

**SOLID WASTE MANAGEMENT STUDY
FOR
PULAU PINANG AND SEBERANG PERAI MUNICIPALITIES**

**SUPPORTING REPORT
VOLUME VI
DRAWINGS**

AUGUST 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

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**SOLID WASTE MANAGEMENT STUDY
FOR
PULAU PINANG AND SEBERANG PERAI MUNICIPALITIES
FINAL REPORT
SUPPORTING REPORT
VOLUME VI
DRAWINGS**

AUGUST 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

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20345

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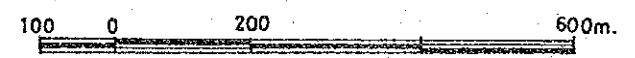
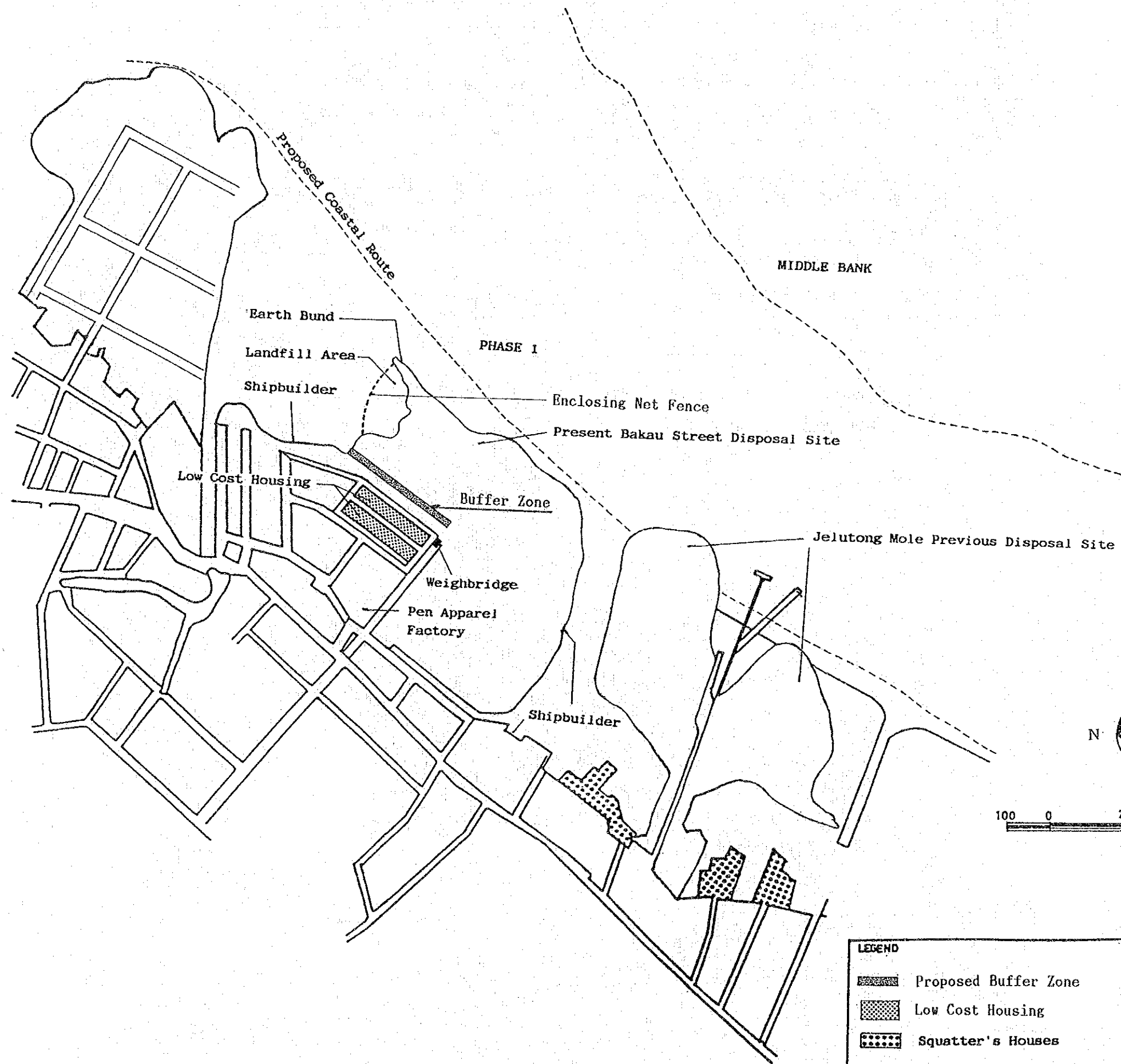
LIST OF DRAWINGS




MPPP	MPSP
Phase II Project	Phase II Project
Fig. 7-1 Disposal Site Plan Phase II and Phase III	Fig. 8-1 Disposal Site Plan Phase II, KMDS Fig. 8-2 Disposal Site Plan Phase II, PBDS
Phase III Project	Phase III Project
- NIL -	Fig. 10-1 Disposal Site Plan Phase III, KMDS Fig. 10-2 Disposal Site Plan Phase III, PBDS
Ultimate Use	Ultimate Use
Fig. 9-1 Ultimate Use of PADS	Fig. 11-1 Ultimate Use of KMDS Fig. 11-2 Ultimate Use of PBDS

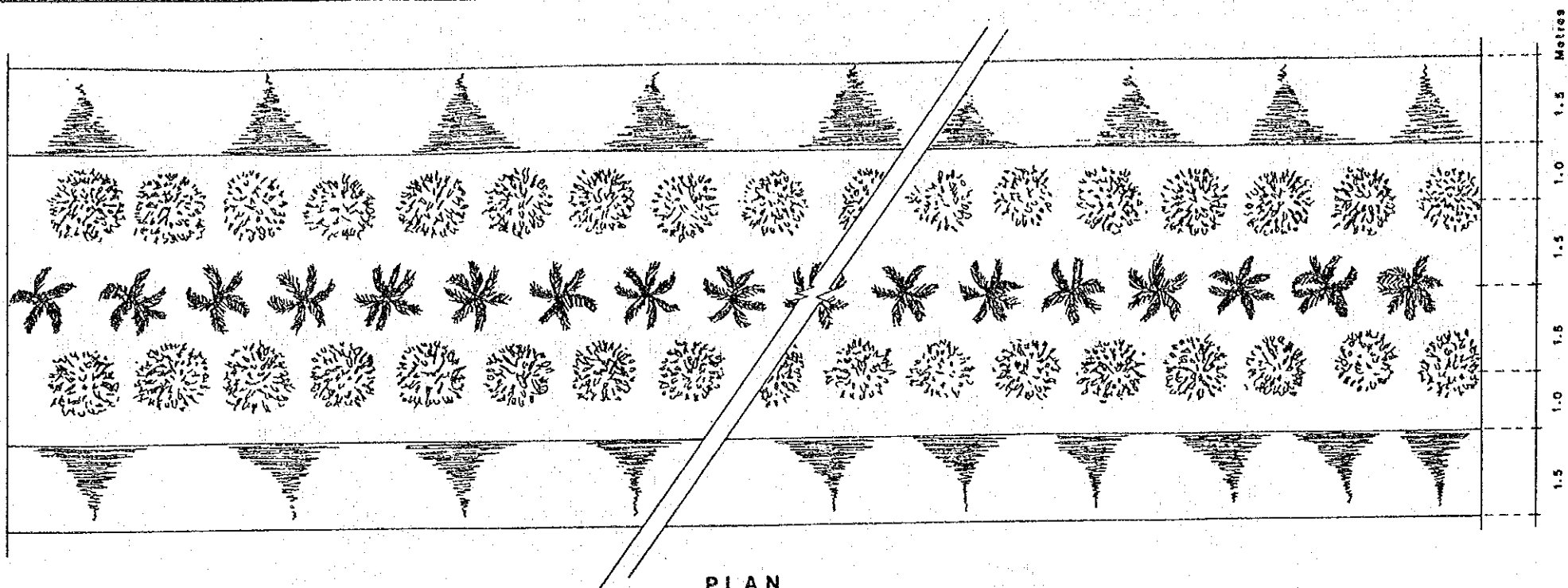
ABBREVIATION

ABC : Action Plan for a Beautiful and Clean Malaysia
BSDS : Bakau Street Disposal Site
BPTS : Balik Pulau Transfer Station
CIF : Cost, Insurance and Freight
DBKL : City Hall of Kuala Lumpur
DID : Drainage and Irrigation Department
DOE : Department of Environment
EIA : Environmental Impact Assessment
ENSEARCH : Environmental Management and Research Association of Malaysia
EPU : Economic Planning Unit
FTZIP : Free Trade Zone Incineration Plant
FTZTS : Free Trade Zone Transfer Station
GDP : Gross Domestic Product
IKU : Public Health Institute
JICA : Japan International Cooperation Agency
JKKK : Village Development and Security Committee
JMPDS : Jelutong Mole Previous Disposal Site
JMTS : Jelutong Mole Transfer Station
JPBD : Town and Country Planning Department
KEMAS : Community Development, Ministry of National and Rural
Development
KMDS : Kuala Muda Disposal Site
LWL : Low Water Level
LA : Local Authority
M : Million
MC : Municipal Council
MMTS : Mak Mandin Transfer Station
MPPP : Majlis Perbandaran Pulau Pinang
MPSP : Majlis Perbandaran Seberang Perai
MOH : Ministry of Health
MHLG : Ministry of Housing and Local Government
M/P : Master Plan
MSWM : Municipal Solid Waste Management
NEB : National Electricity Board
NEP : New Economic Policy
PADS : Pantai Acheh Disposal Site
PBDS : Plan Burong Disposal Site
PDC : Penang Development Corporation
PERDA : Penang Rural Development Authority
PHA : Public Health Assistant
PHI : Public Health Inspector
PICIP : Prai Industrial Complex Incineration Plant
PSD : Public Services Department, Prime Minister's Department
JKR/PWD : Public Works Department
PPC : Penang Port Commission

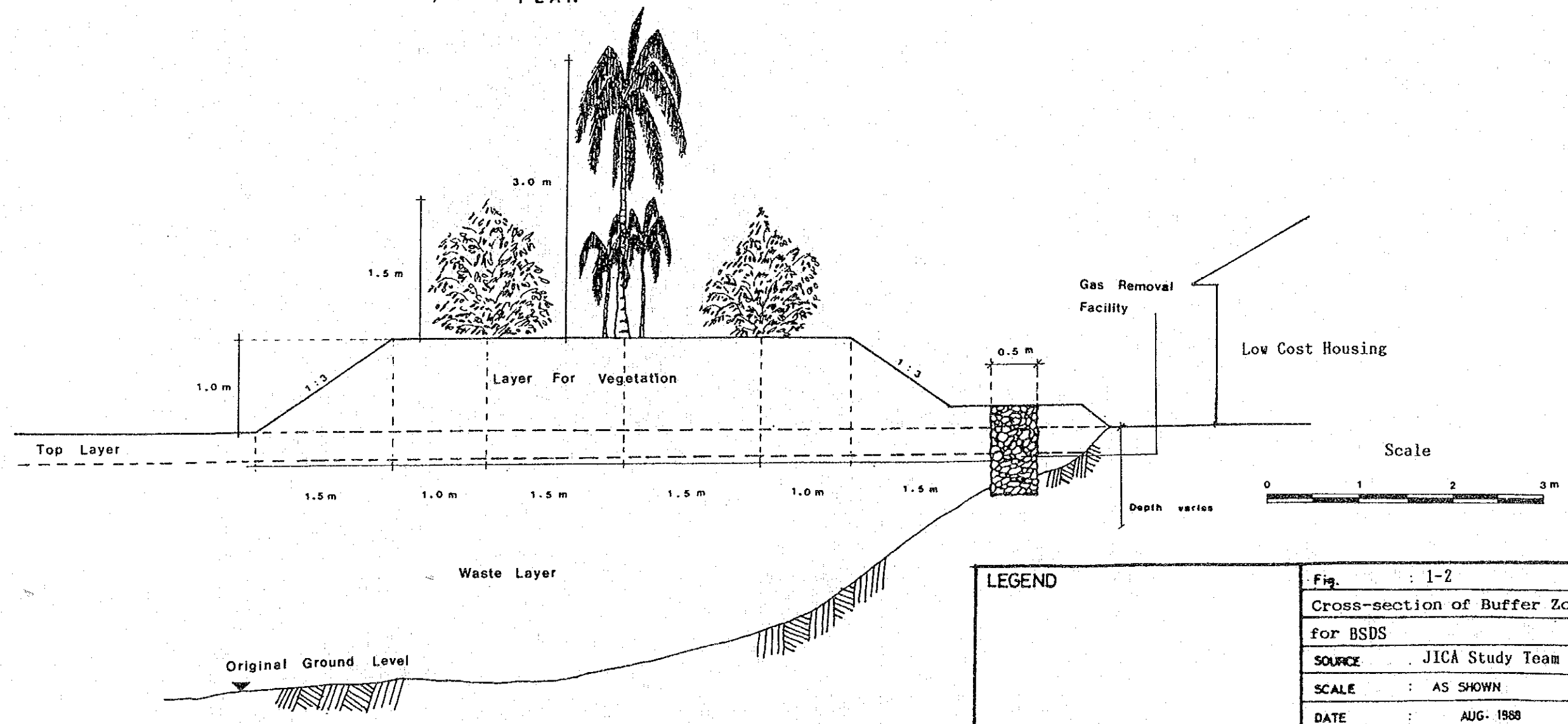
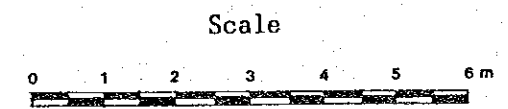
PPC : Penang Port Commission
S/R : Supporting Report
SWM : Solid Waste Management
SWMIS : Solid Waste Management Information System
TDC : Tourist Development Corporation
UDS : Urban Drainage System
USD : Urban Service Department
USM : University Sains Malaysia



LEGEND  Proposed Buffer Zone  Low Cost Housing  Squatter's Houses	Fig. : 1-1
	Immediate Improvement Plan for BSDS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Dec. 1988



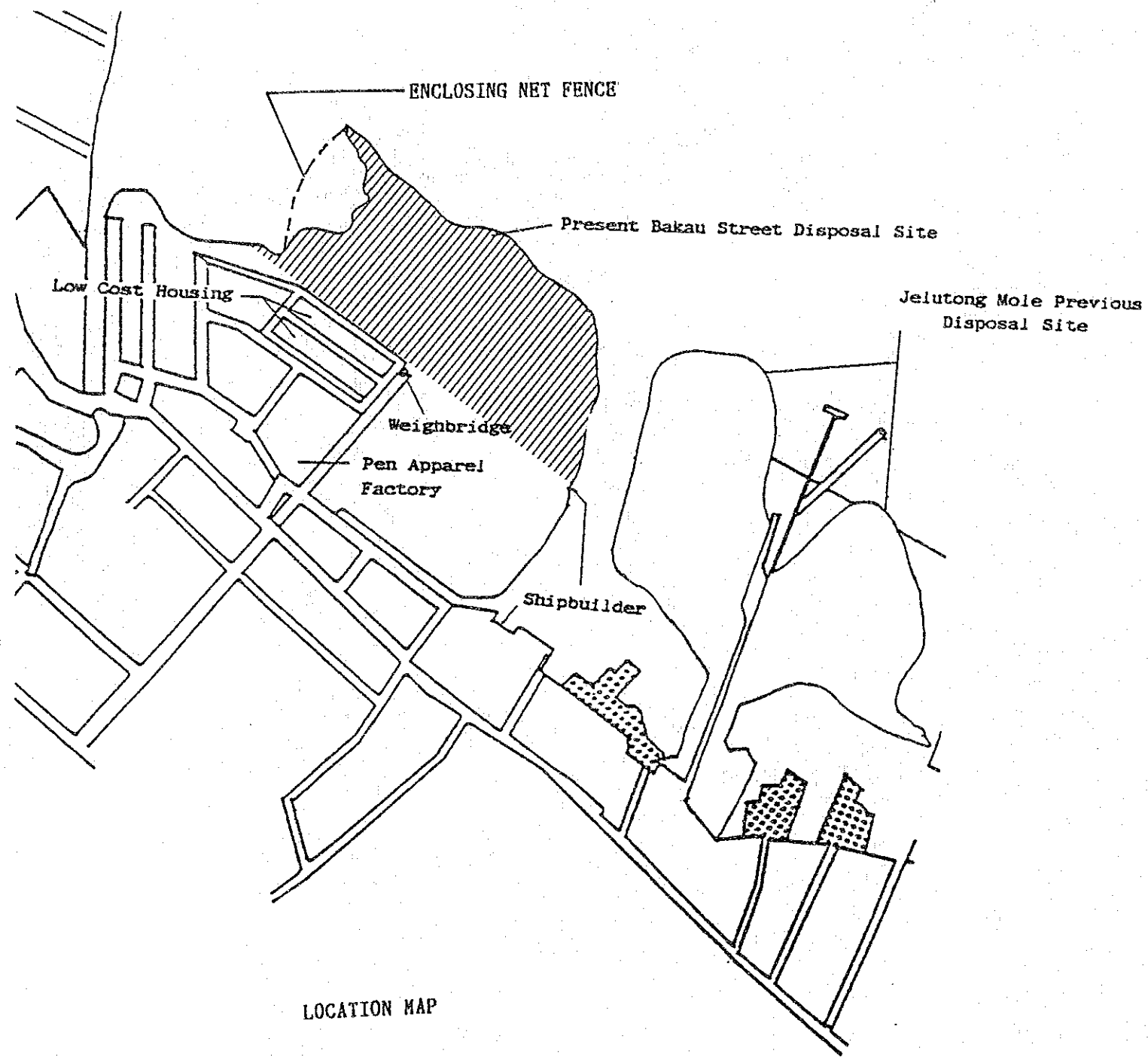
PLAN



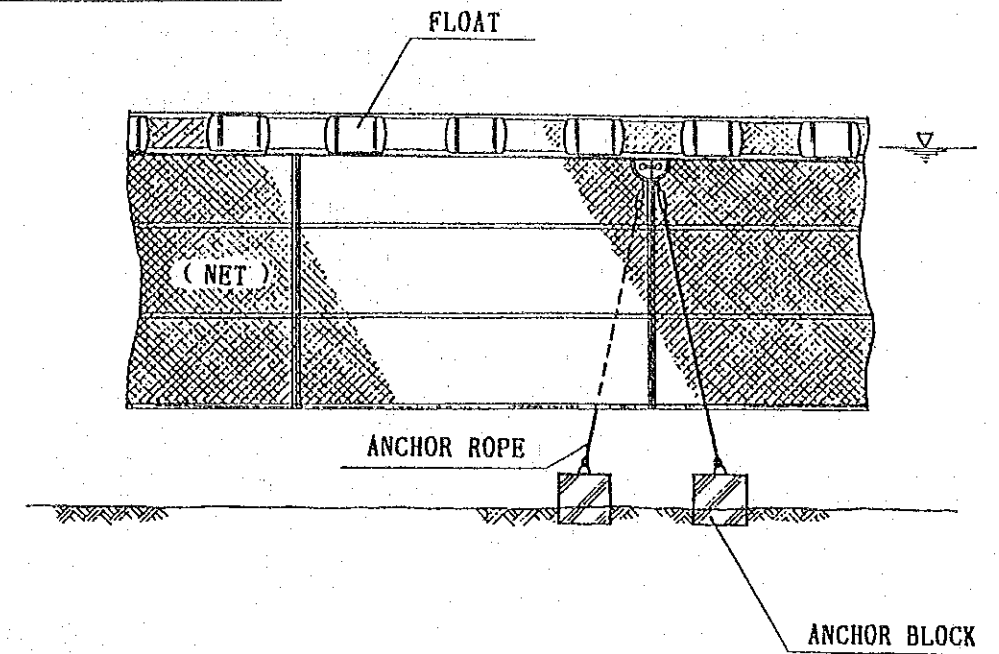
ELEVATION

LEGEND	Fig. : 1-2
	Cross-section of Buffer Zone for BSDS
	SOURCE : JICA Study Team
	SCALE : AS SHOWN
	DATE : AUG. 1988
PREPARED BY: JICA STUDY TEAM	

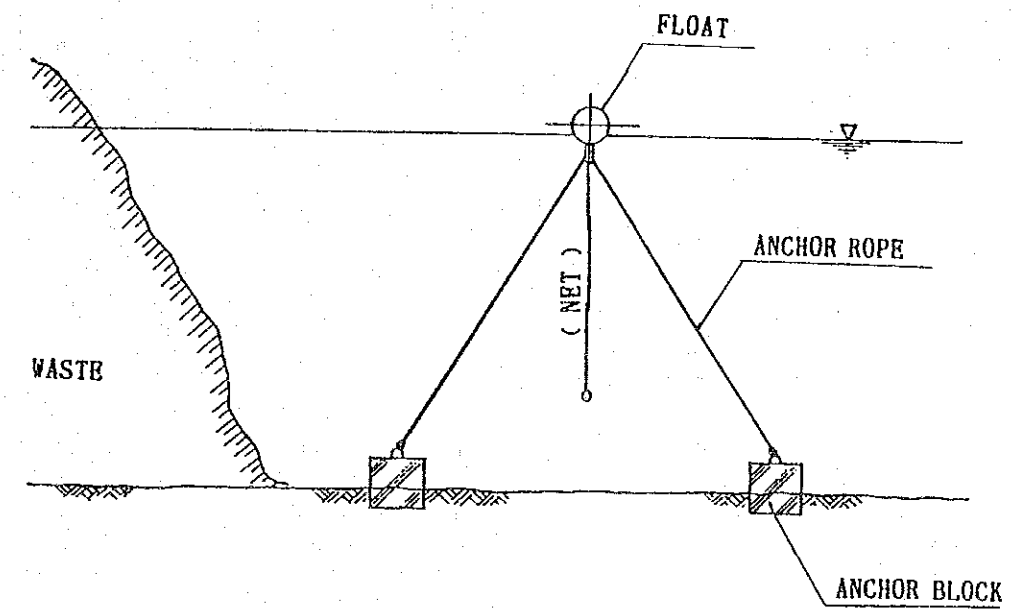
THE SOLID WASTE MANAGEMENT STUDY For P.PINANG & S.P



ENCLOSING NET FENCE

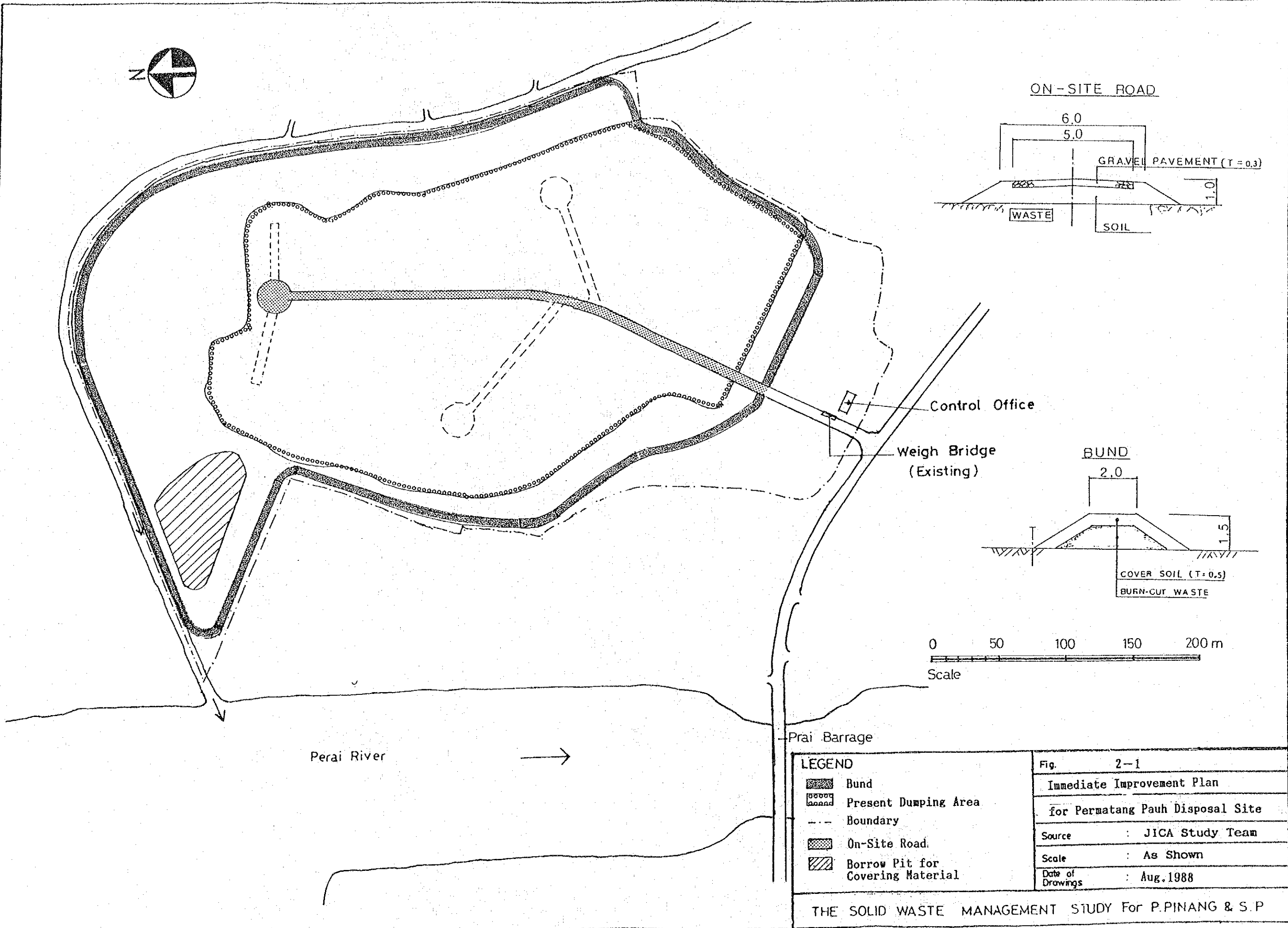
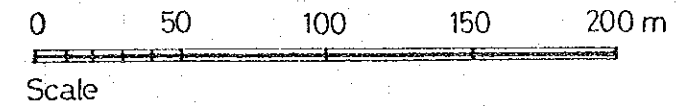
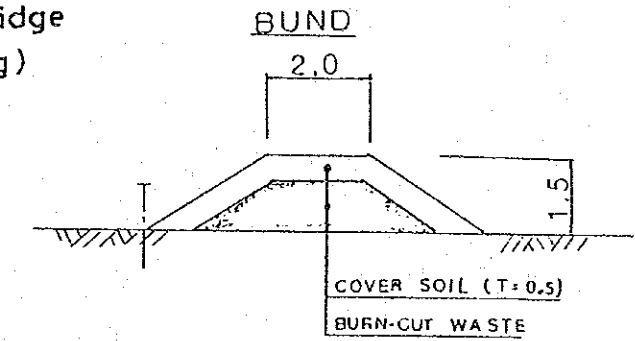
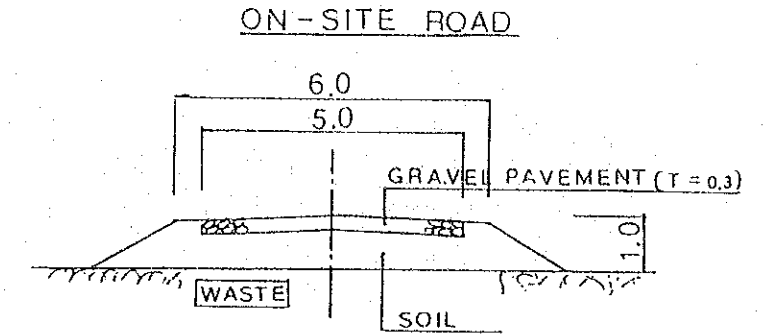


CROSS SECTION



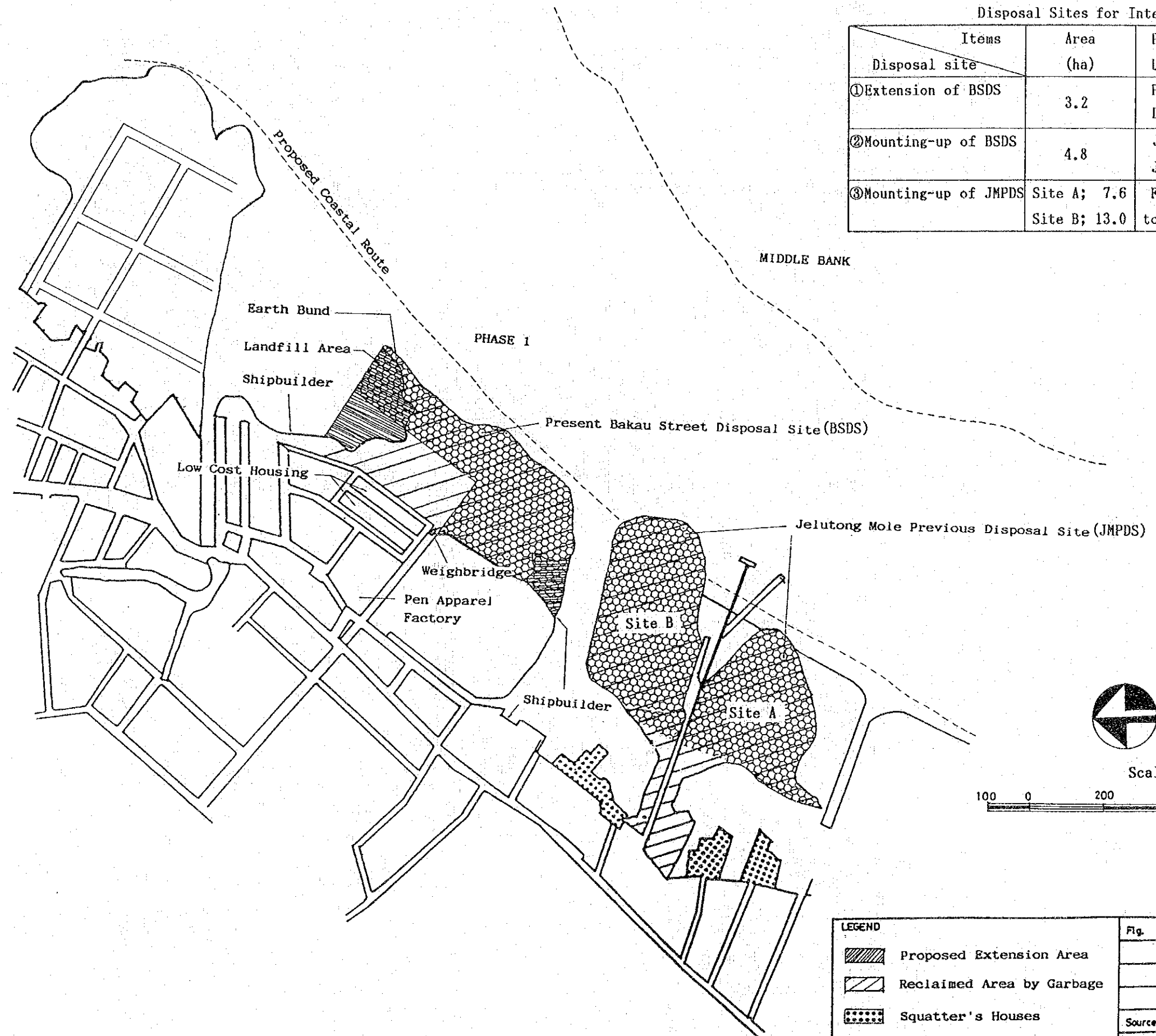
LEGEND	Fig. : 1-3
	Enclosing Net Fence for BSDS
	:
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : Aug. 1988	

THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI



LEGEND	Fig. 2-1
	Immediate Improvement Plan
<ul style="list-style-type: none"> Bund Present Dumping Area Boundary On-Site Road. Borrow Pit for Covering Material 	for Permatang Pauh Disposal Site
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Aug. 1988

