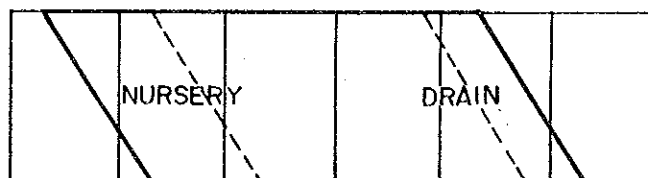


	D	J	F	M	A	M
--	---	---	---	---	---	---



(1) E _{To}	(mm)	108	123	141	162	183	-
(2) KC		-	1.21	1.30	1.29	1.28	-
(3) = (1) x (2)	(mm)	-	149	183	209	235	-
(4) Percolation	(mm)	-	90	90	90	90	-
(5) Effective Rainfall	(mm)	-	0	0	20	50	-
(6) = (3) + (4) - (5)	(mm)	-	239	273	279	275	-
(7) Area Factor		-	0.22	0.94	0.97	0.35	-
(8) = (6) x (7)	(mm)	-	53	256	271	97	-
(9) Puddling Water	(mm)	-	150	30	-	-	-
(10) Nursery Water	(mm)	7	14	-	-	-	-
(11) NW (8) + (9) + (10)	(mm)	7	217	286	271	87	-
(12) DW (11) ÷ EF	(mm)	12	356	469	445	159	-
(lit/sec/ha)		0.05	1.38	1.80	1.72	0.62	-

Table-10 Irrigation Water Requirement (Dry Season Paddy)

FIGURES

LEGEND

SOIL CLASSIFICATION	
X : Acrisols	P : Fluvisols
	D : Gleysols
RELIEF CONDITIONS	
1 : Upper Pediment	
2 : Medium Upper Pediment	
= : Flat	
7 : Medium Lower Pediment	
T : Lower Pediment	
SOIL DEPTH	
1 : > 100 cm	
2 : 70-100 cm	
3 : 50-70 cm	
4 : 25-50 cm	
5 : < 25 cm	
SURFACE SOIL TEXTURE	
a : Sand	
b : Sandy Loam	
c : Silty Loam	
d : Silty Clay	
e : Clay	

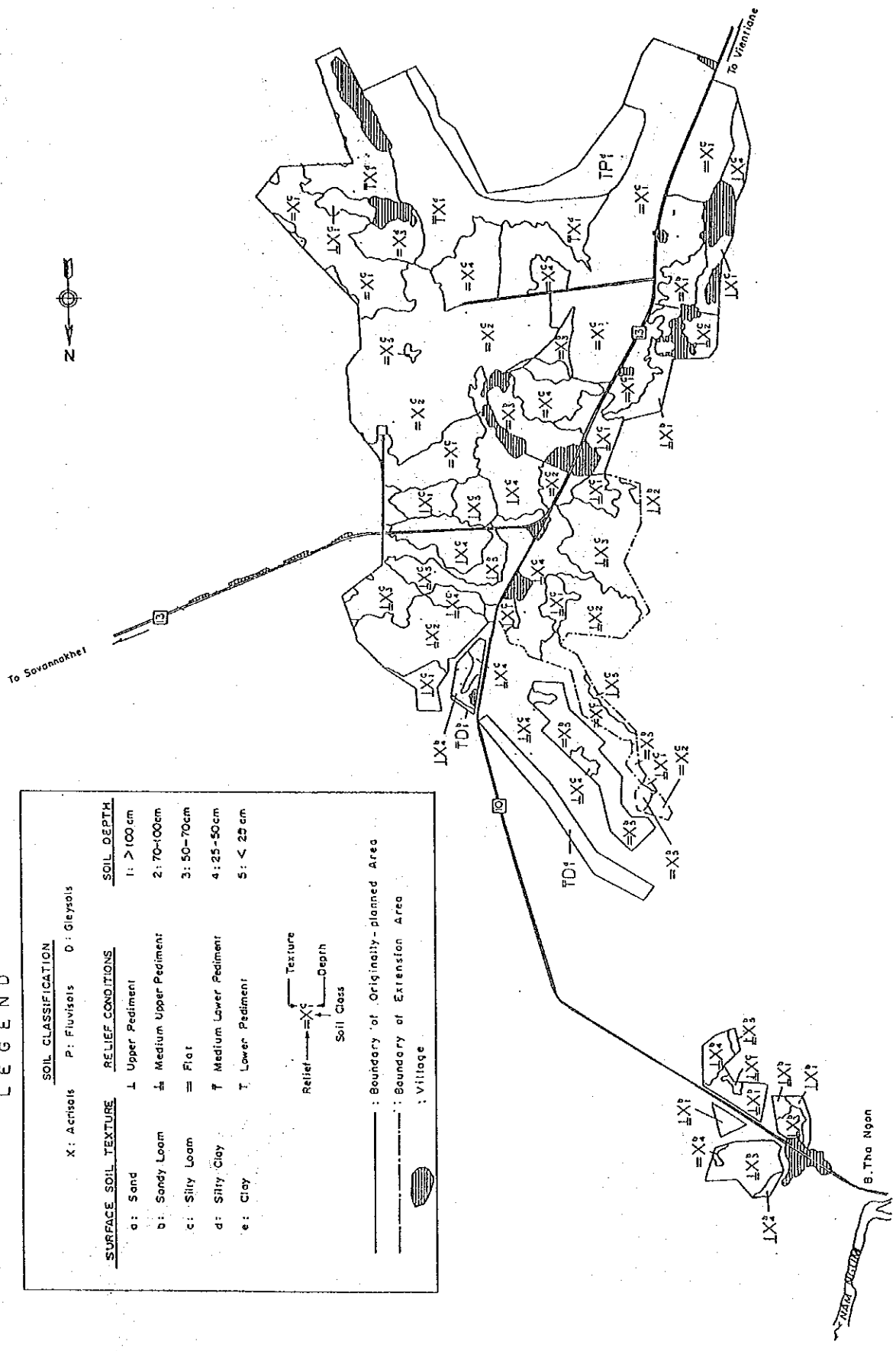
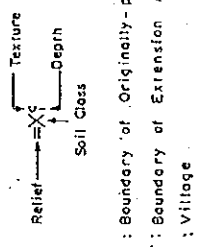
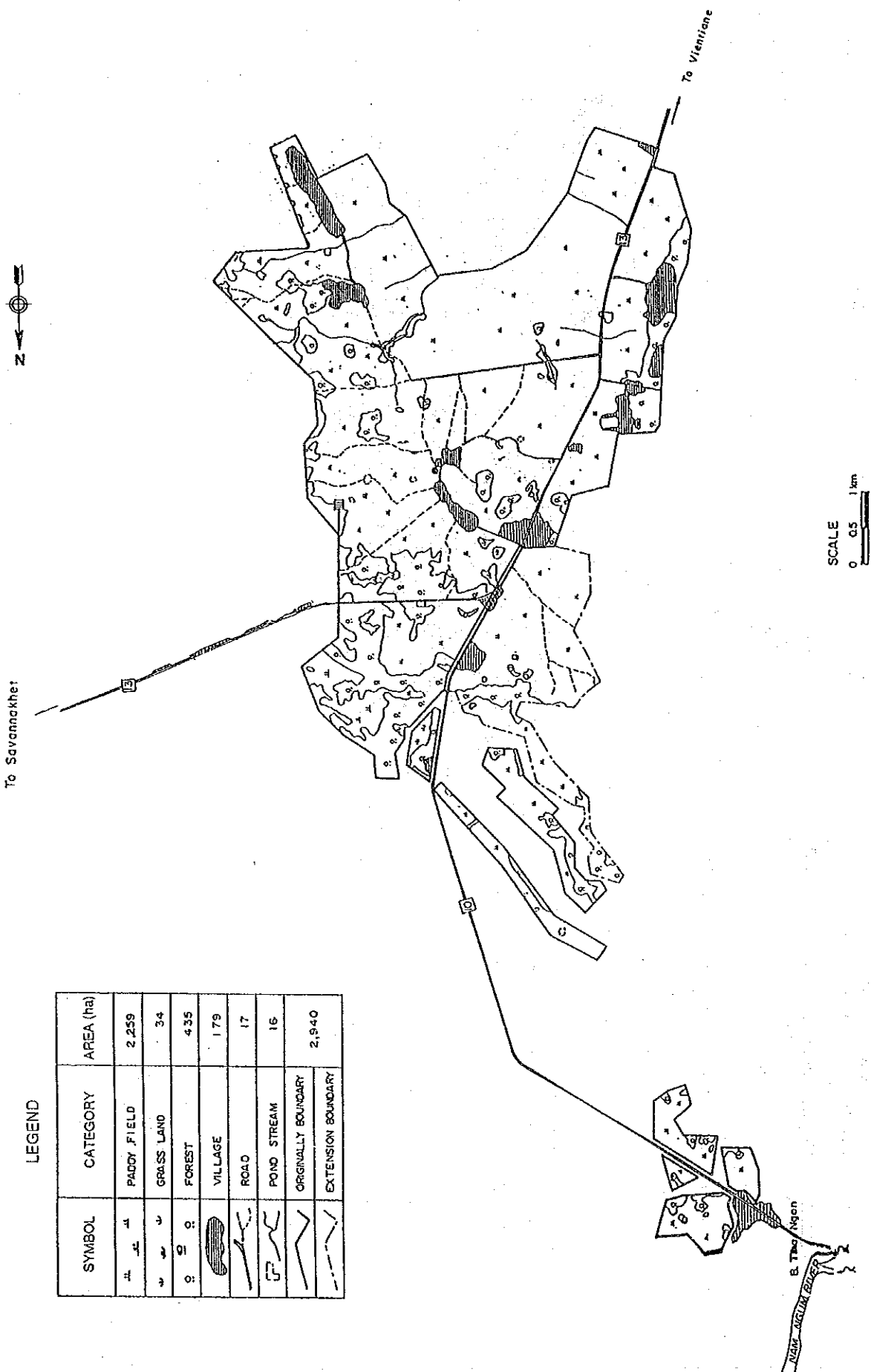


Figure-1 Soil Map



LEGEND

SYMBOL	CATEGORY	AREA (ha)
	PADDY FIELD	2,259
	GRASS LAND	34
	FOREST	435
	VILLAGE	179
	ROAD	17
	POND/STREAM	16
	ORIGINALLY BOUNDARY	2,940
	EXTENSION BOUNDARY	

Figure-2 Present Land Use Map

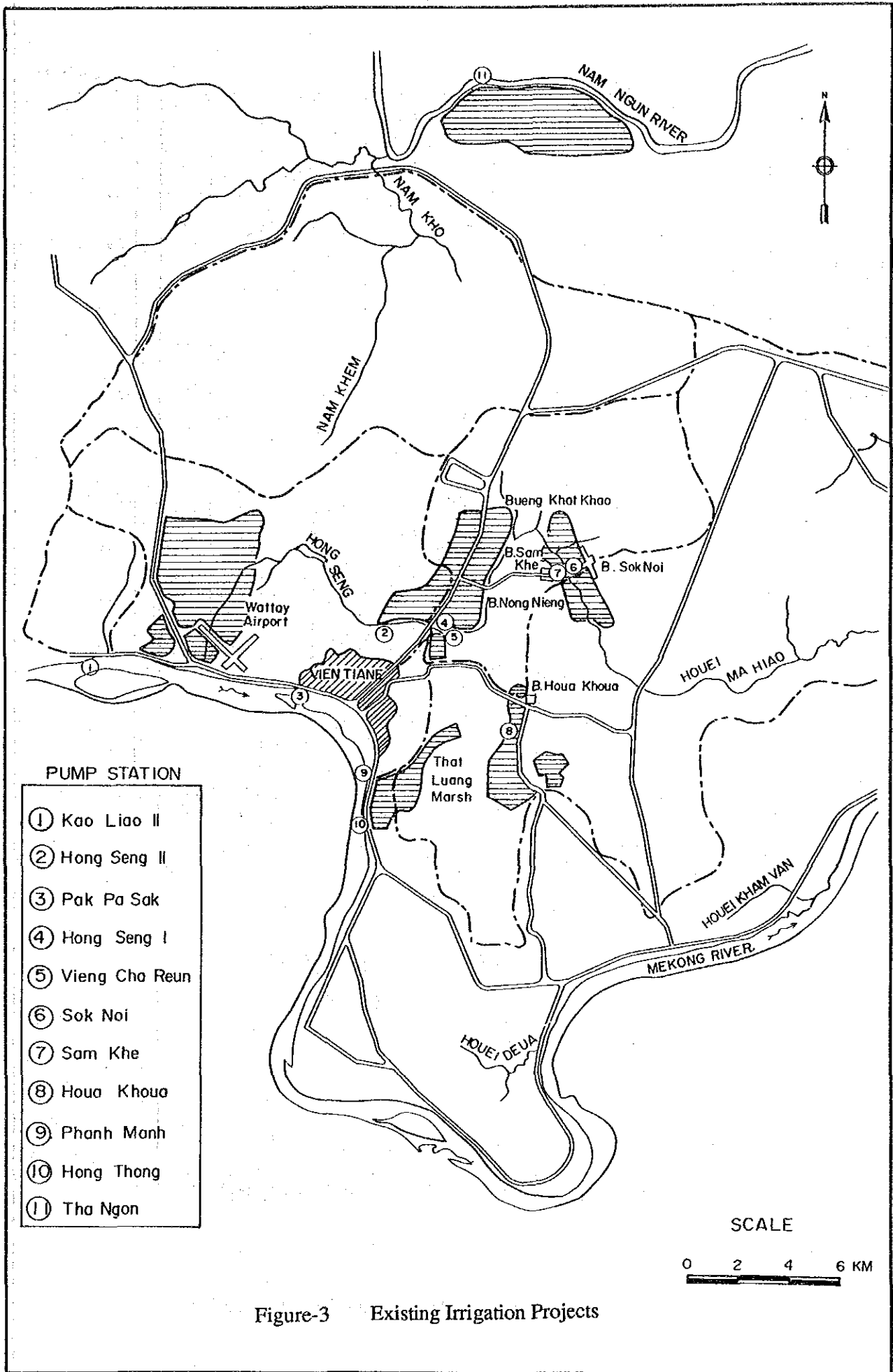


Figure-3 Existing Irrigation Projects

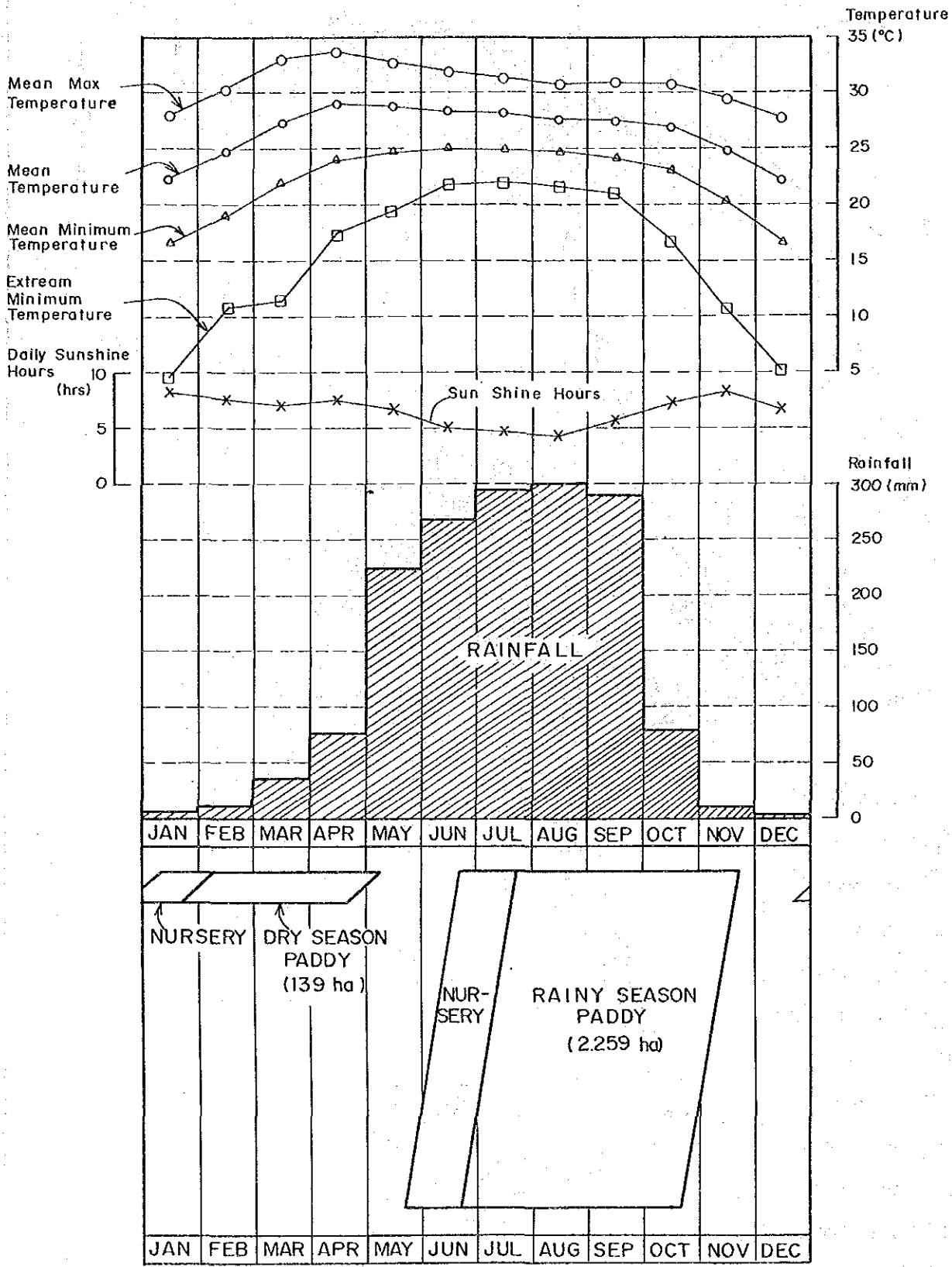


Figure-4 Present Cropping Pattern and Climatic Condition

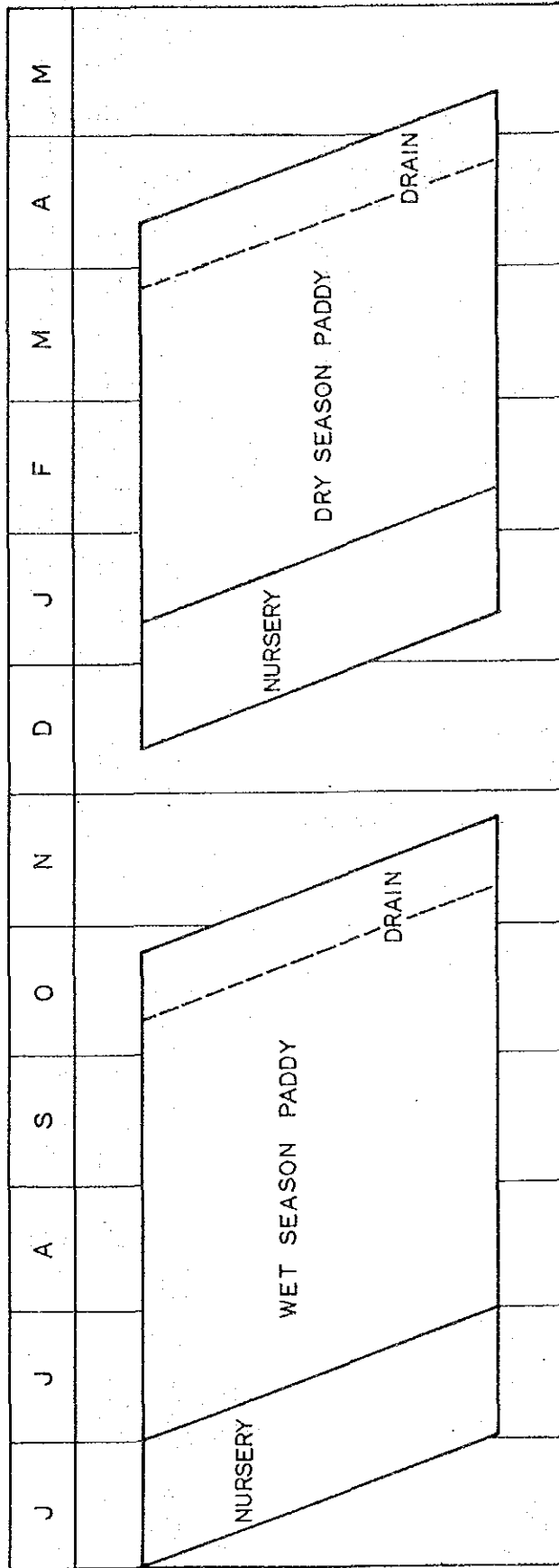
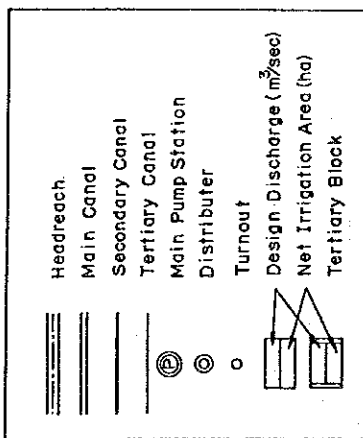


Figure-5 Proposed Cropping Pattern

LEGEND



Note :

- 1) Main pump's operation hour is 24 hours, while irrigation hour is 18 hours.
- 2) West Main Canal No.2 is not constructed in this project.

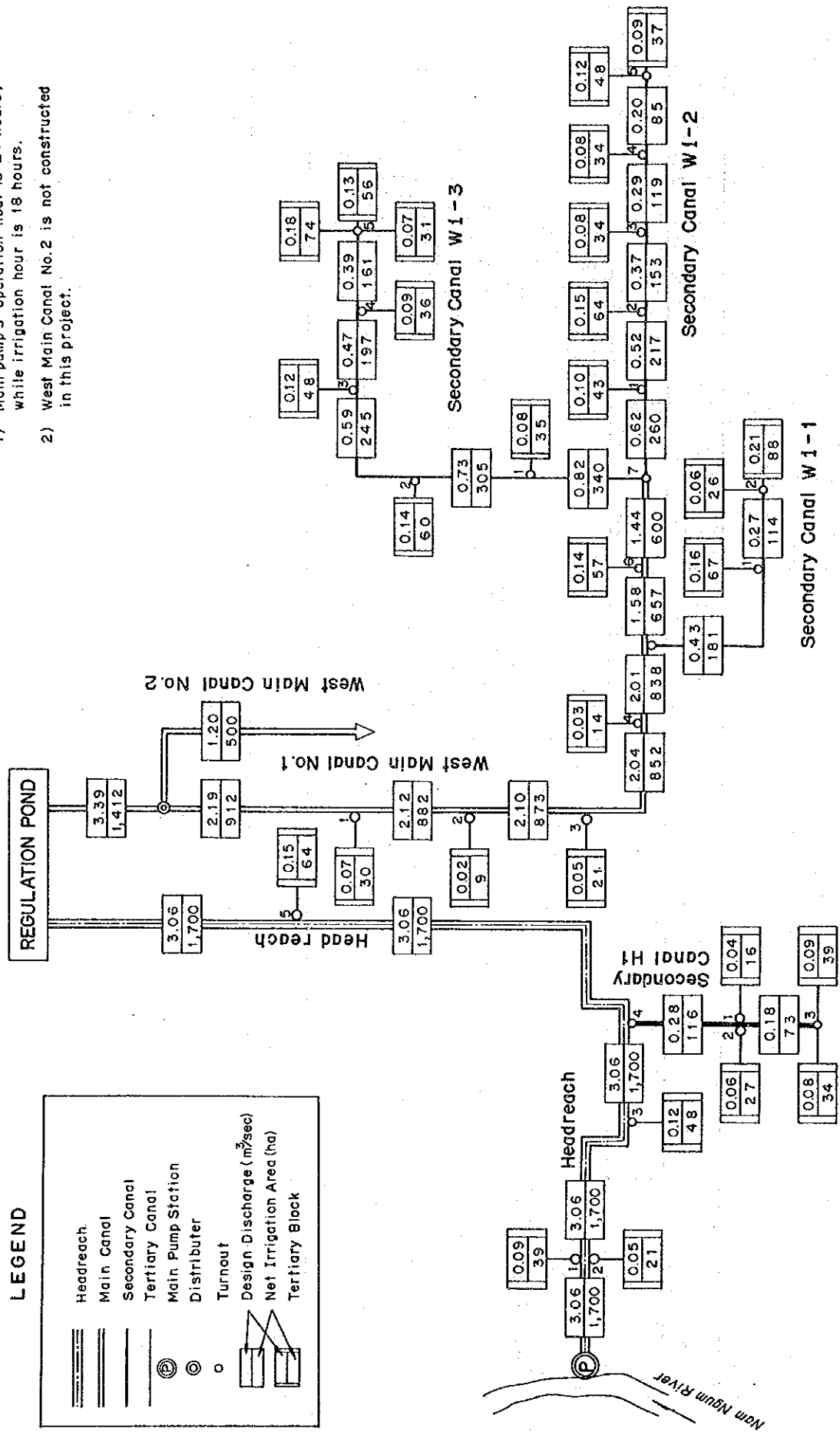


Figure-6 Irrigation Flow Diagram

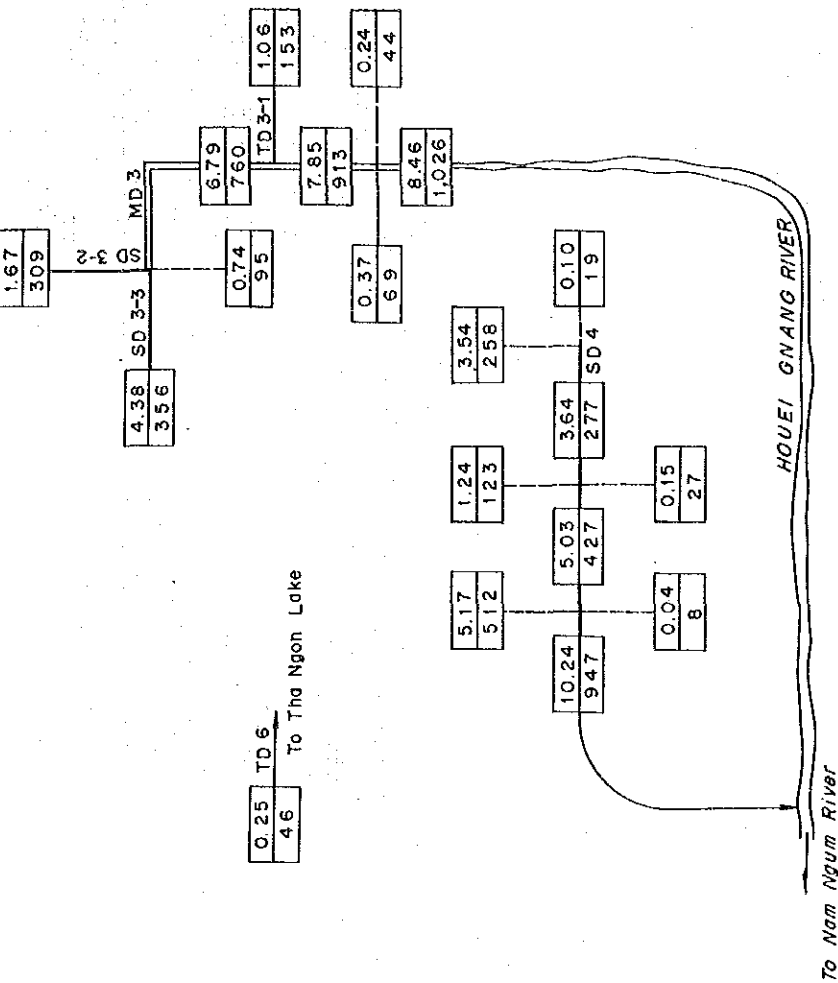


Figure-7 Drainage Flow Diagram (1/2)

