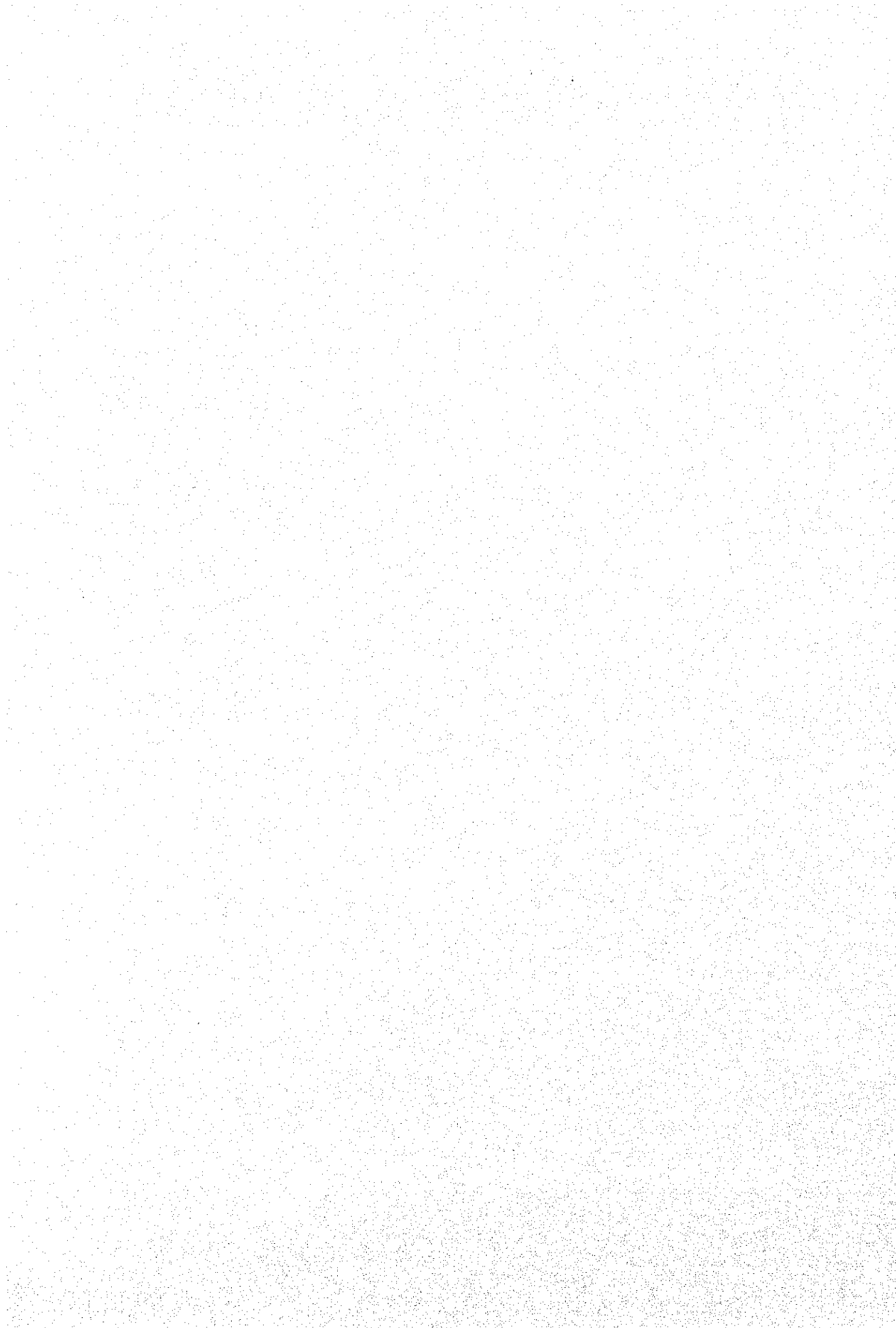


Figure 4.28 Concept of Proposed Electricity Supply System





(f) Telecommunication

The telecommunication service is provided by Telekom Malaysia through the telephone exchange station at the airport. Although the current exchange station has a capacity of more than ten thousand lines, Telekom Malaysia plans to develop in a few years time a new exchange station near the project area to meet rapidly growing demand. Proposed improvements include:

- i) provision of a site for a new exchange station (2 acres) in the project area; and
- ii) relocation of overhead telephone lines into the ground.

3) Land Development

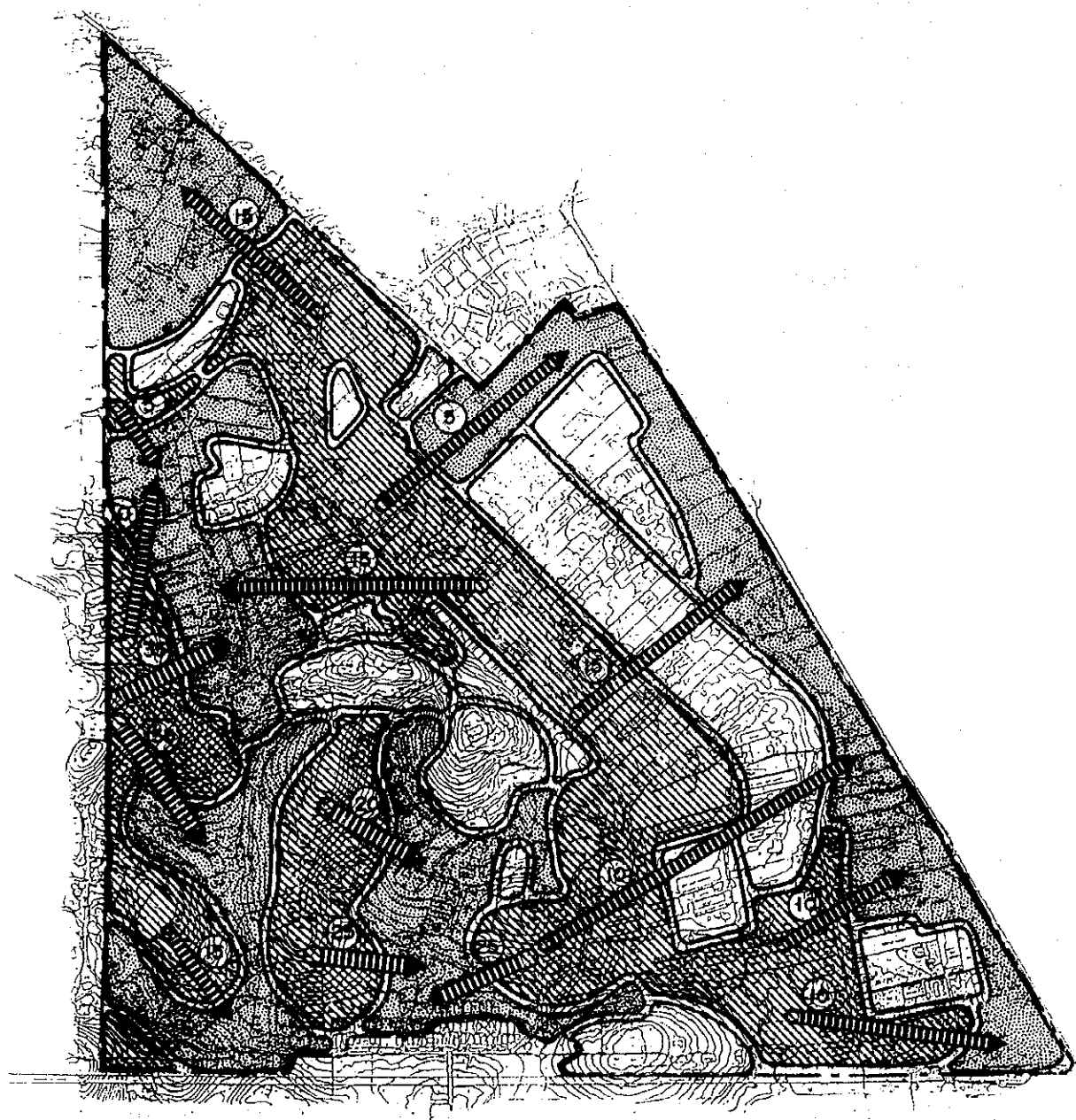
The Project requires considerable earthwork of approximately 2.5 million m³ cutting and equivalent fillings. The following factors will be considered to avoid adverse effects of the earthwork (refer to Figure 4.29):

- Some hilly terrains will be untouched to preserve the existing environment and landscaping;
- Areas where buildings will be densely constructed will be basically untouched;
- The cut and fill will be balanced within the project area to avoid importing soil from outside;
- Catchment areas of the existing two river systems will not be charged;
- Earthwork will be done to facilitate effective construction/installation of other infrastructure/facilities;
- Adequate slope protection measures will be provided;
- To prevent possible disaster during the construction period, necessary measures will also be provided including construction of subdrainage, storm water control measures, fences against falling stones, etc.



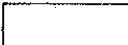
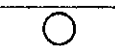
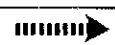
4) Estimate of Construction Costs

The construction cost of the project was estimated based on the available data on similar construction works undertaken in the region as well as the experiences and knowledge of an experienced local consulting engineer employed by the Study Team. The total construction cost is RM137.3 million, which is equivalent to RM431,000/ha., RM43/sq.m. or RM4.0/sq.ft. The breakdown of the cost is shown in Table 4.11.

