

APPENDIX D

LAND USE PLAN AND LAYOUT

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APPENDIX D LAND USE PLAN AND LAYOUT

D.1 General

Appendix-D presents the results of studies on land use plan of five alternative sites designated as New Industrial Estates. Land grading plan, factory lot plan and plan of relevant facilities have also been studied and they are integrated in the land use plan.

In the land grading plan, land elevation has been designed in order to pursue the optimum earthworks and to secure the technically sound industrial estate.

Factory lot planning is studied on the basis of the investor's requirement clarified through the questionnaire survey for investment demand, and basic parameters as lot size, lot form and lot distribution have been planned.

In the plan of relevant facilities, road, park, administrative facilities and service facilities have been planned and preliminarily designed.

D.2 Land Use Plan

Land use plans for the new industrial estates at each alternative site have been developed and designed as shown in Table D-1~D-5 and Figure D-1~D-5.

1) Atherfield Site

Atherfield site is located 57 km east of Colombo and it takes about two (2) hours to drive from the center of Colombo to the site via A4 national road. Some travel time can be saved after 1995 when the improvement is completed by RDA with the financial assistance of ADB.

Atherfield site can be divided into the northern part and southern part by the electric transmission line crossing over the site. The northern part with an area of 67.3 ha (166 acres) is undulated between EL.20 m and 50 m with 10~20 % slope gradient. The southern part with the area of 100.3 ha (248 acres) is more hilly and undulated between EL. 20 m and 100 m with 20~30 % slope.

The southern part of Atherfield site, where many outcrops of hard rocks are observed, is not suitable to be entirely developed as the estate. The northern part could be developed comparatively easily due to gentle gradients.

The following two alternatives for land use have been conceived for comparative analysis:

Alternative A: Large scale development: Central hilly area of the southern part is also developed, as well as the northern part, although the most hilly area in the southern end (EL. 100 m) is precluded from the development.

Alternative B: Medium scale development: The northern part and a part of the southern part are developed. Central mountainous area in the southern part is excluded from the development.

Land use concept of the two alternatives are presented in Figure D-6 and D-7 and area distribution of land use is shown hereunder:

	Alternative A		Alternative B	
	(ha)	(acre)	(ha)	(acre)
1. Factory lot	92.4	228	71.6	176
2. Residential area	3.8	9	3.8	9
3. Road	9.7	24	7.7	19
4. Utility	4.0	10	3.5	9
5. Other facility	7.5	19	7.5	19
6. Reserved green	50.2	124	73.5	182
Total	167.6	414	167.6	414

Area distributed for the factory lot will be 92.4 ha and 71.6 ha for large scale development and medium scale development, respectively. The earthwork volume is estimated to be 4.2 million m³ for Alternative A, and 1.8 million m³ for Alternative B.

Although the area of factory lot for Alternative A exceeds the area of Alternative B by 20.8 ha, earthwork for Alternative A will cost US\$ 8.4 million, or more than double of Alternative B, as shown in Table D-6.

Alternative B, therefore, has been selected as the land use plan for Atherfield site.

2) Martin Site

Martin site is located 4 km north of Chilaw town and 80 km from Colombo. It takes two and half hours to get the site from Colombo via A3 national road.

Martin site is composed of three areas as follows:

(1)	Martin	136.6 ha	(337 acres)
(2)	Manaweliya	29.1 ha	(72 acres)
(3)	Thambanakelly	28.3 ha	(70 acres)
	Total	194.0 ha	(479 acres)

Main portion of Martin site will be the only area studied, because the other two portions, Manaweliya and Thambanakelly, are separated by a branch of the Deduru Oya, and they are difficult to be developed in an integrated manner.

It has been informed that 32 ha (79 acres) of the main portion of Martin will be designated for the tannery and leather industry as follows:

(1)	Tannery (13 investors)	10.5 ha	(26 acres)
(2)	Leather industry	13.4 ha	(33 acres)
(3)	Waste water treatment plant	8.1 ha	(20 acres)
	Total	32.0 ha	(79 acres)

UNIDO is scheduled to cooperate for construction for the waste water treatment plant for the tannery and leather industry at Martin.

Main portion of Martin site is divided into two sites; the western part and the eastern part. In view of the possible offensive odor from tannery and leather industries, separate disposition by type of industry is necessary to create comfortable environment in the industrial estate. Thus, the western part with an area of 45.9 ha has been distributed for tannery and leather industries, and the eastern part with an area of 90.7 ha has been allocated for other industries such as chemical, metal working (plating), food processing, etc. (see Figure D-8).

3) Sirigampola Site

Sirigampola site, with an area of 244.8 ha (605 acres), is located between the A3 road and B28 road. A main access road with the length of 2.2 km should be constructed between the site and A3 national road in order to upgrade the attractiveness and to encourage the promotion of investment. The east entrance which is connected to B28 road will be important when Katunayake to Chilaw highway is realized in the future.

Although factory lot of 130 ha can be obtained at the maximum, lesser area of 34 ha will be developed at the first stage of development in view of the lower investment demand in Sirigampola site.

4) Ekala site

Ekala site is located adjacent to the Ekala interchange of the Colombo - Katunayake highway scheduled to be completed in 1998.

The site with an area of 182 ha designated by the highway, national road A33 and Dandugam Oya river is planned to be utilized for industries, housing, utilities and facilities as shown in Figure D-4.

5) Katana site

Katana site with the area of 59 ha (146 acres) is located 30 km north of Colombo, or about 4 km north of the Katunayake international airport, as shown in Figure D-12.

Katana site is accessible either via Negombo or via road running to the northeastern end of runway of the airport. In the event that Colombo-Katunayake highway is constructed (scheduled for 1998), the site will have an easy access to the airport and Colombo port.

The land is owned by the State. Paddy fields extend along the Kimbulapitiya Ola, and filling work in paddy field will be necessary. Filling area is approximately 15 ha and filling volume is estimated to be 150,000 m³.

D.3 Lot Formulation Plan

A number of prospective investors in the new industrial estates, identified through the investment demand survey, are summarized in Table D-7~D-10 with the investors' requirement for factory land as well as number of employees.

It has been presumed that one hundred ninety five (195) prospective investors are expected from Sri Lanka, Japan and other countries and that their distribution would be as follows:

	Number of investor
Sri Lanka	81
Japan	36
NIES	37
Europe/USA	41
Total	195

These number of investors, type of industry and lot area requirement will be utilized solely for the purpose of designing a land use plan.

Investors are sorted and distributed to each industrial estate by type of industry in the light of the development strategy for the industrial estates. Thus, the development area required for the new industrial estates is presumed as shown in Table D-11~D-15 and as summarized hereunder:

	Factory Lot Demand (ha)
Atherfield	45 ~ 80
Martin	60 ~ 85
Sirigampola *	25 ~ 45
Ekala	60 ~ 120
Katana	36 ~ 67

Remark: * Demand of Sirigampola site and Ekala site are duplicated with the demand of Katana.

D.4 Grading Plan

1) Atherfield site

Atherfield site is undulated as shown in Figure D-9, and cut and filling work is necessary. Grading plan has been designed under following assumptions:

Maximum gradient of Main road:	5%
Maximum gradient of Submain road:	7%
Slope gradient (cut area)	1:1.5
Slope gradient (filling area)	1:2.0
Gradient of factory lot:	0.5%~2%

Cut volume and filling volume have been designed to balance, to the maximum extent, within the site so that no transport of earth from/to outside of the site have been envisaged. Earth work volume will be 1.8 million m³ for cut and 1.7 million m³ for filling as shown in Table D-6. Cut and filling areas are presented in Figure D-10. A difference of 0.1 million m³ between cut and fill is assumed as rock and it is planned to be transported out of the site.

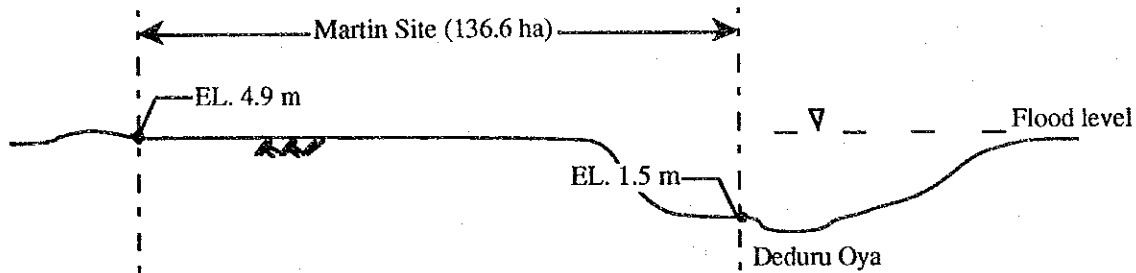
Note: Five percent of total cut volume is assumed as rock, based on the experiences at Biyagama BPZ developed by BOI.

2) Martin site

Since Martin site has been occasionally flooded by the Deduru Oya, the land should be filled to prevent flooding in the industrial estate.

Elevation of Martin site is estimated to be 1.5 m AMSL on the south boundary and 4.9 m AMSL on the north boundary, according to the map and field observation. On the other hand, high water level of the Deduru Oya near Martin site is estimated by means of probability analysis of water level records from 1979 to 1992.

Flood level (m)	Return period (year)
4.55	10
5.06	30
5.29	50
5.61	100



Fill volume for Martin site has been calculated as summarized hereunder, assuming that one fifth of the site is to be filled.

Return period (year)	Flood level (m)	Grading level (m)	Filling volume* (million m ³)
10	4.55	4.90	0.50
30	5.06	5.40	1.20
50	5.29	5.70	1.60
100	5.61	6.00	2.00

Remark: * Assumed that one fifth of site (30 ha) is low land according to the site reconnaissance.

Considering the serious damage to be caused by floods, the return period should be more than 30 years. Accordingly, the grading elevation at Martin estate is designed to be 5.4 m AMSL. It is estimated that 1.2 million m³ is required as fill volume. Earth for filling could be obtained from the river bed of the Deduru Oya river or hilly areas in the vicinity. Detail investigation on a borrow pit should be done during the design stage.

3) Sirigampola site

Land of Sirigampola site was originally used for coconut plantations and it is almost flat. Therefore, cut and fill work will be unnecessary except for the surface clearing work.

4) Ekala site

Ekala site is currently used for paddy field and a part of the site is swampy. The site should be filled to improve the bearing capacity of the ground and to drain rain water from

Ekala site. For the filling, two meters in thickness is estimated on an average, judging from the site reconnaissance. Fill volume will be 3.0 million m³ for the site of Ekala, except for retention pond and buffer green.

The planned retention ponds with an area of 12.5 ha will be utilized as a source of fill. If the depth of retention pond is designed to be 20 m, cut volume from the retention pond will be 2 million m³. Another 1 million m³ of earth will have to be obtained from another borrow pit. The hilly area located at 5 km to be east from the site could be a possible borrow pit.

5) Katana site

Katana site is currently used as coconut plantation (44 ha) and paddy field (15 ha). Paddy field should be filled by the earth, so as not to be damaged by the flood of the Kimbulapitiya river and to improve the bearing capacity of the ground in the estate.

The filling will be one meter in thickness on an average, and filling volume will be 150,000 m³ to cover all the site of Katana except for retention pond.

D.5 Plan of Other Facilities

D.5.1 Road

1) Internal road network

Three types of road are proposed as follows:

- (1) Boulevard: 4 lanes with wide pedestrian way, ROW is 23.0 m
- (2) Main road: 2 lanes with wide pedestrian way, ROW is 14.0 m
- (3) Submain road: 2 lanes with pedestrian way, ROW is 11.0 m

Typical cross sections of the above roads are presented in Figure D-11.

2) Access road

Access roads for each site are planned as shown in Figure D-12.

Atherfield

The access road to the Atherfield site should be improved as the existing road is narrow. The length of road to be improved between the entrance of the site and A4 national road will be approximately 650 m.

Martin

An access road is unnecessary because national highway can serve Martin industrial estate directly.

Sirigampola

A main access road with the length of 2.2 km should be constructed between the site and A3 national road at the full development stage.

Ekala

An access road is unnecessary because national road A33 directly serves to Ekala site and it is connected to the interchange of Colombo - Katunayake highway.

Katana

Improvement work of the access road between Katana site and the entrance of the Katunayake airport is recommended. Extension of the Colombo - Katunayake highway up to Katana site is most preferable.

D.5.2 Residential Area

Residential area has been planned in the new industrial estates in order to accommodate workers and their families, in due consideration of residential problems reported in the existing export processing zones. Residential plots are salable to investors who want to construct dormitories for their employees.

Area to be planned for dormitories and houses has been estimated as summarized hereunder.

Site	No. of employee			Residential plan							
				Dormitory		Family type		Total Resident	Required area (ha)		
	Single	Married	Total	Resident (Rooms)	Resident	(Unit)	Dor- mitory /2		/1 House	Total	
Atherfield	8,000	1,200	20,000	3,800	760	-	-	3,800	3.8	-	3.8
Martin	3,600	5,400	9,000	4,000	800	1,300	250	5,300	4.0	2.6	6.6
Sirigampola	1,400	2,200	3,600	1,400	280	2,700	550	4,100	1.4	5.3	6.7
Ekala	5,000	7,000	12,000	5,000	1,000	8,000	1,600	13,000	5.0	16.0	21.0
Total	18,000	26,600	44,600	14,200	2,840	12,000	2,400	26,200	-	-	-

Remarks: /1 100 residents/ha
/2 500 residents/ha
/3 5 members/room
/4 5 members/unit
/5 There is no residence in Katana estate.

D.5.3 Industrial Park Center

An industrial park center with maintenance and operation office, business center, etc. will be constructed as a core of new industrial estate. Facilities necessary for the industrial park center are summarized hereunder.