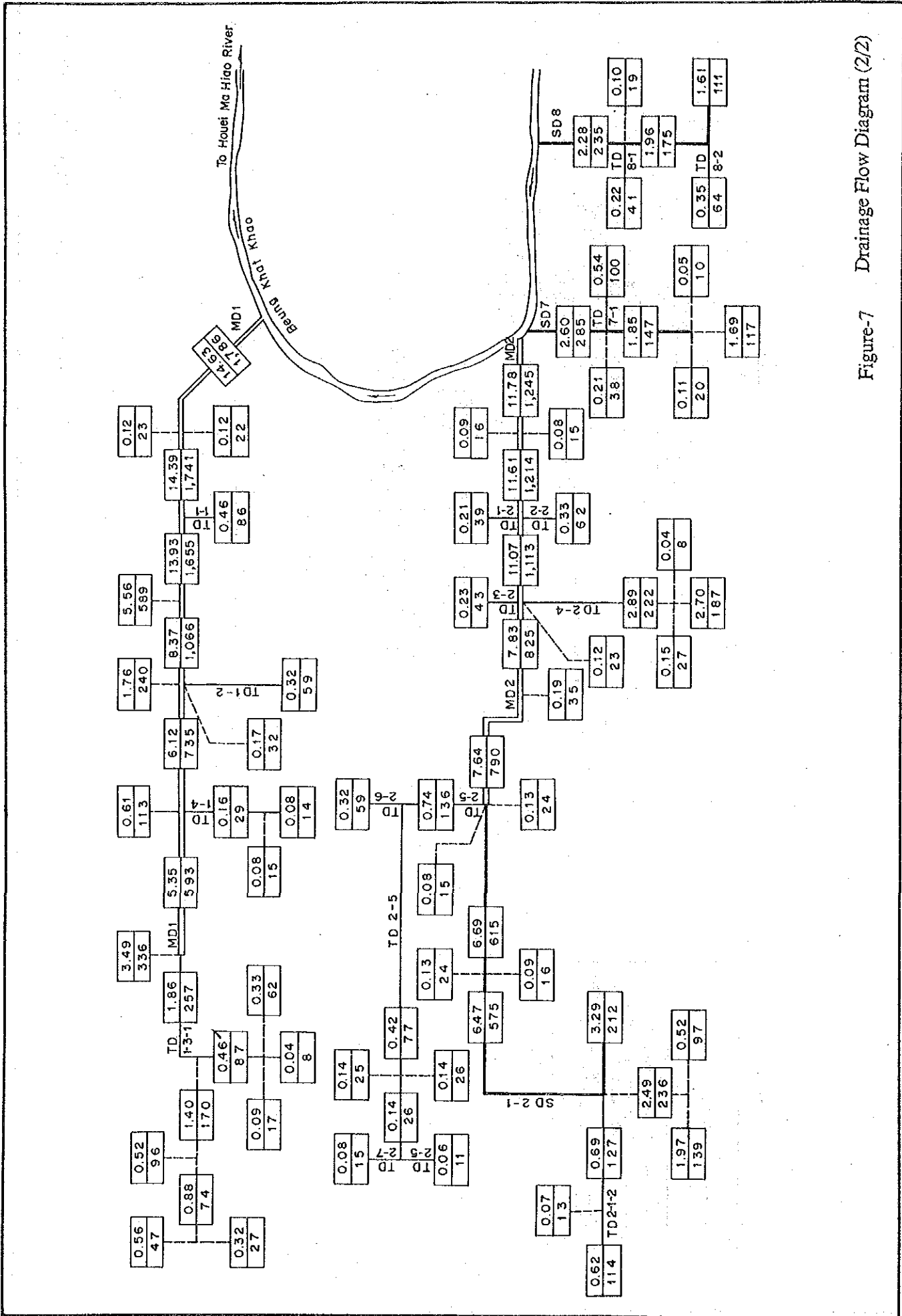


Figure-7 Drainage Flow Diagram (2/2)

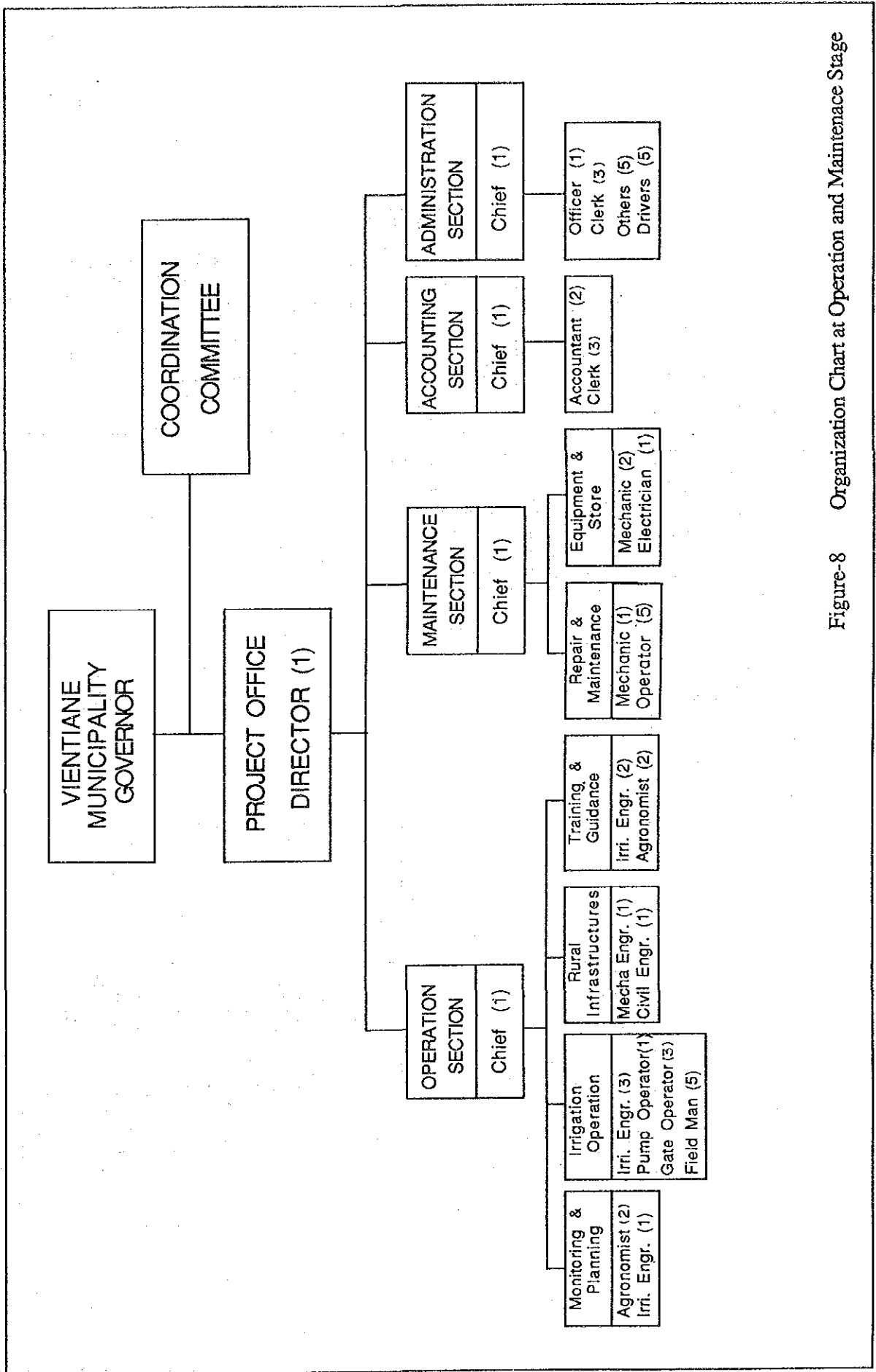


Figure-8 Organization Chart at Operation and Maintenance Stage

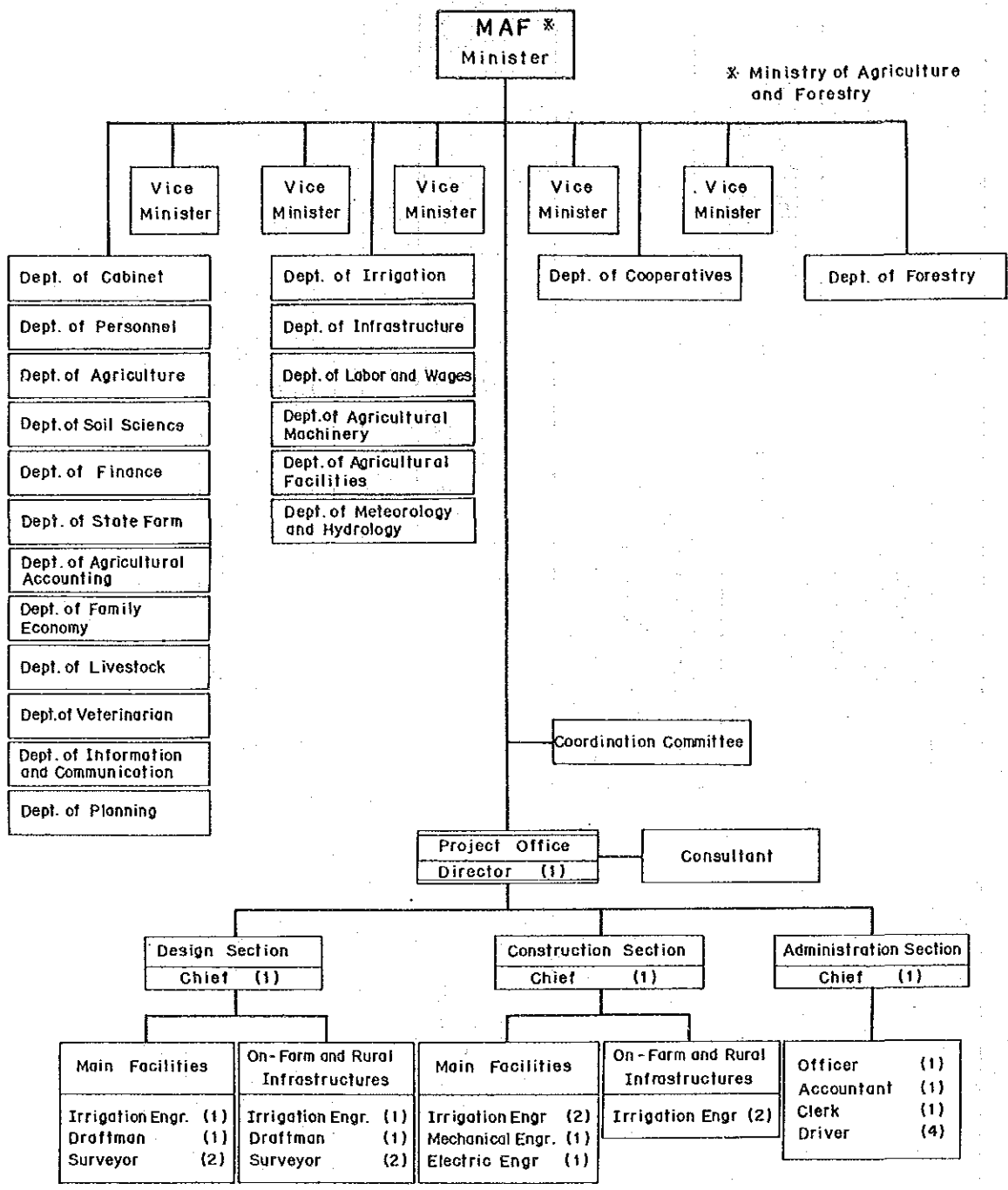
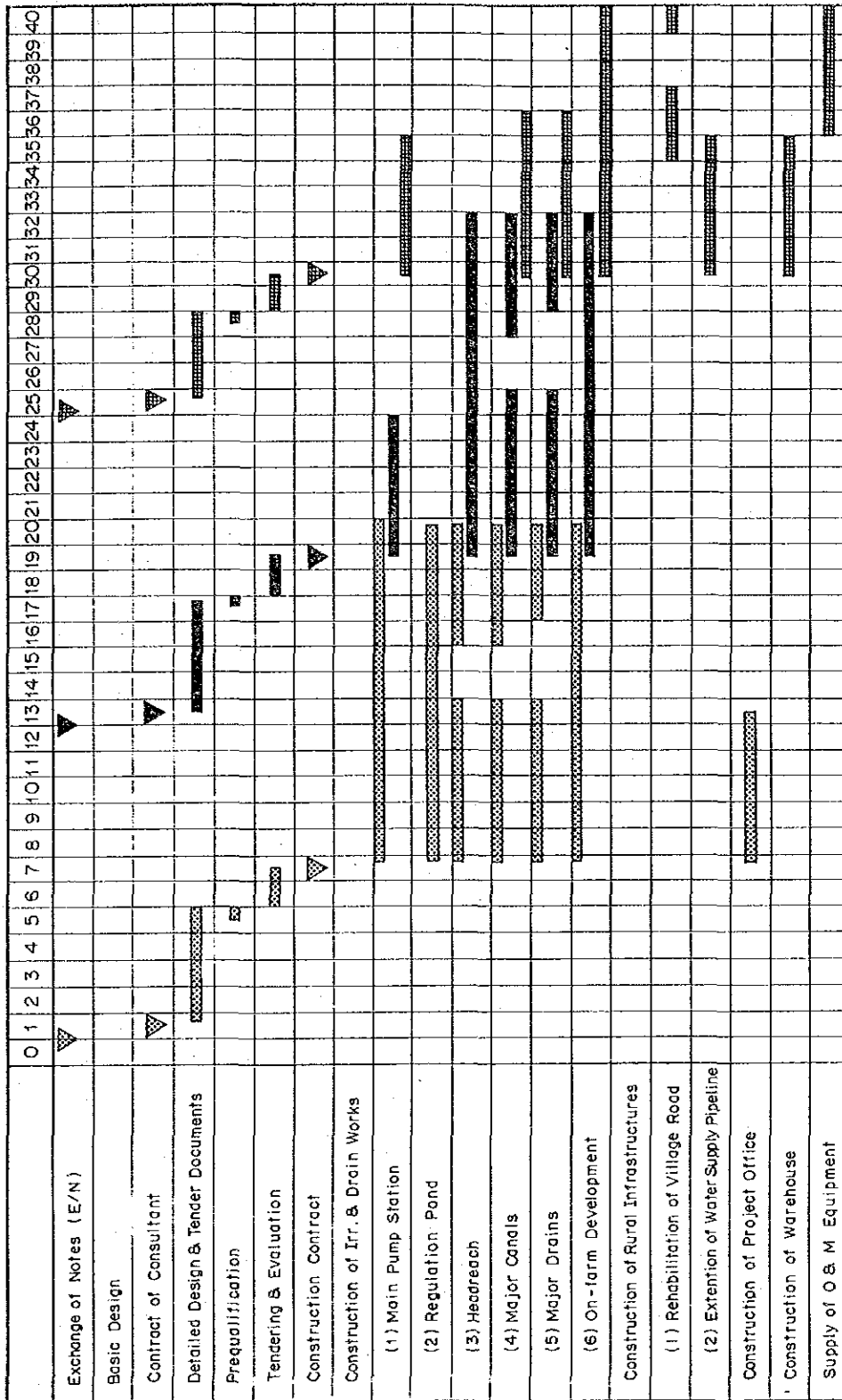


Figure-9 Organization of MAF and Project Office



: Stage I
 : Stage II
 : Stage III

Figure-10 Tentative Implementation Schedule of the Project

APPENDICES

Member List of the Basic Design Study Team

Position	Name	Home Post
Team Leader	Mr. Haruo SUZUKI	Japan International Cooperation Agency
Rural Development Planner	Mr. Akira KUNUGI	Japan Agricultural Land Development Agency
Irrigation / Drainage Planner	Mr. Yusaku TOYA	Nippon Koei Co.,Ltd
Facility Design Engineer	Mr. Hiroshi OKABE	Nippon Koei Co.,Ltd
Rural Development Engineer	Mr. Shigeyuki TANAKA	Nippon Koei Co.,Ltd
Construction Planner	Mr. Kiyotaka MIZUSHIMA	Nippon Koei Co.,Ltd

ACTIVITIES OF THE STUDY TEAM

No.	Date	Activities
1.	Nov. 21 (Tue.)	Depart Tokyo for Bangkok (Messrs. Suzuki, Kunugi, Toya, Okabe and Tanaka)
2.	22 (Wed.)	Visit and explanation of the Project to Mekong Committee in Bangkok
3.	23 (Thu.)	Depart Bangkok for Vientiane <i>Courtesy call to Ministry of Foreign Affairs</i>
4.	24 (Fri.)	Explanation of Inception Report and Questionnaire at MAF/ <i>Courtesy call to Director of Planning Dept. of MAF</i>
5.	25 (Sat.)	<i>Courtesy call to Minister of Agriculture and Forestry</i> Inspection of Tha Ngon Project <i>Inspection of the Project area (Suzuki, Kunugi and Toya)</i> <i>Preparation of survey works (Okabe and Tanaka)</i>
6.	26 (Sun.)	Visit to Nam Ngum Dam (Suzuki, Kunugi and Toya) <i>Preparation of field survey schedule (Okabe and Tanaka)</i>
7.	27 (Mon.)	Inspection of proposed irrigation area and existing rural infrastructure/ <i>Preparation of the Minutes of Discussions at MAF (Suzuki, Kunugi and Toya)</i> <i>Field survey on Main and Secondary drainage canals (Okabe and Tanaka)</i>
8.	28 (Tue.)	Signing of Minutes of Discussions (Suzuki, Kunugi and Toya) <i>Field survey on Pump site (Okabe and Tanaka)</i>
9.	29 (Wed.)	Report to Embassy of Japan/ <i>Visit to Kao Liao Project (Suzuki, Kunugi and Toya)</i> <i>Field survey on Headreach (Okabe and Tanaka)</i>
10.	30. (Thu.)	Leave Vientiane for Bangkok (Suzuki and Kunugi) <i>Discussion at MAF (Toya)</i> <i>Field Survey on Headreach (Okabe and Tanaka)</i>
11.	Dec. 1 (Fri.)	Leave Bangkok for Tokyo (Suzuki and Kunugi) <i>Data collection at State Enterprise of Irrigation No.1 and No.2 (Toya)</i> <i>Field Survey on Headreach (Okabe and Tanaka)</i>

No.	Date	Activities
12.	2 (Sat.)	Data collection at Irrigation Enterprise of Vientiane Municipality (Toya) Field Survey on Main Canal (Okabe and Tanaka)
13.	3 (Sun.)	Data analysis
14.	4 (Mon.)	Data collection at Ministry of Construction/Discussion on forest reserve area with Forestry Dept. of MAF (Toya) Field survey on Secondary canals (Okabe) Data collection at Nampapa Lao (Tanaka)
15.	5 (Tue.)	Report to MAF/Data collection at Institute of Urban Planning of Ministry of Construction (Toya) Field survey on Secondary canals and existing irrigation canal (Okabe) Data collection on electrical works at Electricite Du Lao (Tanaka) Field survey on Project Office site (Okabe and Tanaka)
16.	6 (Wed.)	Discussion with Tha Ngon Project's staffs (Toya) Field survey on water supply system and village roads (Okabe and Tanaka)
17.	7 (Thu.)	Data collection at State Irrigation Construction Enterprise No.1 (Toya) Test pit survey in Regulation pond (Okabe and Tanaka)
18.	8 (Fri.)	Report to Embassy of Japan (Toya) Data collection in Vientiane (Okabe and Tanaka)
19.	9 (Sat.)	Report to MAF (Toya) Data analysis (Okabe and Tanaka)
20.	10 (Sun.)	Leave Vientiane for Bangkok
21.	11 (Mon.)	Leave Bangkok for Tokyo

List of Officials Concerned and Counterpart Personnel

A. Officials Concerned

1. Ministry of Agriculture and Forestry

Mr. Inkong MAHAVONG	Minister
Mr. Sitaheng RASPONA	Vice Minister
Mr. Kham Ovane BOUPHA	Vice Minister
Mr. Moanty VONGPHANOULON	Chief of Cabinet
Mr. Kou CHANSINA	Director of Planning Department
Mr. Bounthong XAISIDA	Head of Wildlife and Fishery Conservation Division, Forest Department

2. Ministry of Foreign Affairs

Mrs. Kanika PHOMMACHANH	Deputy Director of Department No.2
Mrs. Samsanouk VONGSACK	Department No.2

3. Tha Ngon Project

Mr. Keo CHANTAVONG	Deputy Manager
Dr. Masamoto YASUO	JICA Expert
Mr. Eiji TAKEMORI	JICA Expert

4. Embassy of Japan

Mr. Teruo HAYAKAWA	Ambassador
Mr. Hiroshi MANABE	First Secretary

5. Other Officials

Mr. Inpasith THATHONGSAKD	Deputy Director, Institute of Irrigation and Microhydropower
Mr. Vankham THAMMACHAK	Deputy Director, Institute of Irrigation and Microhydropower
Mr. Khamphone SAIGNASANE	Deputy General Manager, Electricite Du Lao
Mr. Samlith SILAPHET	Assistant Manager, Nampapa Lao
Mr. Oth KEOMANIVONG	Chief of Project, Nampapa Lao
Mr. Phila KHAMKOHOMHPHANH	Deputy Director, Department of Communication, Transport & Construction, Vientiane Municipality
Mr. Phom THONG	Chief of Agriculture Division, Saythany District
Mr. Houmpheng SAVATPHONH	Deputy Chief of Agriculture Division, Saythany District
Mr. Linseng DOUANGSAVANH	Director, Institute of Technical Studies and Urban Planning, Ministry of Construction
Mr. Khamsy VIXAIGNOL	Assistant Director, State Irrigation Construction Enterprise No.1

Mr. Vongphachan VONGSIKEO	Managing Director, State Enterprise of Irrigation No.2
Mr. Boumy RATTANATRAY	Deputy Director, State Enterprise of Irrigation No.2
Mr. Kham Souk Lang Ka VANG	Deputy Director, Irrigation Enterprise of Vientiane
Mr. Richard L. BROWN	Team Leader, Lao-Australia Irrigation Project
Mr. Svisavath CHASAME	Director, Lao-Australia Irrigation Project

6. Mekong Committee (Bangkok)

Mr. Caspar J. KAMP	Executive Agent
Mr. Vanpract CHARLES	Staff
Mr. Wouter L. ARRIENS	Staff
Mr. Harrison JOHN	Staff
Mr. Choung PHANRAJSAVONG	Staff
Mr. Somphong MONGKHONVILAY	Staff
Mr. Khamphiou VISSAPRA	Staff
Mr. Takashi KAWAI	JICA Expert
Mr. Kuniyoshi ISHIZAKA	JICA Expert

B. Counterpart Personnel

Mr. Alom THAVONESOUK	Deputy Director of Planning Department
Dr. Soulasith UPRAVANH	Agricultural Service, Vientiane Municipality
Mr. Somphone THAMMAVONG	Agricultural Extension Department, Ministry of Agriculture and Forestry
Mr. Oudon SISONGKHAM	Planning Department, Ministry of Agriculture and Forestry
Mr. Pay THOUN	Irrigation Service, Vientiane Municipality


MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
FOR
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
IN
THE SUBURBS OF VIENTIANE

In response to the request of the Government of Lao People's Democratic Republic, the Government of Japan decided to conduct a Basic Design Study for Grant Aid to the Agricultural and Rural Development Project in the Suburbs of Vientiane (hereinafter referred to as the Project) and entrusted the Study to the Japan International Cooperation Agency (hereinafter referred to as JICA). JICA sent to Lao People's Democratic Republic the Basic Design Study Team headed by Mr. Haruo SUZUKI, Deputy Director of Grant Aid Project Management Department, JICA from November 21, 1989 to December 11, 1989.


The Team had a series of discussions on the Project with the officials concerned of the Government of Lao People's Democratic Republic, and also conducted a field survey in the proposed Project area. The Lao Team was headed by Mr. Alom THAVONESOUK, Deputy Director of Planning Department, Ministry of Agriculture and Forestry. The members of the Lao Team and those of the JICA Basic Design Study Team are given in Annex II hereto attached.

As a result of the Basic Design Study, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached hereto as Annex I, should be examined towards the realization of the Project.

Vientiane, November 28, 1989



Haruo SUZUKI
Leader
Basic Design Study Team
JICA



Alom THAVONESOUK
Leader
Lao Team
Ministry of Agriculture and
Forestry

1. OBJECTIVES OF THE PROJECT

The main objectives of the Project are i) to increase rice production to ease the chronic shortage of rice in the Vientiane Municipality through irrigation development and introduction of improved farming practices and ii) to provide rural infrastructures for enhancement of social and agricultural activities of farmers.

2. PROJECT AREA

The Project area is located at about 6 km to 25 km north of Vientiane city along the national roads of routes 10 and 13 as shown in the attached Location Map.

3. EXECUTING AGENCY

The Ministry of Agriculture and Forestry of the Government of Lao PDR will be responsible for execution of the Project.

4. INCEPTION REPORT

The Government of Lao PDR accepted and agreed to the Inception Report submitted by the JICA Basic Design Study Team on November 23, 1989.

5. SCOPE OF THE PROJECT WORKS

The scope of the Project works will be determined based on the results of the Basic Design Study and within the scope of Japan's economic cooperation program. The scope of the Project works provisionally agreed between the JICA Study Team and the Government of Lao PDR is outlined as follows;

- (a) Irrigation development for a net area of 1,200 ha, which mostly extends along the national roads of routes 10 and 13 and will be commanded by the Headreach and the West Main Canal No.1
- (b) Provision of the Main Pump Station, whose civil works component will be provided in full scale for irrigation of 1,700 ha-area but numbers of pumping equipment to be installed will be limited so that the total pumping capacity will meet the water requirements for irrigation of 1,200 ha-area
- (c) Provision of the Headreach and the Regulating Pond, both with capacities sufficient to irrigate 1,700 ha-area

the Project

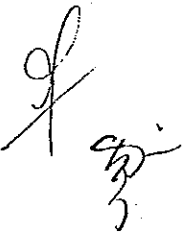
- (e) To utilize and maintain properly and effectively the facilities and equipment provided under the Grant Aid
- (f) To make necessary arrangements on provision of the facilities and equipment, which are directly related to the Project but are not covered by the scope of the Project works to be implemented under the Grant Aid

9. TENTATIVE IMPLEMENTATION PROGRAM

It is expected that, subject to the consent of the Government of Lao PDR and the Government of Japan, the implementation of the Project works will be made in three stages as indicated in the attached Tentative Implementation Schedule, and that the Project works will be implemented stage by stage after making budgetary arrangement in each stage and based on the results of the consultation to be made between the both Governments.

10. PRIVILEGES AND IMMUNITIES

Details of the privileges and immunities to be provided by the Government of Lao PDR will be specified in the Exchange of Notes between the Government of Japan and the Government of Lao PDR, which will constitute part of the Project Agreement to be concluded.



- (d) Provision of main and secondary canals, drains and farm roads with their related structures for 1,200 ha-area
- (e) On-farm works for 1,200 ha-area
- (f) Improvement of rural infrastructures for five villages, i.e. B. Pha Khao, B. Sa Phang Muk, B. Don Noun, B. Xai and B. Na Khe.
- (g) Provision of an office building and a warehouse
- (h) Provision of equipment and tools for operation and maintenance of the Project

6. REQUEST OF THE GOVERNMENT OF LAO PDR

The Basic Design Study Team will convey to the Government of Japan the request of the Government of Lao PDR that the Government of Japan will take necessary measures i) to cooperate in implementation of the Project within the scope of the Japan's Grant Aid Program and ii) to extend technical cooperation in operation of the Project after its completion.