Figure 4.29
Land Development Plan



LEGEND

	CUTTING AREA (126 ha)
	FILLING AREA (118 ha)
	UNTOUCHED AREA (75 ha)
	VOLUME OF SOIL (IN 10,000 m ³)
	SOIL HAULAGE DIRECTION

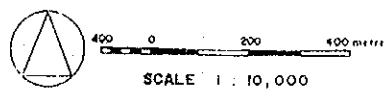


Table 4.11
Estimation of Construction Cost

Work Item	Unit	Quantity	Unit Price	Amount (RM)
1. CIVIL INFRASTRUCTURE				89,207,733
1.1 Site Clearance	ha	171	7,122	1,384,999
1) General Site Clearance	pos	1,000	165	1,219,999
2) Cutting of Trees above 1 meter girth				165,000
1.2 Earthwork	m ³	2,500,000	6.1	17,113,100
1) Cutting and Filling	m ³	300,000	6.2	15,250,000
2) Slope Protection				1,863,100
1.3 Storm water Drainage				19,417,585
1) Sg. Pelumut Improvement	Ls			818,140
2) Sg. Air Kuning Improvement	Ls			918,380
3) Retention Pond along Sg. Pelumut	Ls			778,030
4) Retention Pond along Sg. Air Kuning	Ls	79,105	149.62	905,280
5) Open Drain	m	618	579.29	11,836,690
6) Sump	pos	6,955	360.32	358,001
7) Box Culvert	m	8,640	136.00	2,506,026
8) Concrete Pipe	m	1,980	62.12	1,175,040
9) Slope Drain	m			122,998
1.4 Roads and Bridges				29,626,729
1) Roads				28,827,394
Major Road W=30m	m	988	1,119	1,105,572
Collection Road W=24m	m	6,507	1,019	6,630,633
Major Local Road W=20m	m	10,074	606	6,104,844
Minor Local Road W=15m	m	4,000	670	2,680,000
Minor Local Road W=12m	m	24,130	510	12,306,300
2) Public Parking, Bus Terminal	m ²	15,870	22	349,140
3) Bridges	m ²	560	804	450,240
1.5 Water Supply Reticulation				9,464,730
1) Water Distribution Reservoir	Ls			1,466,850
2) Water Supply Pipes	m	44,000	181.77	7,997,880
1.6 Sewerage Disposal				11,589,220
1) Treatment Plant along Sg. Pelumut	Ls			1,140,000
2) Treatment Plant along Sg. Air Kuning	Ls			2,800,000
3) Pumping Station	Ls			65,000
4) Concrete Sewer	m	33,330	102.0	3,399,660
5) Steel Pipe	m	650	200	130,000
6) Manhole	pos	4,710	860.84	4,054,560
1.7 Landscaping and Turfing	Ls			610,370
2. MECHANICAL AND ELECTRICAL INFRASTRUCTURE				27,559,914
2.1 Electricity Supply				13,512,913
1) Distribution Main Intake	pos	2	2,308,000	4,616,000
2) Distribution Sub Station	pos	6	309,000	1,854,000
3) Electrical Cable	m	62,900	99.97	6,288,113
5) Trenching	m	62,900	12	754,800
2.2 Telephone Service				10,714,001
1) Manhole	pos	350	10,000	3,500,000
2) Telephone Cable	m	62,900	25.17	1,583,193
3) Ducting	m	62,900	74.52	4,687,308
4) Trenching	m	62,900	15	943,500
2.3 Street Light Installation				3,333,000
1) Street Light 150W	pos	250	1,540	385,000
2) Street Light 250W	pos	1,000	1,900	1,900,000
3) Cabling and Trenching	m	18,000	36	648,000
4) Feeder Pillar	pos	20	20,000	400,000
3. DETAILED DESIGN WORKS (1. + 2.) x 0.10				11,676,765
4. MANAGEMENT AND SUPERVISION (1. + 2.) x 0.02				2,335,353
5. CONTINGENCY (1. + 2. + 3. + 4.) x 0.05				6,538,988
TOTAL CONSTRUCTION COST				137,318,753

4.1.5 Formulation of Project Implementation Plan

1) LR Project Implementation Planning

The LR project implementation planning provides the detailed implementing framework of the proposed LR project on the basis of a series of planning work previously done. Various requirements made by concerned parties including landowners, implementing body, government bodies, other relevant companies, etc. are coordinated and reflected in the plan. Information of great concern to these bodies are:

- For landowners : contribution rate, layout plan, etc.
- For implementing body : financial plan, contribution rate, etc.
- For government : layout plan, financial plan, etc.

Landowners prefer a lower contribution rate with better infrastructure and environment; the implementing body's concern is the financial plan with lower contribution rate to ease negotiations with landowners; and the Government is interested in a higher standard layout plan with less commitment of public expenditure. Thus, a unique feature of the LR project is that the process involves maximizing the benefits of the project by coordinating these contradictory elements.

Various documents prepared at this stage will also compose the main part of the legal documents for submission to and approval by the authority. They include the following :

- (a) Name of the LR Project
- (b) Name of the project implementing Body
- (c) Location and Delimitation of the Project Area
- (d) Objectives of the Project
- (e) Existing Conditions in the Project Area
- (f) LR Design Policy
- (g) Project Implementation Schedule
- (h) Financial Plan
- (i) Calculation of Contribution Rate
- (j) Attached Drawings : project location map, project area map, topographic map, LR layout plan
- (k) References : land development plan, drainage system plan, various utilities plans, etc.

2) Assumptions Made for Project Implementation Planning

In formulating the project implementation plan, a couple of major assumptions are made for cost sharing of public facilities and project implementation schedule, as follows:

- (a) **Cost-sharing of Public Facilities:** Cost-sharing of public facilities between the implementing body and government agencies/organizations concerned is a critical element which affects contribution rate on the landowners side and public funding on public sector side. Discussions were held with

counterpart officials to have a set of assumptions, shown in Table 4.12, to undertake the exercise.

- (b) **Project Implementation Schedule:** It is assumed that the project will require six years to complete after the approval of the project.

Table 4.12
Assumed Cost-Sharing in Providing Related Public Facilities

Category	Facility Type		Cost Sharing		Operation and Maintenance
			Land	Facilities	
1. Basic Infra-Structure	Road	<ul style="list-style-type: none"> Major Road (U4) Collector Road (U3) Major Local Road (U2) Minor Local Road (U1) Back Lane/Side Lane 	JKR JKR JKR/IB IB Landowners	JKR JKR JKR/IB IB Landowners	JKR JKR LA LA LA
	Road Transport	<ul style="list-style-type: none"> Public Carpark Bus Terminal 	LA LA	LA LA	LA LA
	River/Waterway/Drainage	<ul style="list-style-type: none"> River, Waterway Drainage Retention Pond 	JPS JPS JPS	JPS JPS JPS	JPS JPS JPS
	Park and Open Space		LA	LA	LA
2. Community Service	Sewage	<ul style="list-style-type: none"> Sewage Network Treatment Facilities 	IWK IWK*	IWK IWK	IWK IWK
	Water Supply	<ul style="list-style-type: none"> Distribution Reservoir Distribution Network 	JBA* JBA	JBA JBA	JBA JBA
	Electricity	<ul style="list-style-type: none"> Distribution Main Intake Distribution Substation 	Tenaga/IB Tenaga/IB	Tenaga/IB Tenaga/IB	Tenaga Tenaga
	Education	<ul style="list-style-type: none"> Secondary School Primary School Kindergarten/Nursery 	MOE MOE KEMAS	MOE MOE KEMAS	MOE MOE KEMAS
	Other Civil Service	<ul style="list-style-type: none"> Community Hall Clinic Fire Brigade Station Post Office Police Station Telephone Exchange Station Cemetery Religious Facility 	SG MOH FSD PM (already exists) TM (already exists) SG/PRV	SG MOH FSD PM (already exists) TM (already exists) SG/PRV	SG MOH FSD PM Police TM SG SG/PRV

Notes : * Purchased at Nominal Value

Legend :

IB	: Implementing Body	MOE	: Ministry of Education
IWK	: Indah Water Konsortium	FSD	: Fire Service Department
MOH	: Ministry of Health	TM	: Telekom Malaysia
PM	: Pos Malaysia	SG	: State Government
LA	: Local Authority	PRV	: Private Sector
JKR	: Jabatan Kerja Raya	JPS	: Jabatan Pengairan dan Saliran

3) Land Transformation Plan

The change in land use before and after the LR project is indicated in Figure 4.30 and Table 4.13. The difference of 58,860 sq.m. between actual and registered land uses can be attributed to the Qualified Titles (Q.T.) status of the boundary in the area. The land use characteristics are as follows :

- Lands for basic infrastructure will increase substantially from the existing 42.6 ha. (13.3% of the total area) to 118 ha. (37.1%). The increase is contributed by roads and parks/open spaces which alone share 33% of the total area. Provisions are also made for parking/bus terminal, river/waterway, retention pond, etc.
- Lands for various community services will also increase from 4.0 ha. (1.3% of the total land) to 22.4 ha. (7.0%) to accommodate a set of comprehensive public service facilities, such as sewerage treatment plant, water distribution reservoir, electricity transmission intake, electricity stations, clinic, fire station, post office, community hall, telephone exchange station, religious facility, etc.
- On the other hand, lands for private use will decrease from 278 ha. (87.2% of the total area) to 178 ha. (55.9%). However, land use which is largely under agriculture will be transformed to industry (102 ha.), residential (66 ha.) and commercial/others (11 ha.).

