VI. THE BASIC DESIGN

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1. The Present Condition of the Site

1) Topography, geography, geology

The proposed area for the Ujung Pandang industrial estate selected according to the studies has an area of 220 hectares and is located about 13 km northeast of the town, and is bounded to the south by Desa Daya, to the west by Desa Bira, immediately to the north by a golf course and public workshops and to the east by the Gowa-Jaya road. Generally speaking, Ujung Pandang and the surrounding region is very flat, low ground, with the Tallo and Jeneburang rivers which pass through Ujung Pandang following extremely rambling courses and forming large marshy areas in the vicinity of the estuaries. The proposed site within this area is slightly higher than the surrounding ground.

The site is a region of gentle hills almost all with a grade of under 10%, with a deposited layer 2 to 3 meters thick of tertiary tuffacious sandstone in between volcanic clay and consolidated clay extending over almost the whole area, and on the high parts of the hills and in the ravines rock lies exposed or the rock base is close to the surface. Because the tuffacious sandstone is relatively soft and is able to be dug by hand, nearly all the paddy-fields within the site have been made by cutting the rock base flat, so that although the topography is very gentle the area under cultivation is still small.

The degree of land utilization overall is low, with paddy-fields accounting for 22%, orchards and farms for 41% and homesteads for 4%; but it is difficult at a glance to differentiate between paddies and farms, and orchards and farms.

Ground conditions are good for foundations of structures, but because blasting is not so effective with this type of isotropic stratous sedimentary rock, and excavation with large-scale plant is difficult because of the difficulty of carrying out ripping operations, probably the method that should be employed is blasting to break up the rock into large pieces followed by large-scale manual

breaking into smaller pieces, using breakers. Also, the absence of a suitable borrow area in the vicinity of the project area requires that the earth quantity for cutting and filling within the site be balanced. Therefore, because of the difficulty in employing blanket-type site preparation, with the concomitant requirements for earthworks on a major scale, the method that should be considered is to divide the site up into lots to thereby reduce the amount of excavation to the minimum possible.

The soil of the site being mostly clay with low cohesiveness, much drying and cracking is in evidence. As the attached results of the soil tests show, natural water content is 28% - 34% below the plastic limit and the plastic index is 30 - 45; as embankment material, easy-to- handle clay.

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Fig VI-1 DISTRIBUTION DIAGRAM OF ELEVATION

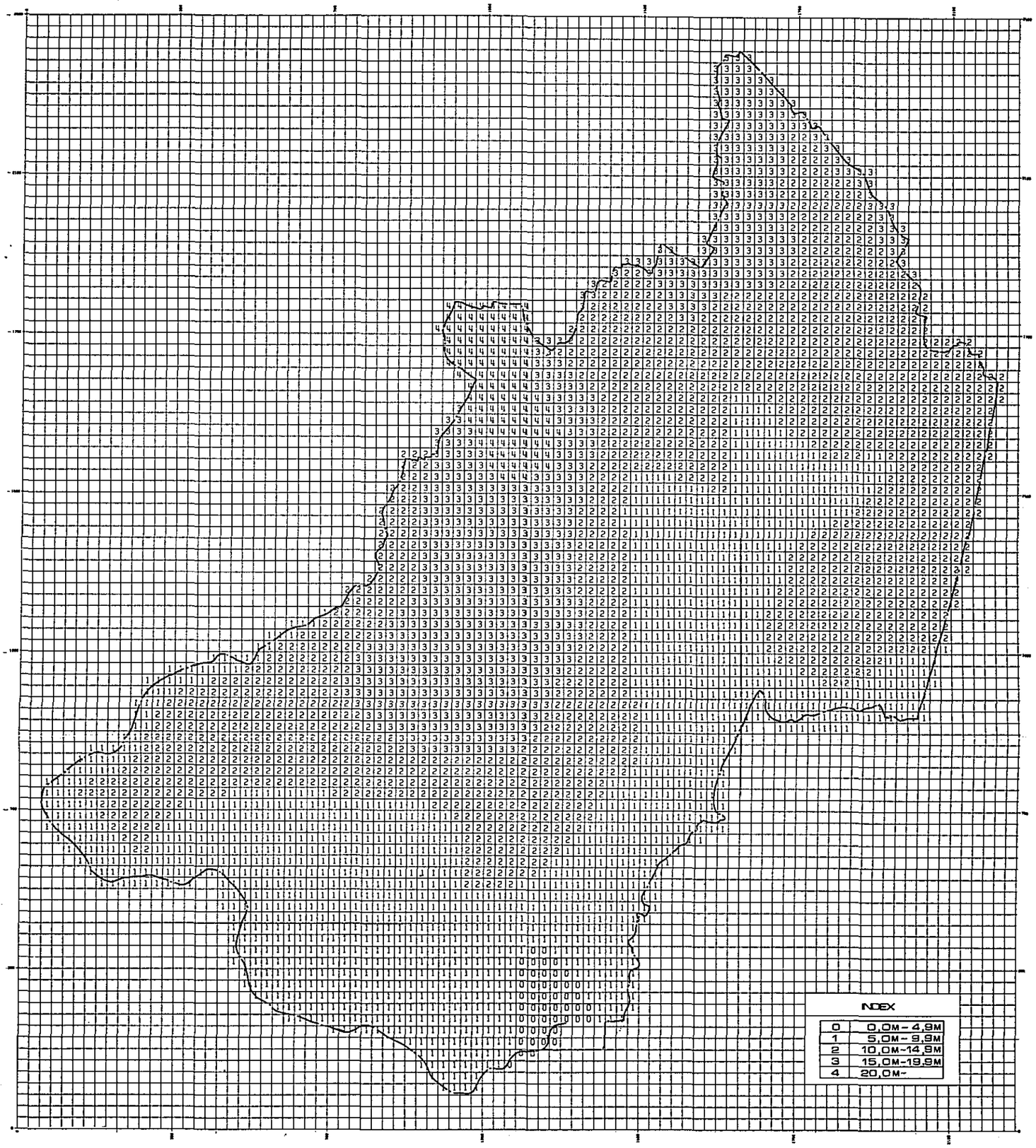

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Fig VI-2 **DISTRIBUTION DIAGRAM OF SLOPE DIRECTION**

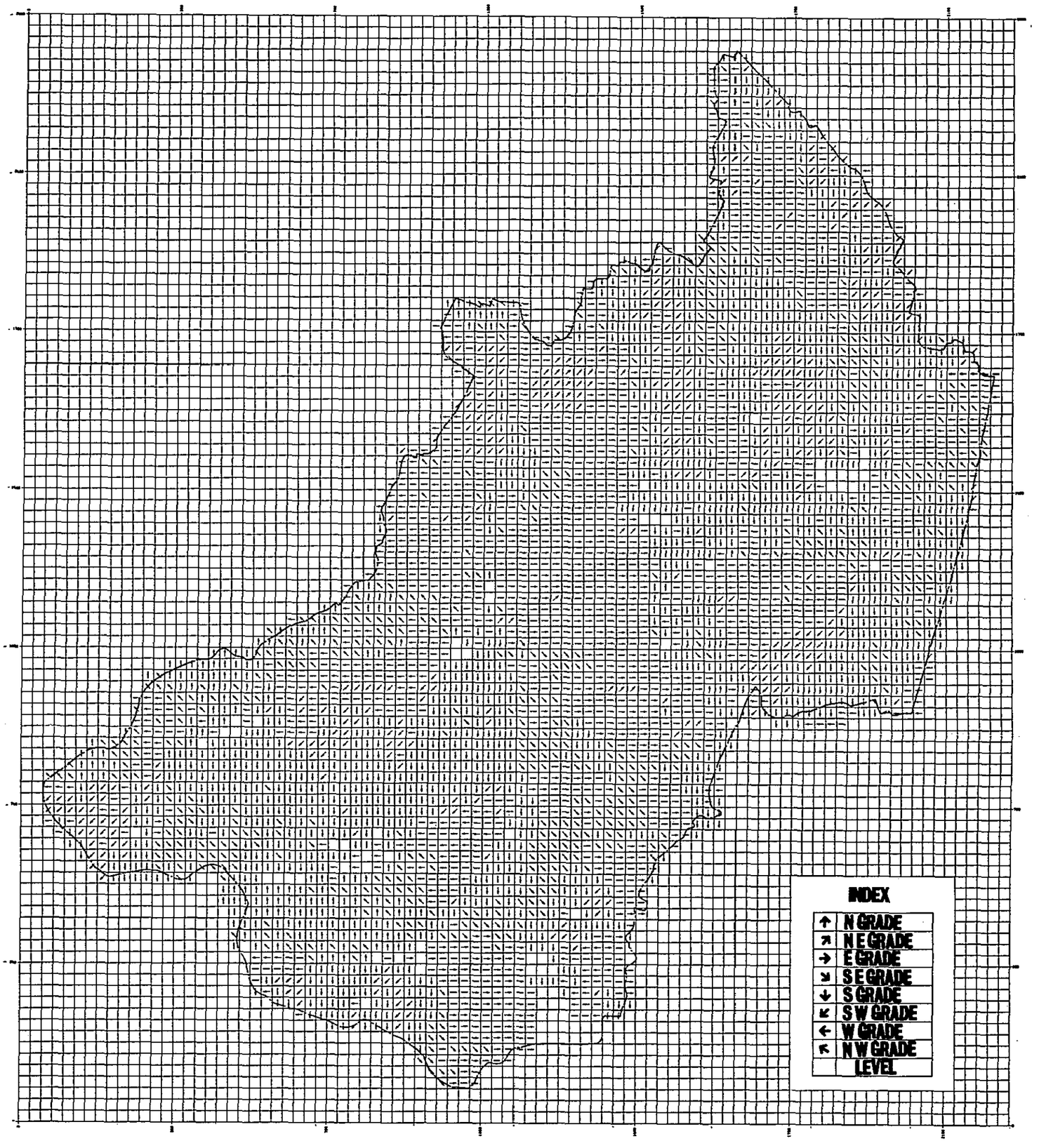

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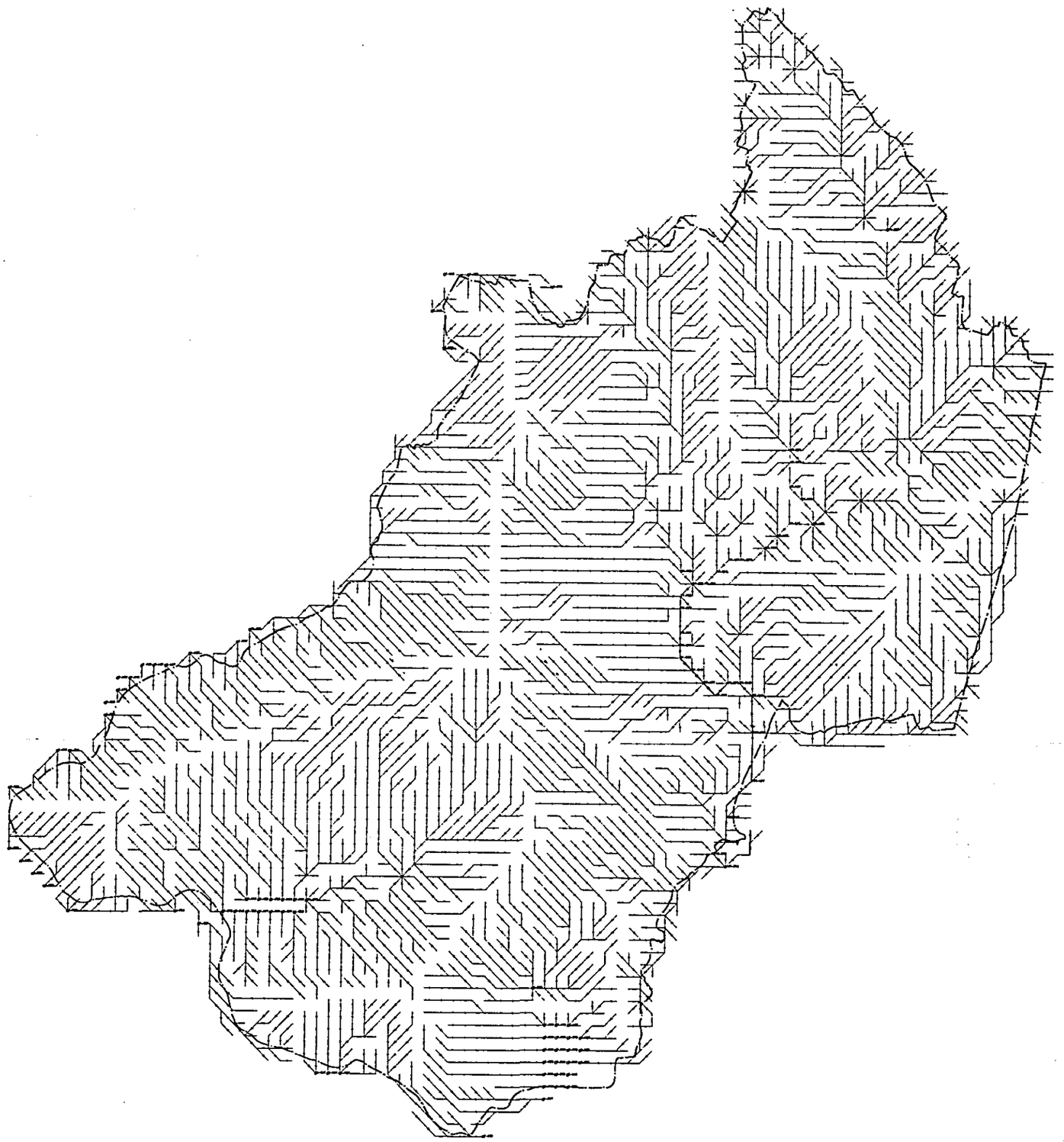
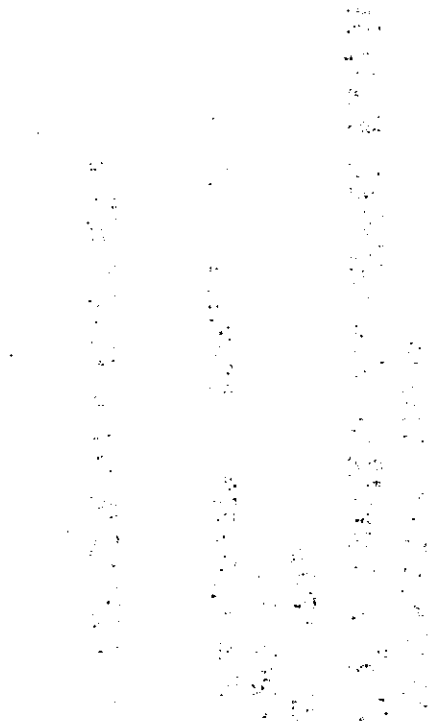
Fig VI-3 **DIAGRAM OF NATURAL WATERCOURSE**





2) Water

(1) Water quality in nearby rivers

Investigation of the present quality of the water of the river (or sea) into which the industrial effluent and sewage generated by the construction of the industrial estate is to be discharged* was to enable establishment of indices for waste-water treatment. Representative items of water quality regulations are as shown below.

pH
Turbidity
Suspended solids (abbreviated to SS)
Dissolved oxygen (" DO)
COD (Chemical oxygen demand)
BOD (Biochemical oxygen demand)

Quality limits for waste-water are mostly regulated according to BOD, or COD and SS. For the present on-site investigation, the cooperation of the Hasanuddin University was obtained for measurements of BOD and pH. Measurements were conducted beneath the bridge which carries the Gowa road over the Tallo river. Moreover, for the purpose of comparisons with other rivers, measurements were also conducted on the Jeneburang river (immediately upstream of the bridge) and Maros river (intake structure). Measurements results are as shown in Table VI-1.

* The Tallo river was assumed as the discharge point.

Table VI-1 Results of Measurement of River Water Quality

Investigation item	R. Tallo	R. Jeneburang	R. Maros
BOD (ppm)	30 - 60	20 - 40	10 - 15
pH	6.5 - 7.0	6.5 - 7.0	6.5 - 7.5
Turbidity	Somewhat yellowish	Somewhat yellowish	Clear, some suspended matter
Tide at point of measurement	Yes	Yes	No

As BOD measurement requires some skill, there is some variation in the results, but roughly the indicated results were obtained. Further, usually BOD values used are those obtained over a 5-day period; but because of the shortness of the investigation schedule, BOD measurements were taken for two days and used to estimate a 5-day BOD level. Moreover, although standards in Japan stipulate that testing must normally take place at a temperature of 20°C, the tests were conducted at 28°C to 30°C, which was the temperature of the laboratory of Hasanuddin University. Temperature has a considerable effect on BOD values, with reading obtained at 30°C being 1.5 times those obtained at a temperature of 20°C.

The above is an outline of the water quality investigations that were conducted. It is necessary prior to commencement of construction of the estate to conduct more detailed measurements and analyses of water quality.

(2) Service water source

1. Water supply methods

The only source for industrial water which can be considered is the town water board (Proyek Air Minum Ujung Pandang, P. A. M. U. P. for short) at present under construction. This is because it would be far too costly to establish independent water catchment facilities (dam, channels) and purifications installations just for this project. Also, as for ground water, judging from the results of investigations on the site that show that the ground consists of sedimentary rock of the Tertiary period, tuffacious sandstone which is widely distributed, it is considered that there is no permeable layer such as a stratum of consolidated gravel, so expectations are not high. Because of this it is planned to obtain water from the P. A. M. U. P. for this project.

2. P. A. U. U. P. -- present situation and future schedule

The schedule for P. A. M. U. P., presently under construction, is as follows.

1st construction phase

Completed in January 1977. Construction of water supply piping for supply quantity of 500 l/sec (about 43,200 m^3/day). Capacity of water treatment facilities of 1,000 l/sec.

2nd construction phase

Completion estimated for 1978. Construction of water supply piping (total water supply: 1,000 l/sec.)

3rd construction phase

Completion date not yet set. Water treatment facilities for 500 l/sec. expansion, and water supply pipe construction. The above schedule for P. A. M. U. P. will ultimately provide a total of 1,500 l/sec (129,600 m^3/day).

3. Estimates of possible water supply amount

Main supply points of the P. A. M. U. P. waterworks will be in Ujung Pandang. Other than Ujung Pandang, recipients include the industrial estate of the present project, and Hasanuddin University which is scheduled to be constructed along the Gowa road (at a point about 5 km north of P. A. M. U. P.). As stated above, the amount of water used on the industrial estate is estimated at 10,800 m^3/day. The amount of water Hasanuddin University will use is uncertain, but if a future capacity of about 5,000 persons is assumed, and daily use per person of 100 liters, a quantity of 500 m^3/day can be estimated. The total amount of water used, therefore, would be 11,300 m^3/day. This is equivalent to about 26% of the 43,200 m^3/day of the 1st construction phase and to about 13% of the 86,400 m^3/day of the 2nd construction phase, and is about 9% of the 129,600 m^3/day ultimately planned. The ratio of population of Ujung Pandang to that of the work force of the industrial estate is about 1 : 30. Considering this proportion, the quantity seems a little high, but it is imperative to ensure this amount of water for the planned industrial estate if it is to assume its proper position as the important industrial base of the South Sulawesi.

Moreover, a look at other examples of quantities of water used for industrial purposes shows that a typical water-consuming enterprise use several dozen times the quantity estimated for the present project. Therefore enterprises brought in by the present project are limited to non-water-consuming-type enterprises. *

* The problem of up-grading the water-supply quantity is that of increased cost. That is, starting with the expansion of water tanks and pipe-systems, the increase in industrial effluent means that the drainage system and waste-water treatment facilities etc. must also be correspondingly expanded.

4. Main water supply pipe outside the site

The scale of the main water supply pipe from P. A. M. U. P. up to the industrial estate (water tanks) is as below.

Daily supply quantity	11,300 m^3
Length of route of supply pipe	10 km
Flow velocity	3. 5 m/sec maximum
Utilization time	7 hr.
Peak factor	1. 3

The above gives a supply quantity of 0. 33 m^3/sec. To fulfill these conditions requires a supply pipe diameter of 500 mm. However, an 8 kg/cm^2 pressure pump will be used to feed the water from P. A. M. U. P.

(3) Precipitation

To safely deal with rainwater that flows into the project area of the industrial estate, a rainwater drainage plan has to be prepared based on an assumed daily rainfall amount. This daily rainfall amount will obtained by statistical use of precipitation data. Precipitation data used will be that based on observations conducted at Hasanuddin Airport (Mandai observation center Nº 415 C), a location about 5 km from that of the project. The data obtained covers monthly precipitation levels and annual maximum daily precipitation over the 16-year period extending from 1961 to 1976. This data is shown in Table VI-2.

Table VI-2 Monthly Precipitation Levels and Annual Maximum Daily Precipitation

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total	Max. mm/day
1961	952	571	244	208	123	77	5	20	17	20	125	323	2,685	211
1962	922	554	410	301	53	112	12	12	70	55	244	750	3,495	212
1963	741	380	452	749	47	-	0	8	0	0	86	1,196	3,659	147
1964	348	382	506	186	217	6	13	6	46	106	448	496	2,760	112
1965	917	418	476	126	88	21	0	0	0	0	98	-	2,244	110
1966	607	498	481	160	14	146	0	0	0	118	146	231	2,401	84
1967	1,189	614	363	285	62	8	56	18	17	47	168	408	3,235	112
1968	1,125	-	441	304	110	70	191	58	7	101	241	587	3,235	96
1969	-	367	404	187	155	49	24	6	0	58	143	520	1,913	108
1970	532	563	352	232	-	-	33	15	54	94	232	-	2,107	188
1971	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	1,130	514	381	193	41	6	0	15	0	1	71	276	2,628	137
1973	507	255	284	246	237	101	87	-	311	114	888	-	3,030	237
1974	402	806	512	103	104	20	140	7	142	278	402	659	3,575	107
1975	511	368	561	372	110	54	190	47	97	246	495	580	3,631	118
1976	904	696	335	25	57	67	0	0	-	-	-	-	2,084	284

1. Analysis of planned daily rainfall

Usually, observational data extending over a period of at least 30 years is required for rainfall analysis. However the data that was able to be obtained here only covered 16 years. When the amount of data is small the general tendency is to take the probable daily rainfall figure as being on the high side. Therefore that the results of the values of the analysis lack reliability cannot be denied. So at the implementation stage more data will be accumulated for re-studying this, and for the present design the values for the return period will be taken as being on the low side.

Obtaining the probable daily rainfall from the maximum annual precipitation data for each year by means of the Iwai method gives the results shown in Fig. VI-4 and Table VI-3.

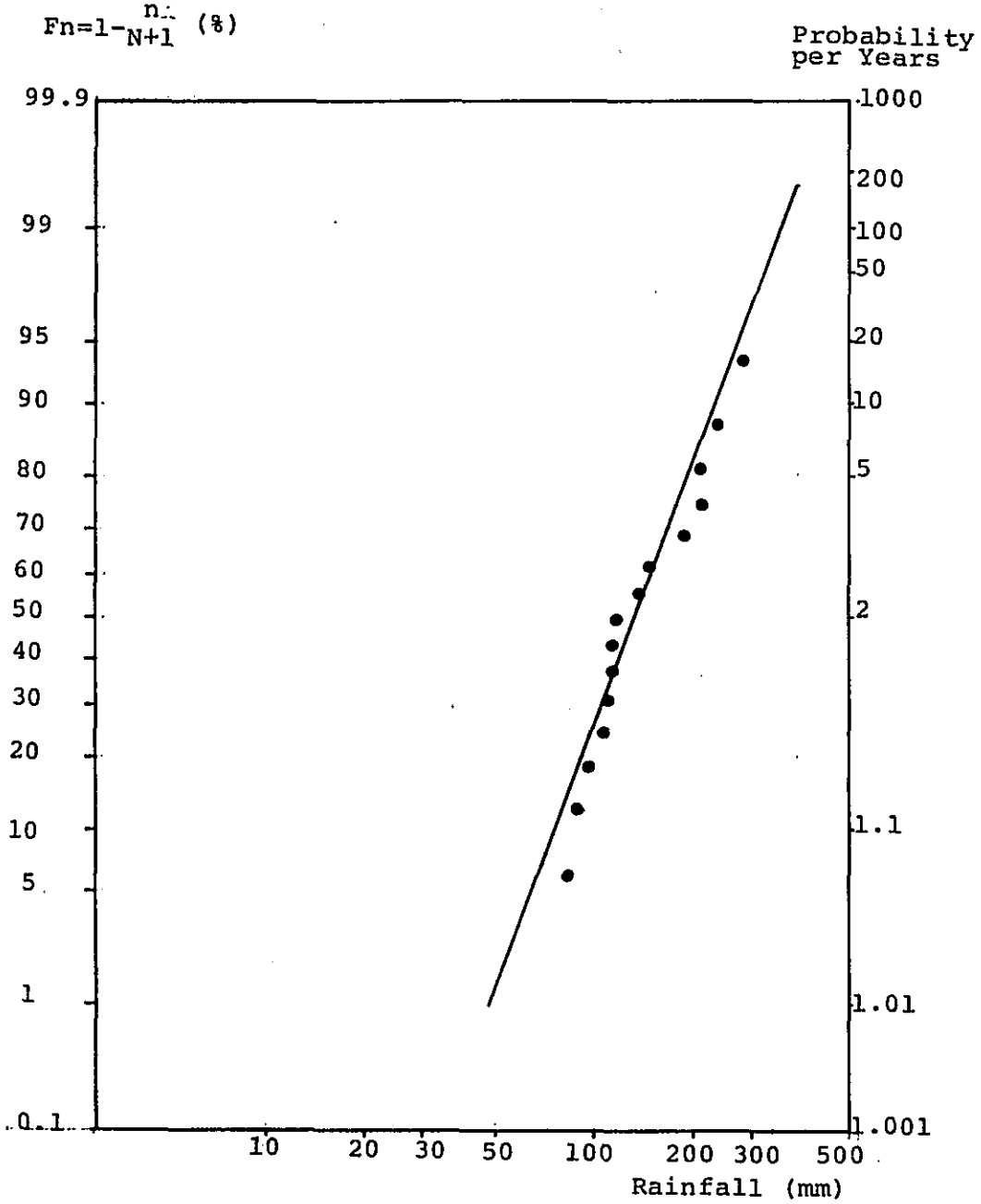


Fig. VI-4 Probalbe Rainfall by IWAI Method (daily rainfall)

Table VI-3 Probable Daily Rainfall by IWAI Method

Probability per Years	Daily Rainfall (mm/day)
1/100	378
1/50	331
1/20	272
1/10	231
1/7.5	212
1/5	190
1/2	135

2. Setting design rainfall amount

For design rainfall amounts, usually values of a minimum of 10 years are used. Moreover, a value of a minimum of 30 years may be used when the degree of damage caused by flooding is estimated to be considerable. However the topography of the project area and of the surrounding area does not suggest that even a heavy downpour would cause major damage. That is, there are no rivers around with rapid flows and houses etc. that would be washed away. Therefore for the design rainfall amount, taking into consideration the points of the previous section, the 7.5 years probability (212 mm/day) value will be employed.

3. Intensity formula for design rainfall amount

a. Hourly rainfall estimation

Data on hourly rainfall that can be used statistically has not been obtained. Therefore estimation from the daily rainfall data is made as follows, using Mononobe's method.

$$rt = \frac{r24}{24} \left(\frac{24}{T}\right)^{0.5} \quad \cdots\cdots\cdots \text{(Equation 1)}$$

Here, rt is average rainfall intensity (mm/hr) within period T.

T is the required period (hr)

r_{24} is the amount of rainfall in 24 hrs (= daily rainfall amount)
Daily rainfall amount for 1/7.5 years probability is 212 mm/day. If T of Equation 1 is taken as 1.0 hr hourly rainfall amount is:

$$1/7.5 \text{ years} \ldots\ldots r = \frac{212}{24} \left(\frac{24}{T}\right)^{0.5} = 44 \text{ mm/hr}$$

b. Estimation of 10 minutes rainfall amount

Topographically, the projected industrial estate drainage basin is extremely limited in size. It is therefore anticipated that the time of concentration is relatively short.

For flood analysis it is necessary to find the average rainfall intensity within the time of concentration. This requires statistically prepared 10 minute rainfall amounts, but such data has not been collected. However, data sheets of recorders used for observations at Hasanuddin Airport were obtained, though the amount of data is extremely small. From this data showing "January 1st, 1976 212 mm/day", a recorded 15 mm rainfall in 10 minutes can be read off.

c. Probable rainfall intensity formula by the characteristic coefficient method

To obtain the average rainfall intensity within the flood arrival time, the rainfall intensity formula for an arbitrary continuous time period is obtained from the hourly rainfall of the 1/7.5 years probability and the 10 minute rainfall amount examined in the previous section. Following are shown the general equations of the probable rainfall intensity formula.

$$I_N^t = B_N^{60} \cdot R_N^{60} = \frac{a'}{\sqrt{t} \pm 6} \cdot R_N^{60} \quad \ldots\ldots\ldots \text{(Equation 2)}$$

Here, I_N^t is rainfall intensity (mm/hr) for time t of probability of N years.

R_N^{60} is the 60-minute rainfall (mm/hr) for probability year N.

B_N is the characteristic coefficient (t = 60 min., B_N = 10) of probability of N years.

I_N^{60} is the 60 min rainfall = R_N^{60} of probability of N years.

a' is $\sqrt{60} \pm b$

b is $$\frac{\sqrt{60} - B_N^t \cdot \sqrt{t}}{B_N^t - 1}$$

The probably rainfall intensity formula for 1/7.5 years probability is as below.

$$R_{7.5}^{10} = 15 \text{ mm}, \quad R_{7.5}^{60} = 44 \text{ mm}$$

$$I_{7.5}^{10} = 15 \times \frac{60}{10} = 90 \text{ mm}$$

$$B_{7.5}^{10} = \frac{90}{44} = 2.045$$

$$b = \frac{\sqrt{60} - 2.045\sqrt{10}}{2.045 - 1} = 1.224$$

$$a' = \sqrt{60} + 1.224 = 8.97$$

So the 7.5 years probably rainfall intensity formula is as shown below.

$$\therefore \quad I_{7.5}^{t} = \frac{8.97 \times 44}{\sqrt{t} + 1.274} = \frac{395}{\sqrt{t} + 1.224} \quad \ldots\ldots \text{(Equation 3)}$$

d Time of concentration

d. Time of concentratiom is faund as fallows

(1) Inlet time (T_1) 10 min. - 15 min.

(2) Time of flow

$$T_2 = 2.40 \times 10^{-4} \, (l/\sqrt{S})^{0.7} \ldots\ldots\ldots \text{(Equation 4)}$$

Here, T_2 is time of concentration (hr)

l is the length of watercourse from the point of maximum distance from the drainage basin to the point where rate of discharge is calculated. S is the average grade from the point of maximum distance from the drainage basin to the point where rate of discharge is calculated.

Further, l and S for the drainage basin on the east side of the industrial estate are:

l = 2,600 m

S = 1/300

Here, time of flow T_2 is:

$$T_2 = 2.40 \times 10^{-4} \, (2600/\sqrt{0.0033})^{0.7} = 0.44 \text{ hr} \fallingdotseq 27 \text{ min.}$$

e. Design hourly rainfall intensity

For time of concentration (T), taking T_1 as 13 minutes and T_2 as 27 minutes gives T = 40 minutes.

From Equation 3 we obtain a rainfall intensity (R) within the time of concentration of 52. 3 mm/hr. Therefore, for design rainfall intensity 55 mm/hr is taken, which gives some margin.

2. Basic Design Policy

The importance of this industrial estate lies in its providing Ujung Pandang with an industrial base. The basic plan was drawn up after studying the various aspects, including the multiple effect on the region, environmental considerations, the merits of integrating enterprises etc. The site conditions were taken into consideration and the following technical points in particular studied.

1. The preparation planning was studied on the basis of the results of investigations of topography and soil for conformation with the natural conditions.
2. The drainage plan was on the basis of full regard for the features of the area.
3. Studies for the road plan were for providing service to each lot and to fit in with the drainage and preparation.
4. Plans for the green park area were drawn up to preserve the environment of the surrounding region.

As estate with a high level if service was planned on the basis of the above policies with the objectives being to increase land utilization efficiency and decrease creation costs.