	Floor (m ²)	Site (m ²)
1. Administrative O/M Center (inclusive of promotion office)	1,000*	5,750
2. Post office	50*	
3. Fire station	150*	
4. Business center (bank, courier serv., etc.)	450	
5. Governmental office (custom, local govt. BOI, police etc.)	300*	
6. Amenities (restaurant, clinic, kiosk, nursery, etc.)	500	
7. Sports facilities (ball courts, etc.)	-	2,000
8. Others (car parking, etc.)	-	2,250
Total	2,450	10,000

* These facilities will be constructed reimbursed by the development body of Industrial Estate.

D.5.4 Training Center

The training center is expected to function as a vocational center as well as a research and development institute. A recruitment service, vocational training and computer business

service will be available for investors in the industrial estate. Site areas and floor areas are assumed as follows:

Site area: 1.2~3.8 ha
Total floor area: approx. 6,000 m²

D.5.5 Park

The total area of the park should not be less than 3 % of the total area of the estate in order to upgrade the aesthetic attractiveness of the industrial estate and the amenities for employees who work in the industrial estate. Facilities to be equipped in the park are presented hereunder:

- Athletic facility: multi purpose field, ball court, etc.
- Common space: open field
 - vegetation area
 - promenade etc.
- Play ground

D.6 Employment Opportunity

Through development of the industrial estates, employment opportunities are created. In accordance with the lot formulation plan noted in Chapter D.3 and the standard number of employees per unit of land, the prospective factory area and prospective number of employees at each estate have been preliminarily estimated as shown in Table D-16 and as summarized hereunder.

Estate	Nos. of Employees
Atherfield estate	20,000
Martin estate	9,000
Sirigamgola estate	3,600
Ekala estate	12,000
Katana estate	4,700

Table D-1 LAND USE PLAN OF ATHERFIELD SITE

	Area (ha)	Ratio (%)	Remarks
1 Factory lot	71.6	42.7	
2 Residential area	3.8	2.3	
3 Road	7.7	4.6	
1) Boulevard	2.7	1.6	1,170m x 23m=2.7 ha
2) Main road	2.4	1.4	1,710m x 14m=2.4 ha
3) Sub main road	2.6	1.6	2,360m x 11m=2.6 ha
4 Industrial park center	1.0	0.6	
5 Training center	1.3	0.8	
6 Park	5.2	3.1	
7 Utilities	3.5	2.1	
1) Water purification plant	0.4	0.2	
2) Sewage treatment plant	1.5	0.9	
3) Electric sub-station	0.5	0.3	
4) Telecommunication center	0.1	0.1	
5) Solid waste disposal site	1.0	0.6	
8 Green (reserve, buffer green and slope)	73.5	43.9	
Total	167.6	100.0	

Table D-2 LAND USE PLAN OF MARTIN SITE

	Area (ha) (1st phase)	Ratio (%)	Remarks
1 Factory lot	83.9	(28.5)	61.4
2 Residential area	6.6	(0.0)	4.8
3 Road	7.5	(3.0)	5.5
1) Main road	6.3	(2.0)	4.6 4,500m x 14m=6.3 ha
2) Sub main road	1.1	(0.9)	0.8 940m x 11m=1.1ha
3) Pedestrian way	0.1	(0.1)	0.1 80m x 6m=0.1ha
4 Industrial park center	0.8	(0.8)	0.6
5 Training center	1.2	(1.2)	0.9
6 Park	5.3	(1.1)	3.9
7 Utilities	16.2	(10.3)	11.9
1) Water purification plant	1.5	(0.0)	1.1
2) Sewage treatment plant(for tanneries)	10.2	(10.2)	7.5
3) Sewage treatment plant(general)	2.5	(0.0)	1.8
4) Electric sub-station	0.3	(0.0)	0.2
5) Telecommunication center	0.1	(0.0)	0.1
6) Solid waste disposal site	1.6	(0.0)	1.2
8 Buffer green	15.1	(1.0)	11.1
Total	136.6	(45.9)	100.0

Table D-3 LAND USE PLAN OF SIRIGAMPOLA SITE

	Area (ha)	Ratio (%)	Remarks
1 Factory lot	34.5	14.1	
2 Residential area	6.7	2.7	
3 Road	4.2	1.7	
1) Main Road	1.4	0.6	1,000m x 14m=1.4 ha
2) Sub main road	2.8	1.1	2,500m x 11m=2.8ha
4 Industrial park center	2.3	0.9	
5 Training center	3.8	1.6	
6 Park	7.3	3.0	
7 Utilities	8.2	3.3	
8 Buffer green	24.0	9.8	
9 Marshy land	33.2	13.6	
Sub-total	124.2	50.7	
10 Future expansion area	120.6	49.3	
1) Factory lot	94.8	38.7	
2) Residential area	3.8	1.6	
3) Road	10.9	4.5	
4) Buffer green	9.5	3.9	
5) Electric transmission line	1.6	0.7	
Total	244.8	100.0	

Table D-4 LAND USE PLAN OF EKALA SITE

	Area (ha)	Ratio (%)	Remarks
1 Factory lot	93.4	51.2	
2 Residential area	21.0	11.5	
3 Road	11.8	6.5	
1) Boulevard	5.1	2.8	2,200m x 23m=5.1ha
2) Main road	4.8	2.6	3,450m x 14m=4.8ha
3) Sub main road	1.9	1.0	1,750m x 11m=1.9ha
4 Industrial park center	1.2	0.7	
5 Training center	1.5	0.8	
6 Park	12.5	6.8	
7 Utilities	6.7	3.7	
1) Water purification plant	1.7	0.9	
2) Sewage treatment plant	2.0	1.1	
3) Electric sub-station	1.0	0.5	
4) Telecommunication center	0.2	0.1	
5) Solid waste disposal site	1.8	1.0	
8 Retention pond	12.5	6.8	
9 Buffer green	21.9	12.0	
Total	182.5	100.0	

Table D-5 LAND USE PLAN OF KATANA SITE

	Area (ha)	Ratio (%)	Remarks
1 Factory lot	44.0	74.6	
2 Residential area			
3 Road	4.1	6.9	
1) Boulevard	0.7	1.2	300m x 23m=0.7ha
2) Main road	1.6	2.7	1,150m x 14m=1.6ha
3) Sub main road	1.8	3.1	1,600m x 11m=1.8ha
4 Industrial park center	1.2	2.0	
5 Training center	1.0	1.7	
6 Park	1.8	3.1	
7 Utilities	1.7	2.9	
1) Water purification plant	0.5	0.8	
2) Sewage treatment plant	0.8	1.3	
3) Electric sub-station	0.1	0.2	
4) Telecommunication center	0.1	0.2	
5) Solid waste disposal site	0.2	0.4	
8 Retention pond	3.0	5.1	
9 Buffer green	2.2	3.7	
Total	59.0	100.0	

Table D-6 COMPARISON OF EARTH VOLUME
(Alternative for ATHERFIELD SITE)

Alternative	1) Earth Volume (million m3)		2) Earth Work Cost
	Cut	Fill	1) x 2\$/m3 (million \$)
A	4.2	4.0	8.4
B	1.8	1.7	3.6
Difference	2.4	2.3	4.8

Table D-7 PROSPECTIVE INVESTORS FROM SRI LANKA

No	ISIC	No. of possible Investors	Required site area (ha/lot) /1	Required employee (/lot) /1	No. of local investors by site /2			
					Aherfield	Martin	Sirigampola	Others
1	3111 Meat processing	1	1.0~1.9	26~99	1			
2	3117 Bakery products	1	10.0~	1000~		1		
3	3220 Apparel	11	1.0~1.9	100~499	8	3		
4	3231 Tannery	13	0.8	100		13		
5	3233 Leather products	17	0.8	100		17		
6	3412 Box (paper)	1	1.0~1.9	100~499	1			
7	3513 Chemical	2	0.2~0.4	-	1	1		
8	3559 Rubber	12	2.0~5.0	100~499	8	2		2
9	3560 Plastic products	5	0.5~1.0	26~99	1	4		
10	362 Glass products	1	0.2	26~99		1		
11	369 Non-metal mineral products	1	1.0~1.9	26~99	1			
12	381 Fabricated metal products	5	0.5~1.0	100~499	3	1		1
13	381 Fabricated metal (plating)	2	0.5~1.0	26~99		1		1
14	382 Machinery	4	1.0~1.9	100~499	2			2
15	383 Electric machinery	1	0.2~0.4	100~499		1		
16	3901 Gems	4	1.0~1.9	100~499	2			2
Total		81	-	-	28	45	0	8

Remarks: /1 Most prospective investors are selected based on the result of interview survey.
/2 Site area and number of employee are assumed on the basis of the results of interview survey conducted by JICA study team and existing data concerning basic unit for industrial location.
/3 Site allocation is assumed based on the results of interview survey.
/4 Data planned in relocation programme of polluted industry by MIST.

Table D-8 PROSPECTIVE INVESTORS FROM JAPAN

No	ISIC	No. of possible Investors	Required site area (ha/lot) /1	Required employee (/lot) /1	No of Japanese investors by site /2			
					Atherfield	Martin	Sirigampola	Other
1	3121 Food	1	0.5~0.9	100~499	1			
2	3212 Made-up textile goods	1	-	26~99	1			
3	3220 Apparel	1	0.2~0.4	26~99	1			
4	3233 Leather products	1	(0.5~1.0)	100~499			1	
5	3513 Chemical	2	2.0~4.9	100~499			2	
6	3522 Drugs	1	2.0~4.9	26~99			1	
7	3559 Rubber	1	0.2~0.4	5~25	1			
8	3819 Plating and polishing	1	(1.0~2.0)	(26~99)			1	
9	3822 Agricultural machinery	1	1.0~1.9	26~99			*1	1
10	3823 Metal working machinery	1	-	5~25			*1	1
11	3829 Other machinery	2	1.0~1.9	26~99			*2	2
12	383 Electric machinery	6	1.0~1.9	100~499			*6	6
13	3851 Professional machinery	1	-	-			*1	1
14	3903 Athletic goods	4	1.0~1.9	-				4
15	3909 Others (Button, Toy, Pencil)	12	1.0~1.9	26~99				12
Total		36	-	-	4	5	*11	27

Remarks: /1 Site area and number of employee in the parentheses are assumed on the basis of "Report on Industrial Location Basic Unit, Japan Industrial Location Center."
 Site area and number of employee without parentheses are assumed on the basis of the results of questionnaire survey conducted by JICA study team in Japan.
 /2 Site allocation is assumed considering the characteristics of each site described in Chapter 5 "Development Strategy of New Industrial Estate."
 * Demand for Sirigampola site is duplicated with the other site.

Table D-9 PROSPECTIVE INVESTORS FROM NIES

No	ISIC	/1		/2		Required site area (ha) /3	Required employee /3	No of NIESinvestors by site /5					
		1) No. of Japanese Investors	2) Expansion Factor (times)	3) No. of NIES Investor 1) x 2)					Atherfield	Martin	Sirigampola	Other	
1	3220	Apparel	2	3	6	~1.0~	1000	6					
2	3560	Plastic products	-	-	3 /6	~1.0~	200			3			
3	381	Fabricated metal	1	1	1	1.0~1.9 /4	110			1			
4	383	Machinery	6	0.5	3	1.0~1.9 /4	100 /4					*3	3
5	390	Others (toy, etc.)	16	1.5	24	0.5~0.9	300	12					12
Total			-		37	-	-	18	4	*3			15

Remarks: /1 Possible number of Japanese investors according to the results of interview survey.
/2 Expansion factor is assumed on the basis of the number of existing enterprises approved by GCEC.
/3 Factory lot area and number of employee are assumed based on the existing data of NIES enterprises established in KEPZ and BEPZ.
/4 These numbers are assumed same as Japanese investors' demand.
/5 Site allocation is assumed considering the characteristics of each site described in Chapter 5 "Development Strategy of New Industrial Estate."
/6 Five percents of total investors are assumed as Plastic industries considering existing data of NIES enterprises approved by GCEC.
*Demand for Sirigampola site is duplicated with th other site.

Table D-10 PROSPECTIVE INVESTORS FROM EUROPE AND USA

No	ISIC	/1		/2		Required site area (ha) /3	Required employee /3	No of Europe and USA investors by site /5					
		1) No. of Japanese Investors	2) Expansion Factor (times)	3) No. of Europe /USA Investor 1) x 2)	/6			/4	/3	Atherfield	Martin	Sirigampola	Others
1	3220	Apparel	2	2.5	5	~1.0~	1000	5					
2	3560	Plastic products	-	-	2 /6	~1.0~	200			2			
3	381	Fabricated metal	1	1	1	1.0~1.9 /4	40			1			
4	383	Machinery	6	1.5	9	1.0~1.9 /4	110				*9	9	
5	390	Others (jewellery, etc.)	16	1.5	24	0.5~0.9	300	12				12	
Total			-		41	-	-	17	3	*9		21	

Remarks: /1 Possible number of Japanese investors according to the results of interview survey.
/2 Expansion factor is assumed on the basis of the number of existing enterprises approved by GCEC.
/3 Factory lot area and number of employee are assumed based on the existing data of Europe and USA enterprises established in KBPZ and BBPZ.
/4 These numbers are assumed as same as Japanese investors' demand.
/5 Site allocation is assumed considering the characteristics of each site described in Chapter 5 "Development Strategy of New Industrial Estate."
/6 Five percents of total investors are assumed as Plastic industries considering existing data of Europe and USA enterprises approved by GCEC.
* Demand for Sirigampola site is duplicated with the other site

Table D-11 ASSUMED DEVELOPMENT DEMAND FOR ATHERFIELD SITE

ISIC	No. of Investors					Unit Area (ha/lot)								Factory Area Required (ha)										
	Sri Lanka		Europe			Minimum				Maximum				Minimum				Maximum						
	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA	Total	
311	Food	1	1			2	1.00	0.50			2.00	1.00			1.00	0.50			1.50	2.00	1.00			3.00
321,2	Textile, Apparel	8	2	6	5	21	1.00	0.25	0.25	1.00	2.00	0.50	0.50	1.00	8.00	0.50	1.50	5.00	15.00	16.00	1.00	3.00	5.00	25.00
323,4	Leather, Footwear																							
33	Wood products																							
34	Paper products	1				1	1.00				2.00			1.00				1.00		2.00				2.00
35	Chemical products																							
355	Rubber products	10	1			11	1.00	0.25			2.00	0.50		10.00	0.25			10.25	20.00	0.50				20.50
36	Non metal mineral products	1				1	1.00				2.00			1.00				1.00		2.00				2.00
381	Fabricated metal products																							
382-9	Machinery																							
3901	Gems	2			12	14	1.00		0.50		2.00		1.00	2.00		6.00	8.00	8.00	4.00				12.00	16.00
3902-9	Others(Toy, etc.)			12		12		0.50				1.00			6.00	6.00		6.00				12.00		12.00
	Total	23	4	18	17	62								23.00	1.25	7.50	11.00	42.75	46.00	2.50	15.00	17.00		80.50

Remark /1 Chemical industry, leather industry and fabricated metal industry of Sri Lanka are not distributed to Atherfield site due to environmental reason in spite of their preference of Atherfield site.
Machinery is distributed to Sirigampola site and Ekela site instead of Atherfield site.