Figure 4.30
Land Use Transformation through LR Project

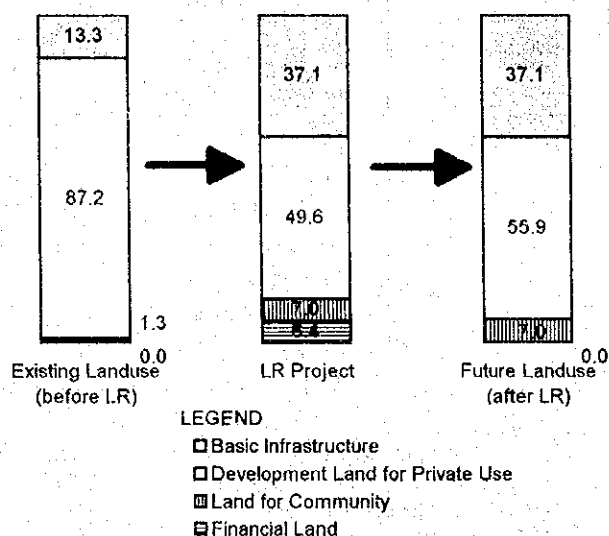


Table 4.13
Land Use Transformation

Item	Land Use Before LR		Land Use in LR Scheme		Final Planned Land Use	
	Area (sqm)	(%)	Area (sqm)	(%)	Area (sqm)	(%)
Public Facility						
Basic Infrastructure						
Road	310,285	9.7	747,447	23.4	747,447	23.4
River & Waterway	7,801	0.2	57,910	1.8	57,910	1.8
Retention Pond	0	0.0	60,000	1.9	60,000	1.9
Park & Open Space	0	0.0	238,610	7.5	238,610	7.5
Buffer Space	0	0.0	78,325	2.5	78,325	2.5
Reserved Land	107,401	3.4	0	0.0	0	0.0
Basic Infrastructure Total	425,487	13.3	1,182,292	37.1	1,182,292	37.1
Community Service Facilities						
Kindergarten	0	0.0	5,520	0.2	5,520	0.2
Primary School	17,019	0.5	47,250	1.5	47,250	1.5
Secondary School	0	0.0	34,600	1.1	34,600	1.1
Police Station	13,825	0.4	11,000	0.3	11,000	0.3
Fire Brigade Station	0	0.0	7,310	0.2	7,310	0.2
Clinic	0	0.0	6,120	0.2	6,120	0.2
Water Facility	0	0.0	7,450	0.2	7,450	0.2
Public Parking	0	0.0	11,920	0.4	11,920	0.4
Bus Terminal	0	0.0	3,950	0.1	3,950	0.1
Cemetery	8,934	0.3	13,250	0.4	13,250	0.4
Religious Facility	0	0.0	5,000	0.2	5,000	0.2
Community Hall	0	0.0	14,540	0.5	14,540	0.5
Radar Site	400	0.0	400	0.0	400	0.0
Post Office	0	0.0	1,400	0.0	1,400	0.0
Electricity Substation	0	0.0	8,710	0.3	8,710	0.3
Electricity Main Intake	0	0.0	20,050	0.6	20,050	0.6
Telephone Exchange Station	0	0.0	9,730	0.6	9,730	0.6
Sewage Treatment Plant	0	0.0	15,700	0.5	15,700	0.5
Community Service Facility Total	40,178	1.3	223,900	7.0	223,900	7.0
Public Facility Land Total	465,665	14.6	1,406,192	44.1	1,406,192	44.1
Alienated Land						
Private Use						
Agriculture	2,547,593	79.8	0	0.0	0	0.0
Building : Commercial	0	0.0	0	0.0	57,101	1.8
Building : Medical Welfare	0	0.0	0	0.0	48,119	1.5
Building : Residential	190,911	6.0	640,567	20.1	660,567	20.7
Industry : Medium Scale	30,000	0.9	846,537	26.5	879,317	27.6
Industry : Service	15,278	0.5	94,291	3.0	139,291	4.4
Private Use Total	2,783,782	87.2	1,581,395	49.6	1,784,395	55.9
Other Community Service						
Other Community Service Total	0	0	0	0	0	0
Alienated Land Total	2,783,782	87.2	1,581,395	49.6	1,784,395	55.9
Public Facility & Alienated Land Total	3,248,447	101.8	2,987,587	93.6	3,190,587	100.0
Financial Land	0	0.0	203,000	6.4	0	0.0
Area Difference (Actual - Registered)	-58,860	-1.8	0	0.0	0	0.0
Total	3,190,587	100.0	3,190,587	100.0	3,190,587	100.0

4) Land Valuation

Lands before and after the LR project were evaluated by land use type. The value "before" the project was determined in consultation with the Valuation Department, while those "after" the project were estimated by comparing the quality of the project with similar developments, situated under similar conditions. The average land value of RM83/m² "before" the project is expected to increase to RM436/m² "after" the project. Thus, the total land value increased from RM227 million to RM777 million (refer to Table 4.14). Site utility ratio, defined as the ratio calculated by dividing the average land value "after" the project by that "before" the project, is 5.2 (refer to Table 4.15).

Table 4.14
Estimate of Land Value

Land Use : Alienated Land	Before LR			After LR		
	Unit Price (RM/sqm)	Area (sq.m.)	Amount (RM 000)	Unit Price (RM/sqm)	Area (sqm)	Amount (RM 000)
Private Use						
Agriculture	80.00	2,547,593 293	203,807	100.00	0	0
Building : Commercial	-	0	0	800.00	57,101	45,681
Building : Medical, Welfare	-	0	0	500.00	48,119	24,060
Building : Residential	107.00	190,911	20,427	300.00	660,567	198,170
Industry : Medium Scale	160.00	30,000	4,800	500.00	879,317	439,659
Industry : Service	160.00	15,278	2,444	500.00	139,291	69,646
Private Use Total		2,783,782	231,478		1,784,395	777,216
Other Community Service						
Other Community Service Total	-	0	0	-	0	0
Alienated Land Total		2,783,782	231,478		1,784,395	777,216
Area Difference (Actual - Registered)	83.15	-58,860	-4,894			
Total / Average	83.15	2,724,922	226,584	435.56	1,784,395	777,216

Table 4.15
Estimate of Land (Replot) Value and Site Utility Increase Ratio

Item	Before LR	After LR
Registered Area: sq.m.	2,783,782	-
Actual Area: sq.m.	2,724,994	1,784,395
Average Unit Value: RM/sqm	83.15	435.56
Total Value: RM 000	226,584 (A)	777,216 (B)
Site Utility Increase Ratio: (B)/(A)	5.24	

5) Financial Land Estimate

Financial land planning is an important element of project planning because the sale of the financial lands directly affects the financial viability of the project. The following factors should be considered:

- (a) Marketing aspect: Financial lands have to be sold easily as quickly as possible so that borrowing can be minimized;
- (b) Planning aspect: Types and locations of the financial lands should comply with the layout plan and planned landuse;
- (c) Size of financial lands: The total amount of the financial lands affect directly the contribution of landowner; the higher the value of financial lands, the lower the landowners' contribution rates become; and
- (d) Replotting design: Replotting design also affects the exact location, size, and shape of the financial lands.

The financial lands planned in this study are mostly distributed to the lands with higher potential market value to reduce the contribution rates. A total of 203,000 sq.m. of financial lands are expected to generate RM114.6 million (refer to Table 4.16).

Table 4.16
Planned Financial Lands and Estimated Values

Use	Area (sq.m.)	Average Price (RM/sq.m.)	Amount (RM000)
Commercial	57,101	800	45,681
Residential	20,000	300	6,060
Industry (Medium)	32,780	500	16,390
Industry (Service)	45,000	500	22,500
Medical/Welfare	48,119	500	24,060
Total	203,000	-	114,631

The other important aspect in financial land planning is to estimate the maximum area which can be contributed to financial lands without reducing the land value of landowners. This can be calculated, as shown in Table 4.17. This indicates that the actual contribution for financial lands is only about 16% of the possible maximum, implying that large gains from land value increase still remain with the landowners.

Table 4.17
Estimate of Maximum Contribution for Financial Land

Item	Amount	Remarks
Total value of private use lands before LR : RM000	226,584	Refer to Table 4.14
Total value of private use lands after LR : RM000	777,216	"
Total increased value of private use Lands : RM000 (A)	550,632	"
Unit Value of private use lands after LR : RM/sq.m. (B)	435.56	"
The Maximum Area for Financial Land Contribution : sq.m. (C)	1,264,193	(A) / (B)
Actually planned Financial Land : sq.m. (D)	203,000	Refer to Table 4.16
Actually planned Financial Land : % to maximum	16.1	(C)/(D)

6) Financial Plan

(a) Project Cost

Costs of project implementation include not only the construction cost of the area but also various compensation, project management, necessary premiums and interest repayment. The implementing body will have to employ a large number of designers, supervisors and management personnel by itself in order to carry out the project. Contractors and surveyors have to be employed and supervised as well. The costs of the project are as follows:

Construction Cost: This covers the construction cost of all necessary infrastructure and public facilities needed in the project (refer to Table 4.11 for details).

Compensation Cost: Due to varied reasons such as change in landuse replotting plan, land development plan, construction of public facilities, etc., a total of 994 buildings with 211 thousand sq.m. of floor area need to be relocated or demolished and rebuilt. The affected buildings were identified and 80% of the new construction cost were allocated in the project cost for different building types (residential, commercial, factory, workshop and animal shed) and material types (reinforced concrete, brick, timber, brick and timber, and steel). Compensation will also cover temporary suspension of business activities, loss of agricultural production, and other losses (refer to **Appendix 4.2**).