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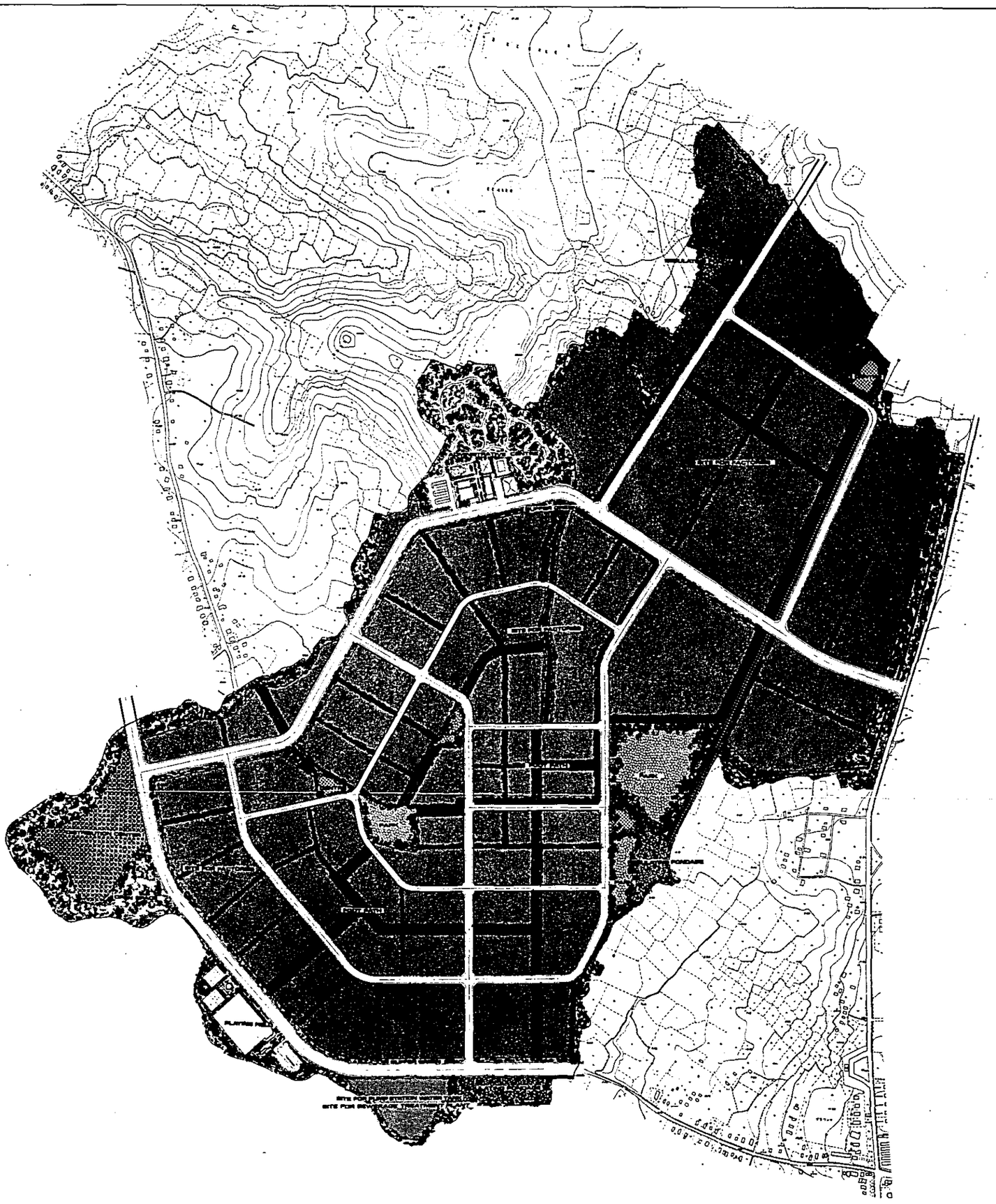
Fig VI-5 **COMPREHENSIVE PLAN**



3. Design Specifications

1) Land use planning

In accordance with the policy for land use planning suggested in the basic plan, the classified table for land use planning was prepared for basic designs as shown below.

Land Use Areas for Each Block

	A Stage		B Stage		C Stage		Total	
		%		%		%		%
Site for Factories	458,750	56.1	597,225	73.0	356,200	62.3	1,412,175	63.9
Site for Administration Center	16,000	2.0	4,200	0.5	5,000	0.9	25,200	1.1
Right of Way	132,050	16.1	76,580	9.4	25,200	4.4	233,830	10.6
Site for Distribution Center					41,750	7.3	41,750	1.9
Utility Facility Site	19,500	2.4					19,500	0.9
Regulating Pondage	10,000	1.2	8,250	1.0			18,250	0.8
Water Way	420	0.1	12,730	1.6	12,540	2.2	25,690	1.2
Park	116,900	14.3	50,500	6.2			167,400	7.6
Buffer Green	19,750	2.4	7,660	0.9	7,200	1.3	34,430	1.6
Open Space	35,400	4.3	39,850	4.9	104,100	18.2	179,350	8.1
Foot Path	9,760	1.2	17,220	2.1	8,890	1.6	35,870	1.6
Area Preserved for High Voltage Cable			4,050	0.5	10,895	1.9	14,945	0.8
Total	818,350	100.0	818,265	100.0	571,775	100.0	2,208,390	100.0

2) Levelling design

(1) Design policy

As mentioned, although the natural topography of the subject area is gentle there is a shallow distribution of tertiary-period tuffacious sandstone over the whole area. An industrial state with an area of 221 ha. is to be built on ground which has these characteristics, but this construction will require a long period and due to various factors it is not a good policy to carry out the construction at one go over the whole site. Therefore the proposal is to divide the site into three stages for construction purposes.

As a result, for the preparation design each facility will function autonomously in each work area and when its objective has been attained and the whole site completed an integrated facility network has to be established. Arranging the basic policies for the design gives the following.

For the design, adequate assembly of the natural and social characteristics of the environment from the on-site investigations and analysis and feasibility studies of the land utilization policy in the basic planning, raising the land utilization efficiency.

Low ground takes up about 40% of the whole project area. Moreover, the configuration is relatively gentle, with the difference in ground height within the area at present being in the region of 20 m. Features that cannot be utilized as they are when building the industrial estate will require reshaping. This means that large scale earthworks have to be carried out. The earthworks schedule requires efforts to reduce the quantity of earthworks together with keeping to a minimum the excavation of the soft rock which is distributed over nearby the whole site. Moreover, in principle, earthwork quantity will be balanced per work area.

Road Areas for Each Road Width

Road Width	A Stage	B Stage	C Stage	Total
30 m	2,545 m 76,350 m^2	740 m 22,200 m^2	340 m 10,200 m^2	3,625 m 108,750 m^2
20 m	2,065 m 41,300 m^2	2,035 m 40,700 m^2	750 m 15,000 m^2	4,850 m 97,000 m^2
12 m	1,200 m 14,400 m^2	1,140 m 13,680 m^2		2,340 m 28,080 m^2

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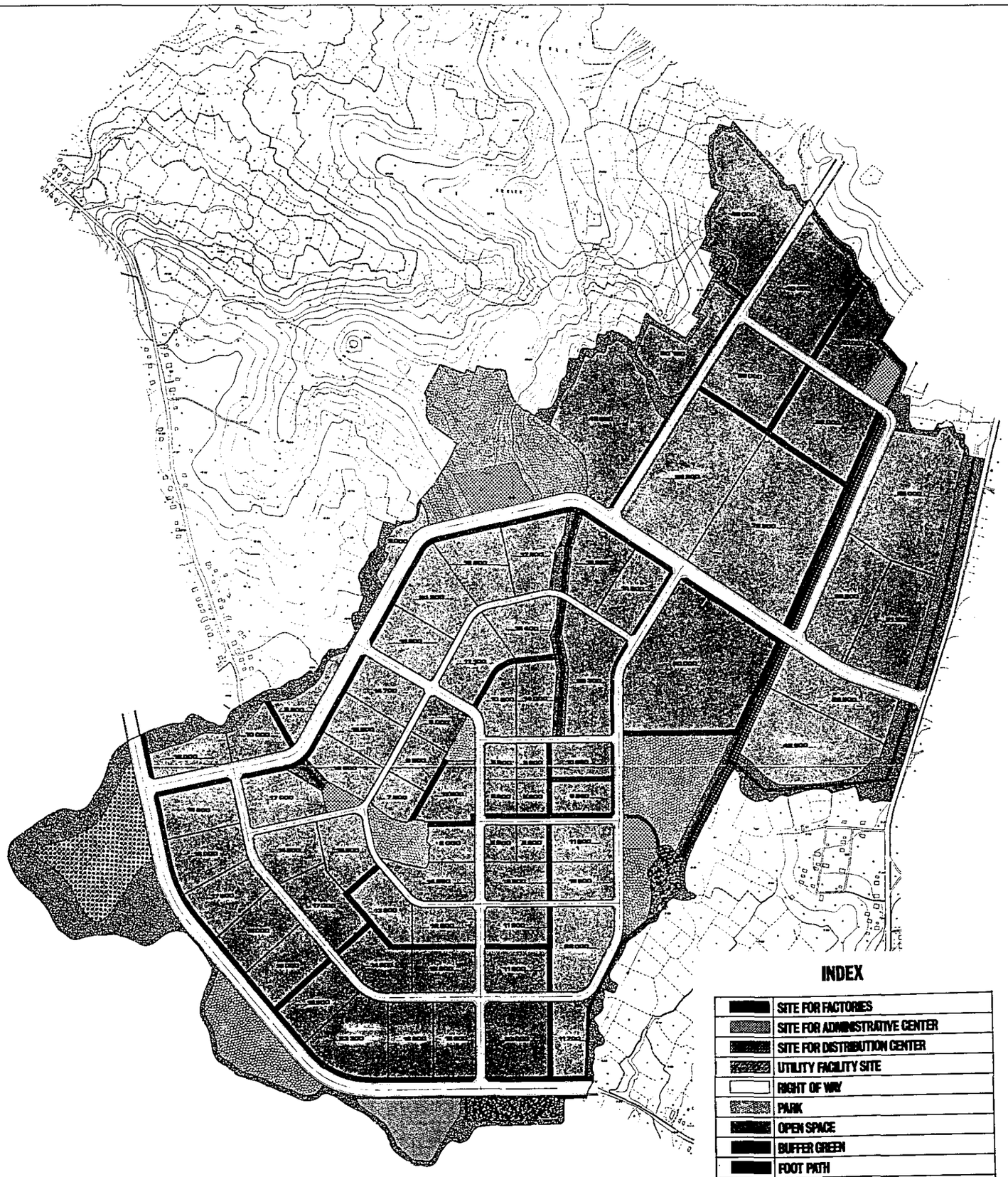
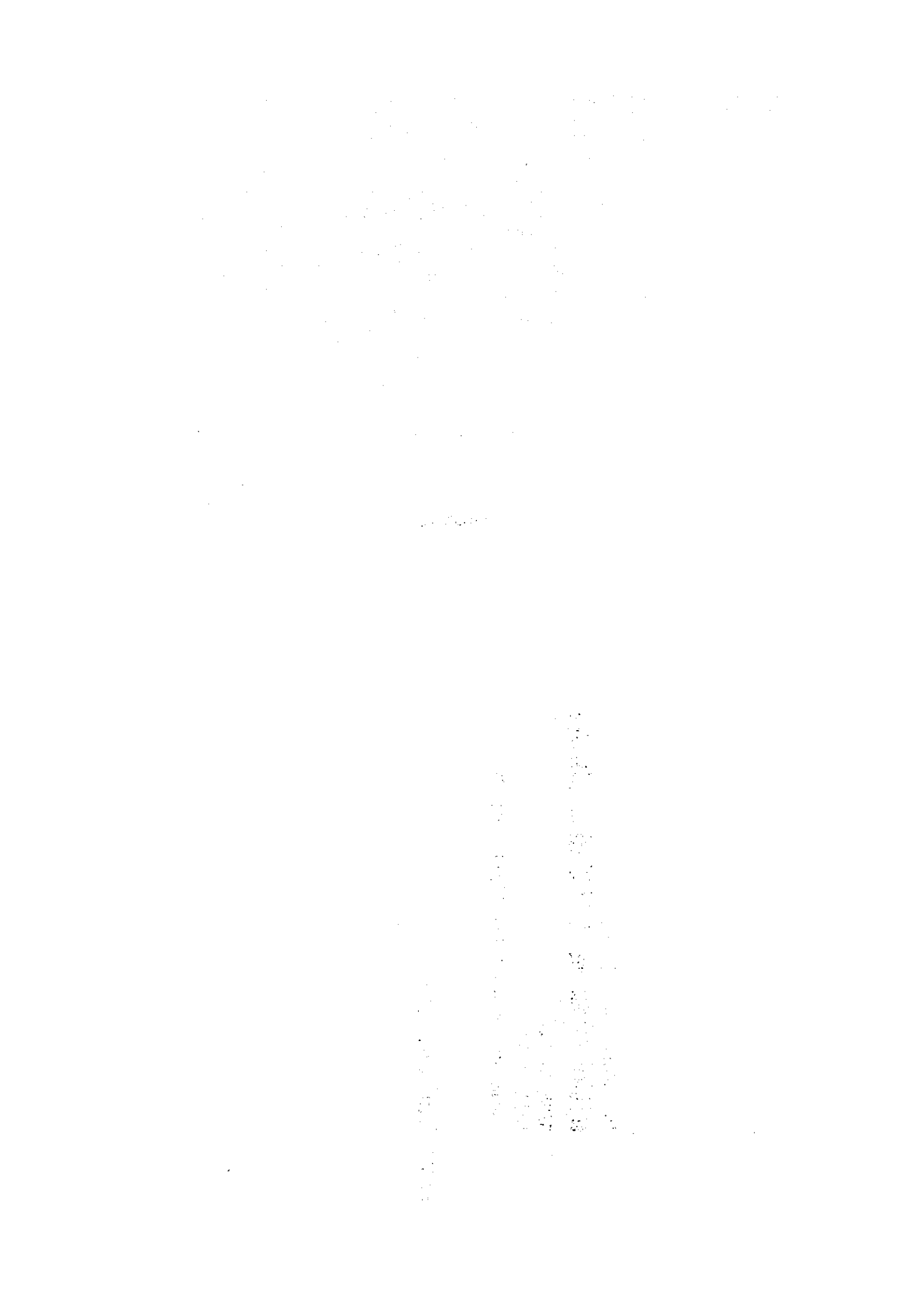
Fig VI-6 **LAND USE PLAN**





Considerations have been given to avoiding as far as possible high retaining walls and slopes between each lots and lots and roads. The results of preparation designs based on the above design policies are as shown in the following diagrams.

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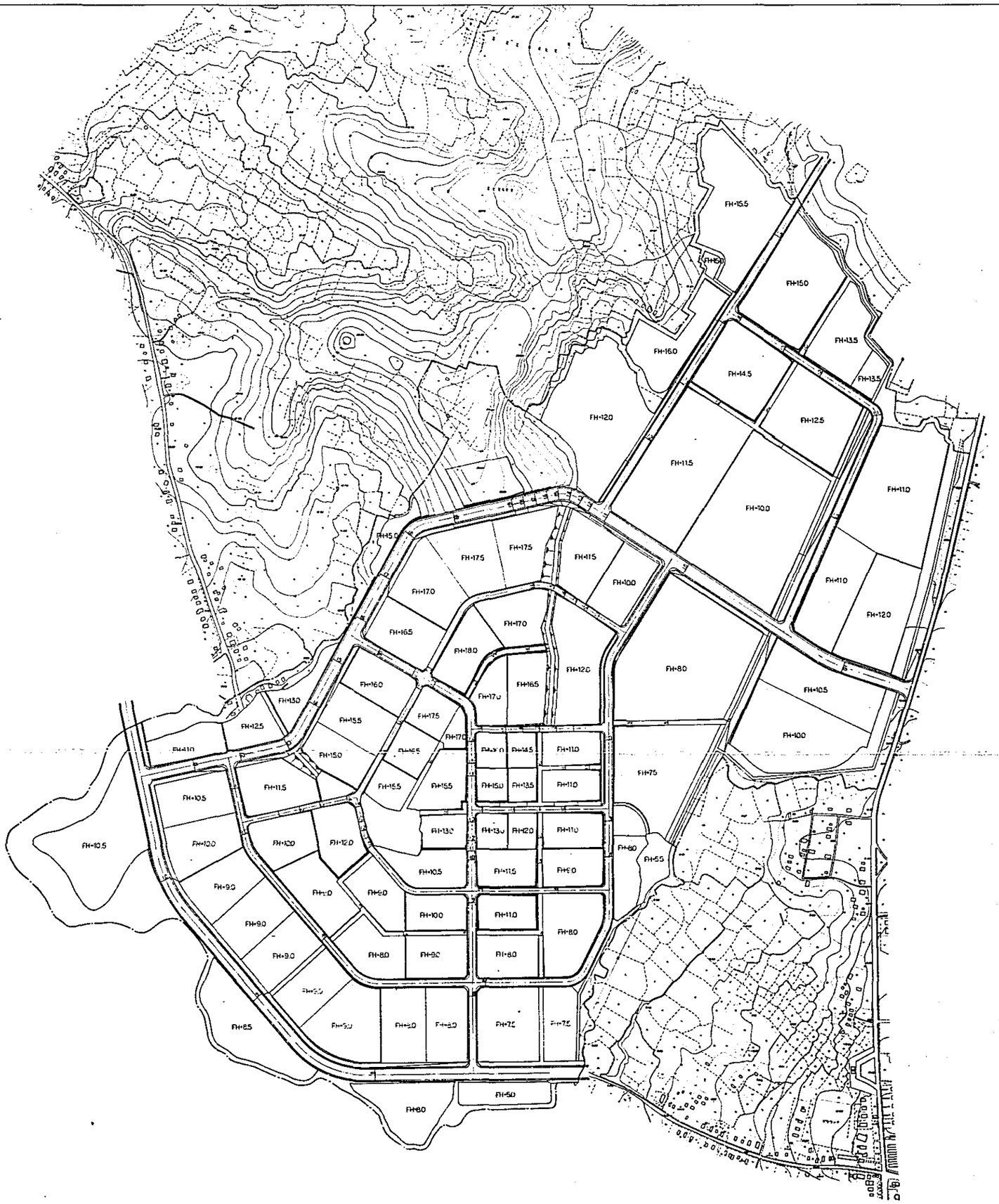
Fig VI-7 GROUND LEVELING PLAN



1 Setting percent swell & shrinkage

As the earth is excavated its volume increases, and compacting it into embankments decreases its volume. This percent swell and shrinkage is very important in the balancing of soil quantity. Although this percent varies according to the type of excavated material, in principle it increases in proportion to the ratio of gravel or rock mixed in. From the judgement that the ground of the project area is distributed soft rock, it is considered that this rock will account for one-quarter to one-third of the total excavation amount. Therefore calculations were carried out for the design assuming a percent swell and shrinkage of 0. 95.

2 Calculations of earthwork quantity

Earthwork quantities were calculated by means of 25m x 25m mesh coordinates using the differences between present ground height and prepared ground height.

Cut and fill quantities were calculated per work area. Earth quantity calculations per work area are as shown in the total below. (Fig. VI-8, 9, 10).

(2) Earth haulage schedule

For the earth haulage schedule, a 50m x 50m mesh was used for the unit of hauled earth and haulage distance was calculated on the basis of straight-line haulage from the surplus earth mesh to the embankment mesh. Results are as shown in the following table.

A stage

***** TOTAL (distance)(m) ** Earth quantity (m^3)

0.0	.....	50.0	P	=	15945.
50.0	.....	100.0	P	=	20429.
100.0	.....	150.0	P	=	25072.
150.0	.....	200.0	P	=	68259.
200.0	.....	300.0	P	=	65739.
300.0	.....	400.0	P	=	45413.
400.0	.....	500.0	P	=	29229.
500.0	.....	600.0	P	=	5654.
600.0	.....	700.0	P	=	0.
700.0	.....	800.0	P	=	0.
800.0	.....	900.0	P	=	0.
900.0	.....	1000.0	P	=	0.
1000.0	.....	1100.0	P	=	0.
1100.0	.....	1200.0	P	=	0.
1200.0	.....	1300.0	P	=	0.
1300.0	.....	1400.0	P	=	0.
1400.0	.....	1500.0	P	=	0.
1500.0	.....		P	=	0.

average carrying distance = 197.06 (m)

B stage

***** TOTAL (distance) (m) ** Earth quantity (m^3)

0.0	.....	50.0	P	=	32688.
50.0	.....	100.0	P	=	27277.
100.0	.....	150.0	P	=	37154.
150.0	.....	200.0	P	=	29487.
200.0	.....	300.0	P	=	82028.
300.0	.....	400.0	P	=	39540.
400.0	.....	500.0	P	=	22667.
500.0	.....	600.0	P	=	8810.
600.0	.....	700.0	P	=	1616.
700.0	.....	800.0	P	=	0.
800.0	.....	900.0	P	=	1141.
900.0	.....	1000.0	P	=	0.
1000.0	.....	1100.0	P	=	0.
1100.0	.....	1200.0	P	=	0.
1200.0	.....	1300.0	P	=	0.
1300.0	.....	1400.0	P	=	0.
1400.0	.....	1500.0	P	=	0.
1500.0	.....		P	=	0.

average carrying distance = 215.38 (m)

C stage

***** TOTAL (distance)(m)***

0.0	.....	50.0	P	=	14468.
50.0	.....	100.0	P	=	10183.
100.0	.....	150.0	P	=	5806.
150.0	.....	200.0	P	=	19274.
200.0	.....	300.0	P	=	4817.
300.0	.....	400.0	P	=	8407.
400.0	.....	500.0	P	=	3849.
500.0	.....	600.0	P	=	224.
600.0	.....	700.0	P	=	0.
700.0	.....	800.0	P	=	0.
800.0	.....	900.0	P	=	0.
900.0	.....	1000.0	P	=	0.
1000.0	.....	1100.0	P	=	0.
1100.0	.....	1200.0	P	=	0.
1200.0	.....	1300.0	P	=	0.
1300.0	.....	1400.0	P	=	5988.
1400.0	.....	1500.0	P	=	8997.
1500.0	.....		P	=	80803.

Earth quantity (m^3)

average carrying distance = 979.59 (m)

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Fig VI-8 COMPUTATION OF CUT FILL(A)

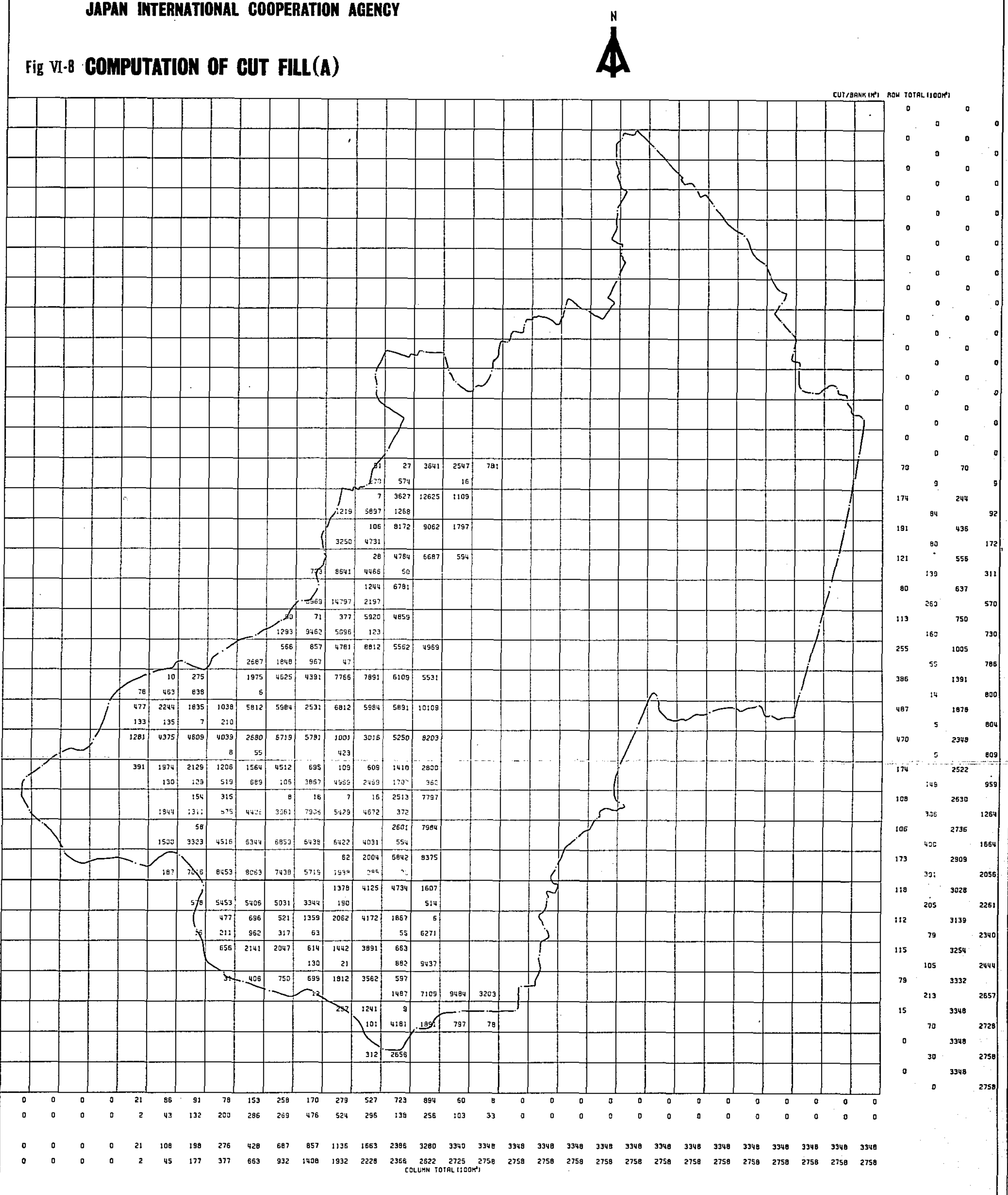

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Fig VI-9 COMPUTATION OF CUT FILL(B)

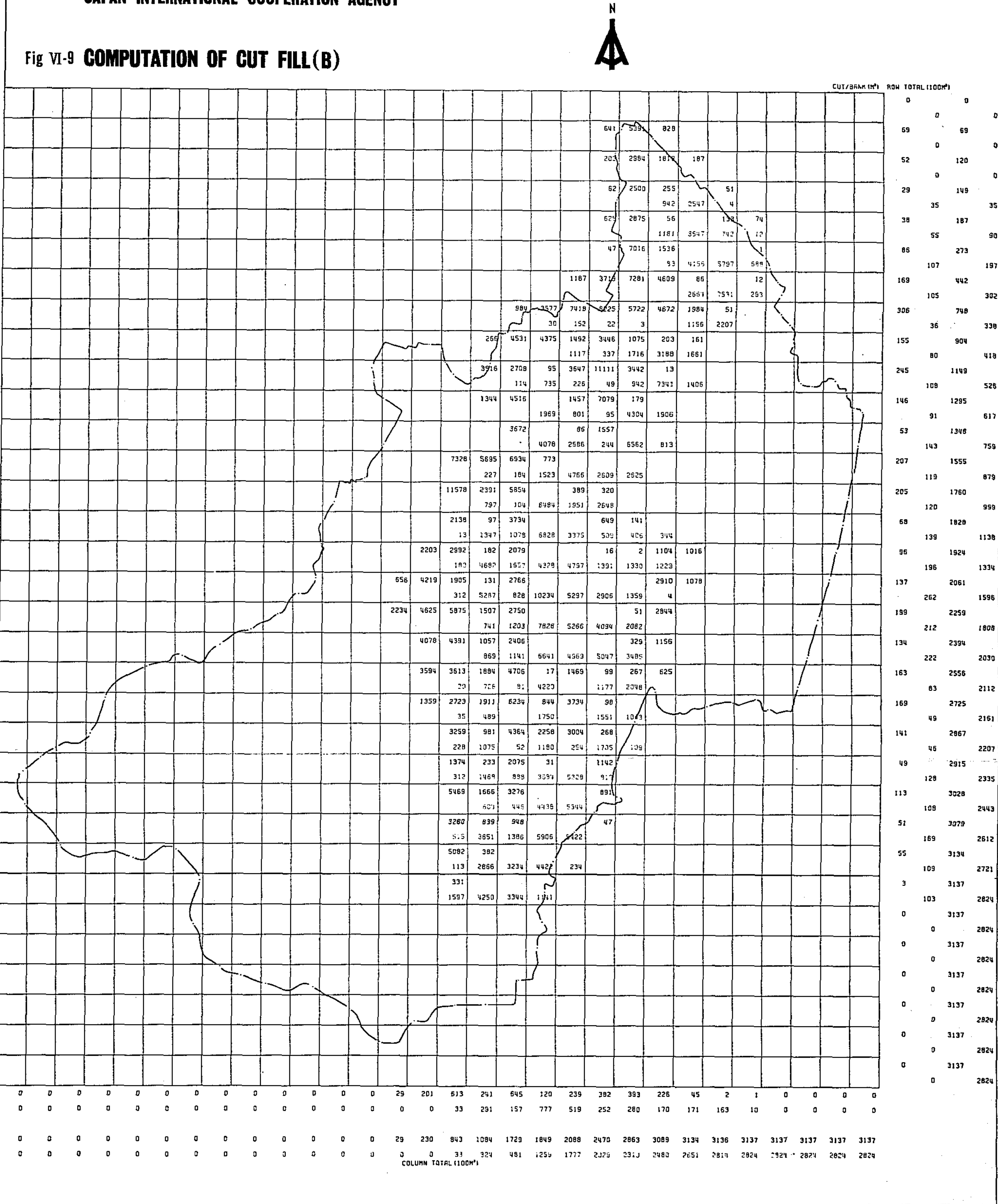

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Fig VI-10 COMPUTATION OF CUT FILL(C)

CUT/BANK (M³) ROW TOTAL (100M³)

COLUMN TOTAL (100M³)

Fig VI-11 DISTRIBUTION DIAGRAM OF CUTTING

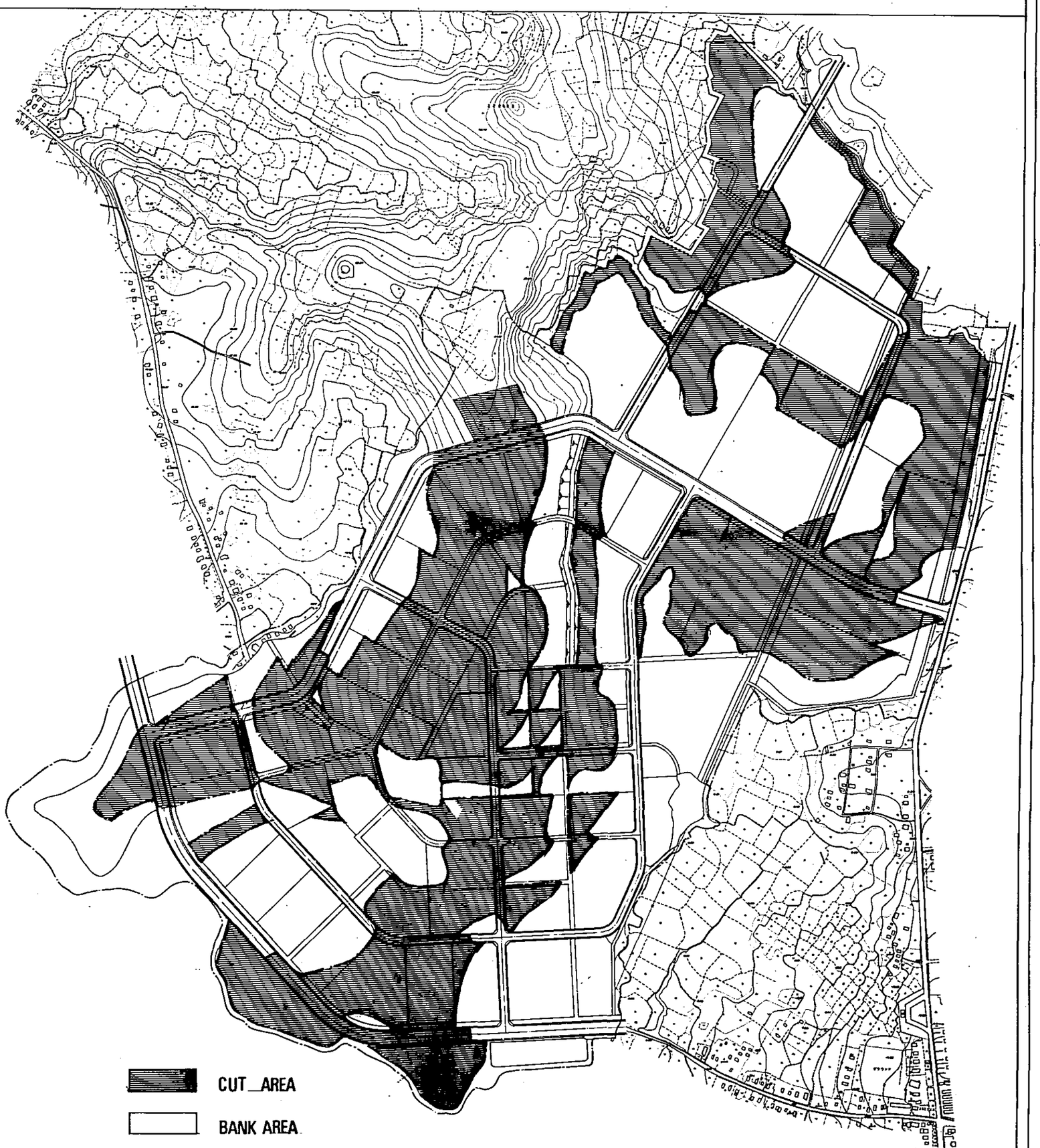

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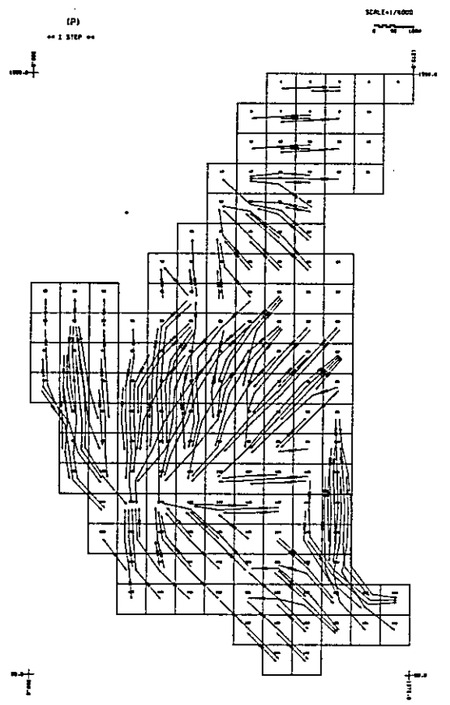
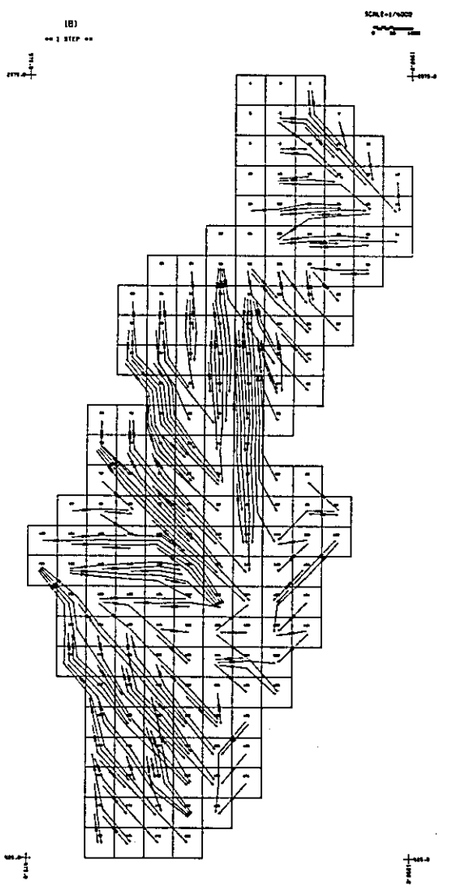
Fig VI-12 EARTH WORK PLAN





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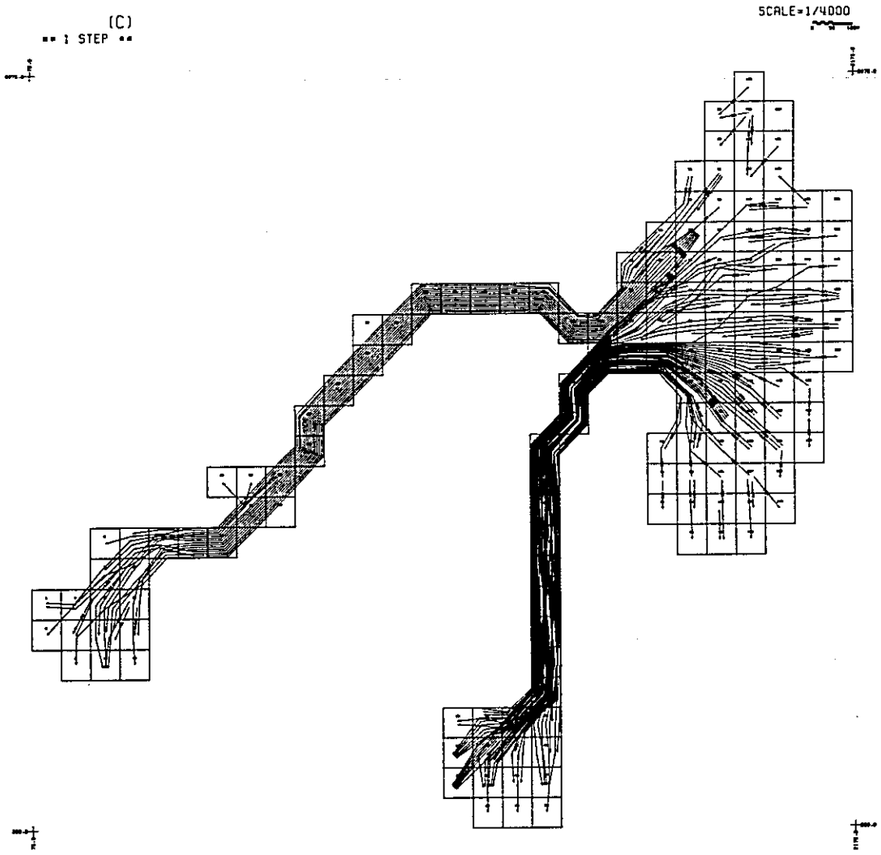


3) Road network schedule

(1) Basic policy

The industrial estate location is about 14 km away from the Ujung Pandang area and has to rely mainly on the 20-meter-wide Gowa road. However, the progress in the construction of various projects in the suburbs of Ujung Pandang will probably give rise to the need for a more effective traffic network pattern. The road system for the industrial estate is to provide a direct link with the port of Ujung Pandang. Within the industrial estate the important function is to satisfy the requirements of each of the enterprises, to interlink the enterprises so as to utilize to the maximum the advantages of such an assembly. For this, plans for the road netowrk gave full consideration to links within and without the industrial area. Moreover, the level of service was ensured by setting standards for the road designs that would provide ample capacity for dealing with the necessary traffic volumes.