Table D-12 ASSUMED DEVELOPMENT DEMAND FOR MARTIN SITE

ISIC	No. of Investors					Unit Area (ha/lot)								Factory Area Required (ha)										
	/1		Europe			Minimum				Maximum				Minimum					Maximum					
	Sri Lanka	Japan	NIES	USA	Total	Sri Lanka	Japan	NIES	USA	Sri Lanka	Japan	NIES	USA	Sri Lanka	Japan	NIES	USA	Total	Sri Lanka	Japan	NIES	USA	Total	
311	Food	1				1	10							10.00					10.00	10.00				10.00
321,2	Textile, Apparel	3				3	1.00							2.00					3.00	6.00				6.00
323,4	Leather, Footwear	/2	1			31	0.80	0.50						1.00	1.00				24.00	0.50				24.50
33	Wood products																							
34	Paper products																							
35	Chemical products	7	3	3	2	15	0.25	2.00	1.00	1.00	0.50	5.00	1.00	1.00	1.75	6.00	3.00	2.00	12.75	3.50	15.00	3.00	2.00	23.50
355	Rubber products	2				2	1.00				2.00			2.00					2.00	4.00				4.00
36	Non metal mineral products	1				1	0.25				0.25			0.25					0.25	0.25				0.25
381	Fabricated metal (plating)	2	1	1	1	5	0.50	1.50	2.00	1.00	1.00	1.50	5.00	2.00	1.00	1.50	2.00	1.00	5.50	2.00	1.50	5.00	2.00	10.50
382-9	Machinery																							
3901	Gems																							
3902-9	Others																							
	Total	46	5	4	3	58								42.00	8.00	5.00	3.00	58.00	55.75	17.50	8.00	4.00		85.25

Remark: /1 Chemical industry, leather industry and fabricated metal industry (plating) of Sri Lanka investor which desired to locate in Atherfield site in the interview survey shall be planned to distribute to Martin site in order not only to build integrated plating equipment but to construct the comprehensive environmental countermeasure. Machinery is distributed to Sirigampola site and Ekala site instead of Martin site, on the other hand. /2 Tannery(13 investors,10.5 ha) and leather industries(13.4 ha) will be invested according to MIST's plan.

Table D-13 ASSUMED DEVELOPMENT DEMAND FOR SIRIGAMPOLA SITE

ISIC	No. of Investors					Unit Area (ha/lot)								Factory Area Required (ha)								
	Sri Lanka		Europe			Minimum				Maximum				Minimum				Maximum				
	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA
311	Food																					
321,2	Textile, Apparel																					
323,4	Leather, Footwear																					
33	Wood products																					
34	Paper products																					
35	Chemical products																					
355	Rubber products																					
36	Non metal mineral products																					
381	Fabricated metal products																					
382-9	11	3	9	23		1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	11.00	3.00	9.00	23.00	22.00	6.00	18.00	46.00	
3901	Gems																					
3902-9	Others																					
Total	11	3	9	23										11.00	3.00	9.00	23.00	22.00	6.00	18.00	46.00	

Table D-14 ASSUMED DEVELOPMENT DEMAND FOR THE OTHER (EKALA) SITE

ISIC	No. of Investors					Unit Area (ha/lot)								Factory Area Required (ha)									
	Sri Lanka		Europe			Minimum				Maximum				Minimum					Maximum				
	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA	Total
311	Food																						
321,2	Textile, Apparel																						
323,4	Leather, Footwear																						
33	Wood products																						
34	Paper products																						
35	Chemical products																						
355	/1 Rubber products																						
36	Non metal mineral products																						
381	5				5	0.50				1.00				2.50				2.50	5.00				5.00
382-9	5	11	3	9	28	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	5.00	11.00	3.00	9.00	28.00	5.00	22.00	6.00	18.00	51.00
3901	2			12	14	1.00			0.50	2.00			1.00	2.00			6.00	8.00	4.00			12.00	16.00
3902-9		16	12		28		1.00	0.50		2.00	1.00			16.00	6.00		22.00		32.00	12.00			44.00
Total	12	27	15	21	75									9.50	27.00	9.00	15.00	60.50	14.00	54.00	18.00	30.00	116.00

Remark: /1 Rubber industry will not be distributed to Ekala site in lie of the preference to Ekala site.

Table D-15 ASSUMED DEVELOPMENT DEMAND FOR THE OTHER (KATANA) SITE

ISIC	No. of Investors					Unit Area (ha/lot)								Factory Area Required (ha)										
	Sri Lanka		Europe		Total	Minimum				Maximum				Minimum					Maximum					
	Lanka	Japan	NIES	USA		Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Lanka	Japan	NIES	USA	Total	Lanka	Japan	NIES	USA	Total	
381	Fabricated /1 metal products	7	1	1	1	10	0.50	1.50	2.00	1.00	1.00	1.50	5.00	2.00	3.50	1.50	2.00	1.00	8.00	7.00	1.50	5.00	2.00	15.50
382-9	Machinery	5	11	3	9	28	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	5.00	11.00	3.00	9.00	28.00	5.00	22.00	6.00	18.00	51.00
	Total	12	12	4	10	38									8.50	12.50	5.00	10.00	36.00	12.00	23.50	11.00	20.00	66.50

Remark: /1 Non-polluting type metal industry

Table D-16 PROJECTION OF NUMBER OF EMPLOYEE AND AREA OF PROSPECTIVE FACTORY

NUMBER OF EMPLOYEE -ATHERFIELD SITE-

ISIC	(1) Lot Area (ha)					(2) Unit No. of Employee (ha)				(3) No. of Employee ((1) x (2))					Average No. of Employee (ha)
	Europe					Europe				Europe					
	Sri Lank	Japan	NIES	USA	Total	Sri Lank	Japan	NIES	USA	Sri Lank	Japan	NIES	USA	Total	
311 Food	2.00	1.00			3.00	50	350			100	350			450	150
321,2 Textile,apparel	16.00	1.00	3.00	5.00	25.00	175	200	1000	1000	2,800	200	3,000	5,000	11,000	440
323 Leather, Footwear															
34 Paper products	2.00				2.00	175				350				350	175
35 Chemical products															
355 Rubber products	20.00	0.50			20.50	75	50			1,500	25			1,525	74
36 Non metal products	2.00				2.00	50				100				100	50
381 Fabricated metal															
382 Machinery															
3901 Gems	4.00			12.00	16.00	175			300	700			3,600	4,300	269
3909 Others(toy,etc.)			12.00		12.00			450				5,400		5,400	450
Total	46.00	2.50	15.00	17.00	80.50					5,550	575	8,400	8,600	23,125	287

Planned number of employee adjusted with land use plan=71.6ha x 287= 20,000

NUMBER OF EMPLOYEE -MARTIN SITE-

ISIC	(1) Lot Area (ha)					(2) Unit No. of Employee (ha)				(3) No. of Employee ((1) x (2))					Average No. of Employee (ha)
	Europe					Europe				Europe					
	Sri Lank	Japan	NIES	USA	Total	Sri Lank	Japan	NIES	USA	Sri Lank	Japan	NIES	USA	Total	
311 Food	10.00				10.00	100				1,000				1,000	100
321,2 Textile,apparel	6.00				6.00	175				1,050				1,050	175
323 Leather, Footwear	30.00	1.00			31.00	100	350			3,000	350			3,350	108
34 Paper products															
35 Chemical products	3.50	15.00	3.00	2.00	23.50	75	75	200	200	263	1,125	600	400	2,388	102
355 Rubber products	4.00				4.00	75				300				300	75
36 Non metal products	0.25				0.25	300				75				75	300
381 Fabricated metal	2.00	1.50	5.00	2.00	10.50	100	50	110	40	200	75	550	80	905	86
382 Machinery															
3901 Gems															
3909 Others(toy,etc.)															
Total	55.75	17.50	8.00	4.00	85.25					5,888	1,550	1,150	480	9,068	106

Planned number of employee adjusted with land use plan=83.9ha x 106= 9,000

NUMBER OF EMPLOYEE -SIRIGAMPOLA SITE-

ISIC	(1) Lot Area (ha)					(2) Unit No. of Employee (ha)				(3) No. of Employee ((1) x (2))					Average No. of Employee (ha)
	Europe					Europe				Europe					
	Sri Lank	Japan	NIES	USA	Total	Sri Lank	Japan	NIES	USA	Sri Lank	Japan	NIES	USA	Total	
382 Machinery		22.00	6.00	18.00	46.00			100	100	110	2,200	600	1,980	4,780	104
Total		22.00	6.00	18.00	46.00						2,200	600	1,980	4,780	104

Planned number of employee adjusted with land use plan=34.5ha x 104= 3,600

NUMBER OF EMPLOYEE -EKALA SITE-

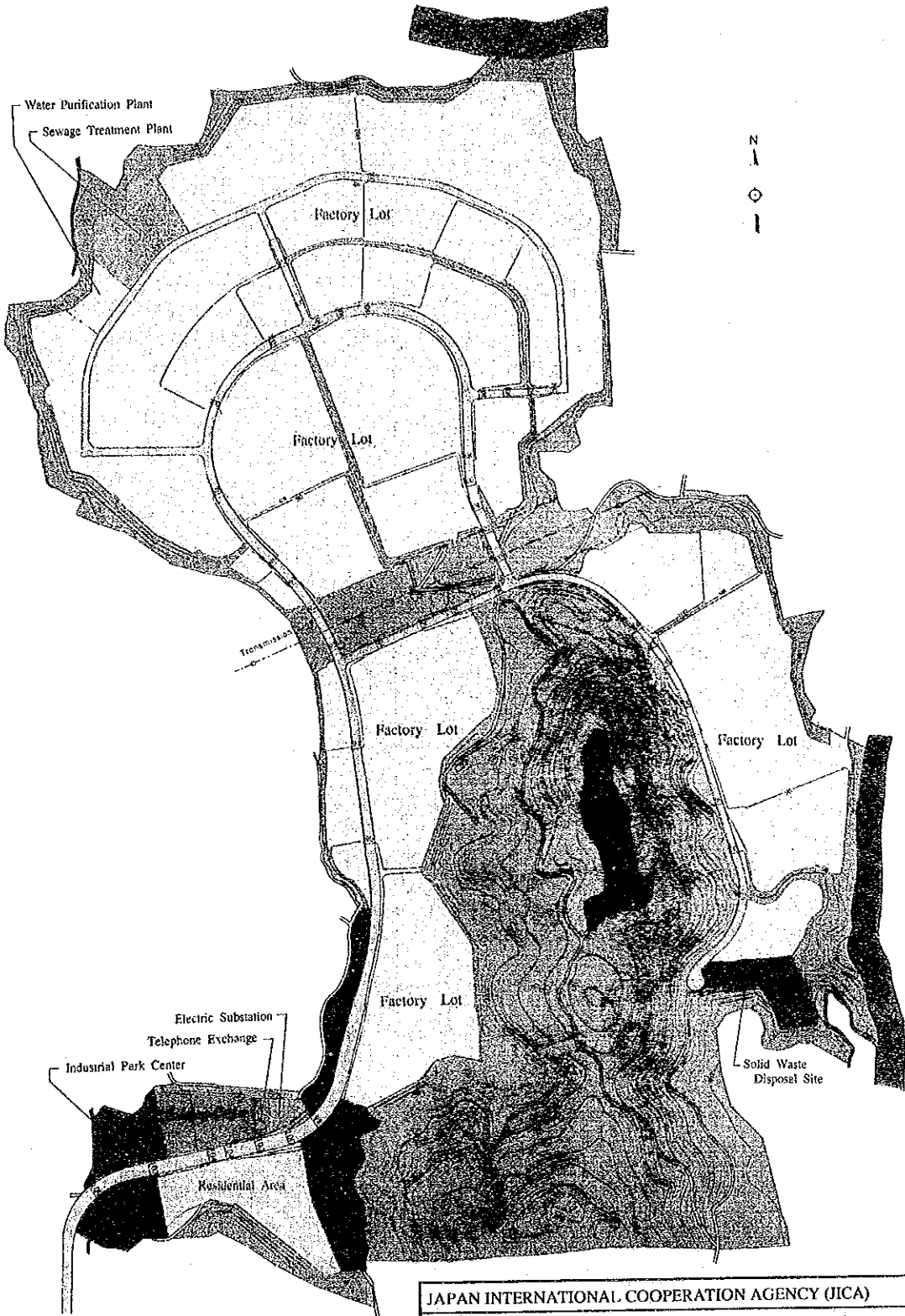
ISIC	(1) Lot Area (ha)					(2) Unit No. of Employee (ha)				(3) No. of Employee ((1) x (2))					Average No. of Employee (ha)
	Europe					Europe				Europe					
	Sri Lank	Japan	NIES	USA	Total	Sri Lank	Japan	NIES	USA	Sri Lank	Japan	NIES	USA	Total	
381 Fabricated metal	5.00				5.00	200				1,000				1,000	200
382 Machinery	5.00	22.00	6.00	18.00	51.00	100	100	100	110	500	2,200	600	1,980	5,280	104
3901 Gems	4.00				16.00	175			300	700			3,600	4,300	269
3909 Others(toy,etc.)		32.00	12.00		44.00		40	300			1,280	3,600		4,880	111
Total	14.00	54.00	18.00	30.00	116.00					2,200	3,480	4,200	5,580	15,460	133