7. JAPAN'S GRANT AID SYSTEM

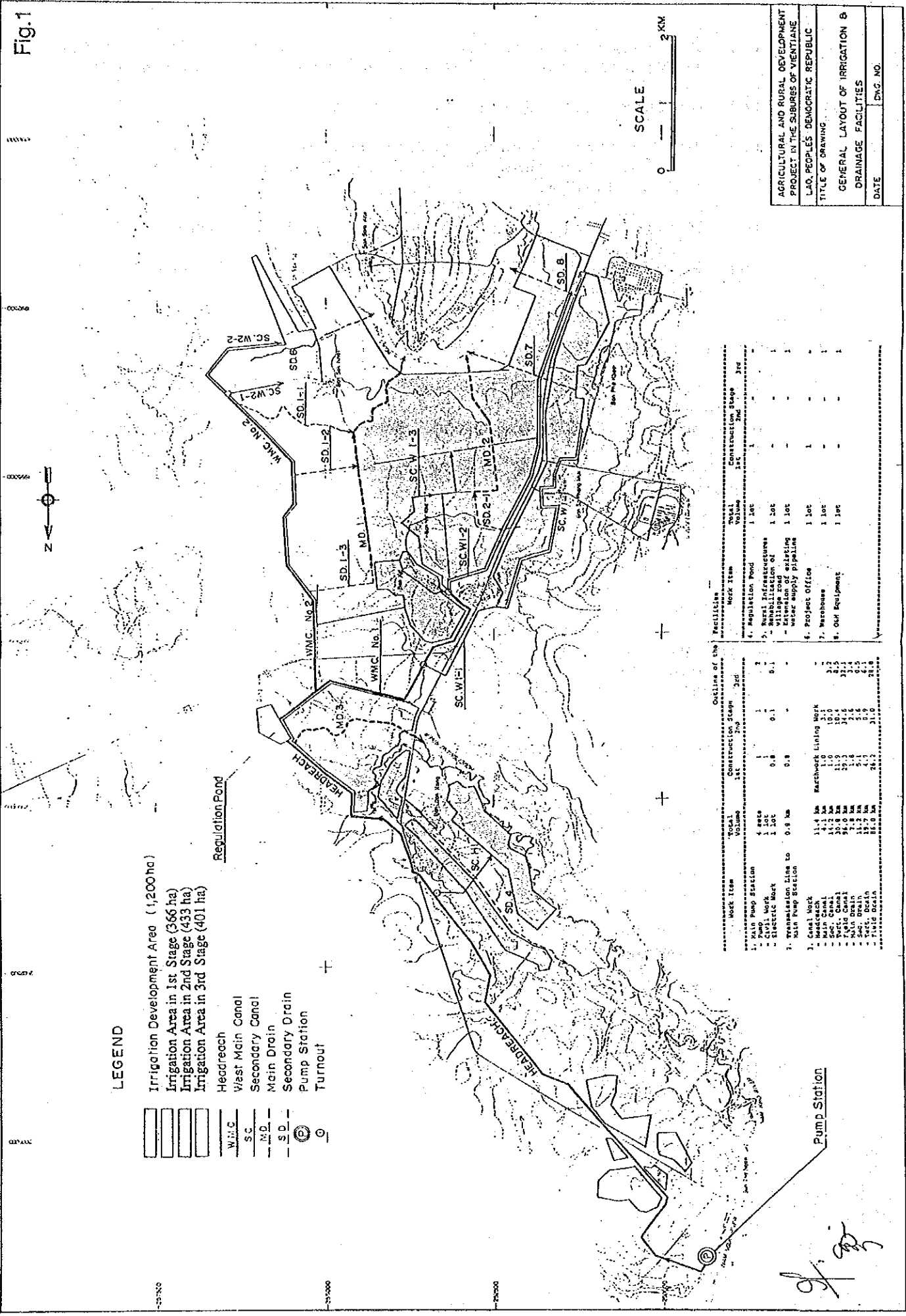
The Government of Lao PDR has understood the Japan's Grant Aid System explained by the Survey Team, which includes a principle of use of a Japanese consulting firm and a Japanese general contractor for implementation of the Project.

8. UNDERTAKINGS OF THE GOVERNMENT OF LAO PDR

In connection with implementation of the Project, the Government of Lao PDR will make the following arrangements on its responsibility;

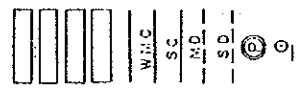
- (a) To secure the lands necessary for construction of the Project facilities
- (b) To clear and reclaim the above lands as required before commencement of the construction
- (c) To provide electricity distribution lines to the proposed sites of the Main Pump Station, the Project office and the warehouse
- (d) To make arrangements on exemption of customs duties and customs clearance of materials and equipment brought from abroad for the purpose of the implementation of

Fig.1



LEGEND

- Irrigation Development Area (1,200 ha)
- Irrigation Area in 1st Stage (366 ha)
- Irrigation Area in 2nd Stage (433 ha)
- Irrigation Area in 3rd Stage (401 ha)
- Headreach
- West Main Canal
- Secondary Canal
- Main Drain
- Secondary Drain
- Pump Station
- Turnout

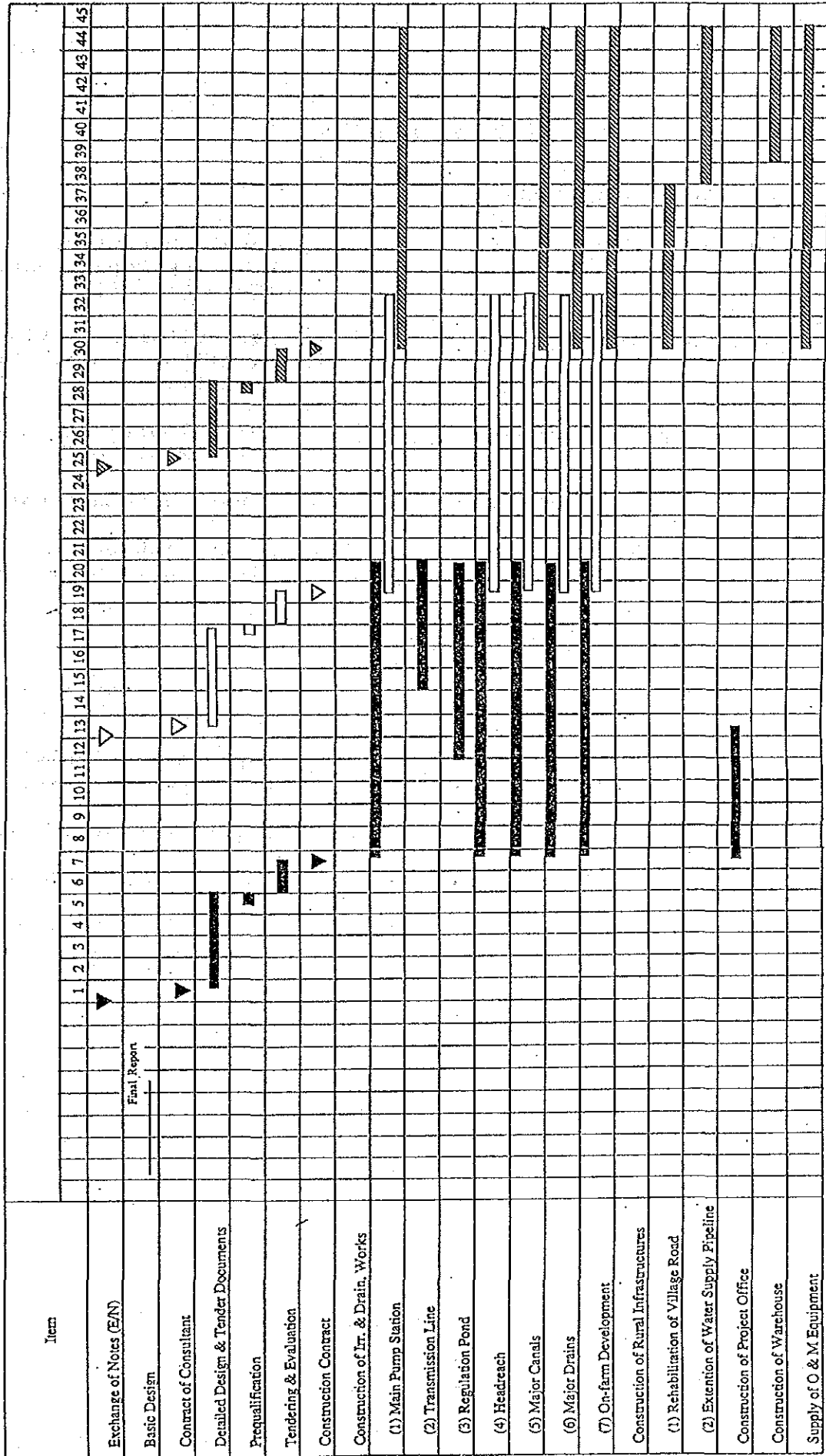


Work Item	Quantity of the		Construction Stage	
	1st	2nd	1st	2nd
1. MAIN PUMP STATION	1	1	1	1
2. Canal Work	1.0	0.1	-	-
3. Electrical Work	0.8	0.1	-	-
4. Transmission Line to Main Pump Station	0.8 Km	0.8	-	-
5. Canal Work	11.4 Km	31.1	-	-
6. Main Canal	4.1 Km	1.0	-	-
7. Sec. Canal	14.7 Km	10.9	-	-
8. Field Canal	22.0 Km	2.2	-	-
9. Field Drain	29.3	34.6	-	-
10. Main Drain	1.8 Km	2.6	-	-
11. Sec. Drain	12.7 Km	2.5	-	-
12. Field Drain	12.7 Km	4.1	-	-
13. Field Drain	86.0 Km	28.3	-	-
14. Field Drain	31.0	2.1	-	-
15. Matchwork Lining Work	-	-	-	-
16. Project Office	1 lot	1	-	-
17. Warehouse	1 lot	1	-	-
18. O&M Equipment	1 lot	1	-	-
19. Rural Infrastructures	1 lot	1	-	-
20. Rehabilitation of Village road	1 lot	1	-	-
21. Water supply pipeline	1 lot	1	-	-
22. Regulation Pond	1 lot	1	-	-

AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE
TITLE OF DRAWING
LAO PEOPLES DEMOCRATIC REPUBLIC
GENERAL LAYOUT OF IRRIGATION & DRAINAGE FACILITIES
DATE
DWG. NO.

Fig.2

Tentative Implementation Schedule of the Project



▲ : Stage I
 ▭ : Stage II
 ▽ : Stage III

[Handwritten signature]

LIST OF PARTICIPANTS

A. GOVERNMENT OF LAO PDR

Mr. Alom Thavonesouk : Deputy Director,
Planning Department, MAF
(Team Leader)

Dr. Soulasith Upravanh : Agricultural Service of
Vientiane Municipality
(Deputy)

Mr. Somphone Thammavong : Agricultural Extension
Department, MAF

Mr. Oudon Sisongkham : Planning Department, MAF

Mr. Pay Thoun : Irrigation Service of
Vientiane Municipality

B. JICA BASIC DESIGN STUDY TEAM

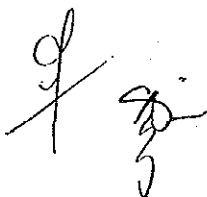
Mr. Haruo Suzuki : Japan International
Cooperation Agency

Mr. Akira Kunugi : Japan Agricultural Land
Development Agency

Mr. Yusaku Toya : Nippon Koei Co., Ltd.

Mr. Hiroshi Okabe : Nippon Koei Co., Ltd.

Mr. Shigeyuki Tanaka : Nippon Koei Co., Ltd.



Country Data

I. Basic Index

1. Name of country : Lao People's Democratic Republic
- Capital of country : Vientiane
- Population : 210,000 (in 1987)
- Independence of country : December 2, 1975

2. Land and Population (in 1988)

- | | | |
|----------------------------|---|---------------------------------|
| Area | : | <u>236,800 km²</u> |
| Population | : | <u>3,940,000</u> |
| Density of population | : | <u>17 person/km²</u> |
| Growth rate of population | : | <u>2.9%</u> |
| Ratio of urban population | : | <u>15%</u> |
| Average span of human life | : | <u>50 years</u> |

3. Form of Government

Democratic republican government under the Lao People's Revolution Party

4. Religion

Buddhism

5. Language

Laotian

6. Race

Thai lineage (60%), Protenesia lineage, Chinese lineage

7. Education

Literacy rate (15 - 45 years) : 98.75% (in 1985)
Enrollment ratio of primary school : 89.5% (in 1980)

8. Currency

Currency : Kip
Exchange rate : US\$1 = Kip 720 (in 1989)

9. Climate and Topography

Lao PDR is a land-locked country with an area of 236,800 km². The country is bordered by Vietnam in the east, Kampuchea in the south, Thailand in the west and Myanmar and China to the north. About 80% of the country is mountainous ranging in height between 200 to 3,000 m. The climate is tropical monsoon and is characterized by two pronounced seasons, the wet season from May to October and the dry season from November to April. The cultivation of paddy is mainly made in the lowland areas along the Mekong river and its tributaries.

II. Socio-economic Index

1. Gross Domestic Product (GDP) in 1986

GDP : US\$ 655 million
Per Capita Income : US\$177
Annual Growth Rate : 6.4% (1982 - 1986)

2. Industrial Structure (in 1986)

	Agriculture	Industry	Services
GDP (%)	65.2	14.0	20.8
Work Force (%)	80.0	2.2	17.8

3. Composition of Official Export and Import

Composition of Official Export

(US\$ million)

	1983	1984	1985	1986	1987
(1) Exports to the Convertible Area	<u>27.8</u>	<u>31.8</u>	<u>38.4</u>	<u>39.5</u>	<u>35.1</u>
Coffee	1.6	0.6	0.3	2.1	0.9
Electric power	24.0	26.9	29.4	29.9	13.7
Logs and wood products	1.7	3.7	5.6	5.5	19.5
Other exports	0.5	0.6	3.1	2.0	1.0
(2) Exports to the Nonconvertible Area	<u>13.0</u>	<u>13.8</u>	<u>19.0</u>	<u>15.6</u>	<u>29.1</u>
Coffee	6.9	8.1	8.2	7.1	8.5
Logs and wood products	1.3	1.3	5.6	2.3	13.3
Tin and gypsum	3.7	2.3	2.5	5.0	4.2
Other exports	1.1	2.1	2.7	1.2	3.1
Total Official Exports	<u>40.8</u>	<u>45.6</u>	<u>57.4</u>	<u>55.0</u>	<u>64.2</u>

Composition of Official Import

(US\$ million)

	1983	1984	1985	1986	1987
(1) Nonaid Imports from the Convertible Area	<u>52.1</u>	<u>35.4</u>	<u>38.3</u>	<u>41.1</u>	<u>55.6</u>
Rice and other food	6.3	4.0	1.7	3.0	7.7
Petroleum products	14.0	10.8	10.6	7.8	6.4
Machinery and raw materials	16.0	10.3	11.1	12.3	14.8
Other official imports	11.0	5.3	7.7	9.4	17.2
Private imports	4.8	4.9	2.2	3.6	4.5
Prefectural imports	-	-	5.0	5.0	5.0
(2) Nonaid Imports from the nonconvertible Area	<u>40.0</u>	<u>62.0</u>	<u>66.6</u>	<u>71.5</u>	<u>82.4</u>
(3) Imports Under Aid Programs	<u>57.3</u>	<u>64.5</u>	<u>88.3</u>	<u>73.1</u>	<u>78.2</u>
Convertible area	24.2	23.9	39.3	37.3	26.1
Nonconvertible area	33.1	40.6	49.0	35.8	52.1
Total Imports	<u>149.4</u>	<u>161.9</u>	<u>193.2</u>	<u>185.7</u>	<u>216.2</u>
Convertible area	76.3	59.3	87.3	76.9	81.7
Nonconvertible area	73.1	102.6	105.9	108.8	134.5

Source: Lao PDR, Country Economic Memorandum, Sept 21, 1988, World Bank

4. Labor Force (1985)

Labor force : 1.6 million

5. Inflation Rate

(Unit: %)

1982/83	1983/84	1984/85	1985/86	1986/87
62.5	27.2	114.7	35.0	6.1

Source: Lao PDR, Country Economic Memorandum, Sept 21, 1988, World Bank

6. Balance of Payments

(US\$ million)

	1983	1984	1985	1986	1987 (est.)
Trade balance	-108.6	-118.1	-139.5	-130.7	-152.0
Exports	40.8	43.8	53.6	55.0	64.2
Imports	149.4	161.9	193.2	185.7	216.2
Services	-12.5	-9.8	-7.2	6.6	7.2
Balance of transfers	25.4	44.9	53.1	34.2	30.5
Current account	-95.7	-82.4	-93.7	-89.9	-114.3
Capital account	76.5	86.0	101.9	106.7	115.0
Errors and omissions	31.1	-9.1	10.4	-7.7	-11.8
Overall balance	11.9	-6.0	18.7	9.1	11.1

Source: Lao PDR, Country Economic Memorandum, Sept 21, 1988, World Bank

7. International Reserves

(US\$ million)

	1983	1984	1985	1986	1987
Gold	0.60	0.60	0.60	0.60	0.60
Foreign exchange	18.70	10.56	25.33	31.79	20.60
SDRs	0.14	0.02	0.01	0.16	0.01
Gross reserves	19.44	11.28	25.94	32.55	21.21
External liquid liabilities	-17.45	-15.19	-11.26	-8.80	-8.60
Net official reserves	1.99	-3.99	14.68	23.75	12.61

Source: Lao PDR, Country Economic Memorandum, Sept 21, 1988, World Bank

8. Debt Service Ratio

	(US\$ million)			
	1984	1985	1986	1987
Convertible area	126.2	145.3	175.4	200.8
Nonconvertible area	318.8	341.8	432.2	534.8
Total debt service ratio	445.0	487.1	607.6	735.6

Source: Lao PDR, Country Economic Memorandum, Sept 21, 1988, World Bank

9. Trade to Japan

	(US\$ million)			
	1981	1982	1983	1984
Exports (timber)	3.79	1.16	2.36	0.63
Imports (Machinery, iron goods)	8.95	9.79	15.23	5.17

Source: Statistics of Japanese Customs

10. Consolidated Government Budget

	(Kip million)				
	1983	1984	1985	1986	1987 (est.)
Revenue	3,496	4,948	10,299	18,503	20,108
Expenditure	2,945	4,126	10,624	15,883	16,833
Current Surplus	551	822	-325	2,620	3,275
Capital Expenditure	3,750	4,259	10,182	11,732	11,841
Overall Deficit	-3,199	-3,437	-10,507	-9,112	-8,566
Financing (External resources)	3,199	3,437	10,507	9,112	8,566

Source: Lao PDR, Country Economic Memorandum, Sept 21, 1988, World Bank

III. Development Index

1. National Development Plan

(1) Past national development plan

Three-Year Plan	1978 - 1980
First Five-Year Plan	1981 - 1985

Through the above development plans, the country has been involved in a policy of developing its agriculture and timber resources. The goal is i) to become self-sufficient in basic food commodities and to have a surplus of certain agricultural products for export, ii) to develop commerce with the aim of exchange between city and countryside, in order gradually to bring the farmers into the cash nexus, and iii) to go beyond the backward state of the existing traditional economy through the growth of commerce and communications.

The principal objectives of the first Five-Year Plan were:

- i) to increase agricultural and forestry production so as to provide enough food for consumption and to increase exports of timber,
- ii) to increase industrial production,
- iii) to improve the economic basic infrastructure by expanding internal transport and constructing route 9 to reach the port of Da Nang in Vietnam; developing the distribution network for electricity; and improving the capacity to maintain equipment and capital,
- iv) to improve the internal distribution of goods,
- v) to increase the number of state enterprises and state controlled cooperatives so as to consolidate the leading role of the socialist sector in the economy,
- vi) to increase, through taxation, exports and foreign aid, the mobilization of resources for investment,
- vii) to expand the education and training system and improve the health system, and
- viii) to improve economic management and organization.

(2) Current national development plan

Second Five-Year Plan 1986-1990

The development priorities are oriented as follows:

- (i) acceleration of development and exports to achieve food self-sufficiency, reduced non-food imports and improvement of balance of payments (export of agricultural, timber, mining, energy and industrial products, particularly to convertible countries),
- (ii) improvement of transportation and communication sectors, and
- (iii) strengthening of management and development of human resources.

The measures required to reach the above priority objectives are shown below:

- (i) Economic measures
 - better use of the existing equipment and infrastructures, upgrading them if necessary,
 - selection of small scale and high-return projects,
 - increased and systematic use of measures to stimulate production (price and service supports to benefit state, cooperative and private producers),
 - diversified and increased production, particularly in agriculture, and
 - better utilization of local raw materials for the development of agro-industries and the wood industry.
- (ii) Financial measures
 - stabilization and reduction of the budget deficit by limiting the least essential expenses and by increasing certain fiscal and semi-fiscal revenues, and
 - improvement of the balance of trade and the balance of payments by promoting exports.

(iii) Measures to control inflation

- reduction of expansion in the money supply,
- control of the debt levels of the public sector,
- increase of the domestic share in the national revenue assigned to savings, and
- change of the price and subvention policy.

(iv) Measures to planning capabilities and management of the economy

- establishment of a viable statistical apparatus,
- development of the coordination of economic policy and external aid,
- improvement of capacities for selection, execution and evaluation of projects,
- rationalization of administrative structures and state enterprises, and
- rationalization of the functional framework of the private sector.

The annual target growth ratio of the first Five-Year Plan (1981-1985) and the second Five-Year Plan (1986-1990) are shown as follows.

(%)

Item	First Five-Year Plan (1981-1985)	Second Five-Year Plan (1986-1990)
Agriculture		
- Livestocks	11.85	7.05
- Crops	5.30	11.30
Industry	7.20	13.65
Transportation and Communications	7.80	11.30
Construction	7.10	12.55
Domestic Commerce	10.20	7.70
Total	7.00	10.35

(3) New Economic Policy

The 4th Resolution of Government announced in 1986 places emphasis on the implementation of two main programs; namely, further increase in production of foodstuffs and reduction of slash and burn cultivation for eliminating forest destruction. In 1987, the New Economic Policy came into force stressing increase in agricultural production, in order to progress from a subsistence economy to a market economy, by promoting the following:

- Subsistence and semi-subsistence
- Small goods production
- Private enterprise
- Joint-venture between the State and private sector
- State-enterprise and cooperatives

All of the above five types of economy have equal priority, and no subsidies are given to any of them. The usual one price system which depends on market forces and trade liberalization has been adopted in line with the new policy. Under the new policy, agricultural production is to be based on family farms.

2. National Budget and Investment Cost

National budget (January to December in 1986)

<u>Revenue</u>		<u>Expenditure</u>	
Nontax revenue	Kip 16,748 million	Current expenditure	Kip 15,883 million
Tax revenue	Kip 1,755 million	Capital expenditure	Kip 11,732 million
External resources	Kip 9,112 million		
Total	Kip 27,615 million	Total	Kip 27,615 million

Investment cost

Investment costs of projects identified for the 1986-90 period is shown as follows

	Investment Cost (million US\$)	Percentage (%)
A. Agriculture	<u>127.0</u>	<u>34.7</u>
- Rainfed rice and other crops	18.5	5.1
- Livestock and fisheries	27.5	7.5
- Irrigation	70.6	19.3
- Training and others	10.4	2.8
B. Industry, Mines and Energy	<u>77.2</u>	<u>21.1</u>
- Manufacturing	9.7	2.7
- Energy	66.6	18.2
- Others	0.9	0.2
C. Transport and Telecommunications	<u>106.0</u>	<u>29.0</u>
D. Commerce	<u>13.4</u>	<u>3.7</u>
E. Housing and Water Supply	<u>14.8</u>	<u>4.0</u>
F. Education	<u>13.9</u>	<u>3.8</u>
G. Health	<u>13.2</u>	<u>3.6</u>
Total	365.5	100.0

Sources: Lao PDR, Country Economic Memorandum, July 15, 1986, World Bank

List of Data Collected

1. Map

- | | | | | |
|-----|-------------------------------|----------------|-----------|----------|
| (1) | Topographic map (Bluecopy) | Scale 1/10,000 | (1967/68) | 9 sheets |
| (2) | Provincial administration map | 1/1,250,000 | (1989) | 2 sheets |
| (3) | Population map | 1/2,000,000 | (1969) | 1 sheet |

2. Statistical Data and Development Plan

- (1) Vientiane Etude Du Schema Directeur Diagnostic Urbain Et Recommendations Preliminaires
Ministry of Communication, Transport, Post and Construction, December 1988
- (2) Urban Development Programme in The Prefecture of Vientiane, Proposal on Rearrangement of District Boundaries of Hatsaifong and Saithany and Selection of District Centres
UNDP, August 1988
- (3) Vientiane Schema Directeur Et D' Aménagement Urbain
UNDP, May 1989
- (4) Vientiane Master Plan Study Road Dossier, Urban Development Program for the Vientiane Prefecture
Ministry of Communication, Transportation, the Post and Telecommunications and Construction, January 1989.
- (5) Basic Data about The Social and Economic Development of Lao People's Democratic Republic
Ministry of Economy Plan and Finance, 1989

3. Hydrological Data

- (1) Daily and Monthly Meteorological Data (Temperature, Relative Humidity, Evaporation, Wind Velocity, Sunshine Hours, Rainfall)

Vientiane:	1988 - 1989
Tha Ngon:	1986 - 1988
Salakham:	1987 - 1989
- (2) Daily Water Level in Nam Ngum River

Tha Ngon:	1988
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DRAWINGS

LIST OF DRAWINGS (1/2)

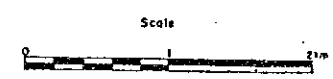
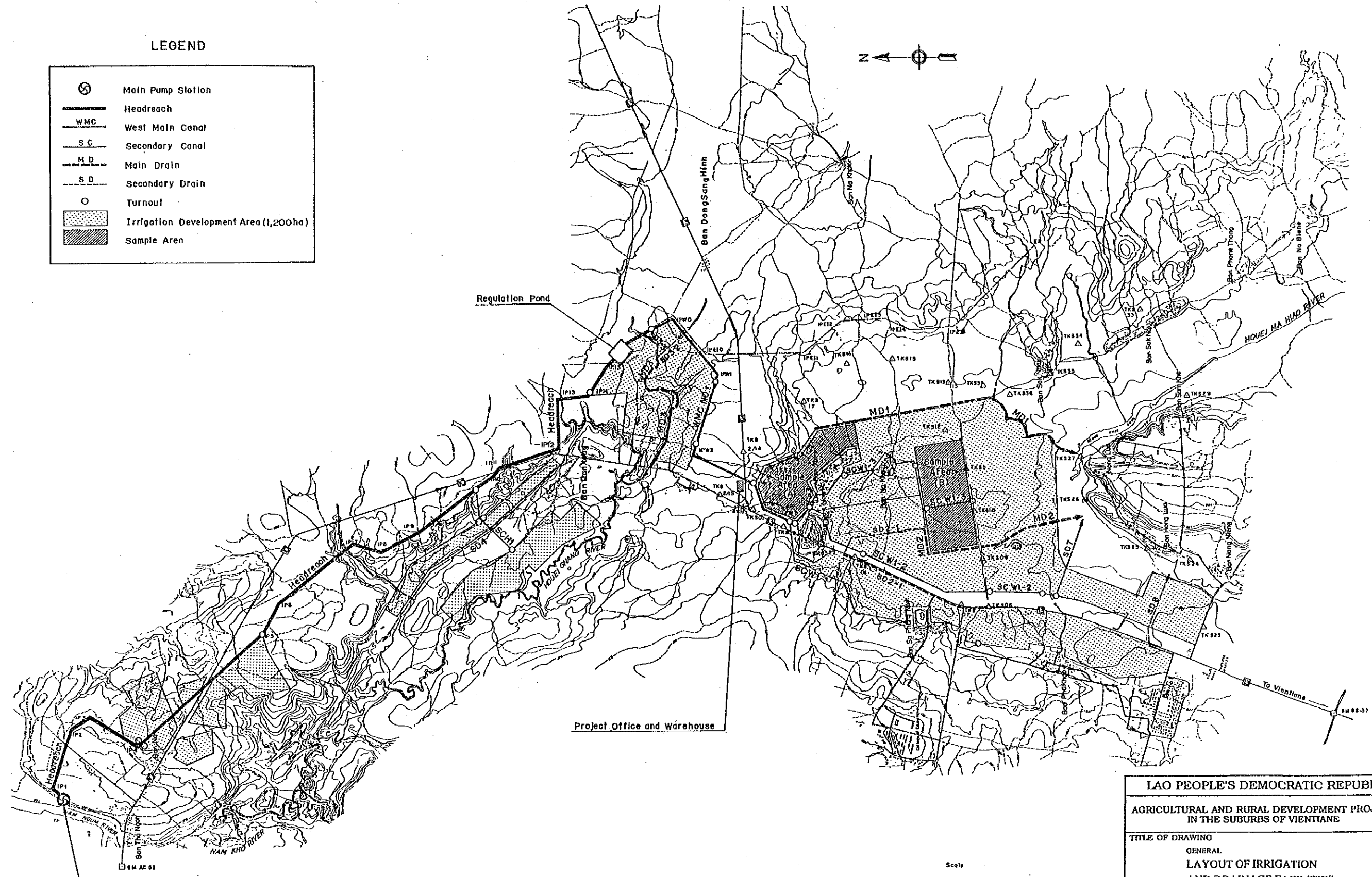
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GENERAL		
1	0001	LAYOUT OF IRRIGATION AND DRAINAGE FACILITIES
MAIN PUMP STATION		
2	1001	PLAN AND PROFILE
3	1002	CONTROL HOUSE
4	1003	REPAIR SHOP
5	1004	OUTLET STRUCTURE
REGULATION POND		
6	2001	PLAN AND CROSS SECTION
7	2002	INLET / SPILLWAY
8	2003	OUTLET
IRRIGATION CANALS AND FARM ROADS		
9	3001	PLAN AND PROFILE OF HEADREACH (1/2)
10	3002	PLAN AND PROFILE OF HEADREACH (2/2)
11	3003	PROFILE OF WEST MAIN CANAL NO.1
12	3004	TYPICAL CROSS SECTIONS
13	3005	CANAL LINING AND UNDERDRAIN / PUBLIC STEPS
14	3006	CONCRETE LINING BLOCKS
15	3007	SLOPE PROTECTION WORKS ON HEADREACH
16	3008	TURNOUTS (1/2)
17	3009	TURNOUTS (2/2)
18	3010	CHECKS
19	3011	SYPHONS (1/2)
20	3012	SYPHONS (2/2)
21	3013	SPILLWAYS / WASTEWAY
22	3014	CULVERTS
23	3015	CROSS DRAINS
24	3016	DROPS / FOOTPATH BRIDGES