(2) Road standards and design specifications

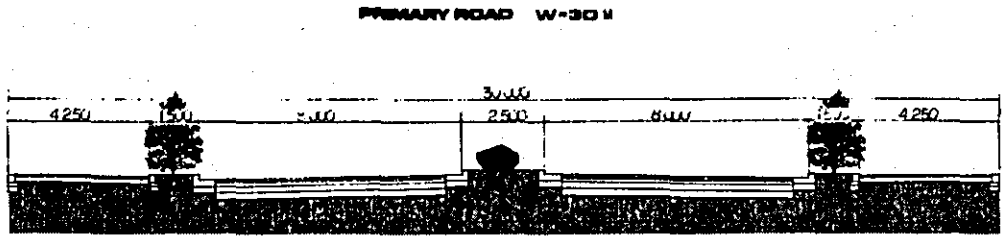
A) Main road

The main road within the estate will link Gowa road and Daya Bira road, and the center of the estate will be built along it. This main road will be 30 m wide to ensure smooth handling of the traffic volume within the estate, and pedestrian and vehicle ways will be completely separated. There will be two traffic lanes for each direction and a median separation strip will be provided to maximize driving efficiency. Below are shown the design specifications of this road. (Fig VI-13)

Design specifications

Item	Design value
Design speed	50 km/h
Minimum curve radius	80 m
Longitudinal slope	4 % min.
Longitudinal curve length	60 m

Fig. VI-13



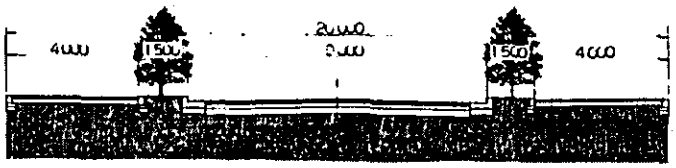
B) Secondary roads

Secondary roads are for collecting the traffic originating from the enterprises in each construction stage, and will link up with the main road of the estate. These roads will be 20 m in width and vehicle and pedestrian ways will be separated. Transverse width structure will be the same as that of the main road and the necessary widths will be such as to ensure that the volume of traffic can be accommodated. Below are shown the design specifications of these roads. (Fig VI-14)

Design Specifications

Item	Design value
Design speed	40 km/h
Minimum curve radius	50 m
Longitudinal slope	1.5 & min.
Longitudinal curve length	40 m

Fig. VI-14



C Lot roads

Lot roads will link the traffic originating from each enterprise with the nearest secondary road, and will not carry much volume of traffic. Planned width for these roads is 12 m and there will be no separation of pedestrian and vehicle ways. (Fig.VI-15)

Fig. VI-15

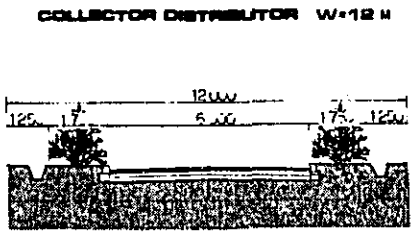


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Fig VI-16 ROAD NETWORK PLAN · TYPICAL SECTION FOR ROADS

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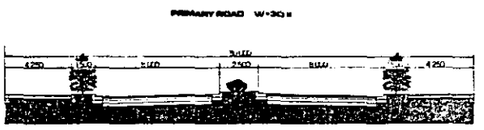

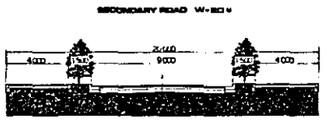

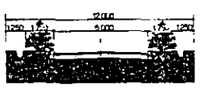

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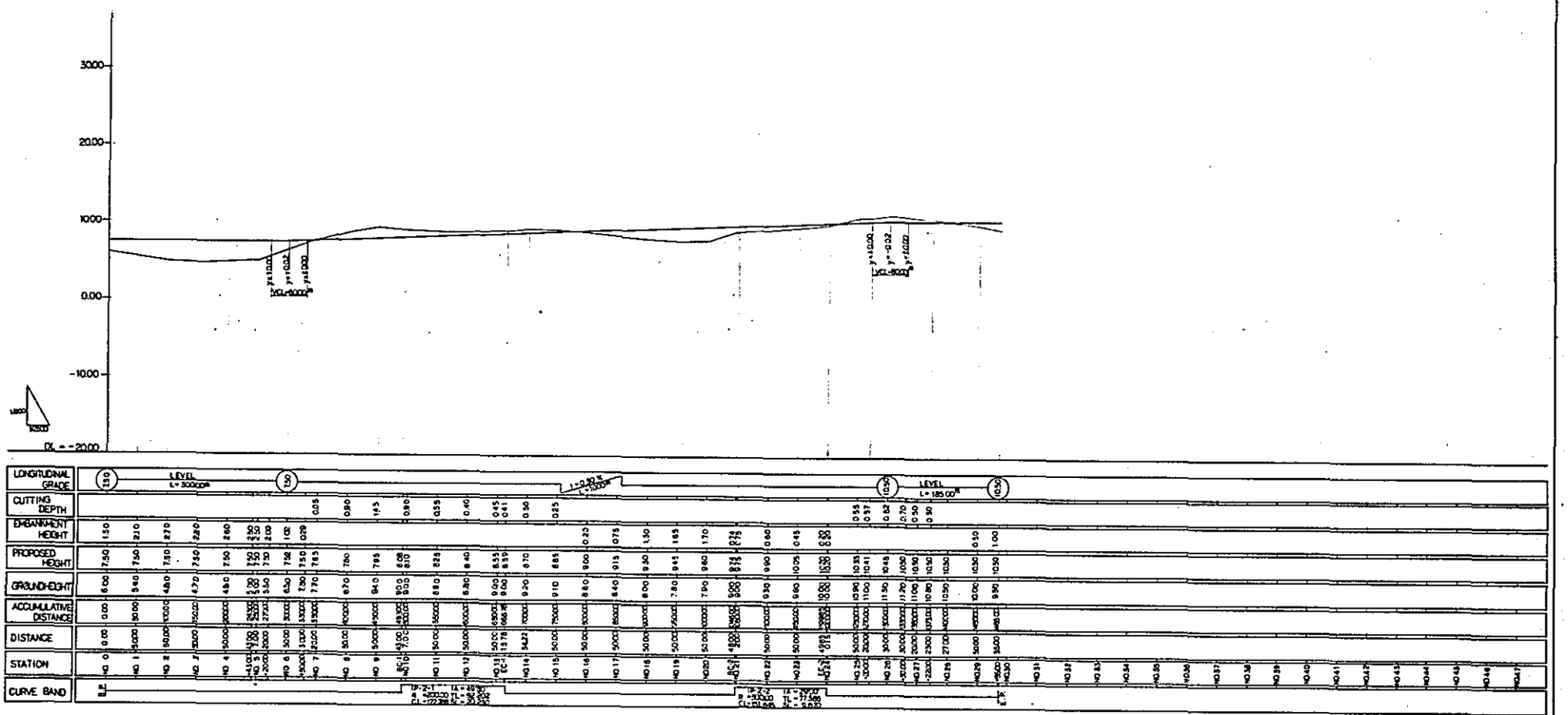
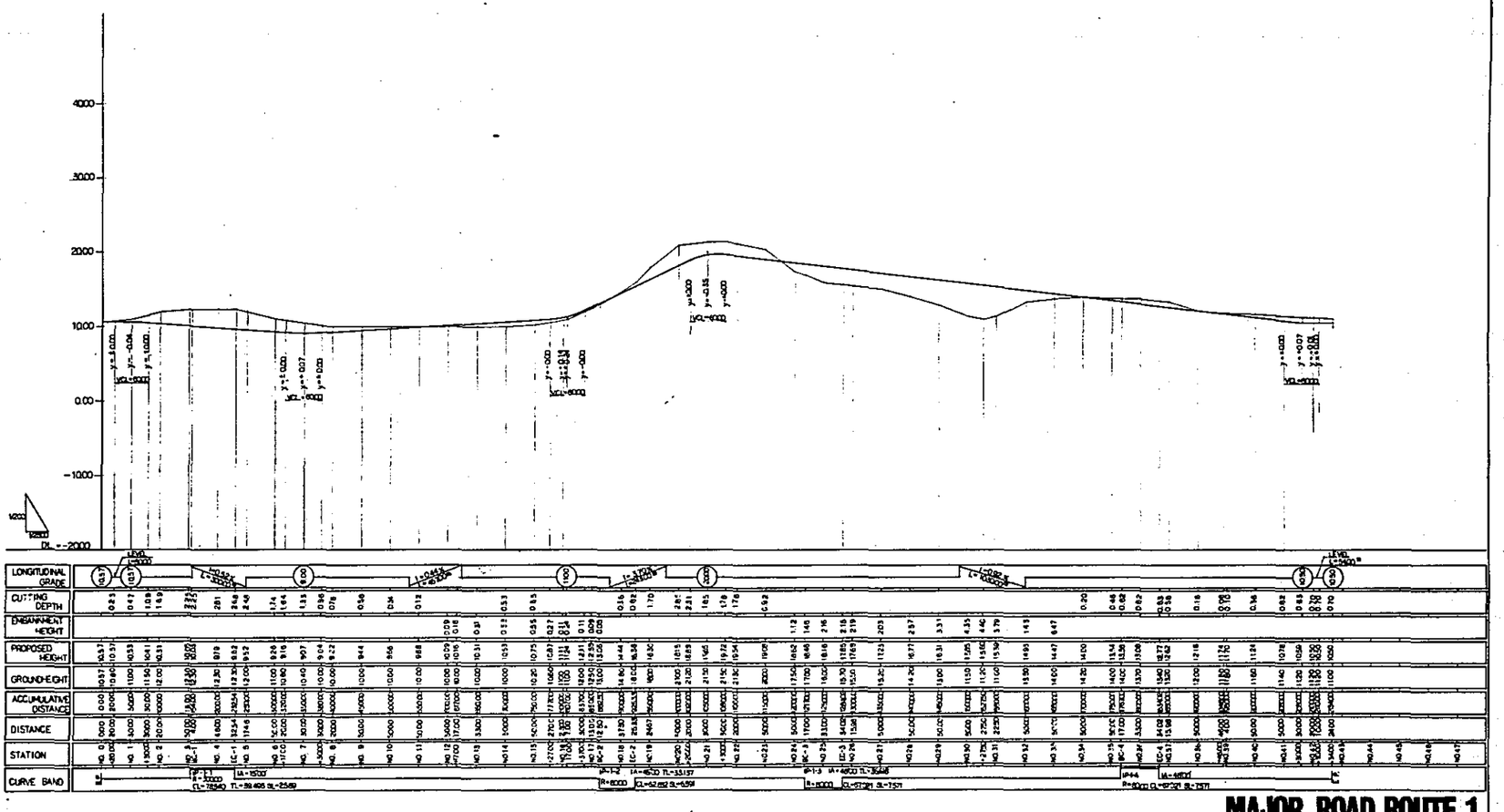
Fig VI-17 LONGITUDINAL SECTION FOR ROADS



MAJOR ROAD ROUTE 2



MAJOR ROAD ROUTE 1

4) Drainage design

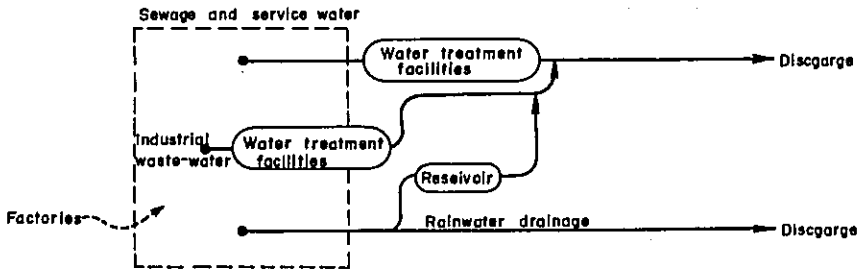
(1) Basic policy

Drainage consists of three categories: rainwater drainage; industrial waste-water drainage; and sewage and service water drainage.

Following is the basic policy on drainage treatment.

1 Drainage system

The separate system will be used for the drainage system.



2 Drainage treatment

A. Rainwater drainage

The industrial estate will be equipped with a drainage system that ensures no hindrance to the operations of the estate.

B. Industrual waste-water drainage

The nature of industrial waste-water differs according to the type of industry and process, and so each enterprise will be responsible for installing facilities suitable to the conditions at the stage of expulsion of harmful substances, so the quality of waste-water from the factories will be suitable for treatment by ordinary water treatment facilities, this being rational and economical. Design volume of industrial effluent is 2,490 m^3/day.

C. Sewage and service water

A standard activated sludge process will be employed for treating sewage and service waste-water. No facilities for treating surplus sludge will

be provided within the industrial estate. Quantity of sludge treatment has been set at 3, 110 m^3/day.

3 Standards for drainage waters

The wide range of qualities of waste-water from the various factories makes supervision difficult. What is necessary really is a supervisory system whereby a reservoir is constructed wherein the industrial waste-water is collected to make water-testing easy to carry out. Shown in Table VI- 4 is an example of industrial waste-water discharge quality standards. Also, for reference, Table VI- 5 shows ingredients that cause problems and the type of industry that discharge them.

Table VI-4 Standards for drainage waters

Toxic substances	Permisible limits
Cd	0.1 mg/l
Cn	1.0 mg/l
Organophosphorous compounds (parathion, methyl paration, END)	1.0 mg/l
Pb	1.0 mg/l
Cr (b)	0.5 mg/l
As	0.5 mg/l
Hg	0.005 mg/l
Alkyle mercury compounds	unsearchable
PCB	0.003 mg/l
An item *1	Permisible limits
PH	50 - 90 (sea), 5.8 - 8.6 (other)
BOD *2	160 (the daily mean 120) mg/l
COD *3	160 (the daily mean 120) mg/l
Afloating matter	200 (the daily mean 150) mg/l
Mineral oil (n-hexane)	5 mg/l
Animal-vegetable oil (n-hexane)	30 mg/l
Phenol	5 mg/l
Cu	3 mg/l
Zn	5 mg/l
Liquefactive Fe, liquefactive Mn	10 mg/l
Cr	2 mg/l
F	15 mg/l
Coliform group of bacteria	the daily mean 3,000 pieces/cc

*1 Applicable to the manufacturing plant where the quantities of waste-water is over 50 m^3/day.

*2 Applicable to the discharge into the stream.

*3 Applicable to the discharge into the lake and sea.

Table IV-5. Ingredients that cause problems and the type of industry that discharge them

Ingredients that cause problems	The type of industry
Water temperature	a thermoelectric power plant, an atomic power plant
BOD	a beet refinery, a brewery, a food factory, a distillery, a pulp, a tannery, a textile factory, a city.
A floating matter	a brewery, a packing house, a coal dressing factory, a coke-gas factory, a distillery, a paper mill, a tannery.
Oils and fats	a laundry, a metal fitting shop, an oil field, a packing house, an oil refining plant, a tannery, a wood washing mill.
Colour	a gilt factory, a paper mill, a tannery, a dyeing factory.
Odour	a chemical factory, a coke-gas factory, an oil refining factory.
Acidity	a chemical factory, an iron mill, a mine, a waste-water of picking process, a textile manufacture, a cell manufacture.
Alkalinity	a boil of cotton and straw, a wood washing mill, a laundry.
Free chlorine	a laundry, a paper mill, a textile bleaching factory, a coke-gas factory, a chemical factory, a dressing plant
Sulphide	a tannery, a gas factory, viscose rayon,
Sulplite	a pulp manufacture, viscose film
Chromium	a gilt factory, a chrome tannery, a chrome-smelting works.
Lead	a cell manufacture, a lead mine, paint
Nickel	a gilt factory, a metal mine.
Cadmium	a gilt factory, a metal mine.
Zinc	a zinc gilt, viscose rayon, a gun factory, a metal mine.
Copper	a copper gilt, a cup ammonium rayon factory.
Mercury	a solt electrolytic factory, a metal mine, a hospital, mercury agricultural chemicals.
Saccharoid	a dairy factory, a brewery, a beet refinery, a food factory.
Starch	a food factory, a textile factory, a starch manufacture,
Phenol	a gas-coke factory, a synthetic resins factory, a textile factory, a tannery, a tar distillery.
Formaline	a synthetic resins factory, a penicillin manufacture.
Arsenic	a mine, agricultural chemicals.

(2) Sewage and service water drainage

1 Design sewage quantity

The quantity of sewage and service water drainage is 3, 110 m^3/day, as examined in the basic planning of section 5.

2. Water quality

Quality of dirty inflow water is generally of the levels shown below.

	Inflow water (ppm)	Quantity/person (assuming 100 l/person/day)
BOD	200	20 g
SS	250	20 g

Treated water (discharge water) will be discharged into the Tallo river. The results of measurements at 30°C of the present BOD5 (BOD value for five days) of the Tallo river show values of 30 - 60 ppm. Treatment to 30 ppm is possible by means of the method termed secondary treatment.

Following are water quality standards for treated water.

BOD	30 ppm
SS	50 ppm

3 Elimination method for polluted water

Placing emphasis on the problem of hygiene and ease of maintenance of the disposal site, a separated system will be used, whereby rainwater is drained off through separate conduits.

4 Treatment method

The activated sludge process will be used for treating the polluted water. Fig. VI-18 shows the flow-sheet outline of this process.

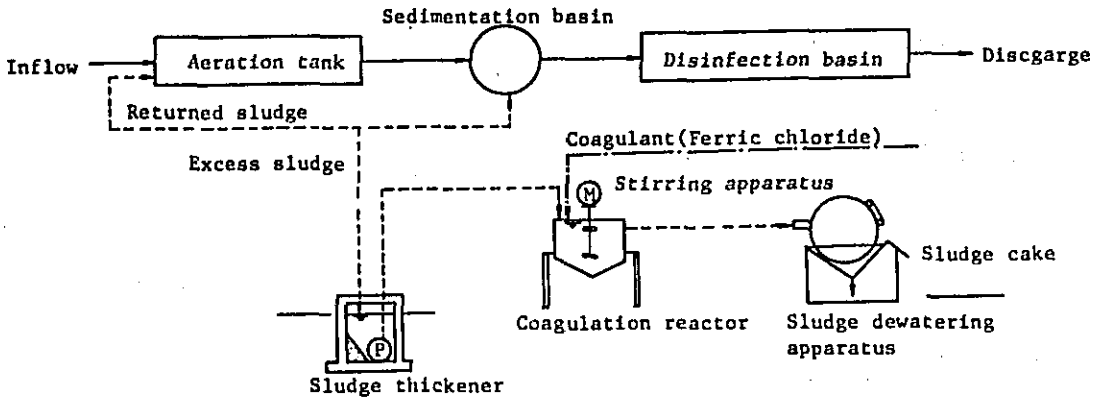


Fig. VI-18 *Flowsheet of standard activated sludge process*

5 Sludge processing

If there is a sewage processing site in the vicinity, the thinking is to use it for any excess sludge generated at the process site. When this is not possible desiccator plants become necessary. The flow-sheet of a desiccator plant is shown in Fig. VI-19.

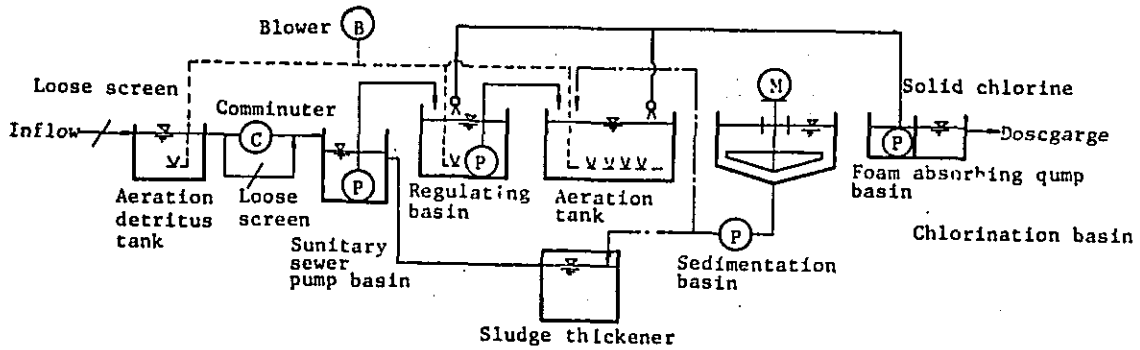


Fig. VI-19 Flowsheet of desiccator plant

6 Drainage of treated water

Treated water contains large quantities (30 - 40 ppm) of nitrogen (N) harmful to wet-land rice; therefore it cannot be discharged by open conduit, but must be drained by pipe. Treated water will be mingled with the industrial waste-water for drainage. Discharge point will be the Tallo river about 3 km away.

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Fig VI-20 **DRAINAGE PLAN**

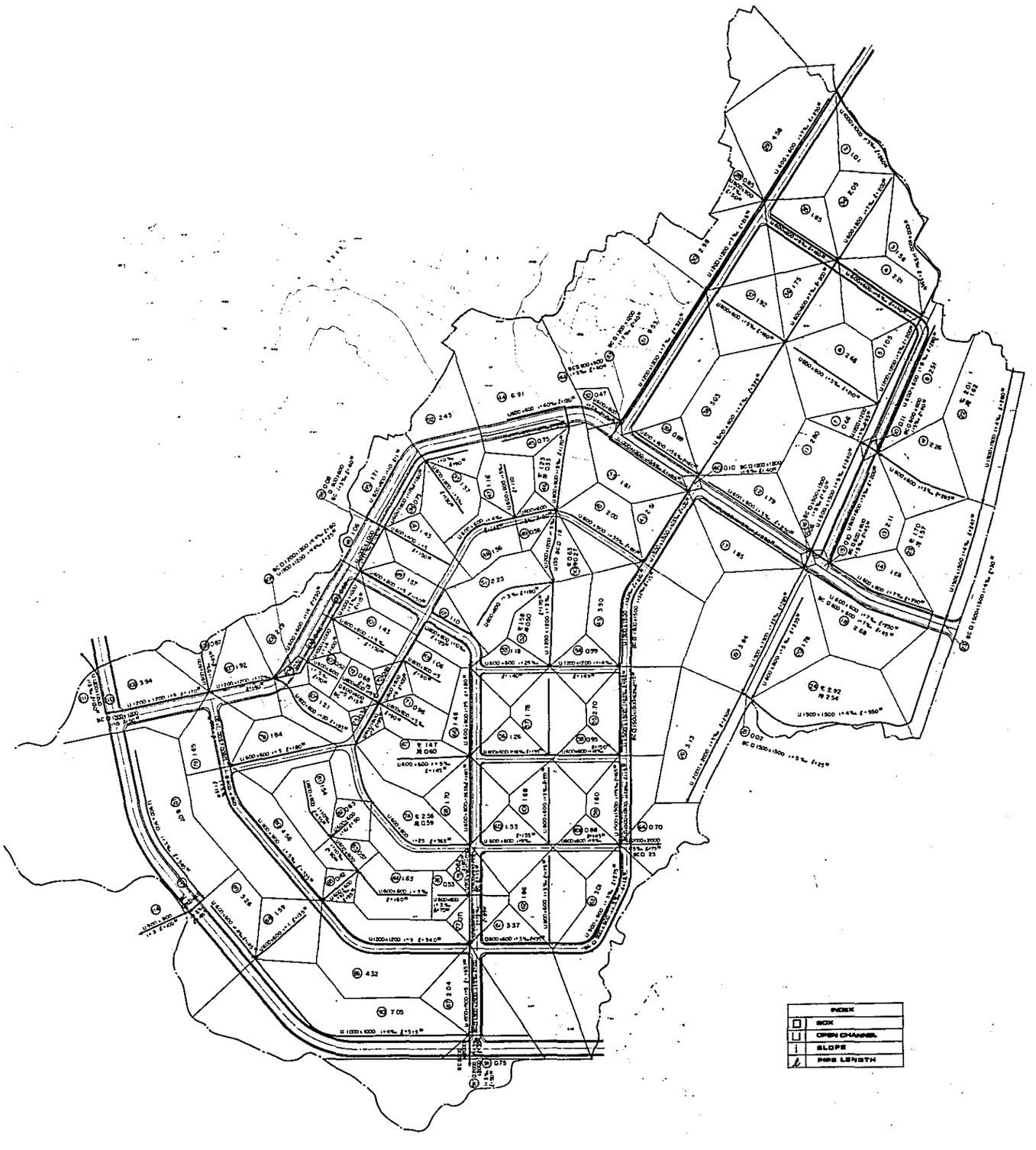

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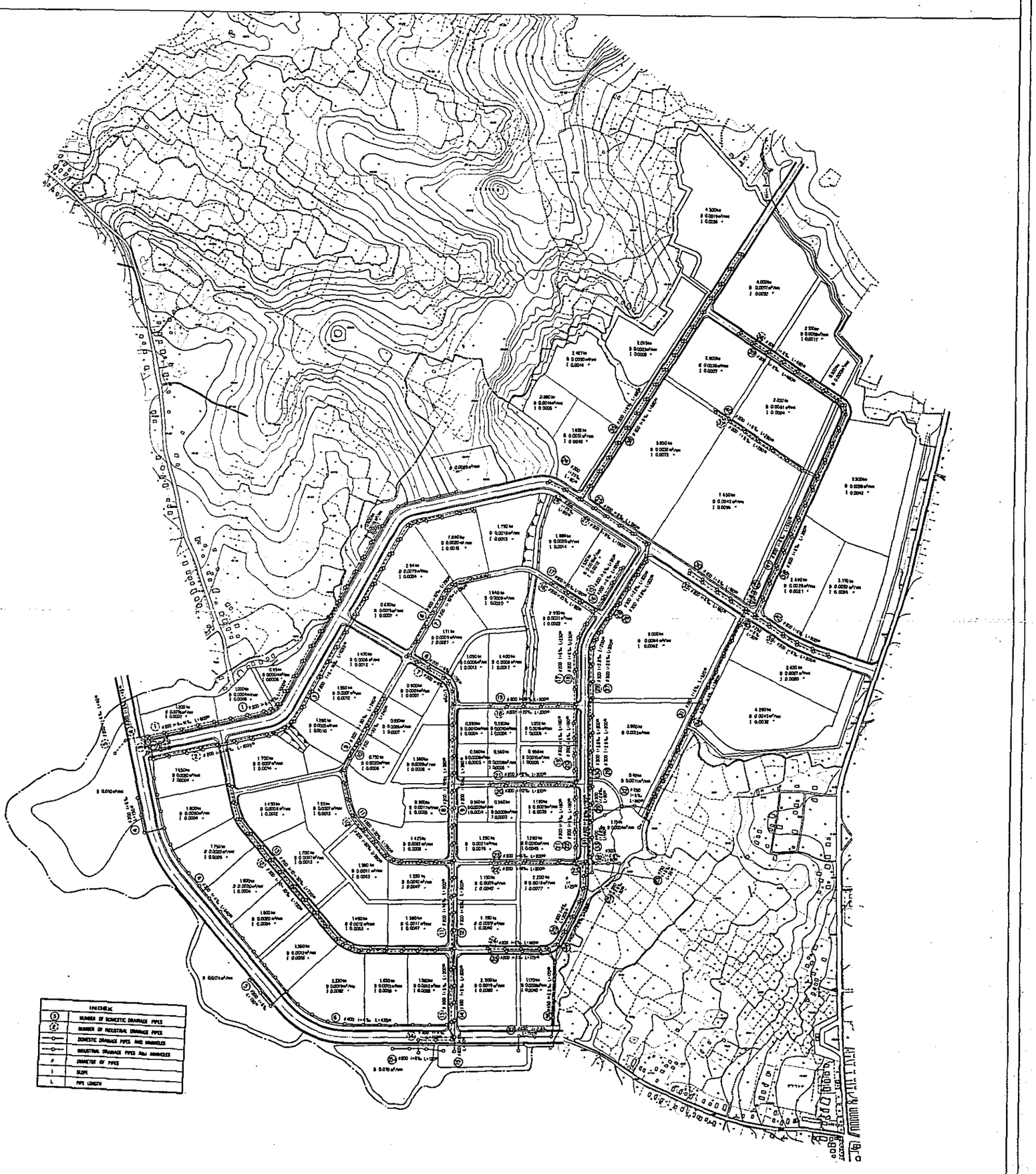
Fig VI-21 **SEWERAGE PLAN**



5) Green park area design

(1) Design policy

Green areas and recreational space will be established with the objective of ensuring a high-quality working environment for the industrial estate. A sports park and zones of natural greenery will be provided as recreational facilities.

The sports park will be 3 ha. in area and will comprise a ground which can be used for baseball, soccer and field sports etc. and a space the size of four tennis courts for ball games such as tennis and volleyball.

The green areas will be distributed within the estate and linked by footpaths. These green areas will provide relaxation for people, and every effort will be made to preserve and utilize the trees as they are now.

The green areas will be in the form of a belt around the perimeter of the estate to harmonize with the land utilization of the vicinity and take consideration of the view from outside the area, and will ameliorate the direct affect accompanying the development.

(2) Design specifications

Facilities plan for sports park

Following are the contents and policy for facilities of the sports park.

1 Ground

The ground will be 80m x 115m in area, allowing space for baseball, soccer, rugby etc. The surface will be compacted and covered with turf strong enough to stand up to the sporting activities, preventing flying sand and promoting the greenery. A back-net will be provided for baseball and a net-fence (2. 4 m high) installed on the Daya-Bira road side to prevent balls flying out.

2 Courts

The area will be 42m x 64m to allow enough space for four tennis courts. The surface will be of clay, and along with a slight lowering of the courts, a net-fence (2. 4 m high) will be erected around the perimeter to prevent balls

flying out. Also, artificial miniature hills and nets will be provided around to promote greenery and increase the quality of the surroundings.

3 Plazas

Two plazas will be constructed as quiet rest-spots.

4 Conveniences etc.

A toilet will be provided by the main entrance. Also, for users of the green park area a parking area (with a capacity of 80 vehicles) will be provided for use by the ordinary citizen. Other facilities that will be provided as necessary include benches, drinking fountains and lighting (for maintenance of public security).