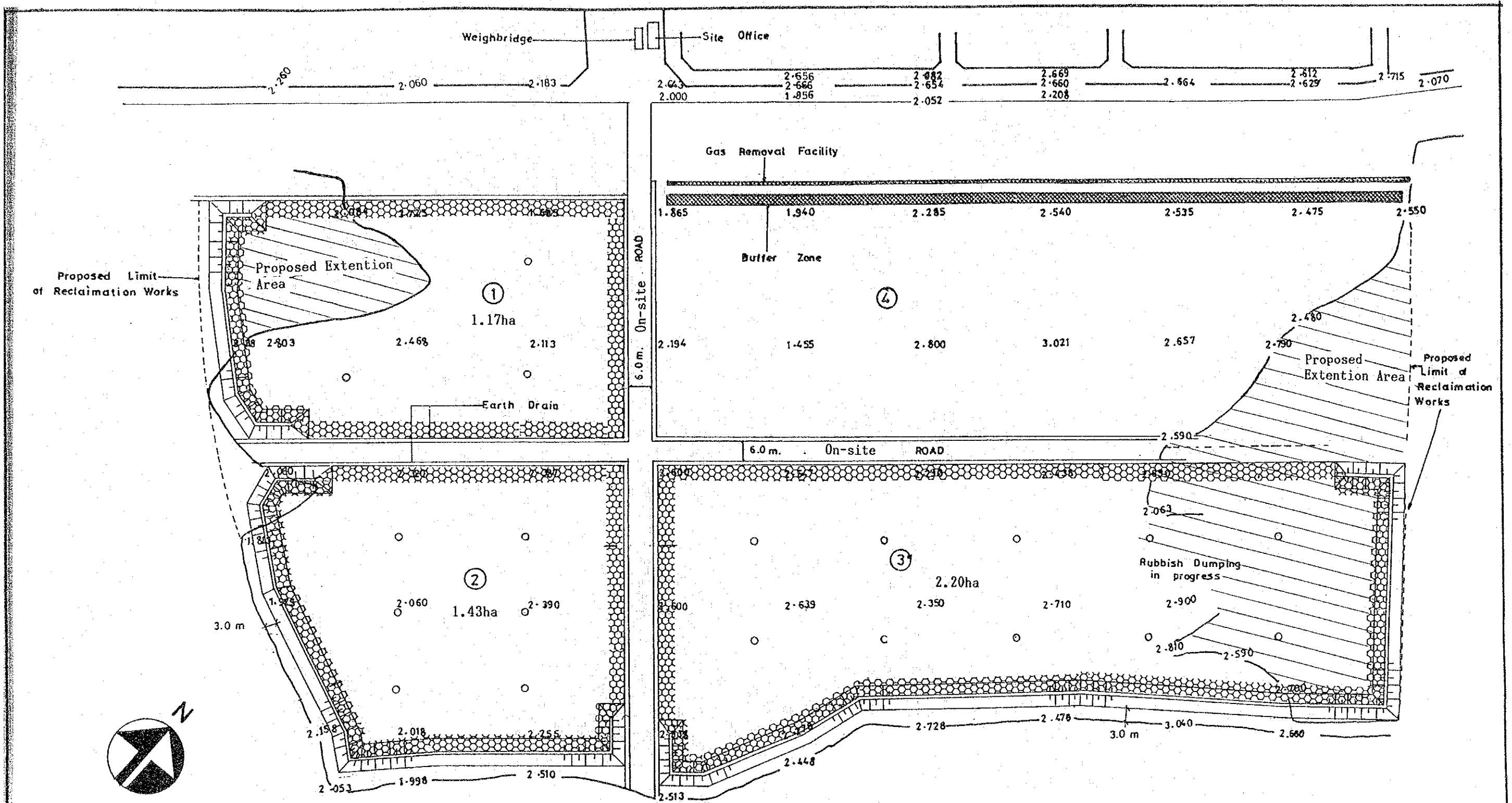
THE SOLID WASTE MANAGEMENT STUDY For P. PINANG & S. P



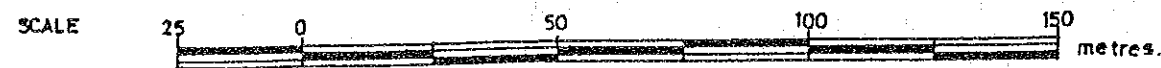
Disposal Sites for Interim Period

Items Disposal site	Area (ha)	Period of Use	Remarks
① Extension of BSDS	3.2	Present to Dec. 1988	Northern & Southern Edge
② Mounting-up of BSDS	4.8	Jan. 1989 to Jan. 1990	
③ Mounting-up of JMPDS	Site A; 7.6 Site B; 13.0	Feb. 1990 to Dec. 1991	

LEGEND Proposed Extension Area Reclaimed Area by Garbage Squatter's Houses Proposed Mounting Up Area	Fig. : 3-1
	Location of Sites for Interim Period
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Dec. 1988
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

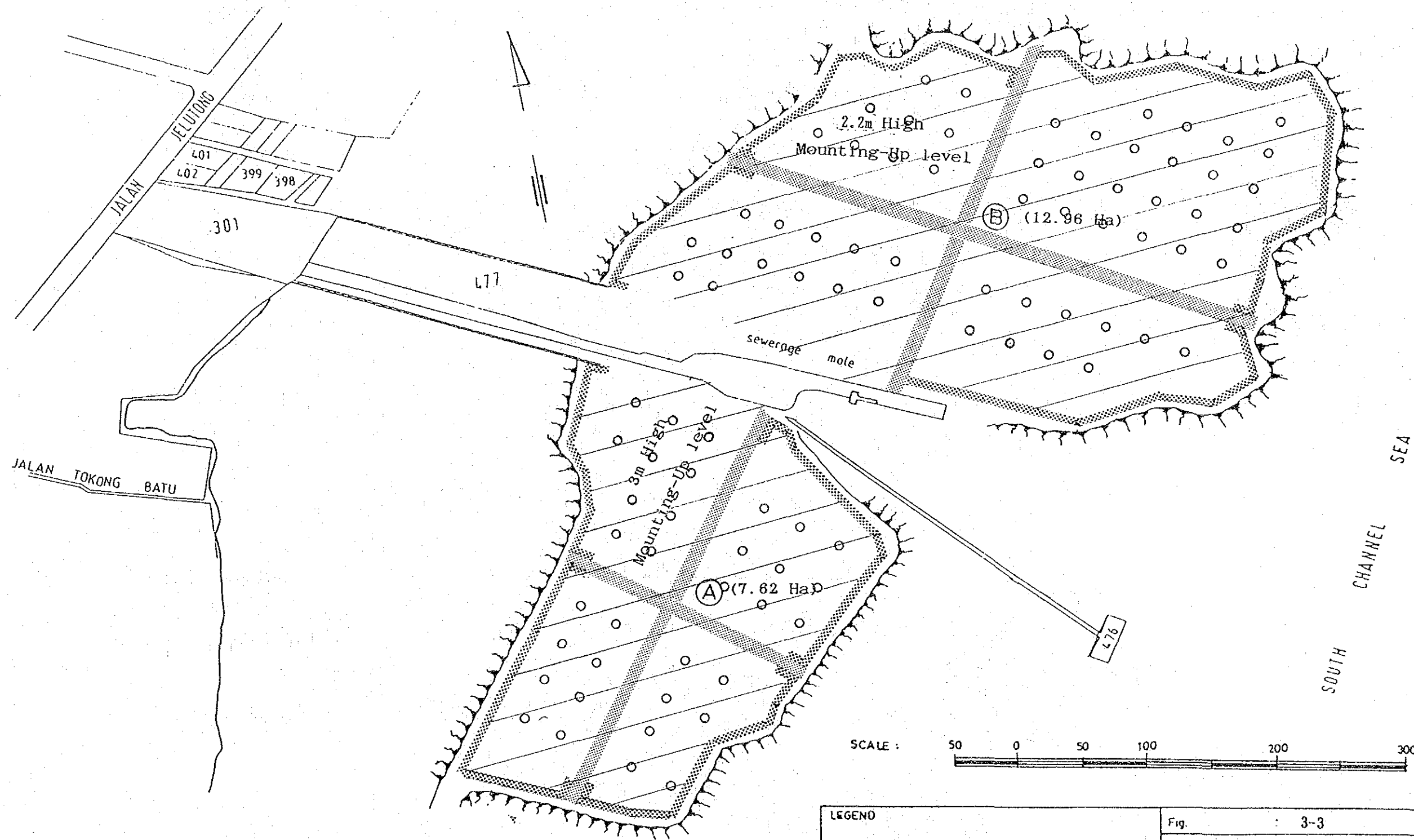


Note: Only cell ①, ② and ③ shall be utilised



LEGEND	BUFFER ZONE	Fig. : 3-2
	GAS REMOVAL FACILITY	Name of Candidate Site : Interim Measure at BSDS
	EARTH BUND	
	DUMPING YARD	Source : MPPP Engineering Dept.
	Gas Removal facility	Scale : As Shown
		Date of Drawings : Dec.1988

THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI

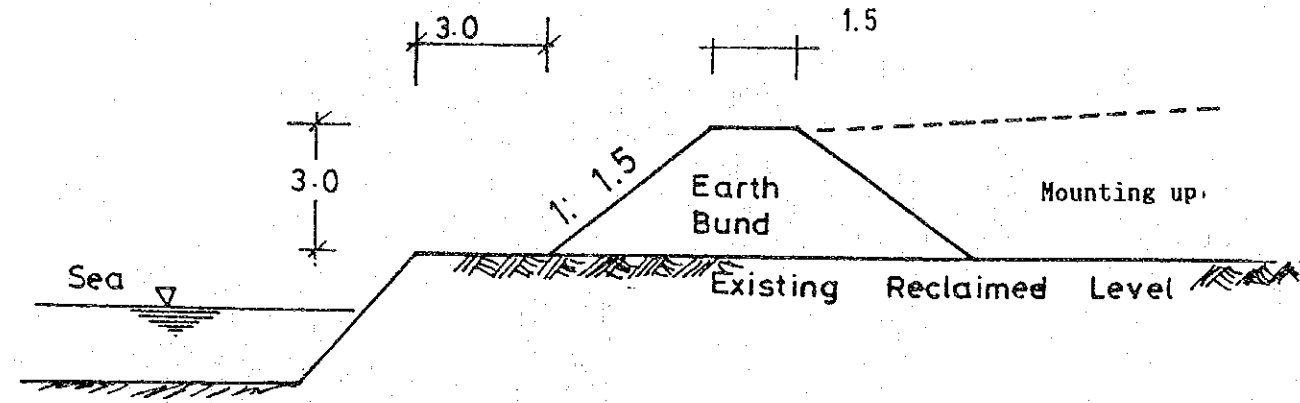


LEGEND	
	Bund
	On-site Road
	Mounting-up Area
	Gas Removal facility

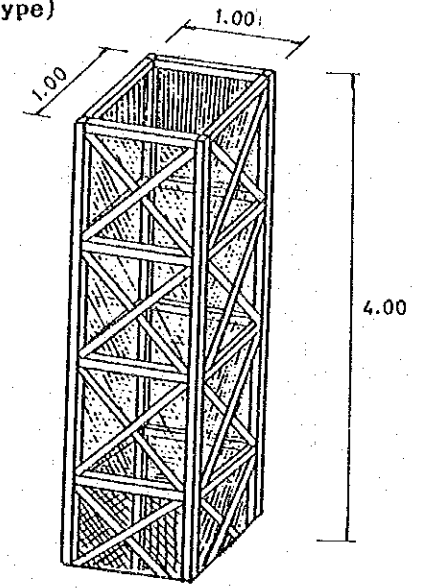
Fig.	: 3-3
	: Interim Measure at
	: JMPDS
Source	: JICA Study Team
Scale	: As Shown
Date of Drawings	: Dec. 1988

THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI.

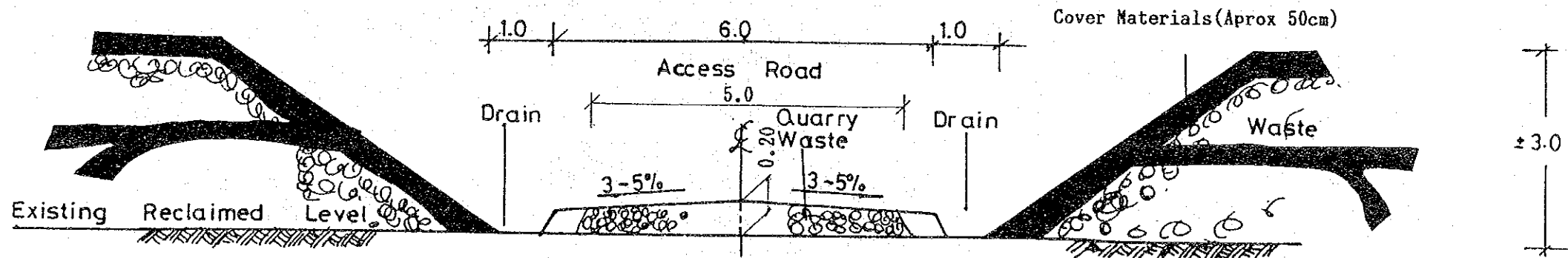
Typical Cross Section of Bund



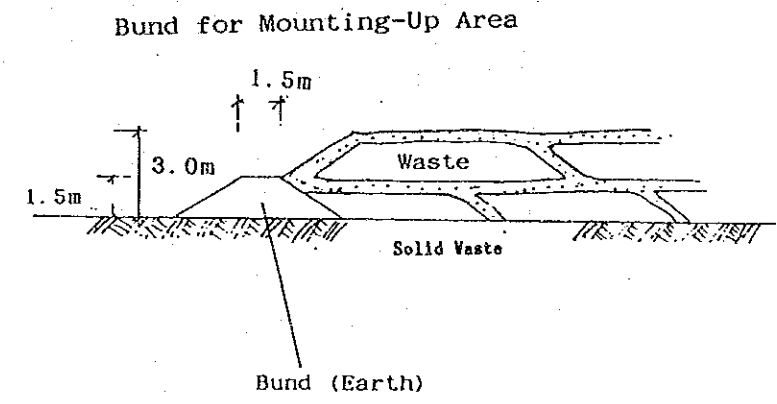
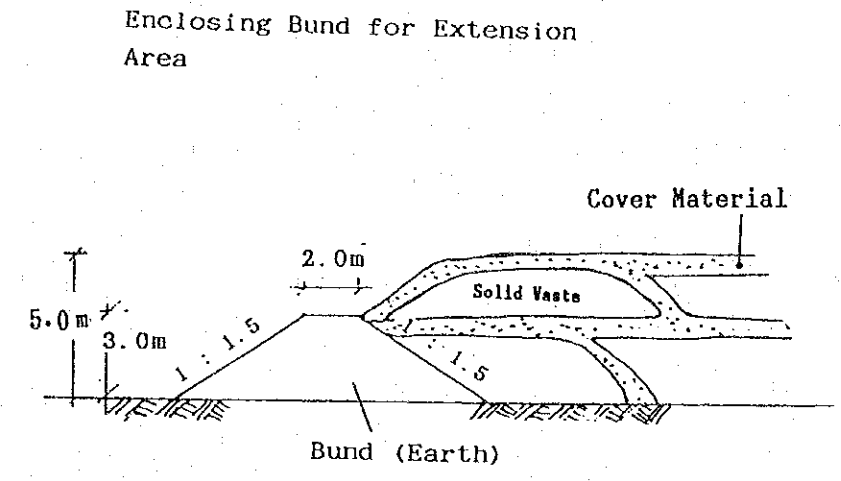
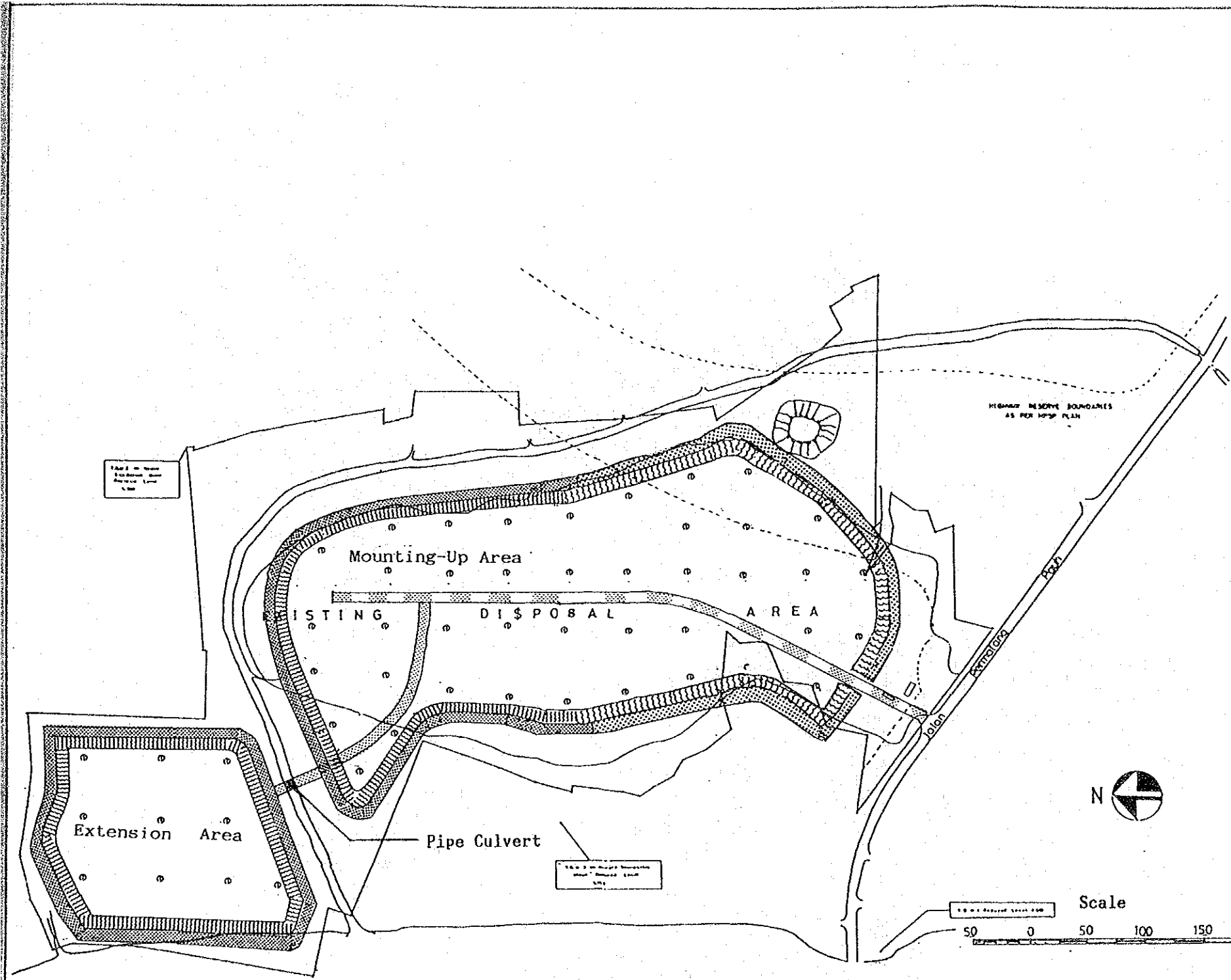
Gas Removal Facility
(Vertical Type)



Typical Cross Section of On-site Road

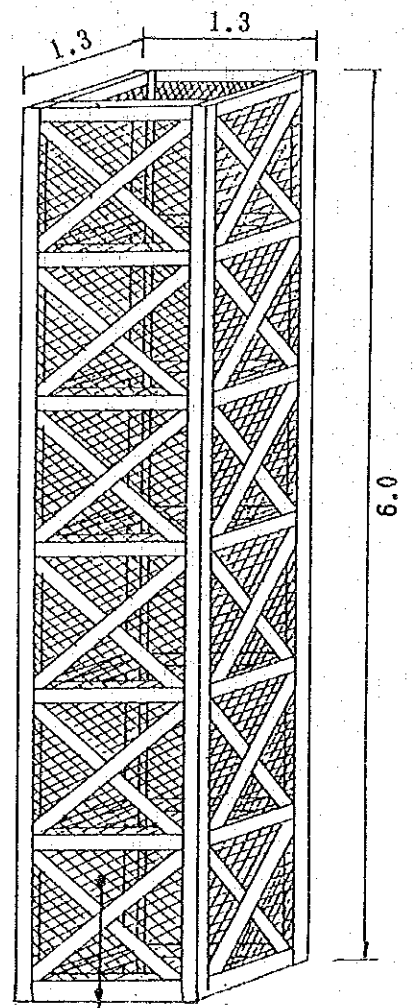


LEGEND	Fig. : 3-4
	Typical Cross Section of Facilities:
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Dec. 1988
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

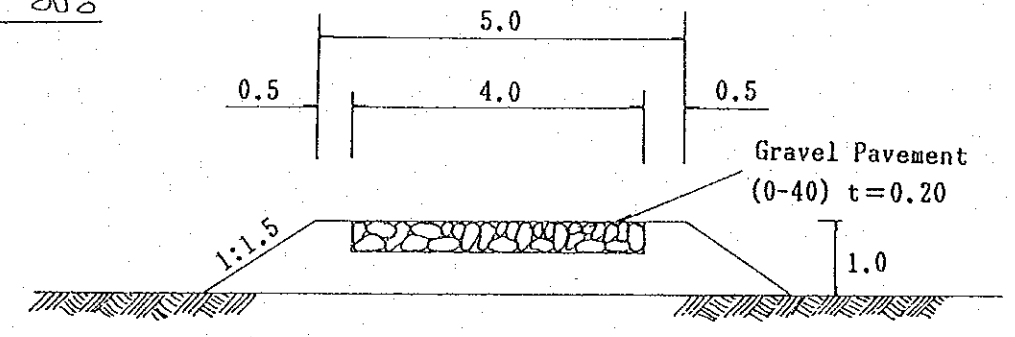
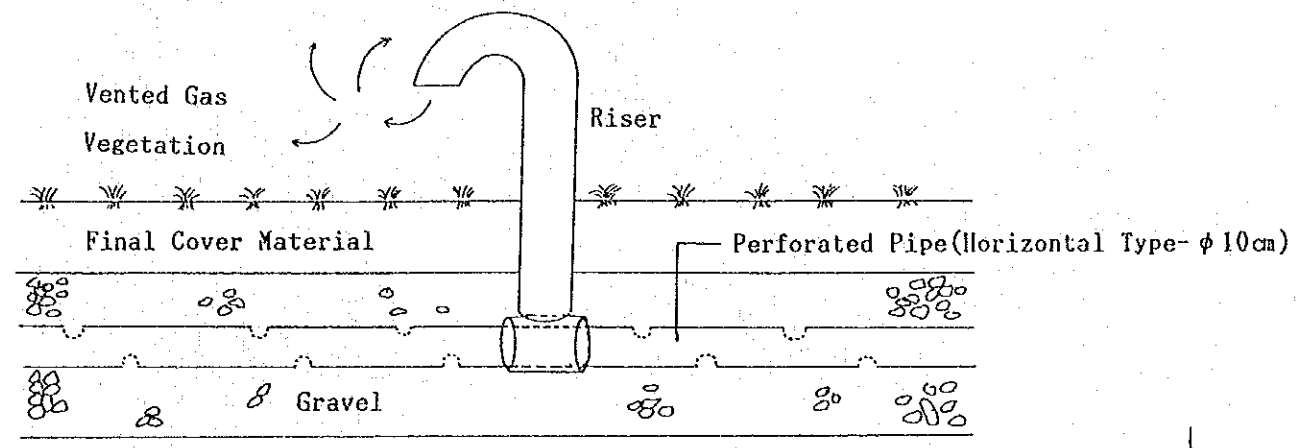


LEGEND Existing Road Bund Dumping Yard Gas Removal Facility On-site Road	Fig. 4-1
	: Interim Measure at
	PPDS
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : Dec.1988	

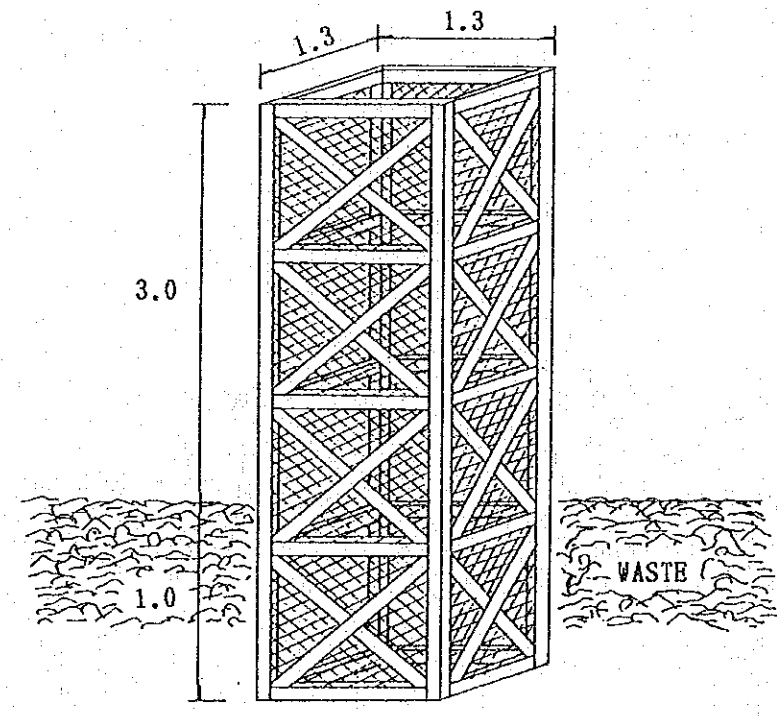
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Wire Mesh
Timber Frames
(Vertical Type)
For Extension Area



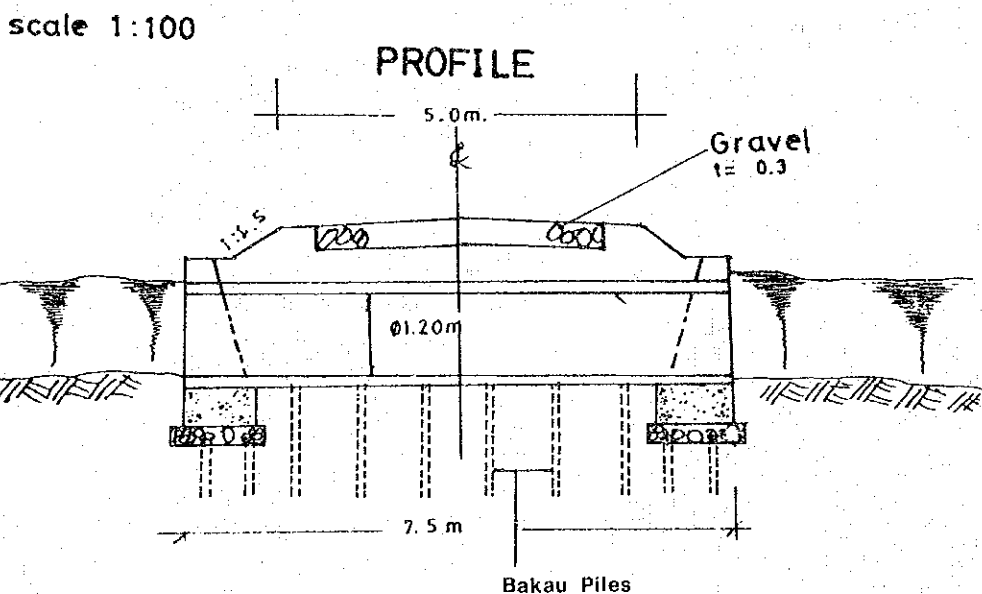
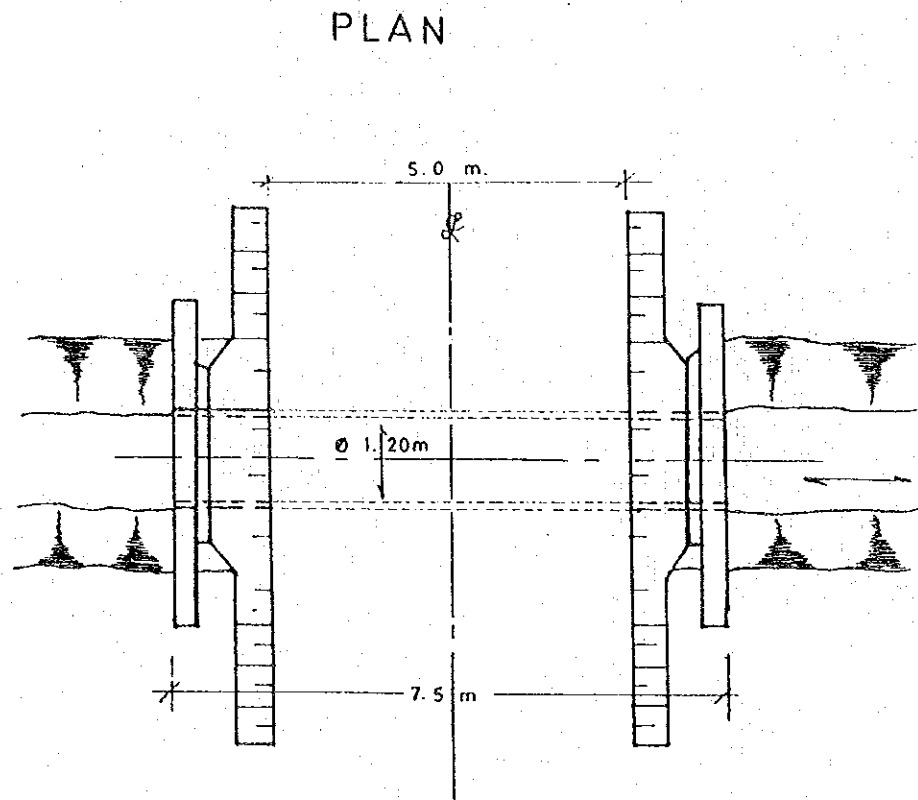
TYPICAL CROSS-SECTION OF AN ON-SITE ROAD



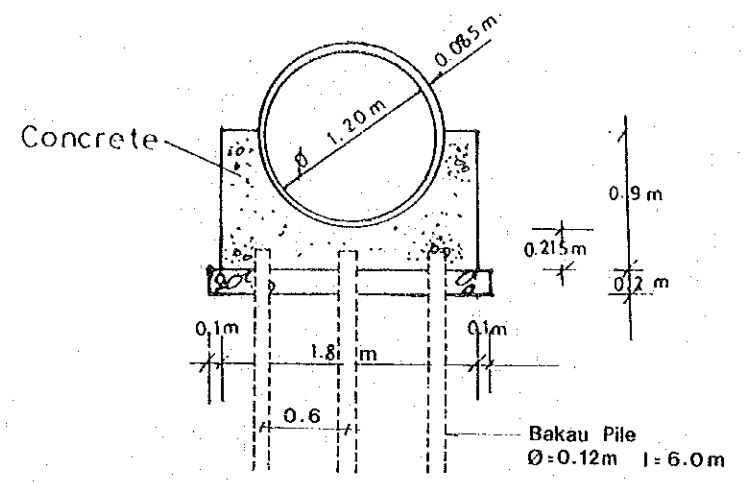
(Vertical Type)
For Mounting-up Area

GAS REMOVAL FACILITIES

LEGEND	Fig. : 4-2
	Details of Facilities
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Dec.1988