Survey Cost: The LR project requires extensive surveys throughout the process. During the preparatory stage, various survey maps are necessary for project planning, and a boundary survey is also needed to delimit the project area precisely. During the implementation stage, block confirmation survey which determines the location of the planned roads on the existing lands, is to be carried out. Together with a road centerline survey, the location and area of the block will be determined. However, when the construction work is completed, differences are normally

observed between the results of the block confirmation survey and the actually developed blocks. For this, a confirmation/alteration survey will be carried out to confirm the location, shape and area of blocks and lots prior to preparation of the replotting plan. A lot confirmation survey is conducted to survey the final area of the replots (refer to Appendix 4.3).

Project Management Cost: Management of the LR project requires preparation of detailed design, supervision of the construction work, undertaking compensation negotiation and work implementation, supervision of various survey works and preparation of replotting design. For this, an effective LR organization needs to be established which is composed of a large number of personnel with adequate levels of expertise (refer to Appendix 4.4).

Land Conversion and Alienation Premium: In the Malaysian land registration system, the LR project will also be subject for conversion premium and (further) alienation premium. The former is imposed when the land use is altered, while the latter when financial land is created (refer to Appendices 4.5 and 4.6).

Total Project Cost: The estimated project cost is approximately RM262 million of which the construction cost shares the largest portion (44.6%), followed by compensation cost (21.5%), project management cost (13.0%), and others. Land conversion and alienation premiums share significant portions of the cost: 9.4% and 7.8%, respectively (refer to Table 4.18).

Table 4.18
Project Cost Estimates

Item	RM000	(%)
Construction Cost	116,767	(44.6)
Compensation Cost	56,456	(21.5)
Survey Cost	1,376	(0.5)
Project Management Cost	39,997	(13.0)
Land Conversion Premium	24,668	(9.4)
Land Alienation Premium	20,463	(7.8)
Interest	8,267	(3.2)
Total Project Cost	261,994	(100.0)

(b) Project Revenue

The revenue sources of the project include the shared costs of the Federal Government, State Government, Local Authority and relevant agencies, and the disposition of financial land.

Defrayals: Shared costs of relevant bodies were worked out on the basis of discussions held with the counterpart team officials to assume cost-sharing for relevant public facilities (refer to Appendix 4.7).

Financial Land: A total of 20.3 ha. have been allocated under various categories of landuse including commercial (5.7 ha.), residential (2.0 ha.), medium-scale industry (3.3 ha.), service industry (4.5 ha.) and medical/welfare (4.8 ha.) (refer to Table 4.16).

Total Project Revenue: The total revenue of the project is expected to be RM262 million of which disposition of financial land contributes 43.7% of the total, followed by federal share (29.2%), state and local authority share (12.5%), and various agencies (14.6%) (The revenue distribution is presented in Table 4.19).

Table 4.19
Revenue Estimates

Revenue	RM 000	(%)
Federal Share	76,438	(29.2)
State & Local Authority Share	32,777	(12.5)
Agency Share	38,148	(14.6)
Disposition of Financial Land	114,631	(43.7)
Total Revenues	261,994	(100.0)

(c) Financial Plan

Disbursement of the project costs and generation of the revenues are more or less made over seven years between 1997 and 2003, as shown in Table 4.20. The cost and revenues will be balanced by year 2001, though the exercise at this stage of the study involves a lot of uncertainties such as project period, the sale of financial land, etc.

d) Contribution Rate

Accordingly, the contribution rate for landowners is calculated to be 34.5% for basic infrastructure and 7.5% for financial land. The aggregate rate is 42.0% (refer to Table 4.21).

4.1.6 Formulation of Replotting Design Plan

1) Assumptions

The normal process of undertaking replotting design work involves intensive formal and informal consultations with landowners and other participants. However, in this study, no direct contacts with landowners nor their representatives were made possible either before preparing the plan or the objective of this case study. Therefore, it should be noted that the replotting design work carried out in this study are based on the following assumptions:

- (a) Statutory plan covering the project area: The project area will be covered under gazetted local plan.

Table 4.20
Cost Disbursement and Revenue Generating Schedule¹⁾

Item		Total RM 000	Yearly Disbursement (RM000)						
			1997	1998	1999	2000	2001	2002	2003
C O S T	Construction Cost	116,767	0	5,838	17,515	29,192	35,030	17,515	11,677
	Compensation Cost	56,456	0	5,646	14,114	16,937	11,291	5,646	2,822
	Survey Cost	1,376	344	275	69	206	69	206	207
	Project Management	33,997	2,720	4,080	5,100	7,819	6,119	4,420	3,739
	Conversion Premium	24,668	0	0	0	7,400	9,867	4,934	2,467
	Alienation Premium	20,463	0	0	0	6,139	8,185	4,093	2,046
	Sub-Total	253,727	3,064	15,839	36,798	67,693	70,561	36,814	22,958
	Interest ²⁾	8,267		306	1,921	3,609	2,431	0	0
	Total	261,994	3,064	16,145	38,719	71,302	72,992	36,814	22,958
R E V E N U E	Federal Share	76,438	0	0	15,288	22,931	22,931	11,466	3,822
	State & Local Authority Share	32,777	0	0	6,555	6,555	8,194	4,917	6,556
	Agency Share	38,148	0	0	0	0	15,259	15,259	7,630
	Disposition of Financial Land	114,631	0	0	0	57,316	47,193	5,172	4,950
	Total	261,994	0	0	21,843	86,802	93,577	36,814	22,958

¹⁾ Yearly allocation of costs and revenues are made based on the assumption shown in Appendix 4.8.

²⁾ 10% per year is assumed as interest rate

Table 4.21
Contribution Rate Calculation

Item		Amount	Remarks
Registered Area before LR (sq.m.) : (A)		2,783,782	
Revised Area before LR (sq.m.) : (B)		2,724,992	
Development Plan & Financial Land After LR : (C)		1,784,395	
Contribution Area (sq.m.)	Basic Infrastructure : (D)	940,527	
	Financial Land : (E)	203,000	
	Aggregated Area : (F)	1,143,627	(F)=(D) + (E)
Contribution Ratio (sq.m.)	Basic Infrastructure : (G)	34.5	(G)=(D)/(B)*100
	Financial Land : (H)	7.5	(H)=(E)/(B)*100
	Aggregated Area : (I)	42.0	(I)=(G) + (H)

(b) Confirmation of land rights: This includes the following:

- boundary of the project area has been determined by survey in the presence of relevant landowners;
- area of public facilities lands has been confirmed by administrator;
- difference in the area between the registered and actual one will be proportionally distributed to individual lots;
- area of the block has been determined with block confirmation survey; and
- no other rights, except registered landownership, have been declared.¹⁰⁾

(c) Land use restriction: Under the local plan, there will be no more agricultural land allocated in the project area and the current practice of mixed land use, such as factory plus residence in one lot, will no longer be allowed. Instead, those who are presently engaged in agriculture will have to sell their lands and move out of the project area, or change their activities/life style to conform with the local plan.

Those who are operating factories and residing in the same lots under agriculture purpose will maintain factories in the industrial area after the project and look for residences by themselves in the project area or outside.

(d) Location of replots: The replots are mostly located near the original lots. However, due to the enforcement of the local plan, physical constraints, and possible request of the landowners, some lands are replotted in remote locations and with different categories of landuse.

It is assumed that all these are the results of consultations with landowners and the adjustment process.

2) Land Valuation

(a) Calculation of Street Value

Street values were calculated based on a specific formula where adjustment factors were considered, as shown in Table 4.22. The street value indexes "before" the project range from 550 to 1,000 and from 2,320 to 2,750 "after" the project (refer to Figure 4.31 and Figure 4.32).

¹⁰⁾ Actually, there are some tenants, sub-tenants and illegal occupants in the project area.