5 Maintenance facilities

A small tool-shed adjoining the toilet will be provided formaintenance equipment of the green areas. Establishment of a supervisory office has not been considered. Ramps will be provided at the side of the parking area to allow service vehicles access to the various areas for maintenance purposes. Moreover sprinkler faucets for plant maintenance will be suitably distributed to promote the good growth of the plant life.

6 Number of users

- Maximum number of people per day = effective area (2.5 ha) divided by the the area occupied per person (8 m^3/hr) = 3,125 people.
- Maximum number of peak-time users = daily maximum users (3,125) times concentration ratio (1/5) = 625 people.

7 Toilets

- Capacity (persons) = maximum peak-time users (625) times utilization ratio (1/80 - 1/40) = 8 to 15 people.
- Number = assumed capacity of 10 people gives 10 toilets (two water-closets and four urinals for men, and four water-closets for women).

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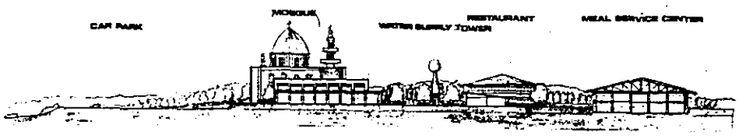
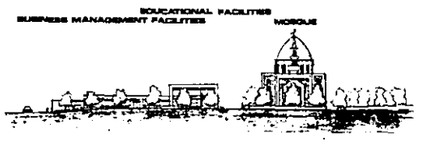
Fig VI-22 ADMINISTRATIVE CENTRE PLAN

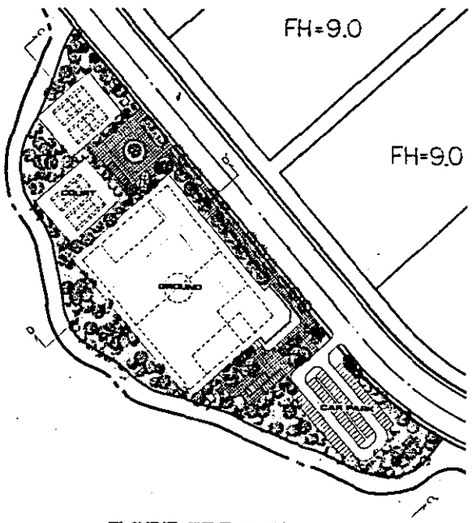
ADMINISTRATIVE CENTRE PLAN S=1:1000



A-A' SECTION

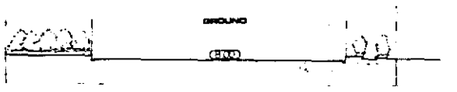


B-B' SECTION



PLAYING FIELD PLAN S=1:1000

C-C' SECTION



D-D' SECTION

VII. ASSESSMENT OF ENVIRONMENT

VII. ASSESSMENT OF ENVIRONMENT

1. SOx as an air pollutant

At this moment no name of locating industries is available. In capter III an assessment of environment was tried on the types of industries that are considered feasible to locate in the industrial estate.

Assumptions:

a. The aggregate heavy oil consumption in the industrial estate shall be 200 m^3/day.

b. The single firing of heavy oil operation will be 10 hours per day.

c. The heavy oil to be used shall contain 0.1% of sulfur.

d. The desulfurization devices shall remove 90% of the sulfur contained.

e. As to the treatment of exhaust gas, concentrated stack system shall be adopted. The stack height will be 30 meters.

f. In using diffusion equations, wind speeds are set at 1 m/sec. and 2.5 m/sec.

g. The most frequent wind directions shall be northwest and southeast. (Data are shown later in this section.)

h. The frequency of wind speed will be 0.328 at 1 m/sec. and 0.449 at 2.5 m/sec.

The following is the result of our assessment. In summary, the air pollution by SOx due to the development of this industrial estate is not considered a problem to human body, because the safety criteria of the SOx density is below average of 0.04 ppm/day based on the value at hour.

Atmospheric Condition \ Wind Speed	Wind Speed at 1 m/sec	Wind Speed at 2.5 m/sec
Stable	0.022 ppm	0.012 ppm
Indifferent	0.008	0.004
Unstable	0.003	0.002

The landing areas for SOx produced will be 0.5 ~ 1.0km away from the industrial estate at wind speed of 1 m/sec.and 1.5 ~ 3.0 km at 2.5 m/sec.

To examine the result more closely:

i. If 200 m^3 of heavy oil is fired for 10 hours a day, there will be an emission of SO_2 at 0.00472 kg/sec.

ii. Setting the wind speed at 1 m/sec, the numerical value of the first term of the diffusion equation comes out as follows:

$$A'(1\,m) = \frac{0.00472\,kg/sec}{1\,m/sec}$$

$$= 0.00472\ SO\,kg/m^3$$

$$= 0.003316\ SO_2\,m^3/m^3 \quad \text{(in terms of volume)}$$

$$= 3.316\ ppm \quad \text{(in terms of density)}$$

iii. The landing density of SOx at wind speed of 1 m is calculated as follows:

(a) The density after passing the desulfurization devices (with sulfur removal capacity at 90%):

3.316 ppm x 0.1 = 331.6 ppm

(b)

Atmospheric Condition	Emission Rate	Landing Density of SOx (Frequency = 0.328)
Stable 10^{-4} x 2	331.6 ppm x 10^{-4} x 2 = 0.06632 ppm	0.06632 ppm x 0.328 = 0.0218 ppm
Indifferent 10^{-5} x 7	331.6 ppm x 10^{-5} x 7 = 0.023212 ppm	0.023212 ppm x 0.328 = 0.0076 ppm
Unstable 10^{-5} x 3	331.6 ppm x 10^{-5} x 3 = 0.009948 ppm	0.009948 ppm x 0.328 = 0.0033 ppm

Thus, the landing density of SOx with the wind speed at 1 m/sec. ranges from 0.0033 ppm to 0.0218 ppm.

iv. Setting the wind speed at 2.5 m/sec, the numerical value of the first term of the diffusion equation comes out as follows:

$$A'(2.5\,m) = \frac{0.00472\ kg/sec}{2.5\,m/sec}$$

$$= 0.001888 \quad SO_2\ kg/m^3$$

$$= 0.001326 \quad SO_2\ m^3/m^3 \quad \text{(in terms of volume)}$$

$$= 1.326\ ppm \quad \text{(in terms of density)}$$

v. The landing density of SOx is calculated as follows:

(a) The density after passing the desulfurization devices (with sulfur removal capacity at 90%):

$$1.326\ ppm \times 0.1 = 132.6\ ppm$$

(b)

Atmospheric Condition	Emission Rate	Landing Density of SOx (Frequency = 0.449)
Stable $10^{-4} \times 2$	132.6 ppm x 10^{-4} x 2 = 0.02652 ppm	0.02652 ppm x 0.449 = 0.0119 ppm
Indifferent $10^{-5} \times 7$	132.6 ppm x 10^{-5} x 7 = 0.009282 ppm	0.009282 ppm x 0.499 = 0.0042 ppm
Unstable $10^{-5} \times 3$	132.6 ppm x 10^{-5} x 3 = 0.003978 ppm	0.003978 ppm x 0.499 = 0.0018 ppm

Thus, the landing density of SOx with the wind speed at 2.5 m/sec ranges from 0.0018 ppm to 0.0119 ppm.

vi. The constant wind directions and wind speeds in Ujung - Pandang (based on data prepared by Hasanudin Airport)

The wind directions in Ujung - Pandang have largely been affected by the trade winds of the west monsoon and the east monsoon. In addition, the sea breeze and the land breeze around this area have joined to make the wind direction and wind speed there very much complicated.

Wind Direction / Wind Speed	West Monsoon				East Monsoon						
	South-west	West	North-west	North	North-east	East	South-east	South	South-west	North-west	Total
1 - 3 knots	22	63	129	73	42	210	264	201	33	100	1,137
4 - 6	47	248	279	77	45	164	194	160	71	269	1,554
7 - 10	37	169	122	22	22	76	35	20	21	207	731
11 - 16	10	11	8	0	2	7	0	1	0	3	42
Total	116	491	538	172	111	457	493	382	125	579	3,464

2. Water Pollution (BOD)

i. Target of Treatment Plan

The target of our treatment plan is to control waste water without changing the existing water quality of the Tallo River into which the waste water is to be discharged.

ii. Basic Policy

(a) Industrial Waste Water

- Special contaminants are to be treated at the factories concerned.
- The central water treatment system handles inorganic waste water.
- The central water treatment system handles also high BOD waste water (organic waste water).

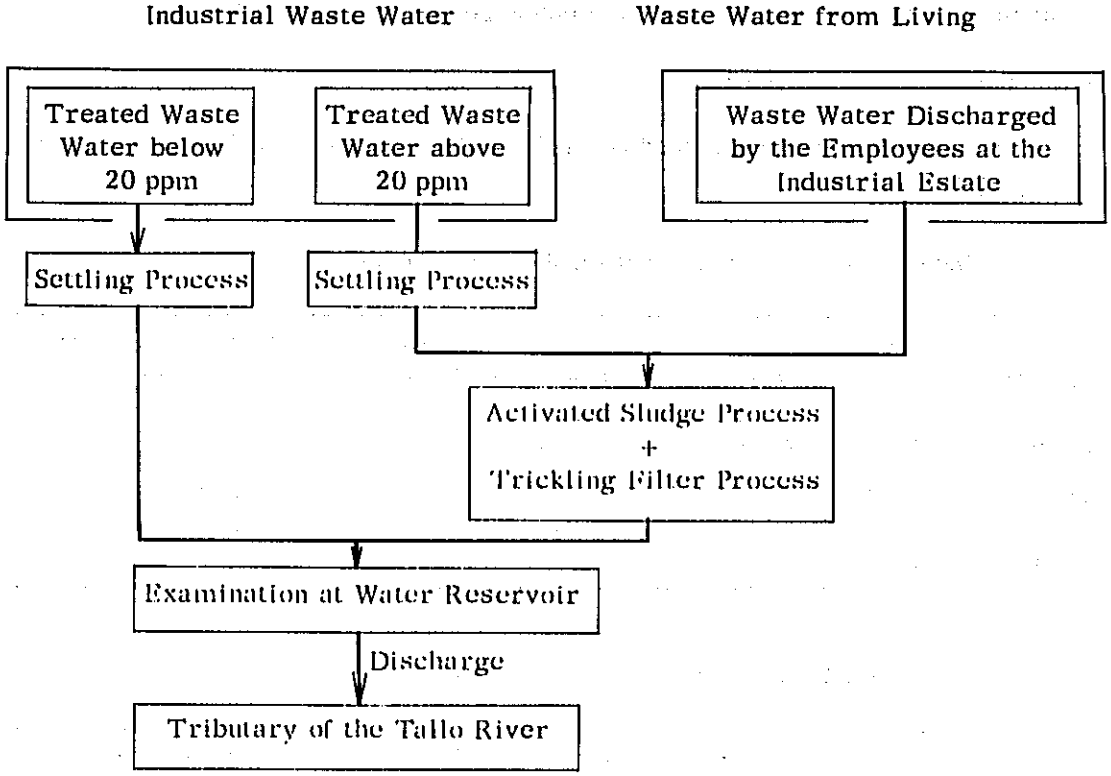
(b) Waste Water from Living

- The central water treatment system handles waste water discharged by the employees at the industrial estate.

iii. Present State of Water Pollution

BOD of the Tallo River, into which the waste water is to be discharged, is now at 30 ~ 60 ppm.

iv. Treatment Process



v. Result of Assessment

The water treated through the activated sludge process and the trickling filter process and added with low density waste water will be maintained at 25 ppm of BOD. Thus, it will not increase the present BOD level of the Tallo River.

vi. Necessities for Further Study

Although at present the treatment process discussed above is expected to bring about no major change in the water quality of the Tallo River, there will be problems arising in the course of actual operation.

(a) It is necessary to assess the water pollution by nitrogen and phosphor because the Tallo River is a source of agricultural water.

(b) The BOD level estimated in this study is served as a reference, and thus it is necessary to make a long-term observation of the Tallo River

(c) It is necessary to study the time lag between the treatment of waste water at the treatment facilities and the discharge of the pollution loads.

vii. Basis of Our Estimation

The waste water discharged from the industrial estate will be classified into the following:

(a) Industrial Waste Water with BOD above 10 ppm

Industry	Volume of Waste Water	Pollution Load per Unit of Waste Water	Volume of Pollution Load
Food	1,108 m^3/day	500 mg/l	554.0 kg/day
Textiles	13	200	2.6
Total	1,121	–	556.6

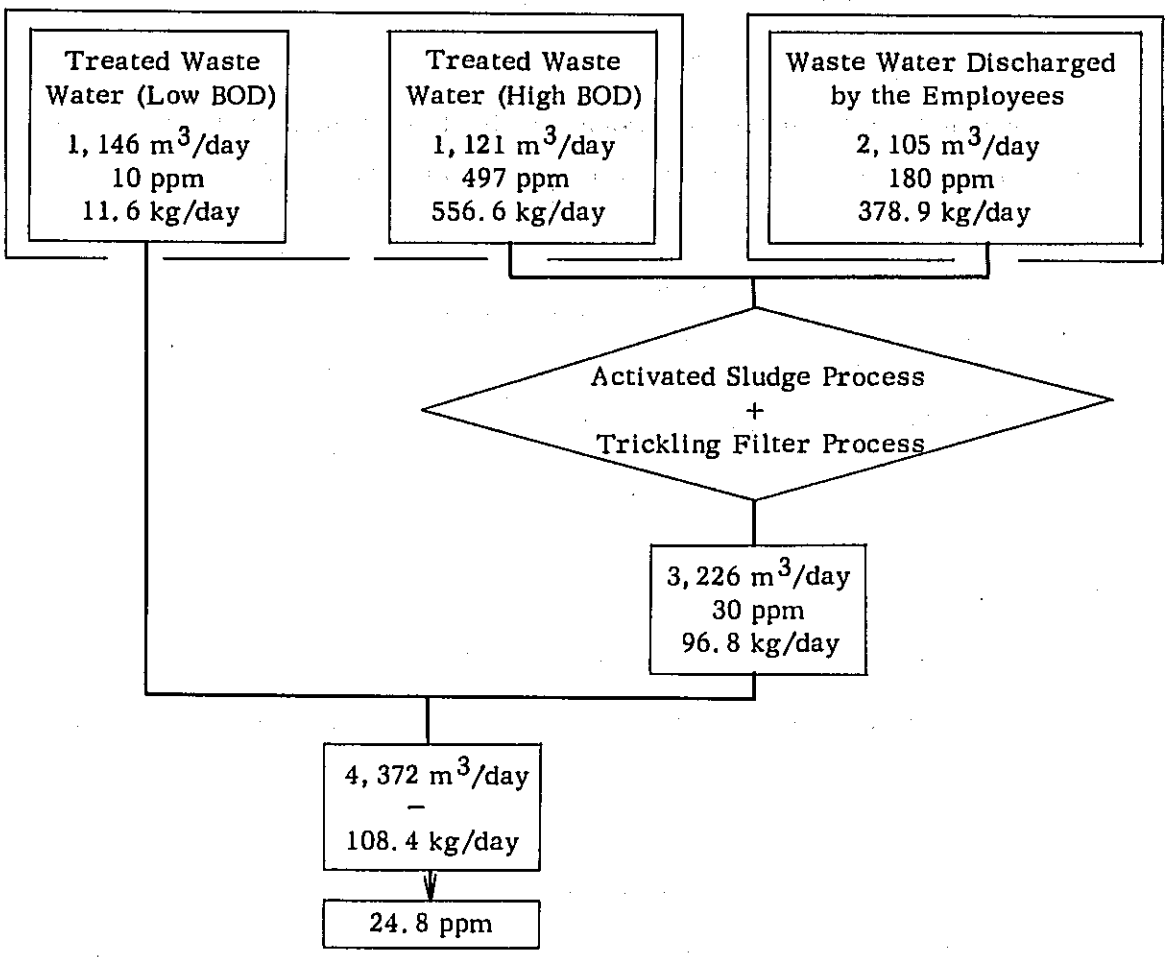
(b) Industrial Waste Water with BOD below 10 ppm

Industry	Volume of Waste Water	Pollution Load per Unit of Waste Water	Volume of Pollution Load
Lumber	51 m^3/day	10 mg/l	0.5 kg/day
Paper and Printing	18	10	0.2
Chemicals	36	10	0.4
Ceramics	251	10	2.5
Metals	337	10	3.4
Machinery	415	10	4.2
Others	38	10	0.4
Total	1,146	-	11.6

(c) Waste Water from Living

	Volume of Waste Water	Pollution Load per Unit of Waste Water	Volume of Pollution Load
Waste Water from Living	2,105 m^3/day	180 mg/l	378.9 kg/day

viii. Process of Treatment and BOD Levels



3. Noise and Vibration

i. Policy

The noise and vibration expected at the industrial estate are classified roughly into those caused by plant or machinery operations, noise generated by automobiles going in and out of factories and noise accompanying the construction of factories. In this section, we are going to discuss factory noise which will not only create a major disturbance for factory workers and reduce their productivity but also become a source of irritation for the inhabitants of areas near the industrial estate.

As to effects inside factories, individual measures should be taken by each factory. In order to reduce the effects on surrounding areas, an overall control plan should be worked out.

ii. Source and Level of Noise

Judging from the industries which are able to participate in the industrial estate, the following sources and levels of noise are estimated.

Foods	Flour mill	90 phons
	Ventilator	80
Textiles	Sewing machine	85
	Spooling machine	80
Lumber	Wood-working machine	90
	Circular saw	95
	Planing machine	90

iii. Control Measures

(a) Grouping of factory sites by type of industry

Factories engaged in metals, ceramics and lumber industries should be located in as inner a part as possible so as to reduce the effects on the surrounding areas.

(b) Attenuation by distance or forests

Although the extent of attenuation of noise by distance differs by source of noise, in general a distance of 50 meters reduces a noise level by 7 ~ 10 phons and a distance of 100 meters by 10 ~ 15 phons.

(c) Sound insulation by fence or building

Building a fence, dike or warehouse around the source of noise will be much effective for the sound insulation.

iv. Result of Assessment

Although the level of disturbance on the inhabitants of the surrounding areas depends on the situation, the establishment of a buffer zone extending over 50 meters, the construction of dikes, the planting of trees and the sound insulation measures within factory sites will help substantially reduce the level of nuisance.

VIII. PHASED CONSTRUCTION AND COST ESTIMATE

VIII PHASED CONSTRUCTION AND COST ESTIMATE

1. Cost Estimate

1) Estimated construction costs

The data on the basis of which the construction costs were estimated were obtained mainly from the Public Works Department of Ujung Pandang Municipal Office and leading construction companies of the city, while those relating to water and power facilities were obtained from PM (for the water supply facilities and PLN (Public Works and Electric Power Ministry). In addition, the cost data relating to the construction of other industrial estate built in Indonesia (such as Jakarta and Surabaya) were consulted. Other source materials consulted in this connection include DAFTAR HARGA SATUAN BAHAN BANGUNAN and DAFTAR HARGA SATUAN REKERJAAN published every four months by PUSAT INFORMASI TEKNIK PEMBANGUNAN. Although they may be less than reliable for the purpose of cost estimation under the given rate of inflation, they nevertheless proved to be useful for determining the difference in the prices of construction materials of various regions of the country. Where cost items for which data were not available in Indonesia, their costs were estimated by correlating the cost data of construction materials available in Japan on the basis of the price indexes of the two countries.

One of the items that accounts for a large part of the construction costs is the one for site preparation, and this is partly due to the peculiar condition of the proposed site that numerous rocks crop up on the site and an equally large number of them may be hidden beneath the surface soil. Accordingly, the estimated unit cost for site preparation assumes an extensive use of blastings, breakers, rippers and manual spalling. Before undertaking the work, however, a detailed on-the-spot investigation will have to be conducted and a method of execution of the work suitable to the given condition of the site may have to be devised. If a method of utilizing the tuff sandstone that exists abundantly on the site (for instance, as construction materials) can be found, it will go a long way toward reducing the cost of site preparation.

Table VIII-1 Construction Materials and Labor Costs

(October, 1976)

Item	Unit	Price (Rp.)
Wage		
Workman	day	300
Journeyman	day	700
Foreman of journeymen	day	800
Foreman of roadmen	day	600
Foreman of construction crew	day	1,000
Operator of heavy machinery	month	50,000
Construction Materials		
Cement	sack	1,450
Sand (for back-filling)	m^3	800
Sand (for mortar)	m^3	1,500
Sand (for concrete)	m^3	2,500
Ballast for concrete	m^3	4,800
Broken stone, 10 cm - 15 cm	m^3	4,000
Broken stone, 5 cm - 7 cm	m^3	4,500
Reinforcing bar	kg	350
Binding wire	kg	500
Nail	kg	400
Log, first-class dayan	m^3	100,000
Lumber (board), first-class dayan	m^3	120,000
Lumber, second-class marant	m^3	40,000
Lumber, third-class	m^3	15,000
Brick	piece	11
Plywood	sheet	3,750
Galvanized iron sheet (#28)	sheet	1,800
Asbestos cement corrugated board	sheet	3,800
Asbesto cement board	sheet	2,800

Item	Unit	Price (Rp.)
Construction Materials (cont'd)		
Ductile cast iron pipe for water (D. I. P.)		
ø 4"	m	1,900
ø 6"	m	3,800
ø 8"	m	4,800
ø12"	m	14,600
ø20"	m	17,000
ø24"	m	20,000
Concrete pipe, ø400 mm	m	1,200
Concrete, 1 : $1\frac{1}{2}$: $2\frac{1}{2}$	m^3	25,400

Table VIII-2 Overall Unit Construction Costs

Item		Unit	Price (Rp.)
1. Site Preparation			
Clearing and grubbing		m^2	80
Stripping (30 cm deep)		m^2	220
Earth work, cutting		m^3	350
Earth work, banking		m^3	175
Rock removal		m^3	3,000
2. Access Road Construction			
Primary access road (30 m)		m	213,000
Secondary access road (20 m)		m	122,000
Collector-distributor (12 m)		m	61,000
Pedestrian path (10 m)		m	40,000
3. Drainage			
Open channel,	600 x 600	m	4,500
	900 x 900	m	7,000
	1200 x 1200	m	14,000
	1500 x 1500	m	22,000
Covered channel,	600 x 600	m	12,000
	900 x 900	m	20,000
	1200 x 1200	m	32,000
	1500 x 1500	m	50,000
4. Sewerage			
Sewerage piping,	ø600	m	25,000
	ø450	m	14,000
	ø250	m	8,000
5. Buildings			
Office		m^2	80,000
Religious buildings		m^2	60,000
Educational buildings		m2	50,000

Item	Unit	Price (Rp.)
5. Buildings (cont'd)		
Shop	m^2	60,000
Factory for lease	m^2	50,000
Distribution facilities	m^2	45,000
Truck terminal	m^2	25,000

2) Construction materials

Generally, the costs of construction materials, particularly, those of secondary products are rather higher in Ujung Pandang than those available in larger cities such as Jakarta, while wages are relatively lower than those paid in larger cities such as those in Java. A sheet of plywood (3' x 7') costs Rps. 2,500 in Jakarta compated with Rps. 3,750 in Ujung Pandang, while a day's wage for unskilled construction worker in Jakarta is Rps. 500 compared with Rps. 300 in Ujung Pandang.

Basic construction materials, such as sand and gravel, can be extracted from the Jenebran River, the Taro River and the Maros River which run through the vicinity of Ujung Pandang, and the bulk of their cost is for transportation. They can be extracted easily during the dry seasons but the extraction work may be hampered during the rainy seasons from October through March. Therefore, the costs of sand and gravel are about 25 % higher in rainy seasons than those available in dry seasons.

3) The state of the construction industry

It is estimated that there are approximately 500 construction companies operating in Ujung Pandang, the larger ones being the branch offices of the leading construction companies based on Jakarta and Surabaya. They include P. T. Waskita Karya, P. T. Pembangunan Perman, and P. T. Hutama Karya which are semi-governmental companies and have joint ventures with Japanese construction companies. P. T Barata is one of the largest private construction companies based on Surabaya and operates Tonasa Cement Factory. Those which specialize in construction work are P. T. Sama Suble and P. T. Pancha Gaya which are in a position to move their equipment and technical personnel from their home office to Ujung Pandang whenever necessity arises.

In Indonesia, the seasons are distinctly divided into dry and rainy ones (October through March), and during the rainy seasons, the rate of operation inevitably slows down. During the six- month period when the rate of precipitation is particularly high, the number of working days averages at about 12 to 15 days a month, and this compares with the monthly average of 25 days for the dry seasons.

Even during the period of Ramadan, construction work continues without serious interruption, except for about ten days before and after Ramadan which are national holidays.

4) Heavy construction equipment

Given the period of construction work, the development of the 200 hectare industrial estate would require the use of heavy construction equipment, cheap though the labor may be in Ujung Pandang.

Most of the big construction companies have their own construction equipment. Besides, there are companies in the city of Ujung Pandang which lease heavy construction equipment. When leased from them, they supply operators for their equipment and the maintenance and management of the construction equipment is their responsibility, but the cost of fuel used by them must be borne by the leasee.

Table VIII-3 Rental Fees of Heavy Construction Equipment
(In the case of United Tractor)

Heavy Equipment	Rental Fee (Rp./H. M.)	No. of Equipment
Bulldozer (Komatsu-D50A-90 hp/1750 rpm)	13,000	5
Dozer Shovel (Bucket capacity: 1.6 m^3) (Komatsu-D55S-3, 125 hp/1900rpm)	14,000	2
Hydraulic Excavator (Capacity: 0.35m^3) - 0.5 m^3) (Sumitomo, LS-2500BJ)	12,000	1
High-speed Diesel Fuel	28Rp-30Rp/1t (121t per H.M.)	

Number and kinds of heavy equipment available today in Ujung Pandang are rather limited, but they can be delivered to the construction site in two weeks from Jakarta or Surabaya or in one month from Singapore. Operators of the leased equipment are readily available from these places.

If a certain heavy equipment is to be employed for a long period (more than six months), it is more advantageous to buy it outright than lease it on a rental

basis. Therefore, it is advisable to work out a detailed plan for the use of heavy equipment with a view to determining whether a certain equipment should be leased or purchased outright. A case in point is the Panakukan Housing Project which is under way on a 1,000-hectare tract of housing lots in an area east of Ujung Pandang City. The developer of the project has purchased one road-roller outright and has taken four units of bulldozers on lease.

5) Buildings

Those which are to be built under the plan within the proposed industrial estate include (a) administrative and recreational facilities, (b) commercial facilities, (c) educational facilities, (d) religious buildings, (e) distribution-related facilities, (f) standardized factory buildings. However, the total estimated construction costs of the proposed industrial estate include only the construction costs of (a), (c) and (d) which generate no direct profits.

6) Works outside the industrial estate

At present, no water facilities are available on the site, nor is any water available from underground sources. (A public works shop operating in the vicinity of the site is buying 40 tons of water daily by means of water wagons.) Accordingly, water pipes will have to be laid connecting the site with the city water reservoir which was recently built in Ujung Pandang, and costs for laying the water pipe were also included in the estimated costs. As regards power supply for the site, a branch line will be hooked on the high-voltage transmission mission line that runs along the Gowar Jaya highway and a substation also is being planned.

The layout of the industrial estate requires the relocation of a part of the existing road which connects Desa Daya and Desa Bira. This entails the construction of a connecting road which will have a sufficient width to accommodate the increased traffic which is bound to be generated by the activities of the industrial estate. Specifically, this applies to the stretch of road that lies between the intersection of Desa Daya and the entrance to the industrial estate and the extension of this road reaching the one that leads to Desa Bira.

During the First Stage, an access road for construction purposes having a width of ten meters will be constructed from the intersection of Desa Daya to the industrial estate. This will be adequate for bearing the initial traffic load but this will have to be widened to a width of 30 meters to accommodate the traffic generated by the industrial estate, and the costs for the road construction outside the industrial estate are also included in the estimated costs.

7) Acquisition of land

For the purpose of estimating the costs for acquiring the needed land, data were obtained from the following sources.

Members of Seven Committee

IPEDA (Land Bureau)

Public Works Department of Ujung Pandang

Recent transactions in land within the city limits

P. T. Sulawesi Jaya Membangun

The would-be managers of the industrial estate will not negotiate for the purchase of land directly with the land owners. Island, a third-party intermediary is organized to intervene between the land owners and the purchasers. Normally, the intermediary continues to negotiate on behalf of the purchasers till the intermediary and the land owners succeed in hammering out a compromise. However, in view of the public nature of the industrial estate, a special arrangement would be necessary for the purchase of the land. This matter is further discussed in Chapter 11.

Land acquisition normally involves the question of compensating for the things that exist on the surface. The Public Works Department of Ujung Pandang is supposed to assume the responsibility for compensating for the houses, wells, school buildings, mosques, bridges and grave-yards, while the Seven Committee will take care of the compensation for the agricultural crops, mango and banana trees and bamboos that stand in the fields of Hyassaba.

Prices of paddyfields are higher than dry fields and wooded land. However, no indemnity is payable for paddyfilds, while dry fields and wooded land are subject to compensation. On balance, therefore, compensation price for a unit

area of these lands works out at Rps. 400/m^2 across the board. As regards the residential area, compensation price is set at Rps. 700/m^2 including those other than the house.

At present, there are 170 units of houses of the bamboo or wooden structure, a group of school buildings of the permanent structure, one wooden mosque and another of the concrete structure within the proposed site of the industrial eatate. Compensation costs for these properties were estimated at Rps. 200, 000 per houses, Rps. 7, 000, 000 for the school and Rps. 10, 000, 000 and Rps. 5, 000, 000 respectively for the mosques.

Table VIII- 4 Land Acquisition Costs

Land:			
Housing lots	88, 336 m^2	Rps. 700/m^2	Rps. 61, 835, 200
paddyfields, dry fields, orchards and others	2, 120, 054 m^2	Rps. 400/m^2	Rps. 848, 021, 600
Sub-total	2, 208, 390 m^2		Rps. 909, 856, 800
Compensation:			
Houses	170 units	@Rps. 200, 000	Rps. 34, 000, 000
School	1 unit	@Rps. 7, 000, 000	Rps. 7, 000, 000
Mosque (concrete)	1 unit	@Rps. 10, 000, 000	Rps. 10, 000, 000
Mosque (wooden)	1 unit	@Rps. 5, 000, 000	Rps. 5, 000, 000
Sub-total			Rps. 56, 000, 000
Total land acquisition costs:			Rps. 965, 856, 800

8) Others

A sum equivalent to 25 % of the costs of the construction work is included as expenses for general administration which cover fees for designing (6 %), fees for supervising the execution of the project and charges for surveys and boring tests. They also cover the costs of temporary works and salaries of the supervisory personnel who oversee the construction of the industrial estate.

Construction of the industrial estate will be executed in three stages covering a period of 12 years, and the computation of the construction costs was made on the basis of the prices prevailing in today's market and effects of inflation on these cost estimates are discussed in a separate chapter under the heading of Economic Evaluation.

9) Total cost

Construction cost of this industrial estate is calculated according to the three construction stages and in consideration of the unit materials cost, unit construction cost, the general situation of construction materials and the use of heavy machinery in Ujung Pandang. (Table VIII-5)

Table VIII-5 Cost of Developing the Industrial Estate

(Rps. 1,000)

Cost Item	Stage I	Stage II	Stage III	Total
1. Preliminary	75,000.0	31,350.0	19,950.0	127,000.0
2. Ground levelling	431,611.0	408,606.5	230,096.5	1,070,314.0
3. Roads	906,615.0	544,310.0	199,480.0	1,650,450.0
4. Paving	9,250.0	3,950.0	34,800.0	48,000.0
5. Drainage and sewerage	179,702.5	120,411.0	126,787.5	426,901.0
6. Water supply	162,410.0	44,770.0	28,550.0	235,680.0
7. Electrical supply	72,000.0	72,000.0	36,000.0	180,000.0
8. Slope protection, prevention of hazard	23,318.9	57,491.1	39,857.0	120,730.0
9. Parks	25,736.0	38,604.0	64,340.0	128,680.0
10. Buffer greenery and others	10,994.0	10,332.0	24,439.0	45,765.0
11. Sewerage treatment	310,000.0	20,000.0	20,000.0	350,000.0
12. Buildings	138,800.0	-	35,000.0	173,800.0
Sub-total	2,346,200.4	1,351,824.6	859,250.0	4,557,275.0
13. Overhead	586,550.1	337,956.1	214,812.5	1,139,318.7
Total	2,932,750.5	1,689,780.7	1,074,062.5	5,696,593.7
14. Land acquisition	965,856.8	-	-	965,856.8
Grand Total	3,898,607.3	1,689,780.7	1,074,062.5	6,662 450.5

Off-site development cost (Rps. 1,000)

Water supply	285,750
Electrical supply (power station)	260,821
Total	546,751
Building 2 (profitable)	1,125,000

2. Stage Construction

The area planned for the industrial estate is about 221 ha. Considerations of the induction schedule for the various industries, the capital schedule and the progress schedule show that the development should be by stages, rather than all at one time. The works of the present project will be divided into three stages, with the works commencing in 1979 and finishing in 1990. The first-stage works (work area A) will tun from 1979 to 1983, the second-stage works (work area B) frpm 1984 to 1987, and the third-stage works (work area C) from 1985 to 1990.

Land utilization area distribution of area A:

Factory site	45.9 ha (56.1%)
Roads	14.1 ha (17.3%)
Estate center site	1.6 ha (2.0%)
Sewerage facilities site	2.0 ha (2.4%)
Park	11.7 ha (14.3%)
Waterways and reservoir	1.0 ha (1.2%)
Green zones, etc.	5.5 ha (6.7%)
Area A total	81.8 ha (100.0%)

The cutting and filling earth quantities for each work area have been planned to attain a balance as far as possible. The length of roadway in the first stage will be 2,500 m of 30 m road, 2,100 m of 20 m road, 1,700 m of 12 m road, plus 1,000 m of pedestrian way.

