

# 図表集



マスタープランの図表

**Table 1 Waste Amount to be Generated, Recycled and Hauled (Average Throughout Year)**

(ton/day)

Year	Waste to be Generated	Waste That May not be Collected	To be Recycled before being hauled to LPA	To be Collected by RT/RW but Disposed at Unidentified Places	To be Collected and Hauled by Waste Generators	To be Hauled under KMS' Responsibility	To be Hauled by KMS' Trucks	To be Hauled by KMS' Contractors
	(1)	(2)	(3)	(4)	(5)	(6)=(1)-(2)-(3)-(4)-(5)	(7)	(8)=(6)-(7)
1992	1,626	249	180	171	137	889	621	268
1993	1,707	246	188	146	202	925	621	304
1994	1,793	243	197	121	267	965	621	344
1995	1,882	240	207	96	332	1,007	621	386
1996	1,976	237	217	71	397	1,054	621	433
1997	2,075	234	228	46	462	1,105	621	484
1998	2,179	231	240	21	527	1,160	621	539
1999	2,288	228	252	0	572	1,236	621	615
2000	2,402	225	264	0	601	1,312	621	691
2001	2,522	222	277	0	631	1,392	621	771
2002	2,649	219	291	0	662	1,477	621	856
2003	2,781	216	306	0	695	1,564	621	943
2004	2,920	213	321	0	730	1,656	621	1,035
2005	3,066	210	337	0	767	1,752	621	1,131
2006	3,219	207	354	0	805	1,853	621	1,232
2007	3,380	204	372	0	845	1,959	621	1,338
2008	3,549	201	390	0	887	2,071	621	1,450
2009	3,727	198	410	0	932	2,187	621	1,566
2010	3,913	195	430	0	978	2,310	621	1,689

Note: Of the waste amount hauled by KMS and the generators (shown in columns (5) & (6) respectively), it is projected that 90 ton/day is hauled to unofficial LPA in Asemrowo till 1999.

**Table 2. Projection of Household Waste Composition**

(Unit: wt.%)

Classification	Rainy Season			Dry Season		
	1992	2000	2010	1992	2000	2010
<b>Recyclable</b>						
• Paper	12.6	13.3	14.1	12.5	13.1	13.9
• Plastics	7.9	9.0	10.6	7.7	8.8	10.2
• Metal	1.0	1.0	1.1	0.9	1.0	1.0
• Glass	0.9	1.0	1.2	1.1	1.2	1.4
Subtotal	22.4	24.3	26.9	22.2	24.1	26.6
<b>Non-Recyclable</b>						
• Textile	1.8	1.8	1.7	2.0	1.9	1.8
• Wood/Glass	19.6	19.0	18.2	18.0	17.4	16.7
• Garbage	52.3	50.8	48.7	52.0	50.4	48.3
• Other Combustible	0.8	0.8	0.9	0.6	0.6	0.7
• Other Non Combustible	3.2	3.4	3.6	5.3	5.6	5.9
Sub total	77.6	75.7	73.1	77.8	75.9	73.4
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Moisture Content</b>	<b>66.1</b>	<b>65.5</b>	<b>64.8</b>	<b>54.7</b>	<b>53.4</b>	<b>52.8</b>
<b>Calorific Value (Kcal/kg)</b>	<b>1,020</b>	<b>1,050</b>	<b>1,090</b>	<b>1,290</b>	<b>1,360</b>	<b>1,410</b>

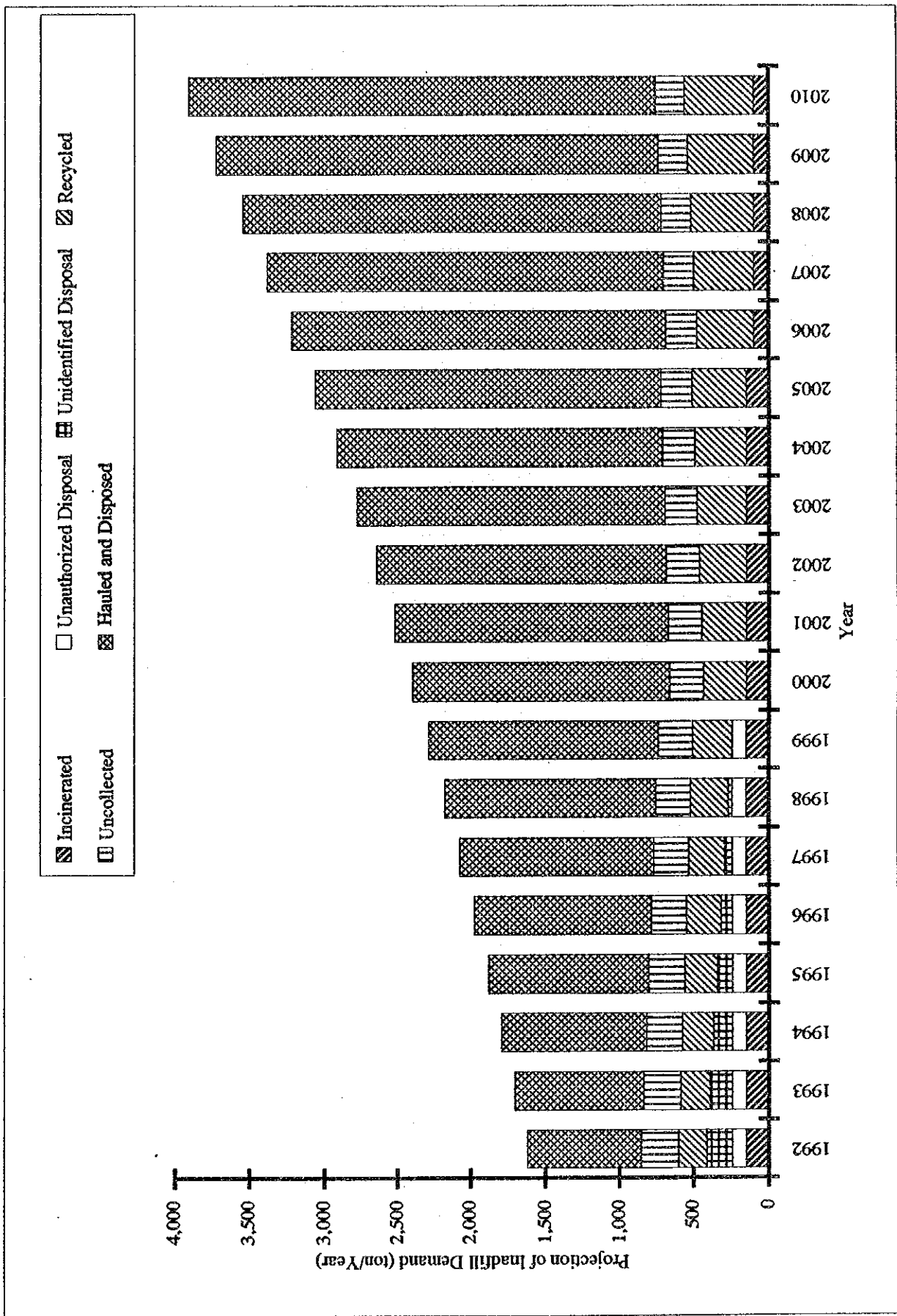
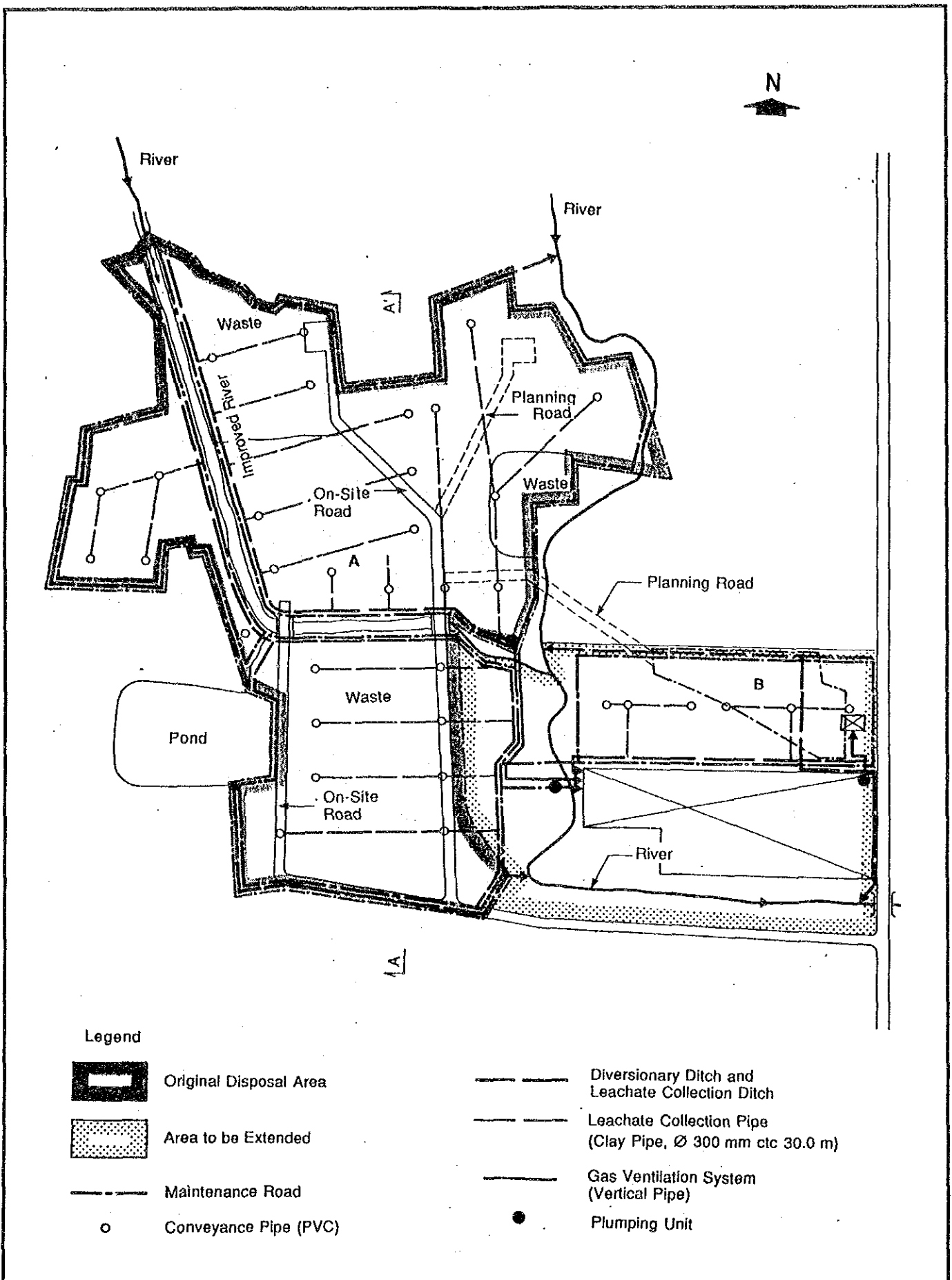


FIG. 1.