Figure 4.31
Street Value Indexes "Before" the Project

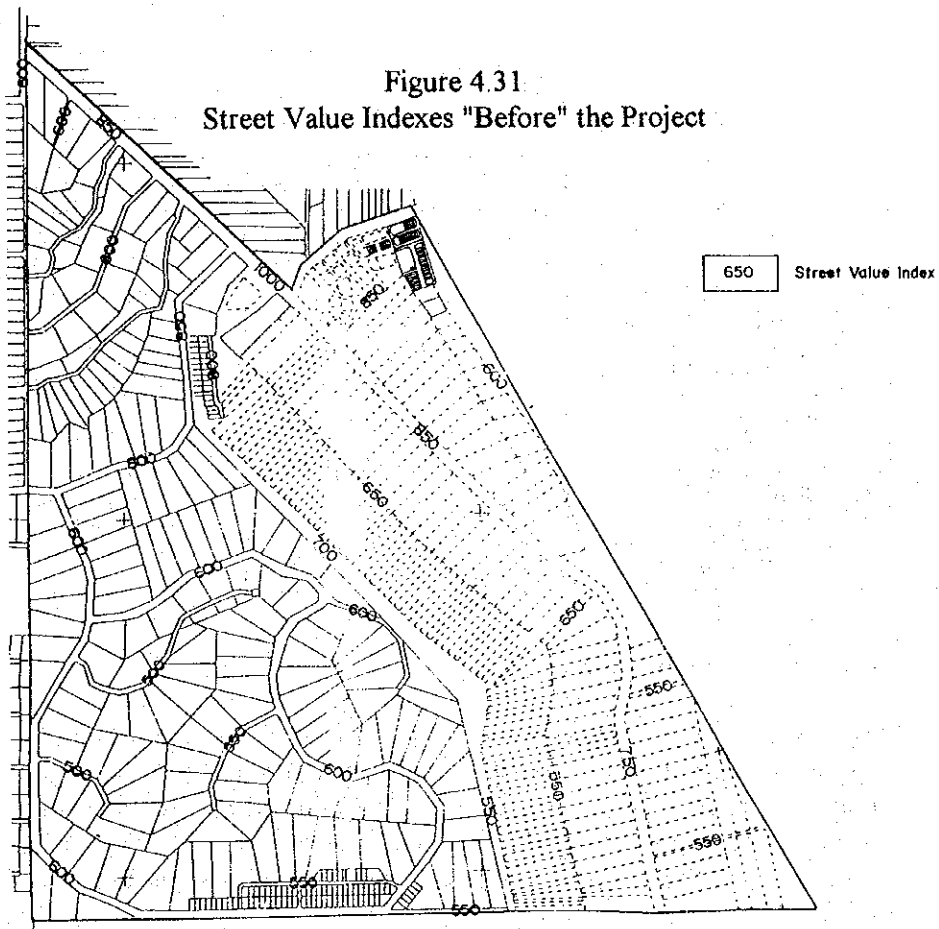


Figure 4.32
Street Value Indexes "After" the Project

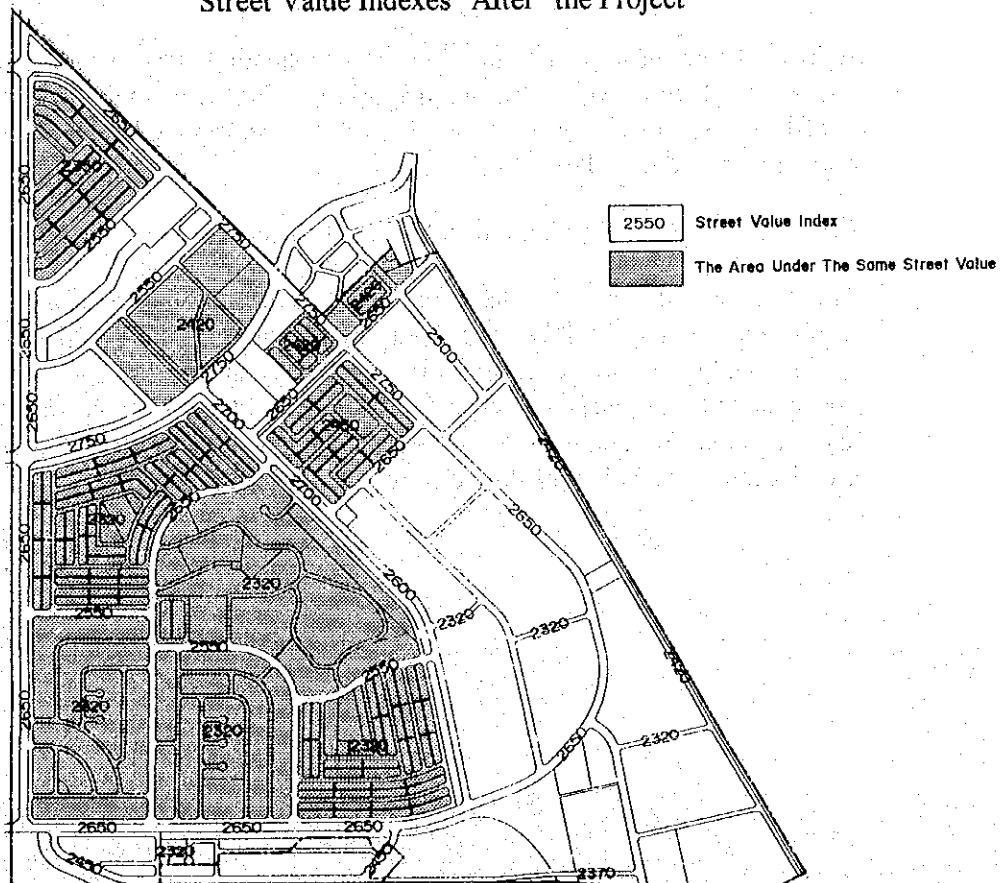


Table 4.22
Factors which Affect Street Values and Coefficient Values

Factors	Ranges of Adjustment (Coefficient Value)	
	(Before the Project)	(After the Project)
• Condition of Street (hierarchy, connection)	- 10% ~ 0%	0% ~ + 25%
• Amenity (neighbourhood status)	- 10% ~ 0%	+ 80%
• Accessibility - 1 (shopping)	- 10% ~ 0%	+ 10% ~ + 20%
• Accessibility - 2 (primary school)	- 5% ~ 0%	+5%
• Width of Street	- 10% ~ +10%	-10% ~ + 10%
• Pavement Type	- 5% ~ 0%	- 5% ~ 0%
• Sewerage / Drainage		+ 30%
• Water Supply	- 5% ~ 0%	-5% ~ 0%

(b) Calibration of Street Value

To calibrate the calculated street values and determine whether they were appropriate or not, the Valuation Department was consulted on the land values of nine lots in the project area which were evaluated according to the prevailing method in Malaysia. The comparative results show more or less the same tendency. This indicates that the proposed street value method is applicable (refer to Figure 4.33).

(c) Preparation of Valuation Conditions

Individual lots have been valued by further adjusting street values according to adjustment factors which are unique to lots. The adjustment factors and their coefficient values shown in Table 4.23 have been applied to individual lots in comparison with standard lots.

(d) Individual Lot Valuation Before the Project

The existing individual lots have been valued in compliance with the prepared factors and coefficient values. The results are indicated in Table 4.24 and illustrated in Figure 4.34. The average lots were valued at an index of 603 while seven lots appreciated at an index valued more than 1,000 due to the current designated landuse of industry and building. The low valued lots of less than 600 index value are distributed on hilly area due to poor land utilization.

Figure 4.33
Comparison Between Assessed Value by Valuation Department
(RM/sqm) and Calculated Street Value (Index/sqm)

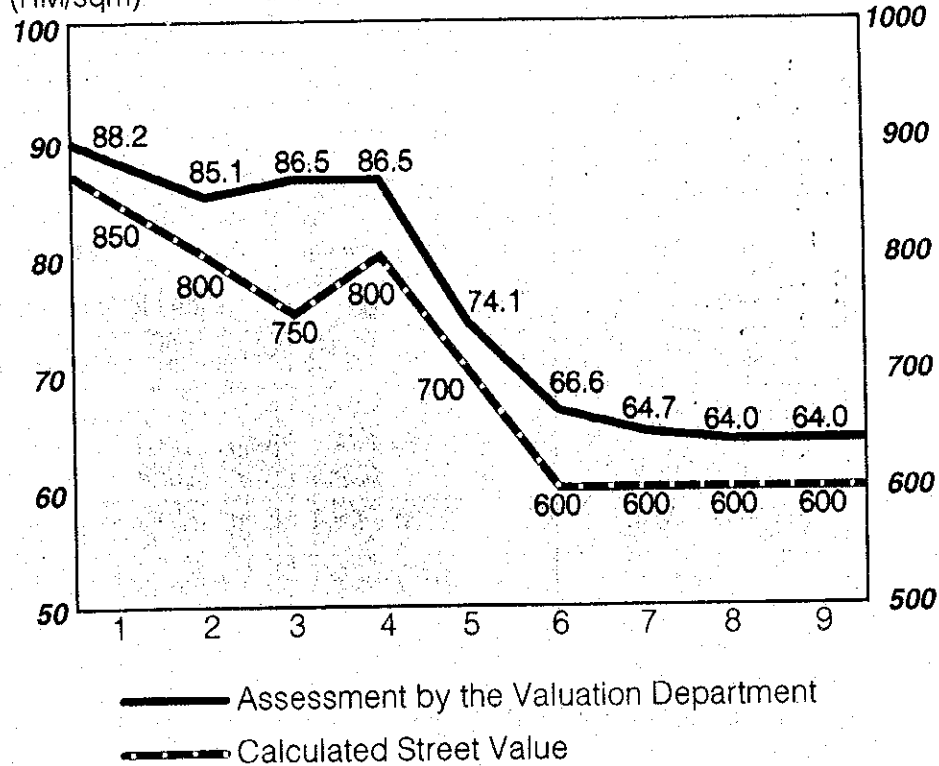


Table 4.23
Adjustment Factors and Coefficient Values for Valuation of Individual Lots

Factor	Condition	Coefficient Value	Note
Category of Land Use	Commerce Middle-Industry Service-Industry Detached & Semi-detached House Terrace House Agriculture	+ 100% + 40% + 30% + 10% 0% - 10%	
Size	A < 20,000 m ² A ≥ 20,000 m ²	0% - 5%	
Terrain	Gradient ≤ 5% Gradient > 5%	0% - 5%	
Existence of Nuisance Facilities	Adjoining Land	- 5%	
Height Difference Between Road and Lot	H ≥ 3m 1m ≤ H ≤ 3m H < 1m	- 5% 0% - 5%	only applied to the block valuation after project
Corner Lot	Commerce Industry Residence	+ 10% + 5% + 2%	
Land Adjoining Front and Back Road	Commerce Industry Residence	+ 10% + 5% + 2%	
Land not Adjoining Any Road		- 5%	