In the initial stages of construction the road starting from the Desa-Daya junction will be expanded and equipped for use as a construction road (10 m) and this road shall be used as the principal access road until work area B construction commences in 1984 and a direct access road is constructed from the Gowa-Jaya road. Factories will be introduced from 1980, so if land purchase is settled in 1977 work will have to commence promptly on construction works for electric power and water utilities supplies outside the area.

The estate center and waste-water treatment facilities will have to be constructed in the first stage, and all the necessary facilities such as the main sections of the drainage facilities, water towers, water tanks, pump stations and the like

must be installed in the initial stages, so the financial burden will be unavoidably heavy.

Land utilization area distribution of area B:

Factory site	59.7 ha (72.9%)
Roads	9.4 ha (11.5%)
Estate center site	0.4 ha (0.5%)
Park	5.0 ha (6.1%)
Waterways and reservoir	2.1 ha (2.6%)
Green zones, etc.	5.2 ha (6.4%)
Area B total	81.8 ha (100.0%)

Length of roadway will be 700 m of 30 m road, 2,000 m of 20 m road, 1,100 m of 12 m road, plus 1,720 m of pedestrian way. Construction area of this stage is the same as that of the first stage, but the 60 ha factory site is 30% larger than that of the first stage.

In the second stage a 30 m access road providing a straight link between the Gowa-Jaya road and the estate center will be constructed. In this stage the east ridge of the area developed in the first stage will be central to the preparation, and the proposed industries to be introduced include the chemical industry, metal industry, foodstuff industry, timber industry, and lease factories.

Land utilization area distribution of area C:

Factory site	35.6 ha (62.2%)
Roads	3.4 ha (6.0%)
Estate center site	0.5 ha (0.9%)
Distribution facility site	4.2 ha (7.3%)
Waterways and reservoir	1.3 ha (2.3%)
Green zones, etc	12.2 ha (21.3%)
Area C total	57.2 ha (100.0%)

Road length will be 340 m of 30 m road, 750 m of 20 m road, plus 890 m of pedestrian way, so the length of road is very much less than that of the second stage. The main infrastructure of the estate has been almost completed, and the outlay for work area C is about one billion yen less.

IX. ORGANIZATION AND MANAGEMENT

IX ORGANIZATION AND MANAGEMENT

1. Organizational Structure

1) Background in examining the organizational structure of Ujung Pandang Industrial Estate

The history of management of industrial estates in Indonesia, like in many other countries, is not long. Accordingly, other industrial estates in this country which have already been constructed have not so much experience to provide efficient suggestions on the organizational and administrative structures. When the effectiveness of an industrial estate is recognized as a powerful tool for the industrialization policy, the following conditions are generally required for the success of the industrial estate.

i) Various governmental policies, legislation and other systems to facilitate the planning and promotion of the industrial estate

ii) Various governmental policies, legislation and other systems to facilitate the management of the industrial estate

The Indonesian Government has recognized the effectiveness of industrial estates, and BKPM, BAPPENAS and the Ministry of Industry have been playing respective roles for their promotion. However, a unified legal system or organization has not been necessarily established. Therefore, the P. T. Industrial Estate as a business corporation under the commercial law to implement the programs of the industrial estate was established from a viewpoint of organizational structure and is totally responsible for the management.

It is desirable that the Ujung Pandang Industrial Estate will adopt the similar style under the present system. In this case, the following points should be taken into consideration.

(1) Ujung Pandang has not yet been developed highly as compared with other industrial bases, which is shown, for example, in a general shortage of talented

personnel to implement the programs and in a relative difficulty to invite enterprises as compared with other districts. Therefore, more advantageous environmental conditions will be generally required.

(2) This industrial estate is decisively important for the economic development in South Sulawesi Province and Ujung Pandang City. Therefore, the two local governments are required to make substantial commitments to the promotion and management of this industrial estate.

(3) More assistance will be needed from the central government to this industrial estate since it will play an extremely important role in regional development and bridging the gap between local economies as compared with the cases in Jakarta, Surabaya and Medan.

2) Considerations in forming the organizational structure

With the above-mentioned points taken into account, we think it is desirable that, in addition to the common structures in Indonesia, the following considerations will be adopted in forming the organizational structure.

(i) In addition to a management company to carry out the activities and the management of the industrial estate, a department will be established within the local government office aimed at promoting the local economy. The department is to strengthen the infrastructure outside the industrial estate, speed up various procedures for legal approval for enterprises to be established in the industrial estate, and coordinate the activities between the industrial estate and the local government.

(ii) Outside experts in such fields as financing, introduction of enterprises and development will be stationed as advisors in order to assist the functional activities of the management company for the industrial estate.

(iii) A project team for the industrial estate will be formed as a temporary organization before the management company is set up and begins the independent operations. The management company will be established after the formation of a substantial financial base is confirmed.

3) Proposed organizational structure and function and role of each organization

On the basis of the above-mentioned points, the following organizational chart can be drawn.

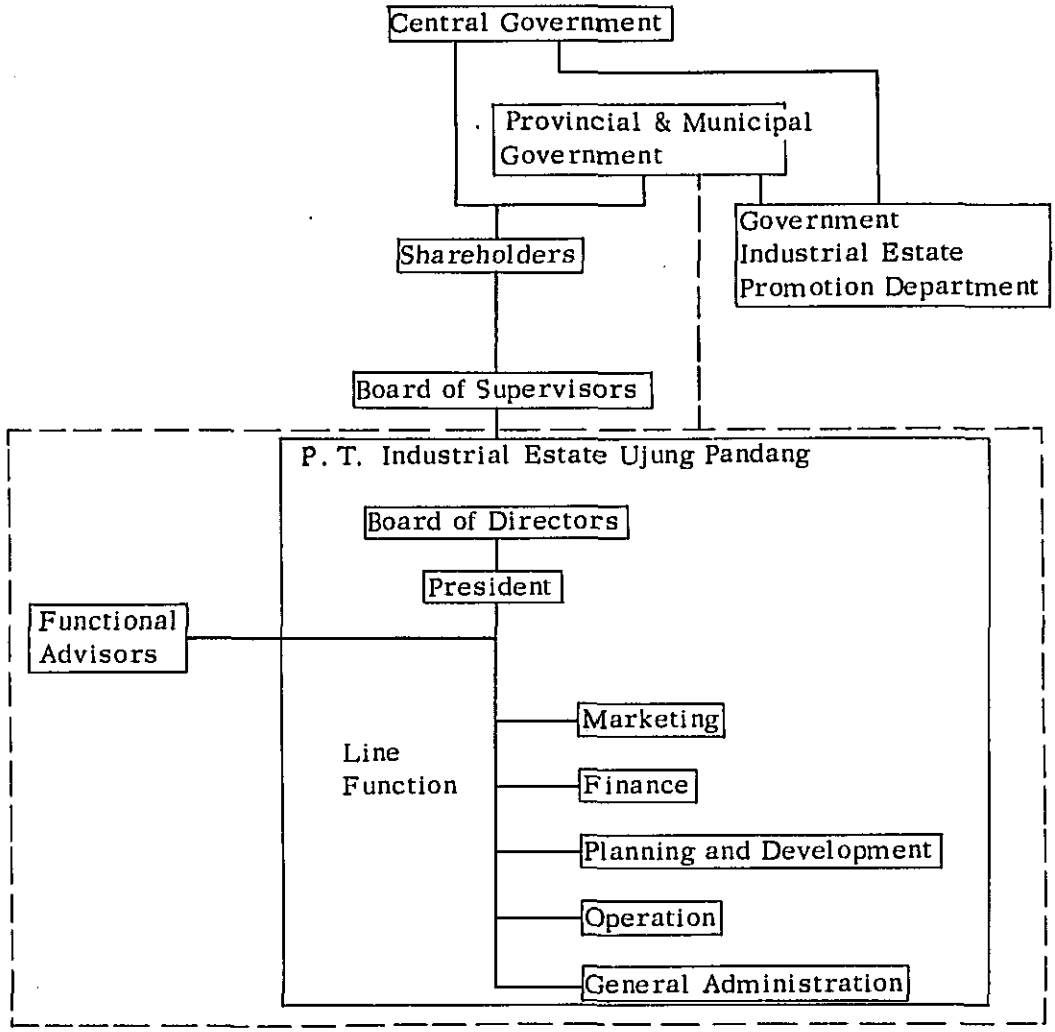


Fig. IX-1 Proposed Organizational Chart of the Project Industrial Estate Ujung Pandang (prior to the foundation of P. T.)

(Source) Prepared by the Mission

The role of each organization can be outlined as follows:

(1) Central Government:

a. To work out general policies and guidelines concerning this industrial estate.

b. To financially assist this industrial estate.(holding of the stocks, loans, etc.)

c. To provide various facilities relating to this industrial estate.

(2) Municipal Governments (Municipality of South Sulawesi and City of Ujung Pandang) :

a. To prepare the programs for this industrial estate and to support the subsequent development.

b. To assume the ultimate responsibility for improving the environments of this industrial estate and other industrial estates, which will later be transferred to lower organizations.

c. To hold stocks of this industrial estate and provide various facilities relating to this industrial estate.

(3) Board of Supervisors:

The members will be named by the shareholders. They will probably include President of P. T. Industrial Estate Ujung Pandang (P. T. IEUP), Governor of South Sulawesi Province, Mayor of Ujung Pandang City and Director of the Industrial Estate Promotion Department. The members will work out major policy guidelines and approve individual policies, including the price policy, the development policy, the main programs and the policy for introduction of enterprises.

(4) Industrial Estate Promotion Department:

In order to strengthen the environments for smooth management of the industrial estate and easier introduction of enterprises, the Industrial Estate Promotion Department will be established within the South Sulawesi Provincial Government or other appropriate agency.

The department will have the following functions:

i) To strengthen the infrastructure outside the industrial estate (for example, roads, transportation facilities, electric power, water supply, sewerage, communications, etc.) in order to bring about smooth operations of the enterprises established in the industrial estate.

ii) To speed up various procedures concerning the approval of investments for the enterprises established in the industrial estate.

iii) Overall coordination of the activities between P. T. IEUP and local governments of South Sulawesi Province and Ujung Pandang City.

The Industrial Estate Promotion Department should be given the most appropriate status in the administrative structure, with various relations of administrative powers taken into account. In this case, the following two points should be taken into consideration.

i) The department will be established as a division of an agency responsible for the promotion of regional economy in general (for example, the Ministry of Promotion of Regional Economy).

ii) The Policy Committee will be established as the decision-making body in the department. The committee members will include the representatives of the province, the city and BAPPEDA.

(5) P. T. Industrial Estate Ujung Pandang (P. T. IEUP):

This is primarily responsible for the implementation and administration of the programs for the industrial estate. The principal staff will include the president and the heads of the five divisions of marketing, finance, planning and development, operation and general administration who assist the president.

(6) Functional Advisors:

In view of lack of experiences in the management and administration of the industrial estate in this area, it will be necessary to have outside advisors in each field of marketing, finance, planning and development, etc. It is desirable that these advisors are foreign or Indonesian specialists experienced in management of the industrial estate and work on a full-time basis.

(7) Project Industrial Estate Ujung Pandang (PIEUP)

The economic feasibility of P. T. IEUP examined in this report will be substantially sound even under the conditions presented so far. However, it seems to be better that, because of many uncertain factors still existing, a project team with the same functions as P. T. IEUP will be first established in the South Sulawesi Provincial Government as a buffer to risks before the official establishment of P. T. IEUP, and the team will become independent when the financial independence is confirmed after a certain period of operations. We called this team the Project Industrial Estate Ujung Pandang (PIEUP). PIEUP is to carry out large-scale tasks expected to be seen concentratedly during the first one and a half or two years, which will probably include the initial overall planning, planning and implementation of the initial fund-raising, initial land procurement, initial overall development and preparations of the initial sales promotion. Without the project team formed, these tasks will have to be carried out by P. T. IEUP itself. However, in order to assure the long-term success of this project, it is more desirable that P. T. IEUP will be inaugurated after the internal financial viability is strengthened by PIEUP.

For reference, the organization charts of the Surabaya Industrial Estate and the Ancol Industrial Estate are shown respectively as follows:

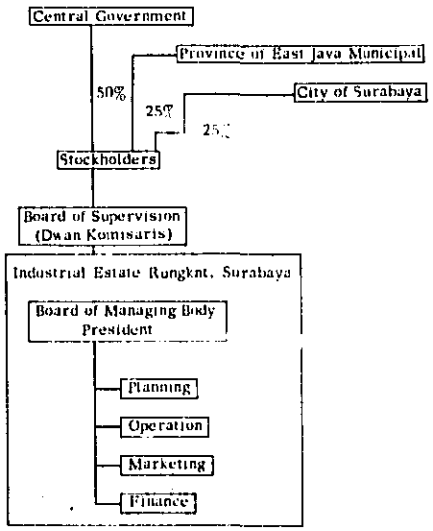


Fig. IX-2 Organizational Chart of the Surabaya Industrial Estate

(Source) Prepared by the Mission

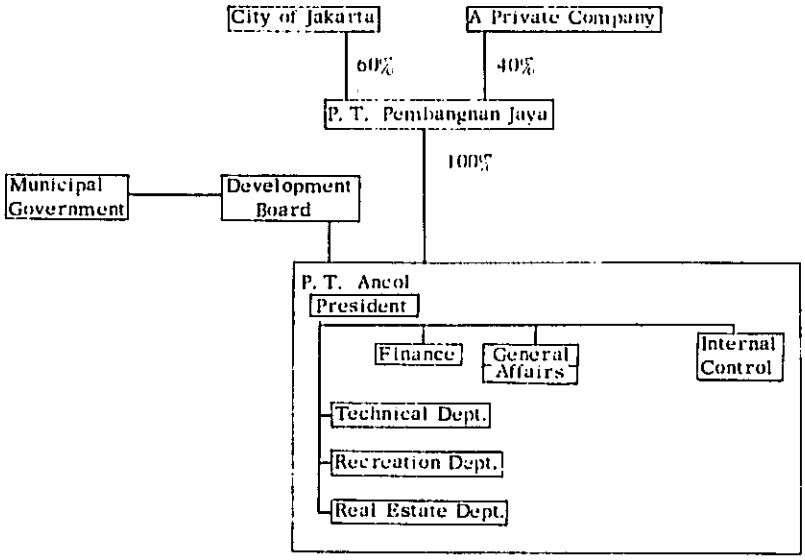


Fig. IX-3 Organizational Chart of the Ancol Industrial Estate

(Source) Prepared by the Mission

2. Management Structure

1) Functions in each administrative and management structure

It is desirable that the administrative and management structure of P. T. IEUP is as flexible and simple as possible. However, as mentioned previously, at least the five functions of marketing, finance, planning and development, operation and general affairs will be required.

The following are somewhat detailed descriptions of each of the five functions:

(1) Marketing

a. Preparation of marketing programs.

b. Public relations work.

c. Preparation and distribution of marketing materials.

d. Identification of potential customers.

e. Sales promotion activities.

f. Negotiations with the enterprises established within the industrial estate.

g. Contracts

h. Price policy and lease policy.

(2) Finance

a. Fund-raising

b. Fund programs and fund administration

c. Fund management

d. Receipt and payment of money

e. Tax affairs

f. Accounting

g. Financial administration and budget

h. Auditing

(3) Planning and development

a. Overall development program.

b. Negotiations for land purchase.

c. Supervision of land development and construction.

d. Administrative negotiations.

(4) Operation

a. Registration of the enterprises established in the industrial estate and the related affairs.

b. Administration and services for the established enterprises.

c. Operations of various regulations.

d. Installation engineering and repairing.

e. Operation of the industrial estate and the related affairs, including electric power, water, sewerage treatment and the maintenance of buildings.

f. Operation of service facilities, including dining halls, first-aid stations and dormitories.

g. Transportation within the industrial estate and flow of goods.

h. Security.

i. Prevention of fire and other casualties.

j. Health and medical care.

(5) General administration

a. Personnel affairs (recruitment and dismissal)

b. Wages

c. Welfare

d. General affairs

In the initial stage, a person may serve as the head of some of these functions. During the peak period, however, each function will require each independent head who will be supported by several assistants. There can be some changes in the responsibilities of respective functions. The president will co-ordinate the functions and be generally responsible for these functional activities.

2) Training program for each manager

At this moment, we cannot go beyond the general descriptions concerning the desirable backgrounds of the staff responsible for each function. Those who are responsible for marketing should have the educational background of management, especially marketing, and be experienced in sales promotion activities. In addition, because of international sales promotion, their understanding of foreign languages, especially English, will be absolutely required. Those who are responsible for financing should have the educational background of financing or accounting and have the practical experiences of financing and accounting. The staff for planning and development should have, if possible, the educational background of civil engineering and the practical experiences of architecture or civil engineering. Those who are responsible for operation should be experienced in mechanical engineering or other related engineering. As for the general administration staff, the educational fields in which they studied have no major importance. However, it is desirable that they are experienced in personnel administration. These managers (or the staff responsible for each function)

should have high ability, strong passion and a wide range of experiences because their status is at the executive level.

The stronger needs in the Ujung Pandang Industrial Estate than other areas are the training programs for these staff. It will be the best way to recruit these staff, including the president, from among the experienced personnel at other industrial estates in Indonesia. If this is impossible, it will be inevitably necessary to organize some form of the intensive training programs. These programs will have to be worked out flexibly, depending on the person and his (or her) responsibilities. However, they should include at least the following training.

(1) Overseas training program

The staff will make on-the-spot investigations at the medium-sized industrial estates abroad, centering on smaller enterprises, in order to understand the actual management at such industrial estates and then work out the management programs in their respective fields. It is reasonable that the countries they will visit are the ASEAN nations, especially Singapore, Malaysia or the Philippines, since the environmental conditions, management styles and scales of industrial estates in these countries are relatively similar to those in Indonesia. If it is not possible, Japan may be the second choice for their overseas training.

During the training, the staff will understand the outline of the respective industrial estates as well as the overall situation of management by exchanging views with the managers and counterparts in the corresponding fields, and will also learn the management policy and the actual situation of management in detail and further various problems as well as superior systems concerning management. For this purpose, the Indonesian staff will visit five or six representative industrial estates for about three days each.

(2) On-the-job training at domestic industrial estates

The staff will be given on-the-job trainings for about two months at a domestic industrial estate, under an agreement, which has already begun oper-

ations in Indonesia, in an effort to obtain the working knowhow in their respective functions. When it is difficult to conclude such an agreement because of the obligations for maintaining secrecy, the reluctance for the domestic industrial estate to accept the outside trainees as the competitor or the lack of the training system, the staff may be trained in ASEAN nations or Japan. In this case, the effectiveness of training will weaken since the training is given in other languages than Indonesian and the management environments, especially the management practice, in these countries are different from those in Indonesia. However, the training of the marketing staff will probably be more effective in foreign countries than at home due to various conditions.

(3) Preparation of management program and management manual in collaboration with functional advisors

It is necessary, even apart from training, to work out the feasible management program and compile the management manual in the initial stage of management of the industrial estate. The task will probably be difficult in the initial stage without the organized cooperation by the functional advisors. In this case, the task should not be entrusted totally to these advisors. Instead, it should be carried out jointly with the staff, and the joint work should also become the opportunity of the training for the staff to obtain the working knowhow.

3) The number of staff

The number of staff required for the management of P. T. IEUP depends largely on several factors. The largest factor among them is the phase of development at the industrial estate. Since the initial phase of development is mainly programming, a relatively small number of staff are required, centering on the responsible managers. The number will reach peak several years later as the development phase advances, and will decrease gradually as the lot for sales is reduced. In the final phase, only the staff for the operation of the facilities in the industrial estate will be enough. Other factors include the percentage of business entrusted to outside organizations and the ability of each staff.

The following table shows the outline of the staff number in (1) the planning and development phase, (2) the peak period and (3) the final phase of settlement of enterprises.

Table IX-1 Number of Employees of P. T. IEUP by Development Stage

	Planning & Development Stage	Number at Peak	After the Peak
President & Directors	4	6	4
Professionals	7	9	6
Clerks	11	18	10
Workers	13	24	15
Site laborers	5	20	10
Total	40	77	45

(Note) Excludes employees at site restaurants, dormitories, workshops, fire stations or any other special sites.

(Source) Prepared by the Mission

The staff number of each division estimated for the peak period is shown in the following table. The grand total has little meaning because each division has a different peak period.

Table IX-2 Number of Employees at Peak Period of Each Division

	Marketing	Finance	Planning & Development	Operation	General Affairs
Director	1	1	1	1	1
Professional	2	2	2	3	1
Clerks	2	4	2	6	5
Workers	2	4	2	11	6
Site laborers	-	-		20	-
Total	7	11	7	41	13

(Note) The President is not counted.

(Source) Prepared by the Mission

3. Sales Promotion and Sales System

1) Importance of marketing activities and the procedure

The most important and crucial work in the management of the Ujung Pandang Industrial Estate is the marketing activities. Such activities as finance, development and others are of course important. However, more attention must be paid to the marketing activities because of the following circumstances.

(1) The profitability of the industrial estate will be realized primarily after the marketing activities are conducted strictly in line with the original plan. In order to strengthen the economic stability, more effective marketing activities are required for this industrial estate than other industrial estates.

(2) As the representative industrial estate in Eastern Indonesia, the Ujung Pandang Industrial Estate will have to maintain a dignity and quality concerning the composition of the industrial estate and the level of the participating enterprises. For this purpose, the base of the participating enterprises will have to be expanded to a large extent.

(3) South Sulawesi Province is expected to be developed substantially in the future in terms of scale of market and industrialization. In this sense, more efforts will be required than other industrial estates in order to recognize the potential of development and enhance the popularity. Therefore, we allocated here one section in this report in examining important points for the marketing activities.

Needless to say, the most important areas for the marketing activities are Ujung Pandang City and local areas in South Sulawesi Province, because one of the major purposes to construct this industrial estate is the promotion of the local industry. This is also because the development of local enterprises based in the Ujung Pandang area and the healthy development of local entrepreneurship are required for this purpose. Therefore, the greatest emphasis should be placed on the marketing activities in Ujung Pandang City, South Sulawesi Privince and the Sulawesi Island. The procedure that we propose hereafter will be substantially valid for the marketing activities in the above-mentioned areas. However, the focal points will be inevitably different.

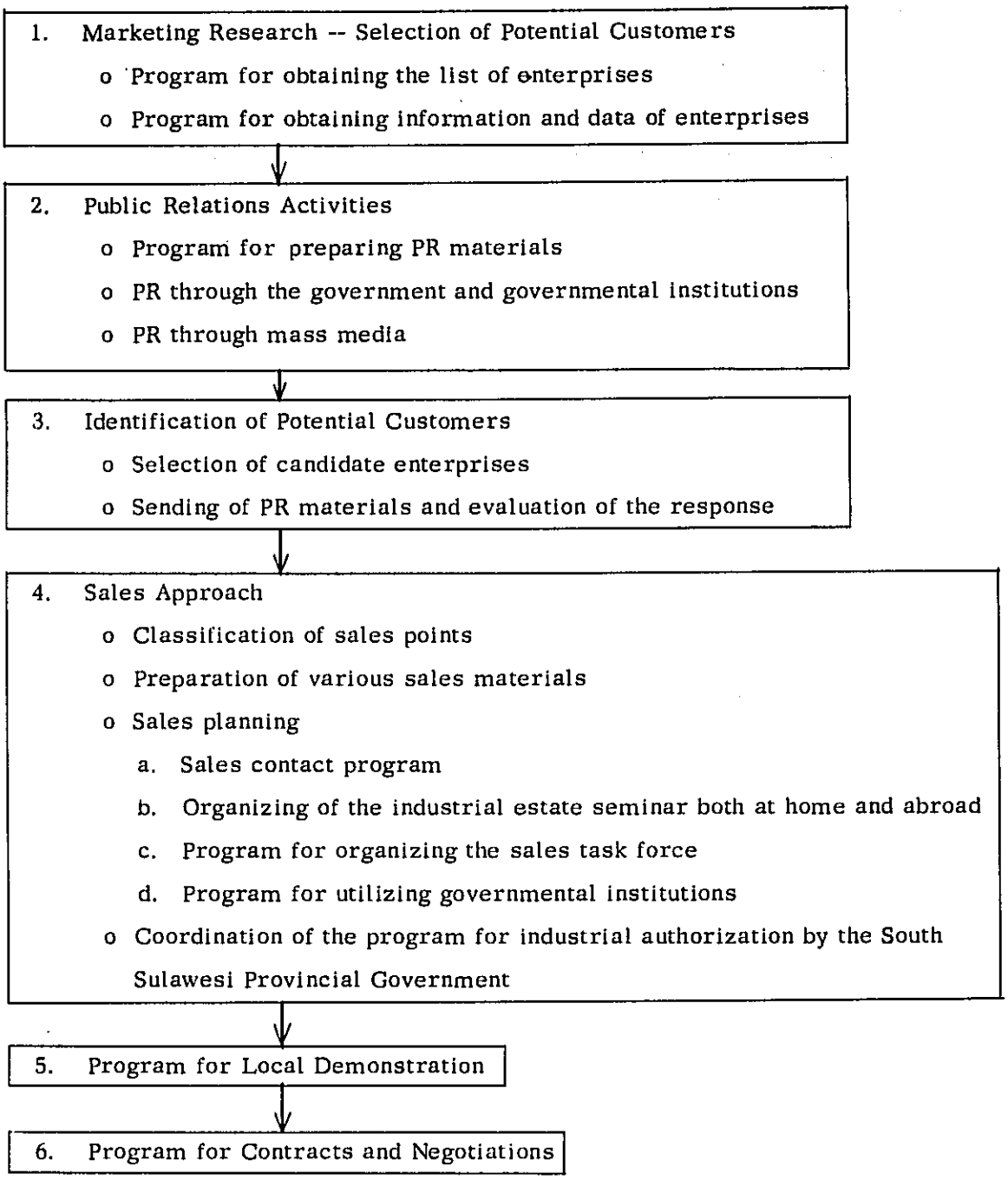
For example, in the following table concerning the step of the marketing activities, the local demonstration program will probably have a heavier weight, and in the sales contact program, the face-to-face sales activities will be generally important.

Concerning the marketing activities covering the above-mentioned local areas, we would like to point out particularly that it is quite important to coordinate efficiently the marketing of this industrial estate and the program for industrial authorization by the South Sulawesi Provincial Government. In other words, a policy will be required, within the framework of this program for industrial authorization, to introduce actively the enterprises and plants suitable for the industrial estate since this industrial estate occupies an extremely important position in the industrial location program of the province.

Now, we would like to comment on the general procedure of the marketing activities both in the international market and in Indonesia, including the Sulawesi region.

The marketing program should be worked out in accordance with each step faithfully on the basis of the marketing principles. Table IX-3 shows each step of the marketing activities.

The reason why we have now mentioned relatively basic matters is that, when we visited several industrial estates, we had an impression that they were not necessarily being operated in accordance with the above-mentioned active marketing program. Therefore, we would like to show here specifically important points.



(Source) Prepared by the Mission.

Fig. IX-4 Step of Marketing Activities

2) Marketing research and identification of potential customers

Marketing must begin with the detailed preparatory activities designed to recognize positively the customers and their needs. Therefore, the first step is to obtain the list and information of related enterprises. It seems that, in the case of the Ujung Pandang Industrial Estate, marketing effort will be equally divided into the domestic market, except the Ujung Pandang area, and the international market, especially Japan and Singapore. The same principle should be introduced in the marketing research. Thus, it is desirable that information of the enterprises which are potential customers in these countries will be gathered from a wider range of sources. The enterprises as potential customers will be selected and will become candidate enterprises for the sales approach.

The procedure is as follows:

i) To obtain the list of enterprises,

ii) To formulate the criteria for selection,

iii) To select the candidate enterprises.

When this procedure is applied to the Japanese enterprises, it is desirable that the selection will be made for two categories: (1) large-sized enterprises and (2) small and medium-sized enterprises.

In selecting the large-sized enterprises, the appropriate list is Japan Company Handbook published semi-annually by The Oriental Economist (address: 1-4, Hongokucho, Nihonbashi, Chuo-ku, Tokyo 103). This handbook written in English covers 957 companies, centering on those listed on Japan's three major Stock Exchanges. One page is used for one company and contains its major data, including address, industrial category and recent business results. Therefore, it may be reasonably sufficient to formulate the selection criteria only by consulting this handbook.

It is a way that a general table for the selection criteria applicable to any case is prepared and used. However, it is more realistic that the table for selection criteria is prepared on the basis of the obtained company list and the information easily available for these companies. In the latter case, the companies with the following conditions can be selected as the candidate companies:

i) The companies belonging to industrial categories desirable for the Ujung Pandang Industrial Estate

ii) The companies with favorable business results and healthy financial structure

iii) The companies which have so far made exports or investments in Indonesia (As for this matter, other materials than the Japan Company Handbook will be utilized: for example, Trade and Industry Directory of Japan for Indonesia, published by Japan-Indonesia Association, Inc.)

iv) The companies belonging to former Zaibatsu, or the giant financial group (Mitsui, Mitsubishi, Sumitomo, Yasuda)

Meanwhile, it is also reasonable that a relatively large number of companies will be selected by easing the selection criteria since Japan's large-sized companies are not so many.

In selecting small and medium-sized enterprises, the appropriate list is Teikoku Ginko Kaisha Yoroku (The Directory of Japanese Banks and Companies) published by Teikoku Koshinsho, Ltd., a private business research institution. This directory covers about 137,000 Japanese companies both large and small, containing about 11 - 15 items of data for each company, such as address, industrial category and sales amount and profits. Therefore, the candidate companies will be selected on the basis of the selection criteria which include the above-mentioned conditions of items 1 to 3 and the business scale. As this directory contains a large number of companies, the candidate companies should be cut to a reasonable number. It is a way to entrust the selection work to an appropriate institution in Japan because this directory is written in Japanese.

As for the list of Indonesian companies, there is, for example, Daftar Nama Dan Alawat Perusahaan - perusahaan Industri Besar & Sedang Tahnn 1971 Di Indonesia which covers the companies across the nation. In this case, the different selection criteria are required. For example, such a condition should be added that the candidate companies have executives who are the natives of the Ujung Pandang area. More companies may be selected as compared with foreign companies since Indonesian companies are located nearer to the Ujung Pandang area than foreign corporations.

3) Public relations activities and sales approach

Along with marketing research, the PR activities for this industrial estate must be carried out. With the previously mentioned local characteristics of Ujung Pandang taken into account, the most essential point in the PR activities is to involve the Central Government, local governments and foreign embassies in them. The location of Ujung Pandang is obviously disadvantageous to the PR activities. Therefore, it is necessary in the considerably early stage to set up a mechanism capable of conducting PR activities through these organizations. For example, the embassies of major countries have usually officials in charge of the invitation of enterprises and the promotion of tourism. The PR pamphlets for the Ujung Pandang Industrial Estate should be constantly distributed to these officials. In addition, the management company should call on these officials to touch on, without fail, the project of this industrial estate at various seminars aimed at promoting industrial investments by foreign capitals. It is generally important in the PR activities to utilize effectively the mass media and other specific media. It is also possible to establish a mechanism which enables smooth flow of information on this industrial estate to mass media through the Central Government.

The next step is the sales approach to the potential customers selected under the above-mentioned procedure and to the enterprises which have shown some responses to the PR activities. The common process is to send directly to these enterprises the beautifully printed pamphlet containing the sales points together with any form of return papers (for example, the application form, the request for detailed information, etc.). The enterprises which have responded to direct mail will be the primary target of the sales approach in the next step. The secondary target will be the enterprises which have shown direct responses to the PR activities. The direct responses include 1) inquiry about the detailed information, 2) the expression of intention to construct the manufacturing plant, and 3) the request for the on-the-spot investigation at the industrial estate.

The amount and degree of these two kinds of responses from enterprises will be one of the decisive factors in the future marketing activities for this industrial estate. Anyway, it is extremely important to expand systematically through

the abovementioned procedure the base of the enterprises to which the sales approach should be directed.

There are two major factors in the sales approach. First, it will be a powerful means to hold the "Ujung Pandang Industrial Seminar" at various areas, since the Ujung Pandang area is relatively remote from the areas where many potential customers are located and therefore there is only a small chance to make the local demonstration. This seminar is a one-day seminar held for the potential customers. The program includes mainly 1) the impressive presentation of the local situation with the aid of audio-visual materials (slides, movies, etc.), 2) the lecture on the industrial estate using the sales promotion materials, and 3) the talks and discussions between participants and lecturers and organizers. This will be a particularly effective sales means when held in foreign countries. In this case, the cooperation of Japanese specialists will be necessary for the holding of the seminar. This seminar is highly effective because the organizer (the Ujung Pandang Industrial Estate) can make contacts with many potential customers at a time. The holding of the seminar itself is generally effective as the sales means.

Secondly, the Central Government, local governments or foreign embassies should also be deeply involved in the sales approach. For example, if the officials of the Central Government agree to become the lecturer at the above-mentioned "Ujung Pandang Industrial Seminar", the seminar will be more effective and will be held more frequently. Meanwhile, it is necessary to have government officials involved in the program for organizing the sales task force and seek cooperation from them. These points should be taken into consideration in the planning stage.

4) Sales points

The sales manual which contains as many advantageous sales points as possible and classifies them will be required for PR materials, face-to-face sales and other measures in each stage of the marketing activities. We would like to point out the sales points of this industrial estate as follows:

i) First, the strong potential and future perspective of economic development in this area should be stressed. As for this point, see the "Significance

of Developing Ujung Pandang Industrial Estate" in the report on pre-feasibility study.

ii) It should be stressed that Ujung Pandang is the most important base for the development of Eastern Indonesia and at the same time it is a strategic base for the huge unexploited market.

iii) The economic merits of this industrial estate are:

a) Relatively good quality and abundant labor force is available at a lower cost.

b) Prices of land lots are relatively low.

c) Superior port facilities.