Projection of Waste Haulage and Disposal Amounts  
(Average Throughout Year)

THE STUDY ON THE SOLID WASTE MANAGEMENT IMPROVEMENT FOR SURABAYA CITY



**Legend**

- Original Disposal Area
- Area to be Extended
- Maintenance Road
- Conveyance Pipe (PVC)
- Diversionary Ditch and Leachate Collection Ditch
- Leachate Collection Pipe (Clay Pipe, Ø 300 mm ctc 30.0 m)
- Gas Ventilation System (Vertical Pipe)
- Plumping Unit

**FIG. 2**

**General Layout Plan for Improvement of Lakarsantri Landfill Site**

**THE STUDY ON THE SOLID WASTE MANAGEMENT IMPROVEMENT FOR SURABAYA CITY**



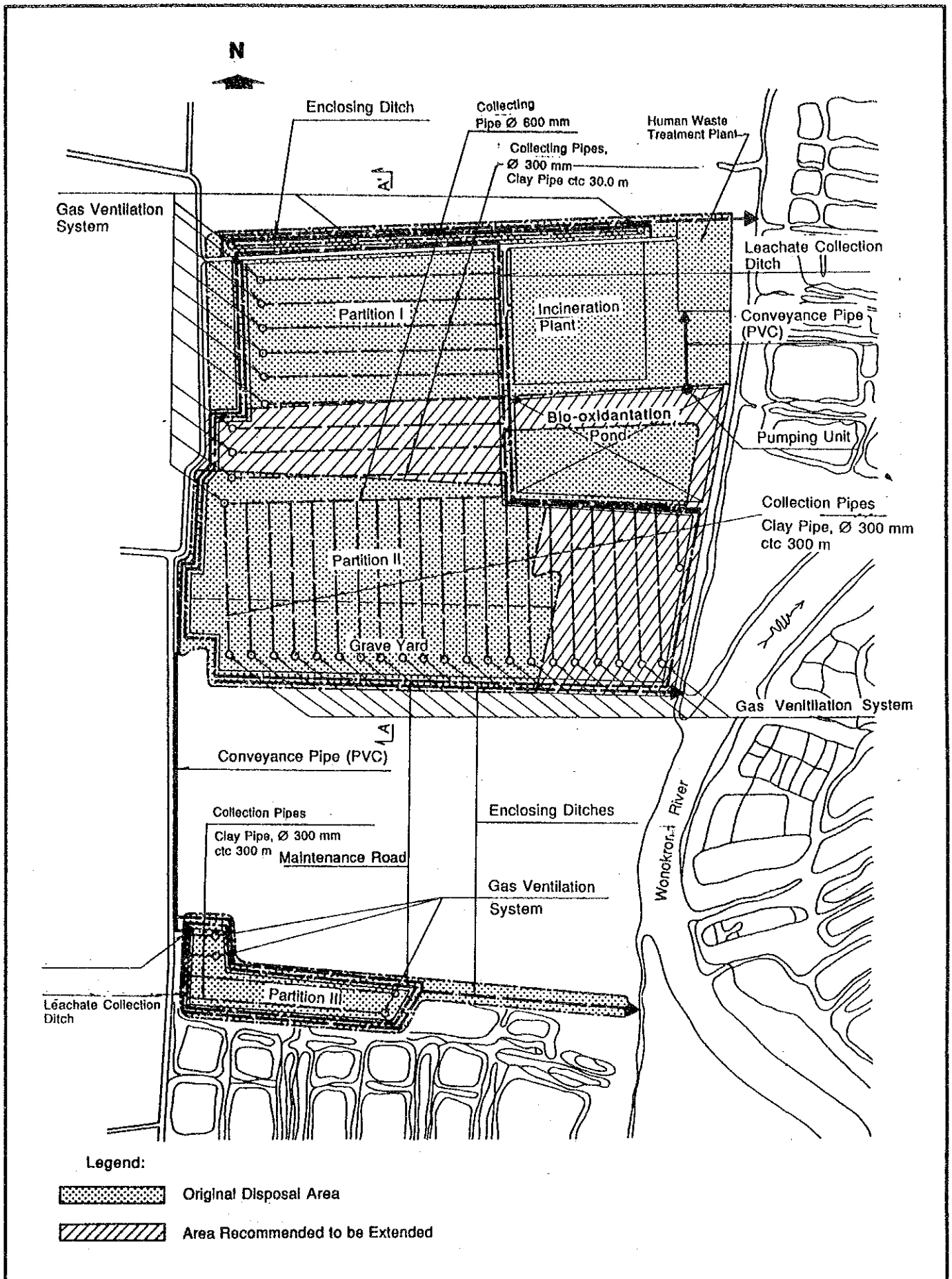


FIG. 3

General Layout Plan for Improvement of Keputih Landfill Site

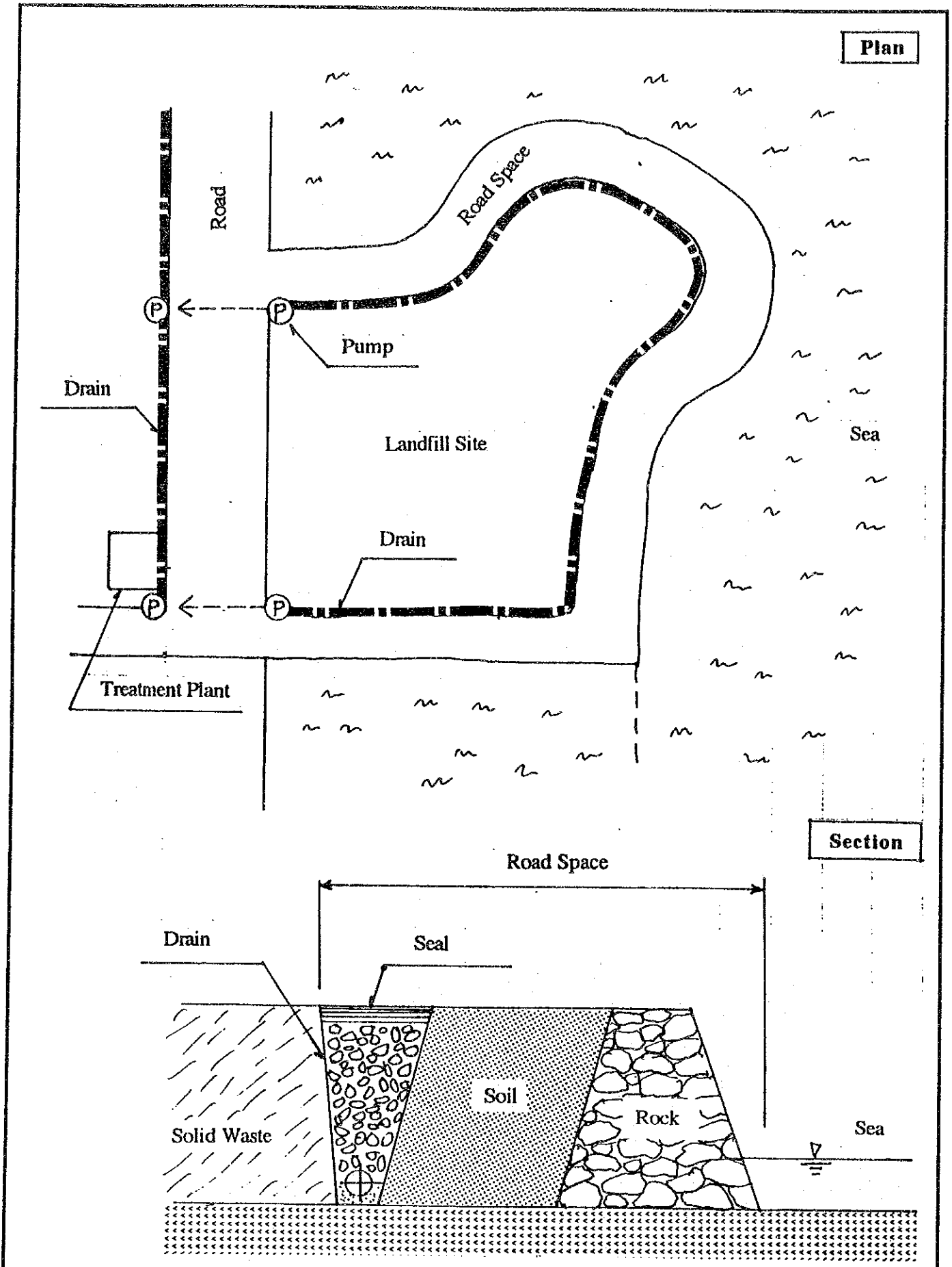
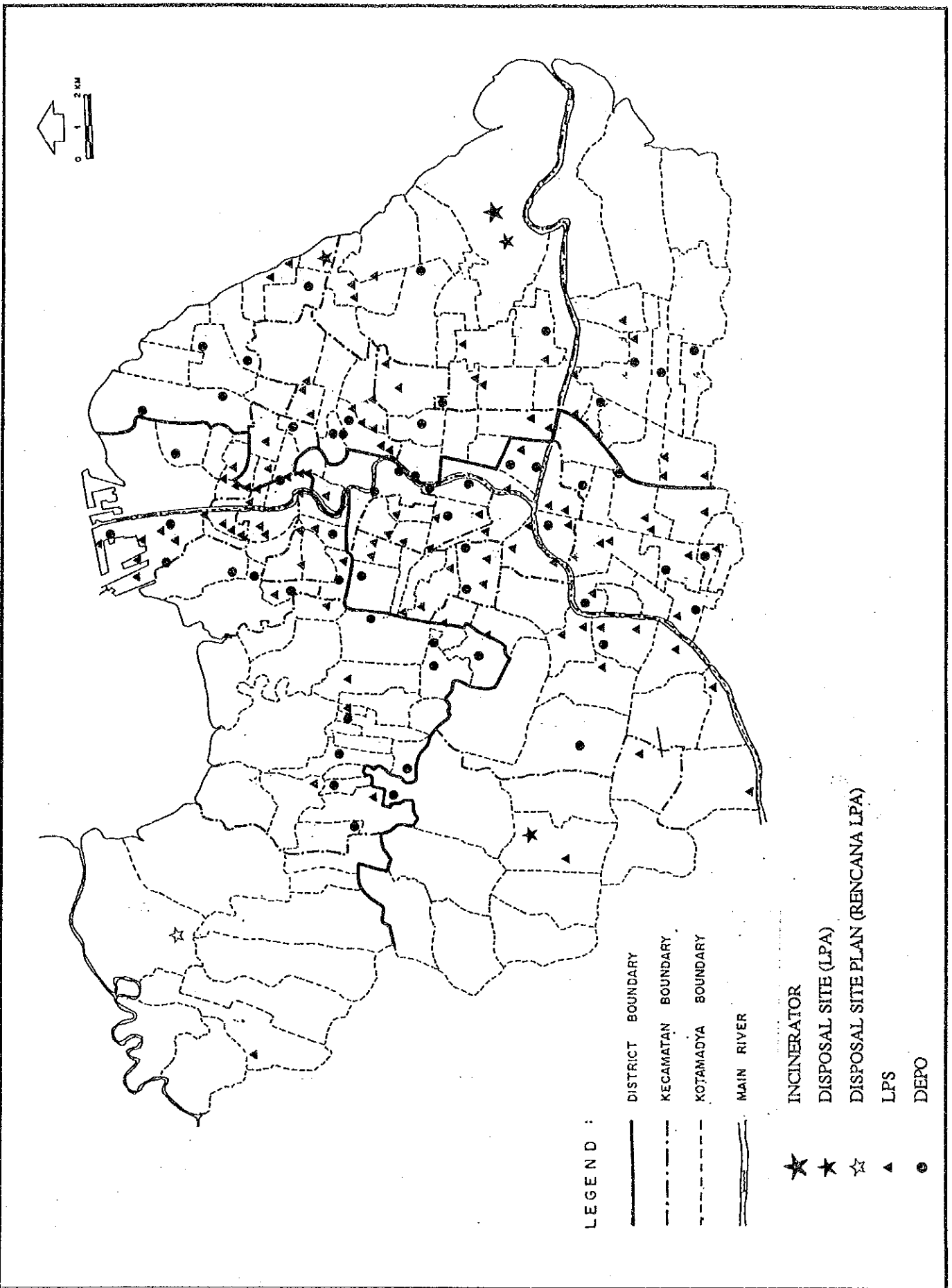