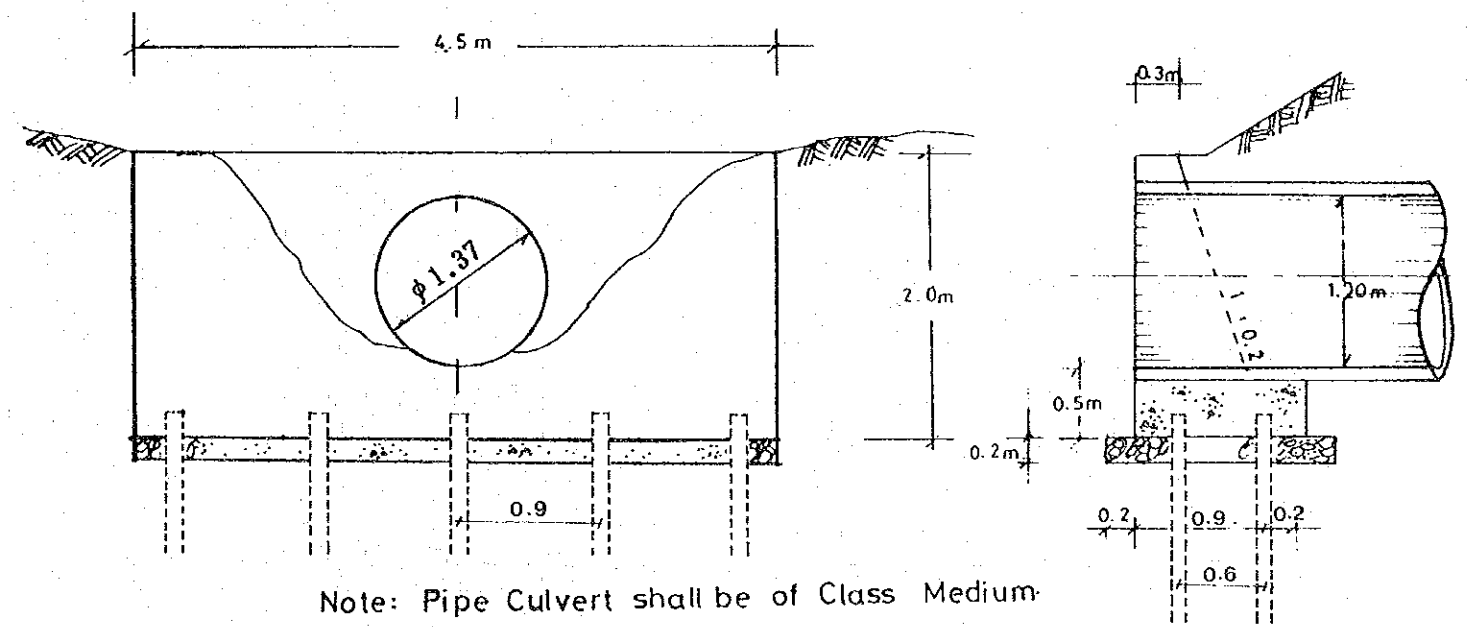


TYPICAL CROSS SECTION



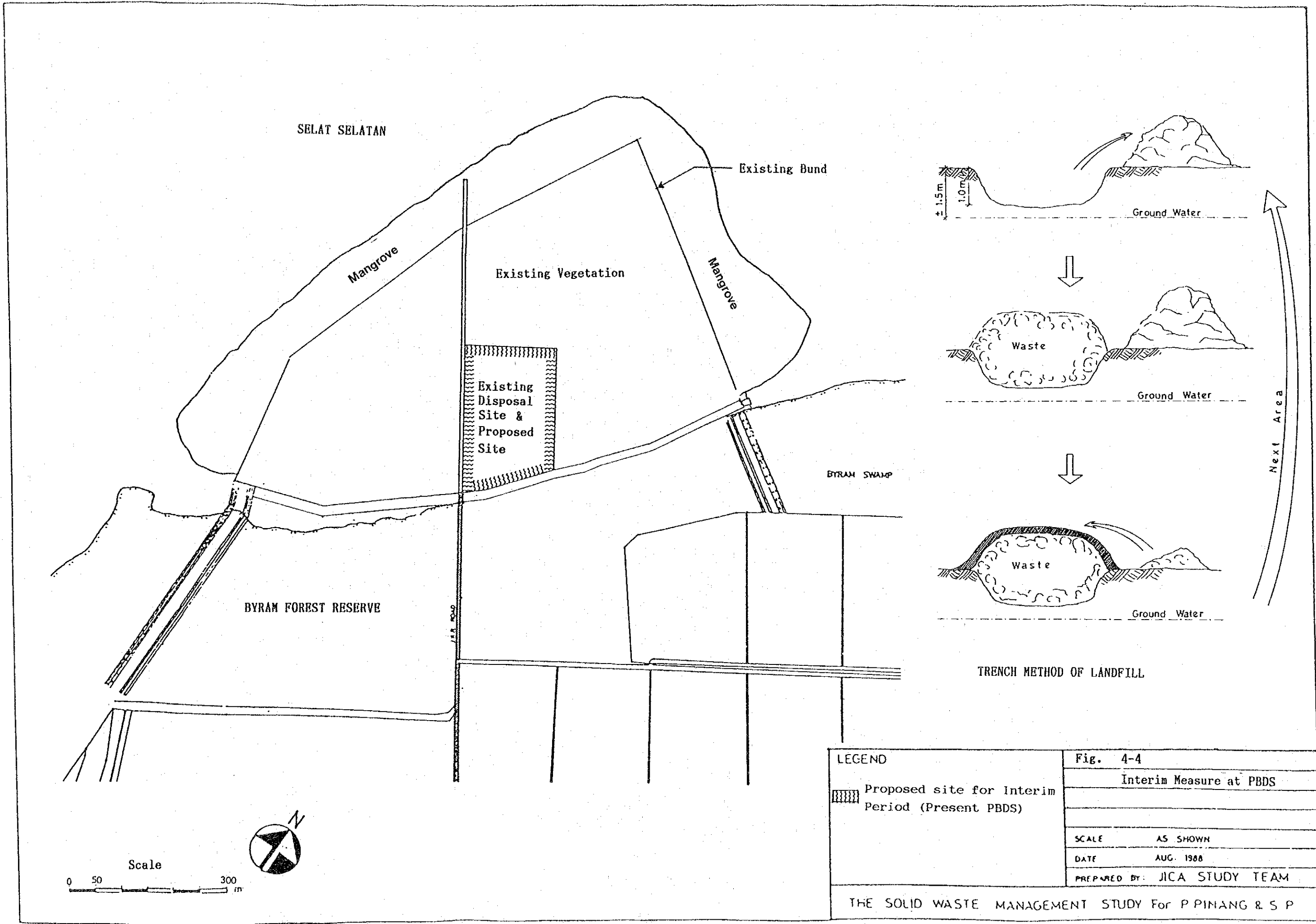
DETAIL OF PARAPET

scale 1:50



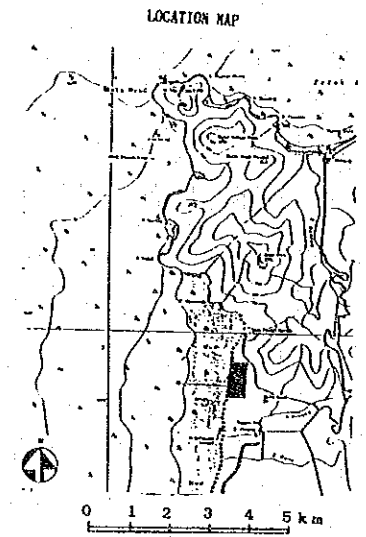
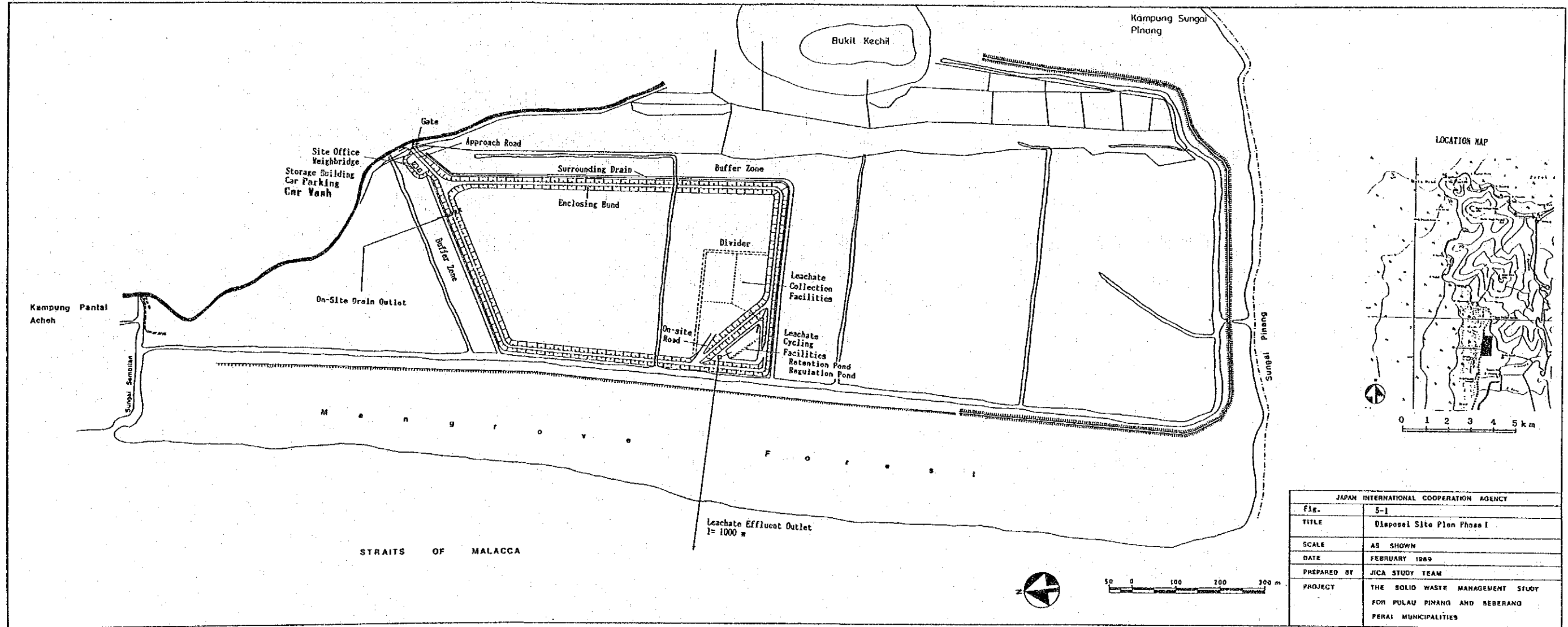
Note: Pipe Culvert shall be of Class Medium.

LEGEND	Fig. : 4-3
	Pipe Culvert for PFDS
	:
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Dec. 1988
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

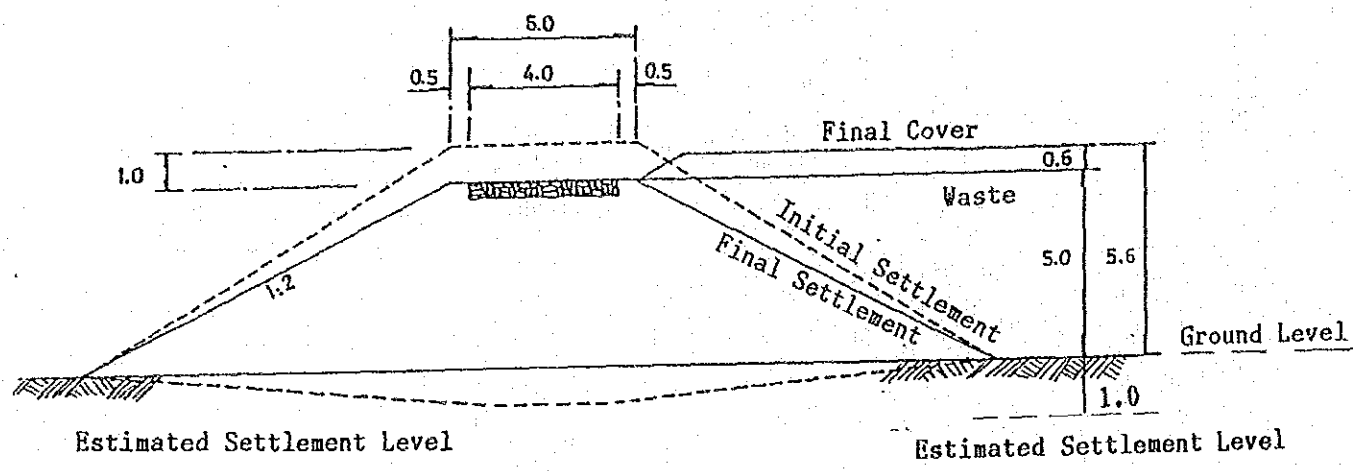


LEGEND Proposed site for Interim Period (Present PBDS)	Fig. 4-4
	Interim Measure at PBDS
	SCALE AS SHOWN
	DATE AUG. 1988
PREPARED BY: JICA STUDY TEAM	

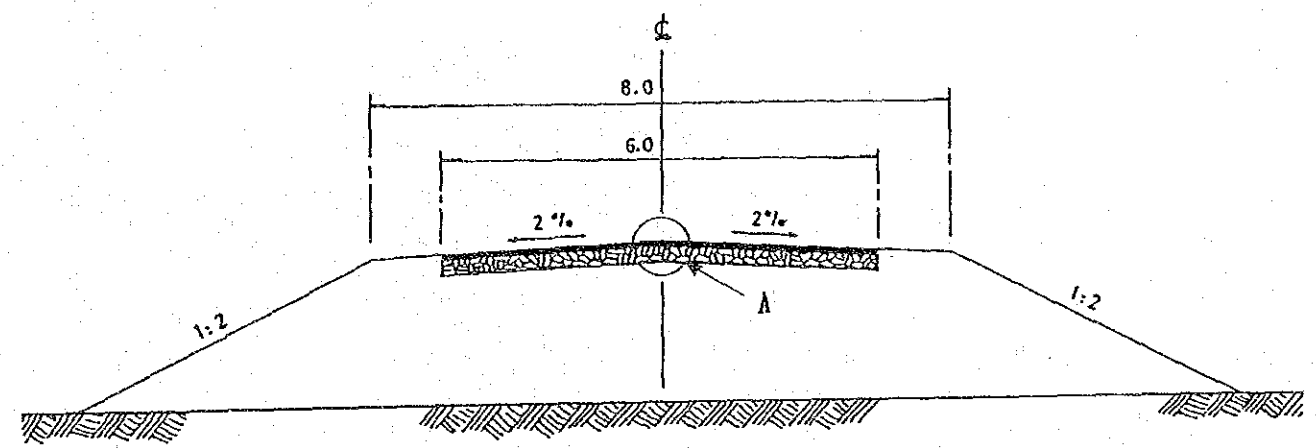
THE SOLID WASTE MANAGEMENT STUDY For P PINANG & S P



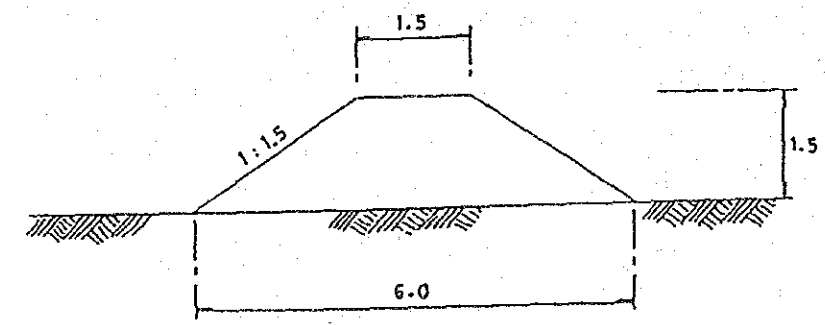
JAPAN INTERNATIONAL COOPERATION AGENCY	
FIG.	S-1
TITLE	Disposal Site Plan Phase I
SCALE	AS SHOWN
DATE	FEBRUARY 1969
PREPARED BY	JICA STUDY TEAM
PROJECT	THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI MUNICIPALITIES



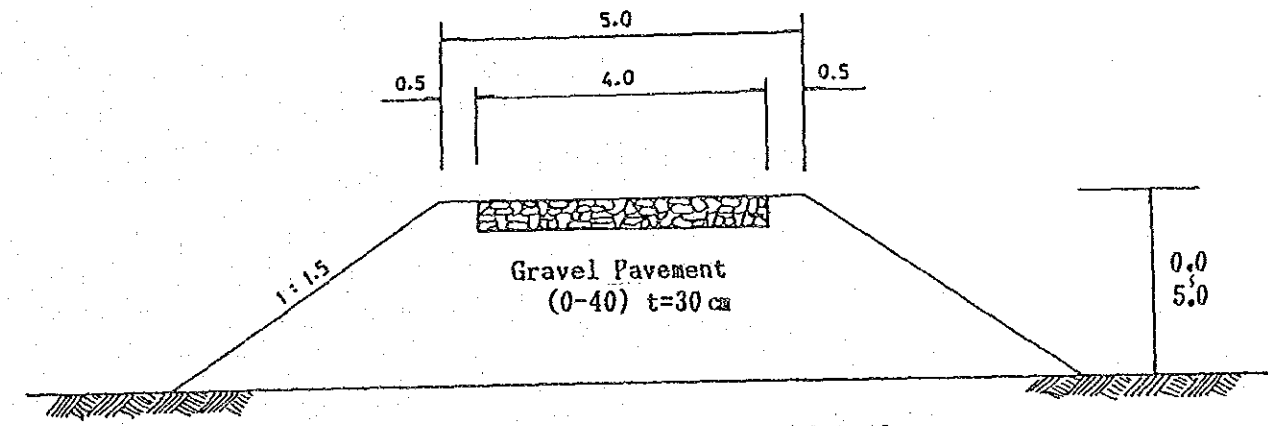
TYPICAL CROSS-SECTION OF AN ENCLOSING BUND



TYPICAL CROSS-SECTION OF AN APPROACH ROAD



TYPICAL CROSS-SECTION OF A DIVIDER



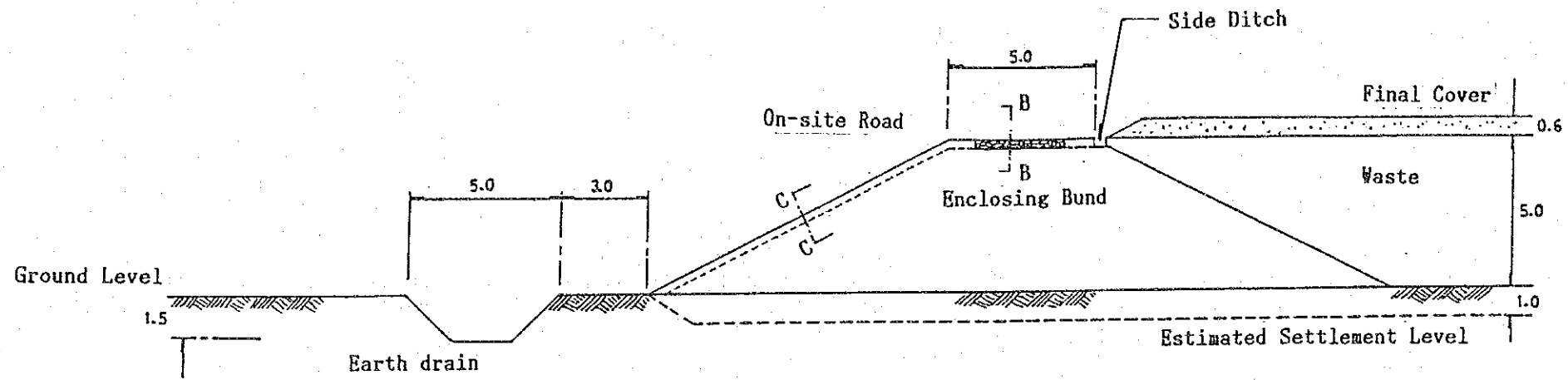
TYPICAL CROSS-SECTION OF AN ON-SITE ROAD

Wearing Course Asphalt Concrete	0.05
Base Course Crushed Aggregate	0.15
Sub-Base Course Sand And Laterite	0.15
0.35	

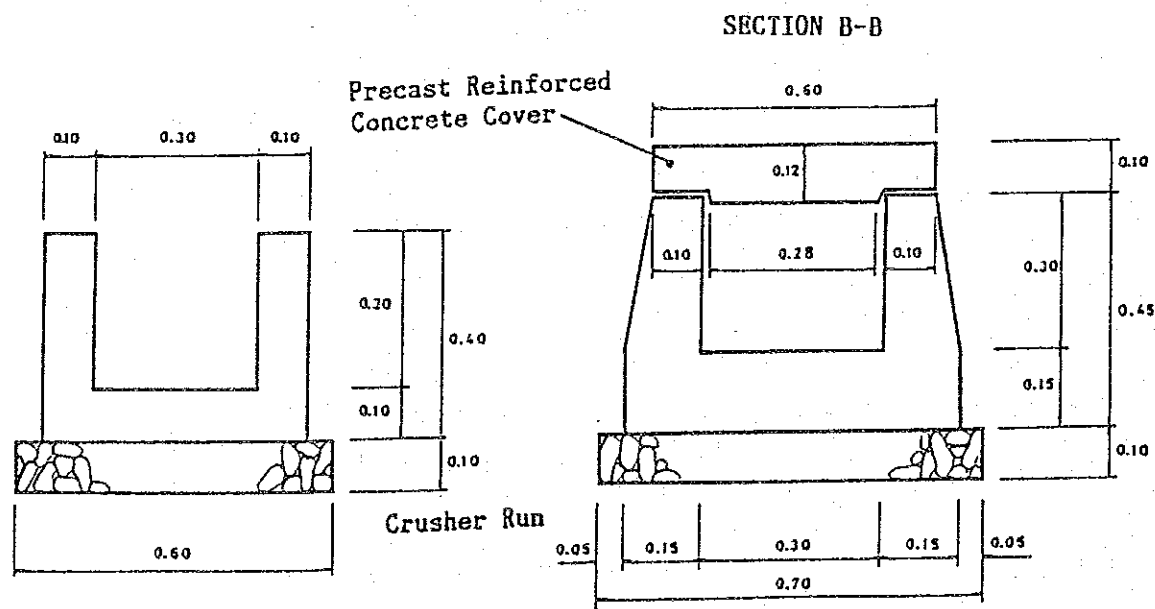
A DETAIL OF APPROACH ROAD

LEGEND	Fig. : 5-2
	Typical Cross-Section of The Main Facilities
	:
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Feb. 1989

THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI

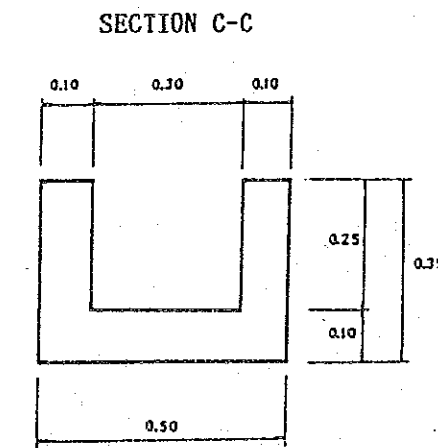


TYPICAL CROSS-SECTION

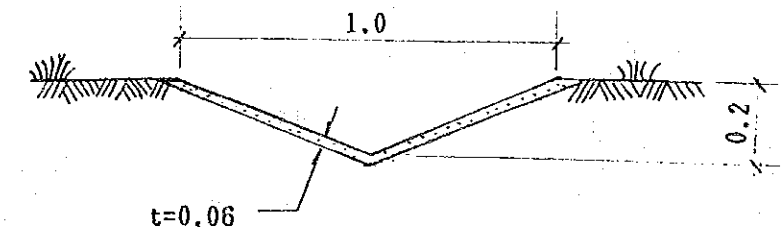


TYPICAL CROSS-SECTION OF A SIDE DITCH

TYPICAL CROSS-SECTION OF A CROSS DRAIN



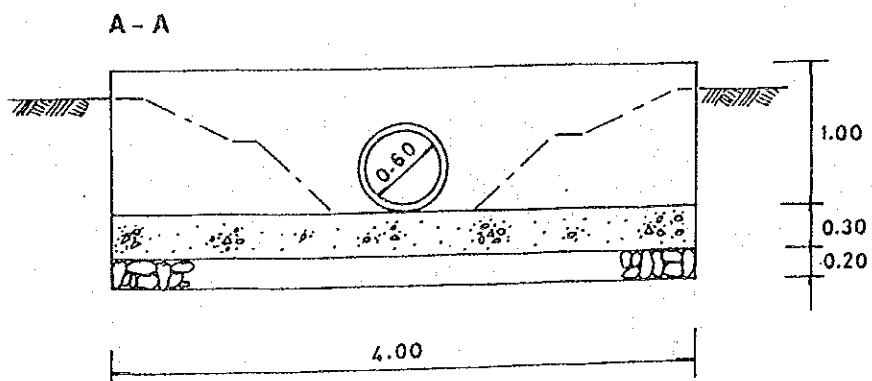
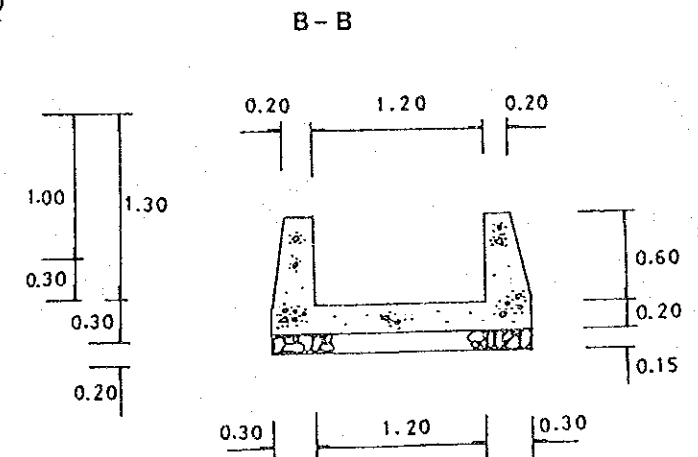
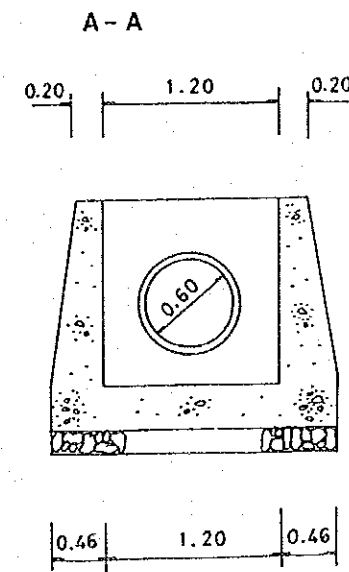
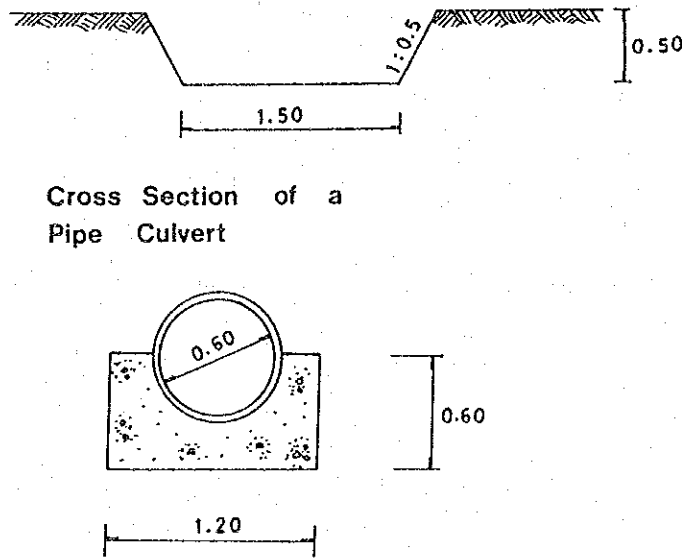
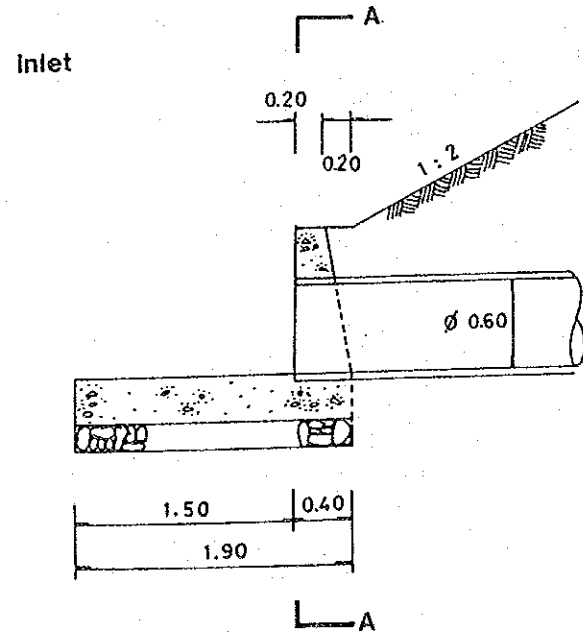
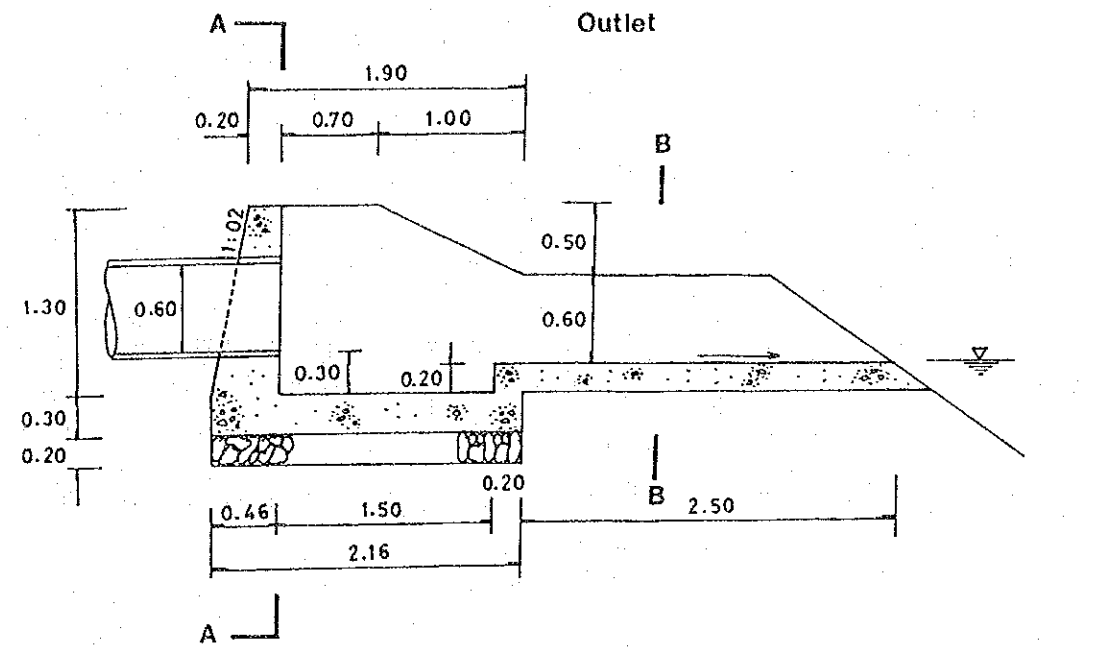
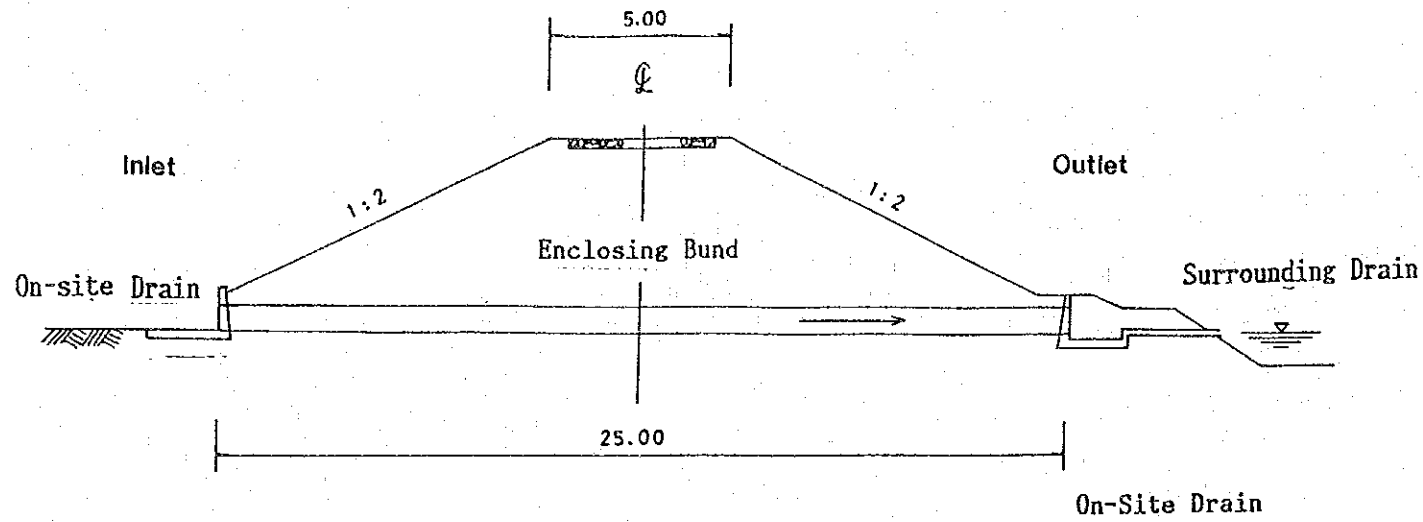
TYPICAL CROSS-SECTION OF A VERTICAL DRAIN



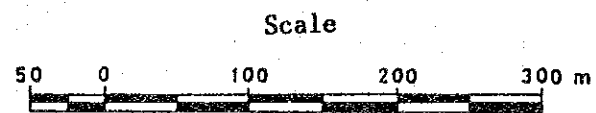
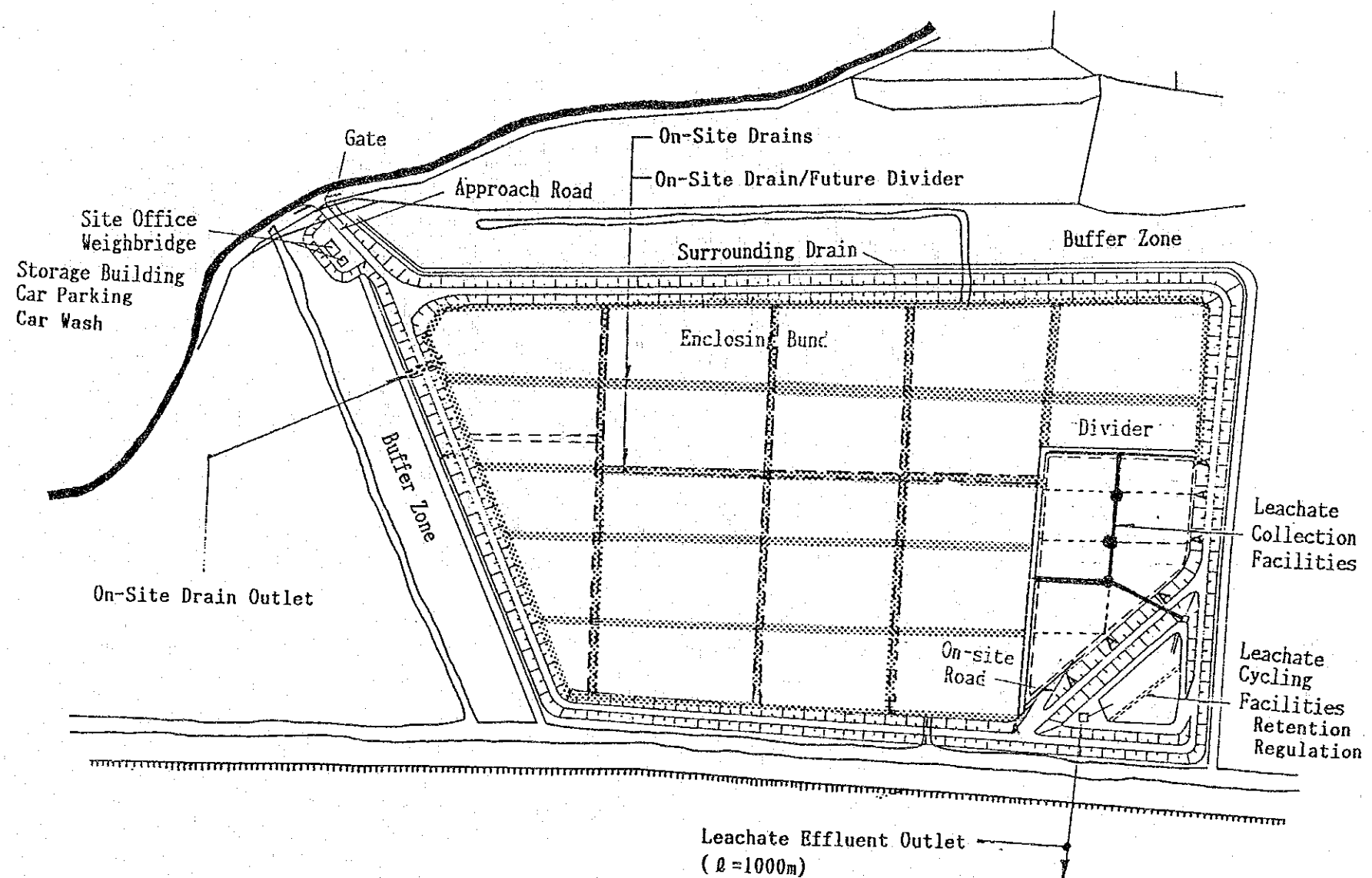
Main Surface Drain For Reclaimed Area