Planned number of employee adjusted with land use plan=93.4ha x 133= 12,000

NUMBER OF EMPLOYEE -KATANA SITE-

ISIC	(1) Lot Area (ha)					(2) Unit No. of Employee (ha)				(3) No. of Employee ((1) x (2))					Average No. of Employee (ha)
	Europe					Europe				Europe					
	Sri Lank	Japan	NIES	USA	Total	Sri Lank	Japan	NIES	USA	Sri Lank	Japan	NIES	USA	Total	
381 Fabricated metal	5.50	1.50	2.00	1.00	10.00	150	50	110	40	825	75	220	40	1,160	116
382 Machinery	5.00	13.00	5.00	11.00	34.00	100	100	100	110	500	1,300	500	1,210	3,510	103
Total	10.50	14.50	7.00	12.00	44.00					1,325	1,375	720	1,250	4,670	106

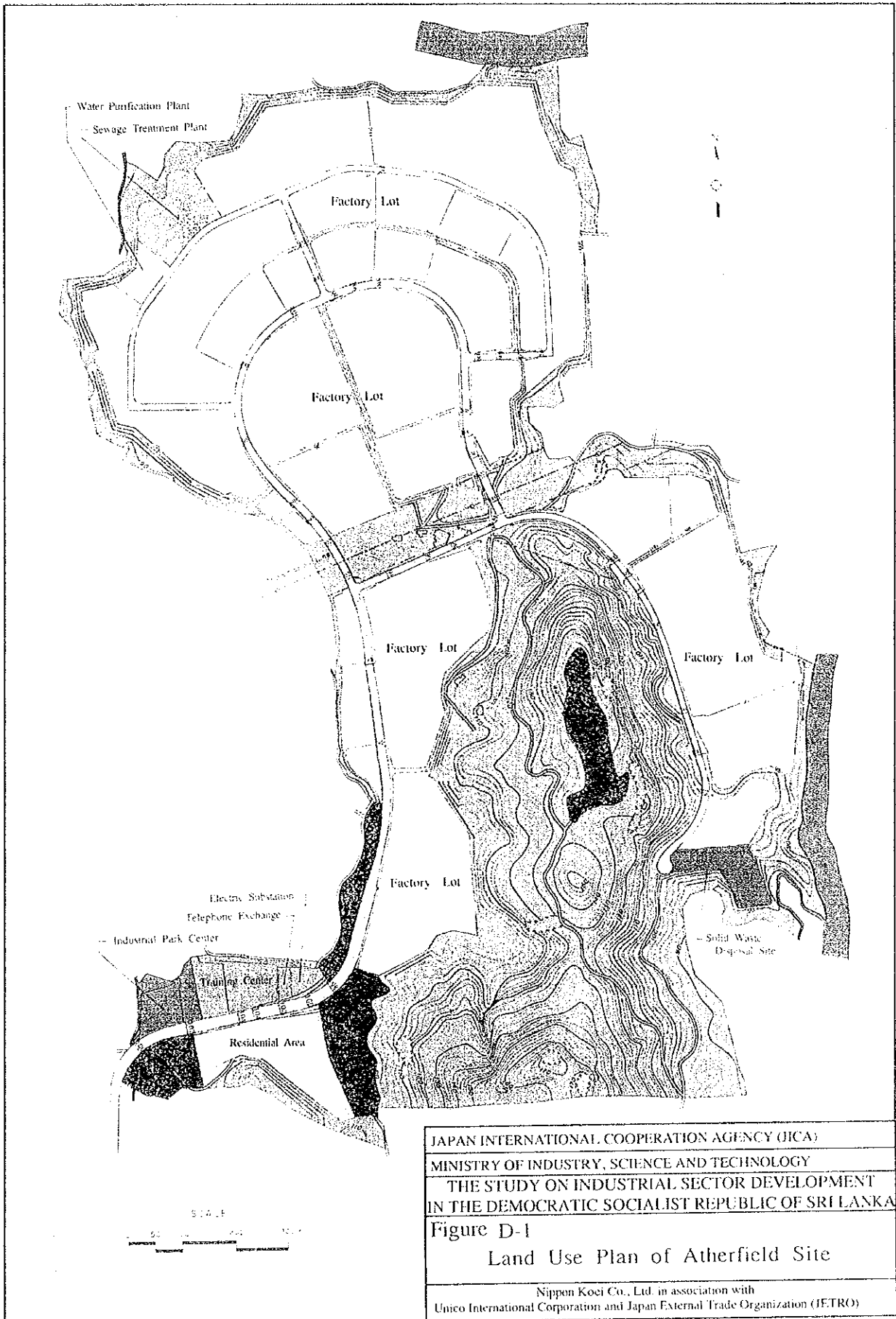
Planned number of employee adjusted with land use plan=44.0ha x 106= 4,700



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Figure D-1
 Land Use Plan of Atherfield Site

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 Unico International Corporation and Japan External Trade Organization (JETRO)

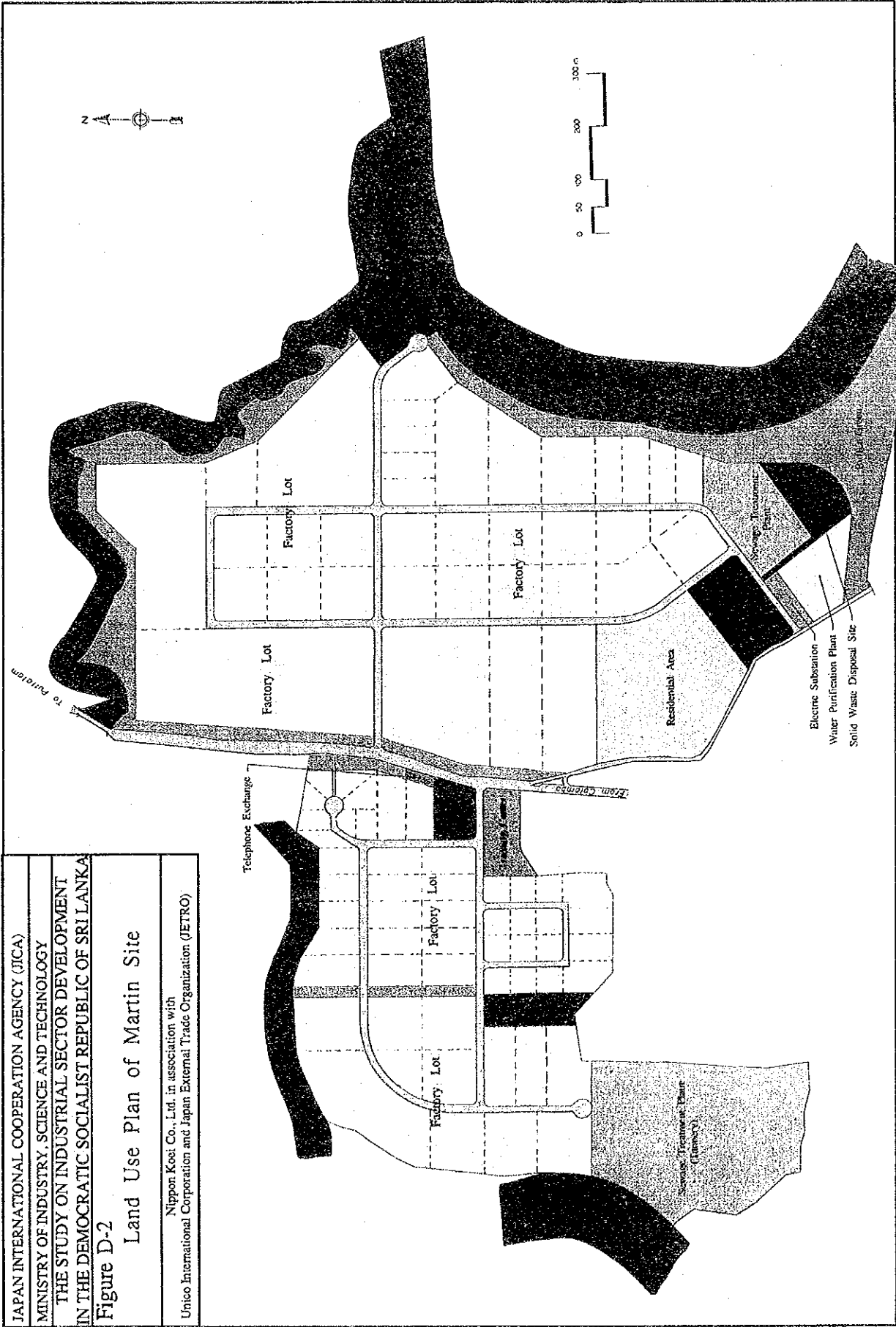


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 Figure D-1
 Land Use Plan of Atherfield Site
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Figure D-2
 Land Use Plan of Martin Site

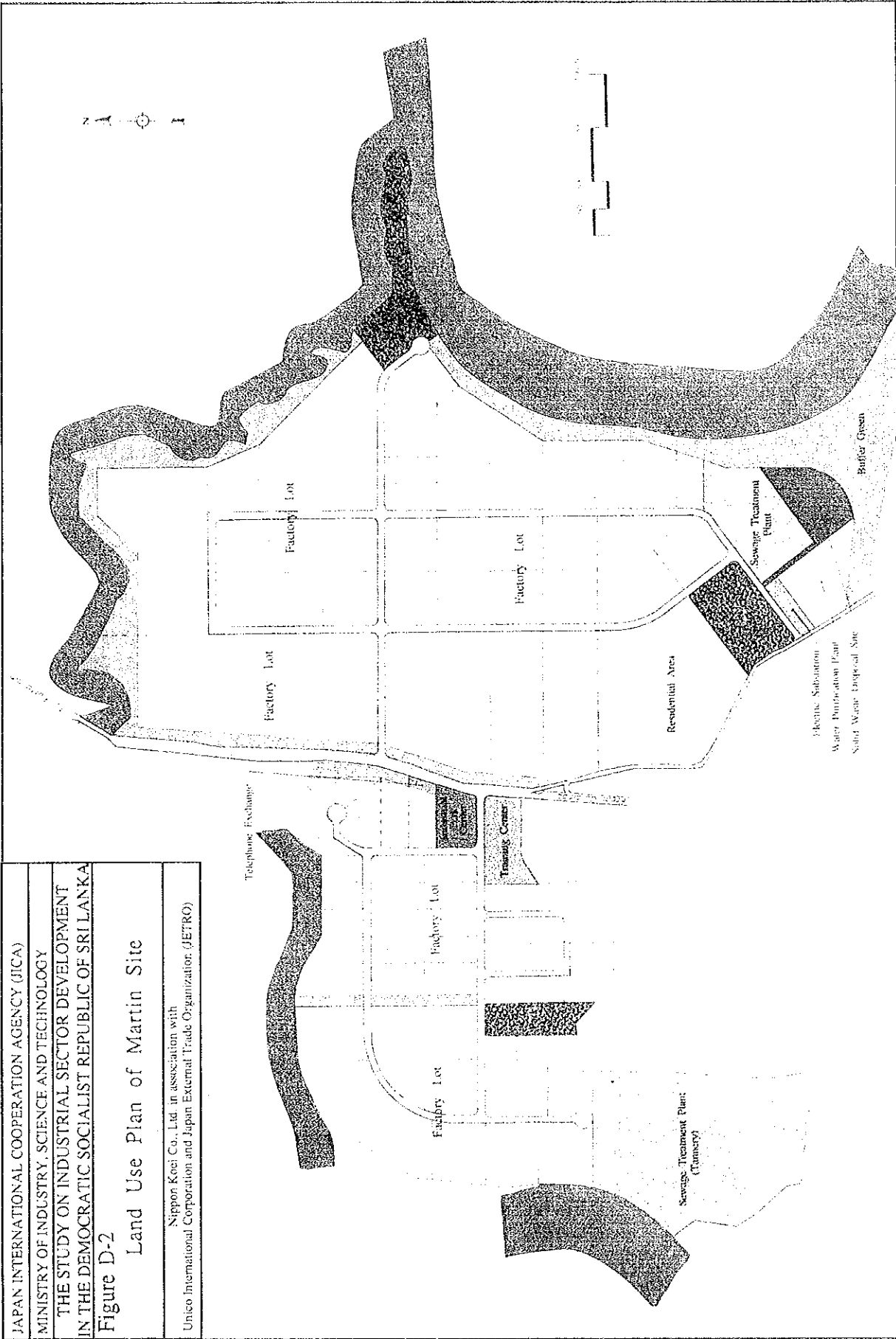
Nippon Koei Co., Ltd. in association with
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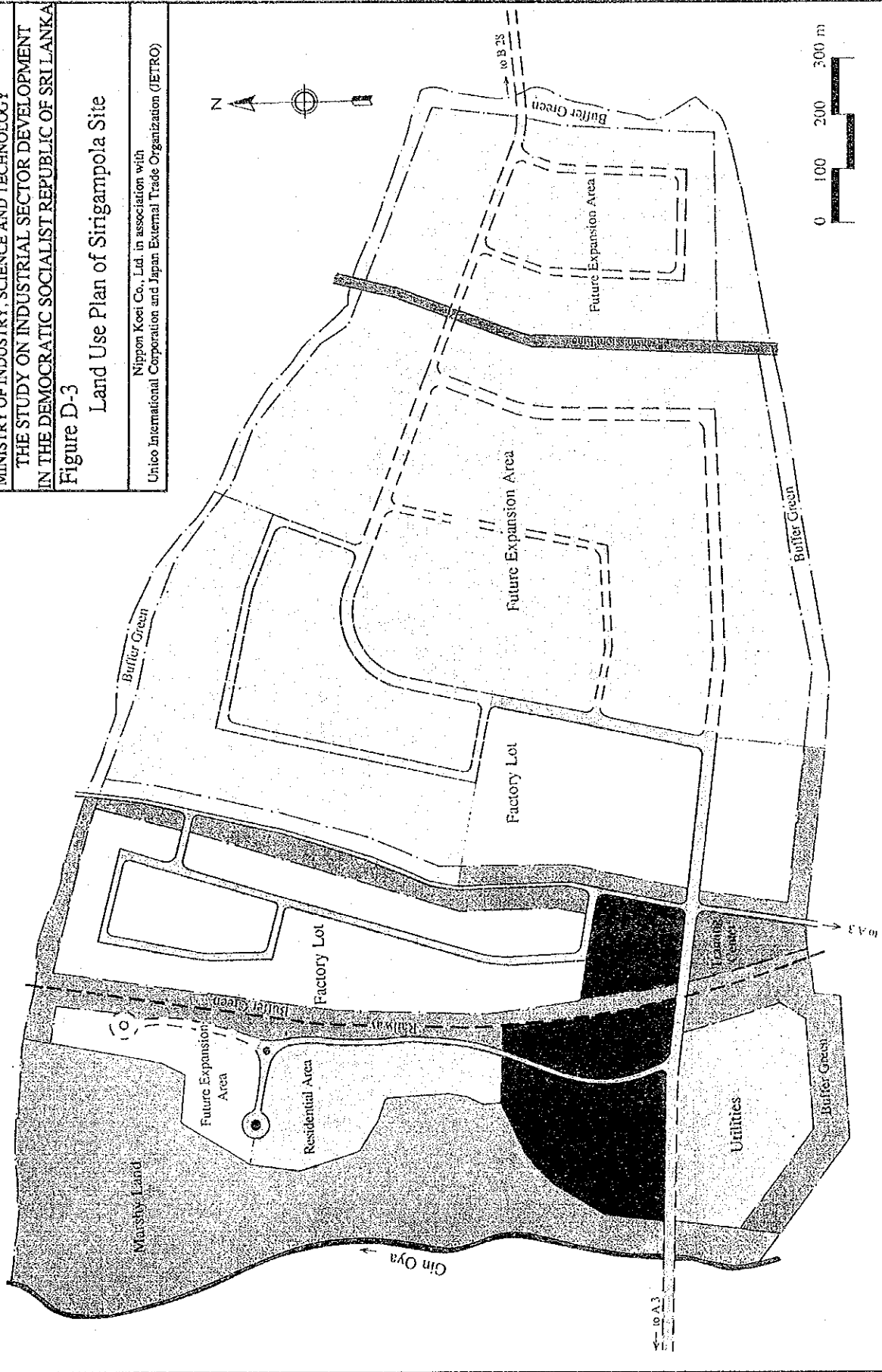
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Figure D-2
 Land Use Plan of Martin Site