FIG. 4

General Layout Plan for Improvement of Kenjeran Landfill Site

THE STUDY ON THE SOLID WASTE MANAGEMENT IMPROVEMENT FOR SURABAYA CITY





**FIG. 5**

**Location of Depo, LPS and Incinerator**

フイージビリティ・スタディーの図表

Table 3 Annual Implementation Program

Projects	Total Quantity	93/94	94/95	95/96	96/97	97/98	98/99
1. Procurement of waste haulage vehicles, containers, & handcart							
1.1 7 GVW Arm-roll trucks serving for 8 m <sup>3</sup> containers	26	7	4	6	0	9	0
1.2 14 GVW Arm-roll trucks serving for 14 m <sup>3</sup> containers	39	18	0	6	0	15	0
1.3 Open dump trucks	5	3	1	0	1	0	0
Sub-total of trucks (1.1+1.2+1.3)	70	28	5	12	1	24	0
1.4 8 m <sup>3</sup> containers	89	39	44	6	0	0	0
1.5 14 m <sup>3</sup> containers	130	122	0	2	1	3	2
Sub-total of containers (1.4+1.5)	219	161	44	8	1	3	2
1.6 1 m <sup>3</sup> Handcarts	256	85	86	0	0	0	0
1.7 1.5 m <sup>3</sup> Handcarts	94	31	32	0	0	0	0
Sub-total (1.6+1.7)	350	116	118	0	0	0	0
2. Construction of sanitary landfill site in Benowo (94/95 - 96/97)							
2.1 LPA (Lump-sum)	1			0.8	0.2		
3. Construction and rehabilitation of Depo/LPS & Improvement of Asemrowo Workshop							
3.1 Construction of Depo	24	0	6	6	6	6	0
3.2 Construction of LPS	12	0	3	3	3	3	0
3.3 Rehabilitation of Depo *	30						
3.4 Rehabilitation of LPS *	34						
3.5 Improvement of Asemrowo Workshop							
3.5.1 Remodeling of Asemrowo Workshop	Lump-sum		1				
3.5.2 Procurement of tools & equipment	Lump-sum		1				
4. Procurement of heavy Equipment							
4.1 Bulldozers	4	0	1	1	2	0	0
4.2 Rotary screen	1	1	0	0	0	0	0
4.3 Excavator	1	0	0	0	1	0	0
4.4 Overhaul of Bulldozer	4	2	2	0	0	0	0
4.5 Overhaul of Landfill compactor	2	1	1	0	0	0	0
4.6 Overhaul of Wheeled loader	1	0	0	0	1	0	0
Sub-total	13	4	4	1	4	0	0

\* See Main Report Table 3.4-5

**Table 4 Annual Investments of the F/S Project**

Unit: Million Rupiah in 1992 price

Projects	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Total
<b>1. Vehicles, Containers &amp; Handcarts</b>								
1.1 Vehicles (3 types)	0	2,041.7 (28)	253.1 (5)	815.4 (12)	50.7 (1)	1,734.9 (24)	0	4,895.8 (70)
1.2 Containers (2 Type : 8 & 14 m <sup>3</sup> )	0	1,210.0 (161)	264.0 (44)	52.0 (8)	8.0 (1)	24.0 (3)	16.0 (2)	1,574.0 (219)
1.3 Handcarts (2 types: 1 & 1.5 m <sup>3</sup> )	0	57.9	57.8	58.9	0	0	0	174.6
Sub-total of Item 1 (1.1 + 1.2 + 1.3)	0	3,309.6	574.9	926.3	58.7	1,758.9	16.0	6,644.4
<b>2. Construction of Sanitary Landfill in Benowo</b>	0	0	0	18,335.0	3,693.0	1.0	1,405.0	23,434.0
<b>3. Depo/LPS construction &amp; rehabilitation &amp; Asemrowo Workshop Improvement</b>								
3.1 Construction of Depo/LPS	0	0	309.5 [81.0] {228.5}	228.5 [0] {228.5}	363.6 [135] {228.5}	255.5 [27] {228.5}	0	1,157.1 [243] {914.1}
3.2 Rehabilitation of Depo/LPS	0	0	52.7	44.4	39.0	47.6	0	183.7
3.3 Asemrowo Work- shop Improvement	0	0	267.0	0	0	0	0	267.0
Sub-total of Item 3 (3.1 + 3.2 + 3.3)	0	0	629.2 [81] {548.2}	272.9 [0] {272.9}	402.6 [135] {267.6}	303.1 [27] {276.1}	0	1,607.8 [243] {1,364.8}
<b>4. Procurement of Heavy Equipment</b>	0	215.0	500.0	300.0	880.0	0	0	1,895.0
<b>Grand Total (1 + 2 + 3 + 4)</b>	0	3,524.6 [0] {3,524.6}	1,704.1 [81] {1,623.1}	19,834.2 [0] {19,834.2}	5,034.3 [135] {4,899.3}	2,063.0 [27] {2,036.0}	1,421.0 [0] {1,421.0}	33,581.2 [243] {33,338.2}

**Notes:**

1. The above-shown investment amounts include the value added tax (10% of original prices).
2. Figures in brackets [ ] indicate cost (million Rupiah) needed for purchase of land.
3. Figures in { } indicate cost (million Rupiah) excluding cost of land purchase.
4. It is assumed that cash expenditures will be not be required for land acquisition of the planned sanitary landfill in Benowo.