These points should be explained concretely and clearly.

iv) It is necessary to point out the extremely high potential of mineral, agricultural and water resources on the Sulawesi Island to foreign enterprises, especially the Japanese enterprises.

v) The advantages of social conditions and living conditions in Ujung Pandang City should also be stressed : for example, low crime rate, sincere and honest people, beautiful scenery, etc.

It is desirable that the sales points will cover as many items as possible and will be classified in accordance with respective purposes, such as PR, sales materials and marketing education for face-to-face sales. We would like to add here that the sales points should be neither exaggerated nor deceitful, although they should be stressed effectively. Such exaggeration and deceit will later have a seriously adverse effect on the sales activities.

X. FINANCIAL AND ECONOMIC ANALYSES

X. FINANCIAL AND ECONOMIC ANALYSES

In the ealier chapters we have estimated the demand for land for the Ujung Pandang Industrial Estate, selected a suitable site, formulated a design for a 221-hectare industrial estate and calculated its development costs. The objectives of this chapter are: 1) to determine the appropriate selling price for the land in the Estate; 2) to discuss, through a financial analysis of the Industrial Estate Company, whether this project can be developed on a sound financial basis; and 3) to study, through a social cost-benefit analysis, whether this project has relevance and merits on the regional economy.

This development project is planned with the view that a huge public works investment of approximately Rps. 8 billion (U. S. $19,280,000) will be required over 14 years. The economic assessment of this chapter aims at investigating whether the Estate will yield a return in excess of the investment. The discussion of whether the Rps. 8 billion can be invested for greater benefits elsewhere, or an analysis of project priority, is beyond the scope of this chapter.

1. Development Costs and Factory Plot Price

In determining the land price for the Industrial Estate, the following items were taken into consideration.

i) Development costs

ii) The prevailing market price of land in the Ujung Pandang region and enterpreneurs' financial ability

iii) Industrial land prices in other regions

1) Development costs

Table X-1 is a summary of the development costs at each stage of the project as described in Chapter VIII.

Table X-1 Development Costs

(mil. Rps., 1976 prices)

		Total	Ist Stage	IInd Stage	IIIrd Stage
Development Area (ha)	Gross	221	82	82	57
	Net	146	46	60	40
Land Acquisition		965.9	965.9	-	-
Development		5,479.3	2,759.1	1,689.9	1,030.3
Buildings		217.3	173.5	-	43.8
Total		6,662.5	3,898.5	1,689.9	1,074.1

The total investment of Rps. 6,625.5 million for saleable land area of 146 hectares gives the cost per square meter of Rps. 4,538. This amount, however, does not include maintenance or management costs of the P. T. Industrial Estate. Nor does it include interest that must be paid on the amount of money invested in the project between the start of the construction and sales of developed sites.

Salary and wages account for more than half of management costs of the P. T. Industrial Estate. The figures in Table X-2 were calculated on the basis of the organization and the number of staffs described in Chapter IX.

Table X-2 Operating Cost of the Estate

(mil. Rps., 1976 prices)

	Total	Ist Stage	IInd Stage	IIIrd Stage
Management Cost	1,106.7	576.2	352.6	177.9
Salaries	609.0	294.4	209.0	105.6
Other Management	497.7	281.8	143.6	72.3
Maintenance Cost	295.7	58.9	117.3	119.5
Total	1,402.4	635.1	469.9	297.4

Other expenses are estimated as follows:

1977 : Rps. 10.0 million (for land acquisition and preparation of the founding of the P. T. Industrial Estate)

1978 - 81 : Rps. 20.0 million plus 60% of personnel cost

1982 - 85 : Rps. 20.0 million plus 40% of personnel cost

1986 - 90 : Rps. 10.0 million plus 40% of personnel cost

Since maintenance costs will increase in proportion to the amount of physical assets requiring maintenance and repairs, 0.8% of the cumulative investment through the previous year excluding expenses for land acquisition is budgeted for this item for each year. When Rps. 1,402.4 million required for maintenance and management through 1990 is added to the development cost, the cost per square meter of saleable land will increase by 22% to Rps. 5,524. As described in the preceding chapter, if for the initial few years the construction of the Estate can be managed by a committee consisting of members of the concerned ministries, instead of forming a separate industrial estate company, management costs can be reduced. Even after the founding of an industrial estate corporation, its personnel cost can be reduced sharply if the size of its full-time managerial staff is kept at the minimum and if the Estate is to be managed by a joint management committee, consisting of its staff and officials of the investing government agencies and local government bodies.

In an economic assessment of a project in Indonesia, interest cost is a major factor influencing the project feasibility. Interest rates on ordinary commercial bank loans are extremely high at 18 - 24%. For the Ujung Pandang project, we have assumed the interest rate to be 15%, the usual rate for public works projects. This is because even if low-interest (3-8%) funds are provided by international financial institutions or through government-to-government bilateral arrangements for this project, the usual method of project financing in Indonesia is such that the funds are first credited to the central government and then loaned by the Bank Indonesia at an interest rate of approximately 15% per annum.

When the interest cost calculated at the rate of 15% a year is added to the development cost, the cost per square meter of saleable land is calculated using the following equation:

$$\sum_{i=1}^{n} P A_i (1+r)^i = \sum_{i=1}^{n} C_i (1+r)^i \qquad P = \sum_{i=1}^{n} C_i (1+r) / \sum_{i=1}^{n} A_i (1+r)^i$$

or

$$\sum_{i=1}^{n} P A_i (1+r)^i = \sum_{i=1}^{n} C_i (1+r)^i \qquad P = \sum_{i=1}^{n} C_i (1+r) / \sum_{i=1}^{n} A_i (1+r)^i$$

where, C_i denotes the development cost inclusive of maintenance and management costs in the year i, A_i the amount of land to be sold in the year i, r interest rate, n the period in which the investment is to be recovered and P construction cost, including interest on development costs, per square meter.

When the costs indicated in Table X-1 and X-2 are broken down by year through 1990 and 15% interest is added to eacy year's investment, in 1990 the amount with interest added will reach Rps. 25,440 million. Since the comparison is to be made in economic values as of 1990, it is assumed that the revenue from sales of industrial estate land will also bear an interest at the rate of 15% per annum. For the sake of calculation, an increase of 15% per annum through 1990 is added to the area planned to be sold each year. With this hypothetical increase in land area, the Estate is projected to comprise 321 hectares in 1990. The construction cost per square meter including the interest, thus, is Rps. 7,934, or Rps. 25,440 million divided by 321 hectares. This is the minimum land price which will permit the P. T. Industrial Estate to recover all the investment and interest cost by 1990, but not to earn a profit.

A high interest rate of 15% means that the minimum land price required to recover total investment plus interest cost varies greatly depending on the length of time between the initial investment and the initial sale of land and the amount of investment made during that interval. The project cost calculation in Chapter VIII, for example, assumes a first-year outlay of Rps. 966 million for land acquisition. It this outlay is to be financed by a loan bearing interest at 15% per annum, it will accrue interest of Rps. 4,977 million through 1990. If the land acquisition is to be financed with such non-interest bearing funds as a government appropriation for development investment or capital of the Industrial Estate Corporation, the minimum land price will be reduced by Rps. 4,977 million for the 321 hectares, or Rps. 1,552 per square meter, to Rps. 6,382 per square meter.

Similarly, if topographical and geological examinations of the site and engineering design, planned for the second year, are conducted by the government, or under foreign technical cooperation, the Industrial Estate Corporation's cost will be reduced by Rps. 319 million. This should further reduce the minimum land

price to Rps. 5,850 per square meter. Table X-3 lists the cost per square meter in each case.

Table X-3 Factory Site (146 ha.) Construction Cost

(In 1976 price)

1.	Excluding Interest Cost		
	1) Excluding Land Acquisition Cost	Rps. 4,862/m^2	US$ 11.7/m^2
	2) Including Land Acquisition Cost	Rps. 5,524/m^2	13.3/m^2
2.	With 15 % Interest Added		
	1) For Full Recovery of Principal and Interest	Rps. 7,934/m^2	US$ 19.1/m^2
	2) Excluding Interest on Land Acquisition Cost	Rps. 6,382/m^2	US$ 15.4/m^2
	3) Excluding Survey and Engineering Cost and Interest on Land Acquisition Cost	Rps. 5,850/m^2	US$ 14.1/m^2

(Source) Prepared by the Mission

2) Market prices of industrial land in Ujung Pandang

In almost all enterprises in the city of Ujung Pandang, enterpreneurs have built factories on their own land or a landowner, by offering land as investment in kind, participates in management. Given this situation, it is extremely difficult to know accurately market prices for factory sites. However, based on information obtained through visits to enterprises, the survey team estimates current market prices of land in the city of Ujung Pandang as follows:

i) The land price in the built-up section of the Old Makassar district is Rps. 10,000 to 40,000 per square meter. Land price is generally higher in the area adjacent to the port and harbor and in the vicinity of Benteng and gets progressively lower as it moves to the south. Plots facing main streets command relatively high prices. However, a large plot of more than 1 hectare is hardly available in the Old Makassar district.

ii) Progress of land development along the Jalan Gowa Jaya national road since the late 1960's has brought many enterprises and public facilities to this section, resulting in a sharp increase in its land prices to Rps. 10,000

to 15,000 per square meter. Enterprises which relocated to this area in 1970 put the valuation of approximately Rps. 3,500 per square meter for land assigned to them by landowners in exchange for a share in the enterprise.

iii) In the case of an iron bar factory built near the mouth of the Tallo River in 1975, the valuation of land used as investment in kind was approximately Rps. 20,000 per square meter.

iv) Since 1974, the city government of Ujung Pandang has been developing a large-scale housing complex in the Panakukan district, adjacent to the city area. The city is now selling the first group of its subdivisions, totalling 40 hectares. Although its selling price was initially set at Rps. 4,000 per square meter, the price rose sharply immediately after the start of the sale and by the end of 1976 reached Rps. 6,000 to 7,000.

v) The price of land north of the Tallo River is at the level of several hundred rupiahs per square meter, because development along Jalan Gowa Jaya, having started in the vicinity of Hasanuddin University and stretched through the suburbs, has not quite reached the Tallo Bridge, where a thermal power station is located. There are, however, signs of a rise in the price of land bordering the national road north of the Tallo River. Relocation of Hasanuddin University to a new campus several kilometers north of the bridge was decided only recently, and land was purchased for this purpose. The site chosen in this industrial estate planning survey is located approximately 5 kilometers north of the new site of Hasanuddin University. This development project will also increase the price of land in the area.

These cases cited above are hardly appropriate yardsticks which can be used in determining the price of factory sites within the Industrial Estate. At present, neither the city of Ujung Pandang nor its outlying areas has a large tract of land with various facilities required of an industrial estate, i.e., transportation, water supply, electricity and sewerage. It is thought that the price of land in an industrial estate, equipped with functions which are not found elsewhere, can be determined apart from the existing price structure of the neighboring area. Nevertheless, an excessively high price will make the sale extremely difficult due to limitations of financial capacity of potential occupants. In view of the

financial condition of the firms already located in Ujung Pandang, the land price for the industrial estate should be set at approximately Rps. 7,000 per square meter at the maximum.

3) Industrial land price in other regions

Industrial estates under construction or being planned in Indonesia include five in Jakarta, of which the Pulo Gadung Industrial Estate has made the most progress, Surabaya's Rungkut Industrial Estate, which is under construction, and industrial estate development plans being formulated for Medan and Cilacap. Their development costs and selling price are listed in Table X-4.

Table X-4 Selling Price of Industrial Estate Land in Indonesia

	PULO GADUNG (JAKARTA)	RUNGKUT (SURABAYA)	MEDAN
Development Area (ha)	262.4	245	134
Saleable Area (ha)	200.0	176	113
Average Development Cost of Saleable Area (Rp/m^2)	3,051	2,976	4,415
Selling Price (Rp/m^2)	3,650 (1972)	4,900 (1975)	6,998 (1975)
	4,380 (1973)		
	5,260 (1974)		
	6,310 (1975)		

(Source): Compiled from the development plan of each industrial estate.

The selling prices for the Pulo Gadung Industrial Estate shown in the above table are the prices indicated in its development plan formulated in 1972. Although they had been scheduled to rise by 20% each year, actual price increases were much sharper. The selling price in 1976 stood at Rps. 10,000 to 12,000 per square meter. Prices vary depending on lot size, its location and the business of the occupant. The selling price is determined individually through negotiation. The Pulo Gadung Industrial Estate commands the highest price among Indonesia's industrial complexes, but this is thought to be reasonable in view of the favorable conditions, such as concentration of existing industries and a large market, exist-

ing in Jakarta.

Part of Surabaya's Rungkut Industrial Estate opened for occupancy in September 1975. As of September 1976, 18 enterprises signed up, of which ten are now building plants and three have already started production. Although the selling price has been maintained at Rps. 4,900 per square meter, sales have been behind schedule. In addition, there has been an unplanned rise in construction costs, resulting in a deterioration of the estate corporation's financial condition. A price hike in the near future is considered inevitable. The terms of payment call for a minimum payment of Rps. 1,000 per square meter when the contract is signed. The rest is to be paid over three years with interest of 18% per annum or over five years with interest of 20% per annum.

Although construction of Medan Industrial Estate had been scheduled to begin in 1976 (with sales to begin in the second half of 1977), it has been falling 6 months to 1 year behind the schedule. Consequently, even if the cost of land acquisition and construction remains within the budget, the selling price of Rps. 6,998 per square meter in 1975 prices is expected to rise to Rps. 9,000 to 10,000 by the time when transactions actually take place.

In promoting sales of land in the Ujung Pandang Industrial Estate, the strongest competition obviously will be provided by the Surabaya Industrial Estate due to its proximity and access to the same market. As indicated in Table X-3, however, no matter which alternative is selected, the minimum selling price, based on construction costs and accruing interest, for the Ujung Pandang Industrial Estate exceeds that of the Surabaya Industrial Estate.

In price competition, the Ujung Pandang Industrial Estate is at a disadvantage. Yet price is only one of many factors businessmen would consider in chosing between Ujung Pandang and Surabaya, and the price difference of Rps. 1,000 to 2,000 per square meter will have only minor influence. Assuming that the cost of land acquisition accounts for 20% of total investment to be made by an occupant, the difference of 20 to 30% in the land price will mean a difference of only 4 to 6% in the total amount of investment. Industrialists would pay greater attention to infrastructures, such as access to the market, availability of raw materials, quality and size of available labor force, sewerage and electric power supply.

In both Surabaya and Ujung Pandang, unemployment is a major problem that needs to be solved. Both areas have many idle unskilled workers, but the average wage is 10 - 20 % lower in Ujung Pandang that it is in Surabaya. Assuming that the daily wage of an unskilled worker employed by larger firms in Ujung Pandang is Rps. 400 to 500, or Rps. 70 below that in Surabaya, and that the average enterprise in the Estate employs 162 unskilled workers, an enterprise can save Rps. 4, 140, 000 a year in labor cost by choosing Ujung Pandang over Surabaya. (As stated in Chapter III, the average enterprise in the Estate is expected to occupy one hectare and to employ approximately 190 persons, of which 85% will be unskilled. This estimate is made on the basis of 52 square meters per man.) Savings over five years, when discounted for annual interest of 15%, have the present value of Rps. 16. 0 million. Since the amount corresponds to a saving of Rps. 1, 600 per square meter, other factors being equal, the selling price of Rps. 6, 500 per square meter for Ujung Pandang would equal the selling price of Rps. 4, 900 per square meter for Surabaya.

Our recommendation concerning determination of the selling price is as follows: Price comparisons with other industrial estates are not always important in promoting smooth sales. Rather, the Industrial Estate should take care to provide desirable environment by building infrastructures, assuring safety of persons and property, and acting on behalf of the occupant in acquiring government licences and permits required for operation. The Corporation should also stage a vigorous sales campaign directed to domestic as well as foreign businessmen.

4) Selection of selling price (in 1976 prices)

The selling price of the industrial estate, as in the case of other goods, should be determined primarily by supply-demand balance. However, it should be set in such a way that it covers at least development costs, interest and operating costs in order to ensure sound financial management of the project. Even then, the minimum selling price can vary considerably depending on what policy will be followed. Table X-3 shows that the selling price can range from approximately Rps. 6, 000 to 8, 000 per square meter depending on the condition under which the initial funds are provided. If we add a 10% margin to offset risks, the

minimum selling price would range from Rps. 6,600 to 8,800 per square meter.

The price of Rps. 6,500 per square meter will be used in this discussion of financial feasibility of the Industrial Estate Corporation's profitability and balance sheet. This price is slightly above the Rps. 6,382 minimum price applicable when interest-free funds are used for land acquisition. It was selected for the following reasons:

i) Development of an industrial estate should be part of regional economic development policy. Being a quasi-public agency, the industrial estate corporation need not make profits on its investment.

ii) The price was set slightly above the estimated cost for this case to allow the Corporation room for some transactions at special promotional prices of Rps. 4,500 to 5,500 per square meter. These special rates will be applied to limited areas and to industries whose presence benefits the regional economy and also to small enterprises which are to be fostered.

iii) Even at this price, the Corporation may earn profits when at least one of the following conditions is met.

(1) Initial development investment prior to the establishment of the Industiral Estate Corporation is paid out of the government's development budget, relieving the Corporation of this expenditure.

(2) Land sales start ahead of the original schedule.

(3) There is a high rate of inflation. Since the selling price is to be adjusted for an inflation-induced rise in development cost, it should reduce the relative weight of borrowings made prior to the adjustment and their interest in total cost.

If the opposite conditions arise, finance of the Corporation will deteriorate, requiring price revisions. Once the project is started, the Corporation must constantly monitor its cost, progress of sales, and the rate of price increases, compare them with the original plan and determine the appropriate selling price. The above price is predicated on the assumption that the payment will be made in full on transfer of the little to the property to the tenant. For the Corporation, the earlier the payment, the smaller its funds demand. However, it will have to

make provisions for installment plans and leasing in order to facilitate payments by the occupant.

Assuming that the payment is to be made in annual installments, all in an equal amount and the first to be paid on signing of the contract, and that interest of 15% per annum is to be added to the unpaid portion, each installment amounts to Rps. 2,475 per square meter in the case of three installments and Rps. 1,686 per square meter for five installments. The relationship between the number of installments and the amount of each installment is demonstrated in Fig. X-1. As it illustrates, the amount of one installment can fall as low as Rps. 848 per square meter when the number of installments is increased. The financial analysis made in the next section will be based on the assumption that payments will be made in five installments. For leasing, the annual rental is set at Rps. 860 per square meter, the amount equal to the annual installment under a thirty-installment plan.

Because installment plans and leasing increase cash requirements of the Industrial Estate Corporation, it may apply higher interest than what it pays on its borrowing in setting prices for installment and leasing plans. In fact, the Surabaya Industrial Estate charges 18 to 20% interest to its occupants. Here, however, the interest rate of 15% per annum is used in order to minimize financial burden of the occupant and also becuase the land in the Industrial Estate is a reliable security.

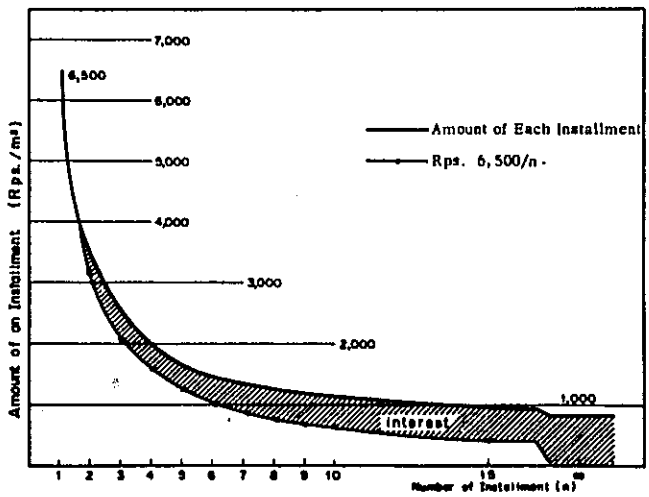


Fig. X-1 Relationship between Number of Installments and Amount of Each Installment

2. Financial Analysis

1) Development program

As stated in Chapter V, the period through 1990 will be divided into three development periods. The area to be developed in each period is 82 hectares for the first, 82 hectares for the second and 57 hectares for the third. Saleable land will occupy 46 hectares, 60 hectares, and 40 hectares, respectively. The key to sound financial management of the Industrial Estate Corporation is to minimize the interval between the start of construction and sales of the property. This will not be achieved without intensive sales campaigns to bring enterprises to the Estate. It is recommended that such campaigns be started well ahead of development and construction work.

Table X-5 shows an annual forecast of land sales beginning in 1980, the year land sales are scheduled to start under the present plan. In order to prevent excessive investment in development work, the area to be developed is scheduled in such a way that the amount of saleable land always falls below demand for factory land, as illustrated in Fig. X-2. Except for the Rps. 976 million outlay, including land acquisition cost, planned for 1977, the largest annual outlay of Rps. 751 million is scheduled to be made in 1980. Planned annual investment by item is listed in Table X-5.

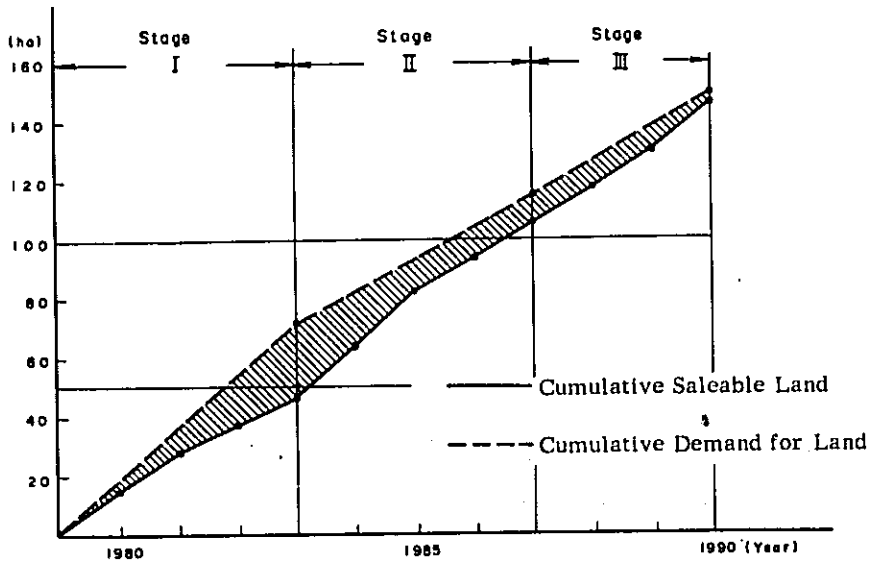


Fig. X-2 Factory Land Sales Plan

Table X-5 Development Schedule Development and Costs

(mil. Rps. in 1976 prices)

	Total	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
SCHEDULE															
Land Acquisition (ha.)		221 ha													
Development															
Stage I			Gross 82 ha		Saleable 46 ha										
Stage II									Gross 82 ha		Saleable 60 ha				
Stage III													Gross 57 ha		Saleable 40 ha
Sales of Land (ha.)					15	13	9	9	18	18	12	12	12	12	16
PROJECT COST															
Land Acquisition	965.9	965.9													
Development															
Stage I	2,932.6		318.8	628.9	637.1	426.4	472.7	448.7							
Stage II	1,689.9								534.6	479.4	360.0	315.9			
Stage III	1,074.1												360.9	336.0	377.2
Total Acquisition and Development	6,662.5	965.9	318.8	628.9	637.1	426.4	472.7	448.7	534.6	479.4	360.0	315.9	360.9	336.0	377.2
Maintenance	295.7			2.6	7.6	12.7	16.1	19.9	23.5	27.7	31.6	34.5	39.0	39.9	42.6
Management	1,106.7	10.0	50.7	81.4	106.6	113.3	107.1	107.1	107.1	107.1	71.3	67.1	67.1	55.4	55.4
Operating Cost	1,402.4	10.0	50.7	84.0	114.2	126.0	123.2	127.0	130.6	134.8	102.9	101.6	104.1	75.3	98.0
Total Cash Outlay	8,064.9	975.9	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Cumulative Cash Outlay	-	975.9	1,345.4	2,058.3	2,809.6	3,362.0	3,957.9	4,533.6	5,198.9	5,813.0	6,275.9	6,693.4	7,158.4	7,589.7	8,064.9

2) Cash requirements by sales plan

In the previous section, the selling prices and rental charge (Rps. 6,500 per square meter for one-time cash payment, Rps. 1,686 per square meter for payment in five installments and an annual rental of Rps. 860 per square meter for leasing) were calculated from the cost and interest. Any of these alternative allows the Corporation to one day recover its capital and repay all its borrowings, as long as sales of property progress on schedule. However, annual cash requirements of the Corporation and the period required to recover its investment vary depending on which of these alternatives, or their combinations, are used. If the Corporation has large funds procurement capacity, it can determine terms of payment according to the wish of the occupant. Otherwise, it must raise the proportion of land to be sold for full cash payment. In this section, we will calculate the annual cash flow of the Corporation by terms of sales and, through a comparison of the funds demand in the peak year, will recommend the most feasible mix of terms of sales.

Table X-6 shows Corporation's cash flow when land is sold at cost (indicated in Table X-3) and for one-time cash payment. In Case I, revenue will match outlay in 1990. In Case II, the Corporation in 1990 will have a surplus equivalent to the cost of land acquisition (which is assumed to have been made with interest-free funds). In Case I, annual cash requirement will peak out in 1983 at Rps. 2,671 million. In Case II, it will peak out also in 1983 at Rps. 1,359 million, or Rps. 2,325 million when the cost of land acquisition is included. The other cases are also based on the assumption that the land acquisition will be made with interest-free funds.

Table X-7 shows annual cahs requirements when the entire saleable land is sold for one-time cash payments for Rps. 6,500 per square meter and on schedule.

Table X-8 shows the annual cash flow when the entire saleable land is sold under a five-installment plan.

Table X-9 shows the annual cash flow when the entire saleable land is leased.

Table X-10 shows the annual cash flow when one-third of the saleable land is sold for immediate cash payments, one-third on terms and one-third is leased.

Table X-11 was compiled from analyses of Table X-7 through 10 (Case III-VI). It shows the annual cash flow when terms of sales are combined in such a way that no excessive cash requirement arises in any year and that investment is recovered within a reasonable period. Under this plan 20 hectares of the 146-hectares saleable land are to be leased, 88 hectares (70% of the remaining 126 hectares) are to be sold for immediate full cash payment, and 38 hectares are to be sold on terms. In 1990 there will still be a cash requirement slightly larger than the cost of land acquisition, but this plan will allow the Corporation to recover all of its investment plus interest by 1995. The annual cost in 1991 and beyond includes Rps. 88 million for operating and maintenance costs.

Table X-6 Maximum Cash Requirements where Land is Sold for Cash for the Minimum (break even) Price

(mil. Rps.; 1976 Prices)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sales Budget (ha.)				15	13	9	9	18	18	12	12	12	12	16
. Case I														
Capital Cost and Operating Cost	975.7	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	-	975.7	1,491.6	2,428.2	2,353.5	2,227.4	2,443.3	2,671.2	2,308.8	1,841.4	1,627.9	1,337.4	1,050.8	687.5
Interest on Opening Balance at 15 % p. a.	-	146.4	223.7	364.2	353.0	334.1	366.5	400.7	346.3	276.2	244.2	200.6	157.6	103.1
Subtotal	975.7	1,491.6	2,428.2	3,543.7	3,258.9	3,157.5	3,385.4	3,737.1	3,269.4	2,580.1	2,289.6	2,003.0	1,639.7	1,265.9
Less Sales Revenue @ Rps. 7,934/m^2	-	-	-	1,190.2	1,031.5	714.2	714.2	1,428.3	1,428.3	952.2	952.2	952.2	952.2	1,269.1
Closing Balance	975.7	1,491.6	2,425.2	2,353.5	2,227.4	2,443.3	2,671.2	2,308.8	1,841.1	1,627.9	1,337.4	1,050.8	687.5	-
Case II														
Capital Cost and Operating Cost	(975.7)*	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	-	10.0	381.5	1,151.1	1,117.7	1,008.1	1,180.8	1,359.2	1,079.5	706.8	509.2	238.1	-27.0	-365.5
Interest on Opening Balance at 15 % p. a.	-	1.5	57.1	172.7	167.7	151.2	177.1	203.9	161.9	106.0	76.5	35.7	-4.0	-54.8
Subtotal	(975.7)*	381.0	1,151.0	2,015.0	1,837.5	1,755.2	1,933.6	2,228.3	1,855.6	1,275.7	1,003.9	738.8	400.3	54.8
Less Sales Revenue @ Rps. 5,382/m^2	-	-	-	957.3	829.7	574.4	574.4	1,148.8	1,148.8	765.8	765.8	755.8	765.8	1,021.1
Closing Balance	10.0	381.0	1,151.0	1,117.7	1,008.1	1,180.8	1,359.2	1,079.5	706.8	509.9	238.1	-27.0	-365.5	-966.3

(Note) * Case II assumes the cost of land acquisition, which is to take place in the first year, is to be paid out of equity capital and does not include in the computation interest (or dividend) payments on the equity capital. In this case, an amount equivalent to land acquisition cost will appear as a surplus to 1990.

Table X-7 Maximum Cash Requirements where All Land is Sold for Cast at Rp.6,500/m^2

(mil. Rps.; 1976 Prices)

Case III	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sales Budget (ha.)				15	13	9	9	18	18	12	12	12	12	16
Capital Cost and Operating Cost	10.0	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	0.0	10.0	381.0	1,151.0	1,100.0	972.4	1,129.2	1,189.2	977.8	568.7	336.9	24.9	-286.3	-678.0
Interest on Opening Balance at 15 % p.a.	0.0	1.5	57.1	172.7	165.0	145.9	169.4	193.4	146.7	85.3	50.5	3.7	- 42.9	-101.7
Subtotal	10.0	381.0	1,151.0	2,075.0	1,187.4	1,714.2	1,874.2	2,147.8	1,738.7	1,116.9	804.9	493.7	102.0	-304.5
Less Sales Revenue @ Rps. 6,500/m^2	-	-	-	975.0	845.0	585.0	585.0	1,170.0	1,170.0	780.0	780.0	780.0	780.0	1,040.0
Closing Balance	10.0	381.0	1,151.0	1,100.0	972.4	1,129.2	1,289.2	977.8	568.7	336.9	24.9	-286.3	-678.0	-1,344.5
Plus Land Cost	975.7	1,346.7	2,116.7	2,065.7	1,938.1	2,094.9	2,254.9	1,943.5	1,534.4	1,302.6	990.6	679.4	287.7	-378.8

Table X-8 Maximum Cash Requirements where All Land is Sold on Terms (5 equal installments)

(mil. Rps.; 1976 Prices)

Case IV	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sales Budget (ha.)				15	13	9	9	18	18	12	12	12	12	16
Sales Subject to Installment (ha.)				15	28	37	46	64	67	66	69	72	66	64
Capital Cost and Operating Cost	10.0	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	0.0	10.0	381.0	1,151.0	1,822.1	2,175.7	2,474.2	2,645.5	2,628.5	2,507.4	2,233.7	1,823.0	1,347.5	868.3
Interest on Opening Balance at 15 % p.a.	0.0	1.5	57.1	172.7	273.3	326.4	371.1	396.8	394.3	376.1	335.1	273.4	202.1	130.2
Subtotal	10.0	381.0	1,151.0	2,075.0	2,647.8	3,098.0	3,421.0	3,707.5	3,637.0	3,346.4	2,986.3	2,561.4	1,981.0	1,473.7
Less Sales Revenue @ Rps. 1,686/m^2/ Year	-	-	-	252.9	472.1	623.8	775.5	1,079.0	1,129.6	1,112.7	1,163.3	1,213.9	1,112.7	1,079.0
Closing Balance	10.0	381.0	1,151.0	1,822.1	2,175.7	2,474.2	2,645.5	2,628.5	2,507.4	2,233.7	1,823.0	1,347.5	868.3	394.7
Plus Land Cost	975.7	1,346.7	2,116.7	2,787.2	3,141.4	3,439.9	3,611.2	3,594.2	3,473.1	3,199.4	2,788.7	2,313.2	1,834.0	1,360.4

Table X-9 Maximum Cash Requirements where All Land is Leased

(mil. Rps.; 1976 Prices)

Case V	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Lease Budget (ha.)				15	13	9	9	18	18	12	12	12	12	16
Cum. lease (ha.)				15	28	37	46	64	82	94	106	118	130	146
Capital Cost and Opening Cost	10.0	369.5	712.9	751.3	552.4	595.9	575.7	665.2	514.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	0.0	10.0	381.0	1,151.0	1,946.0	2,549.5	3,209.6	3,871.2	4,566.6	5,160.6	5,589.2	5,933.5	6,273.7	6,528.1
Interest on Opening Balance at 15 % p.a.	0.0	1.5	57.1	172.7	291.9	382.4	481.4	580.7	685.0	774.1	838.4	890.0	941.1	979.2
Subtotal	10.0	381.0	1,151.0	2,075.0	2,790.3	3,527.8	4,266.8	5,117.1	5,865.8	6,397.6	6,845.1	7,288.5	7,646.1	7,982.5
Less Rental Income at Rps. 860/m^2/Yr.	-	-	-	129.0	240.8	318.2	395.6	550.4	705.2	808.4	911.6	1,014.8	1,118.0	1,255.6
Closing Balance	10.0	381.0	1,151.0	1,946.0	2,549.5	3,209.6	3,871.2	4,566.6	5,160.6	5,589.2	5,933.5	6,273.7	6,528.1	6,726.9
Plus Land Cost	975.7	1,346.7	2,116.7	2,911.7	3,515.2	4,175.3	4,836.9	5,532.3	6,126.3	6,554.9	6,899.2	7,239.4	7,493.8	7,692.6

Table X-10 Maximum Cash Requirements where Land is Sold for Cash, on Terms, and Leased in Equal Proportions

(mil. Rps; 1976 Prices)

Case VI	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sales and Lease Budget (ha.)				15	13	9	9	18	18	12	12	12	12	16
Sales for Cash (ha.)				5	4.3	3	3	6	6	4	4	4	4	5.3
Sales on Terms (ha.)				5	9.3	12.3	15.3	21.3	22.3	22	23	24	22	21.3
Lease (ha.)				5	9.3	12.3	15.3	21.3	27.3	31.3	35.3	39.3	43.3	48.6
Capital Cost and Operating Cost	10.0	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	0.0	10.0	381.0	1,151.0	1,622.7	1,899.2	2,271.0	2,601.9	2,724.3	2,745.6	2,719.9	2,593.8	2,445.0	2,239.4
Interest on Opening Balance at 15 % p.a.	0.0	1.5	57.1	172.7	243.4	284.9	340.6	390.3	408.6	411.8	408.0	389.1	366.7	335.9
Subtotal	10.0	381.0	1,151.0	2,075.0	2,418.5	2,780.0	3,187.3	2,657.4	3,747.2	3,620.3	3,545.4	3,447.9	3,243.0	3,050.5
Less Revenue	-	-	-	452.3	519.3	509.0	585.4	933.1	1,001.6	900.4	951.6	1,002.9	1,003.6	1,124.9
Closing Balance	10.0	381.0	1,151.0	1,622.7	1,899.2	2,271.0	2,601.9	2,724.3	2,745.6	2,719.9	2,593.8	2,445.0	2,239.4	1,925.6
Plus Land Cost	975.7	1,346.7	2,116.7	2,588.4	2,864.9	3,236.7	3,567.6	3,690.0	3,711.3	3,685.6	3,559.5	3,410.7	3,205.1	2,891.3

Table X-11 Maximum Cash Requirements where Land is Sold for Cash, on Terms, and Leased in Proposed Proportions*

(mil. Rps.; 1976 Prices)

Case VII	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Sales & Lease Budget (ha.)				15	13	9	9	18	18	12	12	12	12	16
Capital Cost and Operating Cost	10.0	369.5	712.9	751.3	552.4	595.9	575.7	665.2	614.2	462.9	417.5	465.0	431.3	475.2
Opening Balance	0.0	10.0	381.0	1,151.0	1,403.5	1,500.9	1,763.2	1,994.3	1,896.7	1,699.2	1,546.3	1,297.8	1,032.3	705.6
Interest on Opening Balance at 15 % p.a.	0.0	1.5	57.1	172.7	210.5	225.1	264.5	299.2	284.5	254.9	231.9	194.7	154.8	105.8
Subtotal	10.0	381.0	1,151.0	2,075.0	2,166.4	2,322.0	2,603.3	2,958.7	2,795.4	2,417.0	2,195.7	1,957.5	1,618.4	1,286.7
Less Revenue	-	-	-	671.5	665.5	558.8	609.0	1,062.0	1,096.0	870.7	897.9	925.2	912.8	1,079.5
Sales for Cash				588.0	509.6	352.7	352.8	705.5	705.5	470.4	470.3	470.4	470.4	627.1
Sales on Terms				66.0	123.2	162.8	202.4	281.6	294.8	290.4	303.6	316.8	290.4	281.6
Lease				17.5	32.7	43.3	53.8	74.9	95.9	109.9	124.0	138.0	152.0	170.8
Closing Balance	10.0	381.0	1,151.0	1,403.5	1,500.9	1,763.2	1,994.3	1,896.7	1,699.2	1,546.3	1,297.8	1,032.3	705.6	207.2
Plus Land Cost	975.7	1,346.7	2,116.7	2,369.2	2,466.6	2,728.9	2,960.0	2,862.4	2,664.9	2,612.0	2,263.5	1,998.0	1,671.3	1,172.9

(Note) * Of the total saleable land area of 146 hectares, 20 hectares are to be leased, 70 % of the balance to be sold for cash payment in full and 30 % on terms.