Table 4.24
Distribution of Lot Value Index Before the Project

Lot Value Index	No of Lots	Aggregated Area (m ²)
400 ~ 499	85 (19.3%)	530,233.78 (19.4%)
500 ~ 5599	193 (43.9%)	1,200,370.25 (44.1%)
600 ~ 699	42 (9.5%)	297,980.55 (10.9%)
700 ~ 799	72 (16.4%)	518,325.81 (19.0%)
800 ~ 899	36 (8.2%)	91,677.41 (3.4%)
900 ~ 999	5 (1.1%)	38,535.17 (1.4%)
1000 ~ 1099	4 (0.9%)	23,693.69 (0.9%)
1100 ~ 1199	2 (0.5%)	16,412.78 (0.6%)
1200 ~ 1299	1 (0.2%)	7,692.56 (0.3%)
Total	440 (100 %)	2,724,922.00 (100%)

(e) Block Valuation After the Project

The future blocks have also been valued except the blocks for public facilities, as shown in Figure 4.35. The average block is valued at an index estimated at 3,189. Accordingly, the land value increase ratio is expected to be 5.28, which is almost equal to the increase ratio of 5.24 in the project implementation plan. The block values can be grouped into land use types as follows:

Table 4.24'
Block Values by Land Use Type

Land Use Type	Value Index
Terrace House	2,300 ~ 2,500
Semi-Detached, Detached	2,500 ~ 3,000
House	3,000 ~ 3,500
Service Industry	3,500 ~ 4,000
Middle Industry	more than 4,500
Commerce	

3) Replotting Design

(a) Replotting Principle

Replotting design was carried out to locate the replot the value index of which becomes equivalent to the entitled share of a lot based on calculated street value

Figure 4.34
Individual Lot Valuation Before the Project

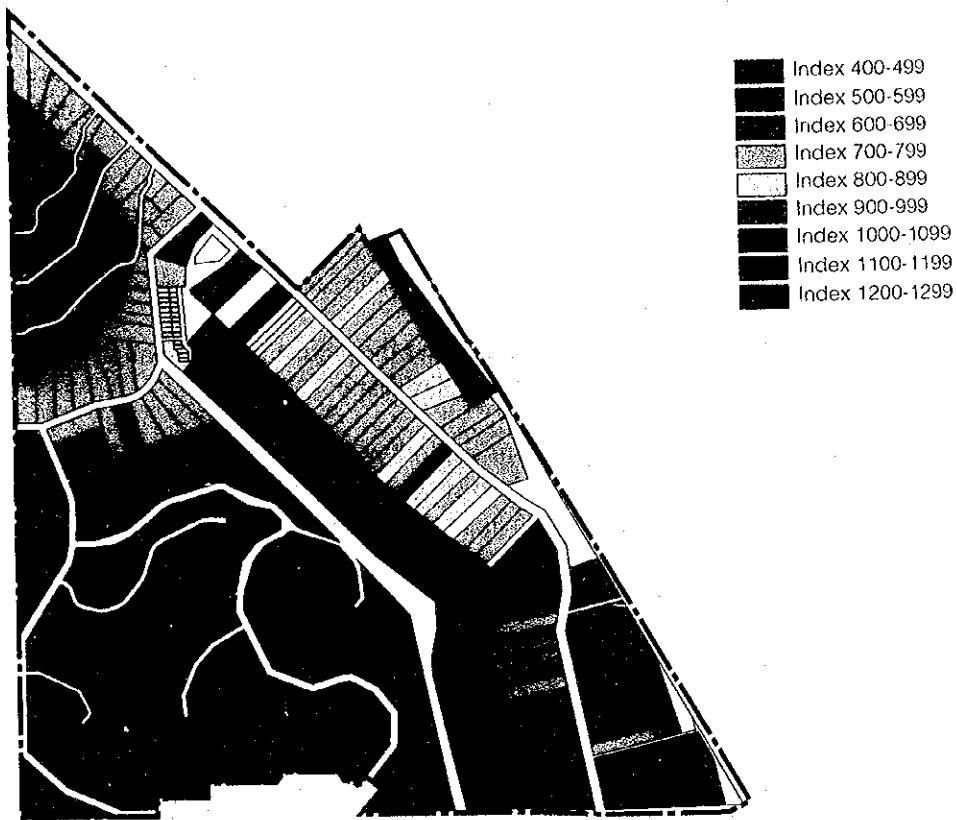
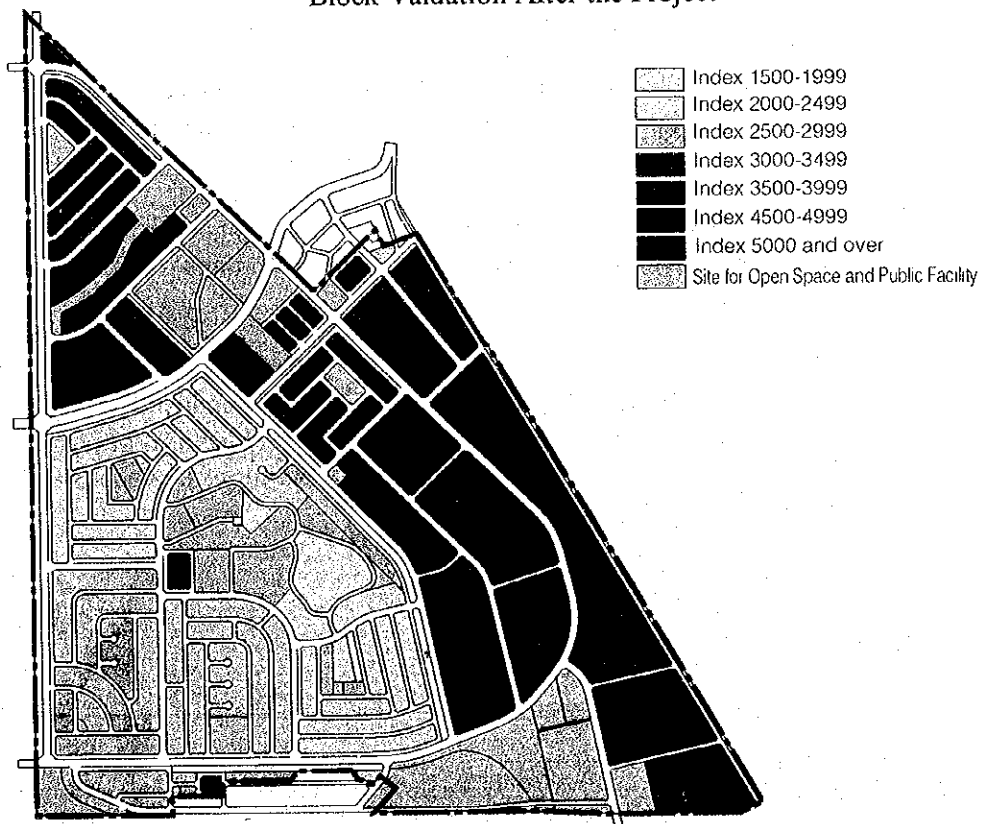


Figure 4.35
Block Valuation After the Project



method. The entitled share of an individual lot is calculated by multiplying proportional ratio¹¹⁾ with assessed value of a lot "before" project.

Based on the project implementation plan, commercial and medical welfare areas are first fixed as financial land and then replotting of the private land is carried out in compliance with the following guidelines:

- Both the current and future landuse plans are observed. Current industrial and residential lots will be replotted to the areas with corresponding landuse zoning, unless it is constrained by special reasons or requested by landowners.
- To ensure efficient lot utilization after the project, replots will be provided with sufficient frontage with rectangular shape.
- Basically, the "one lot to one replot" principle is applied. However, one lot must sometimes be divided into several lots due to the fixed design and use of lands such as terrace house and service industry areas.

(b) Results of Replotting Design

The replotting design plan has been worked out as illustrated in Figure 4.36, which also shows the location of financial lands. The results of the work show the following characteristics:

- Contribution rates of individual lots vary considerably, depending upon relative changes in land use and location due to the project. Contribution rates are normally high when agricultural lands are replotted to industrial or commercial lands. Some lots will gain more area (5-6%) while some contribute more than 60% (refer to Table 4.25).
- The most popular case in this project is replotting from agriculture to industry, which shares approximately 46% in total area. Average contribution rate for this category is 48.7%, ranging between 32.1% and 54.8%.
- The second and third popular cases are replotting from agriculture to detached house and terrace house with average contribution rates of 37.1% and 29.0%, respectively.
- The replotting design is further analyzed by zone: Zone A (northern industrial area), Zone B (residential area) and Zone C (eastern industrial area). It can be observed that many lots are replotted to original locations or nearby in Zone A, while many lots are relocated to remote locations in Zone B and Zone C (refer to Figure 4.37).

11) Proportional ratio is calculated by dividing the total value index of alienated lands, excluding financial lands, by the total value index of the alienated lands before the project, indicating the increased ratio of the lands subject to replotting design. The proportional ratio in this project is calculated at 3.031.