LEGEND	Fig. : 5-3
	Disposal Site Drainage System
	:
	:
	Source : JICA Study Team
Scale : As Shown	
Date of Drawings : Feb.1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

PROFILE OF ON-SITE DRAIN OUTLET



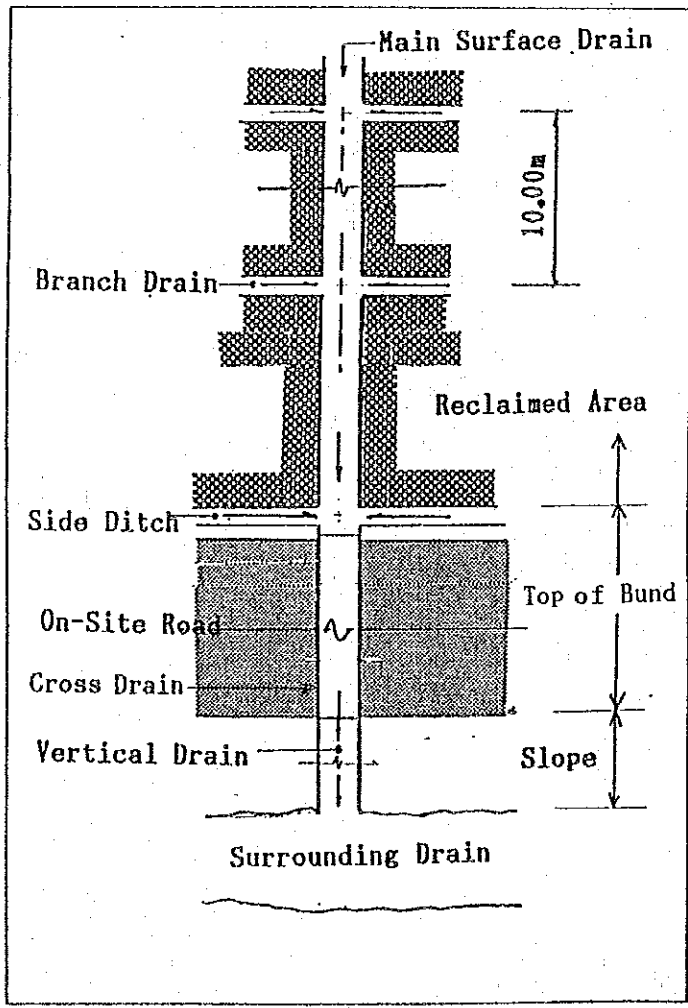
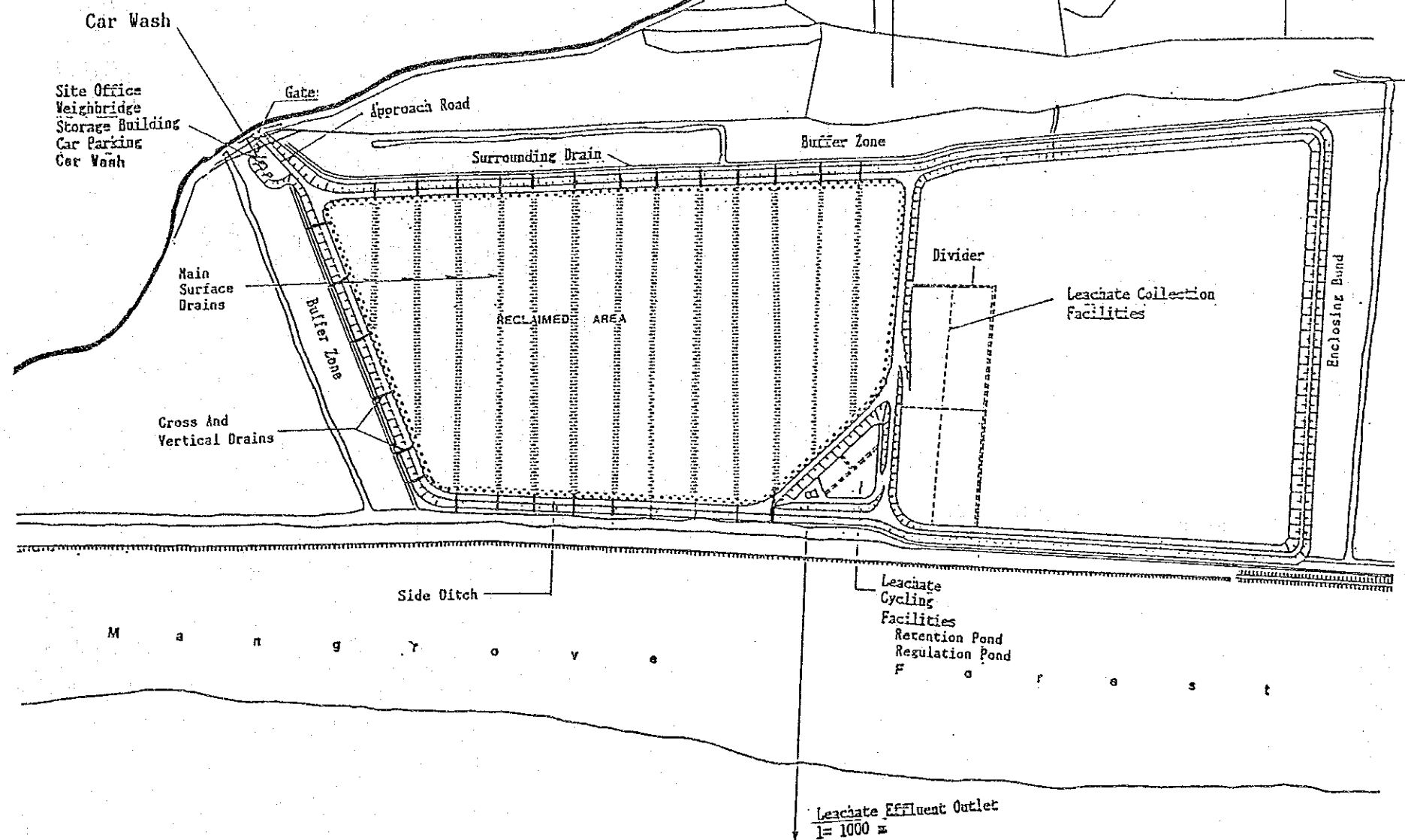
LEGEND	Fig. : 5-4
	On-Site Drainage Details
	:
	:
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : Feb.1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



LEGEND On-Site Drains Future Dividers Gas Removal Facility (Vertical Type) Gas Removal Facilities (Slope Type) Leachate Collection Facility (Main) Leachate Collection Facility (Branch)	Fig. : 5-5
	INITIAL STAGE DEVELOPMENT
	OF FACILITIES NETWORK
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

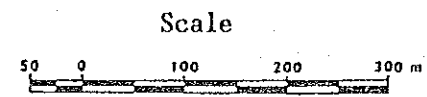
Phase I Project

Phase II Project

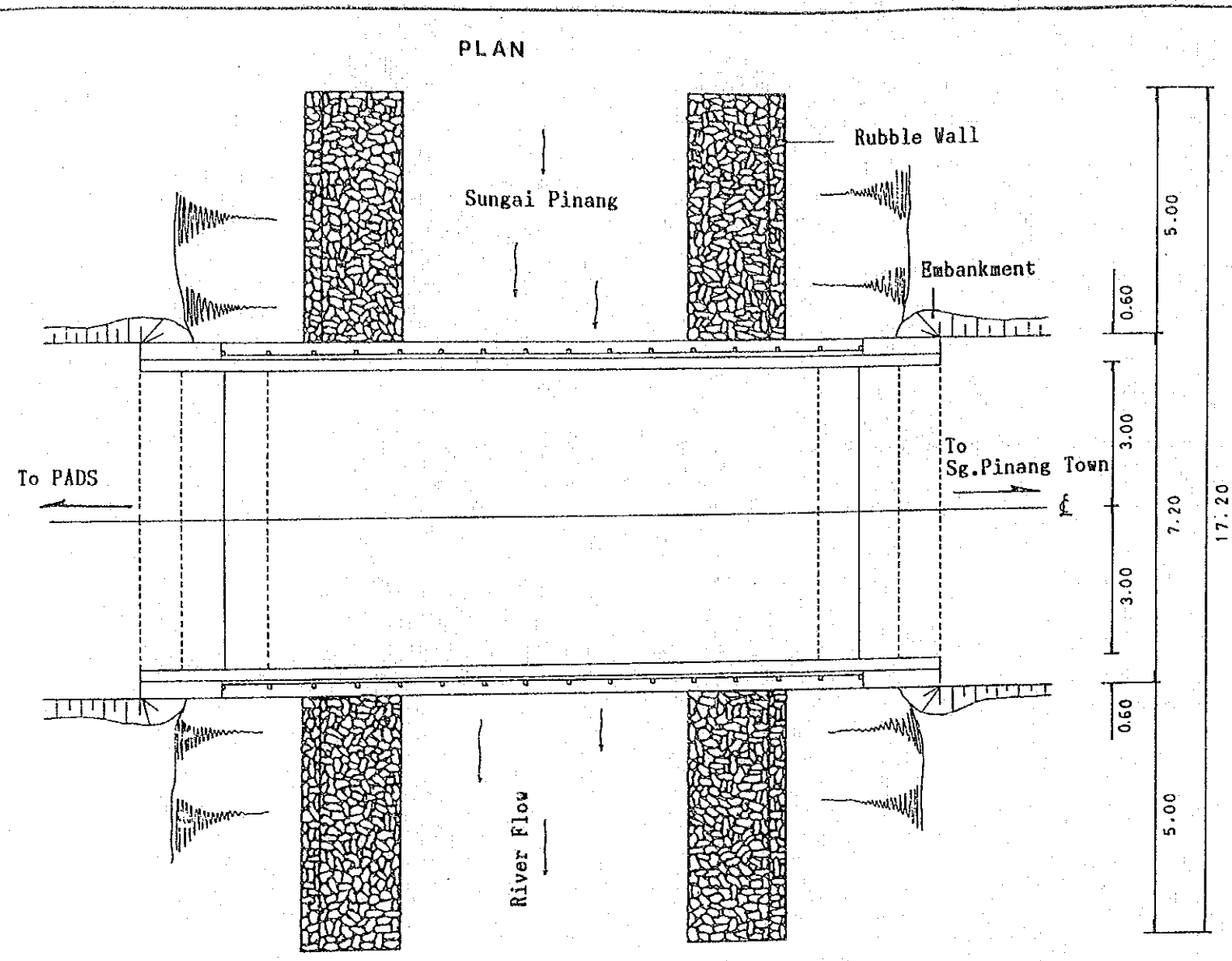


TYPICAL DRAINAGE LAYOUT IN RECLAIMED AREAS

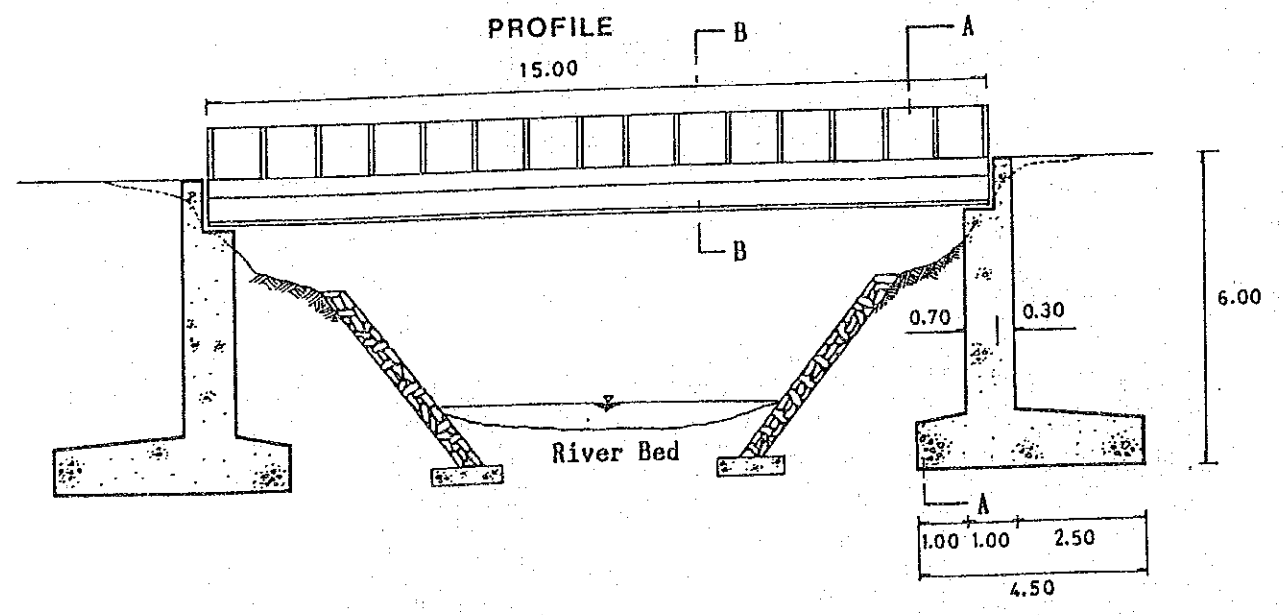
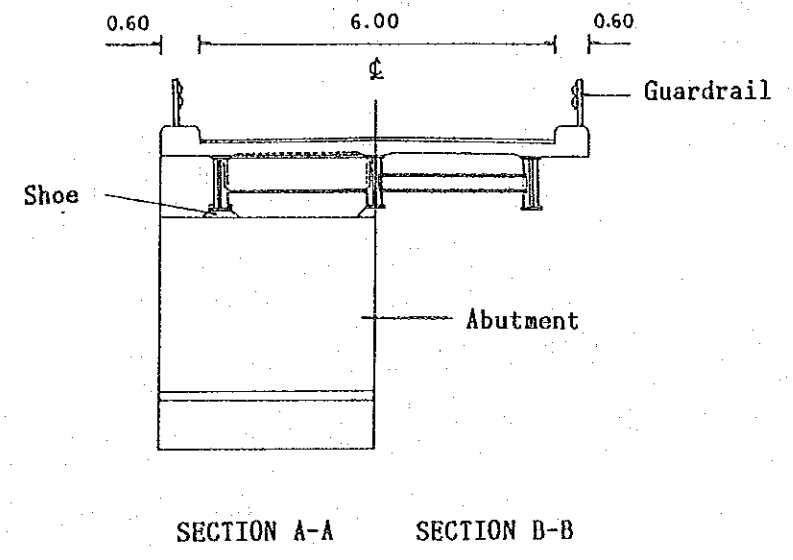
STRAITS OF MALACCA



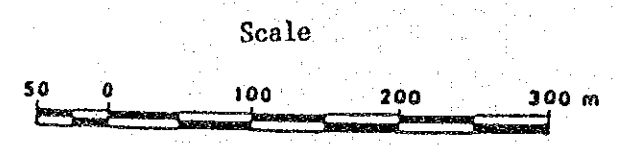
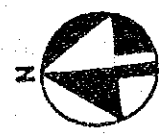
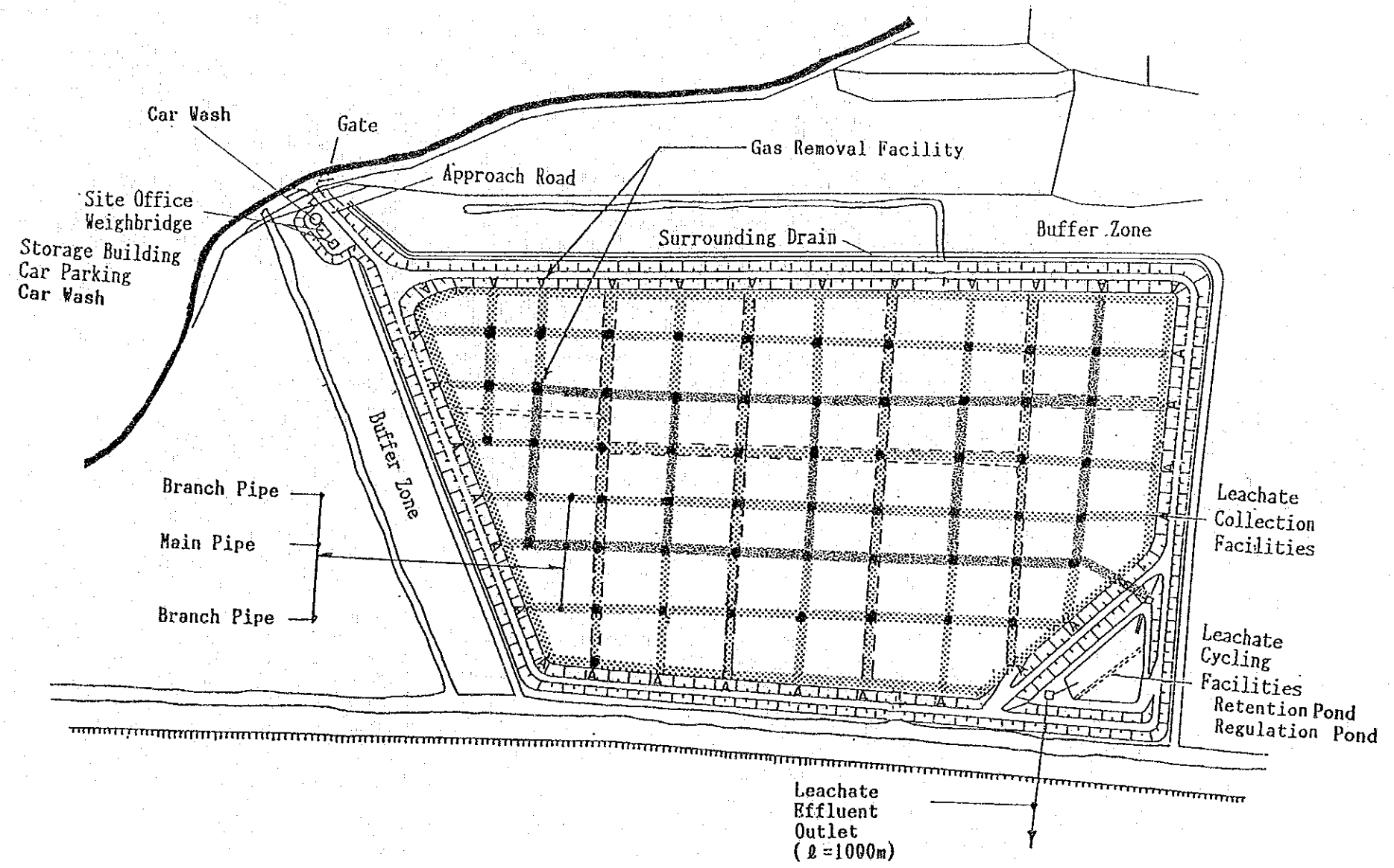
LEGEND Main Surface Drain Cross and Vertical Drains	Fig. : 5-6
	Surface Water Drainage In Reclaimed PADS
Source : JICA Study Team	
Scale : As Shown	
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



H-Beam Bridge-Composite



LEGEND	Fig. : 5-7
	Replacement Of Bridge At Kampung Bukit Kechil
	:
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

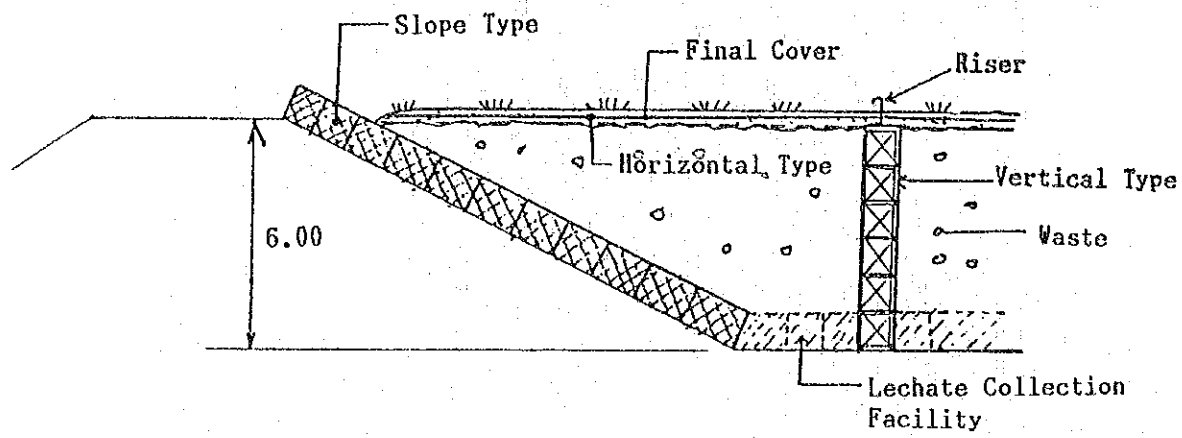


LEGEND	
	Main Leachate Collection Facility
	Branch Leachate Collection Facility
	Dividers
	Side Slope Type Gas Removal Facility
	Vertical Type Gas Removal Facility

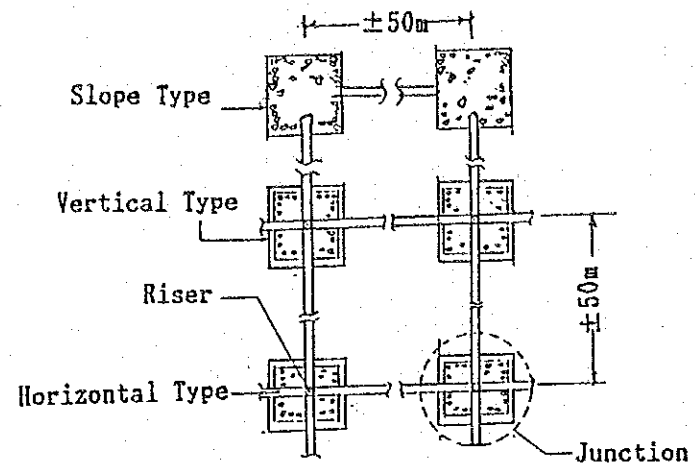
Fig.	: 5-8
FINAL DEVELOPMENT OF FACILITIES NETWORK	
Source	: JICA Study Team
Scale	: As Shown
Date of Drawings	: March 1989

THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI

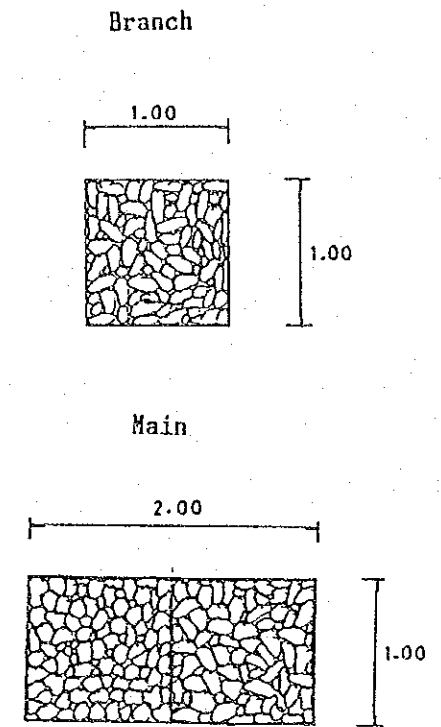
PROFILE OF GAS REMOVAL AND LEACHATE COLLECTION FACILITIES



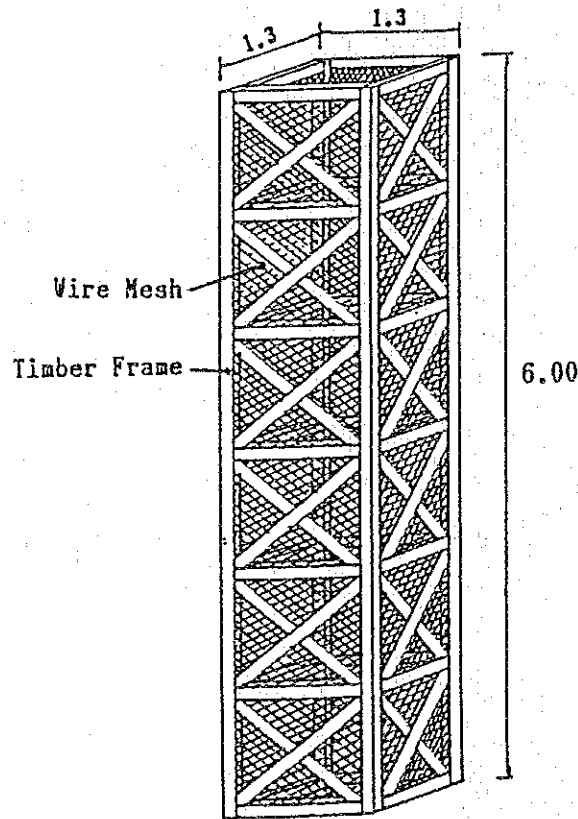
PLAN OF GAS REMOVAL NETWORK



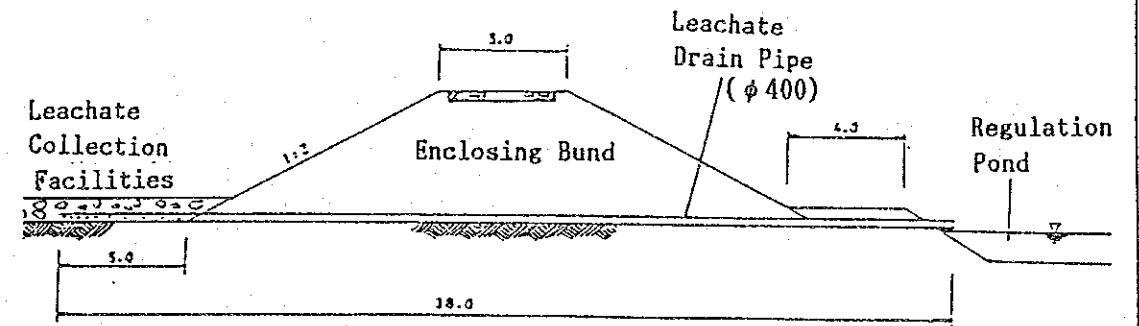
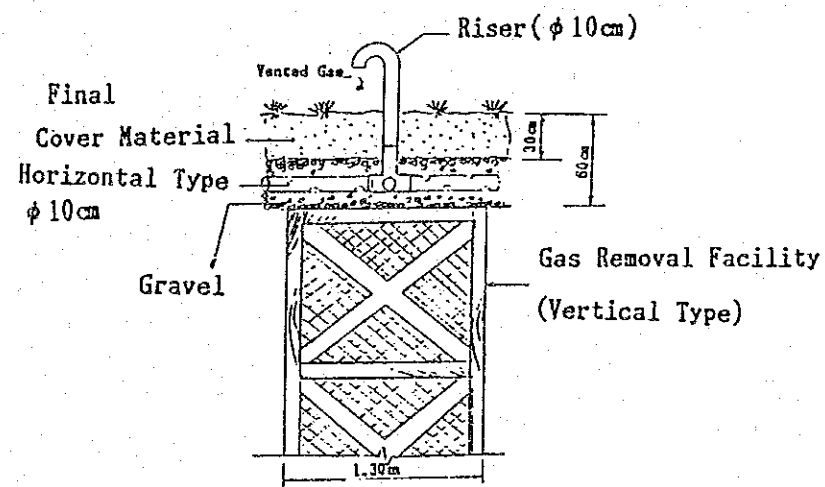
LEACHATE COLLECTION FACILITIES



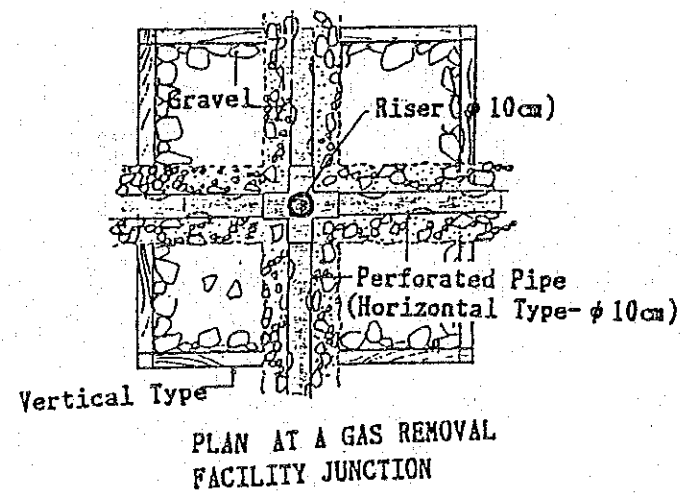
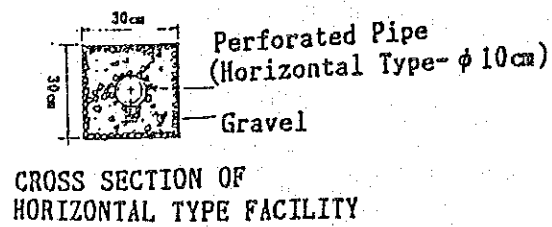
VERTICAL TYPE



CROSS-SECTIONAL VIEW AT A GAS REMOVAL FACILITY JUNCTION

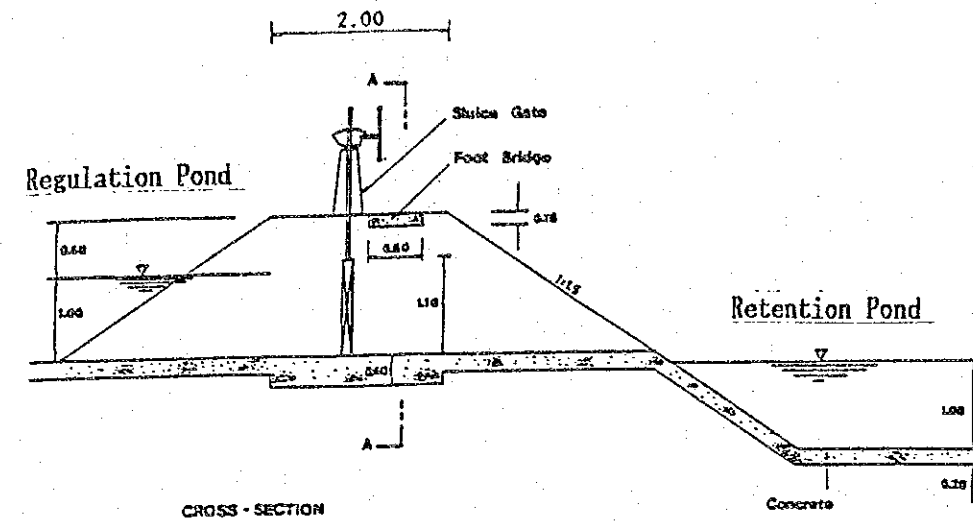


PROFILE OF LEACHATE DRAIN OUTLET



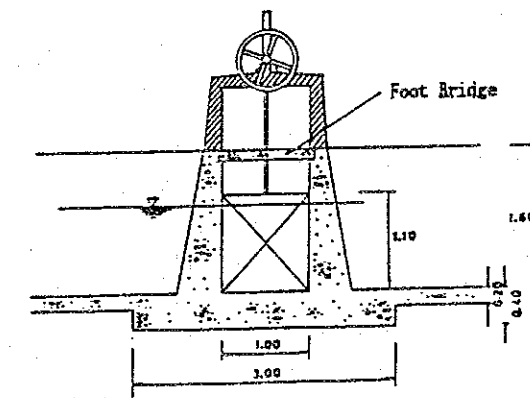
LEGEND	Fig. : 5-9
	Gas Removal And Leachate Collection Facilities
	:
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