Table X-12 Summary of Closing Balance in 1990 and Peak Cash Requirements (Case I - VII)

(mil. Rps. 1976 Price)

Sale Option			Closing Balance in 1990 (mil. Rps.)	Maximum Cash Requirement	
Case	Tab.			(mil. Rps.)	Year
I	X-6	Cash at Rps. 7,934/m^2	4	2,671	1983
II	X-7	Cash at Rps. 6,382/m^2	1	2,325	1983
III	X-8	Cash at Rps. 6,500/m^2	379	2,255	1983
IV	X-9	Terms	-1,360	3,611	1983
V	X-10	Lease	-7,692	7,692	1990
VI	X-11	One third each	-2,891	3,711	1985
VII	X-12	Recommended proportions	-1,173	2,960	1983

(Note) In Case I, cost includes interest payment for land cost.

Since these projections are based on several premises, any change in the premises will change the projected annual cash flow. If construction costs turn out to be smaller than the estimate, cash requirements will be smaller. Cash requirements will also be reduced if land sales proceed ahead of the schedule, or if the proportion of sales by cash increases. The opposite is also true. For example, Case VII assumes that 70% of the 126 hectares will be sold for immediate full cash payment. If this ratio falls to 50%, and if the remaining 50% is sold on terms, the peak cash requirements, expected for 1983, will rise to Rps. 3,192 million, and the balance at the end of 1990 will deteriorate by Rps.300 million.

The selling price and interest rate can be controlled more easily than either construction costs or proportions of land to be sold for cash, credit or to be leased. As long as annual sales budgets are met, the higher the selling price and the lower the interest rate, the better will be the Corporation's finance. Fig. X-3 and X-4 show how changes in these variables affect the balance of accounts at the end of 1990.

Fig. X-3 shows the 1990 balances for various selling prices and interest rates. The balance improves linearly in relation to the price. It is also found that the higher the interest rate, the steeper the slope of the closing balance, indicating that the lower the interest rate, the smaller will be the impact of the

price on the closing balance. Most of the lines cross each other in the Rps. 7,000 - 7,500 per square meter zone, implying that if the price is set within this range, there will be a surplus of Rps. 2. 0 - 4. 0 billion in 1990 as long as the interest rate is between 5 and 20%. At the price of Rps. 6,500 per square meter, the closing balance will vary significantly depending on the interest rate. The interest rate of 15% per annum will produce a surplus of Rps. 379 million, that of 10% a surplus of Rps. 1,137 million and that of 20% a deficit of Rps. 1,172 million. At Rps. 6,000 per square meter, the project will break even if the interest rate is 10% but at 15% or higher will close with large deficits.

Fig. X-4 shows how closing balance for each price will vary by interest rate. It shows if the price is Rps. 6,800 per square meter or higher, the closing balance will be in the black for all possible interest rates between 5 and 20%. The project can break even at some lower prices, but the range of acceptable interest rates is narrower. When the price is Rps, 7,500 per square meter, the interest rate of 12 to 13% will maximize the closing balance. Shift of the interest rate in either direction makes the closing balance slightly smaller.

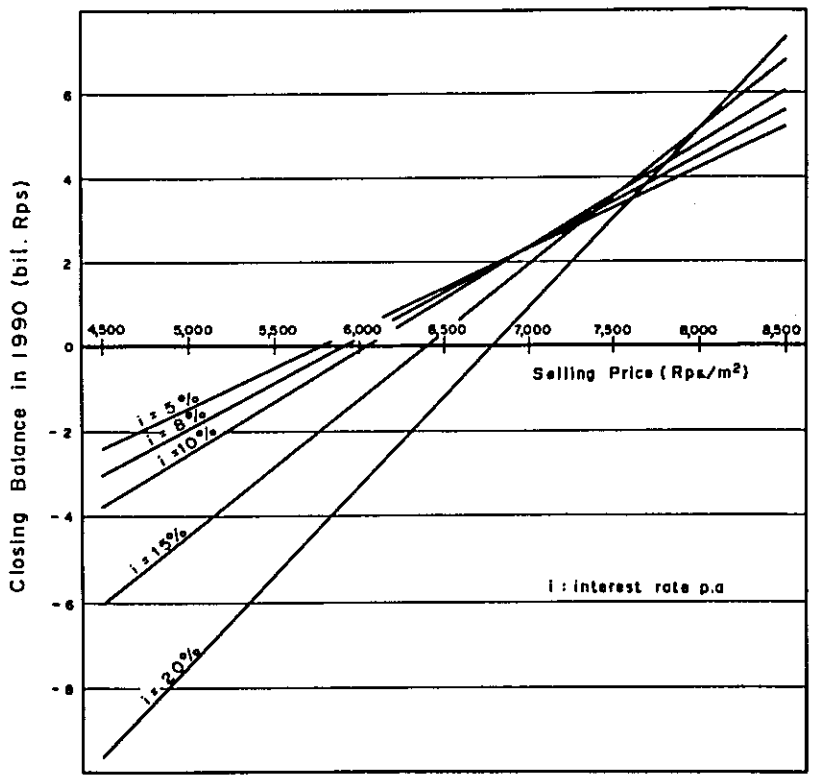


Fig. X-3 Closing Balance in 1990 by Selling Price of Land

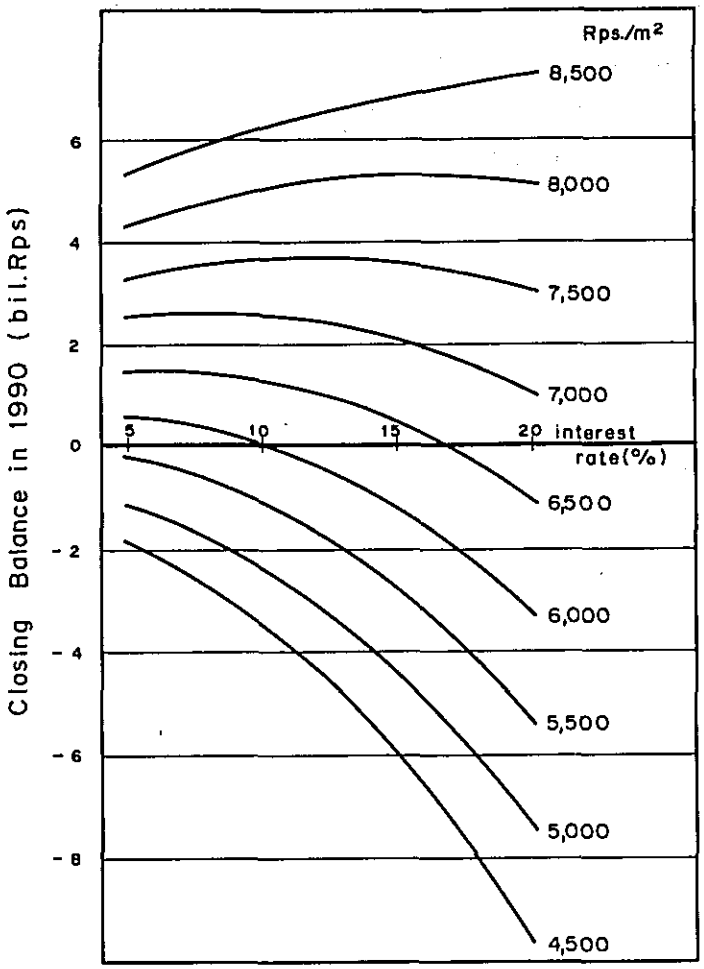


Fig. X-4 Closing Balance in 1990 by Interest Rate

3) Capitalization of P. T. Ujung Pandang Industrial Estate

In Indonesia, shareholders of an industrial estate corporation usually consist of the central government, provincial government and city government. It is assumed that capital of the Ujung Pandang Industrial Estate will also be financed entirely with public funds and that the Corporation can be a non-profit entity.

If the Corporation sells or leases land according to the plan recommended earlier, cash requirements in the peak year will amount to nearly Rps. 3.0 billion (U. S. $7. 23 million) (See Table X-12, Case VII). The ratio of own capital to the total capital employed will be a crucial determinant of the project's payability. Here, we have set the capitalization of the Corporation at Rps. 1. 0 billion, one-thied of the cash requirements expected in the peak year and slightly above the

cost of land acquisition. A greater capitalization is needed if the Corporation is to rent nursery factories for special low rates to small enterprises to aid their growth.

Table X-13 Suggested Capitalization of P. T. Industrial Estate

	Proportion	Rps. Million	U. S. $1,000
Equity	33%	1,000	2,410
Long term loans	50	1,500	3,615
Short term loans	17	500	1,205
Total	100	3,000	7,230

Three-quarters of the remaining capital is to be financed by long-term debts, and one-quarter by short-term debts. Short-term debts, repayable within a year, constitute a reserve to accommodate minor fluctuations in cash requirements. It is also ear-marked for contingencies.

4) Income Statement and Balance Sheet of P. T. Ujung Pandang Industrial Estate

Income Statement and Balance Sheet of P. T. Ujung Pandang Industrial Estate until 2000 are shown in Table X-14.

This estimation is based on the following premises:

i) Industrial land sales, to begin in 1980, will consist of 60% for one-time cash payment, 26% for five-installment payment and 14% for leasing. (The assumption was made despite the high probability that the composition of actual sales will vary from these figures.)

ii) The equity capital of Rps. 1.0 billion is to be paid in, in 1977 and to be used for land purchase. If the Industrial Estate Corporation's founding is postponed by several years and if the land purchase is financed with government funds, the land will be assigned to the Corporation upon its founding as investment in kind.

iii) The first long-term borrowing is to be made in 1978 in the amount of Rps. 500 million. The annual borrowing will increase to Rps. 1.0 billion in 1979 and to Rps. 1.5 billion in 1983/84, the peak years of cash requirements.

It will then decline year by year. The last long-term loan is to be taken out in 1989. As in the case of short-term debts, interest of 15% per annum is payable on the long-term debts.

iv) Straight-line method depreciation over a period of 30 years is used for recovery of development costs of land for lease. The depreciation period for water supply, sewerage and waste water treatment plants and buildings is also 30 years.

v) Only corporation income tax is taken into account. Neither real estate acquisition tax nor development tax is included. The tax rate are 20% for incomes up to Rps. 10 million and 45% for incomes in excess of Rps. 10 million.

vi) Dividends are payable when 80% of net profits after tax exceeds 5% of the capitalization. Profits equal to 5% of the capitalization or its multiples will be set aside for dividend payment.

Table X-14 shows that the operation of the Estate will be in deficit during the first period of development and will turn to a surplus in 1984, the first year of the second stage. The cumulative retained profits will not turn to a surplus before 1995. In this projection, we included dividend payments in 1989 and 1990, as their single-year net profits after tax will meet the criterion stated above. If these profits are retained, the cumulative deficit will be dissolved in 1991.

Table X-15 is a summary of the major indicators used in the analysis of the Corporation's finances. The ratio of gross profits to total investment, an indicator of the project's earning power, will be below 10% during the first period (1978 - 83). It will exceed 10% from the start of the second period and, with a decline in investment, will exceed 30% toward the end of the third period. The profit rate of net worth (the ratio of net profits after tax to shareholders' funds) will be negative during the first period and will average at only 4 to 5% even during the later periods. This is not a high return on investment. But this is only natural, becuase the nature of the Corporation was defined as quasi-public and non-profit earning, and the selling price of land was set at only slightly above the break-even point.

The ratio of total liabilities to net worth, an indicator of the soundness of financial structure, will climb to a fairly high level during the second period. Although it will reach a high of 3.0 in 1983, the peak year of cash requirements, subsequently, it will decline rapidly. On the whole, there is no need for concern. The ratio of short-term debts to total capital employed will rise toward the end of the 1980's, when long-term debts are scheduled to be repaid. It will reach almost 18% in 1989 and 1990. It is, therefore, recommended that the repayment of long-term debts be delayed by a few years or the period of repayment be somewhat extended.

Table X-14 PROJECTED INCOME STATEMENT AND BALANCE SHEET OF P. T. UJUNG PANDANG INDUSTRIAL ESTATE

(Million Rps., 1976 Prices)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
REVENUE:																								
Sales of land	-	-	-	841.4	729.2	504.9	504.9	1009.7	1009.7	673.1	673.1	673.1	673.1	897.5										
Cost of land sold	-	-	-	587.4	509.1	352.5	352.5	704.9	704.9	470.0	470.0	470.0	470.0	626.6										
Gross profit on land sales	-	-	-	254.0	220.1	152.4	152.4	304.8	304.8	203.2	203.2	203.2	203.2	270.9										
Rent of land	-	-	-	17.7	33.0	43.6	54.2	75.4	96.6	110.5	124.9	139.0	153.2	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0
GROSS PROFIT	-	-	-	271.7	253.1	196.0	206.6	380.2	401.4	313.9	328.1	342.2	356.4	442.9	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0
Operating expenses	10.0	50.7	84.0	114.2	126.0	123.2	127.0	130.6	134.8	102.9	101.6	104.1	95.3	98.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0
NET PROFIT BEFORE AMORTIZATION, INTEREST AND TAX	-10.0	-50.7	-84.0	157.5	127.1	72.8	79.6	249.6	266.6	211.0	226.5	238.1	261.1	344.9	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0
Amortization of land for rent	-	-	-	3.1	5.8	7.7	9.5	13.3	17.0	19.5	22.0	24.5	26.9	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3
NET PROFIT BEFORE INTEREST & TAX	-10.0	-50.7	-84.0	154.3	121.3	65.1	70.1	236.3	249.6	191.6	204.5	213.7	234.1	314.7	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8
Interest on installments due	-	-	-	-	14.8	24.7	27.6	27.9	33.9	39.8	38.9	36.9	33.5	31.7	35.7	23.0	12.6	4.8						
Interest on borrowings	-	- 5.1	51.0	167.9	176.1	178.7	217.4	254.6	232.2	193.0	172.8	142.2	114.1	79.7	26.4	12.8	-5.3	-24.0	-43.6	-67.0	-74.4	-82.3	-91.0	-100.3
NET PROFIT BEFORE TAX	-10.0	-45.6	-135.0	-13.5	-40.0	-88.9	-119.8	9.6	51.3	38.4	70.6	108.4	153.6	266.7	63.0	64.0	71.7	82.6	97.3	120.7	128.1	136.1	144.7	154.1
Income tax	-	-	-	-	-	-	-	1.9	20.6	14.8	29.3	46.3	66.6	117.5	25.9	26.3	29.8	34.7	41.3	51.8	55.2	58.7	62.6	66.8
NET PROFIT AFTER TAX	-10.0	-45.6	-135.0	-13.5	-40.0	-88.9	-119.8	7.7	30.7	23.6	41.3	62.1	87.0	149.2	37.2	37.7	41.9	47.9	56.0	68.9	73.0	77.4	82.1	87.2
Dividends	-	-	-	-	-	-	-	-	-	-	-	-	50.0	100.0	-	-	-	-	-	50.0	50.0	50.0	50.0	50.0
RETAINED PROFITS	-10.0	-45.6	-135.0	-13.5	-40.0	-88.9	-119.8	7.7	30.7	23.6	41.3	62.1	37.0	49.2	37.2	37.7	41.9	47.9	56.0	18.9	23.0	27.4	32.1	37.2
ASSETS:																								
Working Capital	-	10.0	25.0	20.0	20.0	20.0	22.0	25.0	23.0	20.0	20.0	15.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Deferred payments due	-	-	-	-	65.5	122.3	161.6	200.9	214.0	235.8	248.9	262.0	235.8	209.6	227.1	174.7	122.3	69.9						
Land for rent	-	-	-	90.1	165.2	213.5	259.9	358.5	453.4	508.6	561.2	611.3	659.0	728.2	698.0	667.7	637.5	607.2	576.9	546.7	516.4	486.2	455.9	425.7
Development in progress	965.9	1284.7	1913.6	1870.0	1706.5	1170.7	1811.0	1528.8	1191.6	1007.1	778.4	594.8	386.2	37.1										
TOTAL INVESTMENT	965.9	1294.7	1938.6	1980.1	1957.1	2126.5	2254.5	2113.2	1882.0	1771.4	1608.5	1483.1	1291.0	984.9	931.0	848.4	765.7	683.1	582.9	552.7	522.4	492.2	461.9	431.7
FINANCED BY:																								
Capital	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0
Retained profits	-10.0	-45.6	-180.6	-194.2	-234.2	-323.1	-442.8	-435.2	-404.5	-380.9	-339.5	-277.4	-240.4	-191.3	-154.1	-116.4	-74.5	-26.6	29.5	48.4	71.3	98.7	130.8	168.0
SHAREHOLDERS' FUNDS:	990.0	954.4	819.4	805.8	765.8	676.9	557.2	564.8	595.5	619.1	660.5	722.6	759.6	808.7	845.9	883.6	925.5	973.4	1029.5	1048.4	1071.3	1098.7	1130.8	1168.0
NET BORROWINGS:																								
Long term	-	500.0	1000.0	1000.0	1000.0	1000.0	1500.0	1500.0	1300.0	1100.0	900.0	600.0	300.0											
Short term	-24.1	-159.7	119.2	174.3	191.3	449.5	197.3	48.3	-13.5	52.3	48.0	160.5	231.5	176.2	85.1	-35.2	-159.8	-290.4	-446.5	-495.7	-548.9	-606.5	-668.9	-736.4
TOTAL BORRWINGS	-24.1	340.3	1119.2	1174.3	1191.3	1449.5	1697.3	1548.3	1286.5	1152.3	948.0	760.5	531.5	176.2	85.1	-35.2	-159.8	-290.4	-446.5	-495.7	-548.9	-606.5	-668.9	-736.4
TOTAL CAPITAL EMPLOYED	965.9	1294.7	1938.6	1980.1	1957.1	2126.5	2254.5	2113.2	1882.0	1771.4	1608.5	1483.1	1291.0	984.9	931.0	848.4	765.7	683.1	582.9	552.7	522.4	492.2	461.9	431.7

Table X-15 Projected Profits and Financial Position

Year	Profits		Financial Position	
	Return on Total Investment before Tax and Interest (%)	Return on Share-holders' Funds after Tax and Interest (%)	Debt/Equity Net of Cash Surpluses (ratio)	Short-term Bor-rowings/Total Capital Employed (%)
1977	-1.0 %	-1.0 %	-	-
1978	-3.9	-4.8	0.4	-
1979	-4.3	-16.5	1.4	6.2 %
1980	8.0	-1.7	1.5	8.8
1981	6.5	-5.2	1.6	9.8
1982	3.4	-13.1	2.1	21.1
1983	3.5	-21.5	3.0	8.8
1984	11.8	1.4	2.7	2.3
1985	14.2	5.2	2.2	-
1986	11.9	3.8	1.9	3.0
1987	14.1	6.3	1.4	3.0
1988	16.1	8.6	1.1	10.8
1989	20.2	11.4	0.7	17.9
1990	35.0	18.4	0.2	17.9
1991	9.0	4.4	0.1	9.1
1992	9.9	4.3	-	-
1993	11.0	4.5	-	-
1994	12.3	4.9	-	-
1995	14.4	5.4	-	-
1996	15.2	6.6	-	-
1997	16.1	6.8	-	-
1998	17.1	7.0	-	-
1999	18.2	7.3	-	-
2000	19.5	7.5	-	-

Tables X-14 and 15 are based on several premises. Any change in the premises will vary the figures listed here. These tables should be viewed as an attempt to obtain an overall concept of the Corporation's financial position and not as infallible projections. For example, as indicated in Table X-16, change in the proportion of equity capital to total capital employed can considerably change the earning power and financial health of the Corporation. An increase of 10% in the equity capital to Rps. 1,100 million, for example, can quadruple the retained earnings through the year 2,000 and nearly double the dividends in the same period. If the equity capital is increased to Rps. 1,500 million, net profits after taxes will be more than twice its amount; accumulated retained profits will amount to Rps. 1,500 million and dividends to Rps. 1,800 million. Interest rate is another key factor. A reduction in the interest rate from 15% to 10% will have the same effect on Corporation's finances as a 10% increase in equity capital.

Table X-16 Profits and Financial Position by Amount of Equity Capital

Equity Capital (mil. Rps.)	900	1000		1100	1500
Interest rate (%)	15	15	10	15	15
1. Year when accumulated retained profits turn to a surplus	1999	1995	1984	1988	1980
2. Accumulated retained profits in 2000 (mil. Rps.)	26	165	706	628	1534
3. Total dividends through 2000 (mil. Rps.)	135	400	1050	770	1800
4. Peak Debt-to-Equity Ratio (Ratio) (Year)	4.9 (1983)	3.0 (1983)	1.8 (1983)	2.0 (1983)	0.4 (1983)
5. Peak Ratio of Short-term Debt to Total Capital Employed (%) (Year)	57.4 (1990)	21.1 (1982)	22.3 (1982)	33.1 (1989)	

4) Conclusions

Conclusions of the financial analysis of this project are as follows:

- This project is financially feasible as long as the assumptions concerning construction costs, the selling price, sales timetable, interest rate, capitalization etc. hold true in the actual situation.

- The selling price was determined in such a way that the balance of discounted cahs-flow (the rate of discount, 15% per annum) in 1990 will be in near equilibrium. The internal rate of return of this project, therefore, should be roughly equal to the interest rate. (The actual rate will be 16.6%.) When the rate of discount is 15%, the net present value will be Rps. 107.5 million.

- Since the aim of this project is to build a physical environment in which an industrial estate can be built, its foreign currency requirement is very small compared with other industrial projects. The major items requiring foreign currencies are water treatment plants, examination of rock beds and explosives for removal of rocks, which, combined, will amount to less than 15 % of the in-site development cost, or $2.4 million. (See APPENDIX 12)

- If development costs of this project can be partially financed by international financial institutions or funds provided through bilateral economic cooperation, such foreign funds will be first applied to the above-mentioned work. In addition, use of foreign funds for construction of factory buildings to accommodate a number of small- and medium-sized enterprises is desired. Construction costs of such buildings are estimated at Rps. 1.5 billion (3 hectares floor space x @Rps.

50,000/m^2). Introduction and fostering of traditional-type enterprises will be difficult unless rents for these buildings are reduced through the use of low-interest funds.

- If further economic cooperation can be expected, the next item to be financed with foreign funds would be the long-term debt, totalling approximately Rps. 1.5 billion.

3. Economic Analysis

The financial analysis in the previous section was made from the viewpoint of whether the Industrial Estate Corporation is financially viable. The economic assessment which follows is aimed at evaluating the impact of this project on the regional as well as national economies.

1) Type of benefits

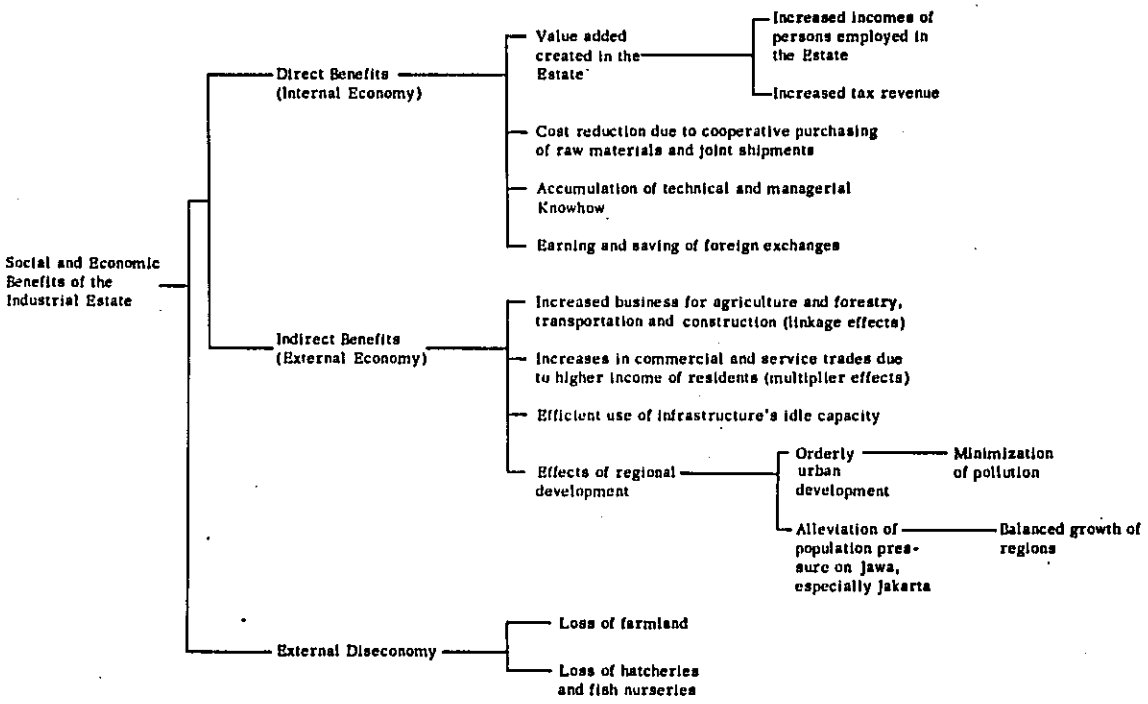


Fig. X-5 Type of Benefits

(1) Direct benefits

The most direct economic benefit from the Estate is value added to be created through its productive activity. Following its completion in 1990, the Estate is projected to yield Rps. 30. 0 billion (U. S. $72 million, in 1976 prices) annually in value added, as stated in Chapters I and III. Such value added will be distributed as wages and salary, taxes, interest and dividends, depreciation and retained profits. Wages and salary in particular will have a large impact on the regional economy.

The Ujung Pandang region at present has few employment opportunities, with unemployment and out-migration of the population becoming increasingly serious problems. When the Estate is completed, it will provide jobs to approximately 25, 000 persons without counting those who will benefit indirectly from the Estate, and their combined wages and salary are expected to amount to Rps. 9. 0 billion (U. S. $22 million) annually. Since corporate income tax is paid to the national treasury, this will constitute a cash outflow from the regional economy. However, the benefit to the national economy arising from that revenue will be partially ploughed back to the regional economy in the form of revenue sharing.

The Estate will also contribute toward meeting a major task of the Indonesian economy, namely to earn and save foreign exchanges, due to import and export substituting nature of firms to be located in it. Another benefit not to be overlooked is technical and managerial knowhow to be accumulated through the development of the Estate. Such knowhow will lay the groundwork for upgrading industries to a higher level of sophistication.

Concentration of a large number of firms in an industrial estate can bring other benefits. Firms using same input materials, such as lumber, agricultural and marine products, and intermediate industrial materials, can make joint purchasing arrangements to strengthen their bargaining position and to reduce transportation costs. Downstream integration within the estate, furniture and woodwork plants to use boards coming out of sawmills in the Estate for example, can also reduce transport and warehouse charges. Although these benefits will accrue to individual firms, the aggregate of such economic values can be re-

garded as benefits to the regional economy.

(2) Indirect benefits

Promotion of industrialization achieved through the Industrial Estate development will have a large impact on related industries: development of processing industries for primary commodities will expand their output; production of farm machines, fertilizers and fishing nets will result in an increased output by agriculture and fishery. There will be many business opportunities for the transport, construction and distribution industries, the industries directly associated with operation of the firms located in the Estate, during and after the Estate's construction. In addition, though not directly related to the operation in the Estate, city's commerce and service industries are expected to grow to match rising living standards of the people and a resultant increase in consumption. The process through which industrial development induces development of other sectors which, in turn, accelerates development of industries and so on is called multiplier effects. Multiplier effects are generally equal to or larger than the project's direct benefits.*

The Industrial Estate has a large impact on development of various regions in Indonesia. As stated in Chapter I, one of the objectives of building this Industrial Estate is to create employment opportunities in Ujung Pandang to check the out-migration of the population from this region. If the Estate can thus alleviate population pressure on Java, especially Jakarta, it can prevent excessive outlays for social infrastructures, especially urban development, on the island. It will also help balanced national development, the major objective of the Indonesian Government in promoting regional development. The Industrial Estate is also essential for urban planning by the city of Ujung Pandang, in as much as it plans to promote industrial development. Since the end of 1960's there has been a sharp increase in the number of firms located in Ujung Pandang. If enterprises are allowed to choose their sites freely in the future, factories will be located in all sections of the city, working havoc on urban functions, people's living environment and appearance of the city. Building a well-planned industrial estate with infrastructures, i.e., transportation, electricity, water supply

* Quantification of multiplier effects will become possible when the input-output table, now being compiled by the Indonesian Government, is completed.

and sewerage, etc., and bringing enterprises to one location is the best means of minimizing pollutions and building a well-planned city.

(3) External diseconomy and impact on social infrastructure

The Industrial Estate is bound to create some external diseconomies. They include traffic congestions, noise and environmental pollutions. The direct aspect of the diseconomy is the loss of economic values which would have been created by the farmland on which the Estate is to be built and by fish nurseries whose water supply will be affected by wastewater from the Estate. Naturally, owners of these properties must be adequately compensated.

For the regional economy, however, the loss of economic value arising from these activities is negligible in comparison with economic value to be created in the Estate. If we assume the per-hectare annual productivity of land to be Rps. 168,000 for rice paddies and Rps. 117,000 for dry farmland, the averages for South Sulawesi, since the Industrial Estate site includes 46.9 hectares of rice paddies and 86.9 hectares of dry farmland, the value of agricultural output to be lost by the construction of the Estate is Rps. 18,050,000 per annum. If we assume this annual output to remain constant, the present value of the output from 1979, (the year the construction is to begin,) through the year 2000, discounted by 15% per annum, is Rps. 133 million. This amount is less than 1% of the present value of value added to be created in the Estate in one year. The Rps. 30.0 billion value added expected for 1990, for example, has the present value of Rps. 15.3 billion.