LIST OF DRAWINGS (2/2)

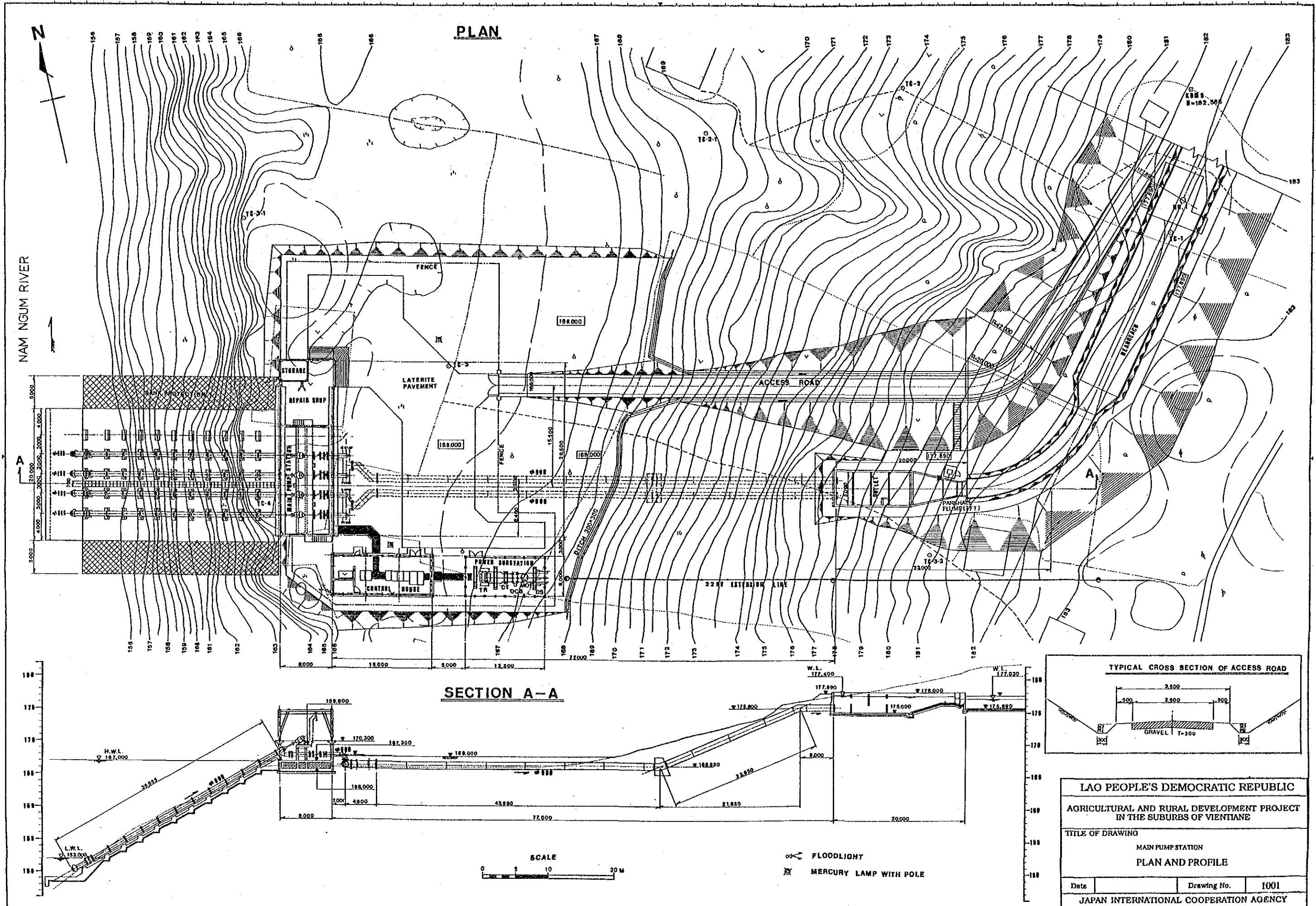
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DRAINAGE CANALS		
25	4001	PROFILE OF MAIN DRAINAGE CANALS (MD1) AND TYPICAL CROSS SECTION
26	4002	PROFILES OF MAIN DRAINAGE CANALS (MD2 & MD3)
27	4003	DRAINAGE CULVERTS / DRAINAGE DROPS
ON-FARM WORKS		
28	5001	TYPICAL LAYOUT (SAMPLE AREA-A)
29	5002	TYPICAL LAYOUT (SAMPLE AREA-B)
30	5003	DIVISION BOXES
RURAL INFRASTRUCTURES		
31	6001	GENERAL LAYOUT / VILLAGE ROADS
32	6002	POTABLE WATER SUPPLY
PROJECT OFFICE AND WAREHOUSE		
33	7001	GENERAL LAYOUT
34	7002	PROJECT OFFICE (1/2)
35	7003	PROJECT OFFICE (2/2)
36	7004	WAREHOUSE (1/2)
37	7005	WAREHOUSE (2/2)

LEGEND

	Main Pump Station
	Headreach
	West Main Canal
	Secondary Canal
	Main Drain
	Secondary Drain
	Turnout
	Irrigation Development Area (1,200ha)
	Sample Area

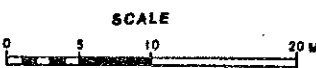
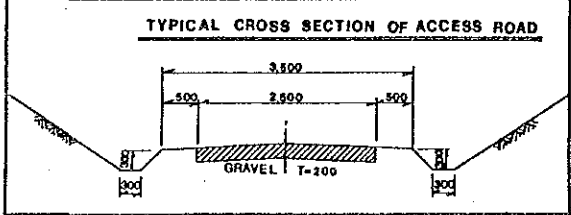


LAO PEOPLE'S DEMOCRATIC REPUBLIC			
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE			
TITLE OF DRAWING GENERAL LAYOUT OF IRRIGATION AND DRAINAGE FACILITIES			
Date	Drawing No.	0001	
JAPAN INTERNATIONAL COOPERATION AGENCY			



PLAN

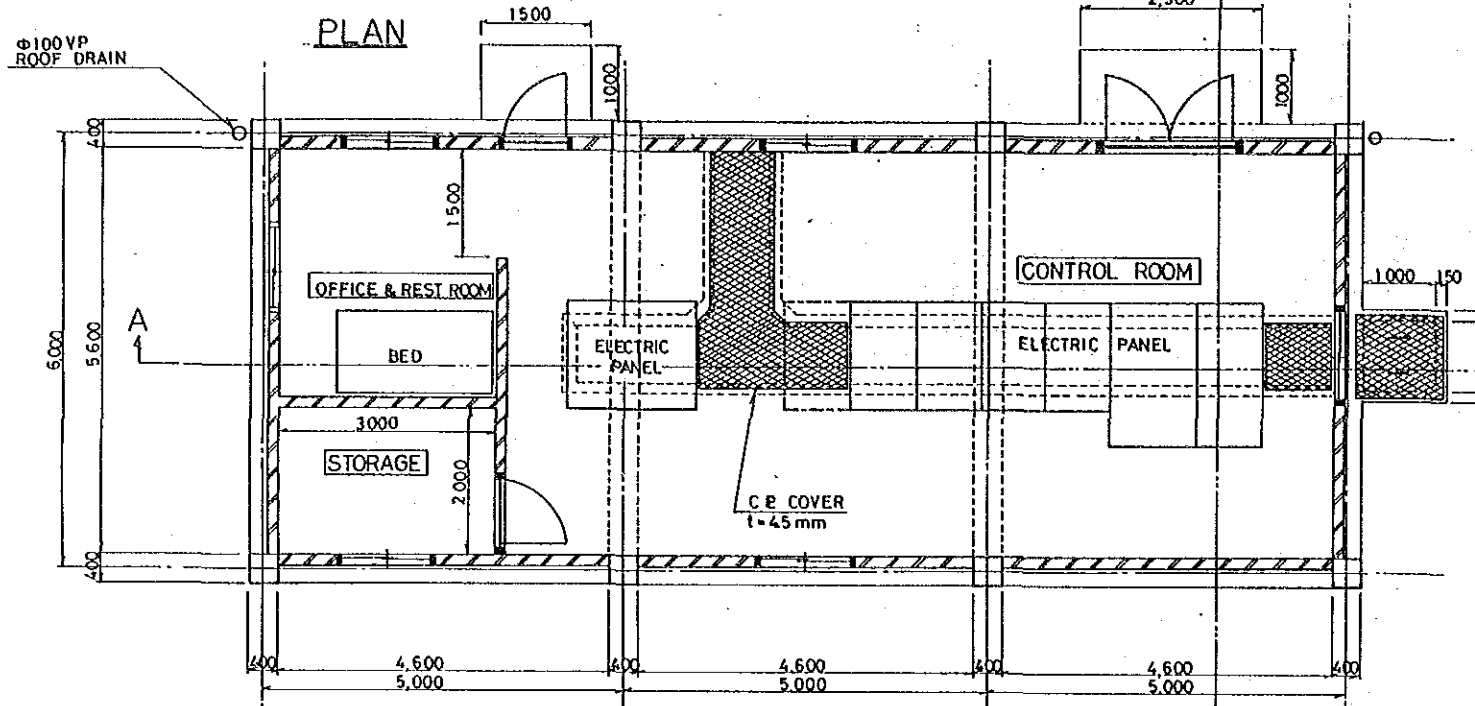
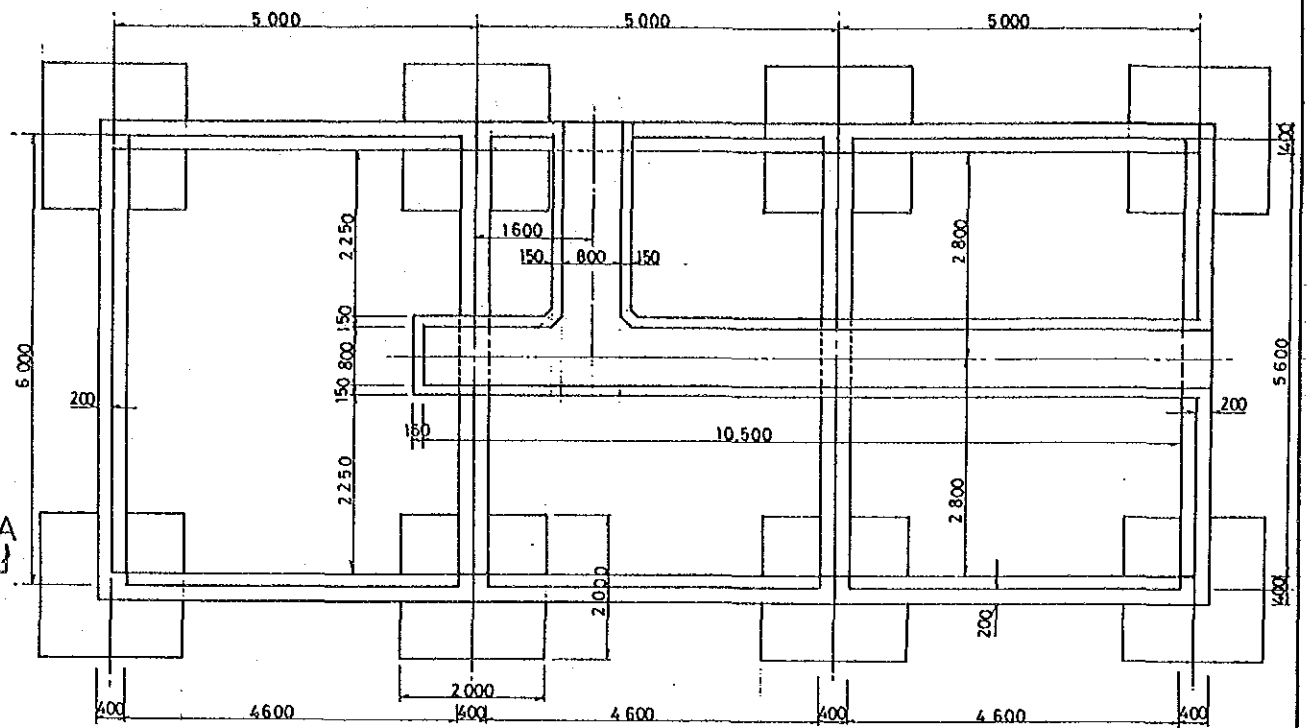
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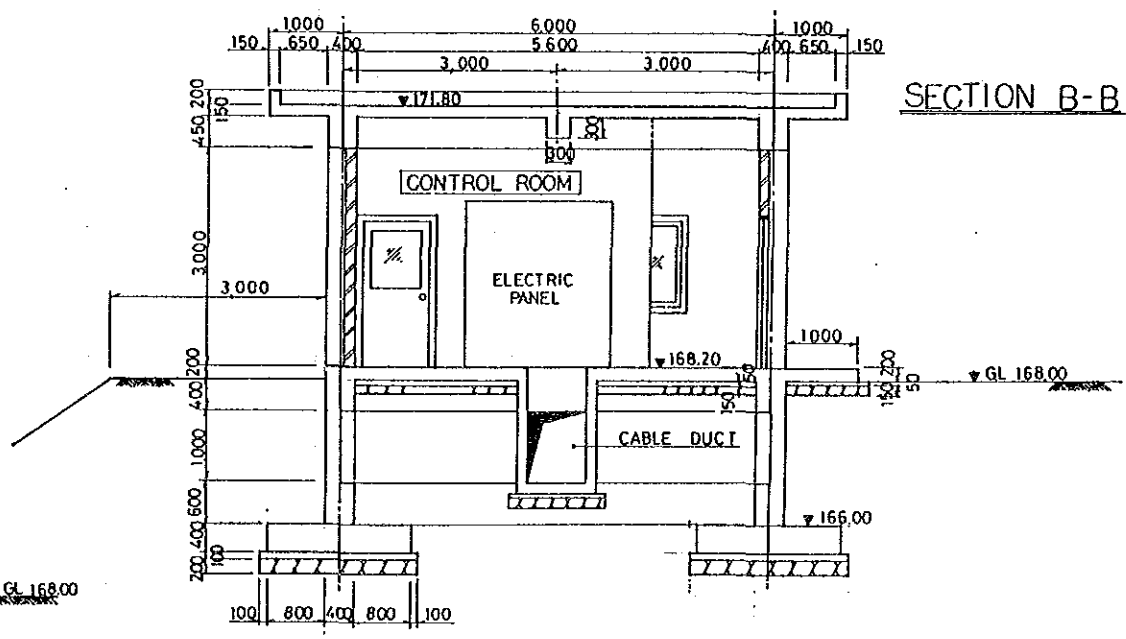
- FLOODLIGHT
- MERCURY LAMP WITH POLE

LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
MAIN PUMP STATION PLAN AND PROFILE		
Date	Drawing No.	1001
JAPAN INTERNATIONAL COOPERATION AGENCY		

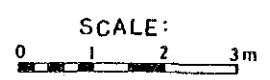
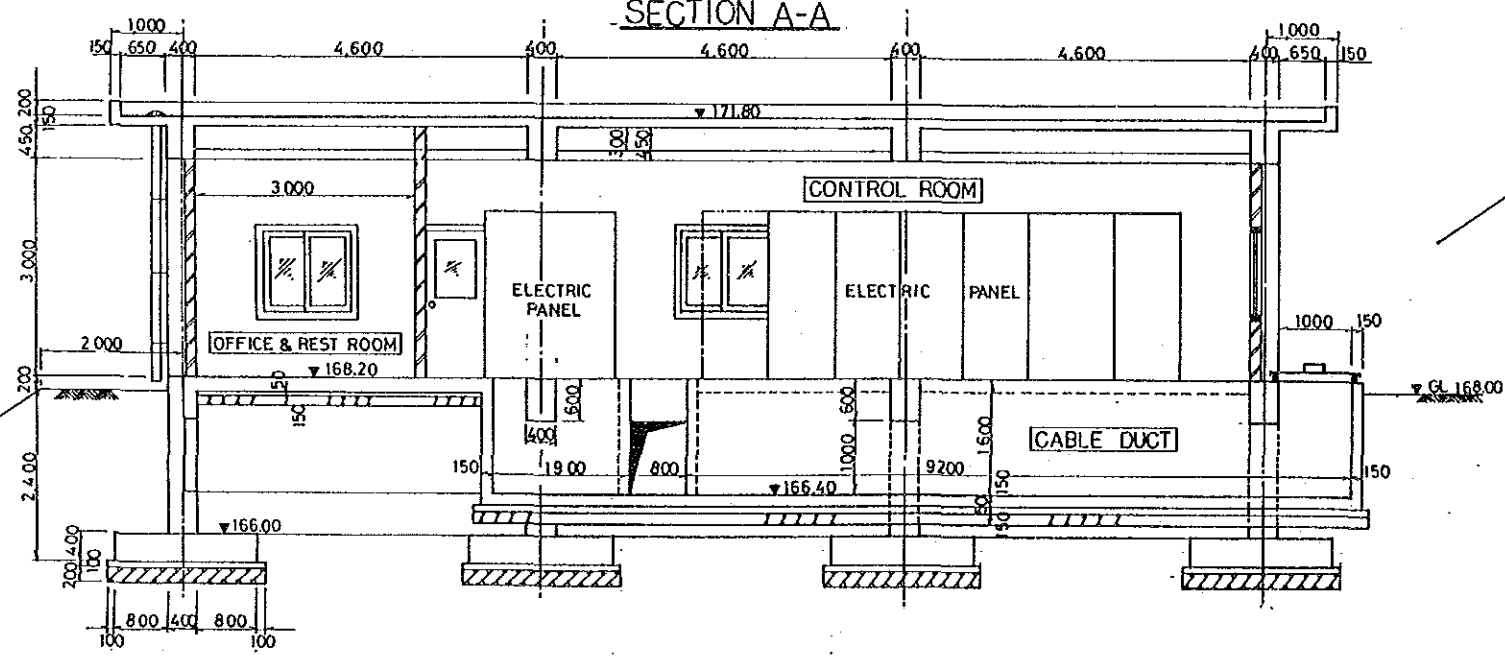
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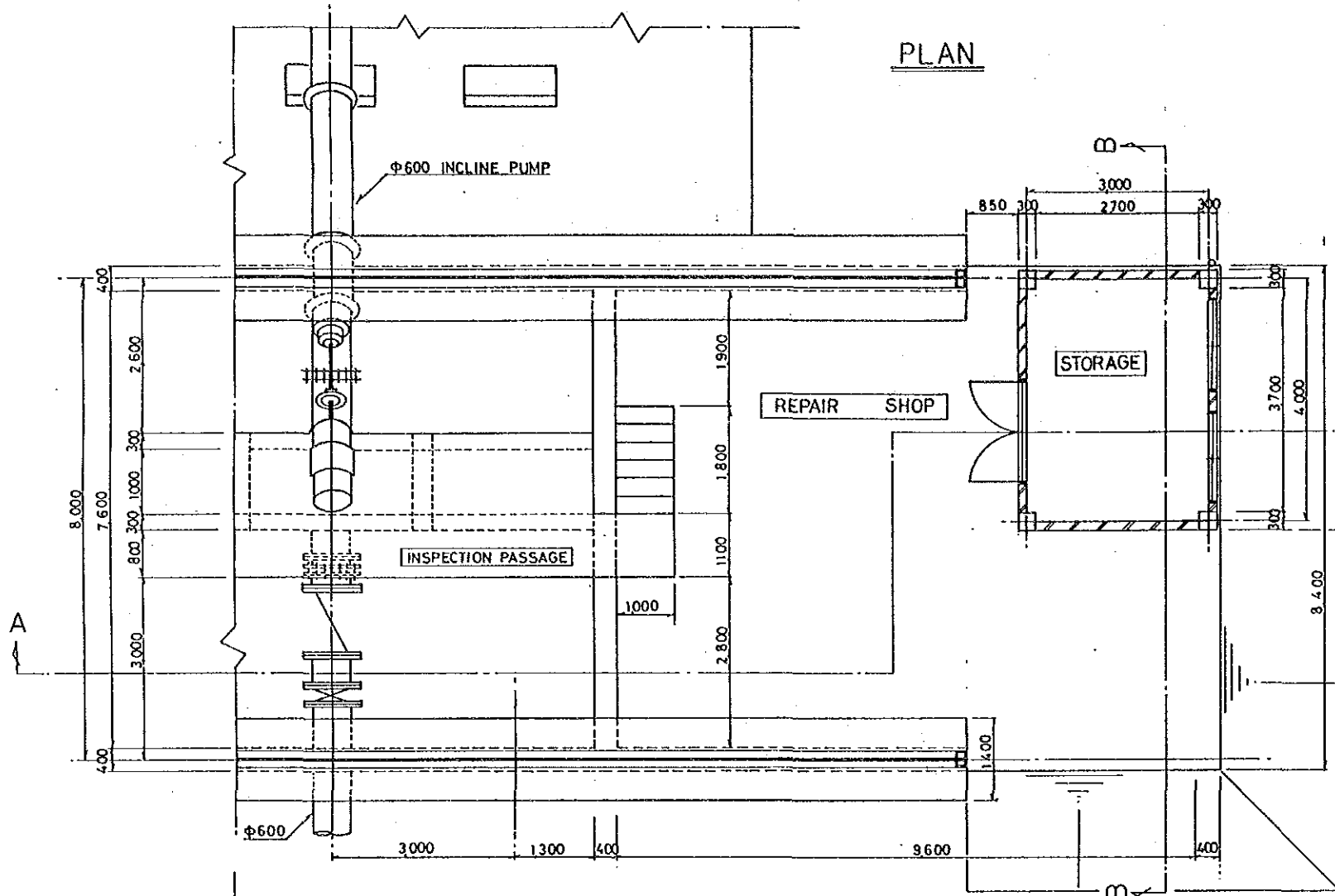
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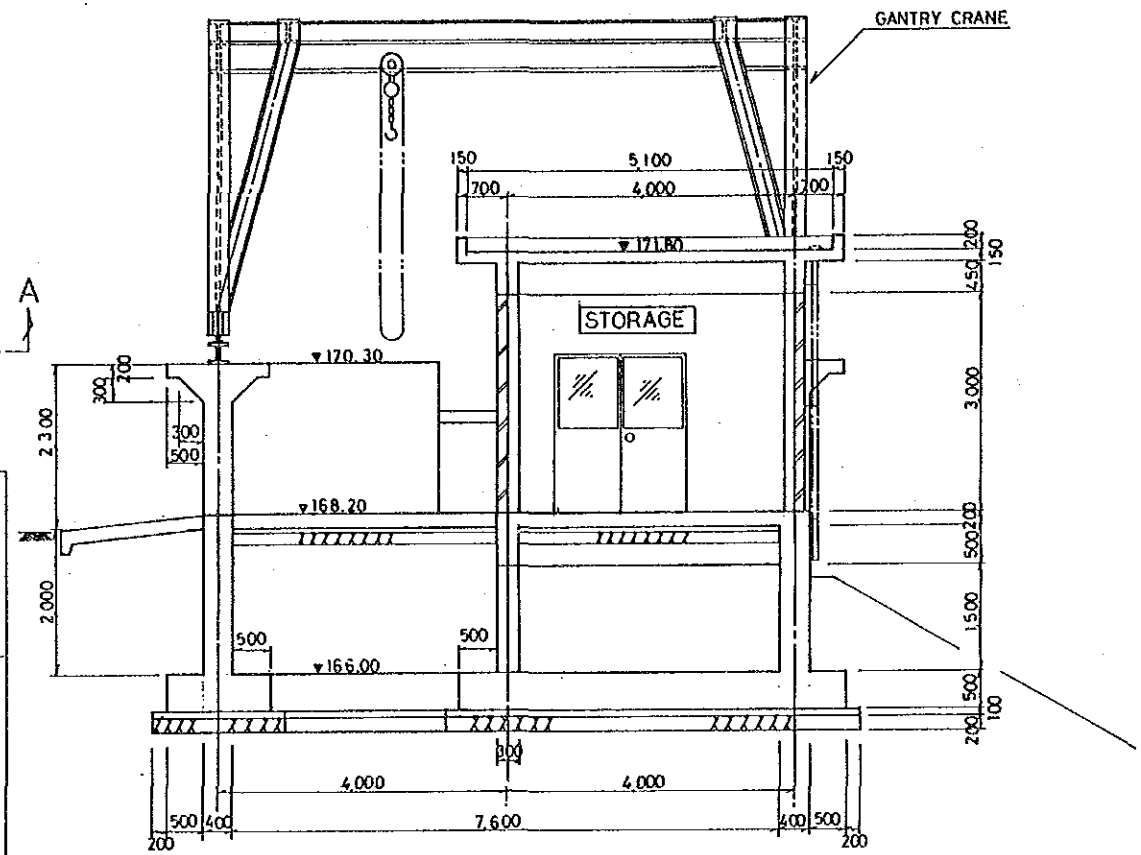
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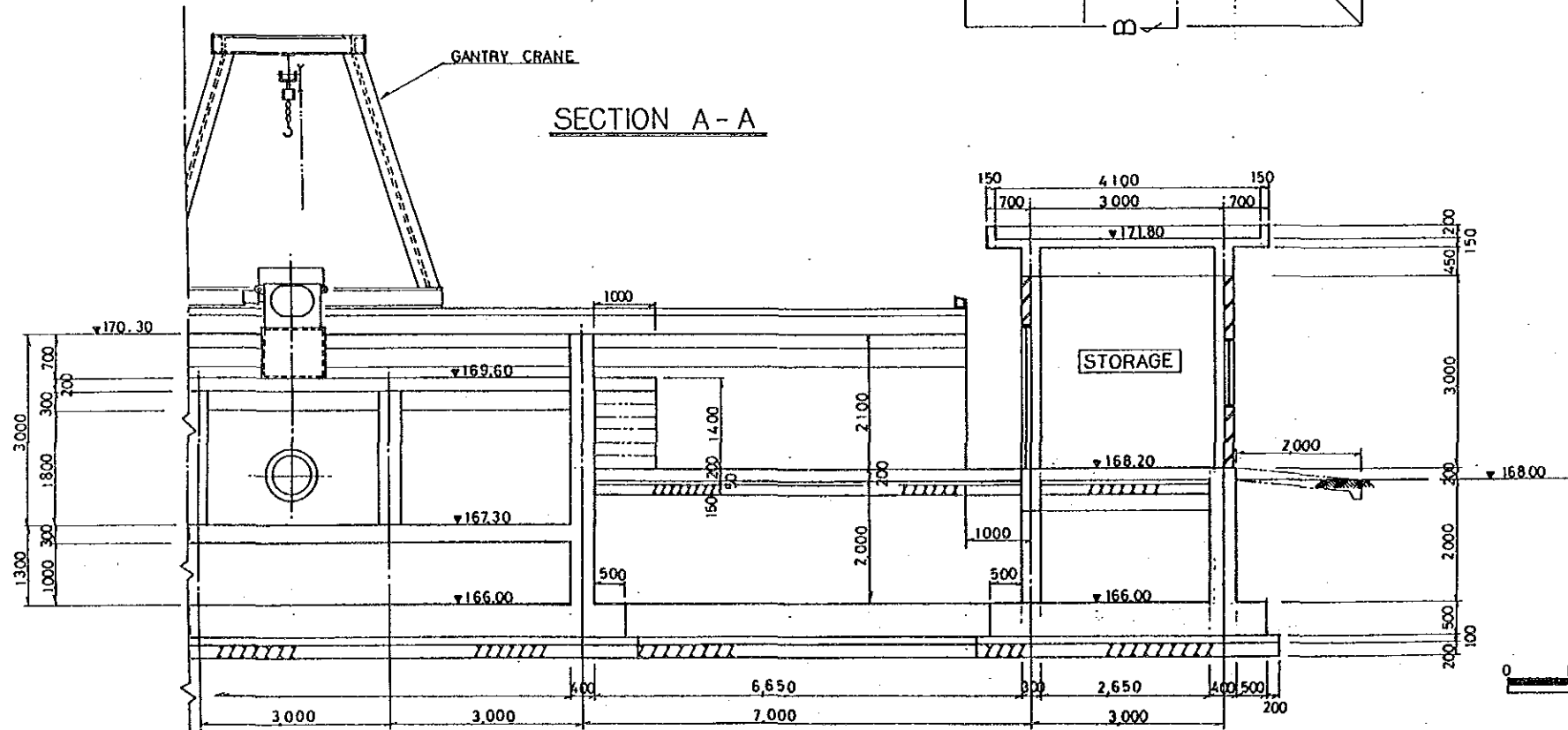
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TITLE OF DRAWING		
MAIN PUMP STATION CONTROL HOUSE		
Date	Drawing No.	1002
JAPAN INTERNATIONAL COOPERATION AGENCY		