**Table 5 Annual Operation and Maintenance Costs of the F/S Project**

Unit: Million Rupiah in 1992 price

Projects	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Total
1. Vehicles, Containers & Handcarts								
1.1 Vehicles & Containers	0	451.7	632.2	685.2	987.4	987.3	1,531.9	5,275.7
1.2 Handcarts (2 types: 1 & 1.5 m <sup>3</sup> )	0	0	0	0	0	0	0	0
Sub-total of Item 1 (1.1 + 1.2)	0	451.7	632.2	685.2	987.4	987.3	1,531.9	5,275.7
2. Construction of Sanitary Landfill in Benowo	0	0	0	0	683.0	683.0	683.0	2,049.0
3. Depo/LPS construction & rehabilitation & Asemrowo Workshop Improvement								
3.1 Construction of Depo/LPS	0	0	31.0	22.9	36.3	25.5	0	115.7
3.2 Rehabilitation of Depo/LPS	0	0	5.3	4.4	3.9	4.8	0	18.4
3.3 Asemrowo Workshop Improvement	0	0	26.7	0	0	0	0	26.7
Sub-total of Item 3 (3.1 + 3.2 + 3.3)	0	0	63.0	27.3	40.2	30.3	0	160.8
4. Procurement of Heavy Equipment	0	0	26.9	89.4	126.9	236.9	236.9	717.0
<b>Grand Total (1 + 2 + 3 + 4)</b>	<b>0</b>	<b>451.7</b>	<b>722.1</b>	<b>801.9</b>	<b>1,837.5</b>	<b>1,937.5</b>	<b>2,451.4</b>	<b>8,202.5</b>

**Table 6 SWM Expenditures Other Than Those Related to the F/S Project**  
Unit: Million Rupiah in 1992 price

Projects	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Total
<b>1. Haulage</b>								
1.1 O & M of the existing trucks	1,328	610	238	45		0	0	2,221
1.2 Payment to contractor	1,788	2,509	2,952	3,414	3,800	4,224	4,680	23,367
1.3 Total (1.1+1.2)	3,116	3,119	3,190	3,459	3,800	4,224	4,680	25,588
<b>2. Street Sweeping</b>								
2.1 Personnel expenditure	1,458	1,336	1,215	1,094	972	850	729	7,654
2.2 Equipment	88	81	74	66	59	52.0	44	464
2.3 Payment to contractor	926	986	1,047	1,108	1,168	1,229	1,290	7,754
2.4 Total (2.1+2.2+2.3)	2,472	2,403	2,336	2,268	2,199	2,131	2,063	15,872
<b>3. Cost Related to Heavy Equipment</b>								
3.1 O & M of Heavy equipment	228	228	228	228	114	57	0	1,083
3.2 Personnel expenditure	18	18	18	18	9	4	0	85
3.3 Total (3.1+3.2)	246	246	246	246	123	61	0	1,168
<b>4. Costs Related to LPA in the East</b>								
4.1 Construction	0	0	0	0	(6,933)	(1,733)	0	8,666
4.2 Land purchase		0	0	3,542	0	0	0	3,542
4.3 Sub-total (4.1+4.2)	0	0	0	3,542	(6,933)	(1,733)	0	12,208
4.4 O& M	0	0	0	0	0	683	683	1,366
4.5 Total (4.3 + 4.4)	0	0	0	3,542	6,933	2,416	683	13,574
<b>5. Incineration</b>								
5.1 Operation	966	966	966	966	966	966	966	6,762
5.2 Repair & equipment	0	936	171	173	472	1,785	840	4,337
5.3 Repayment of principal & interest	4,400	4,129	3,868	3,606	3,344	3,083	2,821	25,251
5.4 Payment to Consultants & others	120	120	120	120	120	120	120	840
5.5 Total of Item 5.	5,486	6,151	5,125	4,865	4,902	5,954	4,747	37,230
<b>6. Administration</b>	632	632	632	632	632	632	632	4,424
<b>Total (1+2+3+4+5+6)</b>								
a. Investment for LPA	(0)	(0)	(0)	(3,542)	(6,933)	(1,733)	(0)	(12,208)
b. All other costs	11,952	12,551	11,529	11,470	11,656	13,685	12,805	85,648
c. Total (a + b)	11,952	12,551	11,529	15,012	18,589	15,418	12,805	97,856

Note: Amounts in the parenthesis ( ) indicate investments needed for the construction of sanitary landfill in the east part of Surabaya.

**Table 7 Ratios of Net SWM Cash Expenditures and Loan Repayment to the Total KMS Budget** Unit: Million Rupiah (Nominal)

Year	Ratio of Net SWM Cash Expenditures to Total KMS Budget (1)	Ratio of Total Loan Repayments to Total KMS Budget (2)	Total (1) + (2) = (3)	KMS Budget (Nominal Million Rupiah) (4)
1985/86			7.4 %	31,700
1986/87			6.5 %	36,700
1987/88			6.5 %	50,400
1988/89			6.9 %	59,800
1989/90			12.0 %	62,100
1990/91			10.7 %	74,700
1991/92			11.3 %	99,400
1992/93	10.6 %	0.0%	10.6 %	112,700
1993/94	10.7 %	0.0%	10.7 %	134,902
1994/95	9.0 %	0.2%	9.2 %	161,478
1995/96	9.2 %	0.3%	9.5 %	193,289
1996/97	8.3 %	1.5%	9.8 %	231,367
1997/98	8.4 %	1.8%	10.2 %	276,946
1998/99	7.4 %	1.7%	9.1 %	331,504
Average During 1992/93 - 1998/99			9.9 %	

Note: Annual net SWM cash expenditures (N) are defined as follows:

$$N = a + b + c - d, \text{ where}$$

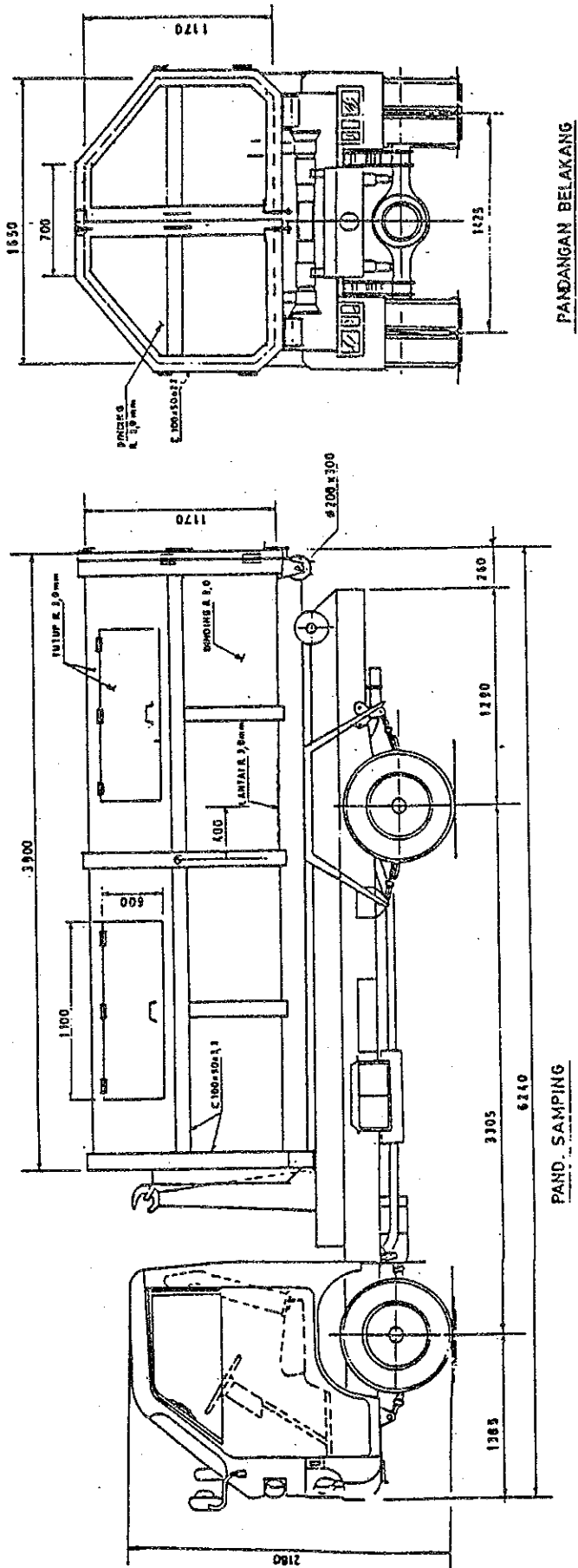
- a: Annual F/S projects expenditures
- b: Annual operation and maintenance costs related to F/S projects
- c: All other annual non-F/S projects expenditures
- d: Annual revenue of the bilateral loans and Indonesian Government loan

**Table 8 Ratios of Net SWM Expenditures (Excluding Loan Repayments) to KMS' Total Budget**

Unit: Million Rupiah in 1992 price

Projects	92/93	93/94	94/95	95/96	96/97	97/98	98/99	Total
A. Total SWM Expenditures including both F/S Projects & other expenditures	11,952.0	16,527.3	13,955.2	35,648.2	25,460.8	19,418.5	16,677.8	139,639.7
B. Bilateral Loan Revenue	0	3,204.2	1,475.6	18,031.1	4,453.9	1,850.9	1,291.8	30,307.5
C. The Indonesian Government Loan	0	0	0	3,542.0	6,933.0	1,733.0	0	12,208.0
D. Net Expenditures (A - B - C)	11,952.0 (10.6%)	13,323.1 (10.7%)	479.6 (9.0%)	14,075.1 (9.2%)	14,073.9 (8.3%)	15,834.6 (8.4%)	15,386.0 (7.4%)	97,124.2 (8.9%)
E. Net Revenue of the Sanitary Retribution	3,500.0 (3.1%)	5,744.0 (4.6%)	6,144.0 (4.4%)	6,544.0 (4.3%)	6,944.0 (4.1%)	7,380.0 (3.9%)	8,080.0 (3.9%)	44,336.0 (4.0%)
F. The Remaining to be Covered by the General KMS Budget (D - E)	8,452.0 (7.5%)	7,579.1 (6.1%)	6,335.6 (4.6%)	7,531.1 (5.5%)	129.9 (4.2%)	8,454.6 (4.5%)	306.0 (3.6%)	52,788.2 (4.9%)
G. KMS' Total Budget	112,700 (100%)	124,872 (100%)	138,358 (100%)	153,300 (100%)	169,857 (100%)	188,201 (100%)	208,527 (100%)	1,095,815 (100%)