While the direct external diseconomies thus will be relatively insignificant, a rapid population increase expected for the city of Ujung Pandang and the resultant pressure for building more social infrastructure will present a very serious problem. The Government and the city authority will have to build roads, bridges and such public facilities as schools, hospitals, parks and auditoriums as well as utilities -- electricity, water supply, sewerage and waste disposal facilities -- at an unprecedented pace. Although this is not a direct impact of the construction of the Estate, it is a problem bound to occur when the city expands in size. The Industrial Estate development project, therefore, must be tackled not in isolation but as part of regional social and economic development, and a great number of related development projects must be promoted

simultaneously.

2) Cost benefit analysis

(1) Cost and benefit measurement method

The most difficult problem encountered in analyzing the social cost-benefit of an industrial estate project is to determine the extent of benefit. The reason is that the coverage of cost depends on the extent of benefit. For example, if the benefit means the value added created within the industrial estate, the corresponding cost equals the development cost and operating cost of the industrial estate as well as the capital cost and running cost of possible occupants. If the increased economic activities in the areas of transportation and construction are to be added to the benefit, the corresponding increase in capital spending in these areas should be included in the cost. It is difficult to determine to what extent the cost and benefit generated by the development of an industrial estate will contribute to the overall development of transportation and construction. The difficulty would mount if the effects on the primary and tertiary industries are to be considered. Since the input-output table is unavailable at present, the measurement of these effects is next to impossible.

Generally, if the extent of benefit is expanded, there will be more uncertain factors. Take the project in question as an example. It would be most appropriate for benefit to include the total value added created by possible occupants. However, more than one hundred different businesses are expected to establish themselves on the estate, and thus both the amount of investment and the value added rate per unit factory area will differ greatly with the type of these businesses. Hasty determination of their median value is very risky and impractical.

In analyzing cost and benefit, therefore, we have considered the total wages receivable by unskilled workers to be employed by the companies in the industrial estate to be the benefit of this project, keeping in mind the importance of the creation of employment, one of the primary objectives of this estate. In this case, the corresponding cost will include land purchasing cost, construction cost and operating cost only. More specifically, investment

- From 1976 to 1990, these industries will be set up at an annual rate of 5.2%. Therefore, without the construction of the industrial estate, the present manufacturing population of 10,625 in Ujung Pandang will increase at an annual rate of 5.2% until the year 2000.
- With or without the industrial estate, the annual income of unskilled workers will be Rps. 150,000 or Rps. 500 per day.
- Land cost of the companies operating in the estate is ignored.

Table X-17 Benefit of the Project

Year	In the case where the estate is developed			In the case where the estate is not developed		Benefit of the project	
	(1) Total area of land sold (ha)	(2) Total number of workers	(3) Total number of non-skilled workers	(4) An increase of workers employed in the industrial sector	(5) An increase of non-skilled workers employed in the industrial sector	(6) (3) - (5)	(7) Benefit (in million Rps.) = (6) x Rps. 150,000 (annual income of non-skilled worker)
1980	15	2,310	1,964	642	449	1,515	227.3
1981	28	4,312	3,665	1,320	927	2,741	411.1
1982	37	5,698	4,843	2,095	1,467	3,376	506.4
1983	46	7,084	6,021	2,781	1,947	4,074	611.1
1984	64	10,612	9,020	3,569	2,498	6,522	978.3
1985	82	14,140	12,019	4,398	3,079	8,940	1341.0
1986	94	16,492	14,018	5,269	3,688	10,330	1549.5
1987	106	18,844	16,017	6,187	4,331	11,686	1752.9
1988	118	21,196	18,017	7,152	5,006	13,011	1951.6
1989	130	23,548	20,016	8,167	5,717	14,299	2144.8
1990	146	25,900	22,015	9,235	6,515	15,500	2325.0
1991	146	25,900	22,015	10,358	7,251	14,764	2214.6
1992	146	25,900	22,015	11,540	8,076	13,939	2090.8
1993	146	25,900	22,015	12,983	8,948	13,067	1960.0
1994	146	25,900	22,015	14,091	9,864	12,151	1822.6
1995	146	25,900	22,015	15,467	10,953	11,062	1659.3
1996	146	25,900	22,015	16,915	11,841	10,174	1526.1
1997	146	25,900	22,015	18,438	9,420	9,108	1366.2
1998	146	25,900	22,015	20,040	12,053	7,987	1198.0
1990	146	25,900	22,015	21,725	14,603	7,122	1068.3
2000	146	25,900	22,015	23,098	17,252	5,846	876.9

The benefit as shown in Table X-17 is compared with the total development cost in Table X-5 to calculate the following indicators for the assessment of the project:

- Cost-benefit ratio (B/C) = 1.24 (discount rate: 15%)
- Internal rate of return (IRR)= 18.8 %
- Net present value = Rps. 994 million

All this points to the social and economic feasibility of the project.

by each company and tax are included neither in cost nor in benefit on the assumptions that the former is recovered from gross profit excluding wages and that the latter is spent in constructing and improving the infrastructure outside the estate. Dividends and retained profits are not included in benefit because their estimation is difficult and their appropriation, for overseas remittance for example, is unclear. Apparently, the wages of unskilled workers compose the most direct benefit of the development of the industrial estate.

The benefit should be estimated from the possible increase accruded by the construction of the industrial estate. In other words, "with and without comparison" should be made instead of "before and after comparison". There is a shortage of engineers and skilled workers throughout Indonesia, and whether or not the industrial estate is constructed, they always find employment. This is why their wages are excluded in the benefit. Since there is an oversupply of unskilled workers in Ujung Pandang, their opportunity cost arising from their employment within the estate is not considered.

(2) Cost-benefit ratio and internal rate of return

The estimated number of employees in the industrial estate is compared in Table X-17 with that of employees who would be employed by manufacturing companies within the city even if the estate is not constructed. The estimation is based on the following assumptions:

- As the result of analysis made in Chapter III, the number of employees per hectares of the industrial estate is 168 on an average: 154 in stage I, 196 in stage II and 162 in stage III.
- Unskilled workders account for 85% of the total workers. The percentage without the construction of the estate is 70%.
- Even if the industrial estate is not constructed, new industries will be set up in Ujung Pandang, but at a much slower pace. Factory area within the city will have totalled 88 hectares, or 60% of the total factory area for sale, by 1990. (Of the industries expected to build factories on the estate as listed in Chapter III, about 25% in terms of area will have difficulty in securing factory site if the estate is not constructed.)

To what extent this conclusion is valid is shown in Table X-18. As far as cost and benefit are concerned, the feasibility of the project becomes doubtful in cases 1 to 3. However, even in these case, it should be kept in mind that the benefit discussed in this analysis is only part of the total benefit of the project.

Table X-18 Sensitivity Analysis

		B/C	IRR (%)	NPV(Rps. Mil.)
Basic case		1. 24	18. 8	994
Case 1	Discount rate is 20%	0. 93	-	-260
Case 2	Sale of factory site is delayed by 20%	0. 99	14. 9	- 46
Case 3	Development cost exceeds estimatedby 25%	0. 99	14. 9	- 57

XI. OTHER CONSIDERATIONS FOR IMPLEMENTATION

XI OTHER CONSIDERATIONS FOR IMPLEMENTATION

In this chapter, we enumerate matters claiming enough consideration at the time when the Ujung Pandang Industrial Estate Development Project will be carried into execution.

They may be broken down as follows:

i) Matters concerning management of an industrial estate project managing and operating agency and P. T. Industrial Estate Ujung Pandang (a tentative name)

ii) Matters concerning construction works

iii) Matters concerning urban and regional development

iv) Matters concerning other subjects

1. Matters Concerning Management of an Industrial Estate Project Managing and Operating Agency and P. T. Industrial Estate Ujung Pandang

1) Measures for attaining full occupancy

Although sales cost of the land for sale in the estate would reach a considerable amount, land prices should not be set at a high level. Therefore, profitability of this project or P. T. Industrial Estate Ujung Pandang may be secured by reducing a gap between supply and demand of lots for sale in the planned period. For this purpose, the following means may be considered:

- To establish and publicize sales points of the estate with a view to attracting enterprises
- To carry out a survey of land demand year by year to determine an area to be developed in accordance with the estimated demand.
- To employ an advance sales system to ensure revenue of the estate.
- To introduce several enterprises which may form a nucleus of the estate,

if possible. Such incentives as a discount on land price should be considered in order to hasten introduction of these enterprises into the estate.

- To develop an institutional means to direct new manufacturing establishments and existing firms' resettlement in the estate with giving the estate such a status as the upper level industrial area among those of the city.

2) Preparation of some incentives for sound management of the P. T. Industrial Estate Ujung Pandang

Since an industrial estate development project is considered as an public project in spite of the legal form of P. T. (private status), it cannot be allowed to aim solely at profitability like a private firm.

However, it is obvious that such a corporation restrained its profit-making activity can not get financial stability especially in case that it must shoulder a huge amount of investments for the development of the estate and the improvement of infrastructure in the peripheral districts. It is quite common in the world that an industrial estate to be developed from a public point of view receives Government support or aid to some extent.

The basic objectives of the Ujung Pandang Industrial Estate Development *Project are to further regional development and to build a* "growth pole (development center)" for industrial development in East Indonesia. It does not bear a character of private business at all.

Therefore, we recommend the Government that the following steps should be considered for ensuring financial stability of P. T. Industrial Estate Ujung Pandang in reward for its supply of low-priced land.

- To examine a possibility of exempting development tax
- To grant "tax holiday" with regard to corporate income tax and other taxes
- To subsidy the cost of various surveys and studies which would be carried out during a preparatory period of construction
- To disburse for development of infrastructure in peripheral areas
- To give a soft loan to the P. T. Industrial Estate Ujung Pandang

2. Matters Concerning Construction Works

1) Effective land acquisition at the planned site

In this report, land cost is estimated on the basis of current land prices. It accounts for 14% of the total construction cost. However, if speculative land purchase arises, the real development cost would largely overrun the estimates. It is, therefore, quite important to acquire the land effectively.

- The boundary of the planned site have been determined based on that of land categories and topographic configuration. In the implementation stage, it should be revised a little for land purchase on the basis of a cadaster.
- The best way of land acquisition is to purchase the whole area of the planned site at an earlier date. If it is impossible, some steps should be taken for freezing land prices.

2) Matters to be considered in drawing an engineering design

Following surveys should be conducted in detail before drawing an engineering design.

(1) Preparation of a detailed topographical map

The existing hastily-drawn topographical map on the scale of 1 : 2,000 is not so accurate to draw out an engineering design. On this map, natural features on the earth were described simply by tracing a photograph blown up from an airscape photograph on the scale of 1 : 5,000 with excessive peripheral aberration, making no correction. Contour lines were drawn based on leveling at datums. In our view, the map is accurate enough to draw out a basic design, but is somewhat rough for an engineering design. It is advisable to make out a new topographical map on the scale of 1 : 500 for drawing out an engineering design. We think it is practical to make out such a map by section-by-section measuring at intervals of about 50 meters, supplementing plane table measuring and making reference to aerial photographs.

(2) Geological survey

Untill now, such minimum geological surveys necessary for drawing out the basic design as measurement of the depth of bedrock by hand boring and analyses

of clay texture were conducted. We recommend measurement of the thickness of bedrock by means of geophysical prospecting, conducting mechanical boring at around ten points, to examine a method of land formation in detail. Based on the assumption that the bedrock might be rather thick, the Mission worked out the basic design in a way to minimize rock work forming tiers of small lots according to topographic configuration. However, if the bedrock is much thinner than expected, larger mechanical construction work will be available. In that case, we would be able to economize the development cost and shorten the period.

In addition, soil survey for vegetation should also be made as a part of geological survey, with a view to covering open space in the estate with verdure.

(3) Water survey

A stable water supply (especially in a dry season) is one of important points of this project. Since foundamental data concerning this subject are not enough at present, we enumerate below surveys to be conducted at the implementation stage in order to supplement insufficient data.

- To gather data of precipitation in and around the planned site
- To examine flux of the Maros River at the intake weir
- To prospect for underground water in and around the area.
  (It is more practical to utilize pits bored by machines on the occasion of geological surveys.)

(4) Local public opinion poll

It is inhabitants living near the planned site that suffer the greatest impact from the construction work and operation of plants in the estate. This project cannot be carried out successfully without their understanding and consent to the project. It is desirable, therefore, to explain the details of the project to them and conduct a local opinion poll to grasp accurately their opinion on this subject, after taking necessary steps for averting a danger of wild speculation in land.

3. Matters Concerning Urban and Regional Development

This project is a part of urban and regional development and has a close relation with other important projects, especially those relating to construction of roads, bridges, waterworks, etc. It is very important, therefore, to balance interaction of these projects to get a multiplied effect. Attention should be paid to the following matters in carrying the project into execution.

1) Improvement of roads outside the estate

Among various routes for the transport of raw materials and products to the city and the port, city roads have a rather small traffic capacity in spite of their width due to undivided traffic with a large difference in speed. Traffic congestion on roads outside the estate should be reduced by the remodelling of intersections in the city, separation of a sidewalk from a roadway, construction of pedestrian bridges or crosswalks, prohibition of the use of "becat" and dissemination of traffic morality in the public.

2) Improvement of transport facilities

It is expected that most of working population in the estate will be supplied by potential labor force in areas which are more than 10 km away from the estate. These workers mainly rely on regular bus service to go to and back from the estate. Assuming that working population in the estate comes to around 25,000, about 140 buses having a peak capacity of 40 passengers will be required on the assumption that each bus would make three round trips in commuting hours, even if a system of staggered office hours is adopted. In addition, it is likely that the bus service will be an ineffective means of transport due to one-way stream of commuters in certain hours. We can not expect a regular transport service by a private profit-making corporation. It is necessary, therefore, to improve public transport facilities, or to set up a new transportation system jointly financed by enterprises to be settled in the estate.

3) Preparation for evacuation of inhabitants in the area covered by the project

Approximately 1,000 inhabitants in the area covered by the project have to move out. It may be indispensable to prepare new houses and farmland for them

for substitution. In this case, land substitution should be made deliberately so that it may be in line with a future course of a development of Ujung Pandang City.

4) Resettlement of the existing firms into the estate

We think that preparation of a well-arranged program from the standpoint of urban development is the best way for resettlement of firms located in disorder in the downtown area of the city into the estate, although sooner or later they will decide on their own to move out of the city to settle into the estate.

5) *Environmental protection*

In case of mixed-type small-size firms, it is quite likely that promiscuous commercial and residential zones will mushroom randomly near the estate for topographical reasons. Therefore, zoning by the land use or building control should be done in the surrounding areas which are within a certain radius from the estate boundaries to protect environment in and around the estate. A commercial area near Desa Daya intersection should be properly remodelled as one of suburban commercial centers of Ujung Pandang City, by means of pertinent advice on building and grant of subsidies.

4. Matters Concerning Other Subjects

Comment on Desirable Administration Systems

The Mission gained an impression that it is desirable to examine a possibility of enacting legislation to expedite planning, construction and management of industrial estates, in view of the fact that the Indonesian Government regards them efficient means for the nation's industrialization.

To put it concretely, we suggest;

(1) legislation which requires the Government or a local public entity to shoulder the expenses for construction or improvement of infrastructure (e.g. roads, water supply, sewerage, port facilities) in the estate. (See remarks)

(2) legislation for setting up a special organization in charge of development of industrial estates throughout the country. (See Remarks)

Such legislation is quite desirable for bringing the Ujung Pandang Industrial Estate Project into a success.

Remarks:

In Japan, the Special Industrial District Development Promotion Act and the New Industrial Cities Development Promotion Act have greatly contributed to the nation's industrialization since 1960. These two acts, which may be classified into the former category stated in (1), cover not only development of industrial estates but that of such related areas as residential zones and of the nearest city, regarding the industrial estate as a part of the city. The purposes of these acts are to work out a development project, to improve infrastructure such as roads and port facilities, to expropriate land and to supply necessary fund for development. Almost all the industrial estates in Japan, including such large-scale industrial estates as those in Kashima, on the east coast of the Bay of Suruga and in Eastern Mikawa, were constructed by the aid of these acts. In most cases, a project was carried out by local public entity itself, but two-thirds of the expenses required for construction or improvement of infrastructure in the estate were financed by the central government and the remaining one-third were covered by the local government. Therefore, generally speaking, enterprises which want to settle themselves into an estate had to bear only land cost and expenses required for land preparation. In those days, the one-third to be covered by the local government are passed on to the price of each lot to be sold, but a burden of a private enterprise is far lighter than that expected to be borne by an Indonesian enterprise which want to settle into the Ujung Pandang Industrial Estate.

The Japan Regional Development Corporation Law belongs to the latter category stated in (2). This corporation, wholly financed by the Japanese Government, is engaged directly in planning, development and management of some porticular industrial estates throughout the country.

ANNEX

i) Background of the Survey

The Government of the Republic of Indonesia presented a written request in November 1975 to the Government of Japan, asking it to undertake a feasibility survey of the industrial estate development project in South Sulawesi. In response, the Japan International Cooperation Agency conducted a pre-feasibility study, and then to carry out a feasibility study, the Agency organized a 10-man team headed by Mikio Abe and dispatched a term for a field survey of the Ujung Pandang Industrial Estate from October 3rd to November 25th, 1976. Based on the materials collected in Indonesia and on the findings of the field survey, the Agency studied the development feasibility of the Industrial Estate and prepared a draft report. After it was explained by the deputy chief of the team to Indonesian governmental agencies, the draft has been made in the form of this report.

ii) Objectives of the Survey

This survey is designed to study the feasibility of the Ujung Pandang Industrial Estate project in the Republic of Indonesia. The report consists of the following chapters:

(1) Objectives of Industrial Estate Development

(2) Analysis of the Investment Environment

(3) Analysis of Industrial Development in the Ujung Pandang Area

(4) Site Identifacation and Investigation

(5) Master Plan of Industrial Estate

(6) Basic Site Design

(7) Environmental Assessment

(8) Stage Development and Cost Estimation

(9) Organization, Administration and Management

(10) Financial and Economic Analysis

(11) Other Considerations for Implimentation

iii) Team Composition

The composition of the Survey Team is as follows:

Chief	Mikio ABE	Director Nomura Research Institute
Deputy Chief	Akira KONNO	President Regional Planning Union
Member	Shoji MIYAZAKI	Yachiyo Engineering Company
Member	Yoshiaki HORIKOSHI	Regional Planning Union
Member	Toshiro HAMADA	Yachiyo Engineering Company
Member	Katsuhiro MASUDA	Yachiyo Engineering Comapny
Member	Hiroyuki FUJIWARA	Nomura Research Institute
Member	Tetsuo WAKUI	Nomura Research Institute
Member	Toshio SATO	Regional Planning Union
Member	Yoshinobu HIRAYAMA	Nomura Research Institute
Member	Toshio HIDA	Industrial Survey Division Mining & Industrial Planning & Survey Department Japan International Cooperation Agency

iv) Field Survey

The survey team conducted the field survey between October 3 and November 25, 1976. During the period, the survey team held talks with officials of the Japanese Embassy in Jakarta, exchanged views with officials of BKPM and BAPPENAS, Indonesian counterparts, collected necessary information and data, and made on-the-spot investigations at several existing industrial estates, including Pulogadung and Ancor. While in Ujung Pandang City, the Japanese team held a series of meetings with the Ujung Pandang Industrial Estate Project Team, the local Indonesian counterpart, the Governor, the Mayor, the staff of universities, the officials of the Bureau of Public Works and the Bureau of Industry of the provincial government, and other related persons. Furthermore, the team visited candidate sites, conducted a series of surveys on the infrastructure, including port and harbor, roads, water supply and electric power, and made interviews actively with major local corporations.

The team worked out an interim report on the basis of the above-mentioned activities and submitted the report to the Government of the Republic of Indonesia before the team's departure from Indonesia.

The following is the detailed schedule of the survey team during the field survey.

Date	Place	Time	Remarks
Oct. 3 (Sun.)		9:45	Leave Tokyo -- First Group (members : Abe (leader), Horikoshi, Fujiwara, Hida, Hirayama)
	Jakarta	18:50	Arrival at Jakarta
Oct. 4 (Mon.)	Jakarta	9:00	Visit to the Japanese Embassy Courtesy call on Ambassador Sunobe Meeting with Messrs. Ohmura and Kanda of the Embassy
		9:30	Courtesy call on Mr. Tsurumi, Director of JICA Jakarta Office.
		10:00	First joint meeting at BKPM BKPM Chairman : Prof. Barli Halim Ir. Isa Kariandinata Drs. Bambang Djatmiko BAPPENAS Head Beurau for Mining, Industry and Electric Power : Ir. Sugeng Sundjaswadi Mrs. Suwarti
		13:00	Prepared the English-language application to obtain permission for the purchase of air-photographs
Oct. 5 (Tue.)	Jakarta	10:00	Visit to Pulogadung Industrial Estate in Jakarta President : M. Surihandono SH Directors : Drs. Susilohutomo Drs. R.G.P. Harahap Ir. M.E.A. Rogahang
Oct. 6 (Wed.)	Jakarta	10:00	Visit to Ancol Industrial Estate in Jakarta Director : S. Hardjosoewirjo Deputy-Director : Ir. Aryanto, others
Oct. 7 (Thu.)	Jakarta	9:45	Leave Jakarta
	Ujung Pandang	12:45	Arrival at Ujung Pandang (called LIP hereafter)
		15:00	Meeting with LIP Industrial Estate Project Team (local counterpart) Drs. Paris Kadir, Mr. Yusuf

Date	Place	Time	Remarks
			Drs. Tanawalinono Ir. Rusdy Ottoluwa Drs. Mohamed Akib Undzir Ing. P. P. Tandilangi Miss Hasmi Syamsul Alam Mr. Amin Hayat (BAPPEDA SUL-SEL) Mr. Agus Dasuki (BKPM), others
Oct. 8 (Fri.)	UP	9:00	Joint meeting with members of the local counterpart team
		15:00	Joint field survey at candidate sites (Nos. 1, 2, 3 and 4 sites)
Oct. 9 (Sat.)	UP	9:00	Courtesy call on General Haji Achmad Lamo, Governor of South Sulawesi Province.
		15:00	Joint field survey at candidate sites (Nos. 5, 6, 7 and 8 sites).
Oct. 10 (Sun.)	UP		Meeting of the team & Classification of collected materials
	Jakarta	18:50	Arrival at Jakarta of Second Group (members : Hamada, Wakui, Sato)
Oct. 11 (Mon.)	Up	8:00	Joint meeting of Land Use Survey Team
		9:00	Joint meeting of Economic Survey Team
	Jakarta	10:00	Visit to BKPM, AGRARIA, and the Ministry of Industry
Oct. 12 (Tue.)	UP	9:00	Joint meeting of Land Use Survey Team Joint meeting of Economic Survey Team
	Jakarta	9:30	Meetings at BKPM and AGRARIA
		11:00	Visit to the Japanese Embassy and JICA Jakarta Office
		13:20	Departure from Jakarta
		16:20	Arrival at UP
Oct. 13 (Wed.)	UP	8:30	Meeting of Land Survey Team
		9:00	Surveys by Land Use Survey Team and Economic Survey Team

Date	Place	Time	Remarks
Oct. 14 (Thu.)	UP	8:00	Investigations at candidate sites (Nos. 1 and No. 3 sites)
		9:00	Distribution survey (Briefing to interviewers on the contents of the questionnaire and the method of interview)
		10:00	Visit to AGRARIA, the Water Supply Bureau and the Traffic Police (LLAJ)
		13:15	Move to Surabaya (Abe and two other members)
	Surabaya	17:00	Courtesy call on Japanese Consul-General Terada in Surabaya
Oct. 15 (Fri.)	UP	9:00	Surveys by Land Use Survey Team, Economic Survey Team and Land Survey Team Meeting of Traffic Survey Team Distribution Survey starts
	Surbaya	10:00	Visit to Surabaya Industrial Estate
Oct. 16 (Sat.)	Surbaya	7:00	Abe moves to Jakarta
		7:45	Two members move to UP
	UP	8:30	Surveys by Land Use Survey Team, Economic Survey Team and Land Survey Team Meeting of Traffic Survey Team Distribution Survey
Oct. 18 (Mon.)	UP	8:00	Preliminary survey by Traffic Survey Team
		9:00	Surveys by Land Use Survey Team and Economic Survey Team
	Jakarta	9:30	Meeting with Mr. Umezawa of Asian Air Survey concerning the map
		10:20	Meetings at BKPM and EXSA International
		10:30	Meeting at the Japanese Embassy
Oct. 19 (Tue.)	UP	7:00	Traffic survey, land use survey (pre-survey)
		8:30	Price survey of industrial products, Distribution survey

Date	Place	Time	Remarks
	Jakarta	8:00	Abe leaves Jakarta (20:30; Arrival at Tokyo)
Oct. 20 (Wed.)	UP	7:00	Traffic Survey, Land use survey
		9:00	Economic Survey (Investigation of private factories) Distribution Survey
		15:30	Investigation at candidate sites (with Mr. Kobayashi of Asian Air Survey)
Oct. 21 (Thu.)	UP	7:00	Land use survey
		8:00	Meeting on surveying
		8:30	Briefing to factory interviewers Distribution survey
		14:00	Investigation of private factories
		15:00	Classification of air-photographs and maps
Oct. 22 (Fri.)	UP	7:30	Surveying of No. 3 candidate site
		8:30	Price survey of industrial products (Examination of data collected in the first survey), Distribution survey
		9:30	Land use survey (Classification of materials)
		14:00	Investigation of private factories
		20:00	Meeting with Mr. Paris Kadir
	Jakarta	19:00	Arrival at Jakarta of Third Group (members : Konno (deputy leader), Miyazaki, Masuda)
Oct. 23 (Sat.)	UP	8:30	Meeting with local counterpart
		9:00	Hearing at IPEDA on administrative district system and fixed asset tax
		10:30	Hearing at the Agricultural Bureau on cultivation Hida moves to Jakarta
	Jakarta	9:30	Third Group pays courtesy call on the Japanese Embassy and JICA

Date	Place	Time	Remarks
Oct. 24 (Sun.)	Jakarta		Meeting between Hida and staff of JICA Jakarta Office
		9:00	Third Group moves to UP
	UP	12:00	Third Group greeted at the airport
		14:00	Meeting and classification of collected materials
Oct. 25 (Mon.)	UP	7:00	Land use survey, Investigation of No. 3 candidate site
		9:00	Hearings at BKPM and BAPINDO
		13:00	Investigation of private factories
		14:00	IPEDA
	Jakarta		Hida leaves for Tokyo
Oct. 26 (Tue.)	UP	7:00	Land use survey
		8:00	Negotiations at AGRARIA to obtain maps
		9:00	Price survey of industrial products Distribution survey (Examination and classification of replies) Bank Negara Indonesia : Hearing
		13:00	Investigation of private factories
		18:00	Meeting of the team members
Oct. 27 (Wed.)	UP	6:30	Konno and a member visit Pare-Pare and Traja (for investigation)
		7:00	Land use survey
		9:00	Hearings at the Development Bureau and the Water Supply Bureau of the provincial government
		10:30	Hearing at Bank Indonesia
		14:00	Investigation of a source of water supply Investigation of private factories

Date	Place	Time	Remarks
Oct. 28 (Thu.)	UP	7:00	Land surveying, Land use survey
		9:00	Hearing at Bank Rakyat, Measurement of current
		10:30	Materials obtained at the Agricultural Bureau
		13:00	Investigation of private factories
		14:00	Materials obtained at IPEDA
		19:30	Konno and a member return from on-the-spot investigation at Pare-Pare and Traja
Oct. 29 (Fri.)	UP	7:00	Land surveying, Land use survey
		10:00	Visit to intake for water supply
		14:00	Measurement of current
		17:00	Preparation of memorandum for Interim Report (Economic Survey Team)
Oct. 30 (Sat.)	UP	8:00	Plenary meeting of the Survey Team
		13:00	Preparation of memorandum for Interim Report (Economic Survey Team)
Oct. 31 (Sun.)	UP	8:00	Investigation aboard a ship
		11:00	Classification of materials
Nov. 1 (Mon.)	UP	7:00	Land surveying
		9:00	Meeting on the price for land purchase Meeting on water quality inspection Classification of materials (Economic Survey Team)
		9:30	Konno leaves for Bone (investigation) Horikoshi moves to Jakarta
Nov. 2 (Tue.)	UP	7:00	Land surveying
		9:00	Meeting on water quality inspection Visit to small-sized iron works and BARATA (State Owned company)
		15:00	Fujiwara and Hirayama move to Jakarta

Date	Place	Time	Remarks
	Jakarta	9:00	Collection of questionnaires at Pulogadung Industrial Estate
Nov. 3 (Wed.)	UP	9:00	Visit to IPEDA, the Water Supply Bureau and Waskita Karya (construction company)
		10:30	Visit to a shipping company
		14:00	Preparation of land utilization map
	Jakarta	9:00	Collection of questionnaires at Ancor Industrial Estate
		11:00	Hearing at BKPM and the Ministry of Agriculture
		15:00	Hearing at JETRO
Nov. 4 (Thu.)	UP	8:30	Classification of materials on land ownership
		9:30	Visit to the Port Management Bureau
		10:00	Survey on boring starts (candidate sites Nos. 1-4)
		13:00	Meeting on water quality inspection Visit to the Telegraph Office
		15:00	Investigation of Nos. 2 & 4 candidate sites
	Jakarta	9:00	Investigation of private factories
		10:00	Discussion at BAPPENAS
		13:00	Briefing of survey results to JICA Jakarta Office
Nov. 5 (Fri.)	UP	8:00	Meeting with local counterpart team
		10:00	Selection of boring sites
		11:00	Visit to the Public Works Bureau of Ujung Pandang City, construction comparies and heavy machinery dealers
		14:30	Hearing on Panakukang Project
	Jakarta	9:00	Greeting to the Japanese Embassy before returning home

Date	Place	Time	Remarks
		11:00	Hearing at JETRO
			Collection of questionnaires at Ancol Industrial Estate
Nov. 6 (Sat.)	UP	8:30	Hearing at the Agricultural Bureau
		9:00	Visit to the Governor Selection of boring sites
		10:00	Visit to the Public Works Bureau
	Jakarta	8:00	Horikoshi, Fujiwara and Hirayama leave for Tokyo
Nov. 7 (Sun.)	UP	16:20	Konno, Hamada, Wakui and Sato move to Jakarta
Nov. 8 (Mon.)	UP	8:00	Selection of boring sites (Nos. 2 & 3 candidate sites)
		10:00	Selection of borrow pit
		14:00	Meeting on BOD inspection
	Jakarta	9:20	Briefing of survey at the Japanese Embassy
		10:30	Greeting to JICA Jakarta Office
		11:00	Hearing at the management office of Pulogadung Industrial Estate
		16:00	Meeting for preparation of Interim Report
Nov. 9 (Tue.)	UP	8:00	Boring, Inspection of test materials
		13:00	Collection of water, Inspection of water quality
	Jakarta	8:00	Preparation of Interim Report
		14:00	Hearing at the management office of Ancol Industrial Estate
		16:00	Preparation of Interim Report
Nov. 10(Wed.)	UP	8:00	Boring, Inspection of test materials
		13:00	Collection of water, Inspection of water quality

Date	Place	Time	Remarks
	Jakarta	8:30	Preparation of Interim Report at BAPPENAS
		14:50	Briefing of survey results at the Embassy
Nov. 11 (Thu.)	UP	8:00	Boring, Inspection of test materials
		13:00	Survey of topographical maps at AGRARIA
	Jakarta	8:30	Interim briefing at BAPPENAS BAPPENAS : Ir. Sugeng Sundjaswadi Mrs. Suwarti BKPM : Ir. Isa Kariadinata Mr. Agus Dasuki S.H. Embassy : Mr. Ohmura, First Secretary Mr. Kanda, Second Secretary JICA : Mr. Onozaki
Nov. 12 (Fri.)	UP	9:00	Investigation of borrow pit Inspection of water quality
	Jakarta	9:00	Briefing of survey results to the Ambassador and the Minister
		13:00	Meeting at BAPPENAS
Nov. 13 (Sat.)	UP	9:00	Investigation of downtown streets and crossings Collection of water, Inspection of water quality
	Jakarta	8:00	Konno, Hamada, Wakui and Sato leave for Tokyo
Nov. 14 (Sun.)	UP	16:20	Miyazaki and Masuda move to Jakarta
Nov. 15 (Mon.)	Jakarta	9:00	Briefing of survey results at the Embassy
		10:00	Greeting to JICA Jakarta Office
		14:00	Meeting at BKPM
Nov. 16 (Tue.)	Jakarta	9:00	Meeting and work at BKPM
Nov. 17 (Wed.)	Jakarta	9:00	Work at BKPM
		11:00	Data collection at the Central Statistics Bureau
Nov. 18 (Thu.)	Jakarta	8:15	Masada leaves for Tokyo
		9:00	Meeting at JICA Jakarta Office

Date	Place	Time	Remarks
		11:00	Data collection at AGRARIA
Nov. 19 (Fri.)	Jakarta	9:00	Data collection at Directorate of Land Registration-Department of Home Affairs Kuninujan Barat
Nov. 20 (Sat.)	Jakarta	10:00	PLN Kuniujan Barah : Selection of air-photographs (No. 3 candidate site) and request for contact printing
Nov. 22 (Mon.)	Jakarta	9:00	Meeting at BKPM Meeting with Mr. Tanawalinono on training
Nov. 23 (Tue.)	Jakarta	10:00	Receive air-photographs from Directorate of Land Registration-Department of Home Affairs Kuninujan Barat
Nov. 24 (Wed.)	Jakarta	9:00	Greeting to the Japanese Embassy before returning home
		10:00	Greeting to JICA Jakarta Office
		11:00	Collection of precipitation data at Lembaga Meteorologi Geofiska
Nov. 25 (Thu.)	Jakarta	8:15	Miyazaki leaves for Tokyo
	Tokyo	19:00	Arrival