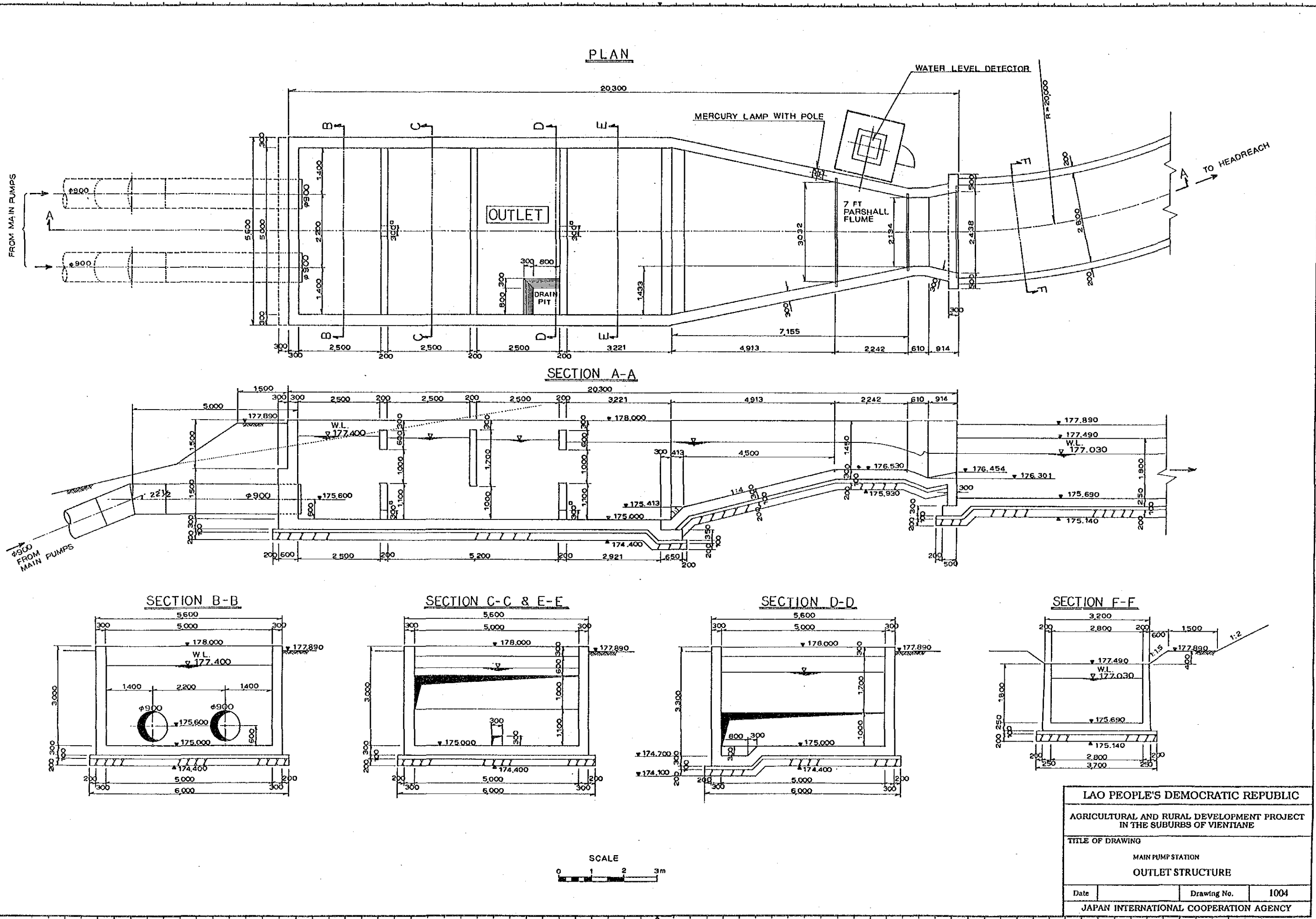
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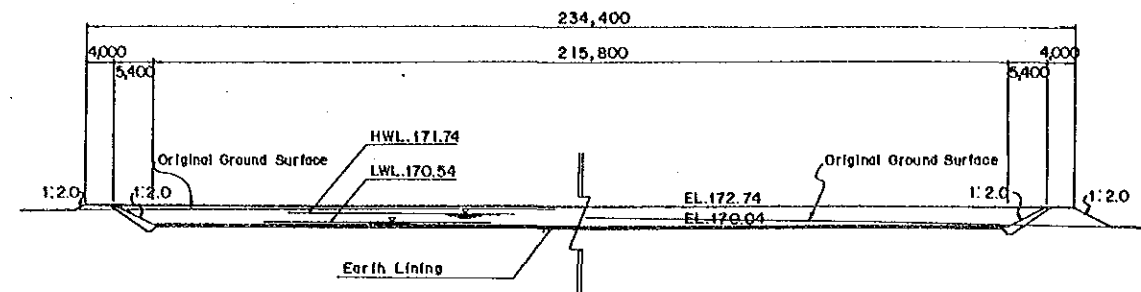
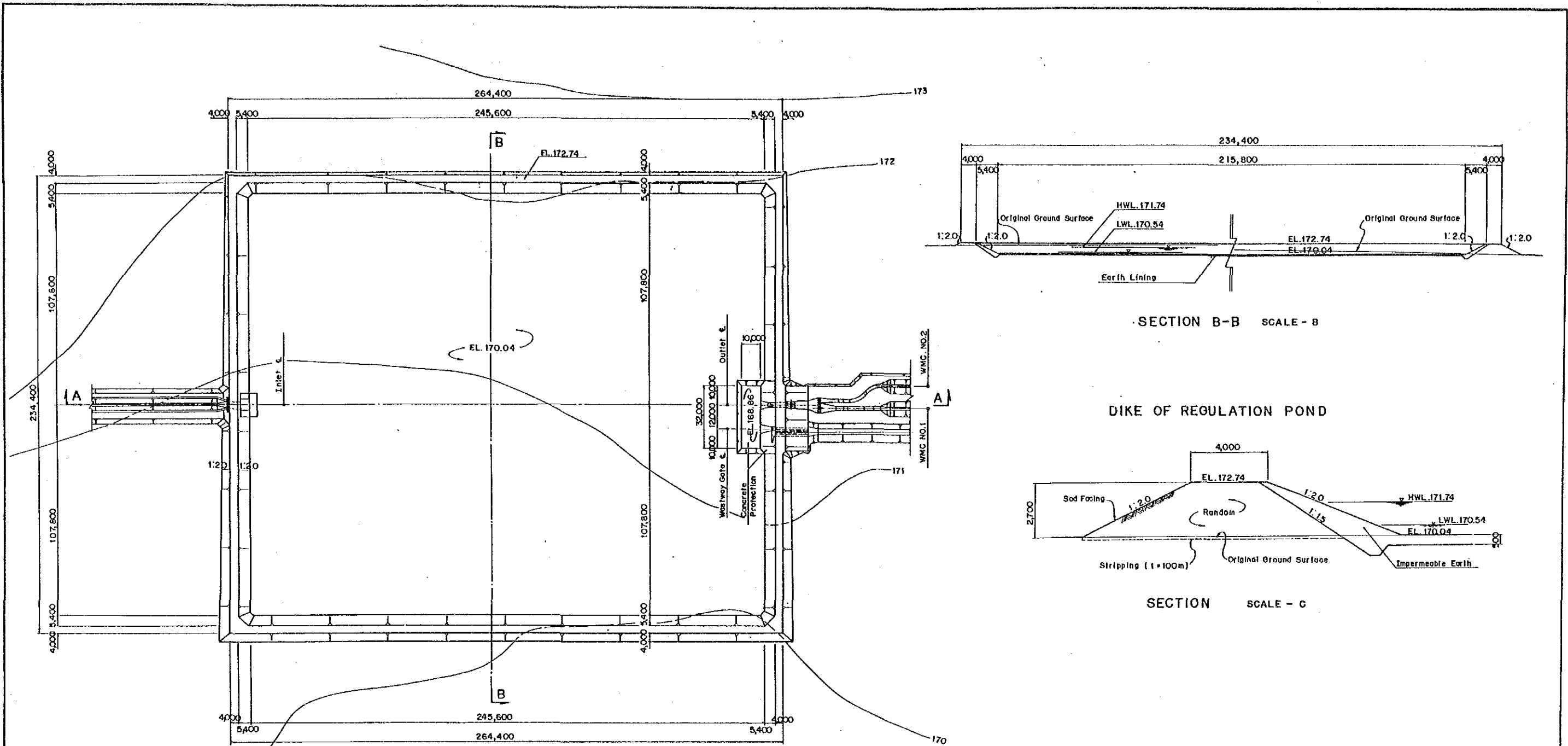
SECTION A-A



LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
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MAIN PUMP STATION REPAIR SHOP		
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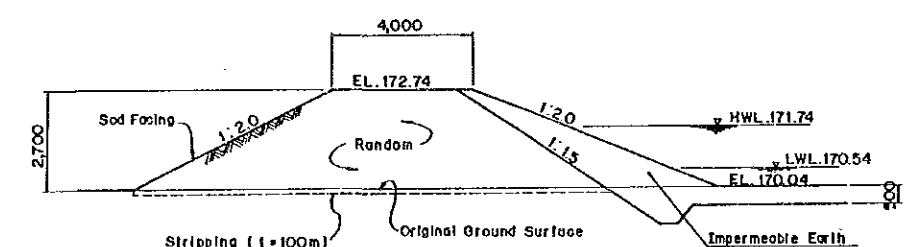


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
MAIN PUMP STATION OUTLET STRUCTURE		
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JAPAN INTERNATIONAL COOPERATION AGENCY		

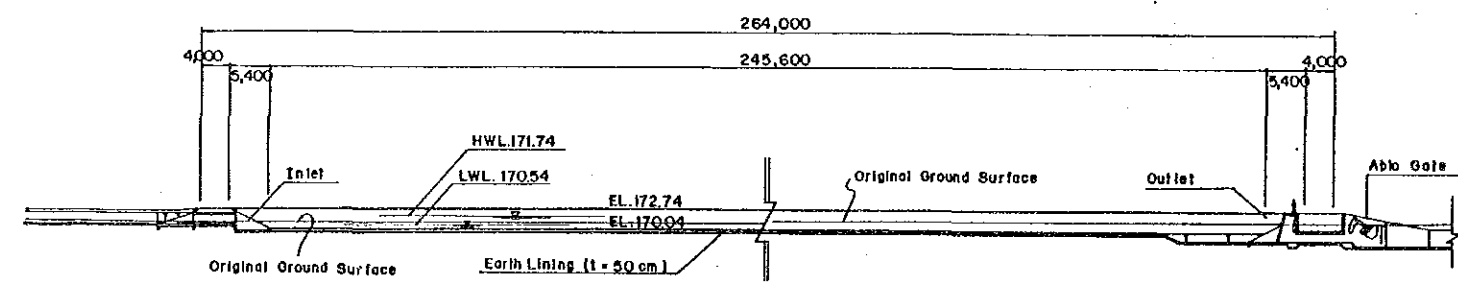


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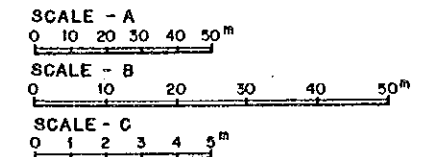
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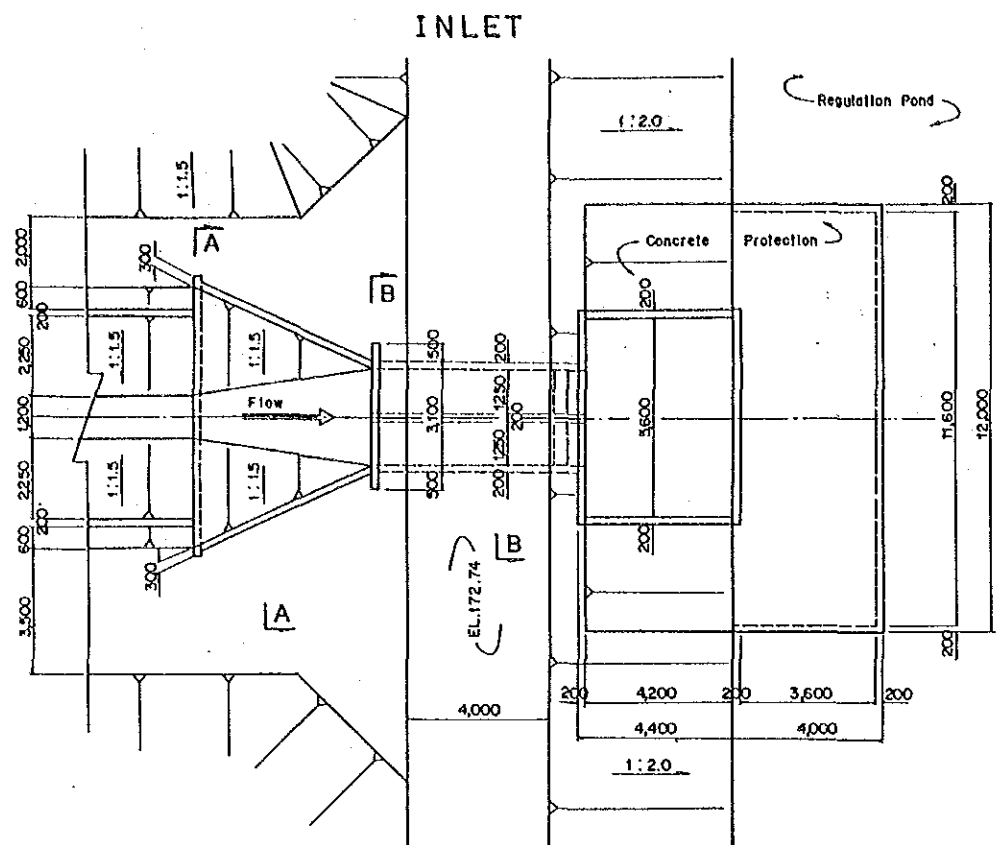
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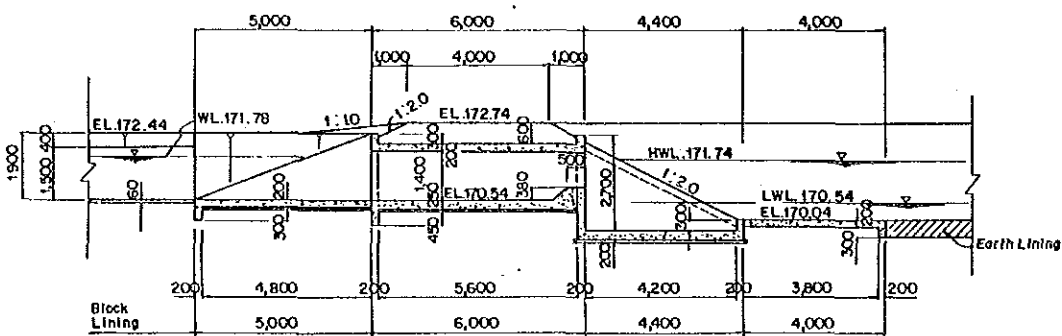
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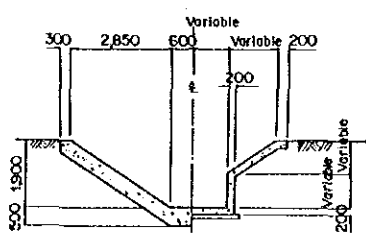
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TITLE OF DRAWING		
REGULATION POND PLAN AND CROSS SECTION		
Date	Drawing No.	2001
JAPAN INTERNATIONAL COOPERATION AGENCY		



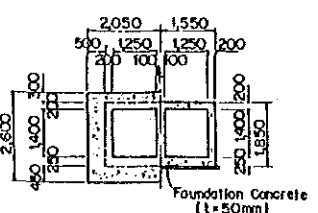
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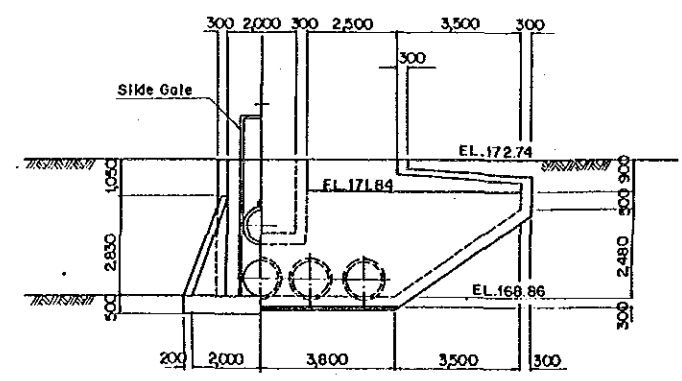
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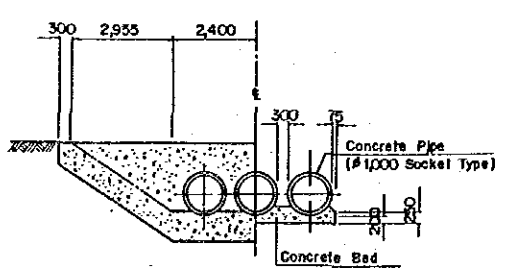
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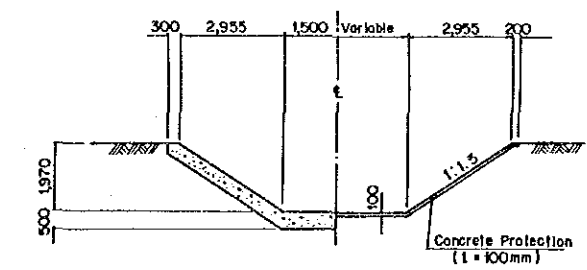
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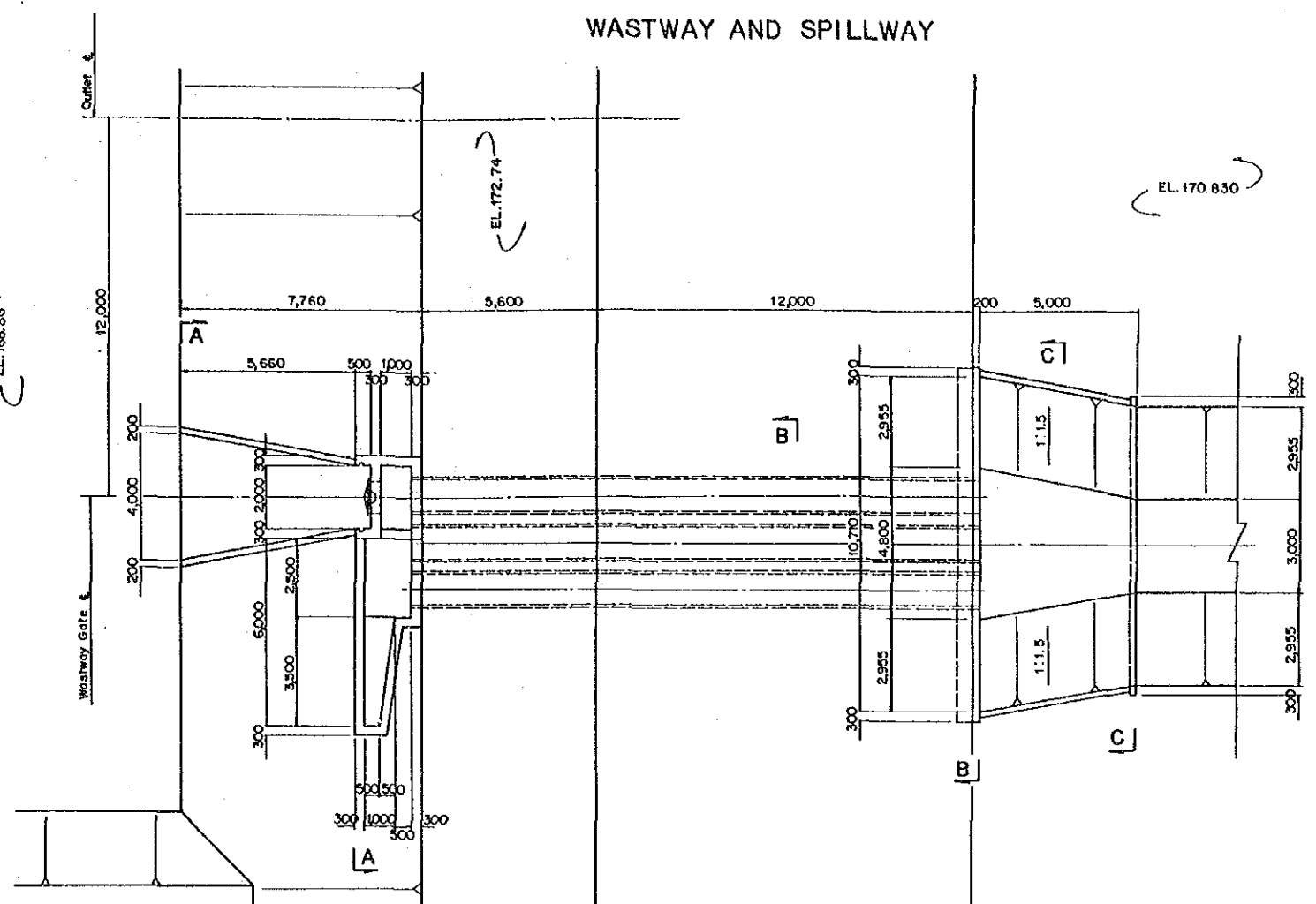
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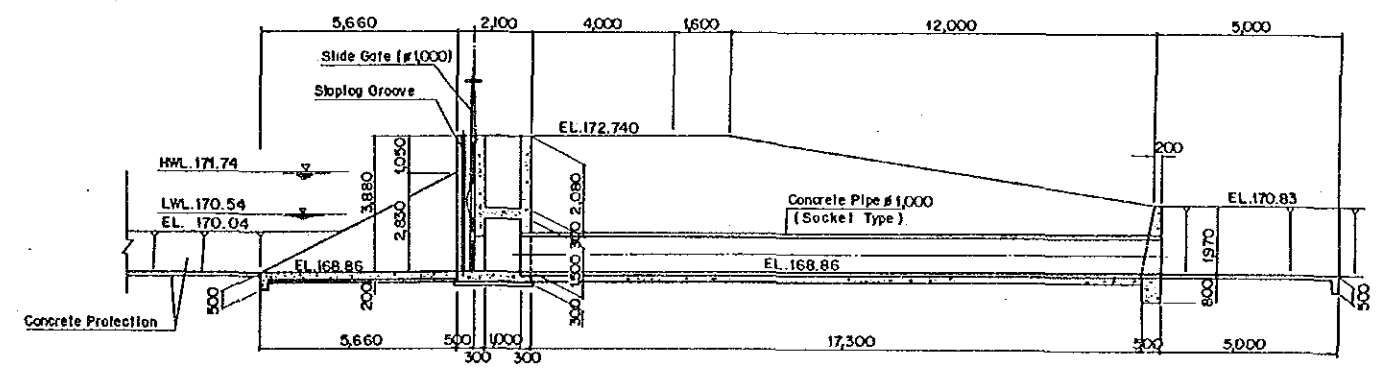
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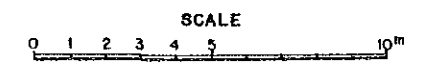
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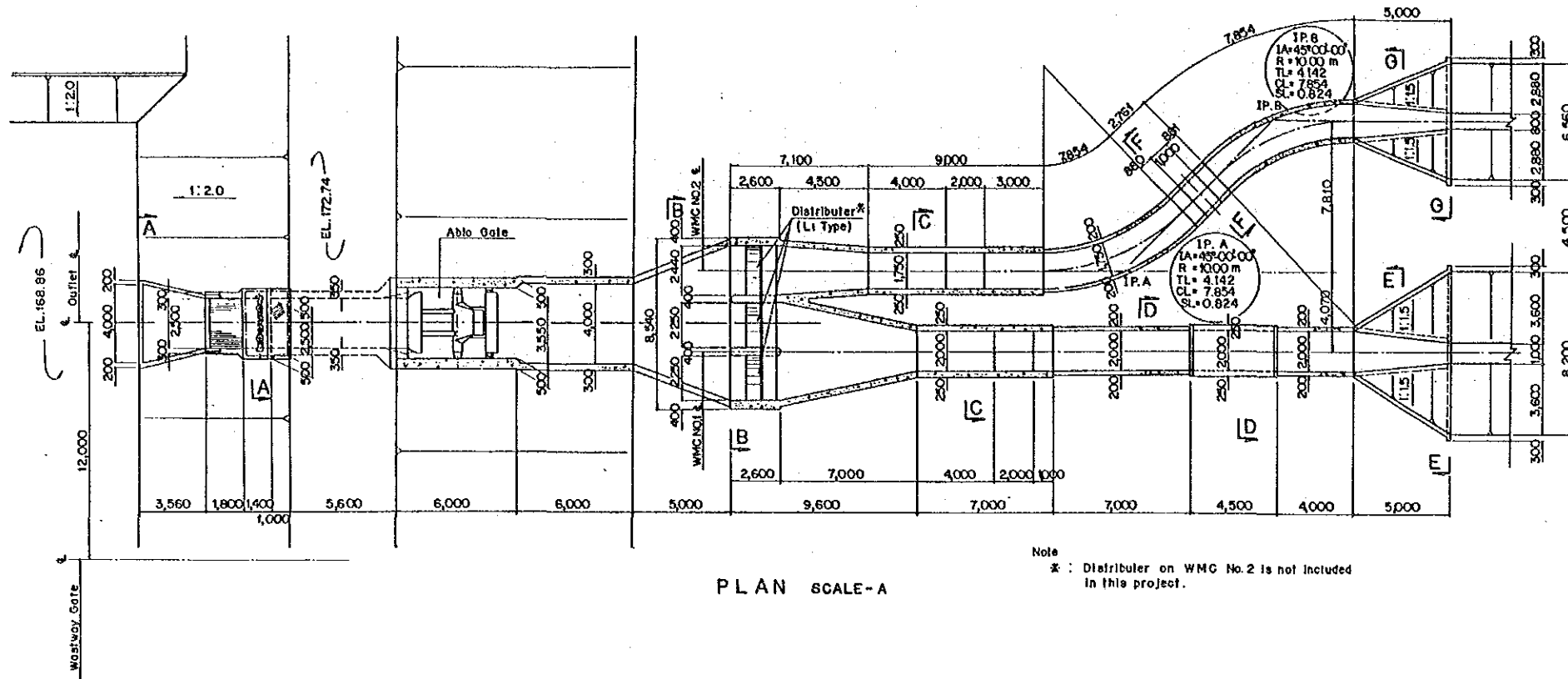