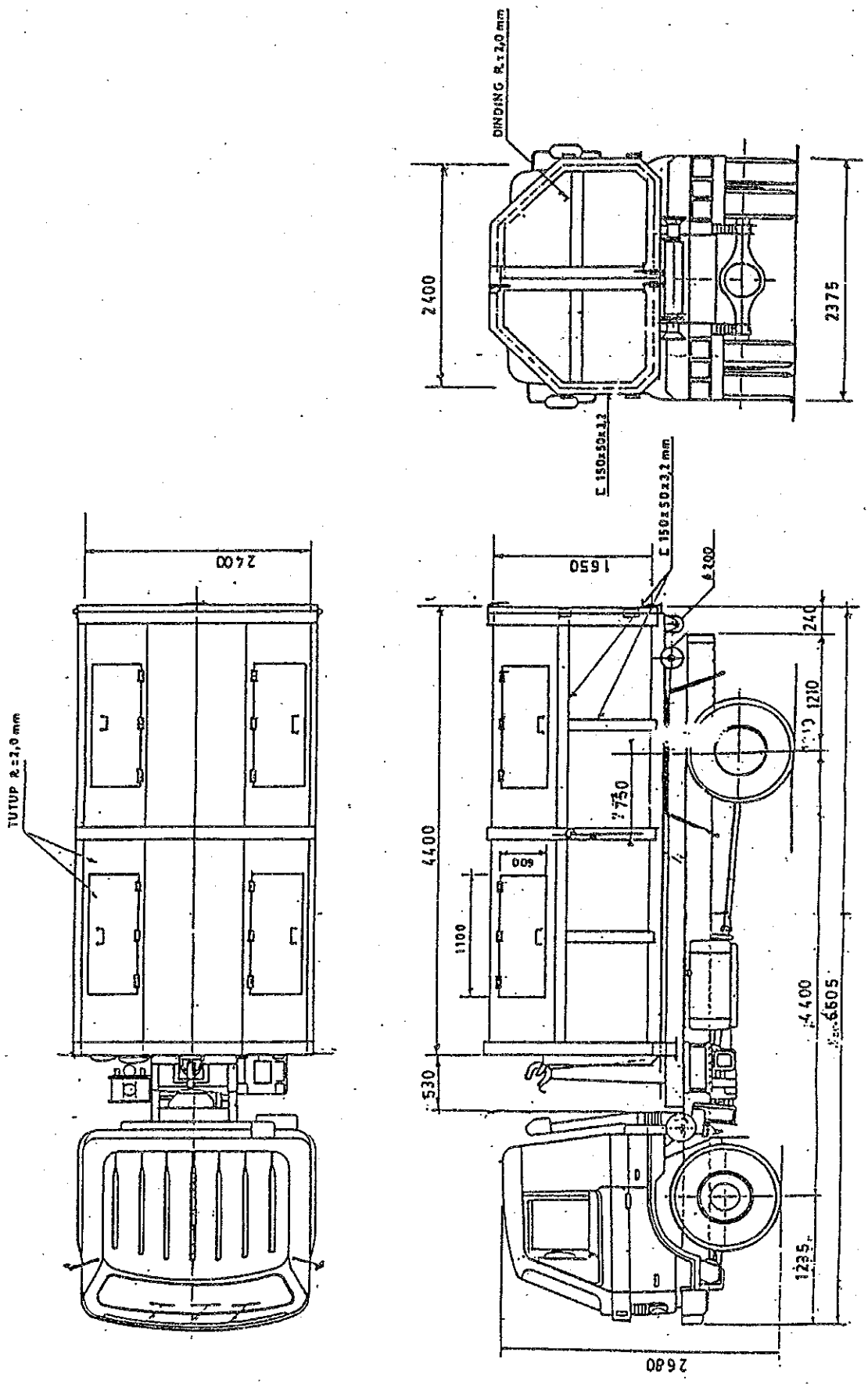
Note: It is assumed that KMS' total budget will increase by 10.8 %/year in real term, the same percentage as in the past.



Source : WIRA GULFINDO SARANA

FIG. 6

Example of 7 GVW Arm-Roll Truck with 8 M<sup>3</sup> Container



Source : WIRA GULFINDO SARANA

FIG. 7

Example of 14 GVW Arm-Roll Truck with 14 m<sup>3</sup> Container

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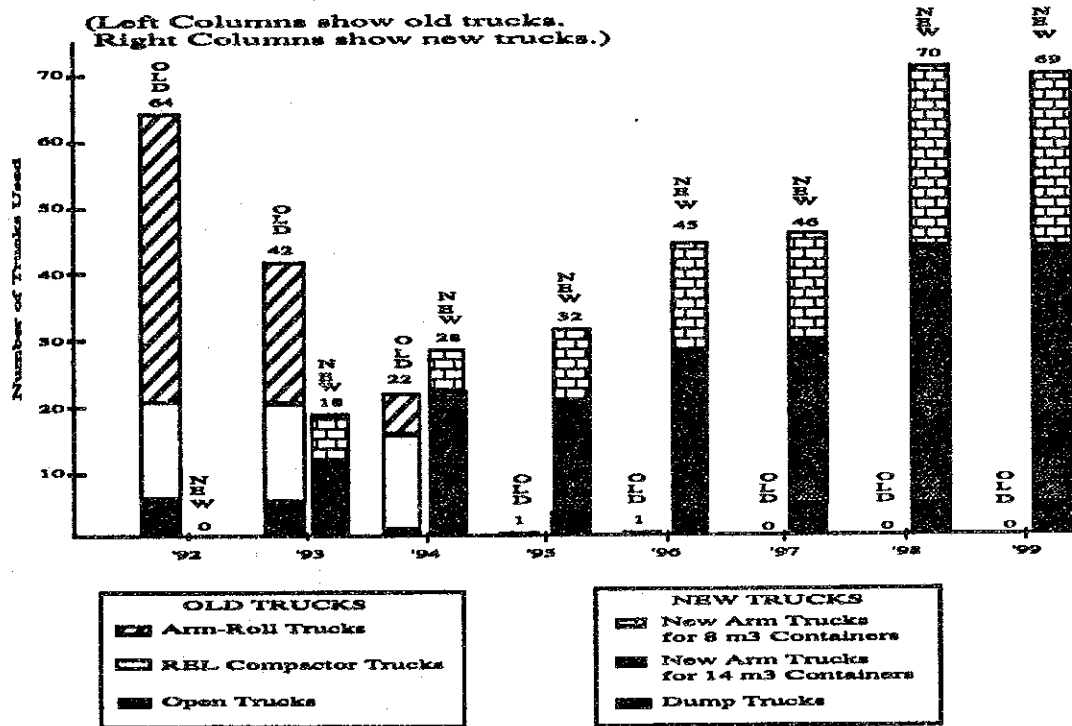


**Table 9 Future Amount of Waste to be Hauled by Type of Trucks**

Unit : ton/day on rainy season base

Year	Waste Amount to be Hauled under KMS' Responsi- bility (1)	To be Hauled by K M S' Own Trucks				To be Hauled by Contractors			
		Arm- Roll Trucks [2]	Com- pactor Trucks (3)	Open Dump Trucks (4)	KMS Total (5)=(2)+ (3)+(4)	Arm- Roll Trucks [6]	Com- pactor Trucks [7]	Open Dump Trucks [8]	Con- tractors' Total (9)=[6]+ [7]+[8]= (1) - [5]
1992	989	539	121	31	691	0	0	298	298
1993	1,027	617	60	14	691	217	69	50	336
1994	1,070	658	30	5	691	246	108	25	379
1995	1,117	691	0	5	691	266	148	12	426
1996	1,167	691	0	5	691	312	158	6	476
1997	1,222	691	0	5	691	362	169	0	531
1998	1,282	691	0	5	691	410	181	0	591
1999	1,350	691	0	5	691	464	195	0	659

Note: Waste to be hauled by contractors' compactor trucks (column 7) will increase by a 20 % of annual incremental waste (column 1) in 1996 and thereafter.