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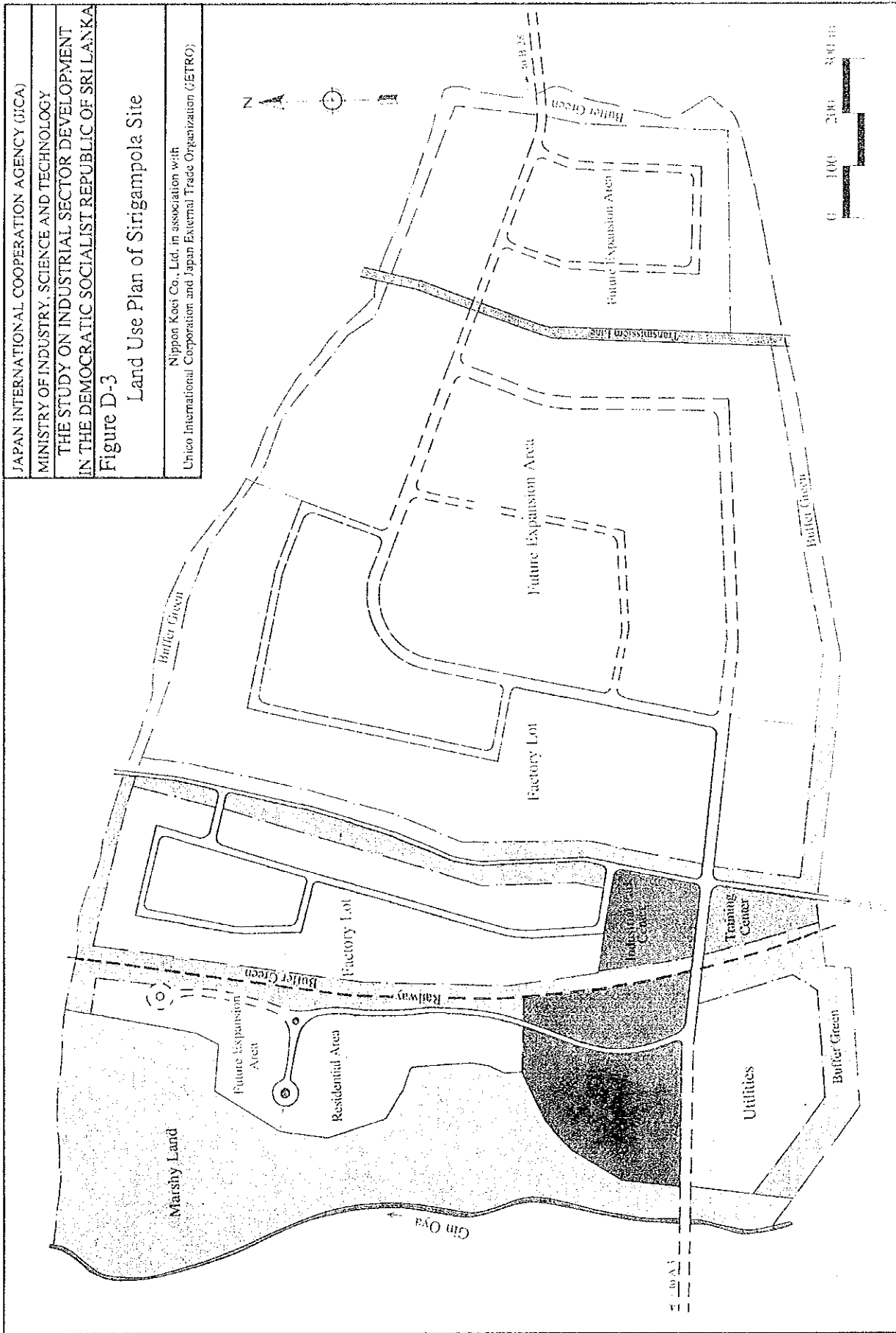
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 Figure D-3
 Land Use Plan of Sirigampola Site
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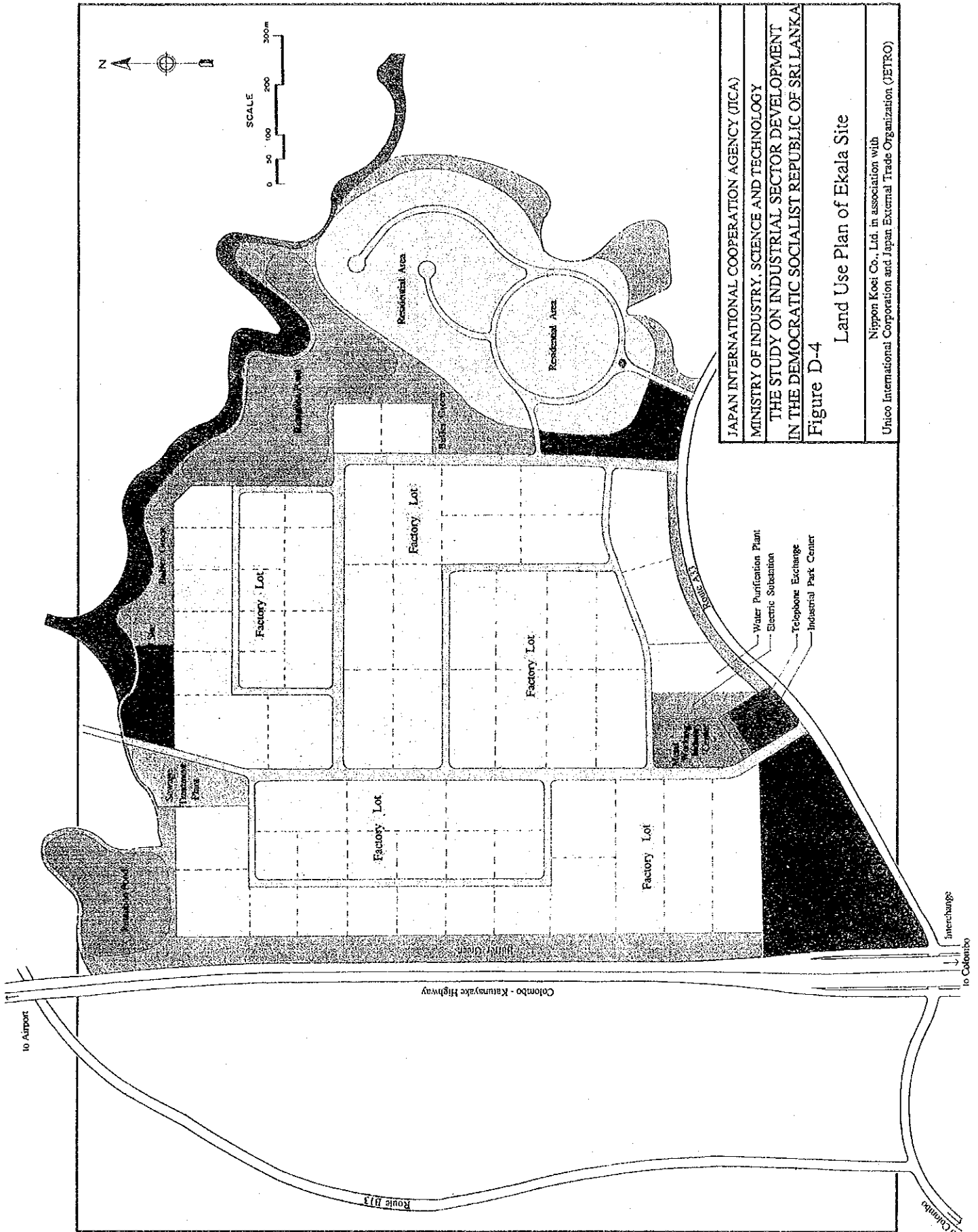