Detail of Gate

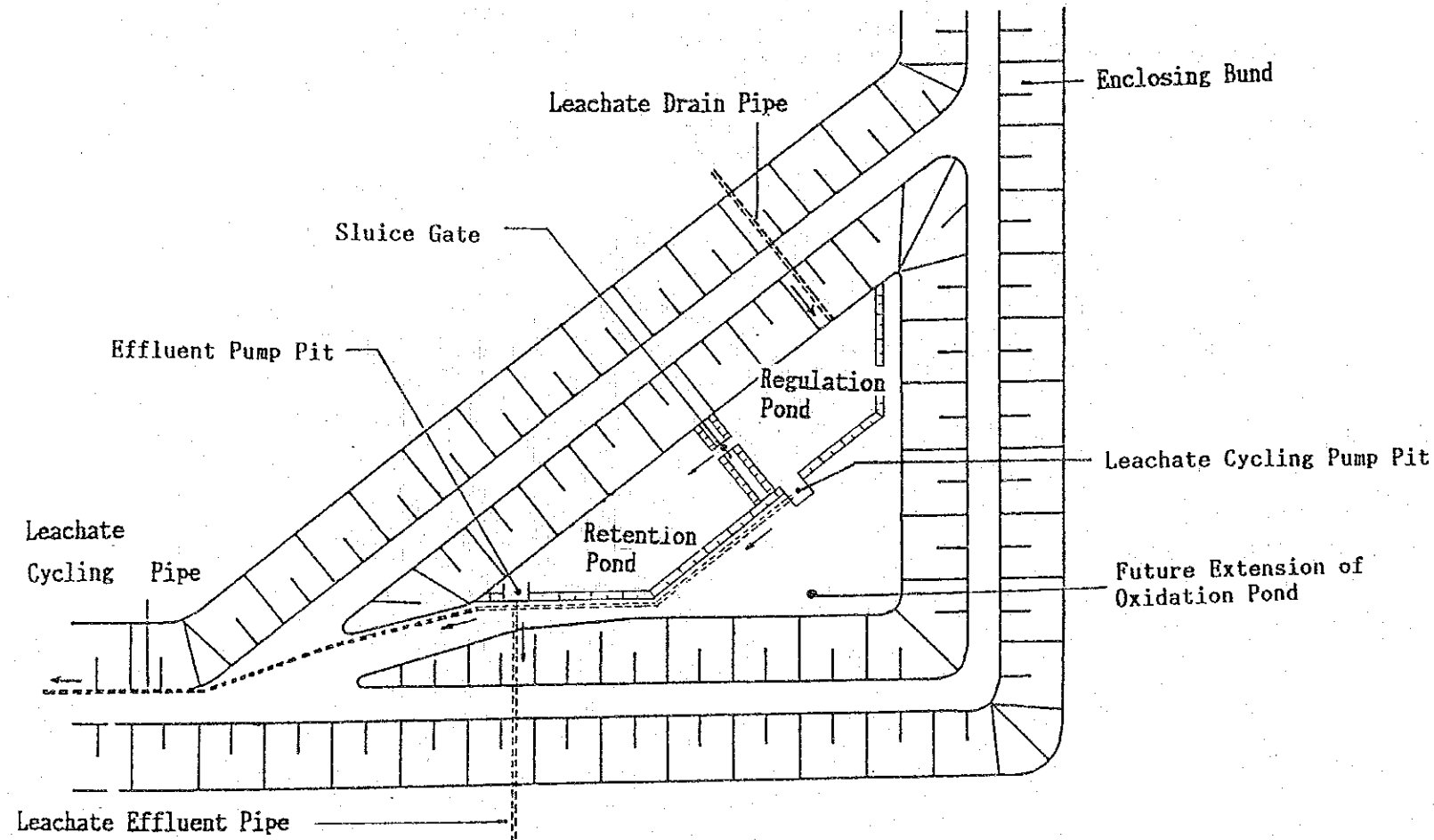


CROSS - SECTION

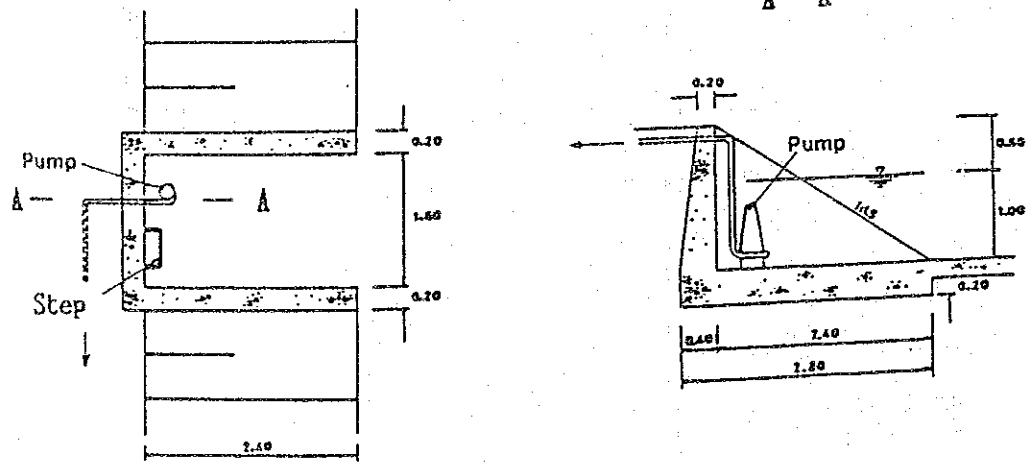
A - A



Front Elevation

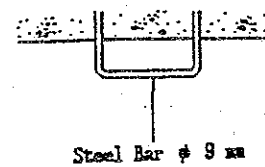


A - A



Leachate Cycling And Effluent Pump Pit

Step

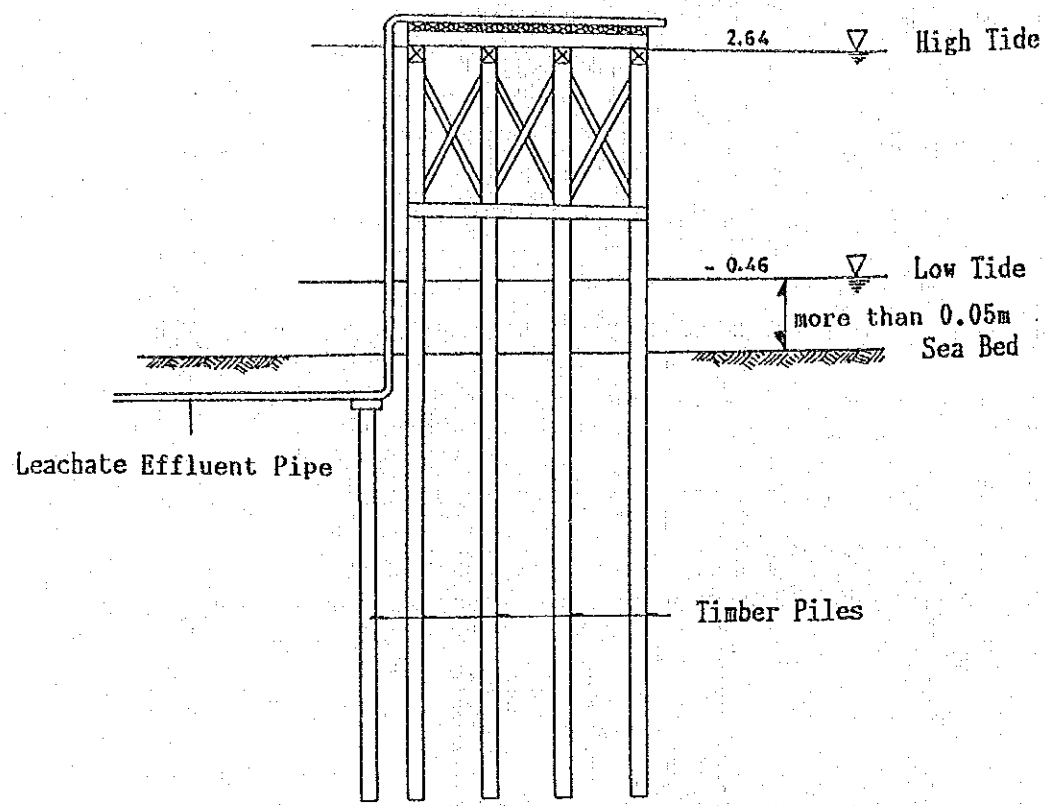


Steel Bar ϕ 9 mm

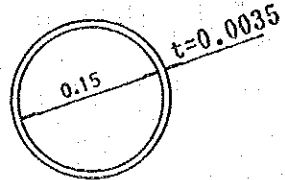
LEGEND

Fig.	: 5-10
Detail Of Leachate Cycling Facilities	
For PADS	
:	
Source	: JICA Study Team
Scale	: As Shown
Date of Drawings	: March 1989

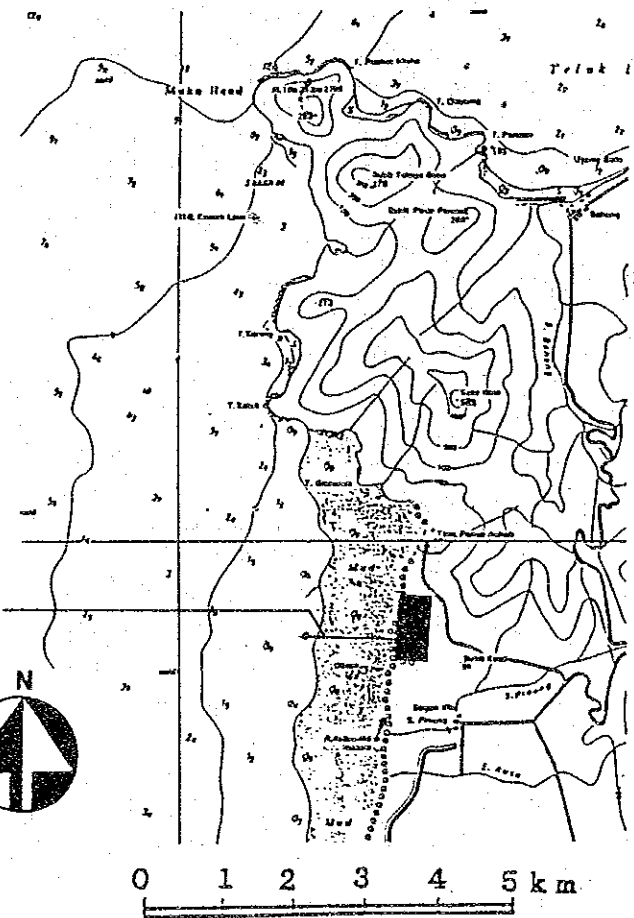
Profile of Effluent Outlet



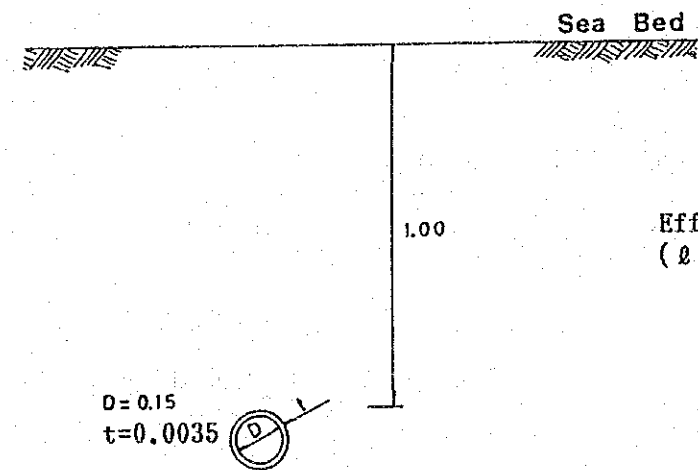
CROSS SECTION OF STEEL DRAIN PIPE



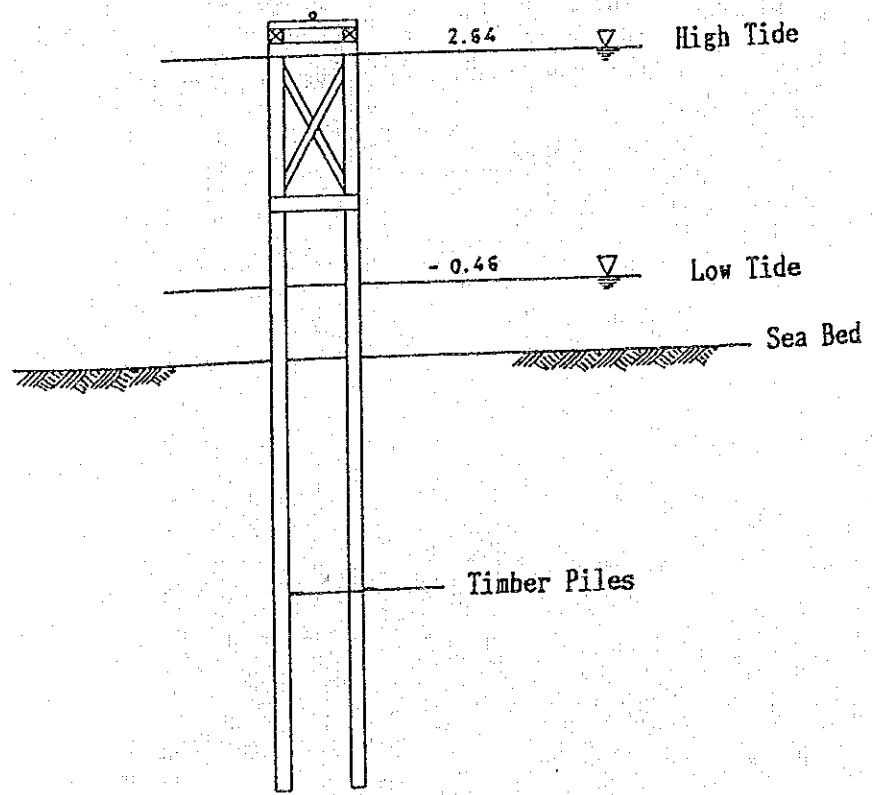
LOCATION MAP



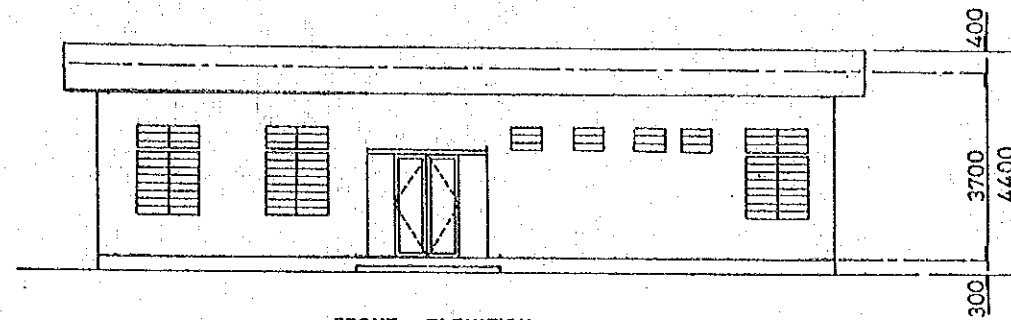
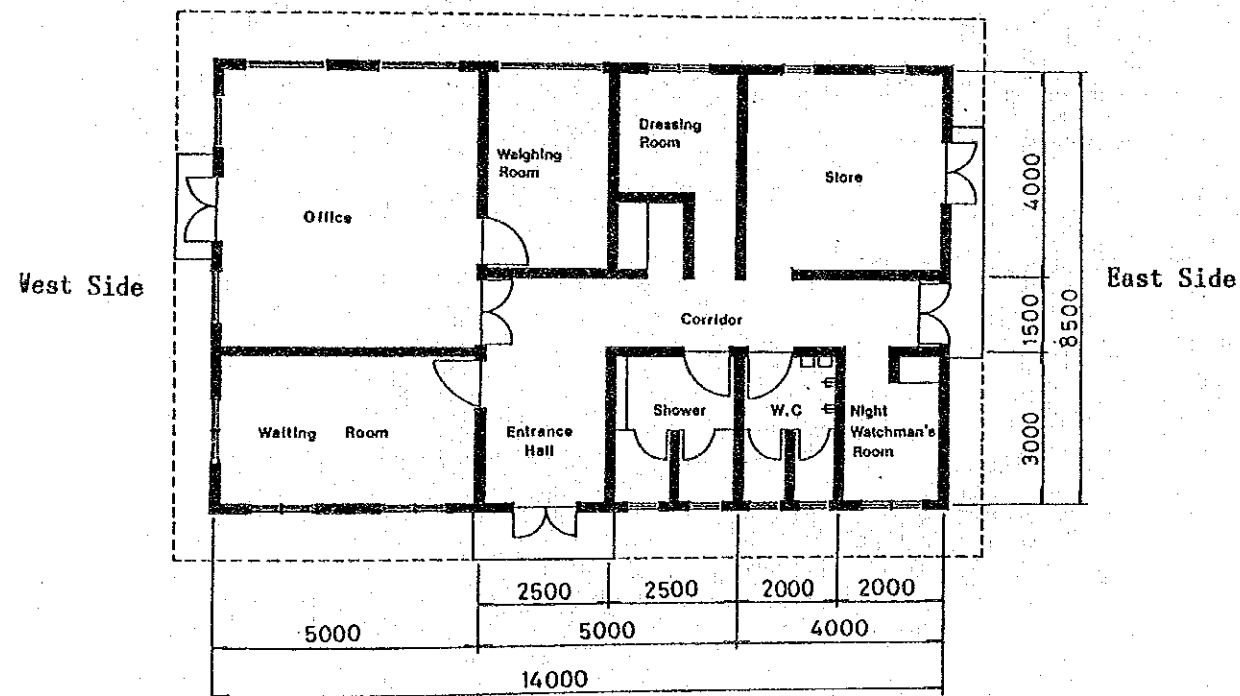
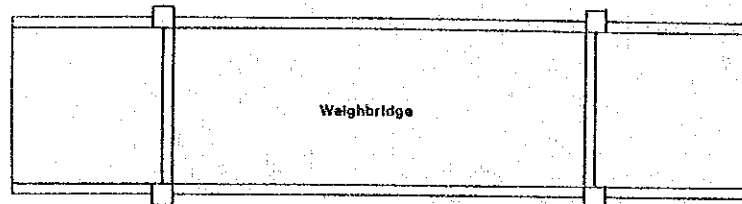
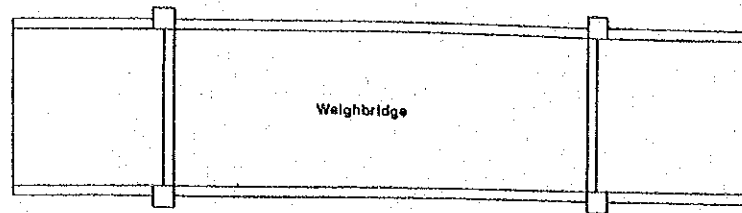
CROSS SECTION OF TYPICAL SETTING OUT



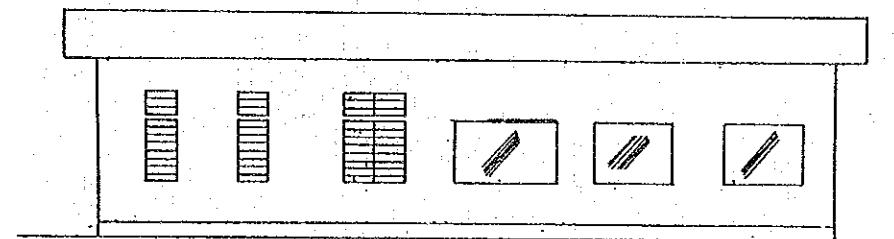
Cross-Section of Effluent Outlet



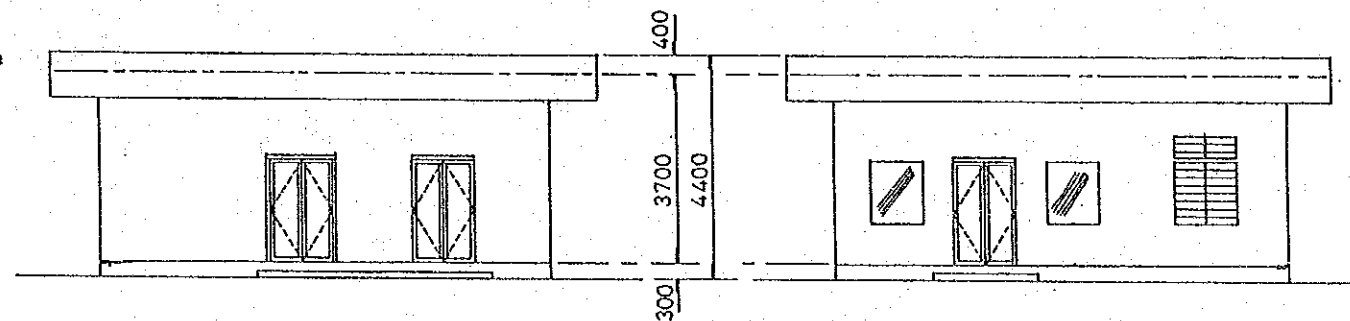
LEGEND	Fig. : 5-11
	Detail Of Leachate Effluent Outlet for PADS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



FRONT ELEVATION



REAR ELEVATION



EAST ELEVATION

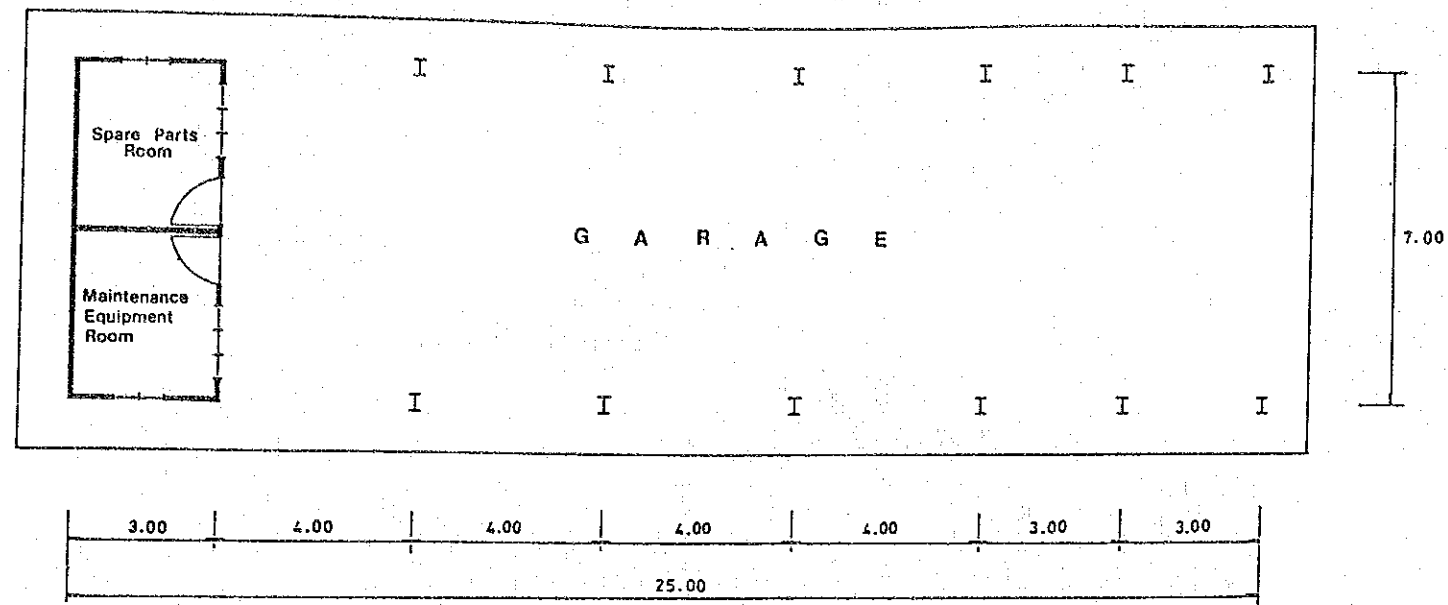
WEST ELEVATION

SCALE:

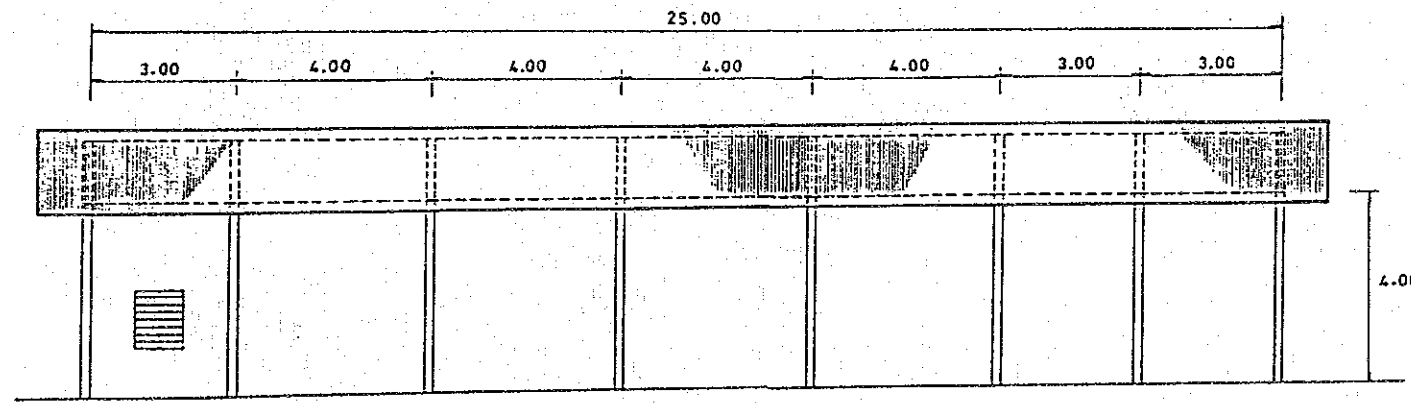


OFFICE BUILDING PLAN

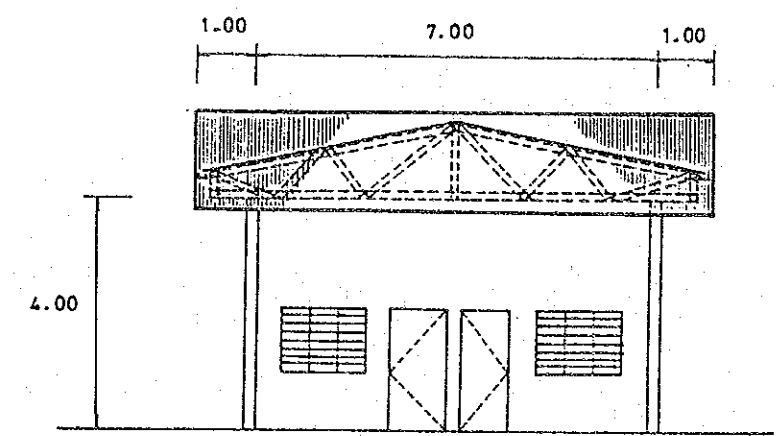
LEGEND	Fig. : 5-12
	Office Building For PADS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



PLAN



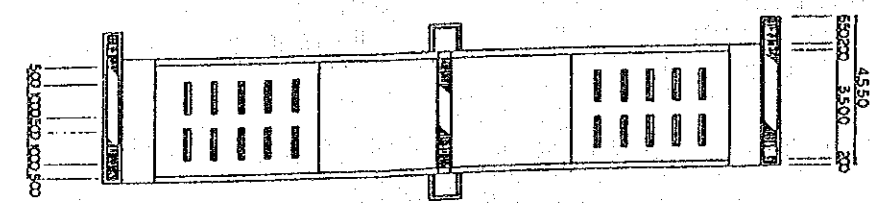
FRONT ELEVATION



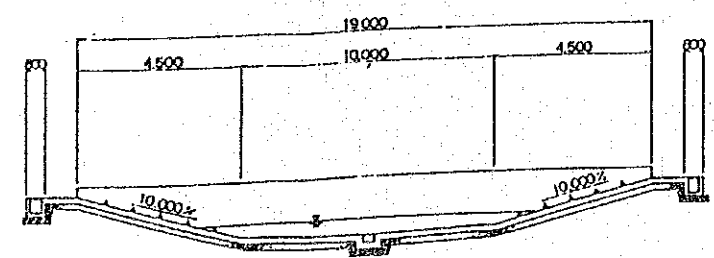
SIDE ELEVATION

CAR WASH

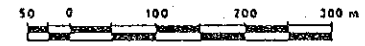
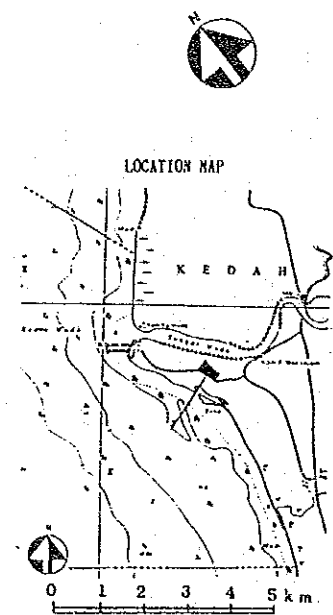
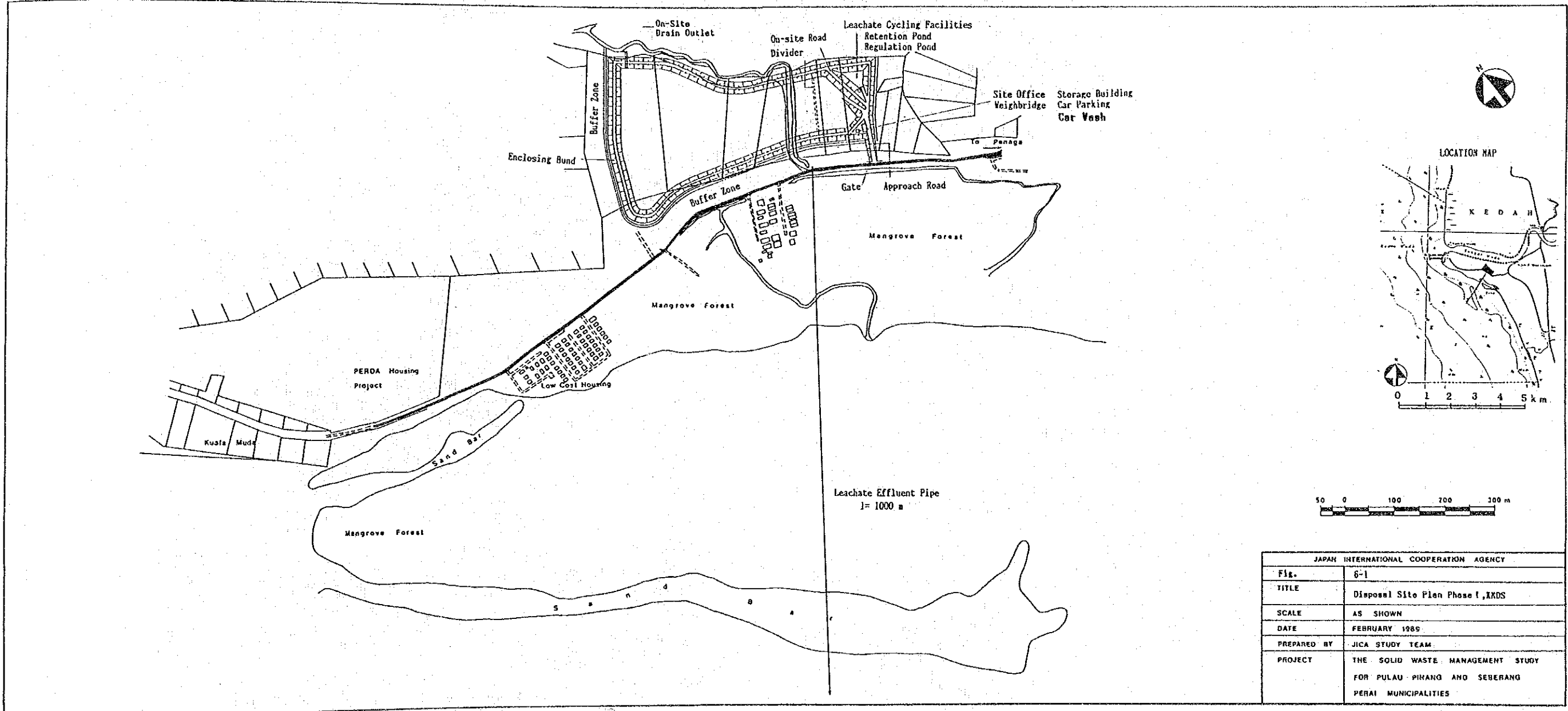
PLAN