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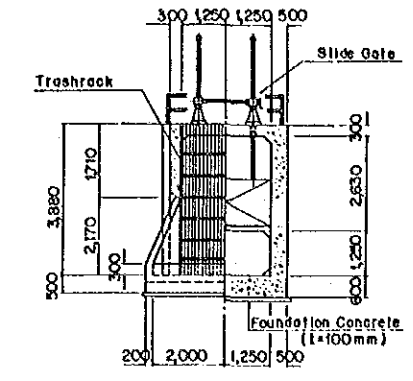
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TITLE OF DRAWING REGULATION POND INLET / SPILLWAY		
Date	Drawing No.	2002
JAPAN INTERNATIONAL COOPERATION AGENCY		

OUTLET

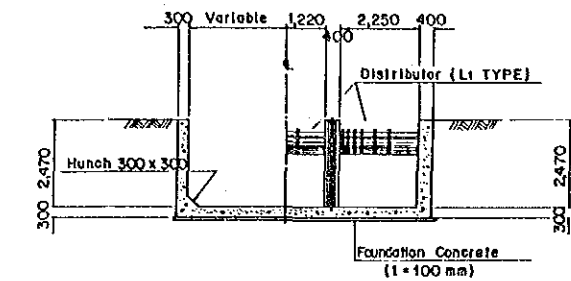


PLAN SCALE-A

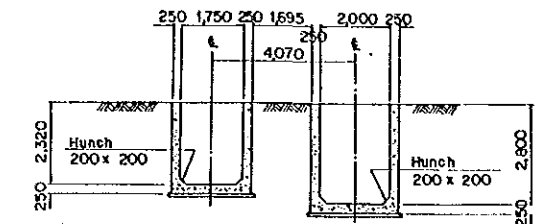
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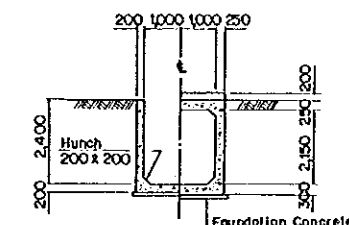
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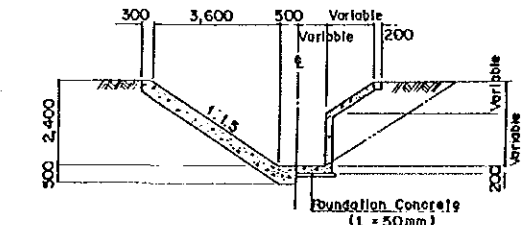
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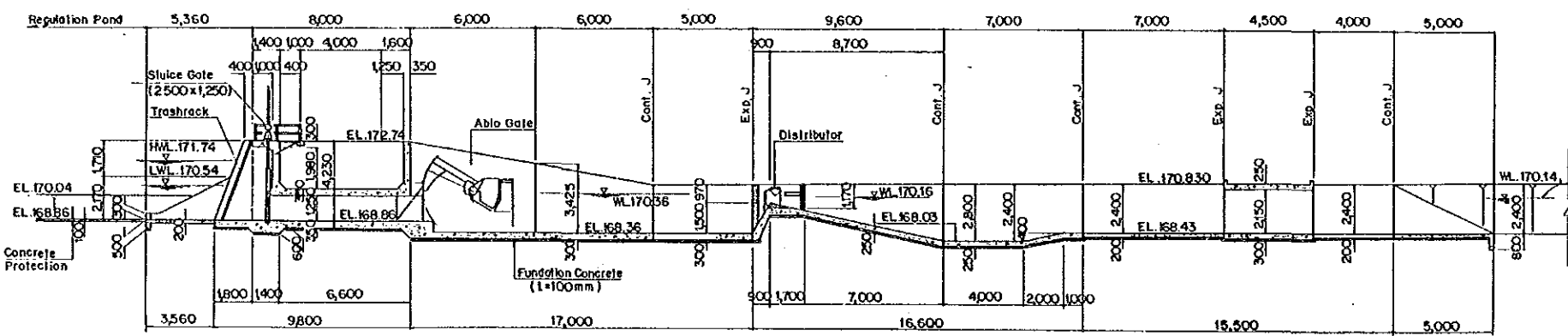
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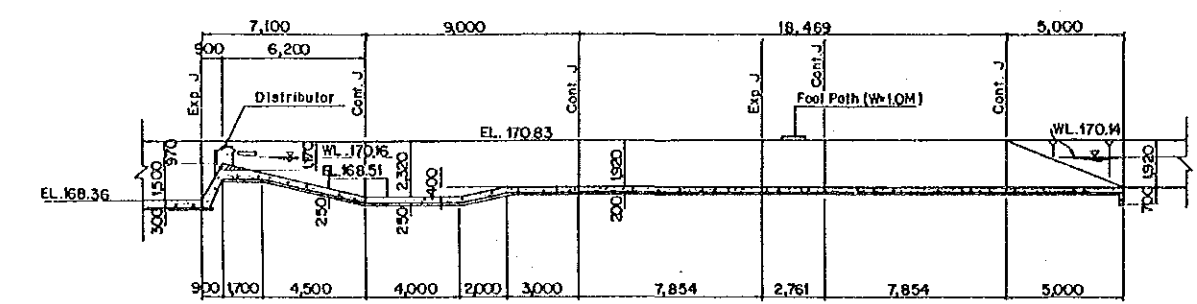
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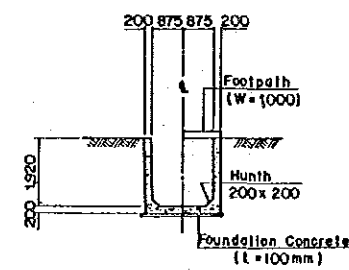
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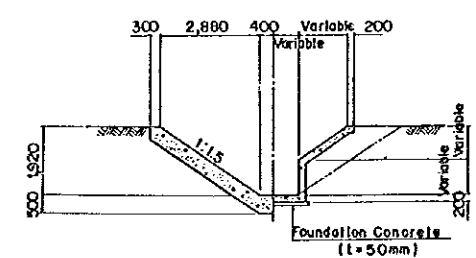
PROFILE (WMC NO.1) SCALE-A



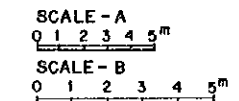
PROFILE (WMC NO.2) SCALE-A



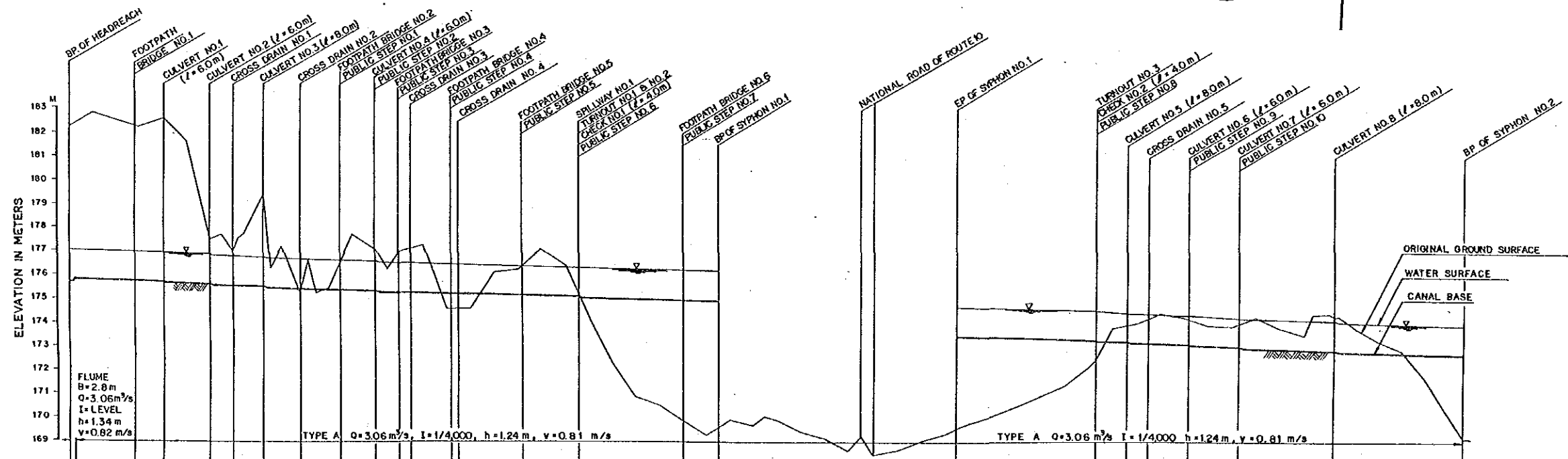
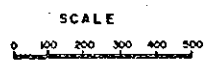
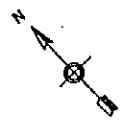
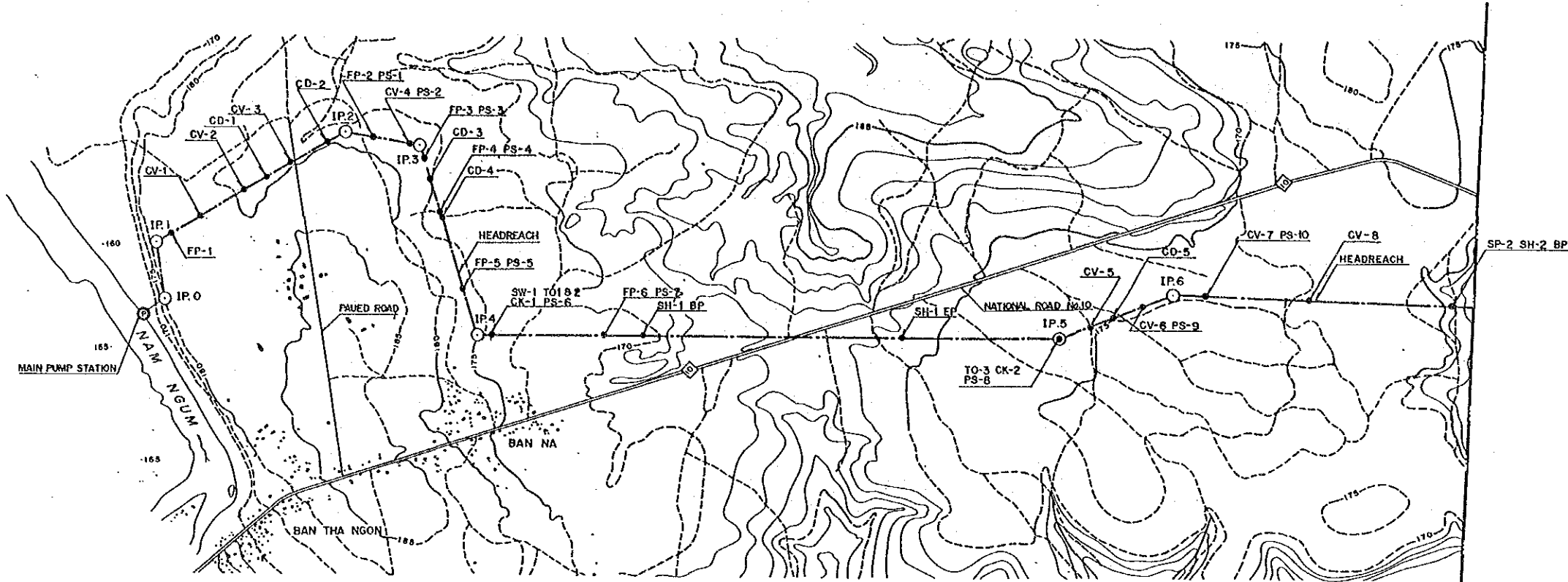
SECTION F-F SCALE - B



SECTION G-G SCALE - B

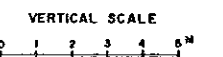
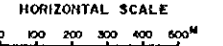


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
REGULATION POND OUTLET		
Date	Drawing No.	2003
JAPAN INTERNATIONAL COOPERATION AGENCY		



- LEGEND**
- HEADREACH
 - NATIONAL ROAD
 - PAVED ROAD
 - - - FOOT PATH
 - ⊙ MAIN PUMP STATION

- ABBREVIATIONS**
- BP: BEGINNING POINT
 - IP: INTERSECTION POINT
 - CV: CULVERT
 - CD: CROSS DRAIN
 - FP: FOOT PATH BRIDGE
 - TO: TURNOUT
 - CK: CHECK
 - WW: WASTWAY
 - SW: SPILLWAY
 - SH: SYPHON
 - PS: PUBLIC STEP



WATER SURFACE ELEVATION	CANAL BASE ELEVATION	ORIGINAL GROUND SURFACE	ACCUMULATED DISTANCE	DISTANCE	STATION	CURVE
177.03	175.98	182.26	0.00	0.00	IP 1	IA=72°00'11"
177.02	175.76	182.79	19.00	4.00	No. 1	
177.00	175.76	182.79	102.00	81.00	No. 2	
176.98	175.74	182.79	200.00	89.00	No. 3	
176.95	175.74	182.79	300.00	89.00	No. 4	
176.95	175.74	182.79	400.00	89.00	No. 5	
176.89	175.65	182.66	480.00	160.00	No. 6	
176.87	175.63	181.63	500.00	84.00	No. 7	
176.84	175.50	177.41	600.00	100.00	No. 8	
176.84	175.50	177.41	650.00	100.00	No. 9	
176.84	175.50	177.41	700.00	100.00	No. 10	
176.84	175.50	177.41	750.00	100.00	No. 11	
176.84	175.50	177.41	800.00	100.00	No. 12	
176.84	175.50	177.41	850.00	100.00	No. 13	
176.84	175.50	177.41	900.00	100.00	No. 14	
176.84	175.50	177.41	950.00	100.00	No. 15	
176.84	175.50	177.41	1000.00	100.00	No. 16	
176.84	175.50	177.41	1050.00	100.00	No. 17	
176.84	175.50	177.41	1100.00	100.00	No. 18	
176.84	175.50	177.41	1150.00	100.00	No. 19	
176.84	175.50	177.41	1200.00	100.00	No. 20	
176.84	175.50	177.41	1250.00	100.00	No. 21	
176.84	175.50	177.41	1300.00	100.00	No. 22	
176.84	175.50	177.41	1350.00	100.00	No. 23	
176.84	175.50	177.41	1400.00	100.00	No. 24	
176.84	175.50	177.41	1450.00	100.00	No. 25	
176.84	175.50	177.41	1500.00	100.00	No. 26	
176.84	175.50	177.41	1550.00	100.00	No. 27	
176.84	175.50	177.41	1600.00	100.00	No. 28	
176.84	175.50	177.41	1650.00	100.00	No. 29	
176.84	175.50	177.41	1700.00	100.00	No. 30	
176.84	175.50	177.41	1750.00	100.00	No. 31	
176.84	175.50	177.41	1800.00	100.00	No. 32	
176.84	175.50	177.41	1850.00	100.00	No. 33	
176.84	175.50	177.41	1900.00	100.00	No. 34	
176.84	175.50	177.41	1950.00	100.00	No. 35	
176.84	175.50	177.41	2000.00	100.00	No. 36	
176.84	175.50	177.41	2050.00	100.00	No. 37	
176.84	175.50	177.41	2100.00	100.00	No. 38	
176.84	175.50	177.41	2150.00	100.00	No. 39	
176.84	175.50	177.41	2200.00	100.00	No. 40	
176.84	175.50	177.41	2250.00	100.00	No. 41	
176.84	175.50	177.41	2300.00	100.00	No. 42	
176.84	175.50	177.41	2350.00	100.00	No. 43	
176.84	175.50	177.41	2400.00	100.00	No. 44	
176.84	175.50	177.41	2450.00	100.00	No. 45	
176.84	175.50	177.41	2500.00	100.00	No. 46	
176.84	175.50	177.41	2550.00	100.00	No. 47	
176.84	175.50	177.41	2600.00	100.00	No. 48	
176.84	175.50	177.41	2650.00	100.00	No. 49	
176.84	175.50	177.41	2700.00	100.00	No. 50	
176.84	175.50	177.41	2750.00	100.00	No. 51	
176.84	175.50	177.41	2800.00	100.00	No. 52	
176.84	175.50	177.41	2850.00	100.00	No. 53	
176.84	175.50	177.41	2900.00	100.00	No. 54	
176.84	175.50	177.41	2950.00	100.00	No. 55	
176.84	175.50	177.41	3000.00	100.00	No. 56	
176.84	175.50	177.41	3050.00	100.00	No. 57	
176.84	175.50	177.41	3100.00	100.00	No. 58	
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176.84	175.50	177.41	3200.00	100.00	No. 60	

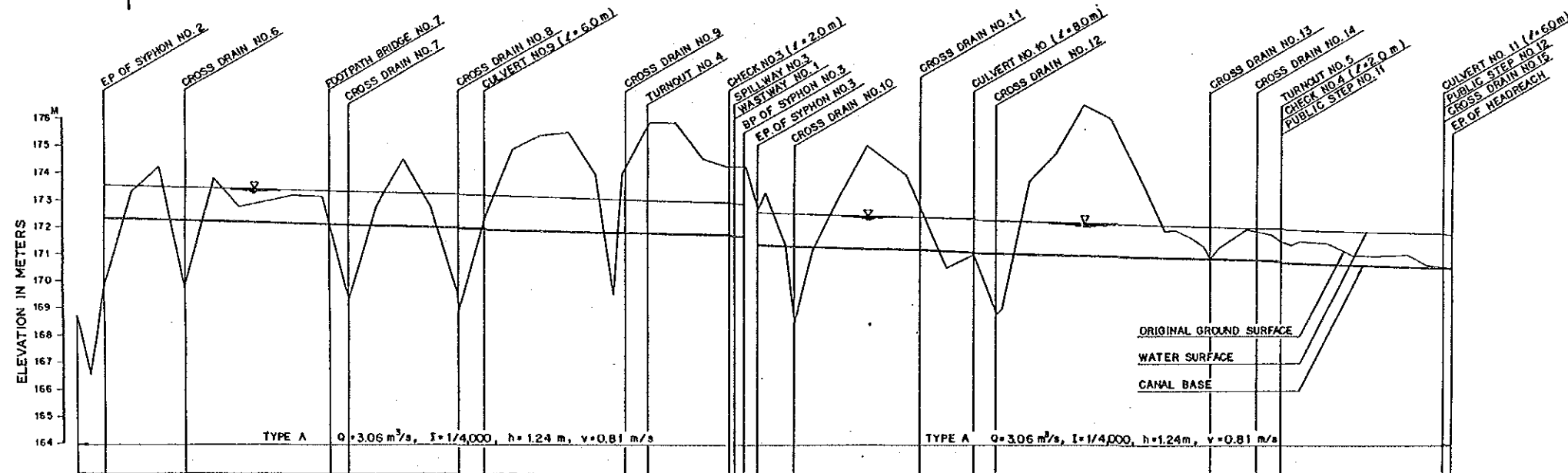
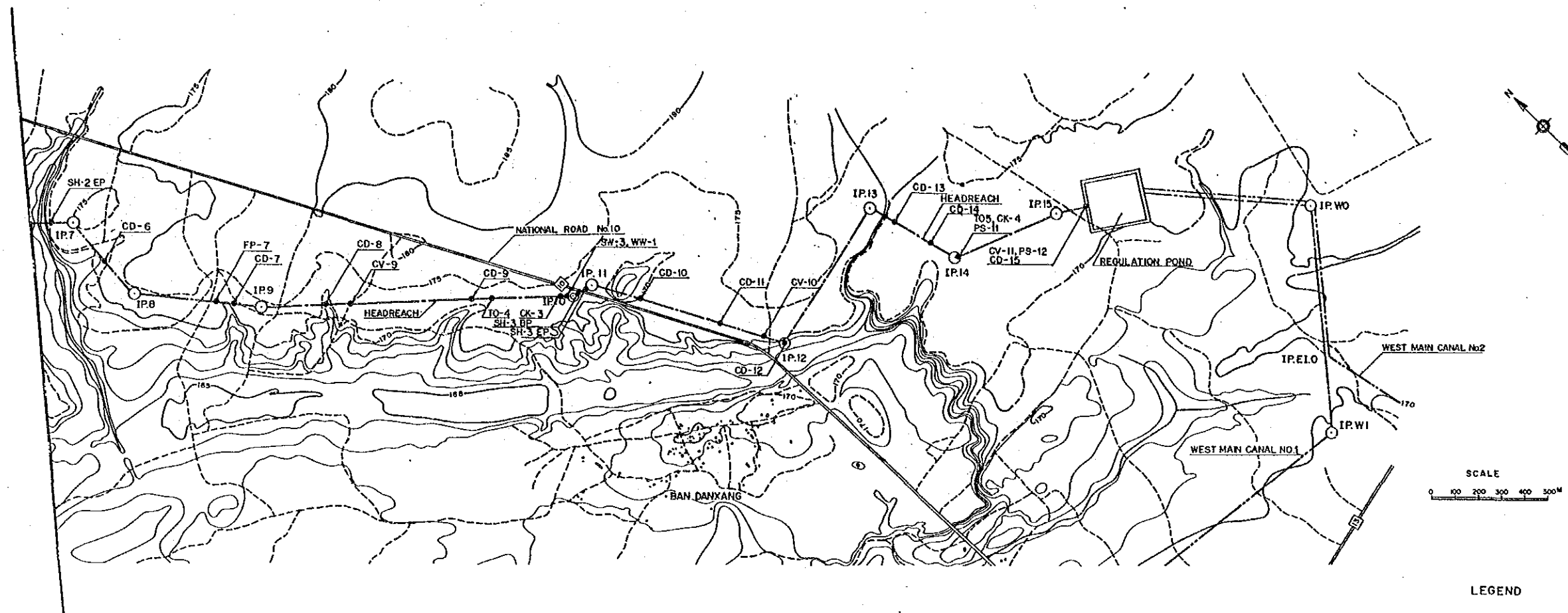
LAO PEOPLE'S DEMOCRATIC REPUBLIC

AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
IN THE SUBURBS OF VIENTIANE

TITLE OF DRAWING
IRRIGATION CANALS AND FARM ROADS
PLAN AND PROFILE OF HEADREACH (1/2)

Date _____ Drawing No. 3001

JAPAN INTERNATIONAL COOPERATION AGENCY



STATION	CURVE	DISTANCE	ACCUMULATED DISTANCE	ORIGINAL GROUND SURFACE	CANAL BASE ELEVATION	WATER SURFACE ELEVATION
No. 59	IP. 7	35.00	35.00	168.65	172.26	173.32
No. 60	IA=42°31'30"	45.00	80.00	168.94	172.28	173.30
No. 61	IP. 8	91.40	171.40	173.50	172.28	173.30
No. 62	IA=53°37'20"	8.60	180.00	174.17	172.23	173.47
No. 63	IA=42°31'30"	100.00	180.00	169.74	172.21	173.45
No. 64	IP. 9	100.00	280.00	173.90	172.16	173.42
No. 65	IA=42°31'30"	15.00	295.00	172.71	172.16	173.40
No. 66	IA=59°33'45"	100.00	395.00	172.95	172.13	173.37
No. 67	IP. 10	100.00	495.00	173.15	172.11	173.35
No. 68	IA=73°09'14"	100.00	595.00	173.11	172.08	173.32
No. 69	IP. 11	30.00	625.00	171.96	172.08	173.32
No. 70	IA=42°31'30"	70.00	695.00	169.27	172.04	173.30
No. 71	IP. 12	100.00	795.00	172.69	172.03	173.27
No. 72	IA=73°09'14"	71.00	866.00	174.44	172.01	173.25
No. 73	IP. 13	100.00	966.00	172.74	171.98	173.22
No. 74	IA=59°33'45"	100.00	1066.00	169.87	171.96	173.20
No. 75	IP. 14	6.00	1072.00	168.85	171.96	173.20
No. 76	IA=42°31'30"	16.00	1088.00	172.31	171.87	173.15
No. 77	IP. 15	84.00	1172.00	174.84	171.87	173.11
No. 78	IA=73°09'14"	100.00	1272.00	173.33	171.89	173.09
No. 79	IP. 16	100.00	1372.00	175.47	171.82	173.06
No. 80	IA=59°33'45"	100.00	1472.00	173.93	171.80	173.04
No. 81	IP. 17	68.00	1540.00	169.48	171.79	173.02
No. 82	IA=42°31'30"	32.00	1572.00	173.92	171.77	173.01
No. 83	IP. 18	13.00	1585.00	174.25	171.77	173.01
No. 84	IA=73°09'14"	85.00	1670.00	175.80	171.74	172.99
No. 85	IP. 19	100.00	1770.00	175.82	171.72	172.96
No. 86	IA=59°33'45"	100.00	1870.00	174.50	171.70	172.94
No. 87	IP. 20	100.00	1970.00	172.13	171.65	172.91
No. 88	IA=42°31'30"	73.00	2043.00	172.93	171.63	172.89
No. 89	IP. 21	43.00	2086.00	172.93	171.63	172.89
No. 90	IA=73°09'14"	17.00	2103.00	172.80	171.62	172.88
No. 91	IP. 22	100.00	2203.00	171.30	171.52	172.86
No. 92	IA=59°33'45"	68.00	2271.00	171.00	171.50	172.84
No. 93	IP. 23	68.00	2339.00	168.80	171.43	172.82
No. 94	IA=42°31'30"	17.00	2356.00	169.00	171.42	172.81
No. 95	IP. 24	100.00	2456.00	173.70	171.40	172.79
No. 96	IA=73°09'14"	100.00	2556.00	174.80	170.97	172.21
No. 97	IP. 25	100.00	2656.00	176.50	170.95	172.19
No. 98	IA=59°33'45"	100.00	2756.00	176.00	170.92	172.16
No. 99	IP. 26	100.00	2856.00	174.00	170.90	172.14
No. 100	IA=42°31'30"	100.00	2956.00	171.90	170.87	172.11
No. 101	IP. 27	42.55	2998.55	171.92	170.86	172.10
No. 102	IA=73°09'14"	57.45	3056.00	171.64	170.85	172.09
No. 103	IP. 28	40.00	3096.00	171.30	170.83	172.07
No. 104	IA=59°33'45"	30.00	3126.00	171.30	170.83	172.07
No. 105	IP. 29	100.00	3226.00	171.95	170.81	172.05
No. 106	IA=42°31'30"	40.00	3266.00	171.97	170.79	172.03
No. 107	IP. 30	60.00	3326.00	171.76	170.77	172.01
No. 108	IA=73°09'14"	110.00	3436.00	171.25	170.75	171.99
No. 109	IP. 31	30.00	3466.00	171.38	170.74	171.98
No. 110	IA=59°33'45"	100.00	3566.00	171.46	170.69	171.93
No. 111	IP. 32	100.00	3666.00	170.97	170.66	171.90
No. 112	IA=42°31'30"	100.00	3766.00	170.97	170.64	171.88
No. 113	IP. 33	86.00	3852.00	171.92	170.62	171.86
No. 114	IA=73°09'14"	70.00	3922.00	170.63	170.59	171.83
No. 115	IP. 34	14.00	3936.00	170.63	170.59	171.83
No. 116	IA=59°33'45"	100.00	4036.00	170.59	170.58	171.82
No. 117	IP. 35	16.00	4052.00	170.58	170.58	171.82
No. 118	IA=42°31'30"	100.00	4152.00	170.58	170.58	171.82

LEGEND

- HEADREACH
- MAIN CANAL
- NATIONAL ROAD
- PAVED ROAD
- FOOT PATH

ABBREVIATIONS

- EP: END POINT
- IP: INTERSECTION POINT
- OC: DRAINAGE CULVERT
- CV: CULVERT
- CD: CROSS DRAIN
- FP: FOOT PATH BRIDGE
- TO: TURNOUT
- CK: CHECK
- WW: WASTEWAY
- SW: SPILLWAY
- SH: SYPHON
- PS: PUBLIC STEP