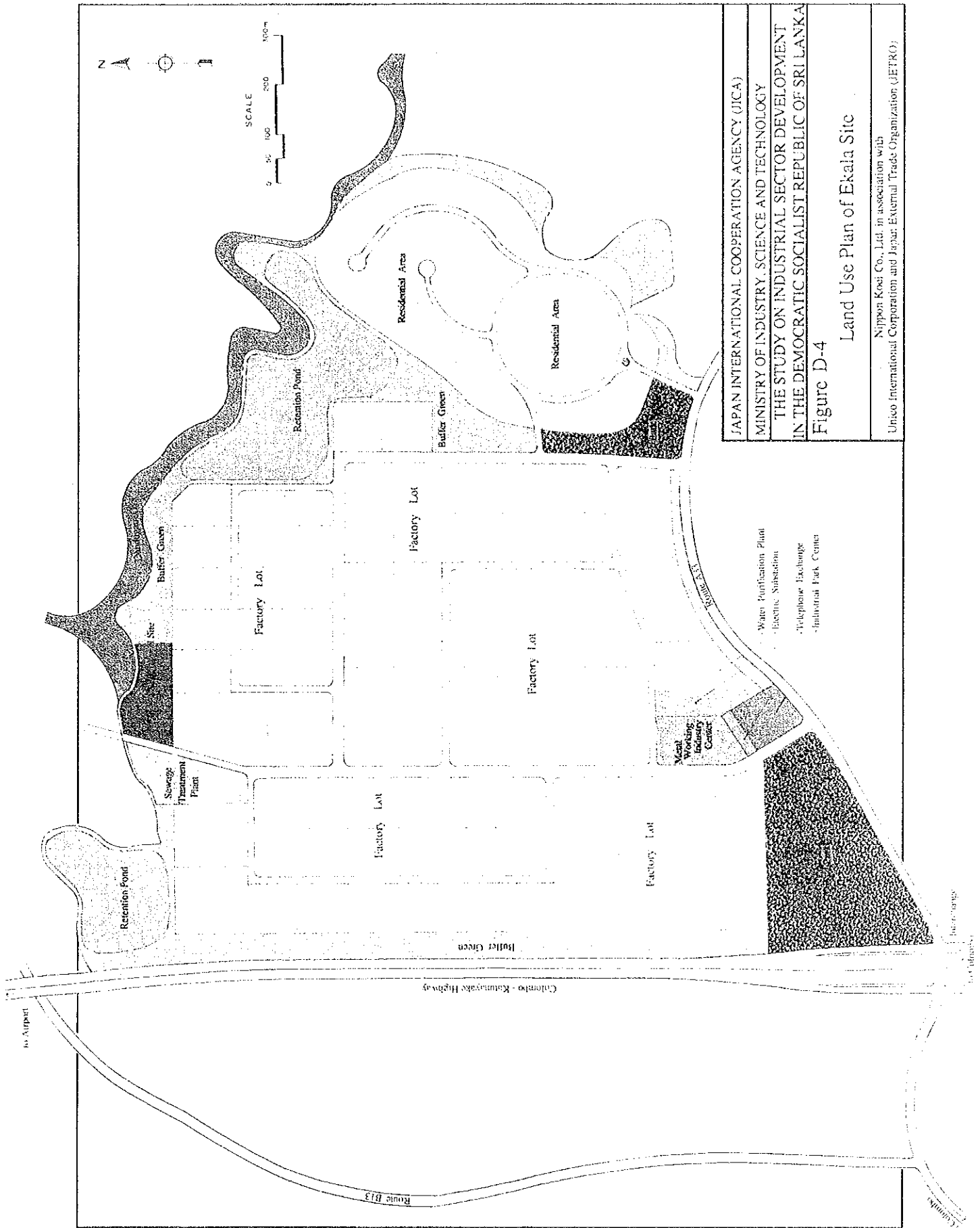
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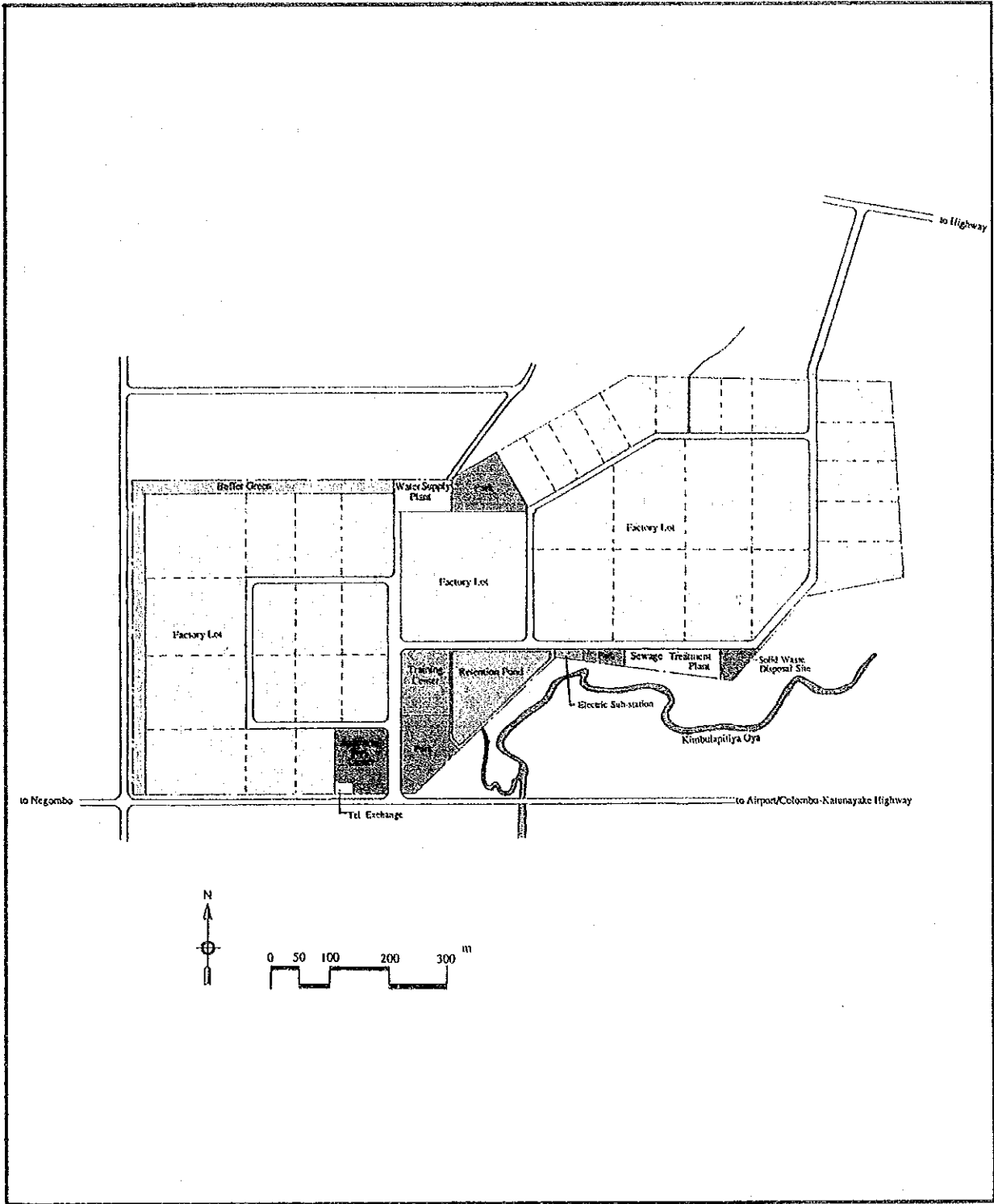
Figure D-3
 Land Use Plan of Sirigampola Site

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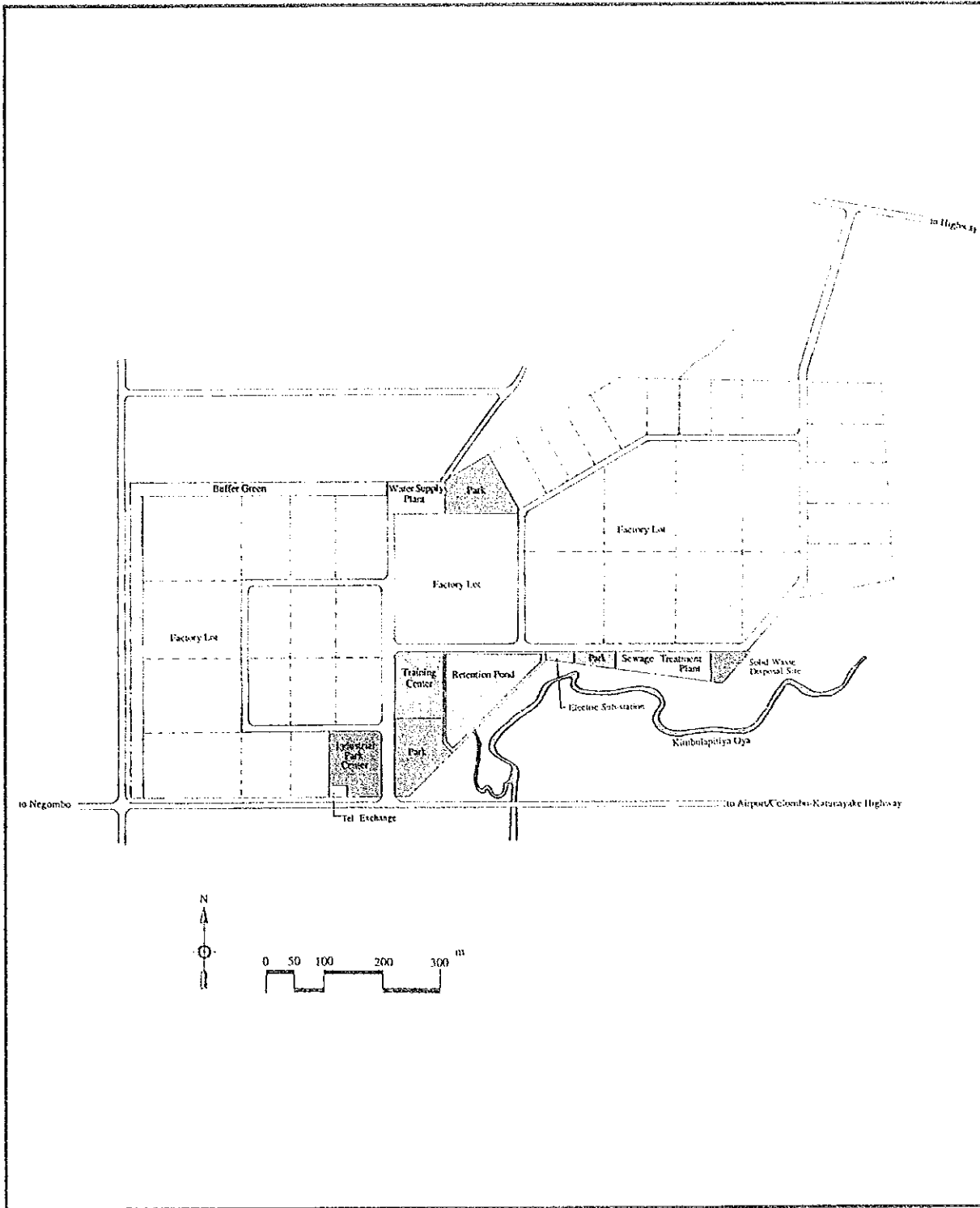