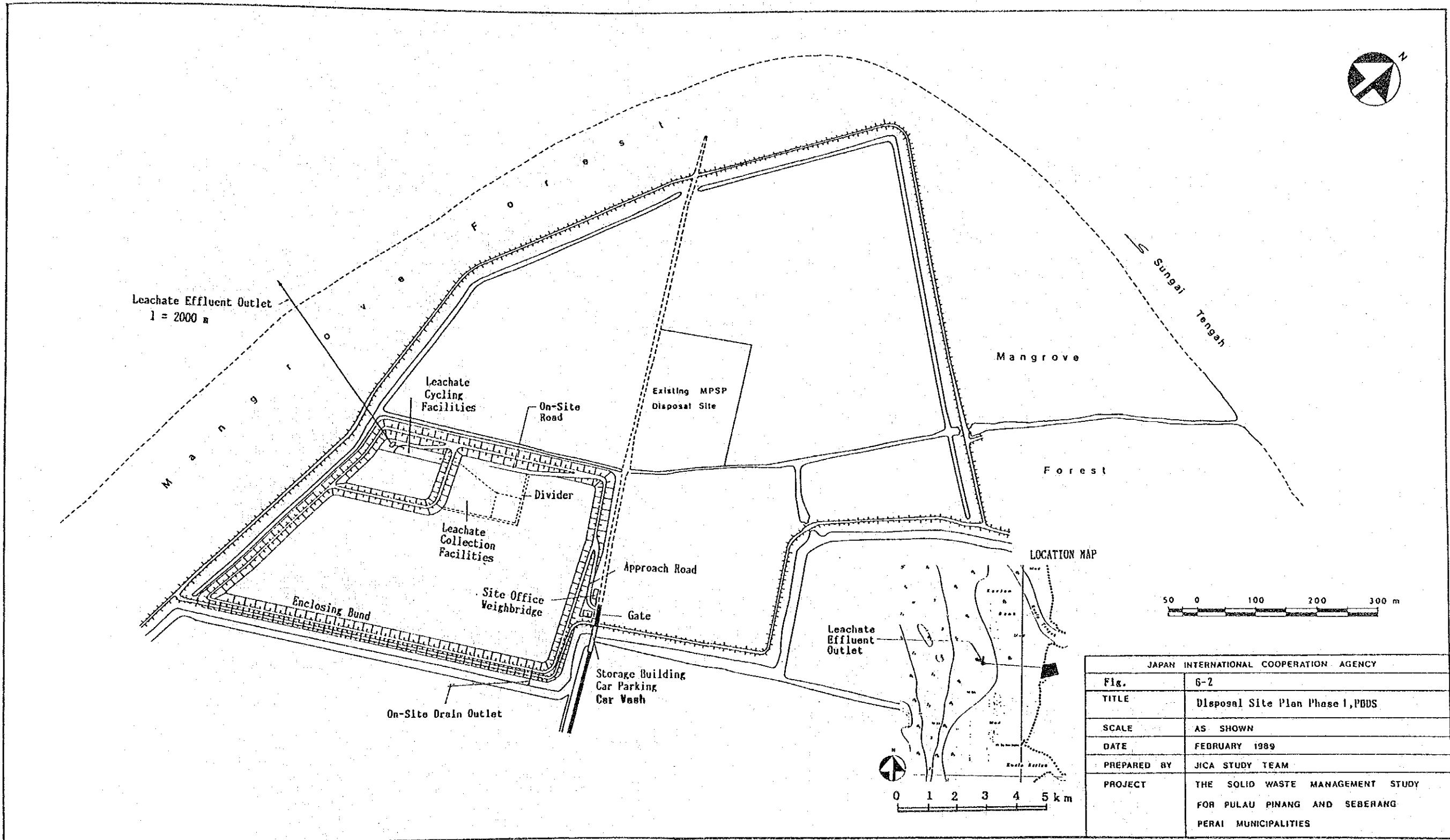
CROSS SECTION



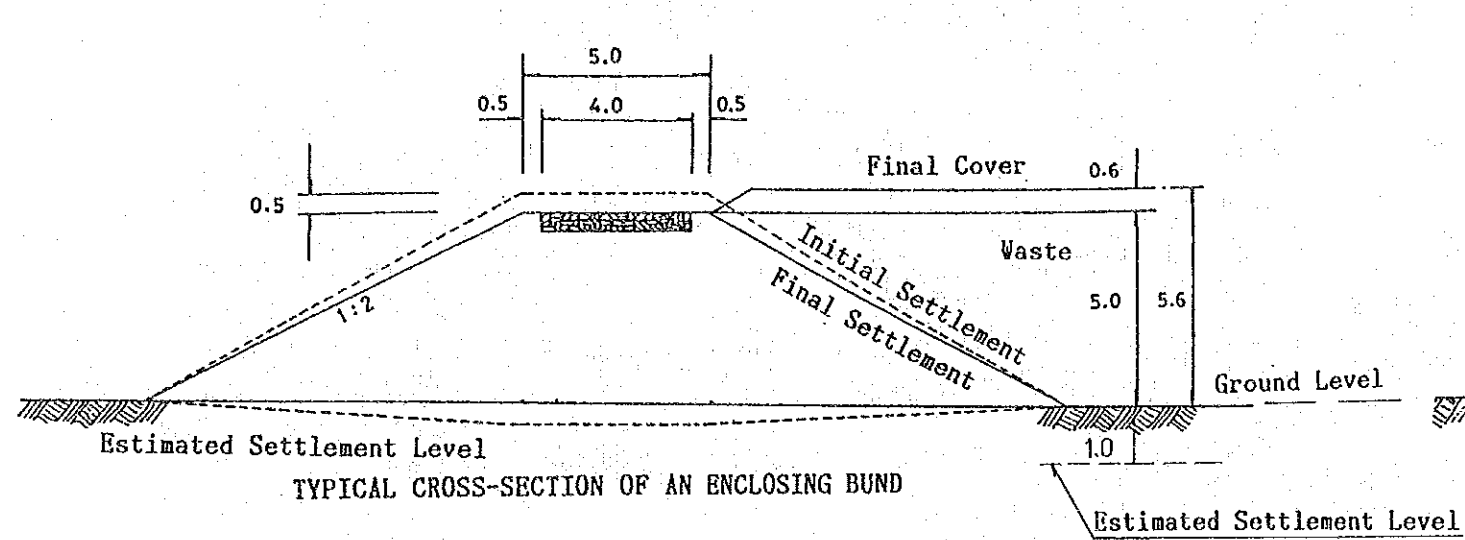
LEGEND	Fig. : 5-13
	Storage Building And Garage For PADS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



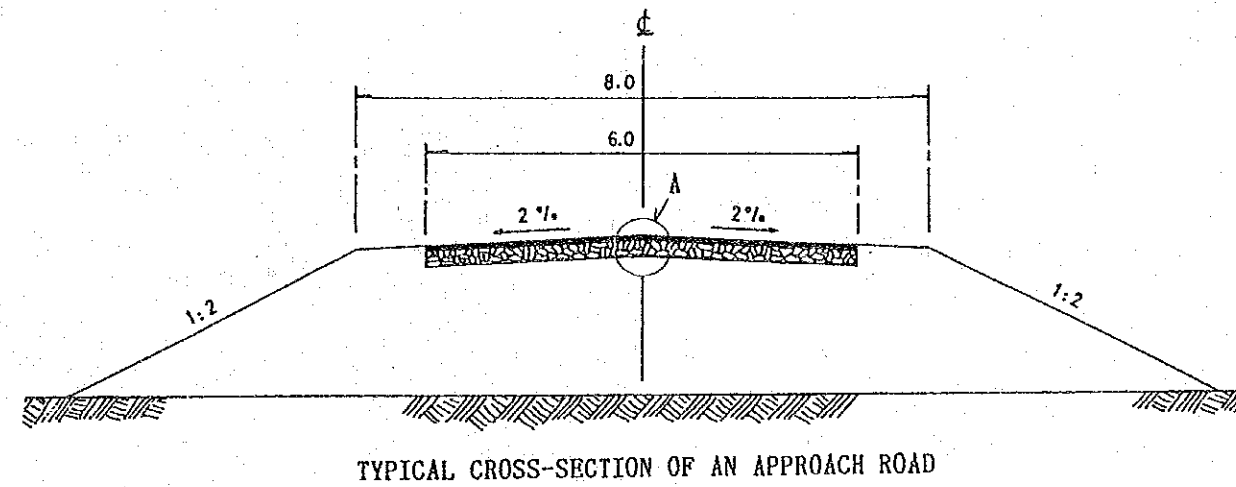
JAPAN INTERNATIONAL COOPERATION AGENCY	
Fig.	6-1
TITLE	Disposal Site Plan Phase I, IKDS
SCALE	AS SHOWN
DATE	FEBRUARY 1985
PREPARED BY	JICA STUDY TEAM
PROJECT	THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PIHANG AND SEBERANG PERAI MUNICIPALITIES



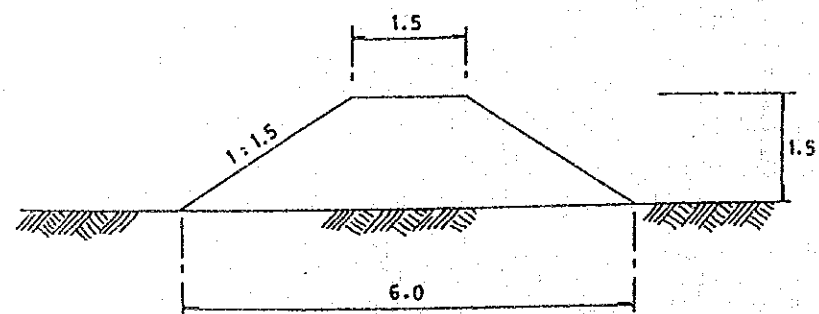
JAPAN INTERNATIONAL COOPERATION AGENCY	
Fig.	G-2
TITLE	Disposal Site Plan Phase I, PDUS
SCALE	AS SHOWN
DATE	FEBRUARY 1989
PREPARED BY	JICA STUDY TEAM
PROJECT	THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI MUNICIPALITIES



TYPICAL CROSS-SECTION OF AN ENCLOSING BUND



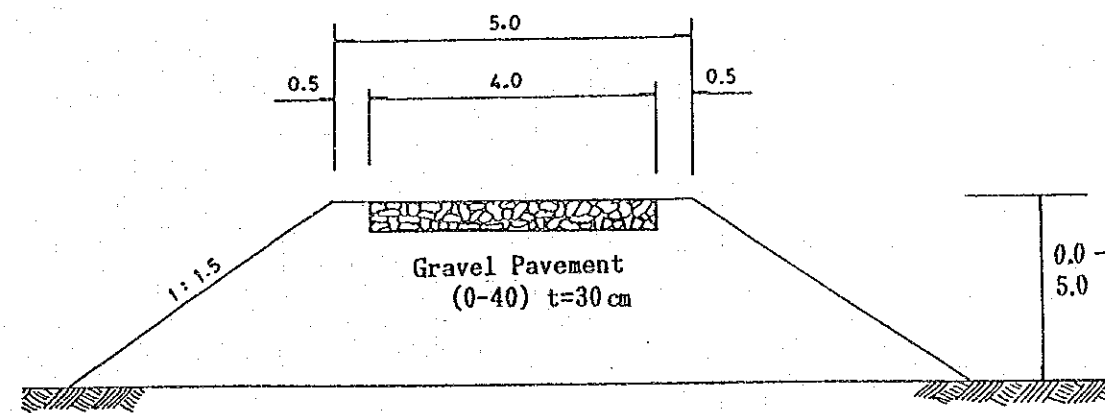
TYPICAL CROSS-SECTION OF AN APPROACH ROAD



TYPICAL CROSS-SECTION OF A DIVIDER

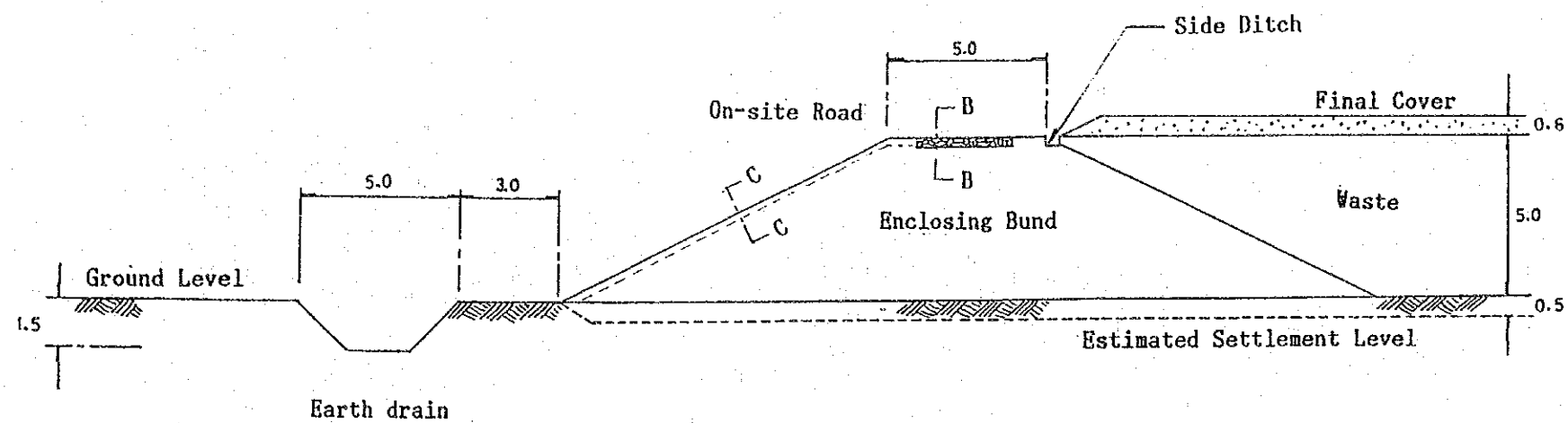
Wearing Course Asphalt Concrete	0.05
Base Course Crushed Aggregate	0.15
Sub-Base Course Sand And Laterite	0.15

A DETAIL OF APPROACH ROAD

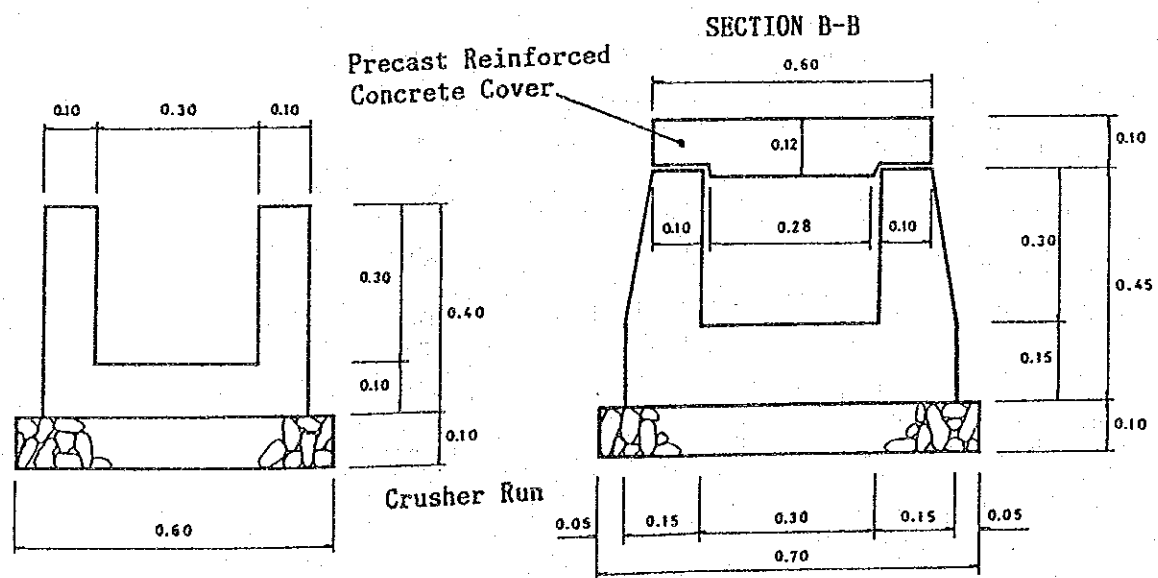


TYPICAL CROSS-SECTION OF AN ON-SITE ROAD

LEGEND	Fig. : 6-3
	Typical Cross Section of The Main Facilities
	:
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : Feb. 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

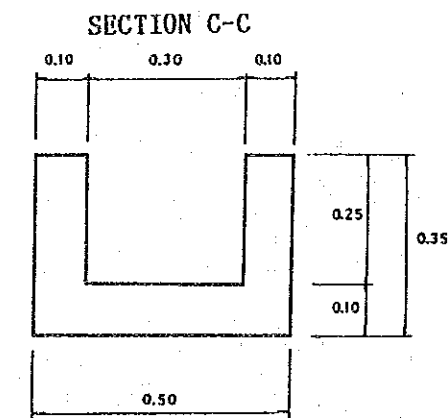


TYPICAL CROSS-SECTION

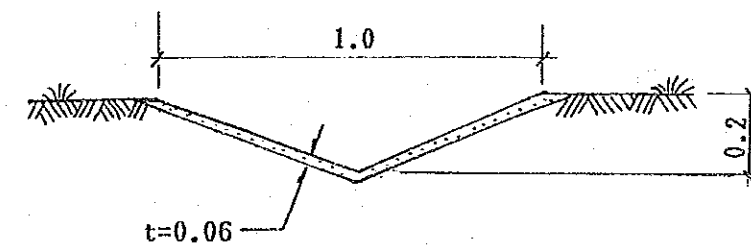


TYPICAL CROSS-SECTION OF A SIDE DITCH

TYPICAL CROSS-SECTION OF A CROSS DRAIN

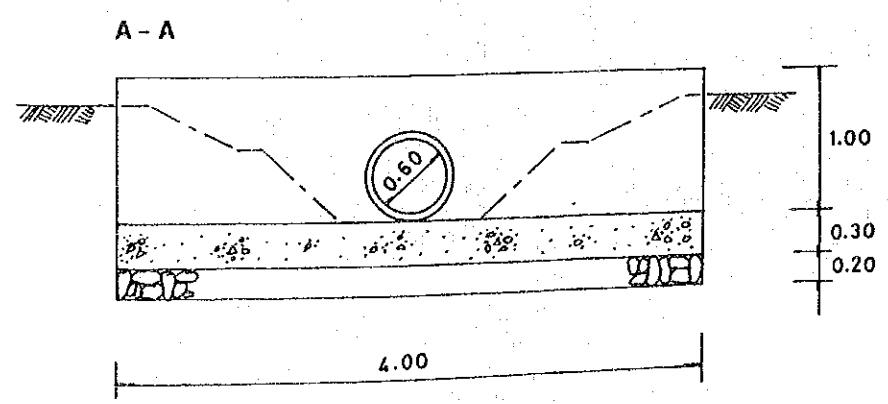
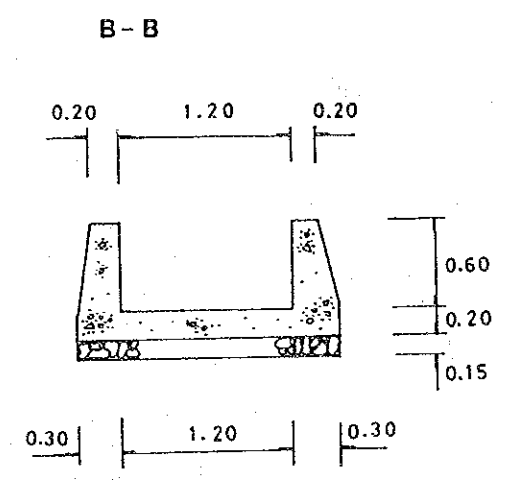
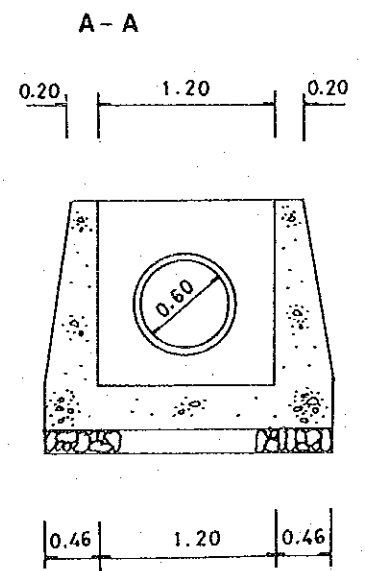
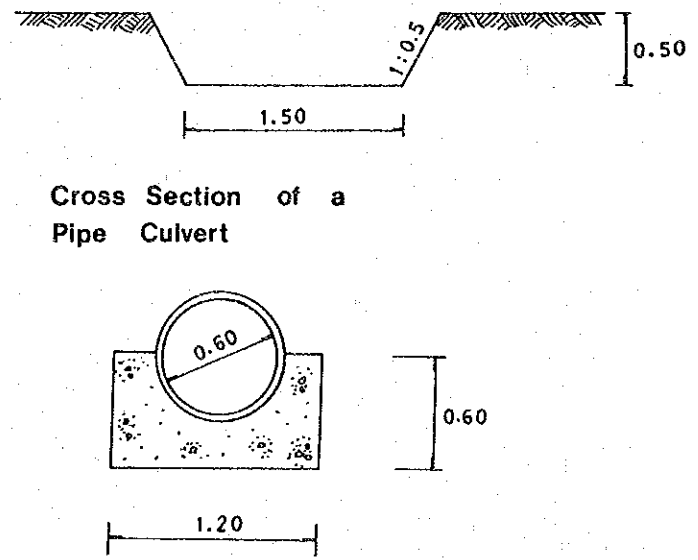
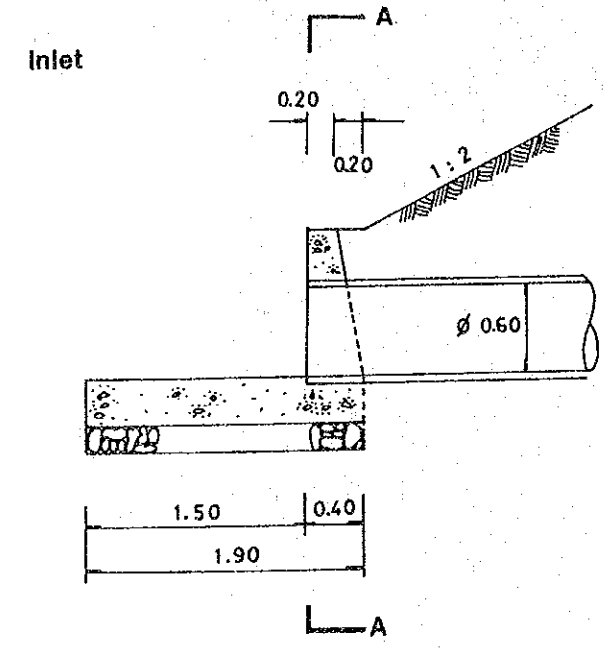
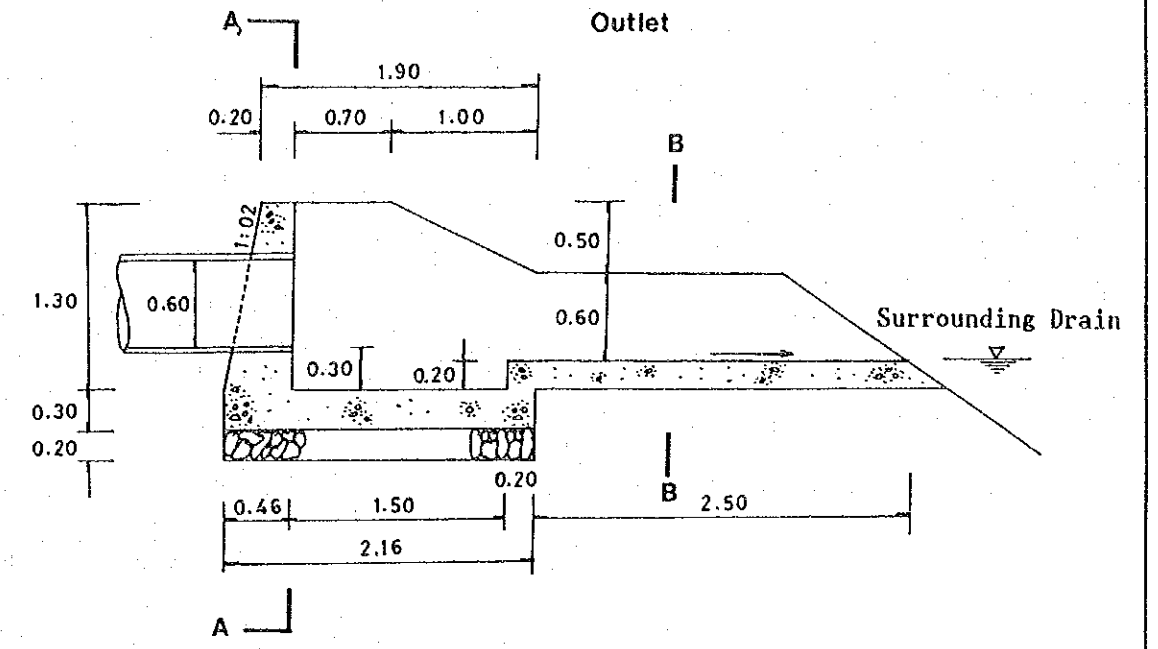
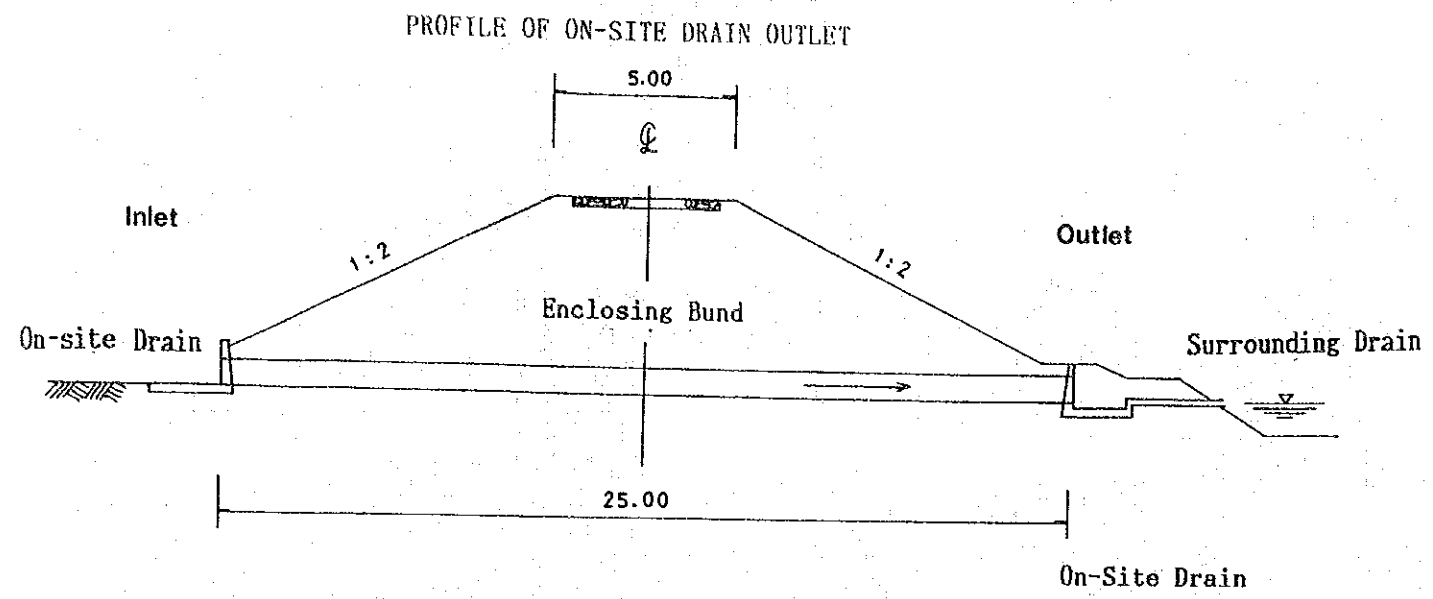


TYPICAL CROSS-SECTION OF A VERTICAL DRAIN

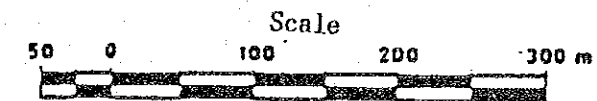
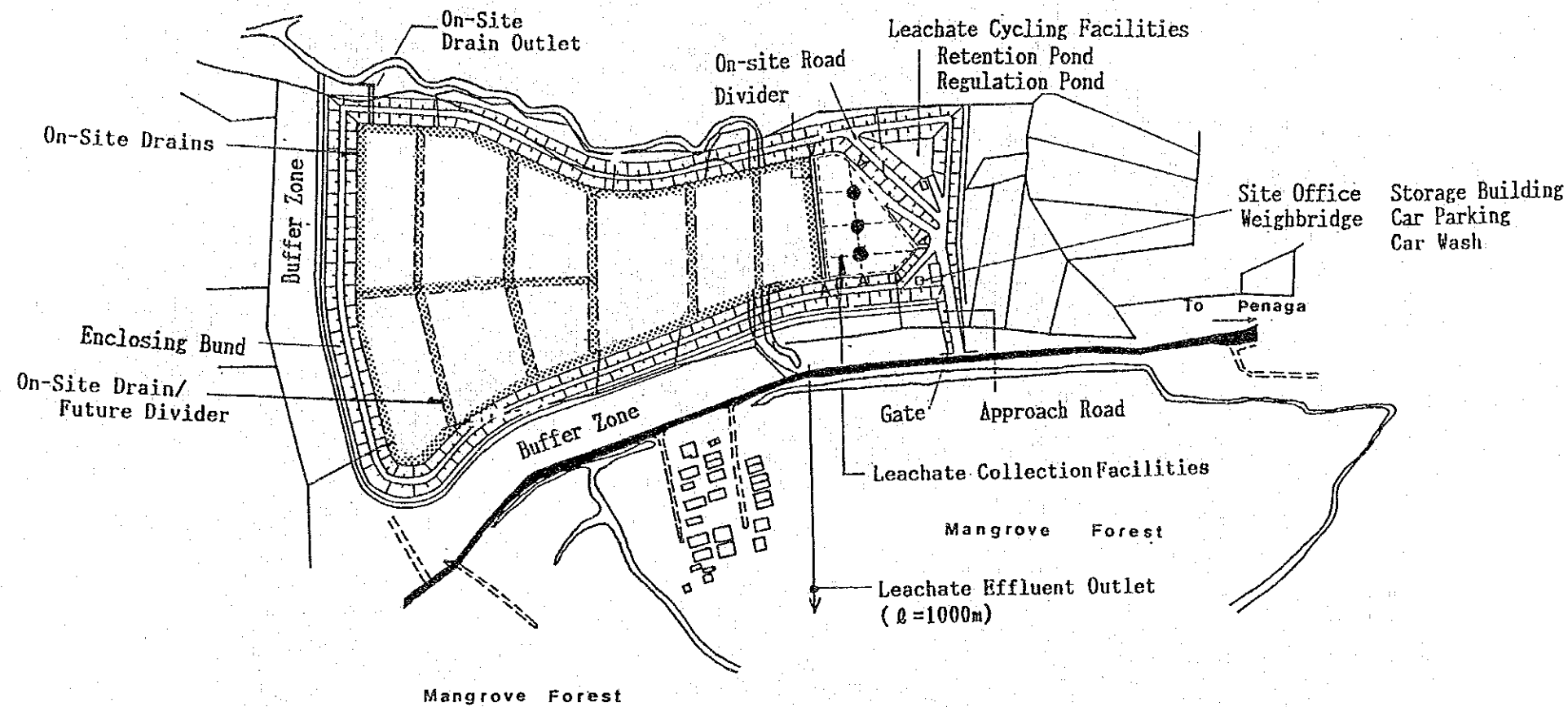


Main Surface DRAIN FOR RECLAIMED AREA

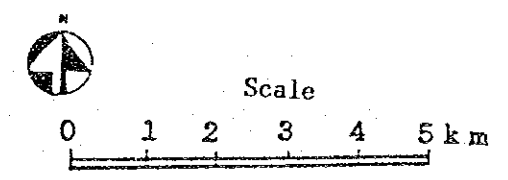
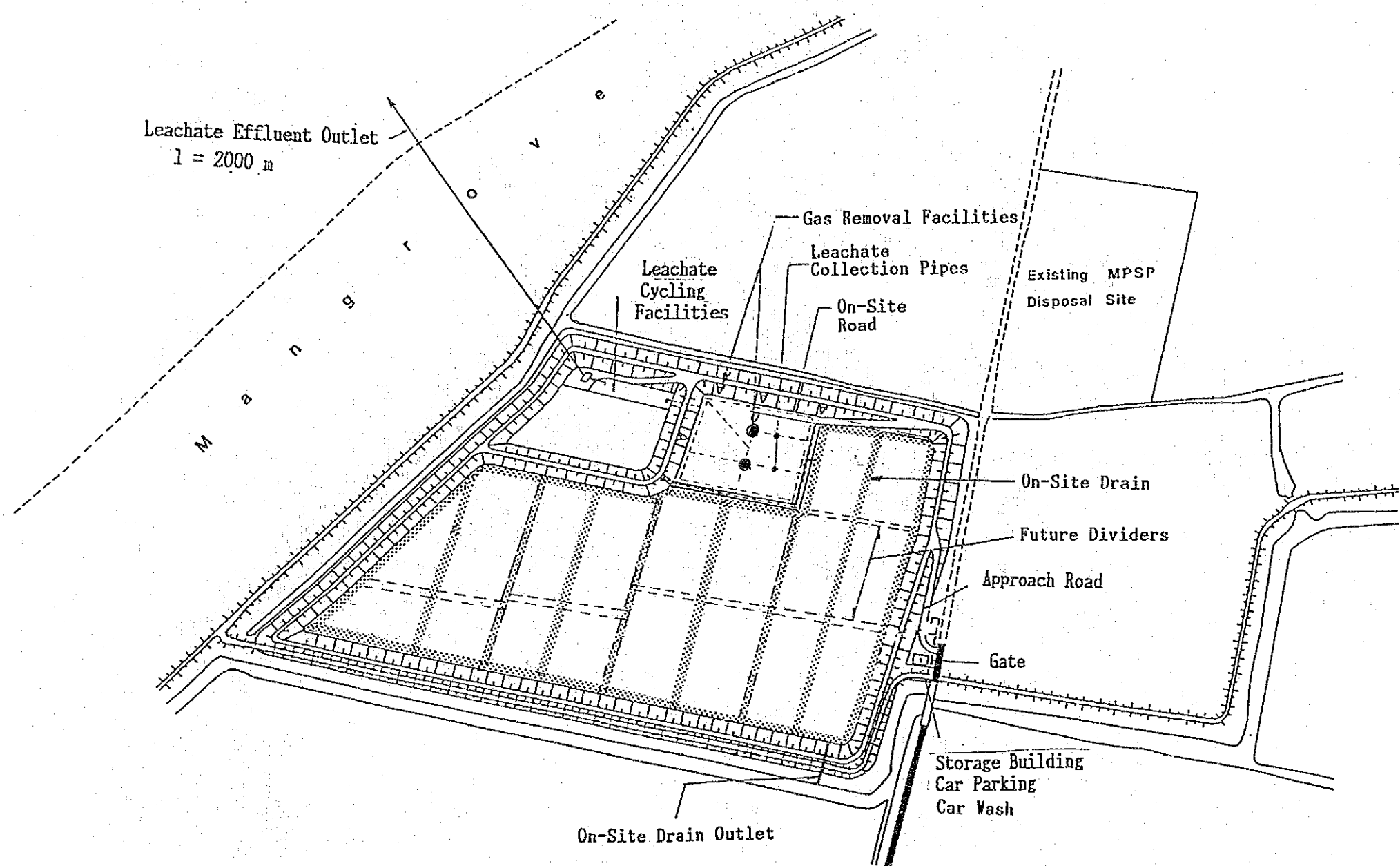
LEGEND	Fig. : 6-4
	Disposal Site Drainage System
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : Feb. 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