HORIZONTAL SCALE
0 100 200 300 400 500m

VERTICAL SCALE
0 1 2 3 4 5m

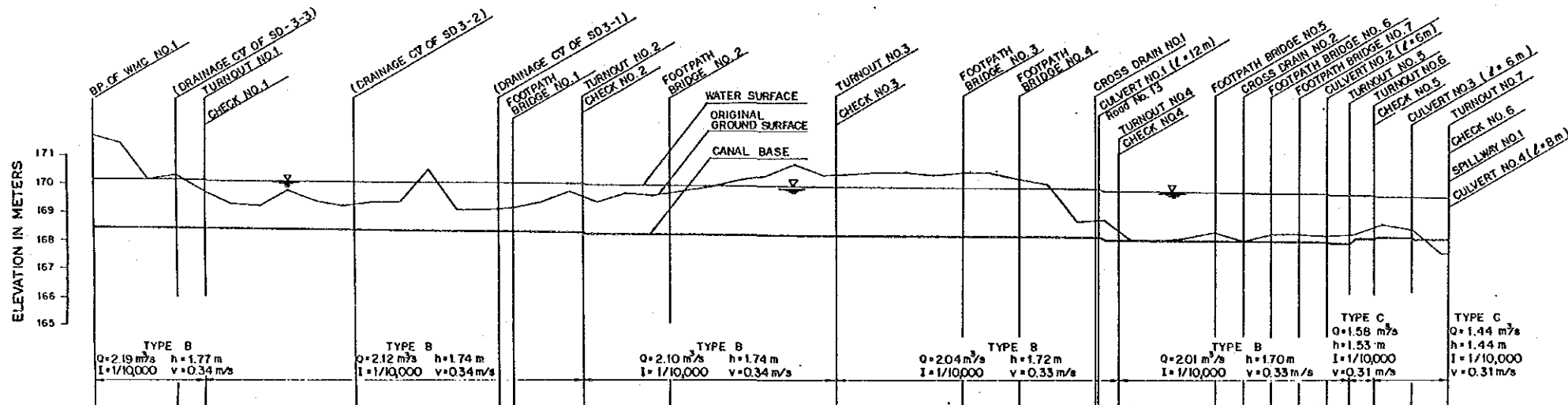
LAO PEOPLE'S DEMOCRATIC REPUBLIC

AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
IN THE SUBURBS OF VIENTIANE

TITLE OF DRAWING
IRRIGATION CANALS AND FARM ROADS
PLAN AND PROFILE OF HEADREACH (2/2)

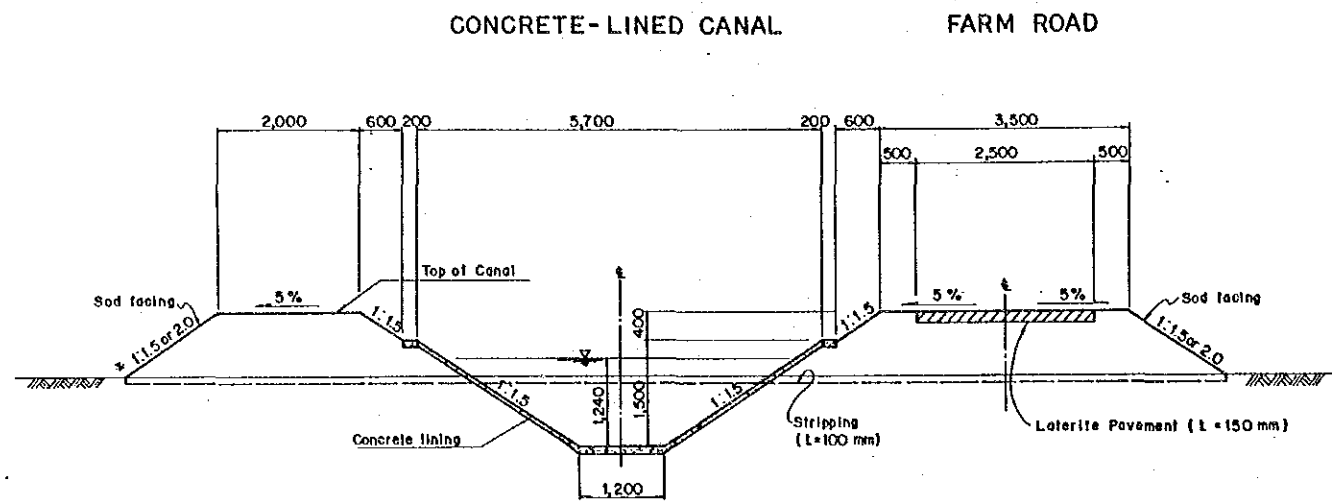
Date	Drawing No.	3002
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JAPAN INTERNATIONAL COOPERATION AGENCY



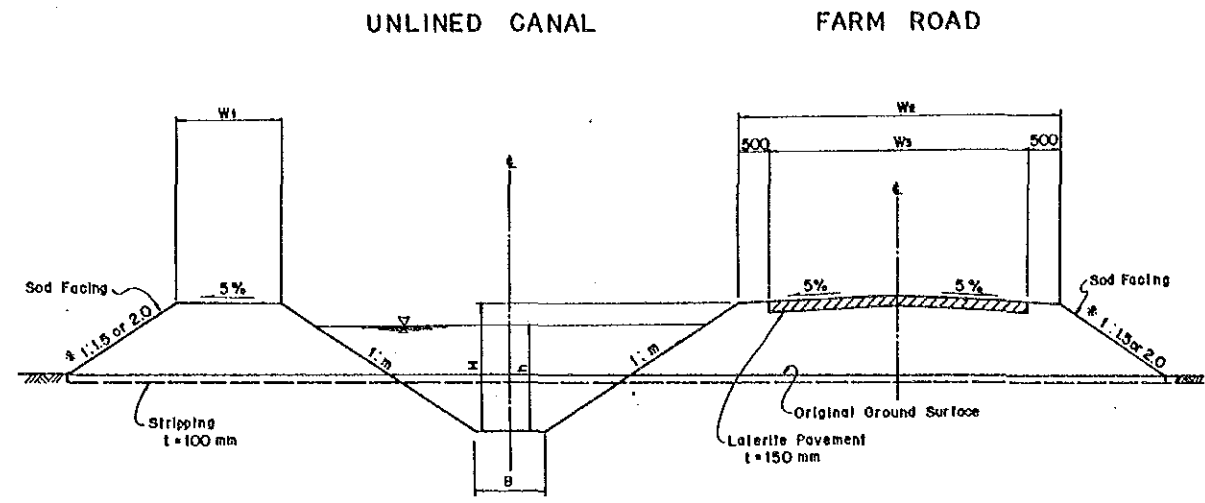
WATER SURFACE ELEVATION	CANAL BASE ELEVATION	ORIGINAL GROUND SURFACE	ACCUMULATED DISTANCE	DISTANCE	STATION	CURVE
170.44	168.37	171.68	0.00	0.00	No. 0	
170.13	168.36	171.42	100.00	100.00	No. 1	
170.12	168.33	170.14	200.00	100.00	No. 2	
170.11	168.34	170.28	300.00	100.00	No. 3	
170.09	168.33	169.69	400.00	100.00	No. 4	
170.07	168.32	169.69	492.00	192.00	No. 4	
170.06	168.32	169.26	500.00	200.00	No. 5	
170.03	168.31	169.19	600.00	300.00	No. 6	
170.04	168.30	169.73	700.00	400.00	No. 7	
170.04	168.30	169.70	710.00	410.00	No. 7	
170.03	168.29	169.36	800.00	500.00	No. 8	
170.02	168.28	169.14	900.00	600.00	No. 9	
170.02	168.28	169.20	940.00	640.00	No. 9	
170.02	168.27	169.20	940.00	640.00	No. 9	
170.01	168.27	169.30	1000.00	700.00	No. 10	
170.00	168.26	169.32	1100.00	800.00	No. 11	
169.99	168.25	170.45	1200.00	900.00	No. 12	
169.98	168.24	169.06	1300.00	1000.00	No. 13	
169.97	168.23	169.03	1400.00	1100.00	No. 14	
169.97	168.23	169.05	1450.00	1150.00	No. 14	
169.97	168.22	169.07	1500.00	1200.00	No. 15	
169.96	168.21	169.28	1600.00	1300.00	No. 16	
169.95	168.20	169.25	1680.00	1380.00	No. 16	
169.94	168.19	169.49	1700.00	1500.00	No. 17	
169.94	168.18	169.49	1750.00	1550.00	No. 17	
169.93	168.17	169.29	1800.00	1600.00	No. 18	
169.93	168.16	169.29	1800.00	1600.00	No. 18	
169.93	168.15	169.36	1900.00	1700.00	No. 19	
169.88	168.14	169.49	2000.00	1800.00	No. 20	
169.88	168.14	169.60	2050.00	1850.00	No. 20	
169.87	168.13	169.67	2100.00	1900.00	No. 21	
169.86	168.12	169.82	2200.00	2000.00	No. 22	
169.85	168.11	170.03	2300.00	2100.00	No. 23	
169.84	168.10	170.20	2400.00	2200.00	No. 24	
169.83	168.09	170.26	2500.00	2300.00	No. 25	
169.82	168.08	170.23	2600.00	2400.00	No. 26	
169.82	168.07	170.42	2650.00	2450.00	No. 26	
169.81	168.06	170.26	2700.00	2500.00	No. 27	
169.81	168.05	170.31	2800.00	2600.00	No. 28	
169.77	168.03	170.31	2850.00	2650.00	No. 28	
169.76	168.04	170.33	2900.00	2700.00	No. 29	
169.75	168.03	170.20	3000.00	2800.00	No. 30	
169.74	168.02	170.27	3100.00	2900.00	No. 31	
169.73	168.01	170.26	3200.00	3000.00	No. 32	
169.72	168.00	170.06	3300.00	3100.00	No. 33	
169.71	167.99	169.84	3400.00	3200.00	No. 34	
169.70	167.98	168.52	3500.00	3300.00	No. 35	
169.70	167.97	168.53	3550.00	3350.00	No. 35	
169.69	167.96	168.50	3600.00	3400.00	No. 36	
169.69	167.95	168.50	3650.00	3450.00	No. 36	
169.68	167.94	168.50	3700.00	3500.00	No. 37	
169.68	167.93	168.50	3750.00	3550.00	No. 37	
169.67	167.92	168.50	3800.00	3600.00	No. 38	
169.60	167.90	167.90	3800.00	3600.00	No. 38	
169.59	167.89	167.98	3900.00	3700.00	No. 39	
169.58	167.88	168.16	4000.00	3800.00	No. 40	
169.57	167.87	168.15	4050.00	3850.00	No. 40	
169.57	167.86	168.15	4100.00	3900.00	No. 41	
169.56	167.85	168.15	4100.00	3900.00	No. 41	
169.55	167.84	168.11	4200.00	4000.00	No. 42	
169.55	167.83	168.09	4300.00	4100.00	No. 43	
169.55	167.82	168.03	4400.00	4200.00	No. 44	
169.54	167.81	168.03	4416.00	4216.00	No. 44	
169.54	167.80	168.03	4500.00	4300.00	No. 45	
169.53	167.79	168.03	4600.00	4400.00	No. 46	
169.53	167.78	168.03	4700.00	4500.00	No. 47	
169.52	167.77	168.03	4800.00	4600.00	No. 48	
169.51	167.76	168.03	4900.00	4700.00	No. 49	
169.51	167.75	168.03	5000.00	4800.00	No. 50	
169.41	167.64	167.42	5000.00	4800.00	No. 50	

LAO PEOPLE'S DEMOCRATIC REPUBLIC
 AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
 IN THE SUBURBS OF VIENTIANE
 TITLE OF DRAWING
 IRRIGATION CANALS AND FARM ROADS
 PROFILE OF WEST MAIN CANAL NO.1
 Date _____ Drawing No. _____ 3003
 JAPAN INTERNATIONAL COOPERATION AGENCY



* Note : Outer slope of canal and road shall be as follows.
 Elevation of Top of canal - Elevation of OGS \leq 2.5 m : 1 : 1.5
 Elevation of Top of canal - Elevation of OGS $>$ 2.5 m : 1 : 2.0

TYPICAL CROSS SECTION SCALE - A
 (Type A)



Note : Laterite pavement will be provided only on the top of farm roads for headreach, main and secondary canals

TYPICAL CROSS SECTION SCALE - A
 (Type A, B)

CANAL DIMENSION TABLE

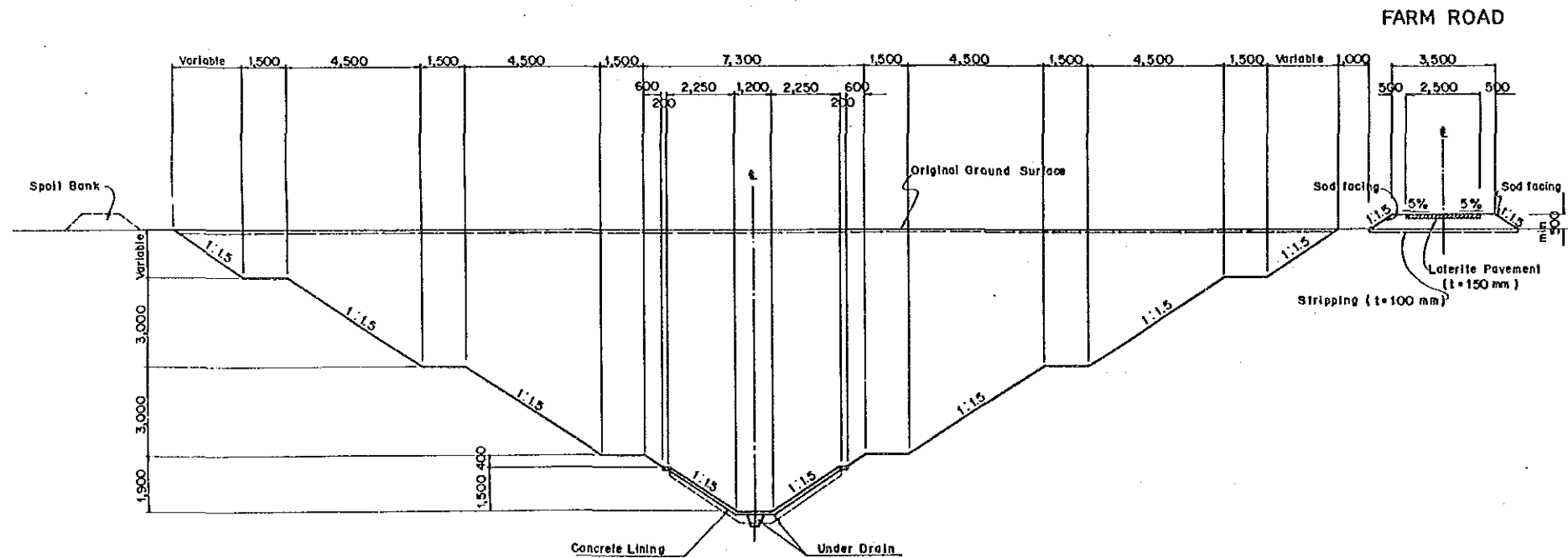
Canal Type	B	H	h max	W1	W2	W3	m
A	1,200	1,500	1,240	2,000	3,500	2,500	1.5

unit : mm

CANAL DIMENSION TABLE

Canal Type	B	H	h max	W1	W2	W3	m
B	1,000	2,000	1,770	1,500	4,500	3,500	1.5
C	1,000	2,000	1,530	1,500	4,500	3,500	1.5

unit : mm

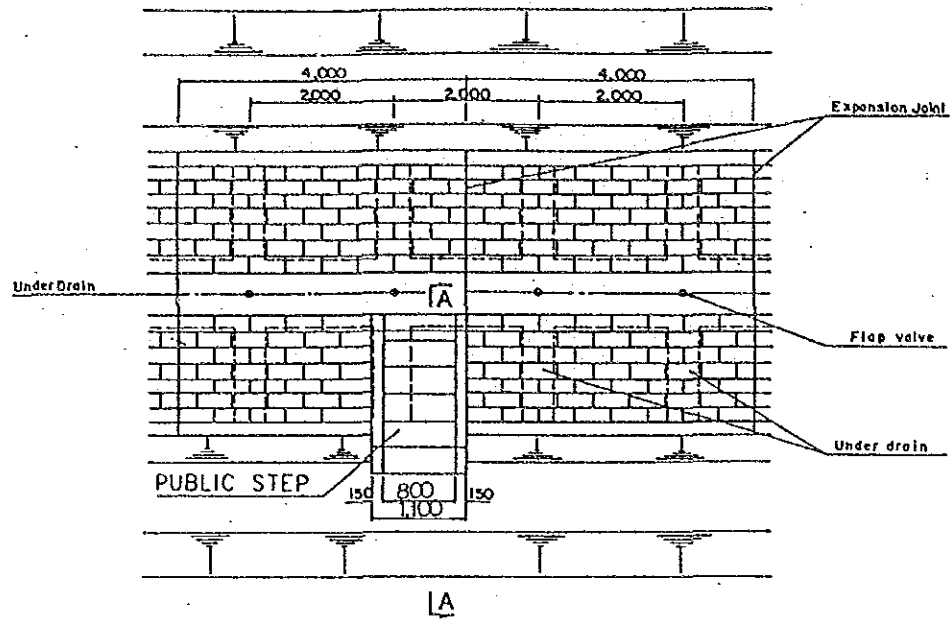


TYPICAL CROSS SECTION OF DEEP CUT SCALE - B
 (Type A)

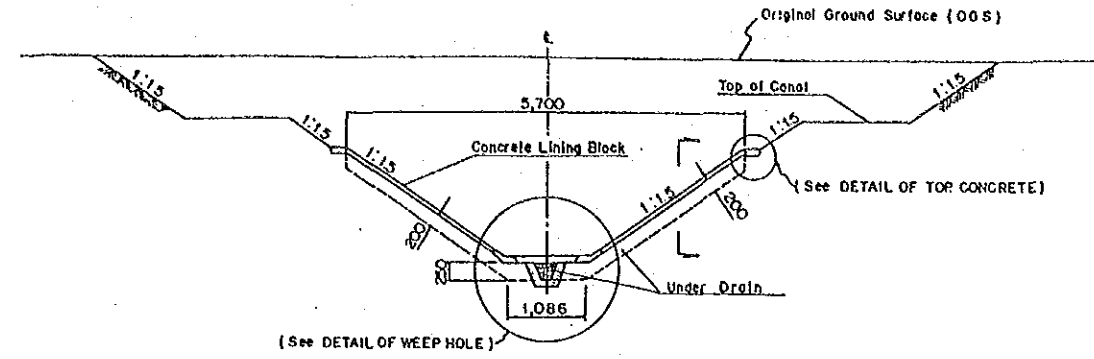
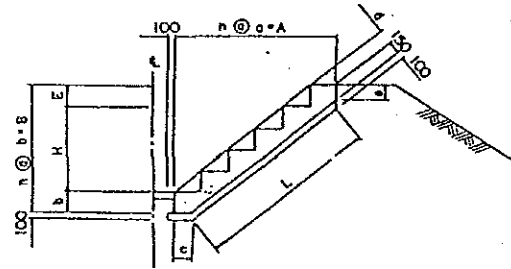


LAO PEOPLE'S DEMOCRATIC REPUBLIC			
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE			
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS TYPICAL CROSS SECTIONS			
Date		Drawing No.	3004
JAPAN INTERNATIONAL COOPERATION AGENCY			

PUBLIC STEP

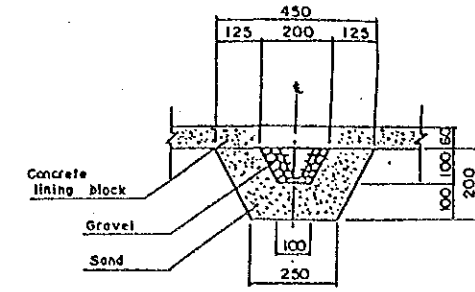


P L A N
SCALE : A

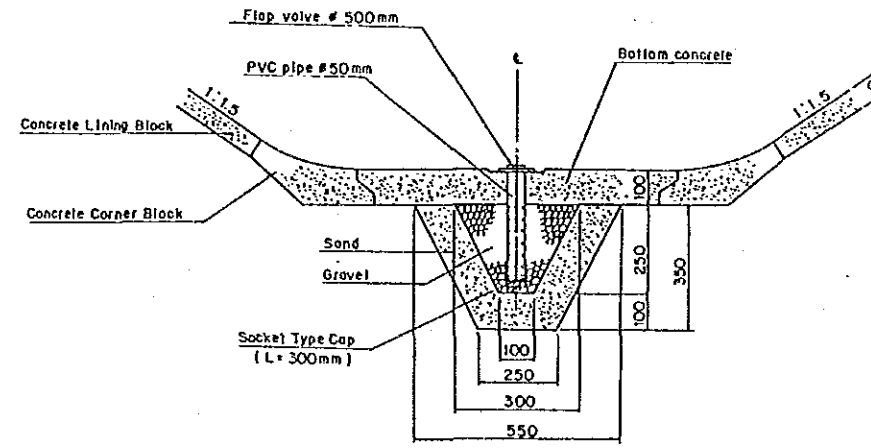
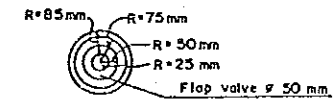


Note : Under Drain shall be provided when Elevation of OGS is higher than Elevation of Top of Canal.

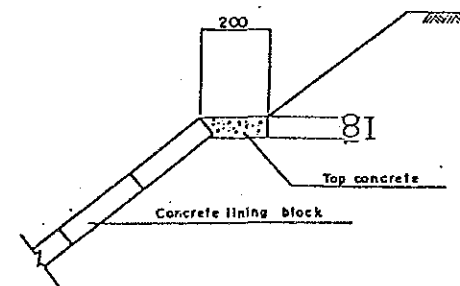
TYPICAL CROSS SECTION OF UNDER DRAIN
SCALE : A



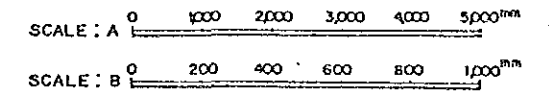
SECTION C-C
SCALE : B



DETAIL OF WEEP HOLE
SCALE : B



DETAIL OF TOP CONCRETE
SCALE : B

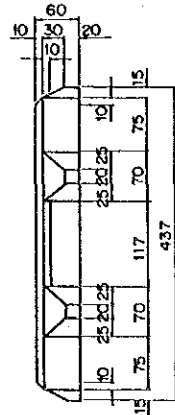
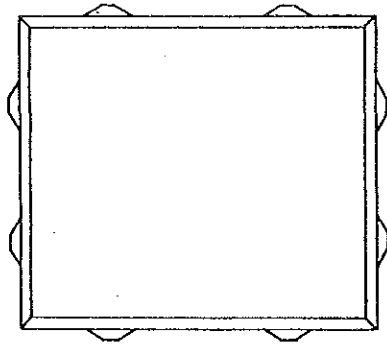
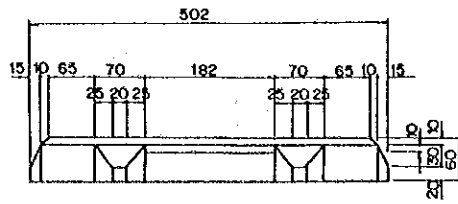


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS CANAL LINING AND UNDERDRAIN / PUBLIC STEPS		
Date	Drawing No.	3005
JAPAN INTERNATIONAL COOPERATION AGENCY		

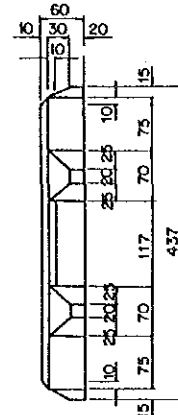
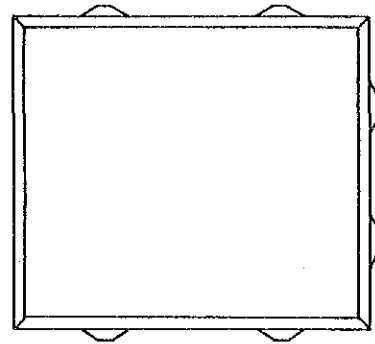
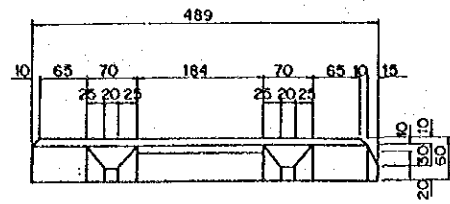
CONCRETE LINING BLOCK

SCALE - A

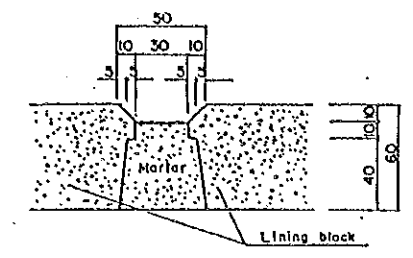
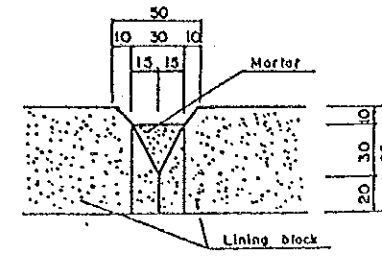
TYPE - A



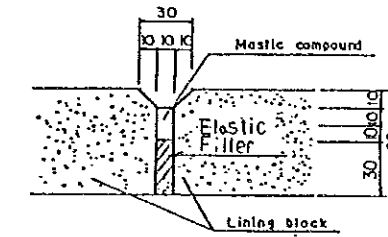
TYPE - B



JOINT
SCALE - B



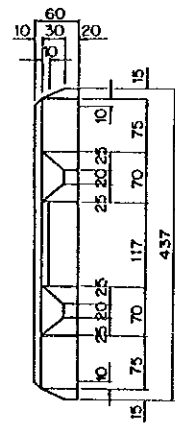
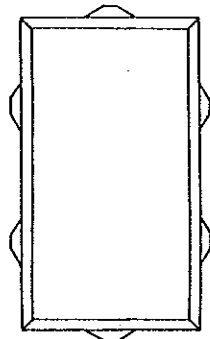
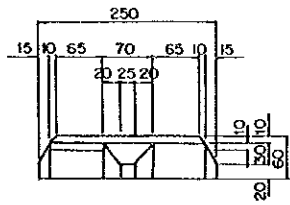
EXPANSION JOINT
SCALE - B



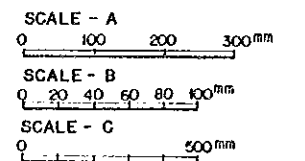
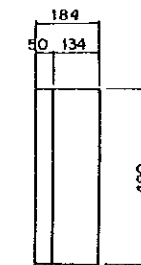
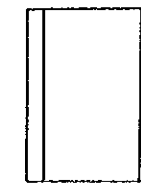
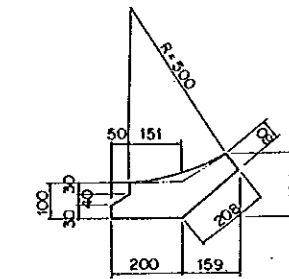
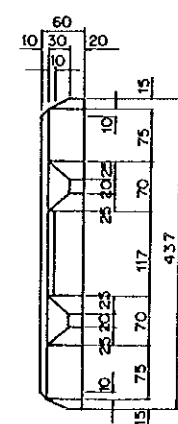
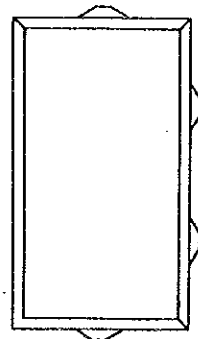
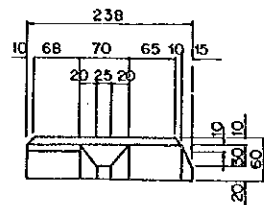
CONCRETE CORNER BLOCK (TYPE - E)