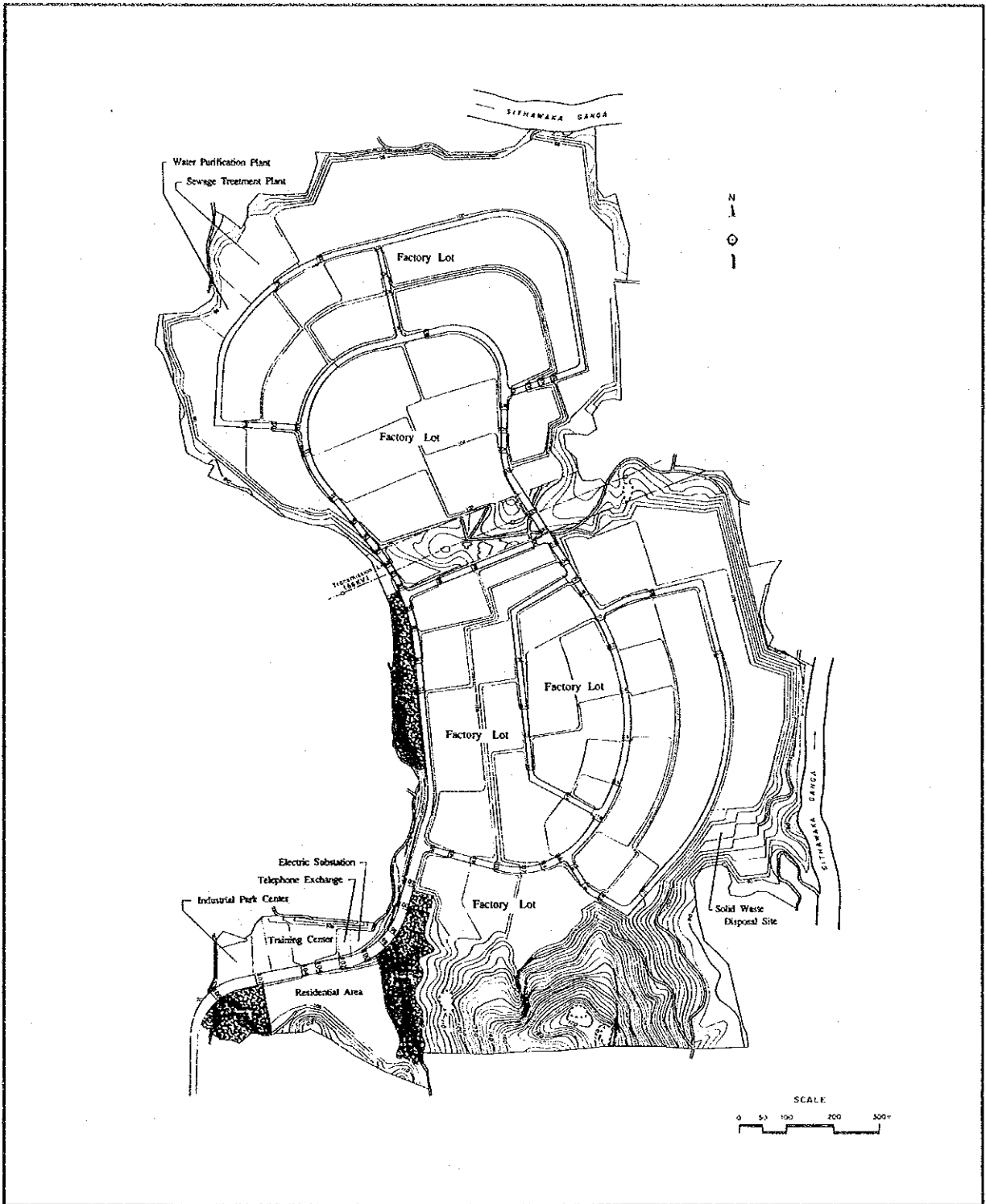




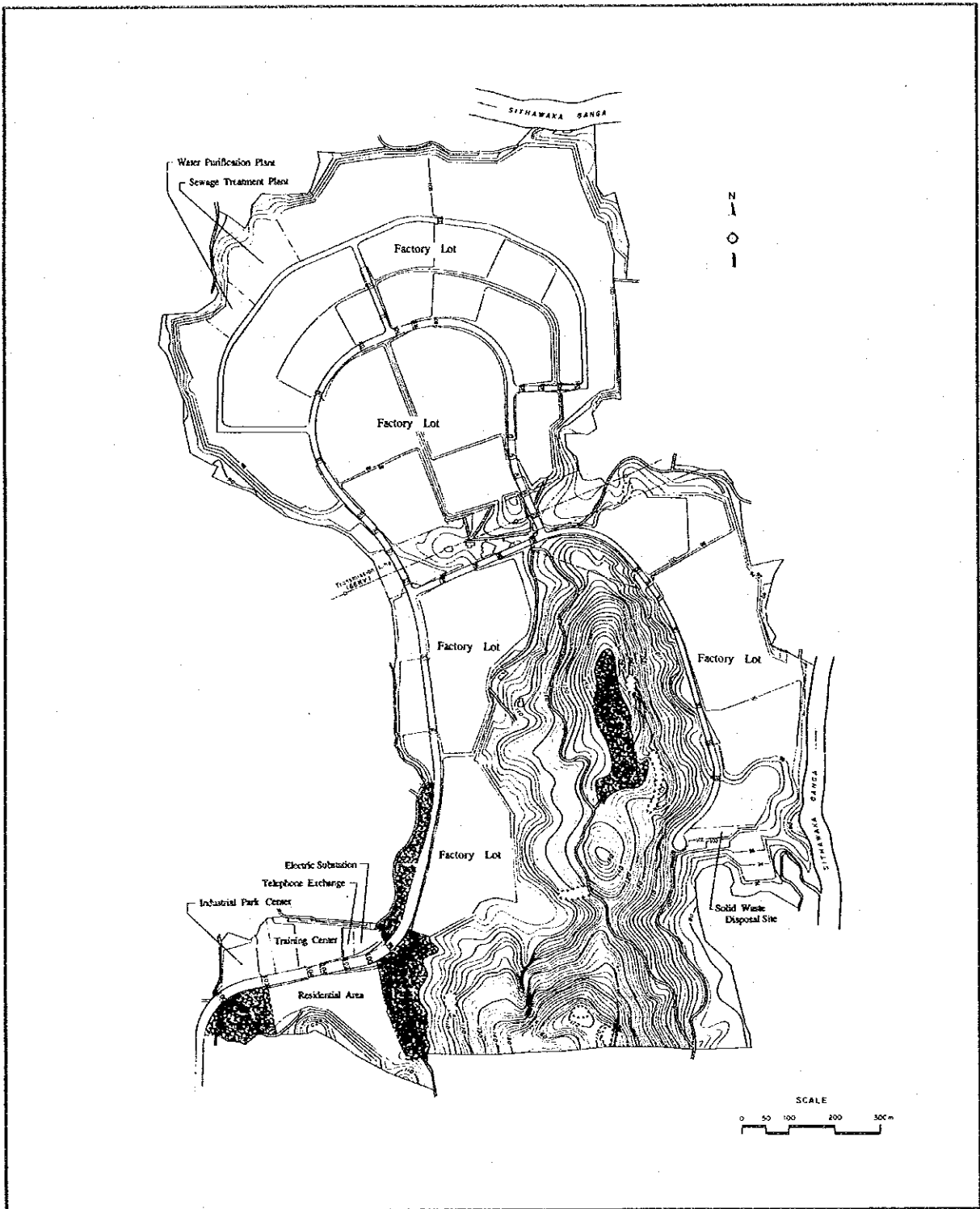
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	Figure D-5 Land Use Plan of Katana Site
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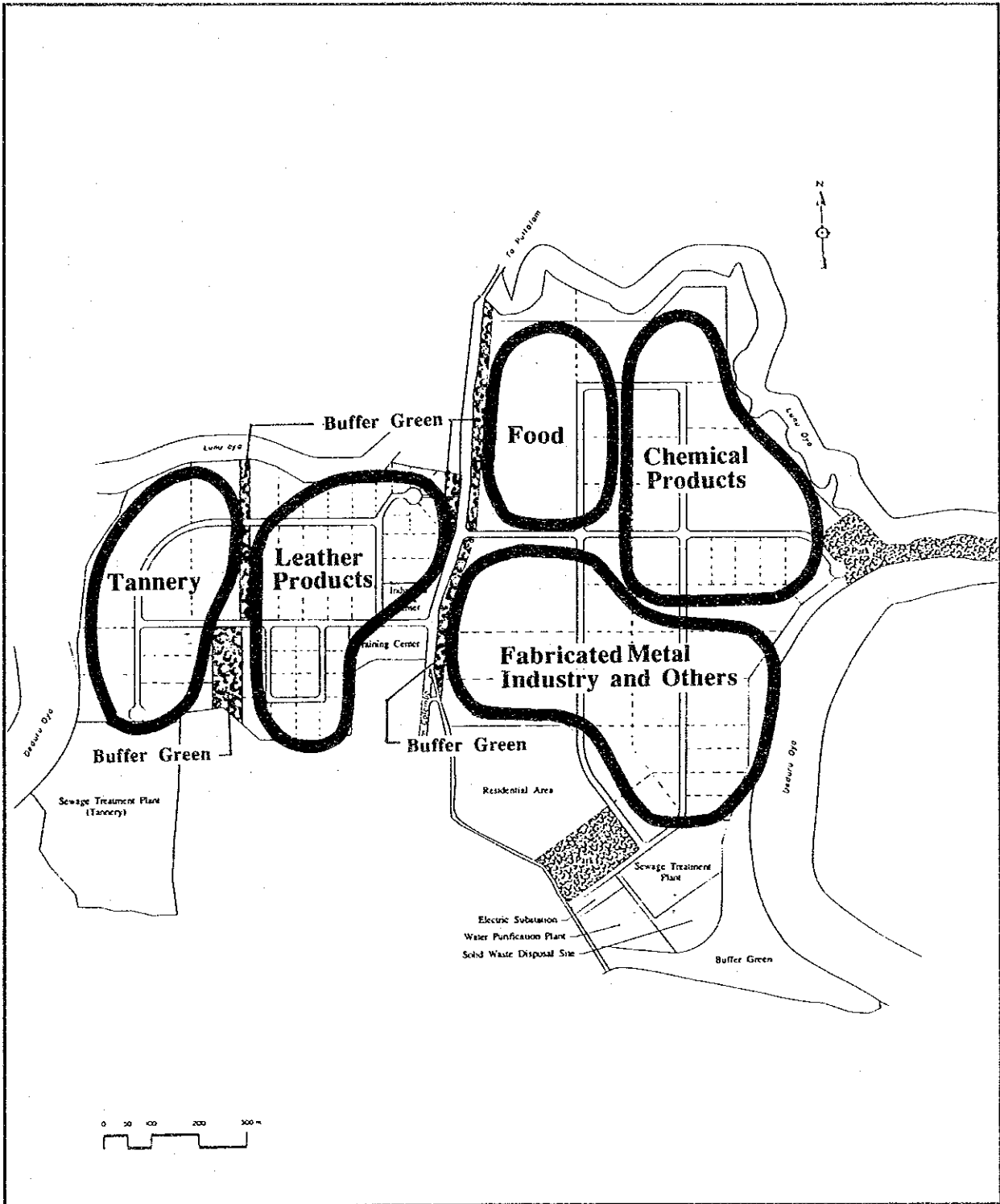
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Figure D-5 Land Use Plan of Katana Site
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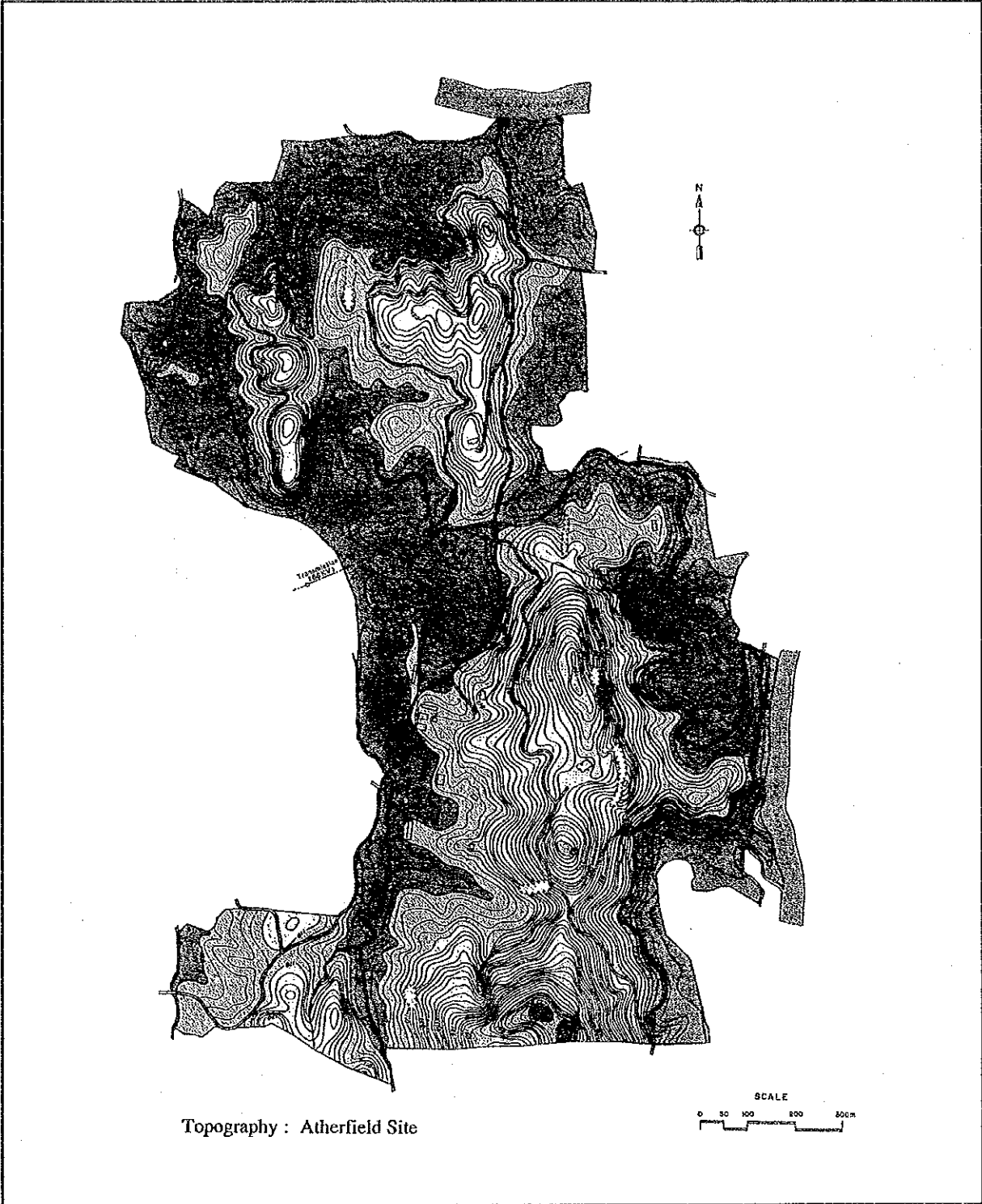
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	Figure D - 6 Land Use Plan of Atherfield Site Alternative A - Large Scale Development -
	Nippon Koei Co., Ltd. in association with Unico International Corporation and Japan External Trade Organization (JETRO)



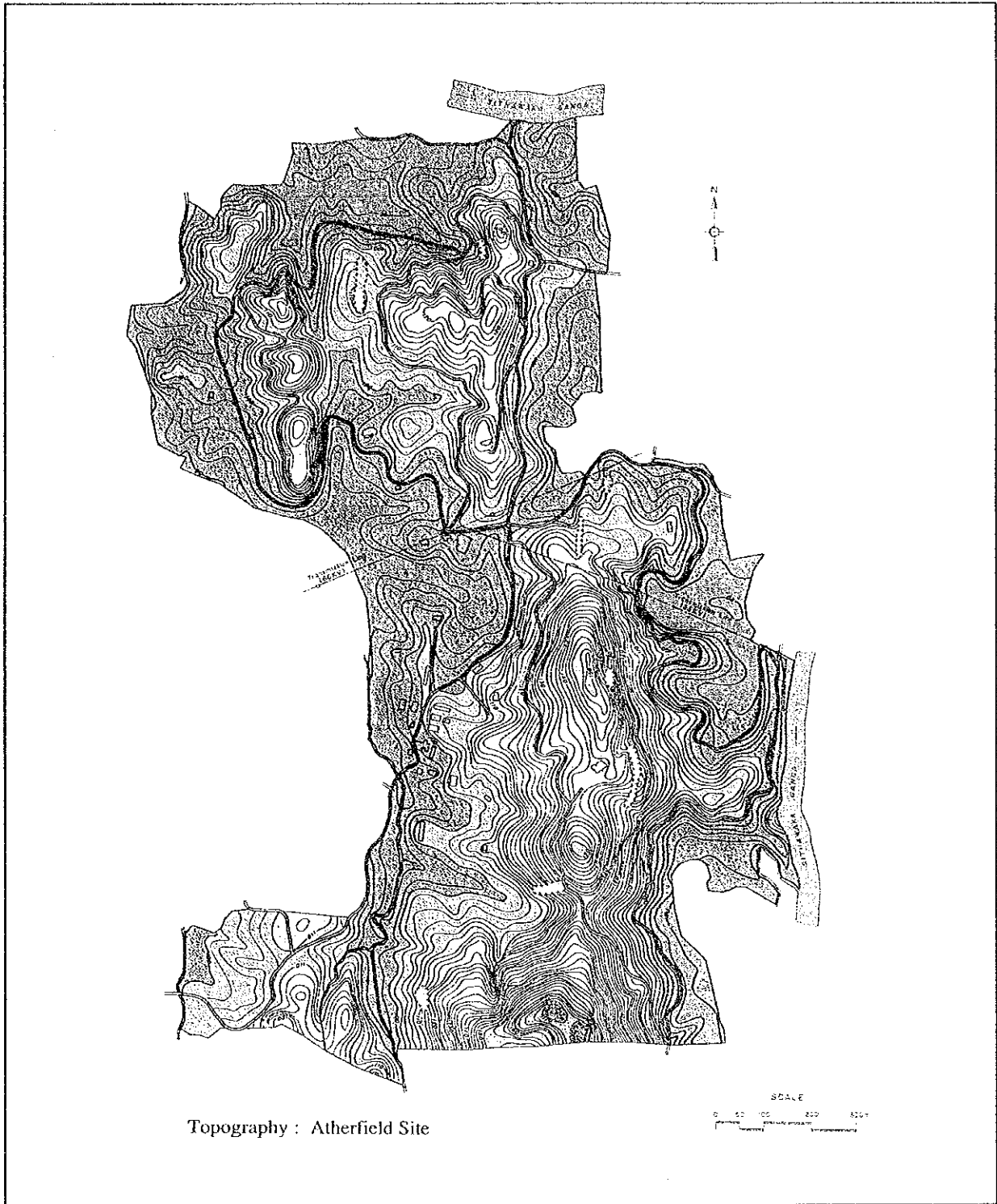
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	Figure D-7 Land Use Plan of Atherfield Site Alternative B - Medium Scale Development -
	Nippon Koei Co., Ltd. in association with Unico International Corporation and Japan External Trade Organization (JETRO)