**Fig. 8 Number of the Existing and New Trucks in Comparison**

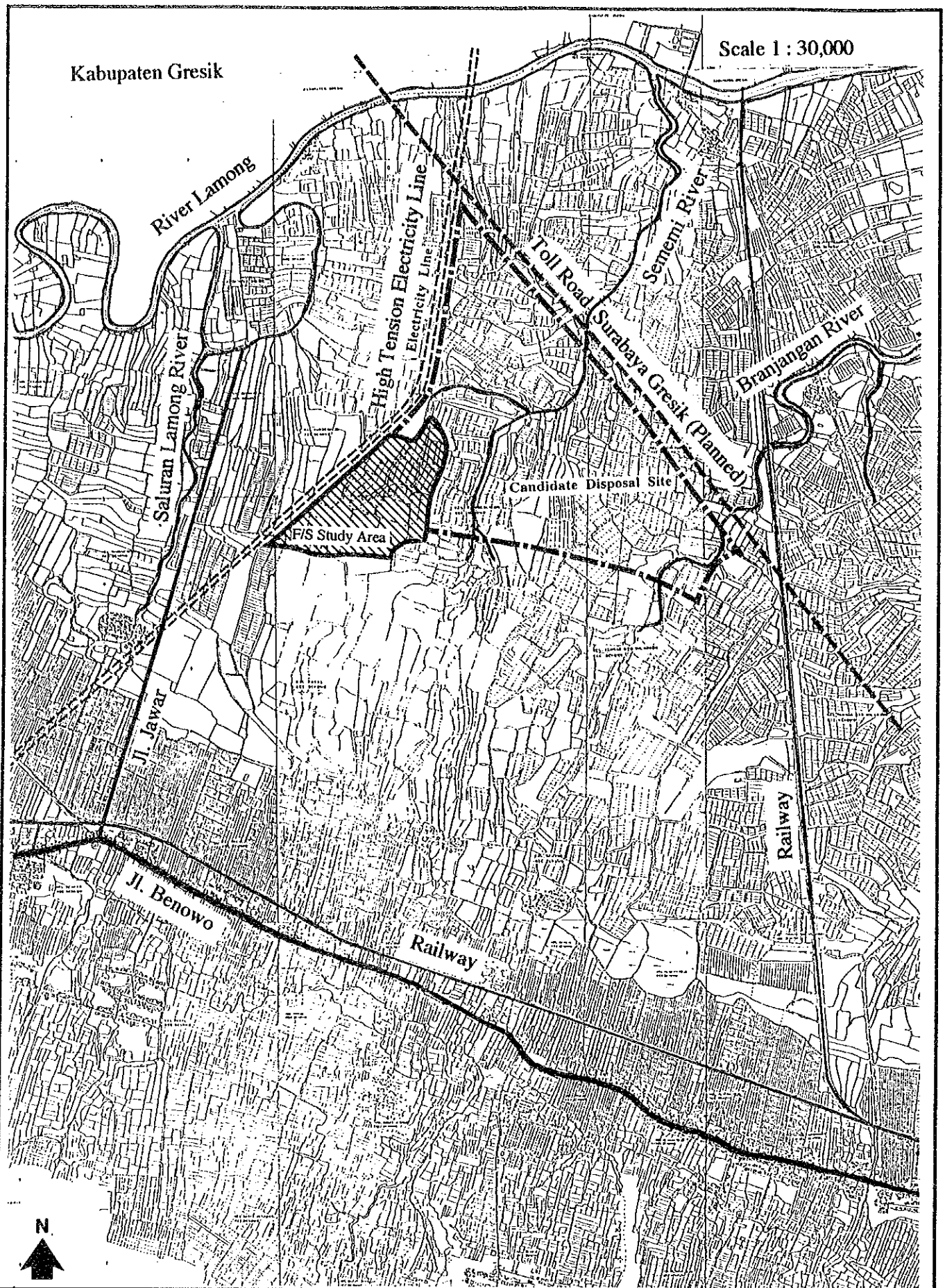


FIG. 9

Access to the Planned Landfill Site in Benowo

THE STUDY ON THE SOLID WASTE MANAGEMENT IMPROVEMENT FOR SURABAYA CITY

**LEGEND**

	KELURAHAN BOUNDARY
	PROJECT SITE
	SURVEY AREA
	TREE
	WIND MILLS
	ELECTRICITY TOWER
	SALT FARM
	FISH POND
	RESIDENTIAL LOT & AREA
	TEMPORARY RESIDENCE
	WAREHOUSE
	PASTURE
	OPEN AREA WITH NO USAGE
	POND AREA WITH NO USAGE
	ROAD
	TREAD
	RIVER
	DITCH

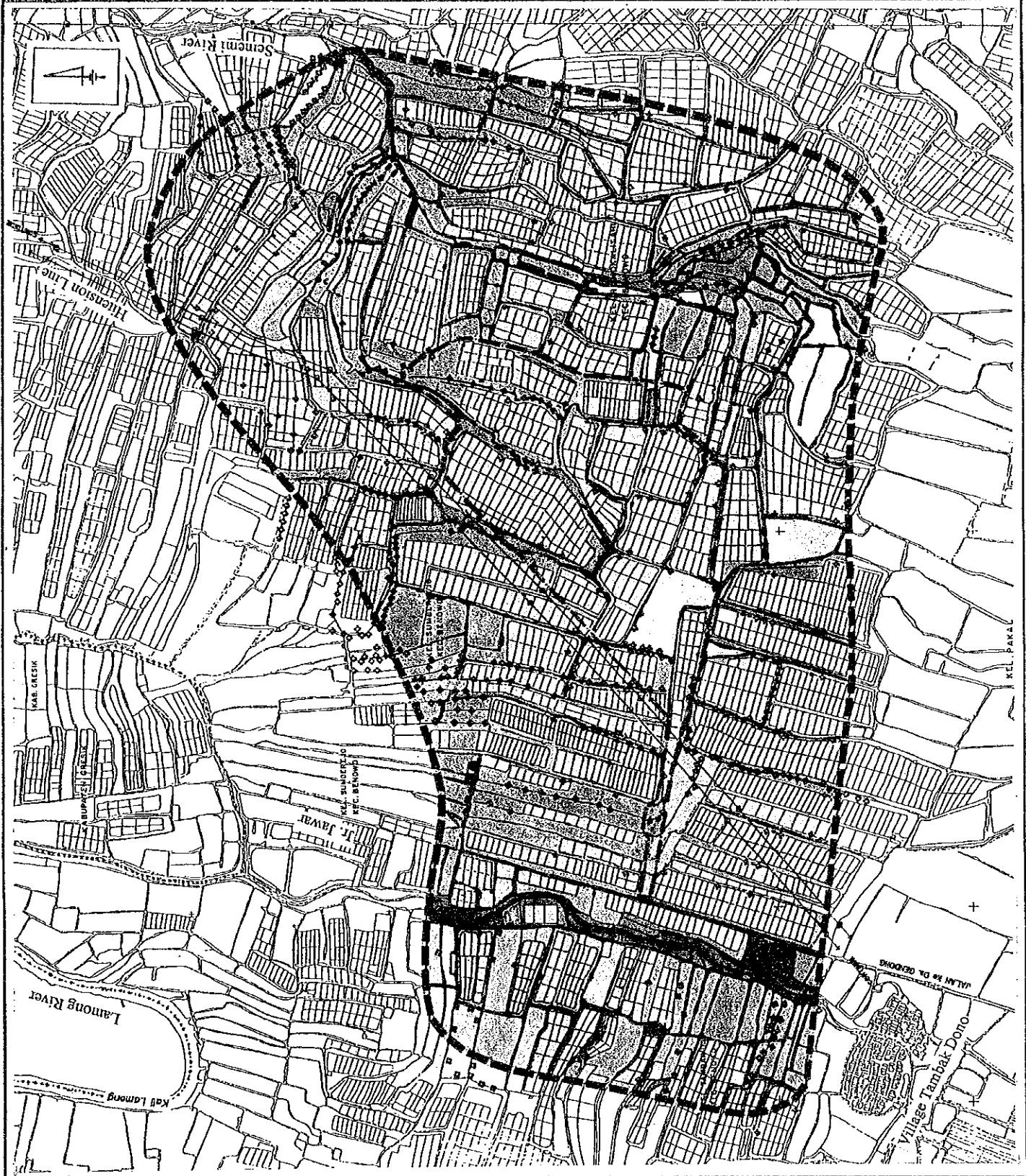
**TITLE: Fig. 10**  
**Present Land Use of Planning Site**

**LOCATION:**  
**PROPOSED BENOWO FINAL DISPOSAL SITE**

**DRAWN :** RACHMAT      **DATE :**  
**CHECKED :** URUSHBATA      **SCALE :** 1 : 10,000

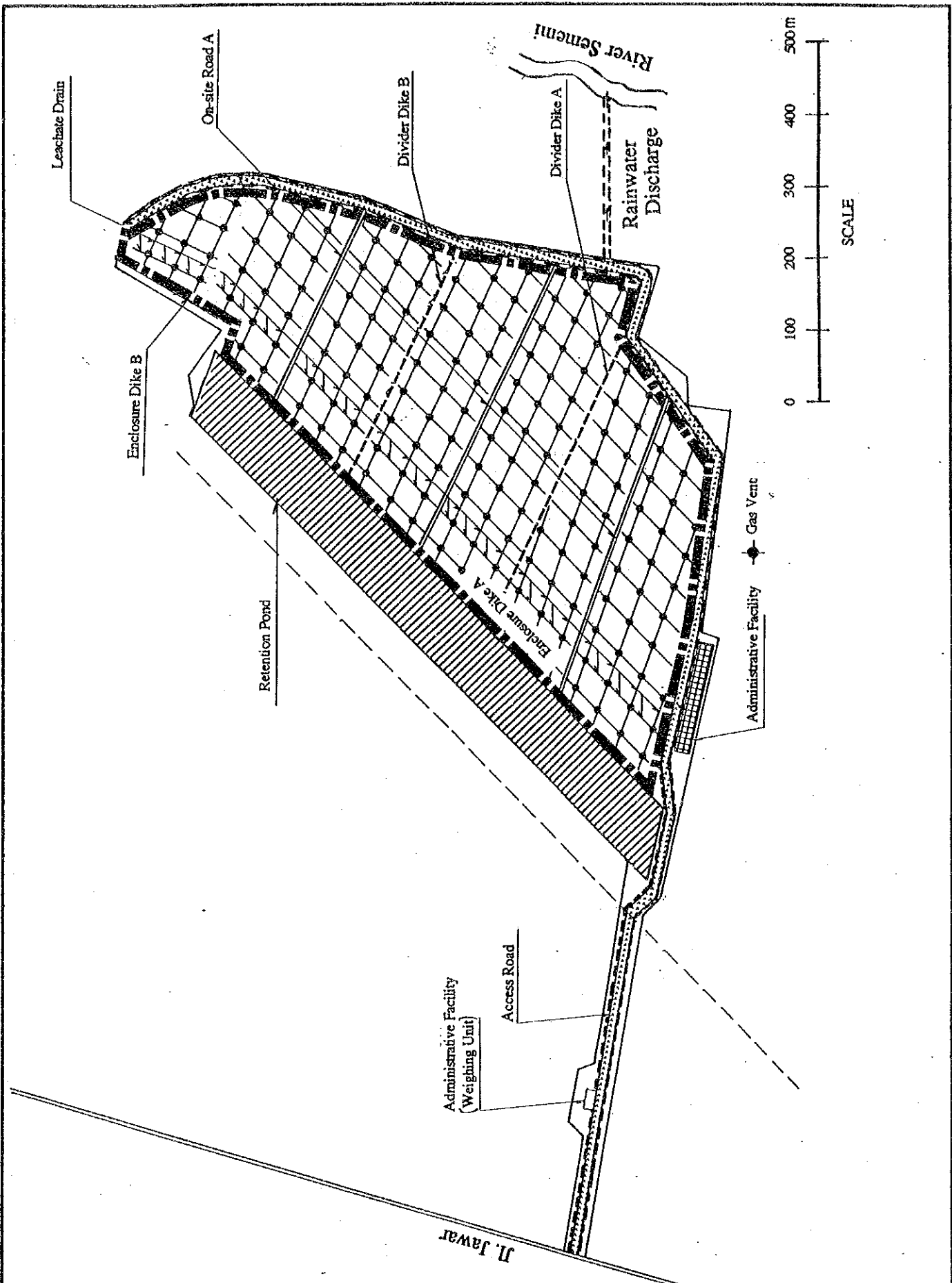
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 Japan-International Cooperation Agency