(c) Other Considerations in Replotting Design

In an actual LR project, replotting design is a reiterating planning process done in consultation with landowners. Although this process has not been undertaken at this stage, the results of the exercise indicate that a number of key aspects should further be considered in replotting design as follows:

- (i) Alternatives in replotting design to solve the problem of mixed land use: Mixed land use is the current common practice while the proposed layout plan does not allow mixed land use. Therefore, many landowners split their lots into two, i.e., one for residential use and another for commercial, industrial or other types of usage, which they operate before the LR project. When the size of original lands are large enough, the split is possible but when they are not, problems can arise. It is also anticipated that some landowners might not agree to separate their current activities. The locations of the two split lands might also be a concern to landowners.
- (ii) Application of vertical replotting: Due to contribution, some landowners with relatively small lands originally might not be able to continue with their current activities. In this instance, the replots will be given in the form of a floor with an equivalent value instead of land. For example, a small-sized land with a detached house built on it will be replotted to a floor or a unit of flat. Similarly, those who operate an industry can also be accommodated in an industry building. Vertical replotting cannot only solve the above problem but also promote more effective land use so that the contribution of landowners can be reduced.
- (iii) The way in which landowners' preferences in replotting design is identified: LR involves extensive consultation process with landowners where their opinions and desires can be considered in preparing the replotting design plan. However, the implementing body should lead the landowners adequately by preparing plans and countermeasures which will provide an effective basis for their decisions.

One possible measure is to prepare a layout plan in such a way that two split lands can be located closely, while another is to prepare a plan which can accommodate original facilities/ activities in a more effective manner on the smaller size of lands.

Figure 4.36
LR Replotting Design in Subang Project Area

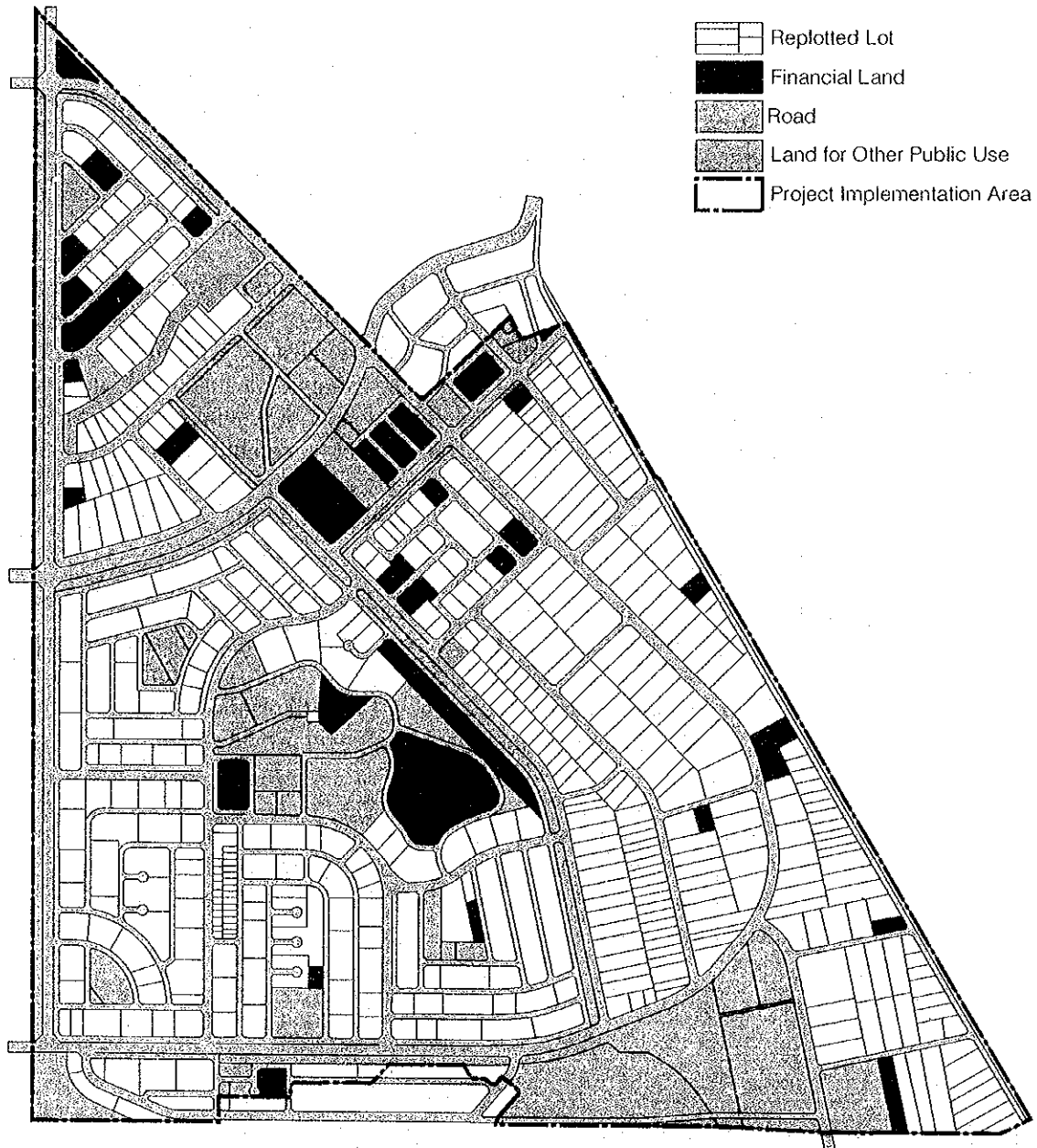
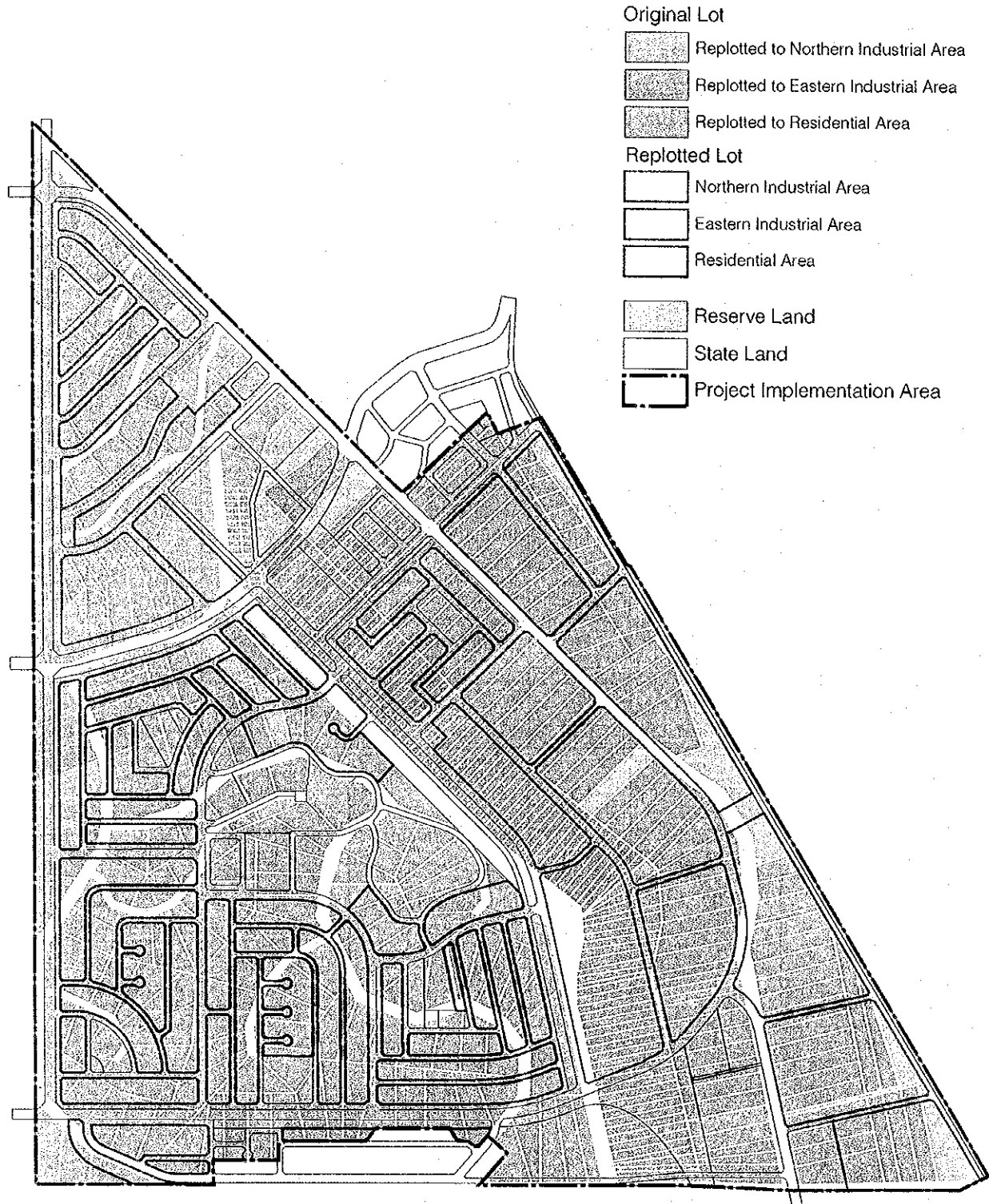
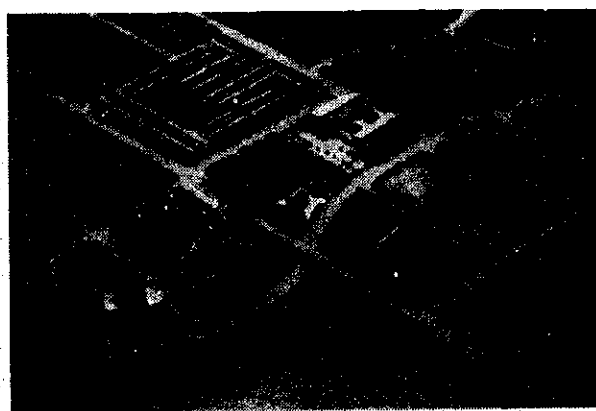
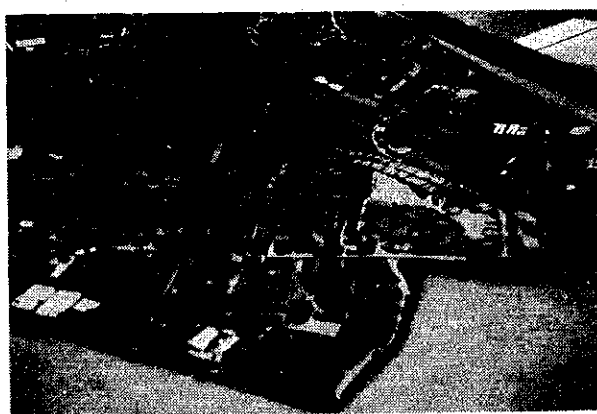
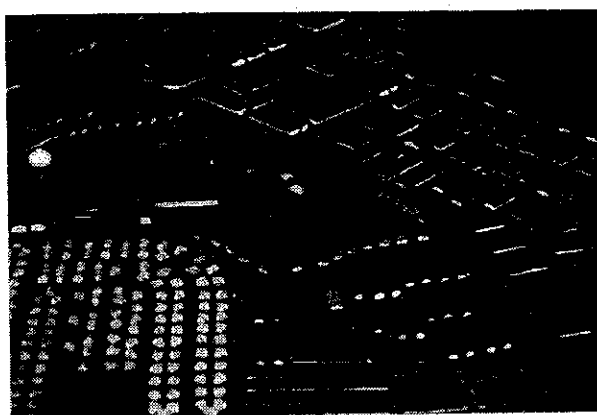
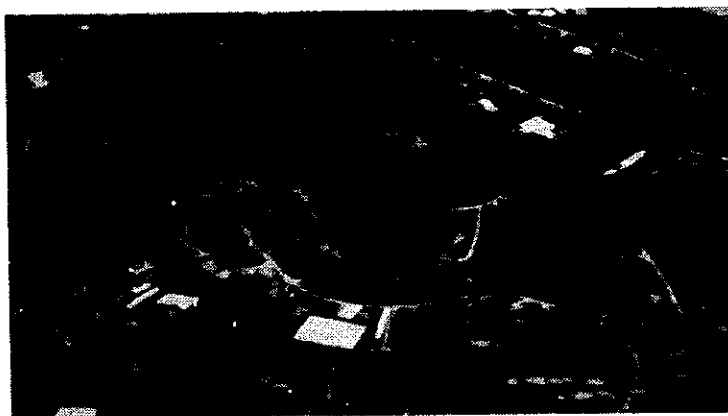