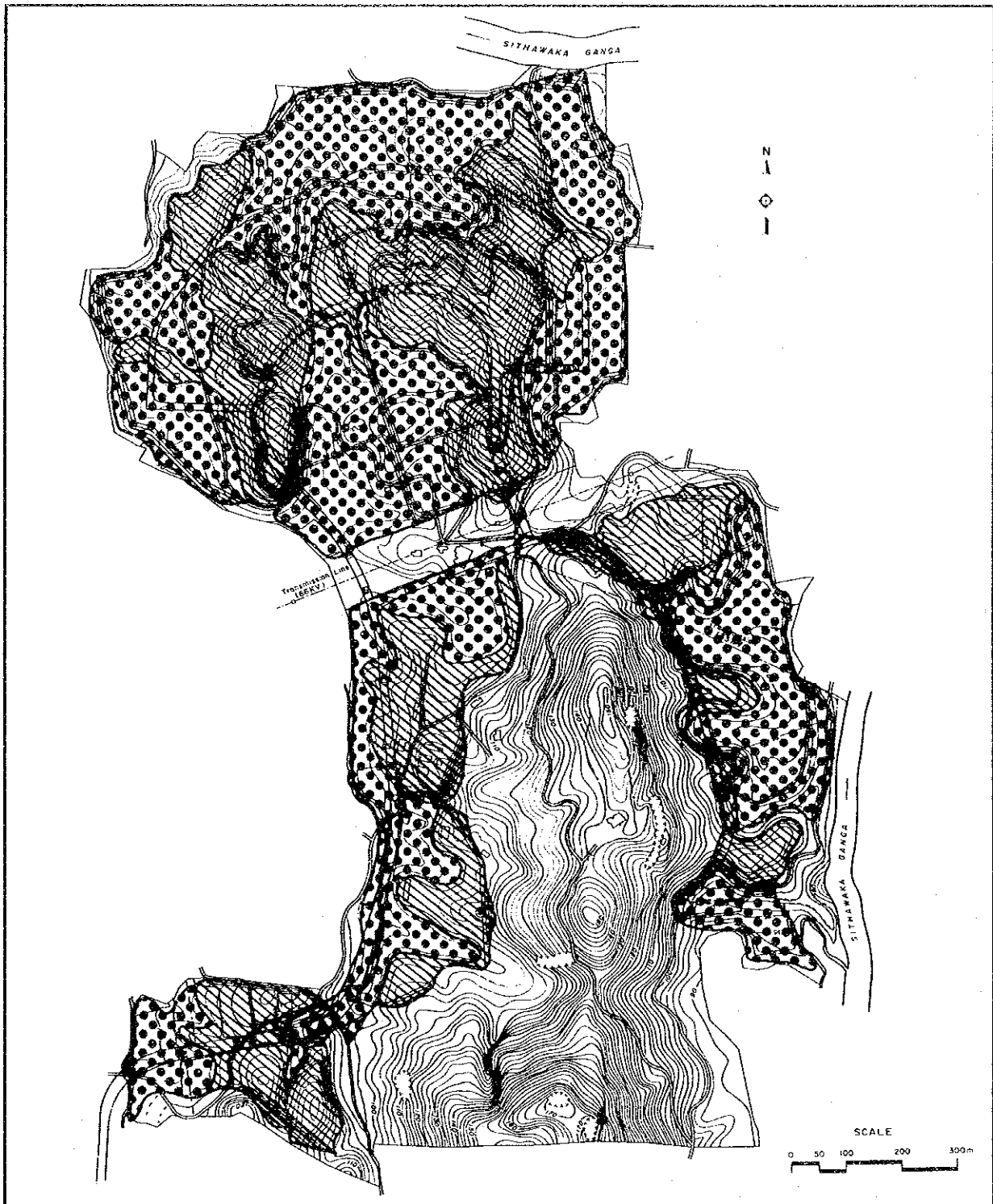
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	Figure D- 8
	Distribution Plan by Type of Industry in Martin Site
	Nippon Koei Co., Ltd. in association with Unico International Corporation and Japan External Trade Organization (JETRO)





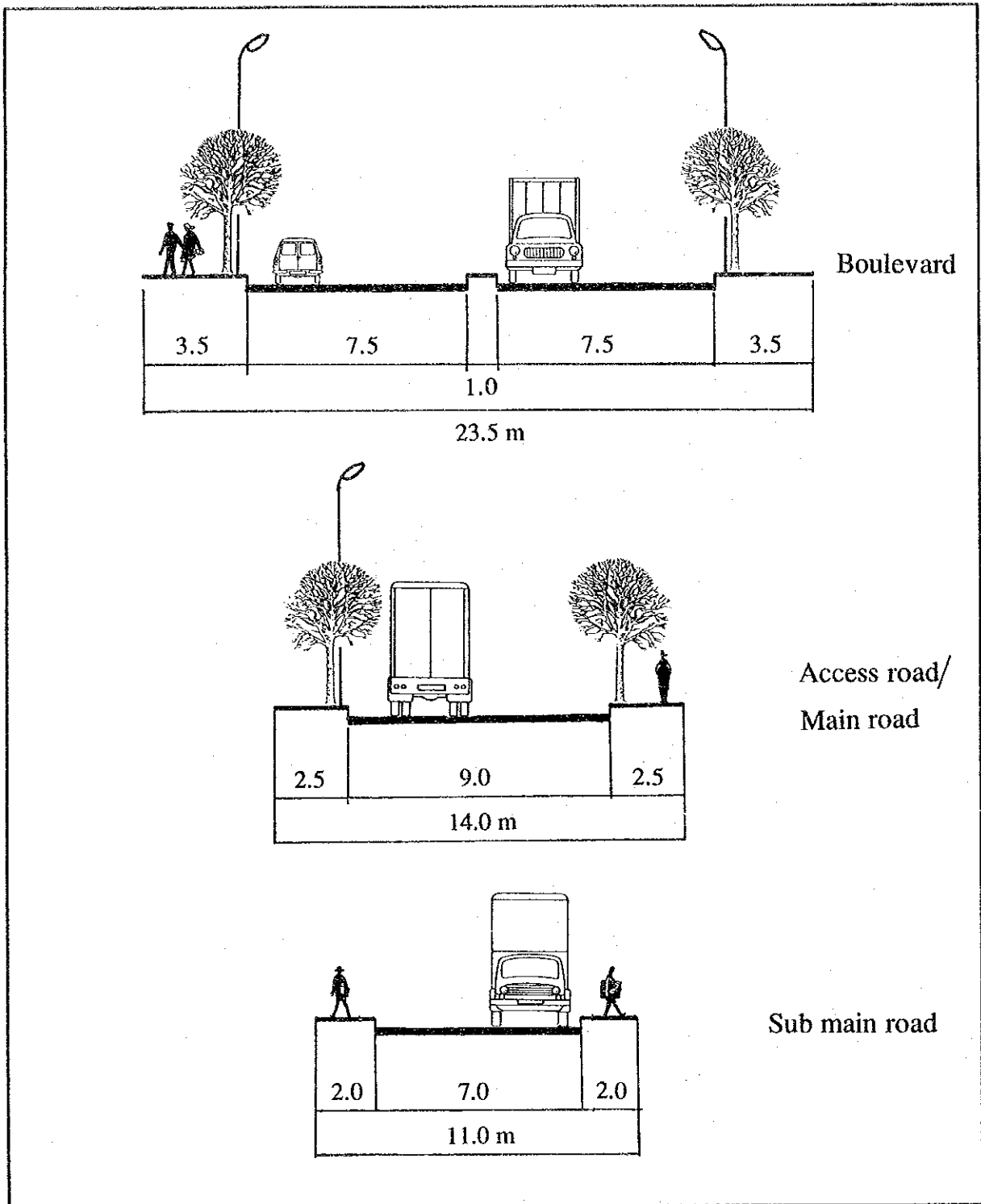
<p>Remark: Ten (10) meter contour interval</p>	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
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	Figure D - 9 Topography of Atherfield Site
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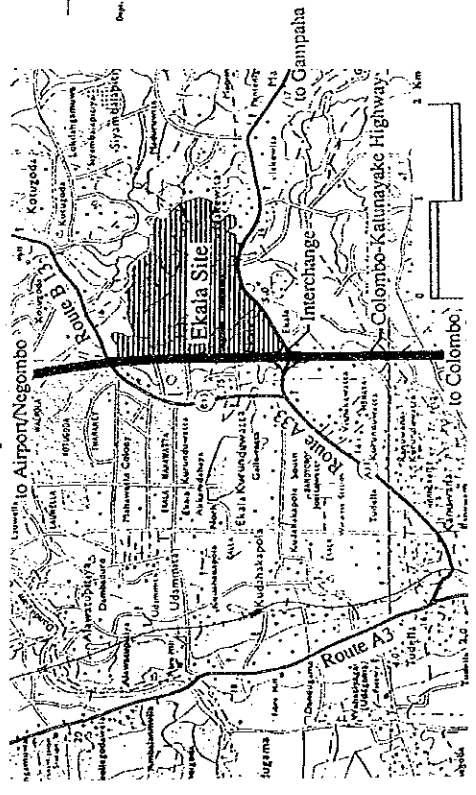
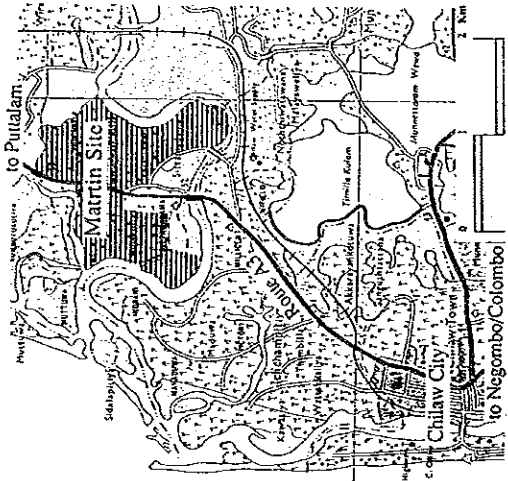
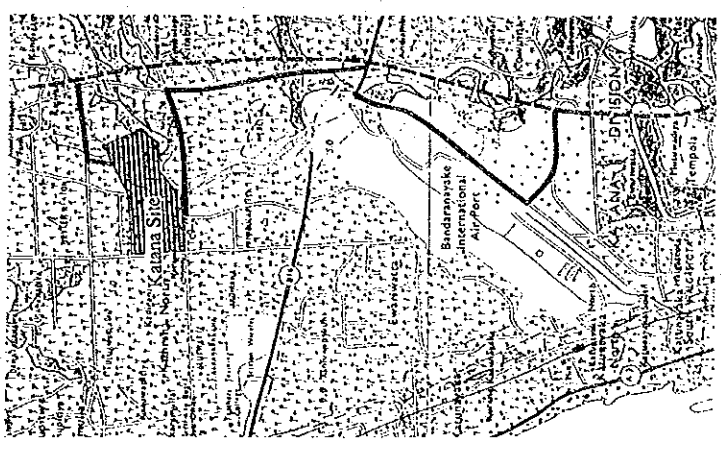
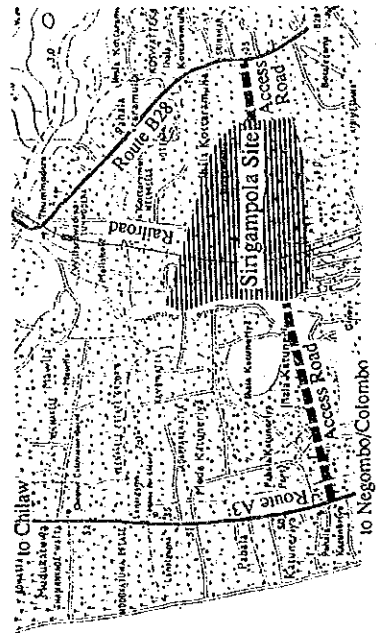
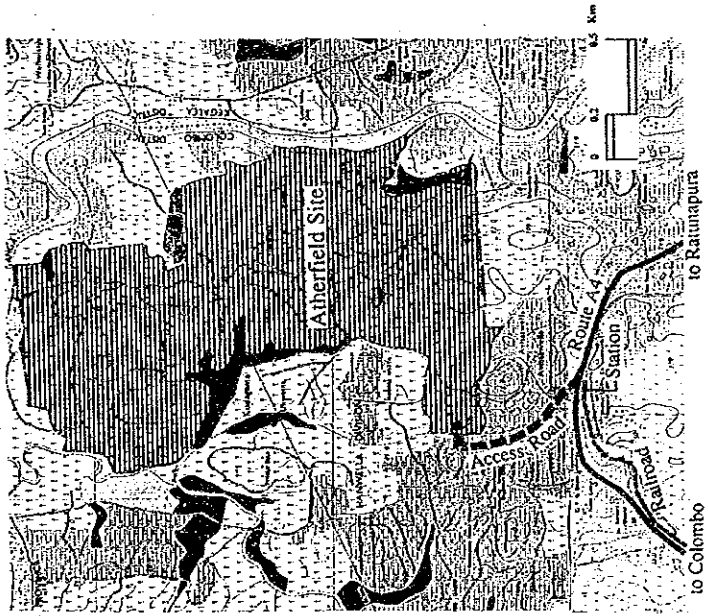
<p>Remark: Ten (10) meter contour interval</p>	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
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	THE STUDY ON INDUSTRIAL SECTOR DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
	Figure D - 9 Topography of Atherfield Site
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<p>Legend</p> <p> Cut area</p> <p> Fill area</p>	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
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	Figure D - 10 Cut and Fill Area of Atherfield
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	Figure D - 11 Typical Cross Section of Road
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 IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 Figure D-12.
 Access Road of New Industrial Estates
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