**PT.INDULEXCO**  
 Consulting Group



PRESNT LAND USE

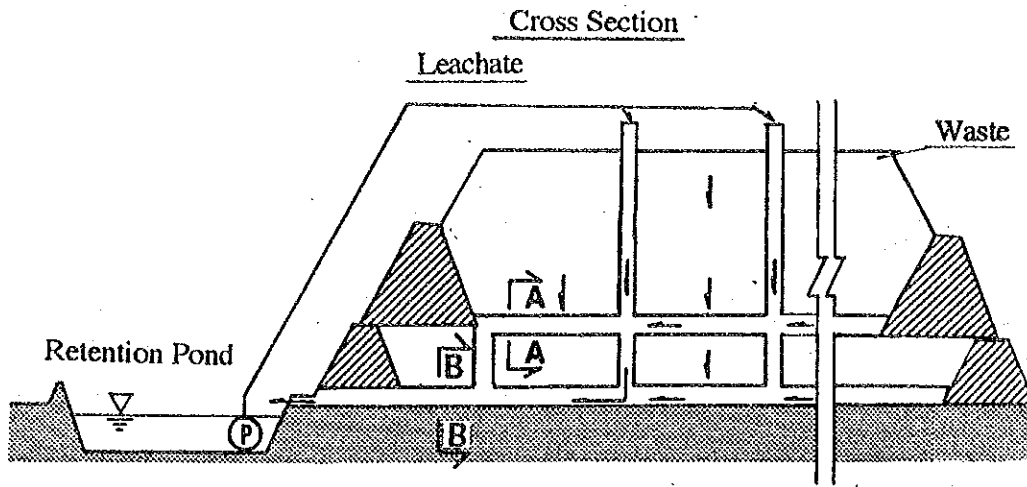




**FIG 11**

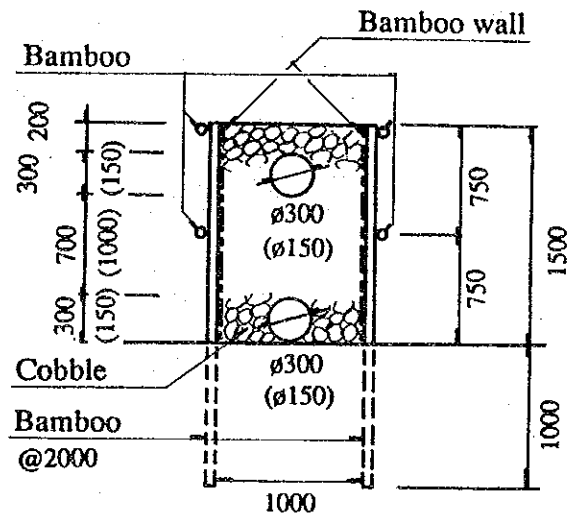
**Facility Layout Plan for the Planned Sanitary Landfill in Benowo**