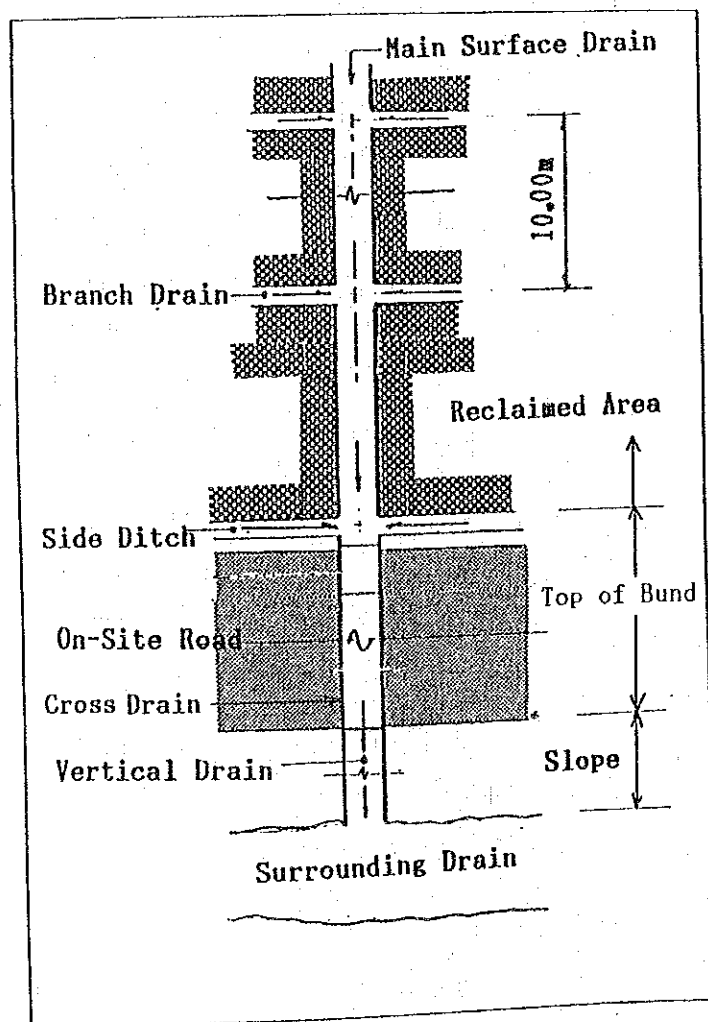
LEGEND	Fig. : 6-5
	On-Site Drainage Details
Source : JICA Study Team	
Scale : As Shown	
Date of Drawings : Feb. 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



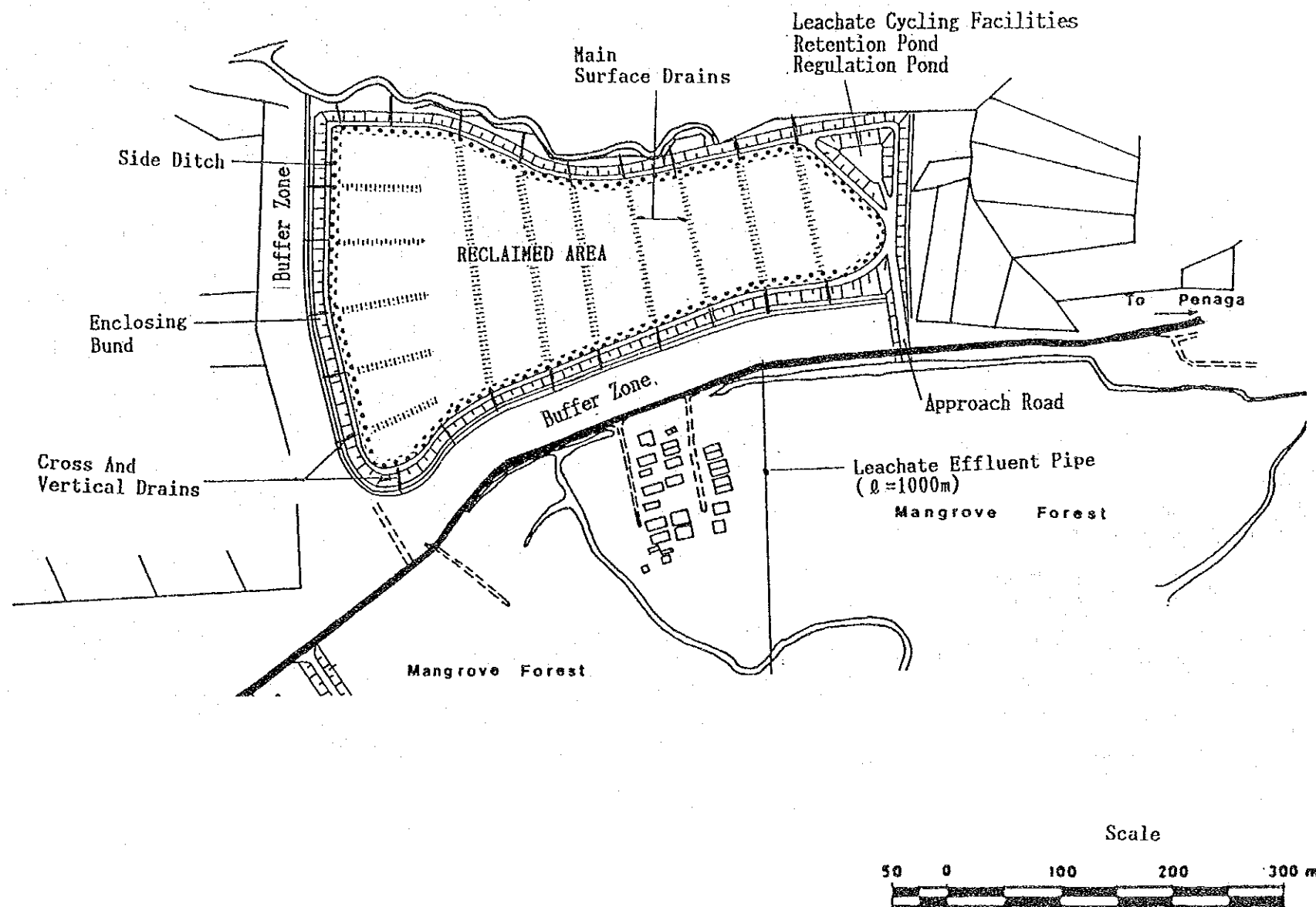
LEGEND On-site Drains Future Dividers Gas Removal Facility (Vertical Type) Gas Removal Facility (Slope Type) Leachate Collection Facilities	Fig. : 6-6
	INITIAL STAGE DEVELOPMENT
	OF FACILITIES NETWORK, KMDS
	KMDS
	Source : JICA Study Team
Scale : As Shown	
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



LEGEND On-Site Drain Future Dividers Gas Removal Facility (Vertical Type) Gas Removal Facility (Slope Type)	Fig. : 6-7
	INITIAL STAGE DEVELOPMENT OF FACILITIES NETWORK, PBDS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



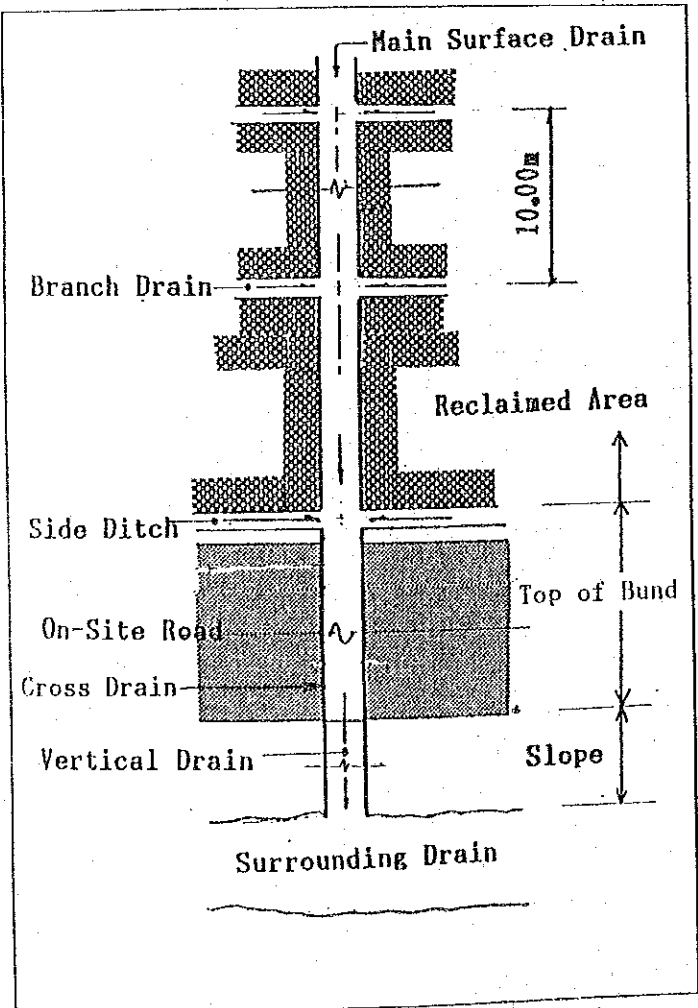
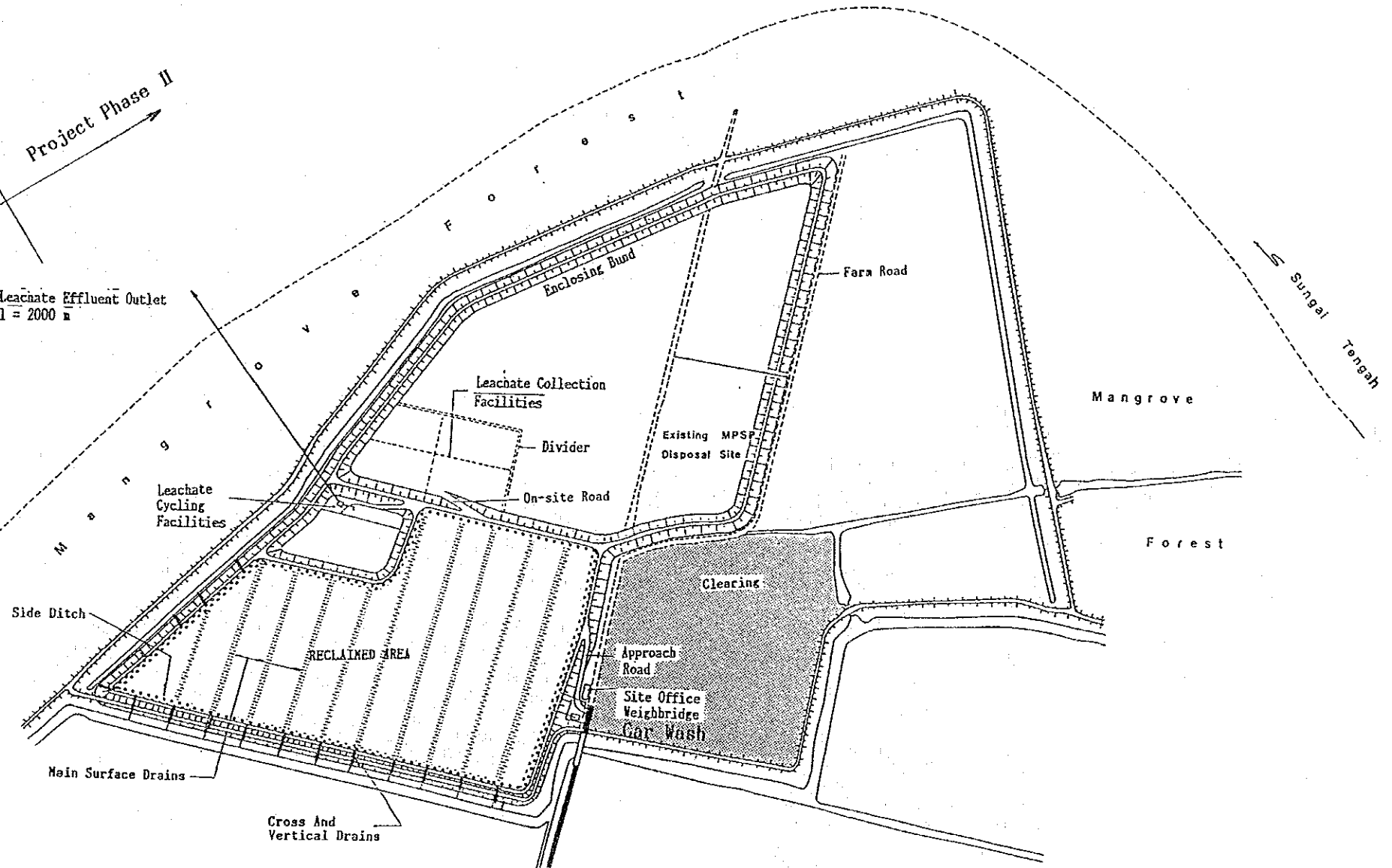
TYPICAL DRAINAGE LAYOUT IN RECLAIMED AREAS



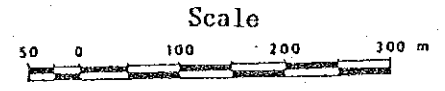
LEGEND	—	Main Surface Drain	Fig. : 6-8
	—	Cross and Vertical Drains	Surface Water Drainage In Reclaimed KMDS
			Source : JICA Study Team
			Scale : As Shown
			Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI			

Phase I Project
Project Phase II

Leachate Effluent Outlet
l = 2000 m



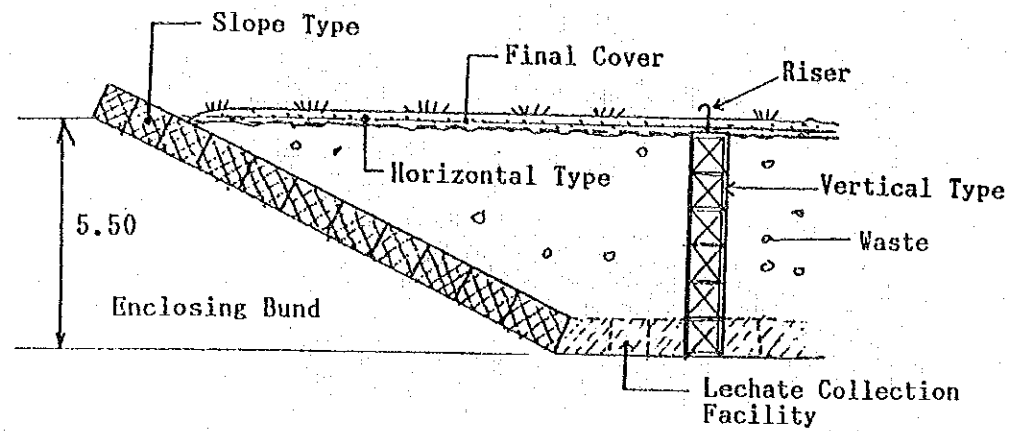
TYPICAL DRAINAGE LAYOUT IN RECLAIMED AREAS



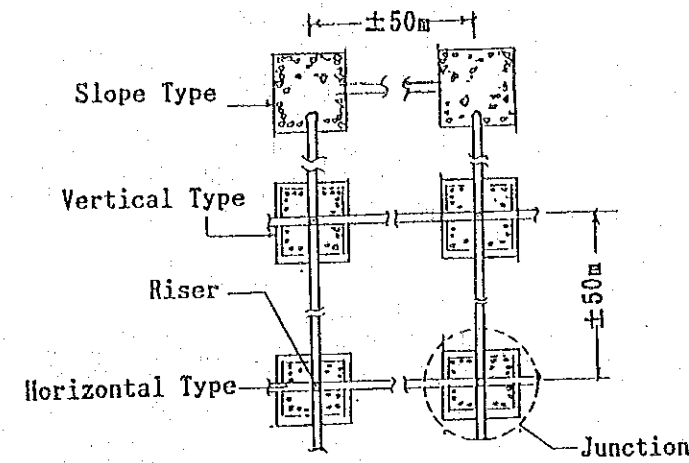
LEGEND	
	Car Wash
	Cross and Vertical Drains

Fig.	: 6-9
	Surface Water Drainage In Reclaimed PBDS
Source	: JICA Study Team
Scale	: As Shown
Date of Drawings	: March 1989

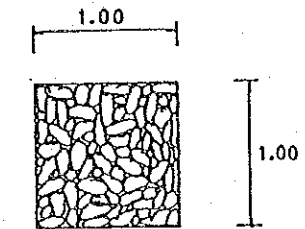
PROFILE OF GAS REMOVAL AND LEACHATE COLLECTION FACILITIES



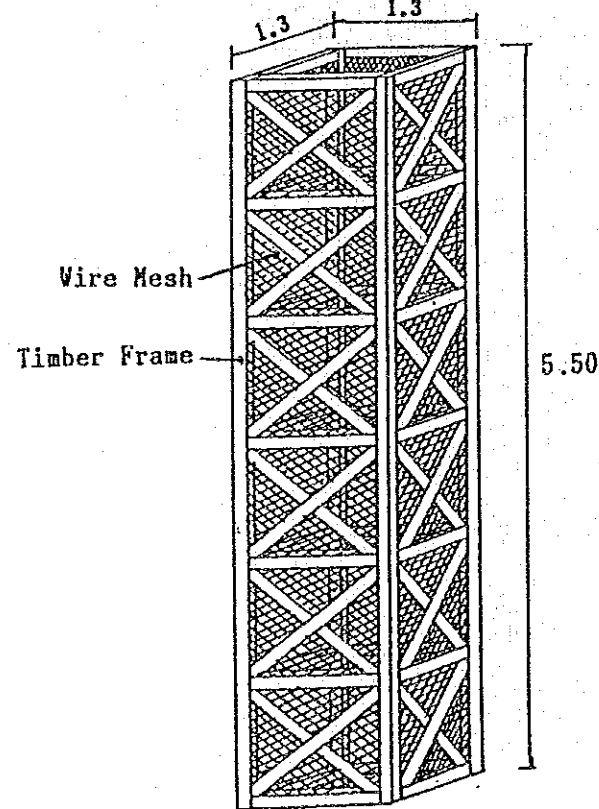
PLAN OF GAS REMOVAL NETWORK



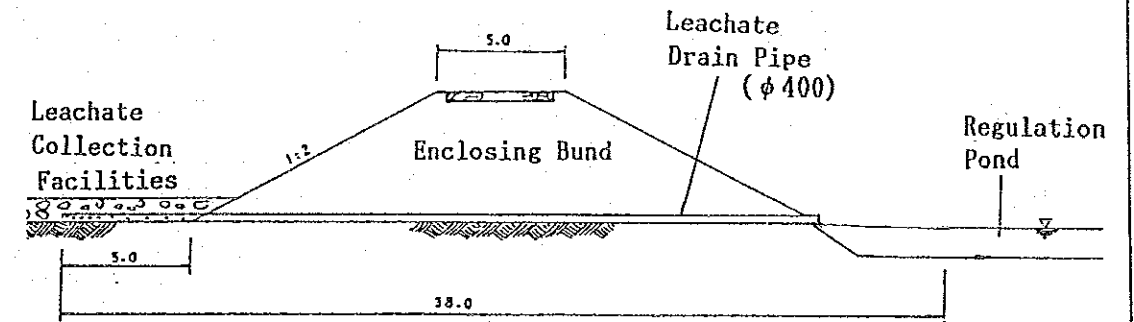
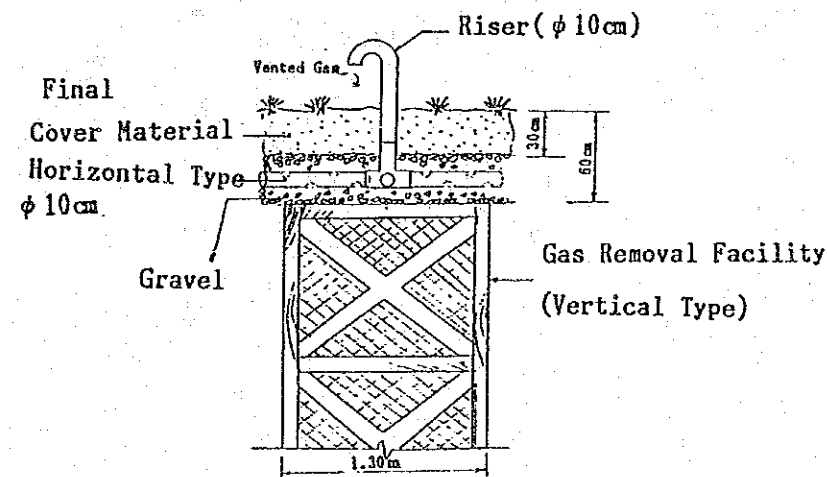
LEACHATE COLLECTION FACILITIES



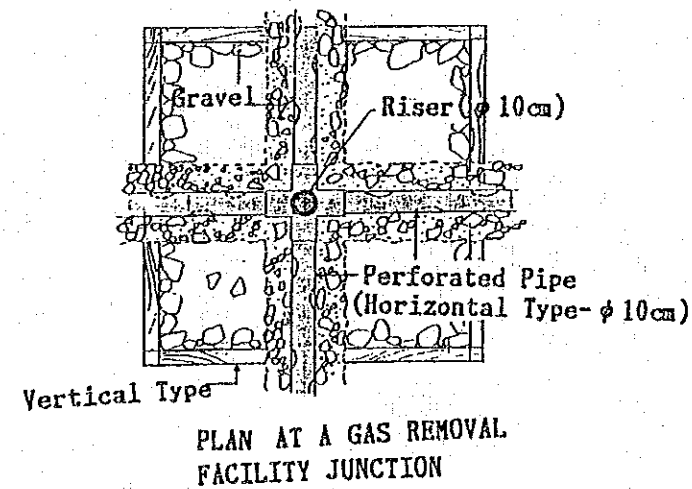
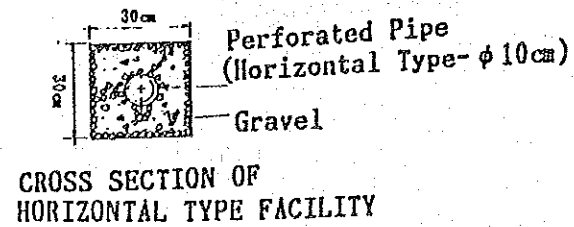
VERTICAL TYPE



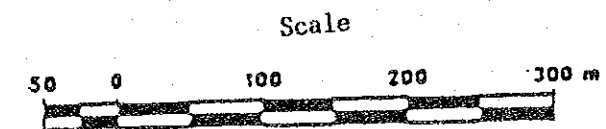
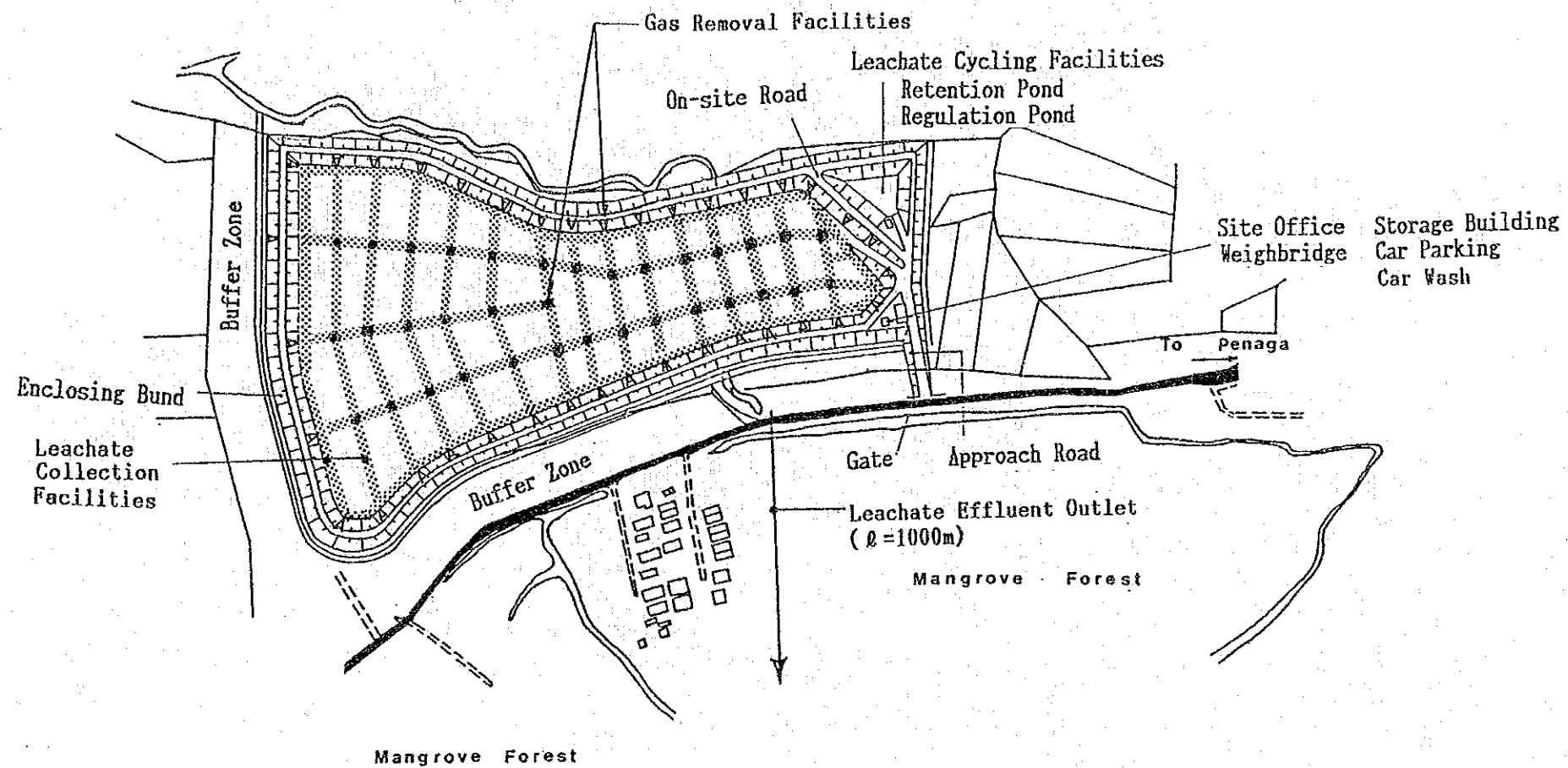
CROSS-SECTIONAL VIEW AT A GAS REMOVAL FACILITY JUNCTION



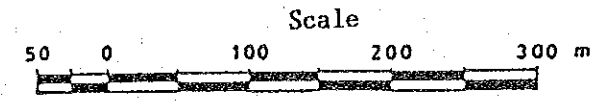
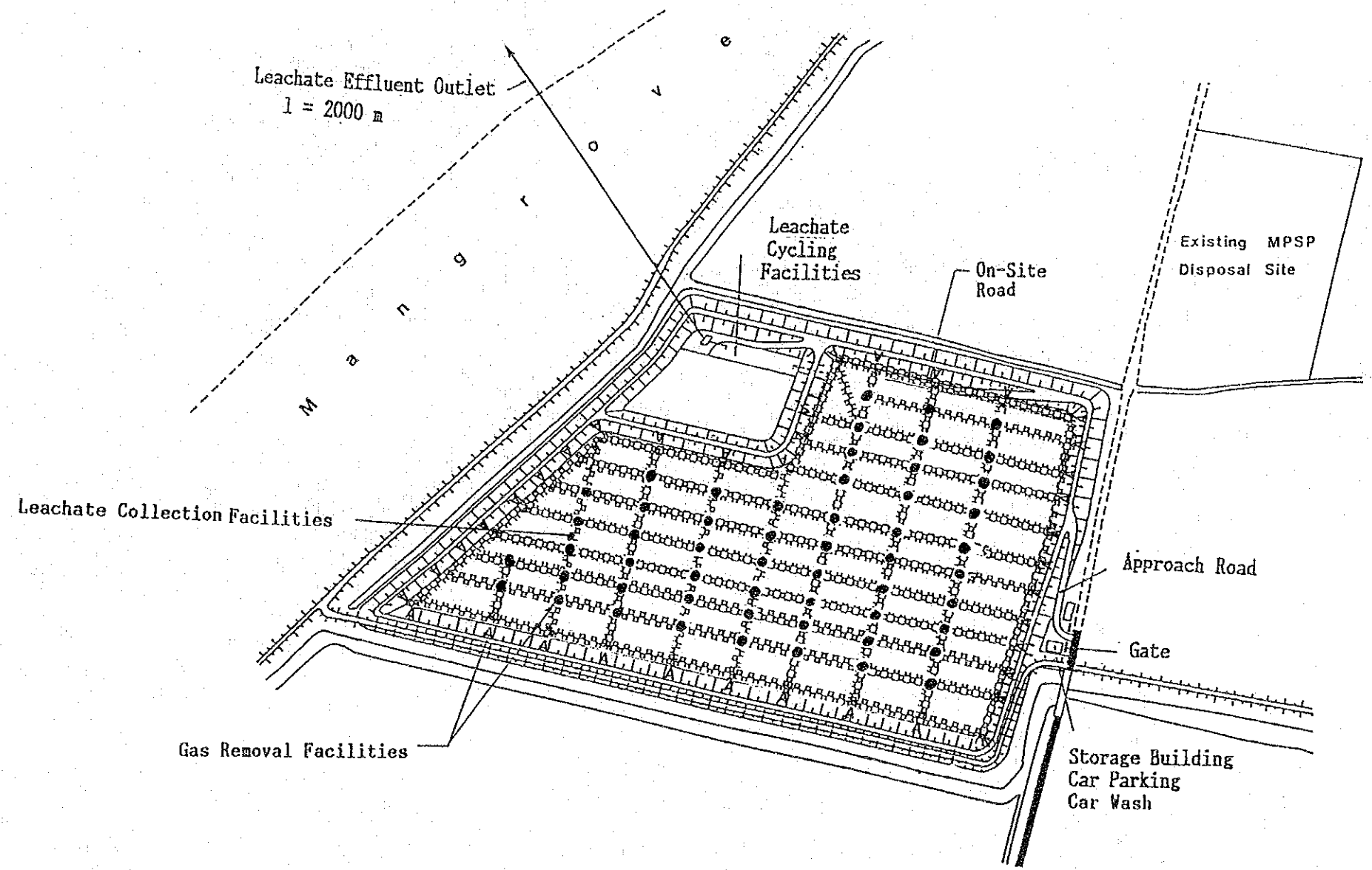
PROFILE OF LEACHATE DRAIN OUTLET