Table 4.25
Contribution Ratio by Land Use Transformation After the Project

Before the Project			After the Project		
Land use	Basic Area (m ²)	No of Lots	Landuse	Basis Area (m ²)	Contribution Ratio (%)
Agriculture	287,030.10 (10.5%)	43 (9.8)	Terrace House	203,723.98 (12.9%)	-5.4 ~ 40.0 Average 29.0
Agriculture	165,012.98 (6.1%)	20 (4.6)	Semi-Detached	97,906.96 (6.2%)	-6.3 ~ 55.4 Average 40.7
Agriculture	347,542.37 (12.8%)	42 (9.5)	Detached House	218,581.30 (13.8%)	9.4 ~ 54.9 Average 37.1
Agriculture	152,066.33 (5.6%)	32 (7.3)	Service Industry	80,845.29 (5.1%)	26.9 ~ 55.1 Average 46.8
Agriculture	1,404,568.18 (51.5%)	228 (51.8)	Middle Industry	719,953.68 (45.6%)	29.0 ~ 63.2 Average 48.7
Agriculture	81,626.09 (3.0%)	10 (2.3)	Two Residential Types	56,673.24 (3.6%)	11.6 ~ 54.8 Average 30.6
Agriculture	66,266.06 (2.4%)	8 (1.8)	Residence + Industry	36,049.90 (2.3%)	32.4 ~ 59.1 Average 45.6
Building	31,777.01 (1.2%)	5 (1.1)	Terrace House	23,437.79 (1.5%)	2.0 ~ 39.1 Average 26.2
Building	19,372.13 (0.7%)	26 (5.9)	Semi-Detached	15,164.28 (1.0%)	3.1 ~ 39.5 Average 21.7
Building	10,851.34 (0.4%)	1 (0.2)	Detached House	8,430.00 (0.5%)	22.3 Average 22.3
Building	19,185.24 (0.7%)	5 (1.1)	Service Industry	14,748.46 (0.9%)	6.5 ~ 39.3 Average 23.1
Building	95,625.26 (3.5%)	14 (3.2)	Middle Industry	64,516.48 (4.1%)	26.4 ~ 49.8 Average 32.5
Industry	43,998.91 (1.6%)	1.4 (1.4)	Middle Industry	39,689.80 (2.5%)	2.8 ~ 19.9 Average 9.8
Total	2,724,922.00 (100.0%)	440 (100)	Total	1,579,721.16 (100.0%)	-6.3 ~ 63.2 Average 42.0

Figure 4.37
Location of Replots and Original Lots





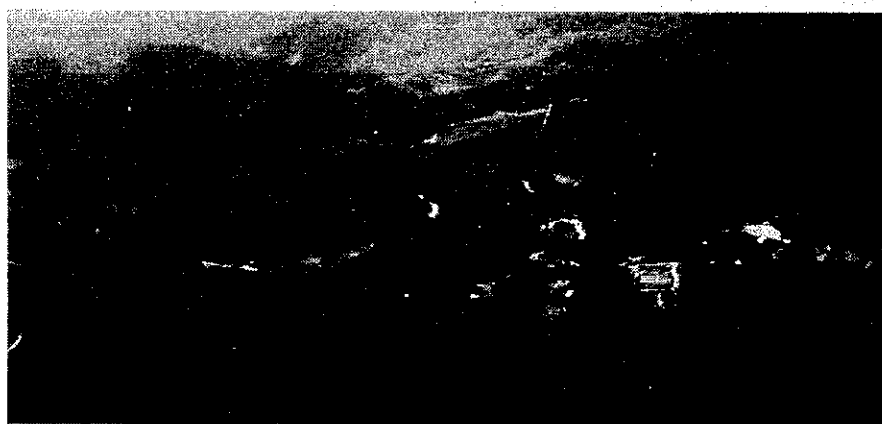
4.2 Kg. Kuantan, Ulu Selangor Study Area

4.2.1 Planning Framework

The Kg. Kuantan study area is located approximately 40 km north of Kuala Lumpur (refer to Figure 4.38). Kg. Kuantan is a typical Malay kampung developed on Malay reservation land. However, urbanization has been gradually accelerated with the construction of the North-South Expressway and the announcement of a number of impact projects. A study was also made on the development of the area as a rural growth center. The Kg. Kuantan area, in contrast to the Kg. Seri Subang study area which faces strong urbanization pressure, has been selected for a study on the feasibility of LR application in a rural setting. The methodology and approach taken in this study are shown in Table 4.26.

Table 4.26
Components of the Case Study in Kg. Kuantan Area

PLANNING PHASE	STUDY AREA COVERAGE	OBJECTIVE	BASE MAP	SUPPLEMENTAL SURVEY CONDUCTED
CONCEPT PLAN PHASE	about 1,000 ha. the area between Batang Kali and Kg. Kuantan along Sg. Batang Kali	<ul style="list-style-type: none"> to identify development potentials and constraints from regional / local viewpoints to propose development concept and structure 	Topographic Map (Scale 1:5,000)	<ul style="list-style-type: none"> Social and Engineering Survey (Level 1)
MASTER PLAN PHASE	229 ha. Kg. Sg. Masin, Kg. Genting Malek and Kg. Kuantan	<ul style="list-style-type: none"> to identify existing problems and issues and improvement needs to prepare land use and public facilities layout plan 	Topographic Map (Scale 1:2,500)	<ul style="list-style-type: none"> Social and Engineering Survey (Level 2)
IMPLEMENTATION PLAN PHASE	45 ha. Kg. Kuantan	<ul style="list-style-type: none"> to prepare LR design covering all necessary physical design of public facilities to formulate project implementation plan to evaluate project viability from financial, environmental, social aspects 	Overlaid Topographic and Cadastral Map (Scale 1:1,000)	<ul style="list-style-type: none"> Social and Engineering Survey (Level 3) Environmental Impact Assessment Survey Assessment of Social Acceptability
REPLOTTING PLAN PHASE	45 ha. Kg. Kuantan	<ul style="list-style-type: none"> to prepare replotting plan based on the LR design 	Overlaid Topographic and Cadastral Map (Scale 1:1,000)	<ul style="list-style-type: none"> Supplemental Lands/ Buildings Survey



Rubber Plantation
at Ulu Selangor

Figure 4.38
Location of the Concept Plan Area

The map displays a topographic representation of the Concept Plan Area, which is outlined by a dashed line. The area is divided into several Mukim boundaries, indicated by dotted lines. The road network is shown as solid lines. Key locations labeled include Kg. Rawang Puta, Kg. S. Serong, Kg. Rantau Panjang, Kg. S. Kambing, Kg. Kuantan, and Kg. Kuantan. The map also shows the Batang Kall and Ulu Selangor. A legend in the bottom right corner defines the symbols for Road Network, Concept Plan Area, and Mukim Boundary. A scale bar and a north arrow are also present.