THE STUDY ON THE SOLID WASTE MANAGEMENT IMPROVEMENT FOR SURABAYA CITY

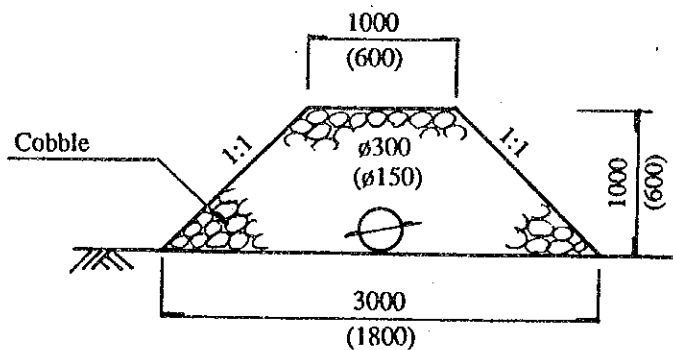


Cross Section of Leachate Drain

1st Stage Main Drain  
(Branch Drain)  
**B-B**

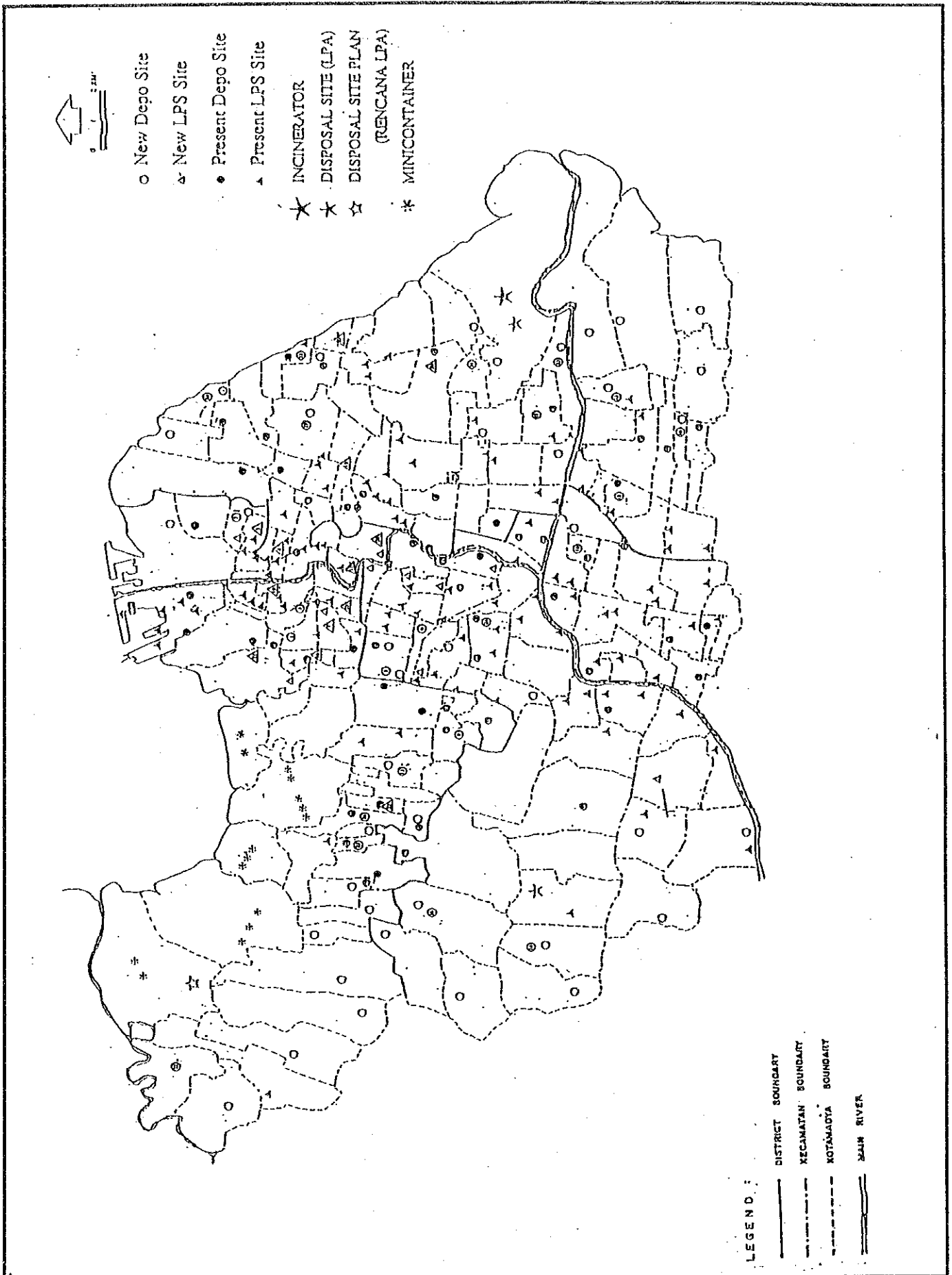


2nd Stage Main Drain  
(Branch Drain)  
**A-A**



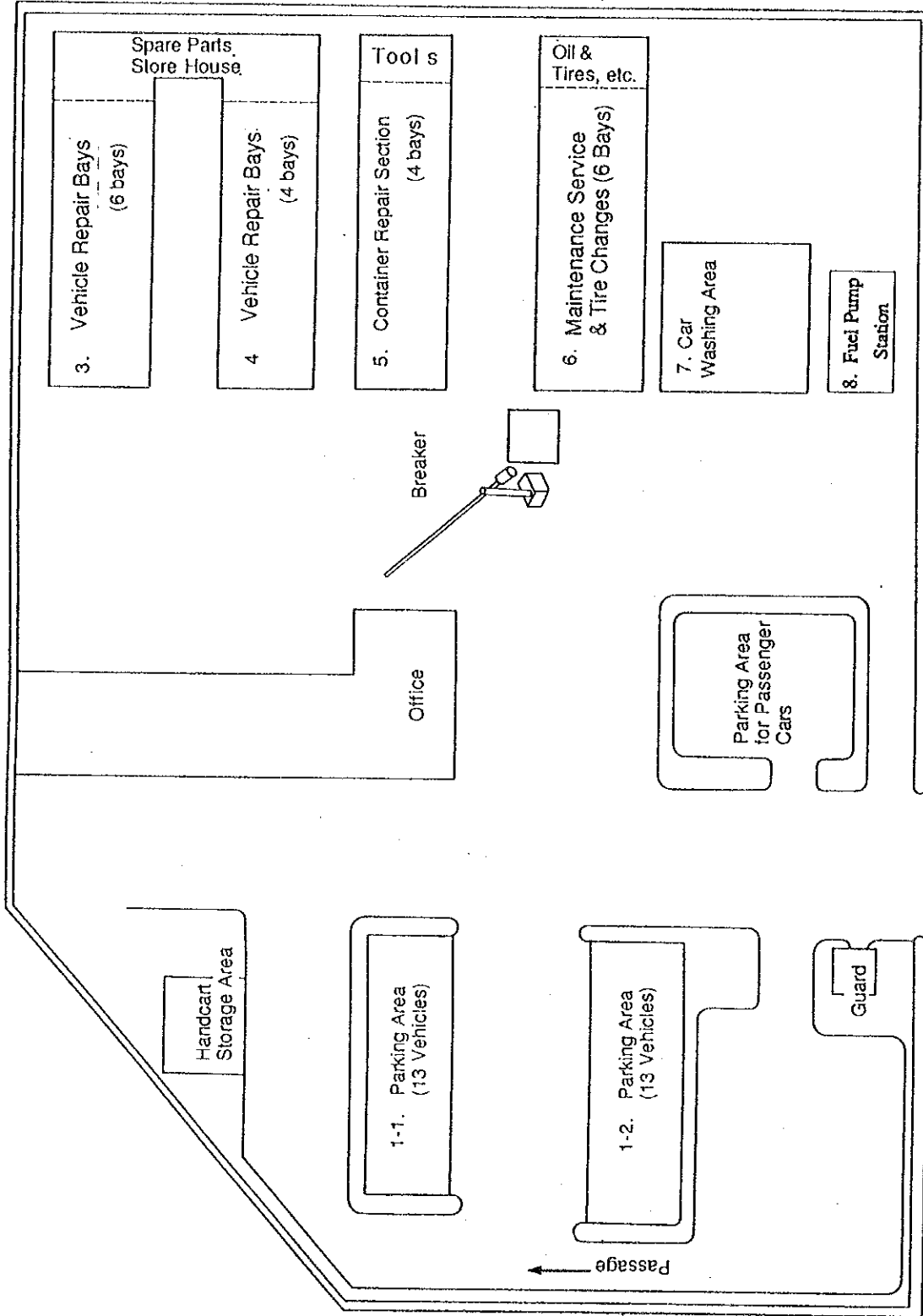
**FIG 12**

**Leachate Control System**



**FIG. 13**

**Planned Location of New Depo and LPS**



**FIG. 14** Remodeling Plan for the Asemrowo Workshop



## Appendix 1 Persons Involved in the Study

### 1. Indonesian Side

#### A. Steering Committee:

1. Mr. Rachmadi B.S. : Director General of Human Settlements, Ministry of Public Works.
2. Mr. Saad Basaib : Head of Bureau of Social Welfare, BAPPENAS.
3. Mr. Nabel Makarim : Deputy I, Environmental Impact Assessment Agency (BAPEDAL).
4. Mr. Darmawan Saleh : Director of Environmental Sanitation, Ministry of Public Works (DPU).
5. Mr. P. Sidabutar : Director of Development Programme, DGHS, Ministry of Public Works (DPU).
6. Mr. Soedarsono Soekardi : Director of Urban Development, Ministry of Home Affairs.
7. Mr. Yusuf Anwar : Director of Foreign Fund, Ministry of Finance.
8. Mr. Gembong Priyono : Head of Bureau for International Cooperation, DPU.
9. Mr. Didie Herkamto : Agency for Assessment and Application of Technology (BPPT).
10. Mr. Chusen Chasbullah : Head of BAPPEDA, Surabaya City
11. Mr. Eddy Indrayana : Head of Cleansing Department, Surabaya City

#### B. Technical Committee:

1. Mr. Deka Paranoan : Sub. Dir. of Solid Waste, Directorate of Environmental Sanitation, DPU.
2. Mr. Dwityo Akoro S. : Staff of Sub. Dir. of Solid Waste, PLP.
3. Mr. Rayas Satyadharma : Staff of Cleansing Department, Surabaya City.

4. Mr. Cholik : Staff of Cleansing Department, Surabaya City.
5. Mr. Boni Tobogu : Staff of Cleansing Department, Surabaya City
6. Mr. Benyamin Hilly : BAPPEDA, Surabaya City
7. Ms. Biempi Harbi Maharani : Urban Planning Department, Surabaya City
8. Ms. Saptorini : Directorate of Development Programme, DPU
9. Mr. Bambang Heruhadi : BPPT (Agency for Assessment and Application of Technology)
10. Mr. Masnelyarti Hilman : BAPEDAL
11. Mr. Akio ISHII : JICA SWM Expert

**C. Counterparts:**

1. Mr. Cholik (Part Time) : Cleansing Department, Surabaya City
2. Ms. Erna (Full Time) : Cleansing Department, Surabaya City
3. Ms. Dahlia Erawati (Part Time) : Staff of PLP for East Java Province
4. Mr. Rudi Lesmono (Full Time) : Staff of PLP for East Java Province

**D. Counterparts of Ad Hoc Base:**

1. Collection : Mr. Suwito, Garbage Collection Division  
Cleansing Dept., Surabaya City
2. Disposal : Mr. Sugiri, Planning & Monitoring  
Division, Cleansing Dept. Surabaya City
3. Vehicle Maintenance : Mr. W.J. Pattikawa, Haulage Division,  
Cleansing Dept. Surabaya City
4. Finance : Mr. Suryanto, Evaluation Division,  
Cleansing Dept. Surabaya City

## 2. Japanese Side

### A. JICA Advisory Committee:

1. Dr. Masaru TANAKA : Chief of Solid Waste Engineering  
(Chairman of the Committee) Department,  
The Institute of Public Health
2. Dr. Kunitoshi SAKURAI : Professor of Urban Engineering in  
(Treatment & Disposal) Faculty of Engineering, Tokyo University
3. Mr. Yoshiaki ISHIKAWA : Director of Construction Section,  
(Waste Administration) Plant Construction Division,  
Bureau of Public Cleansing,  
Tokyo Metropolitan Government

### B. Study Team:

1. Mr. Kihachiro URUSHIBATA : Team Leader (PCI)
  2. Mr. Kiichiro SAKAGUCHI : Organization & Institution/Project  
Evaluation Analyst (EX)
  3. Mr. Shin'ichi SUZUKI : Waste Collection Planner (EX)
  4. Mr. Ramli : Organization & Institution Analyst (EX)
  5. Mr. Shunsuke Aoyama : Intermediate Treatment Planner (EX)
  6. Mr. Minoru Murata : Equipment Maintenance Expert (EX)
  7. Mr. Norio Kan'no : Waste Quality Analyst (PCI)
  8. Mr. Masafumi Aikawa : Final Disposal Planner (PCI)
  9. Mr. Akinori Sato : Environment Analyst (PCI)
  10. Mr. Kazuhiro Nakaishi : Facility Designer (PCI)
- 

### Abbreviations:

Ex: EX Corporation

PCI: Pacific Consultants International

## Appendix 2. Notificaiton of ANDAL Evaluation Result



### GUBERNUR KEPALA DAERAH TINGKAT I JAWA TIMUR

SURABAYA, 7 Januari 1993

Nomer : 660/16/201.3/93 Kepada  
Sifat : P E N T I N G  
Lampiran : - Yth. Sdr. Kepala Dinas Kebersihan  
Perihal : Penilaian Analisis Pemerintah Kotamadya Da-  
Dampak Lingkungan erah Tingkat II Surabaya  
(ANDAL) di  
----- S U R A B A Y A  
-----

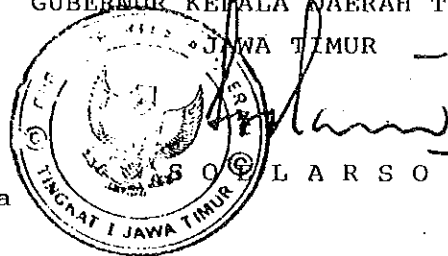
Sehubungan dengan pengajuan atas berkas dokumen ANDAL Rencana LPA Baru didesa Romo Kalisari Kecamatan Benowo Kotamadya Daerah Tingkat II Surabaya, yang saudara sampaikan ke Komisi AMDAL Propinsi Daerah Tingkat I Jawa Timur, maka dapat disampaikan hal-hal sebagai berikut :

- A. Penulisan disusun berdasarkan Surat Keputusan Departemen Pekerjaan Umum Republik Indonesia.
- b. Materi dapat diterima dan hal-hal yang harus saudara diperhatikan adalah ;
  1. Agar memperhatikan dampak sosial budaya yang mungkin timbul akibat kegiatan rencana LPA Baru tersebut, terutama dampak negatipnya.
  2. Tetap memperhatikan estetika lingkungan setelah menjadi LPA Baru.
  3. Menangani limbah cair dan harus membuat bak pengolah limbah cair dan memperhatikan nilai ambang batasnya.
  4. Menangani pencemaran udara seperti bau, debu dan lain-lain.
  5. Mengadakan penghijauan baik didalam maupun di sekitar LPA Baru.

6. Arus lalu lintas umum yang berada pada jalur jalan baik yang menuju atau dari LPA Baru tidak boleh terganggu akibat kegiatan LPA, sehingga tidak terjadi kemacetan lalu lintas.
- C. Berdasarkan uraian tersebut diatas ANDAL Rencana LPA BARU di Benowo dapat disetujui dan segera menyusun RKL dan RPLnya.

Demikian untuk menjadikan maklum.

GUBERNUR KEPALA DAERAH TINGKAT I  
JAWA TIMUR



Tembusan :

Yth. Sdr. Walikota Kepala  
Daerah Tingkat II  
Surabaya di Surabaya.

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**RENCANA**

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**PEMBUKAAN DAN PENGOPERASIAN**

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**LOKASI PEMBUANGAN AKHIR SAMPAH**

---

**DI KELURAHAN ROMO KALISARI - KECAMATAN BENOWO**

---

**KOTAMADYA SURABAYA**

---

**LAPORAN AKHIR**

**STUDI ANDAL**

**RENCANA LPA BARU DI BENOWO**

**DINAS KEBERSIHAN**  
**PEMERINTAH KOTAMADYA DAERAH TINGKAT II SURABAYA**

Dengan dibantu oleh :

**Direktorat Penyehatan Lingkungan Pemukiman**  
**Direktorat Jenderal Cipta Karya - Departemen PU**

Lewat Team Teknis

**JICA STUDY TEAM on SOLID WASTE MANAGEMENT**  
**IMPROVEMENT FOR SURABAYA CITY**

**November - 1992**



JICA