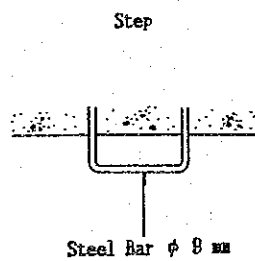
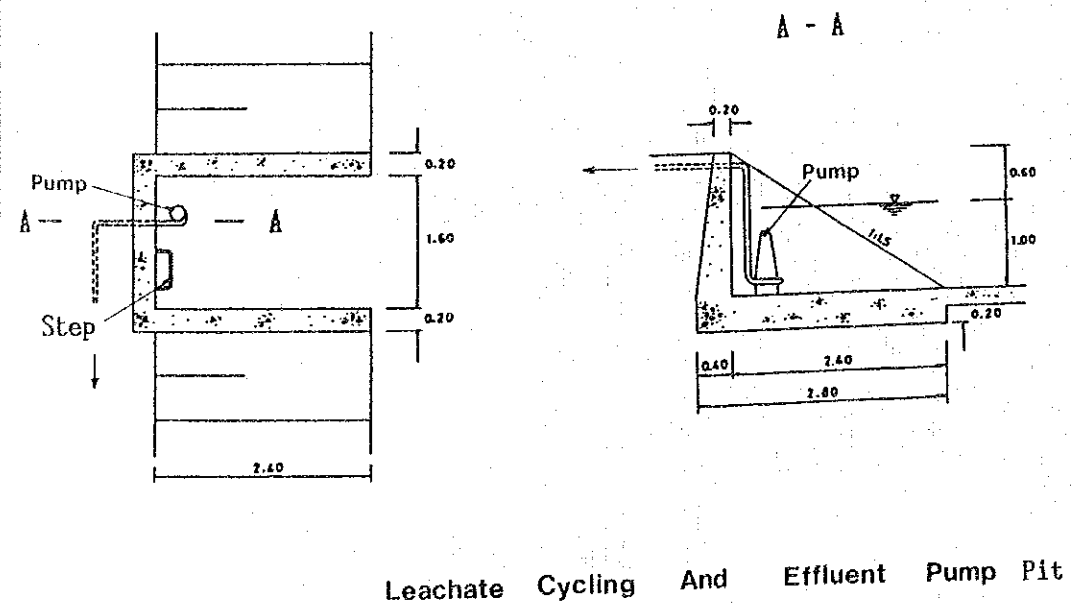
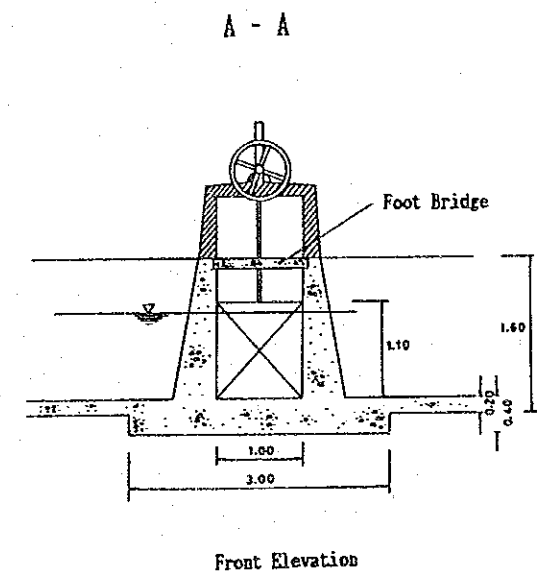
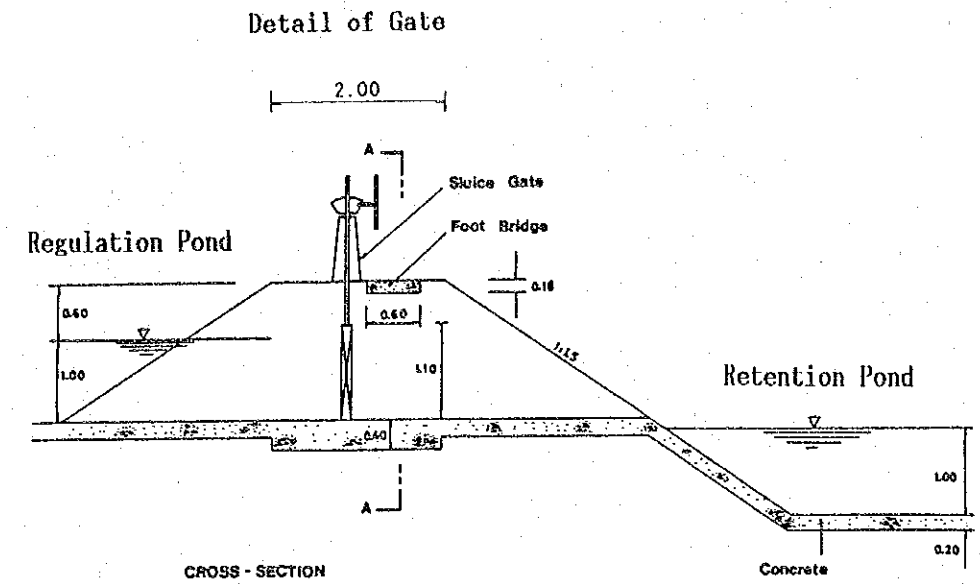
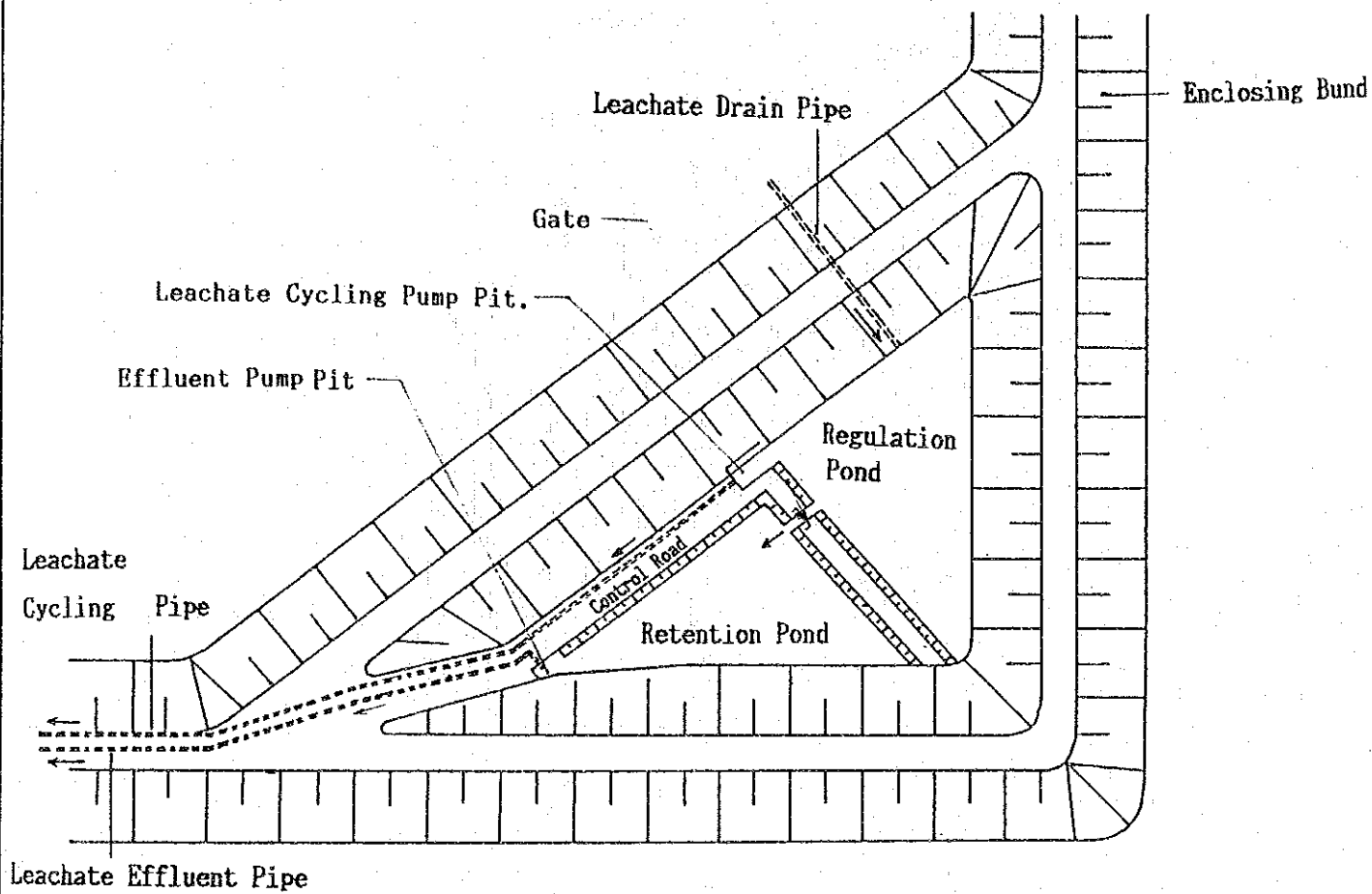
LEGEND	Fig. : 6-10
	Gas Removal And Leachate Collection Facilities
	:
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



LEGEND		Fig. : 6-11
•••••	Leachate Collection Facilities	FINAL DEVELOPMENT OF FACILITIES NETWORK, KMDS
●	Gas Removal Facility (Vertical Type)	
A	Gas Removal Facility (Slope Type)	
		Source : JICA Study Team
		Scale : As Shown
		Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI		

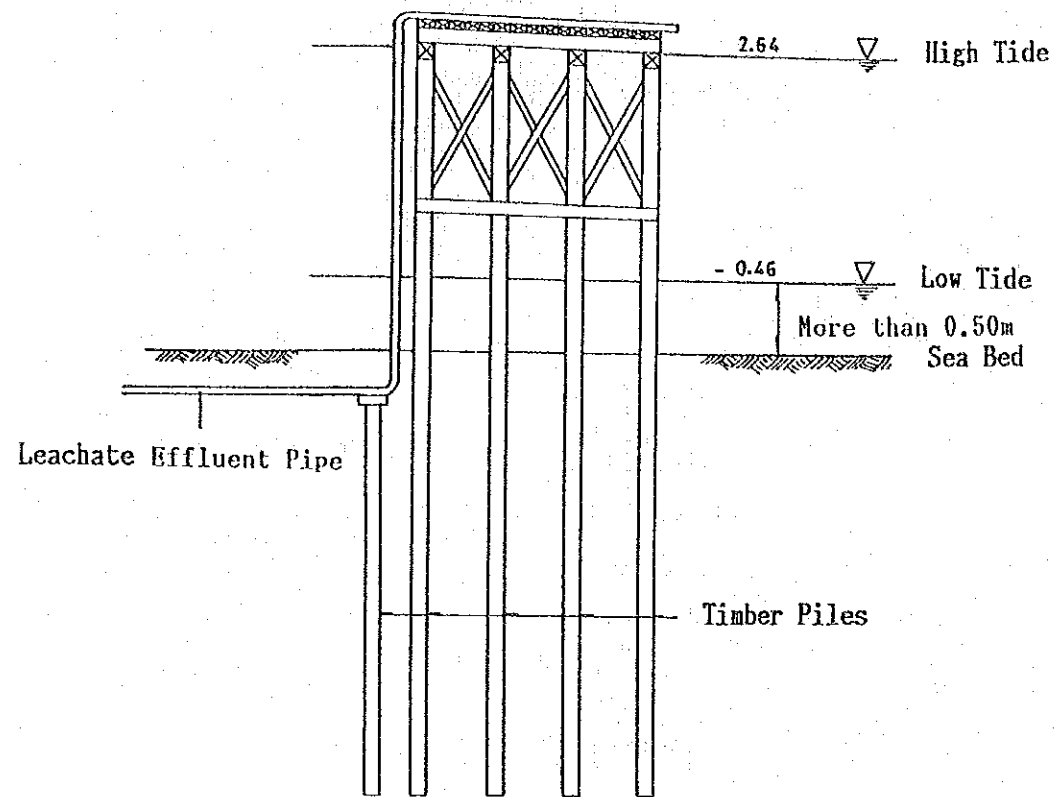


LEGEND	Fig. : 6-12
	FINAL DEVELOPMENT OF FACILITIES NETWORK PBDS
<ul style="list-style-type: none"> ● Leachate Collection Facilities ● Gas Removal Facility (Vertical Type) v Gas Removal Facility (Slope Type) 	Source : JICA Study Team Scale : As Shown Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	

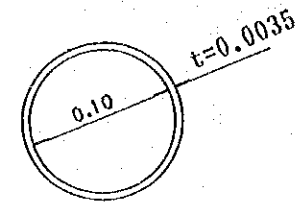


LEGEND	Fig. : 6-13
	Detail Of Leachate Cycling Facilities For KNDS And PBDS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAJ	

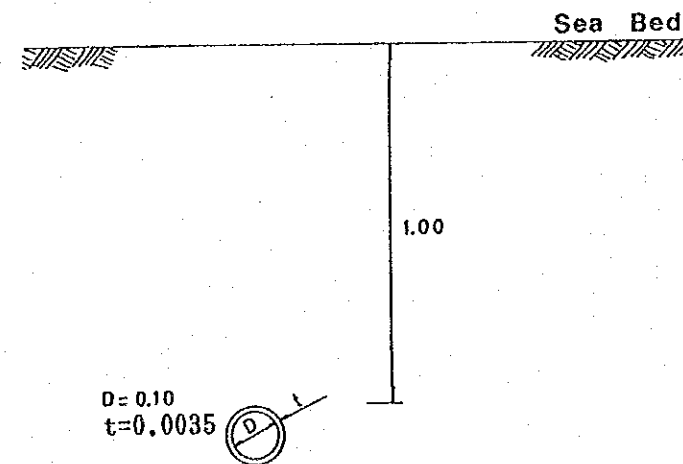
Profile of Effluent Outlet



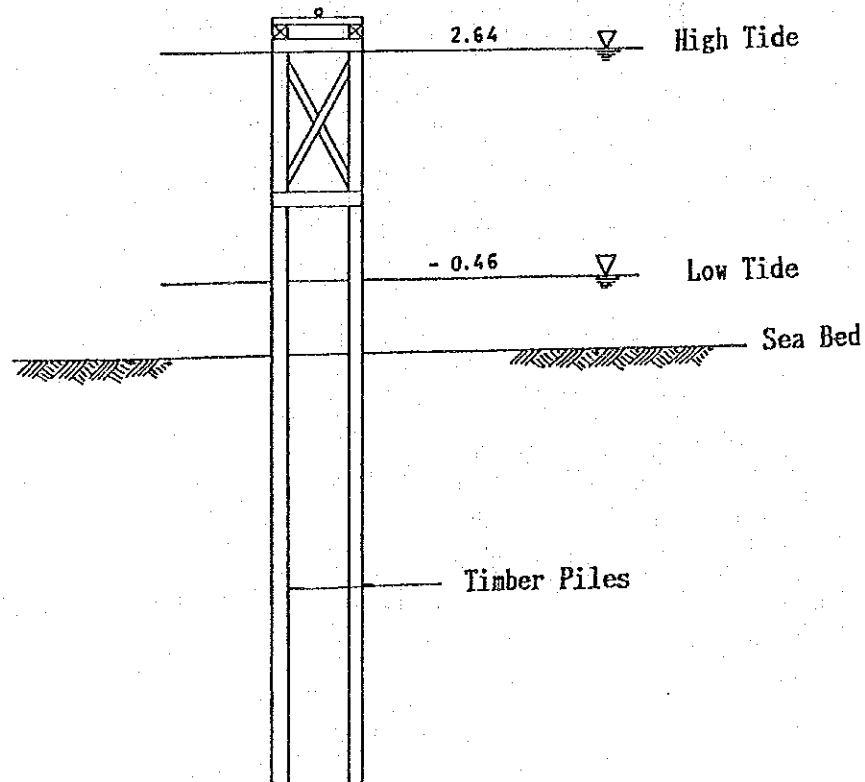
CROSS SECTION OF STEEL DRAIN PIPE



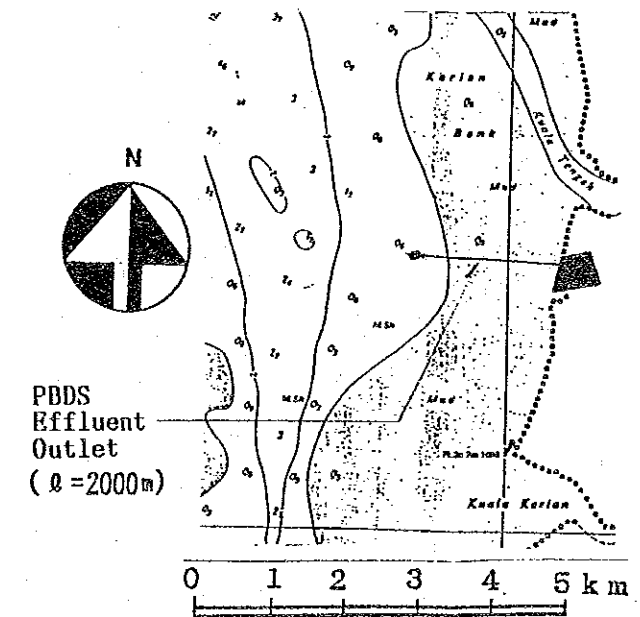
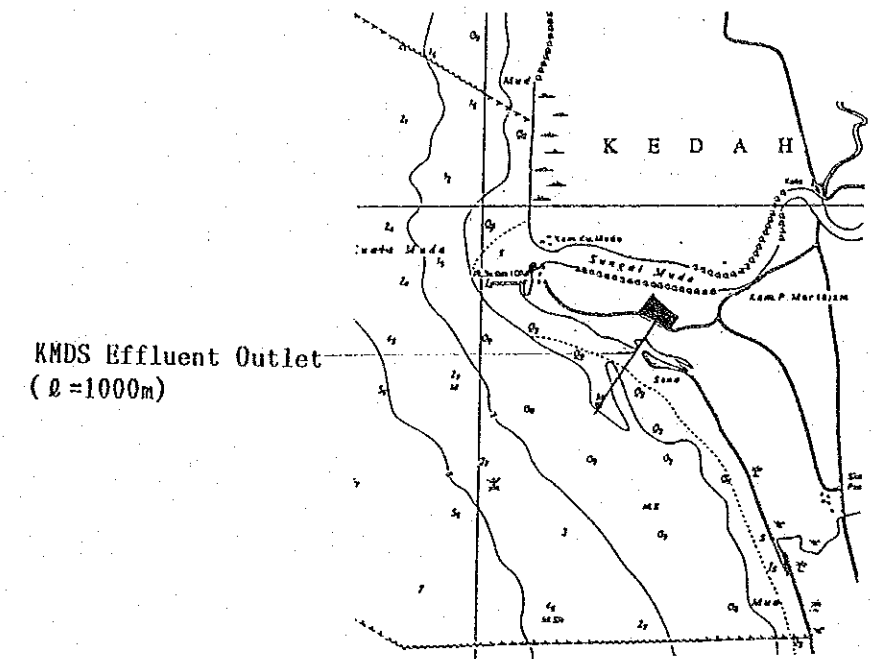
CROSS SECTION OF TYPICAL SETTING OUT



Cross-Section of Effluent Outlet



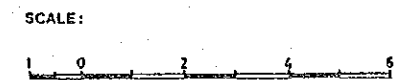
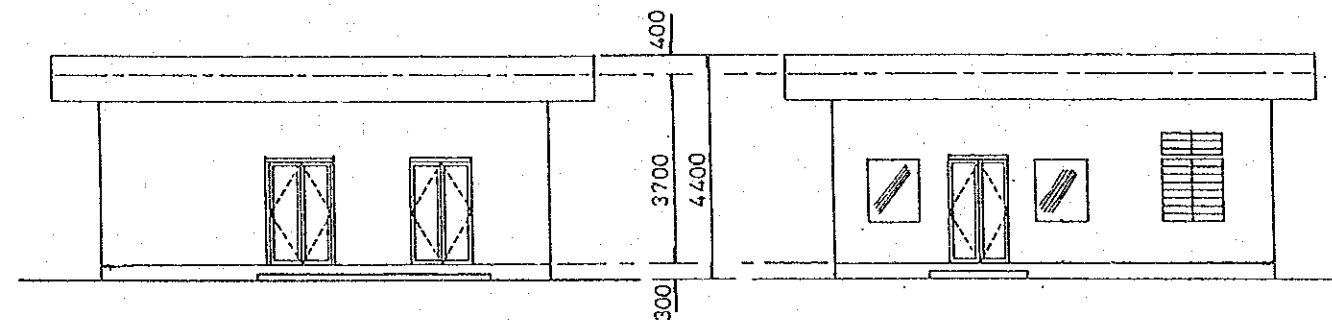
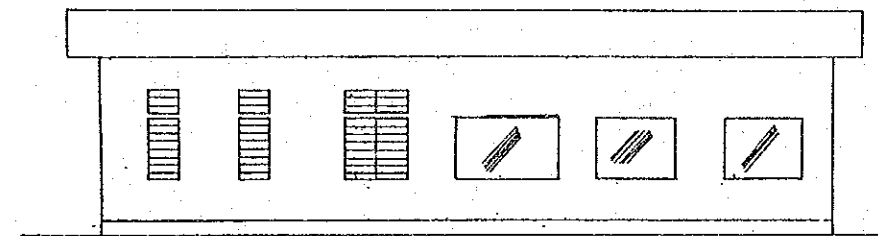
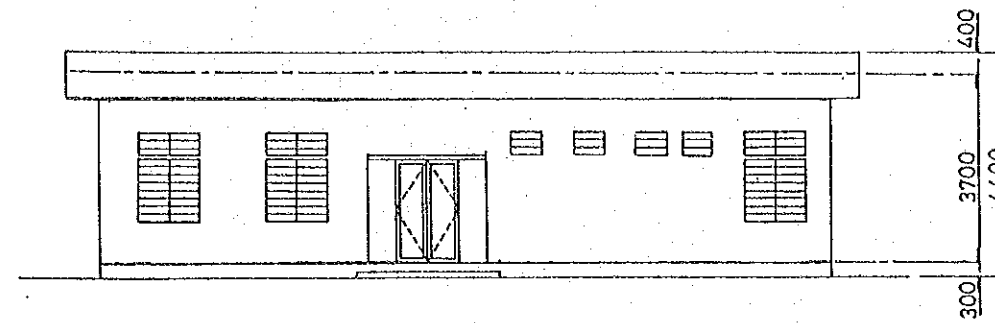
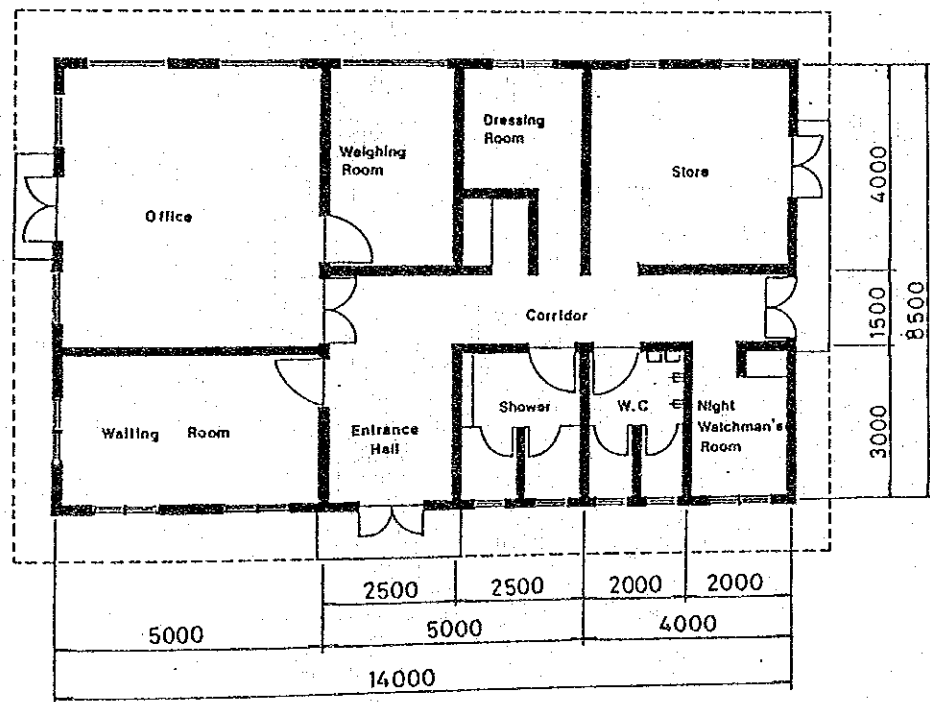
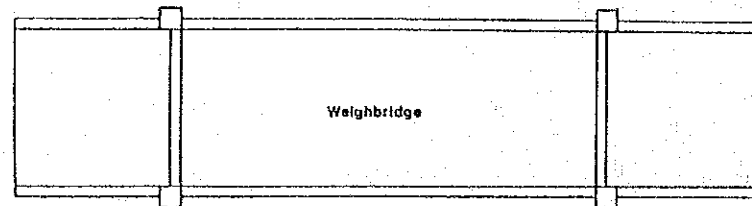
LOCATION MAP



LEGEND

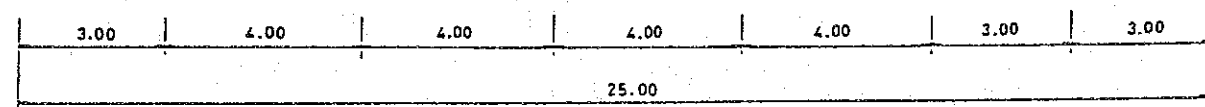
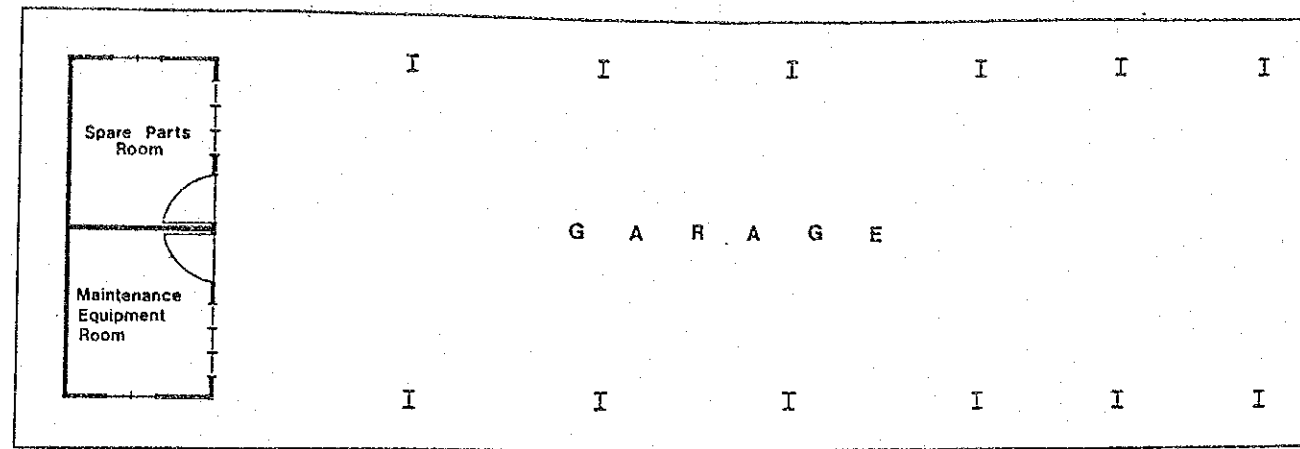
Fig.	: 6-14
Detail Of Leachate Effluent Outlet For KMDS And PBDS	
Source	: JICA Study Team
Scale	: As Shown
Date of Drawings	: March 1989

THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI

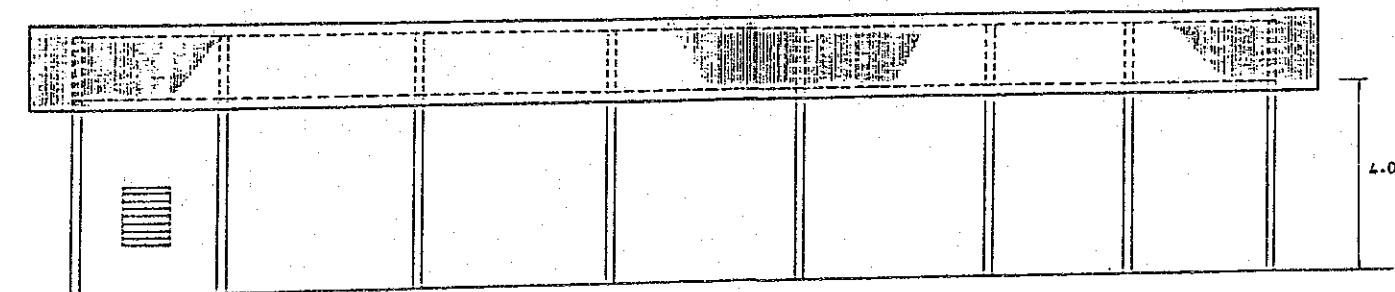
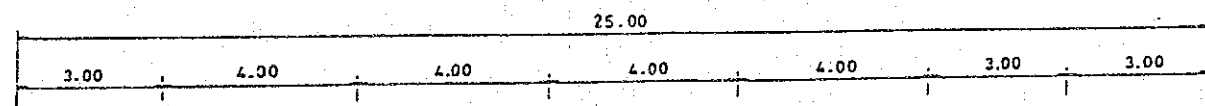


OFFICE BUILDING PLAN

LEGEND	Fig. : 6-15
	Office Building For KMDS & PBDS
	Source : JICA Study Team
	Scale : As Shown
	Date of Drawings : March 1989
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAJ	



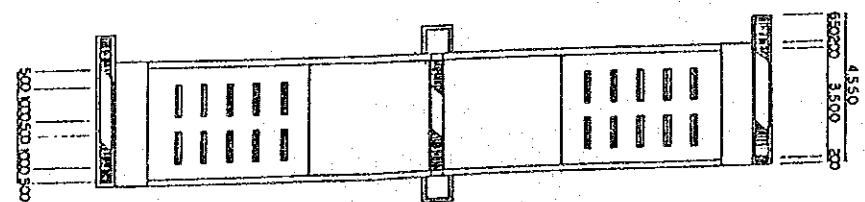
PLAN



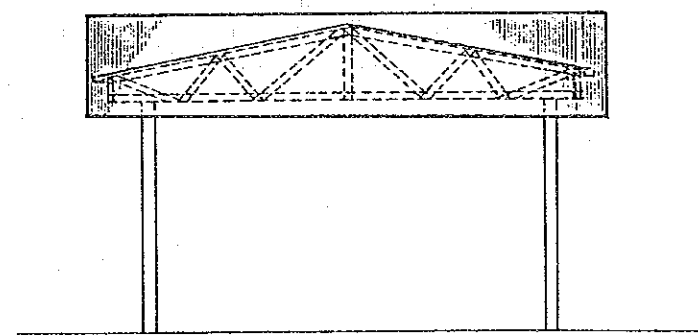
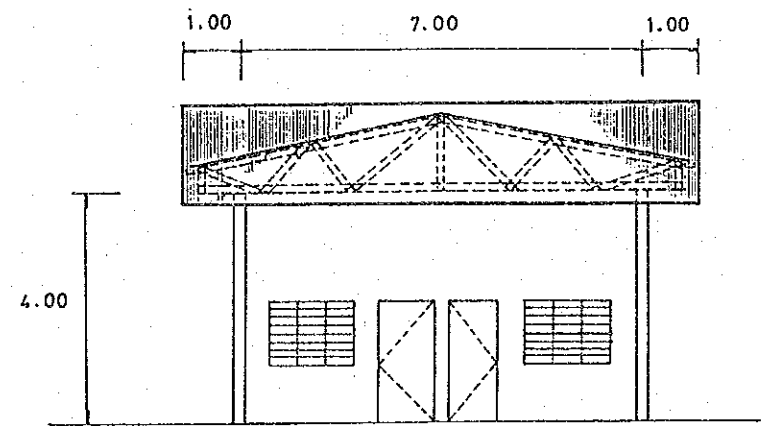
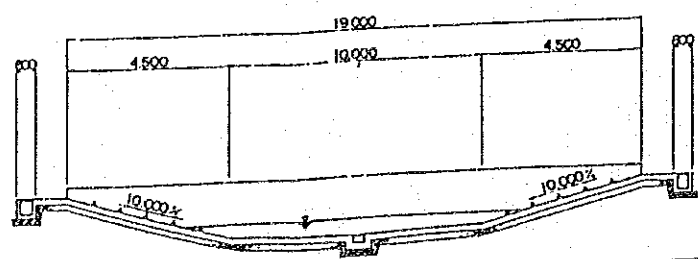
FRONT ELEVATION

CAR WASH

PLAN

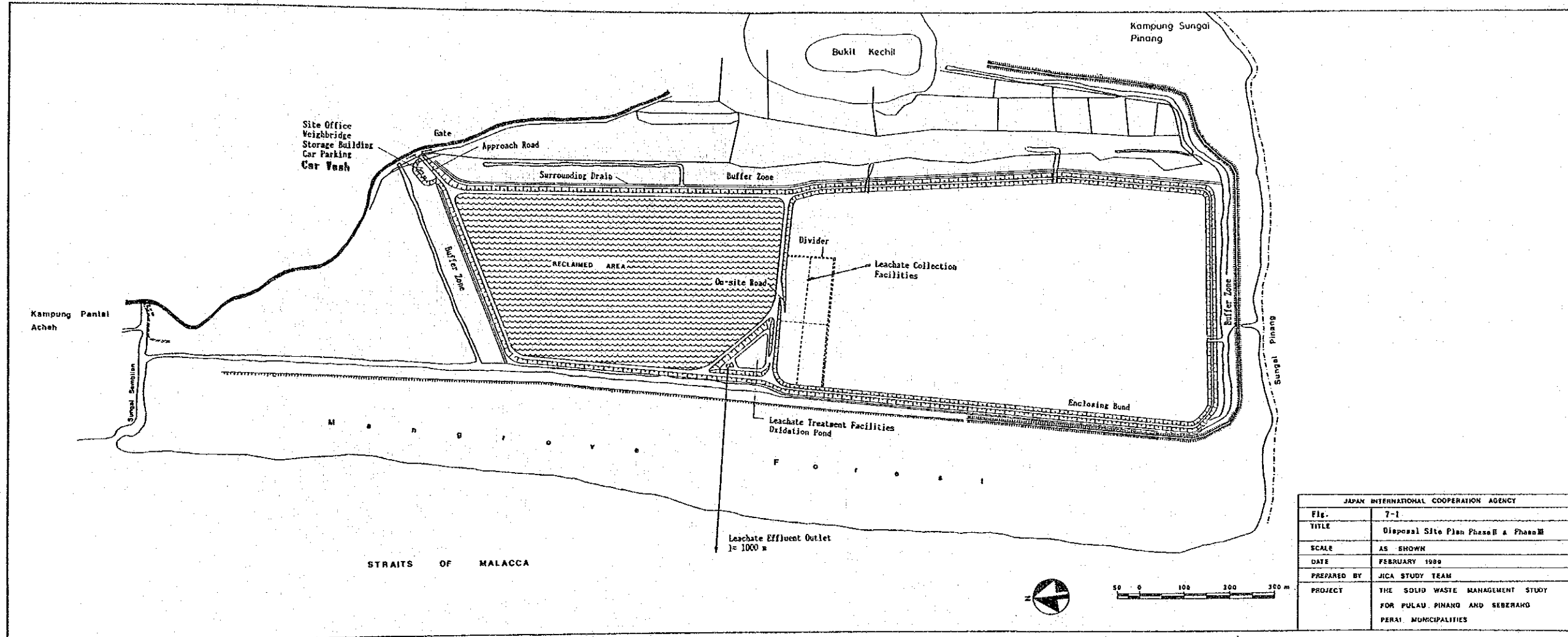


CROSS SECTION



SIDE ELEVATION

LEGEND	Fig. : 6-16
	Storage Building And Garage
	For KMDS And PBDS
	Source : JICA Study Team
	Scale : As Shown
Date of Drawings : March 1989	
THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI	



JAPAN INTERNATIONAL COOPERATION AGENCY	
Fig.	7-1
TITLE	Disposal Site Plan Phase II & Phase III
SCALE	AS SHOWN
DATE	FEBRUARY 1989
PREPARED BY	JICA STUDY TEAM
PROJECT	THE SOLID WASTE MANAGEMENT STUDY FOR PULAU PINANG AND SEBERANG PERAI MUNICIPALITIES