SCALE - C

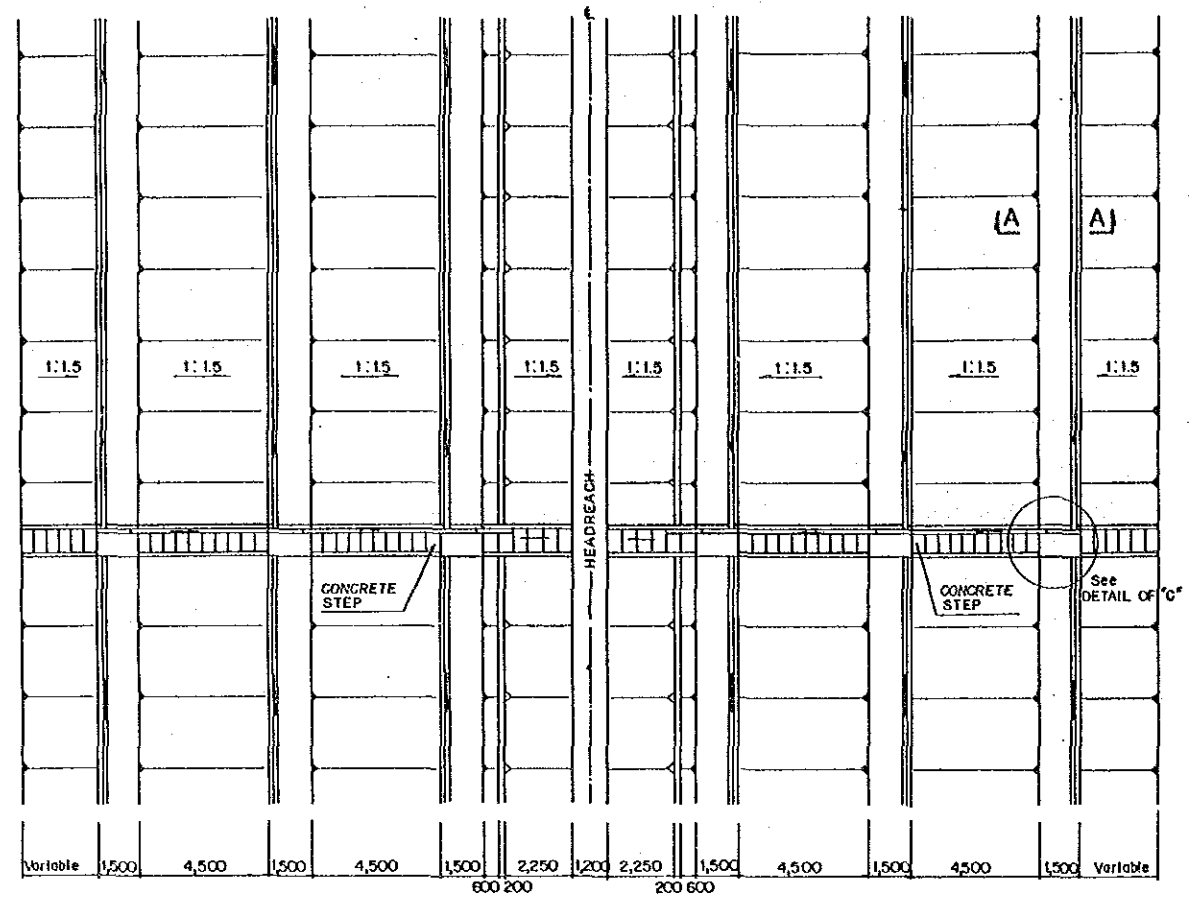
TYPE - C



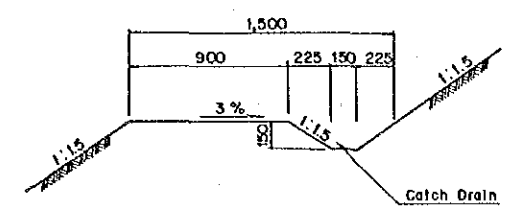
TYPE - D



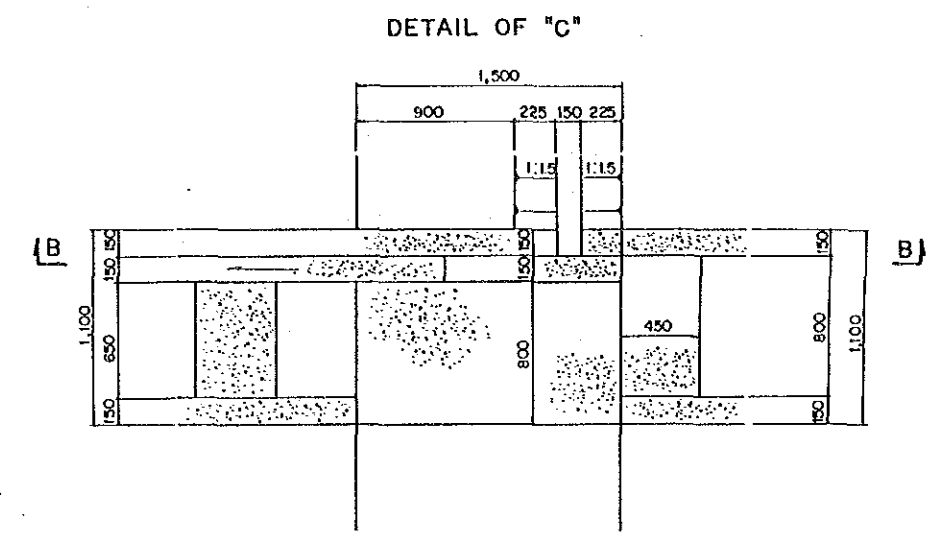
LAO PEOPLE'S DEMOCRATIC REPUBLIC			
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE			
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS CONCRETE LINING BLOCKS			
Date		Drawing No.	3006
JAPAN INTERNATIONAL COOPERATION AGENCY			



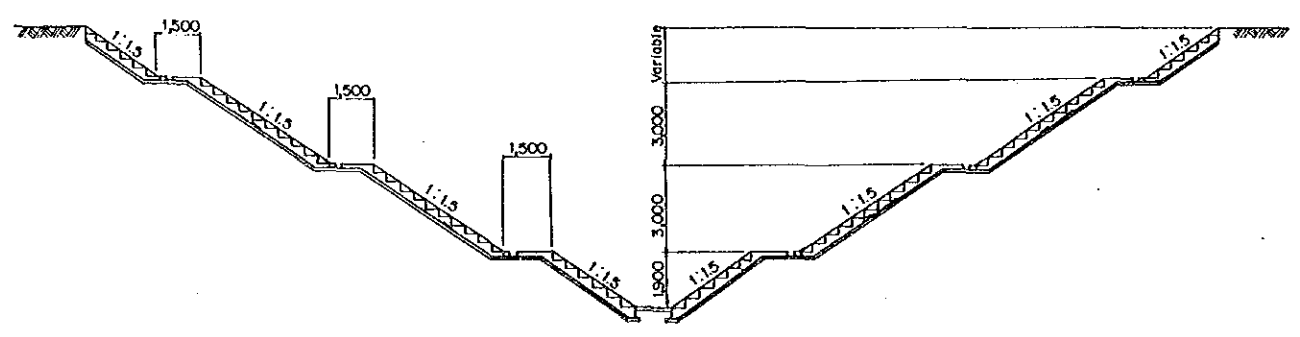
PLAN SCALE - A



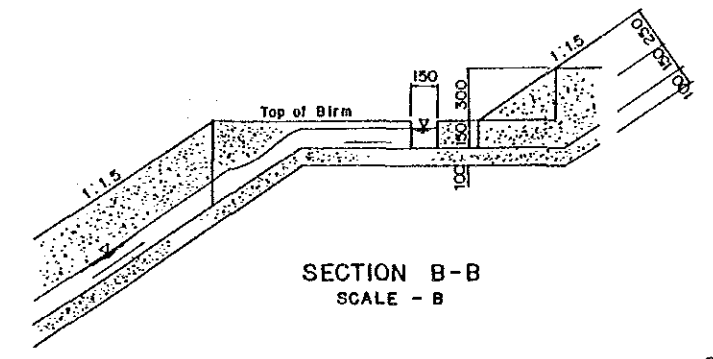
SECTION A-A SCALE - B



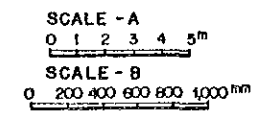
PLAN SCALE - B



PROFILE SCALE - A



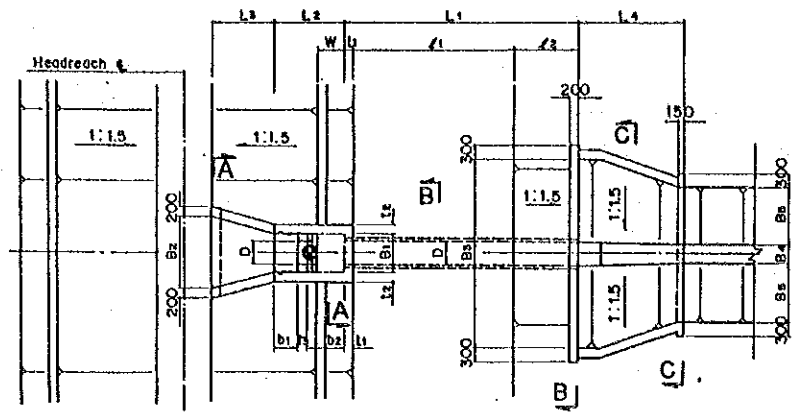
SECTION B-B SCALE - B



NOTE : CONCRETE STEP SHALL BE PROVIDED ON EVERY 100 METERS OF DEEP CUT PORTION IN HEADREACH.

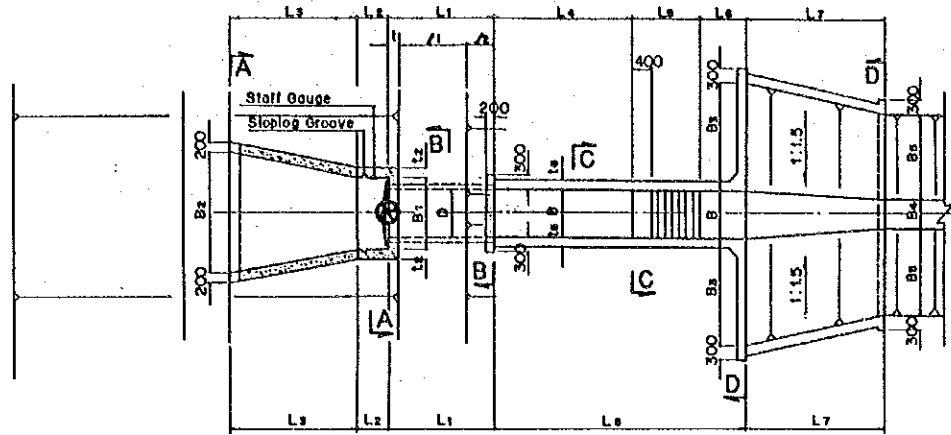
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS SLOPE PROTECTION WORKS ON HEADREACH		
Date	Drawing No.	3007
JAPAN INTERNATIONAL COOPERATION AGENCY		

TYPE - A



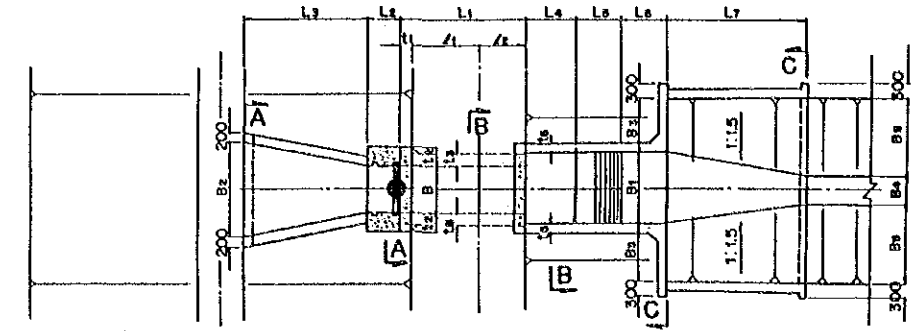
PLAN SCALE - A

TYPE - B

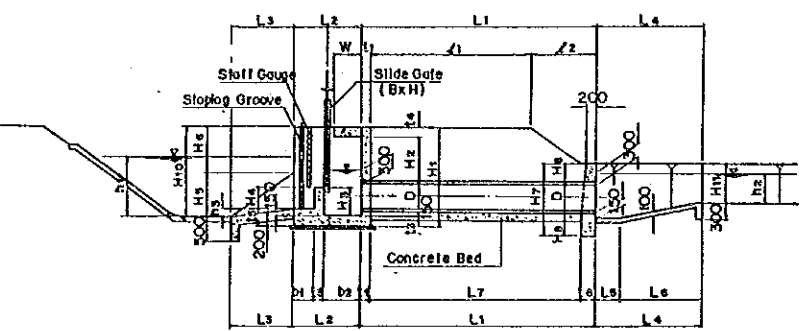


PLAN SCALE - A

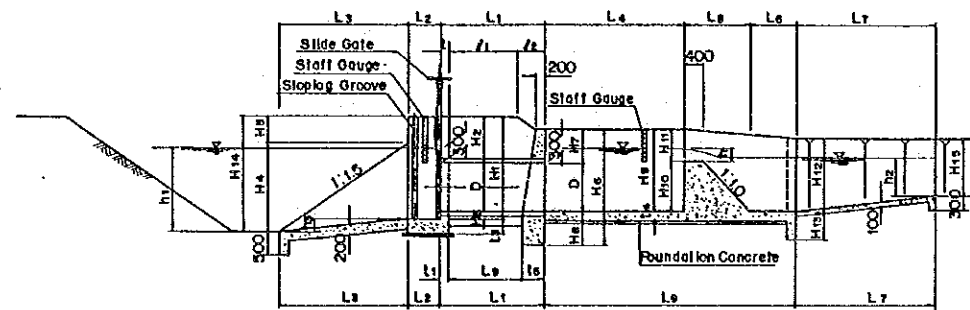
TYPE - C



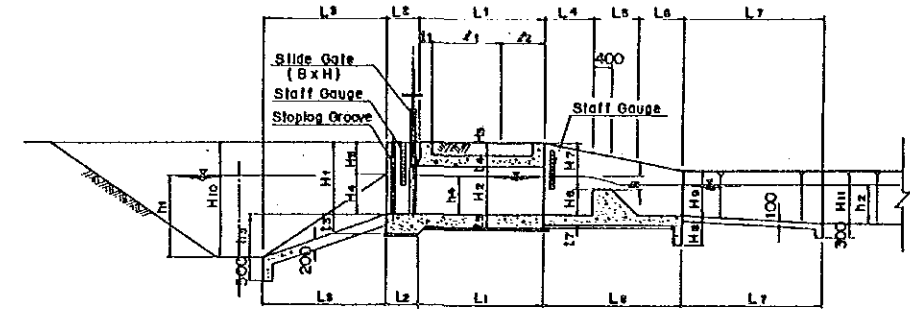
PLAN SCALE - A



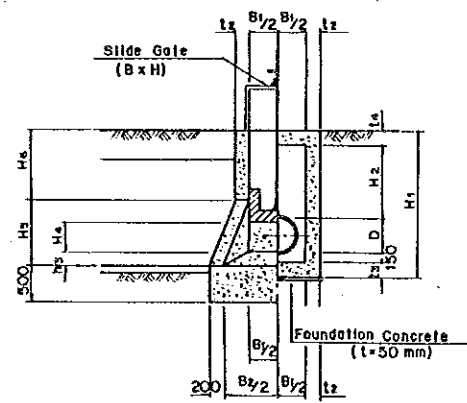
PROFILE SCALE - A



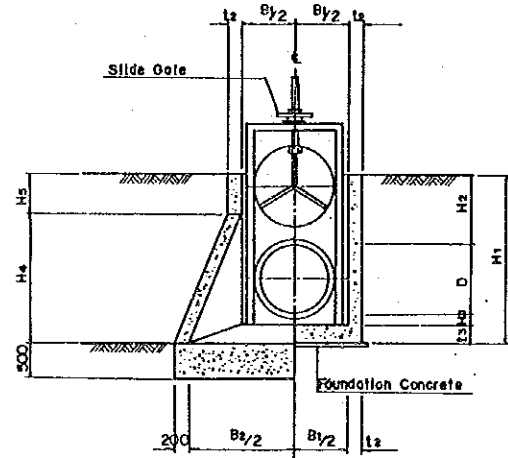
PROFILE SCALE - A



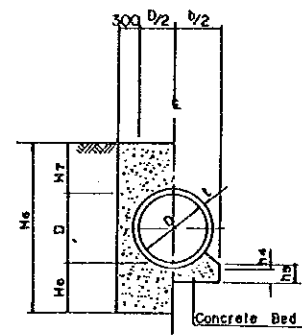
PROFILE SCALE - A



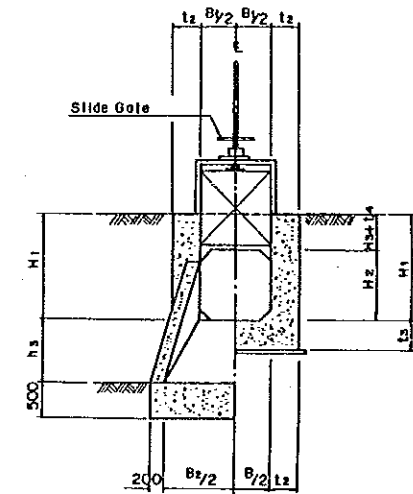
SECTION A-A SCALE - B



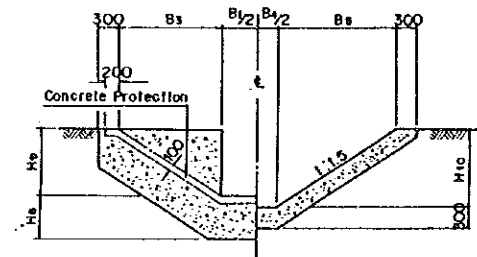
SECTION A-A SCALE - B



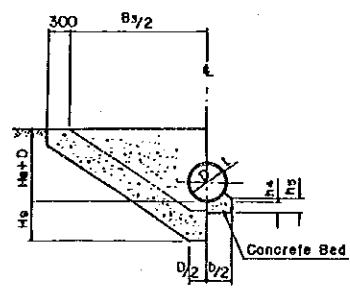
SECTION B-B SCALE - B



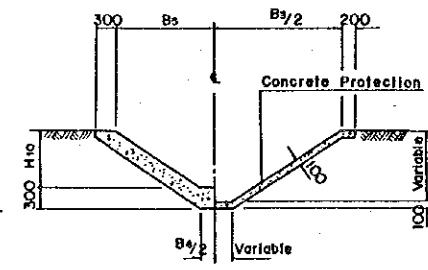
SECTION A-A SCALE - B



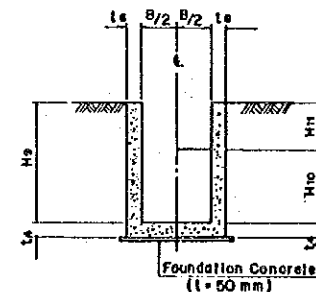
SECTION C-C SCALE - B



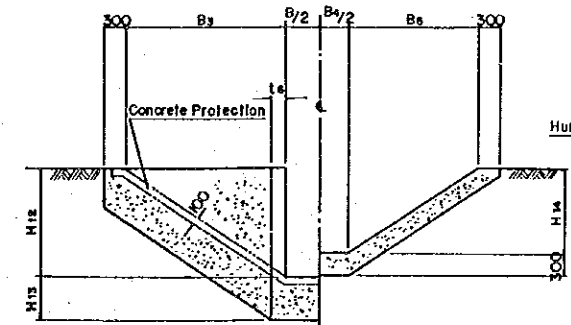
SECTION B-B SCALE - B



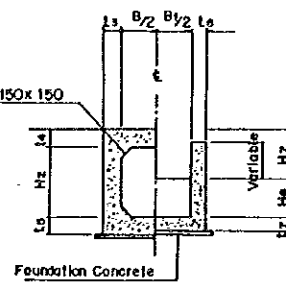
SECTION C-C SCALE - B



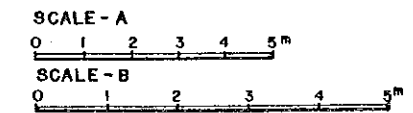
SECTION C-C SCALE - B



SECTION D-D SCALE - B

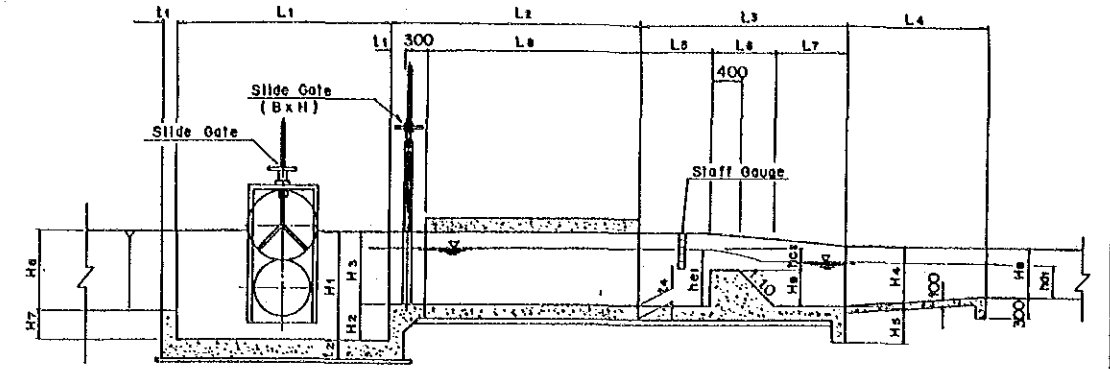
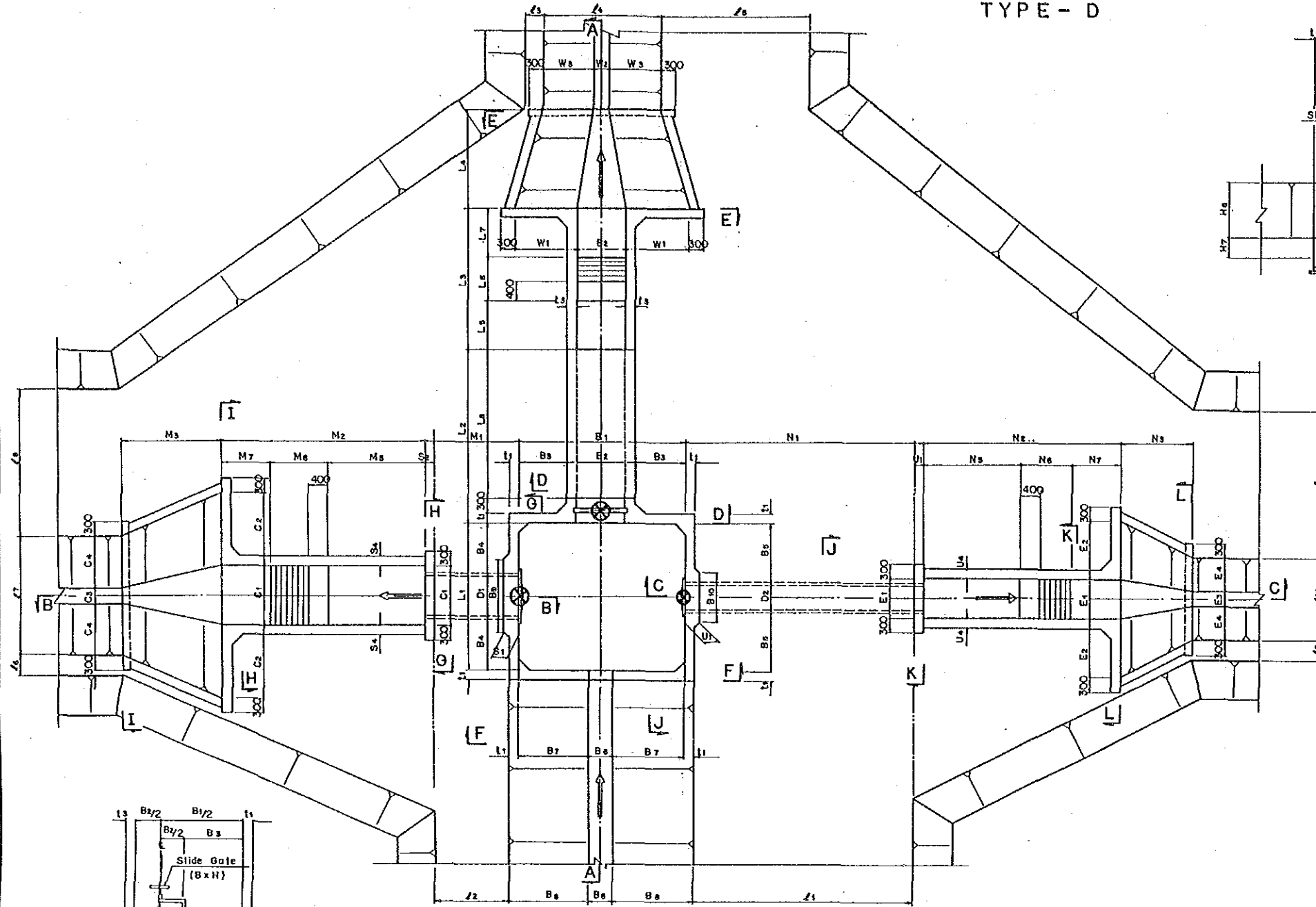


SECTION B-B SCALE - B

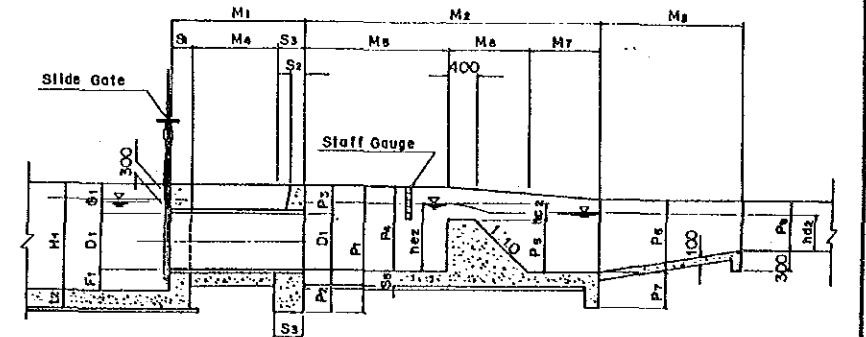


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS TURNOUTS (1/2)		
Date	Drawing No.	3008
JAPAN INTERNATIONAL COOPERATION AGENCY		

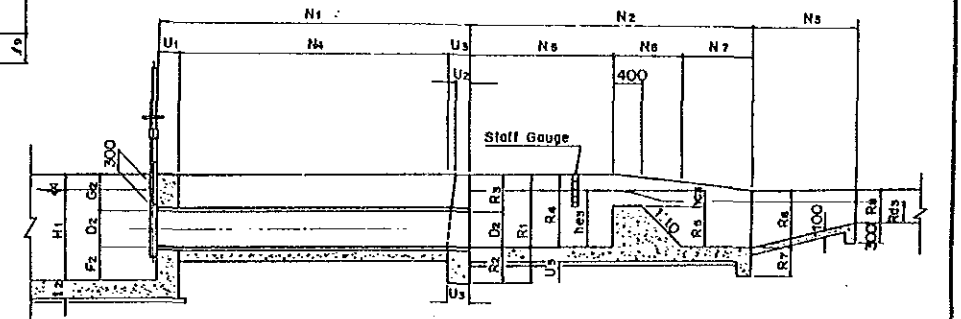
TYPE - D



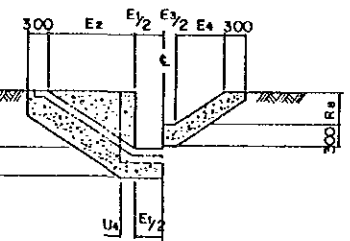
SECTION A-A



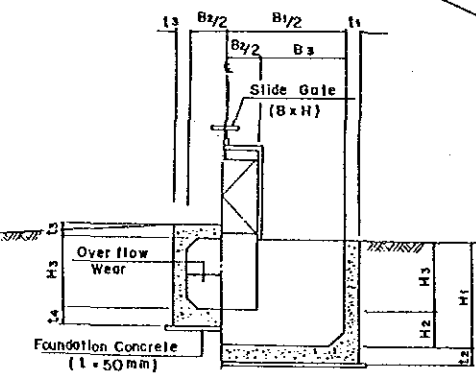
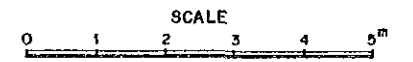
SECTION B-B



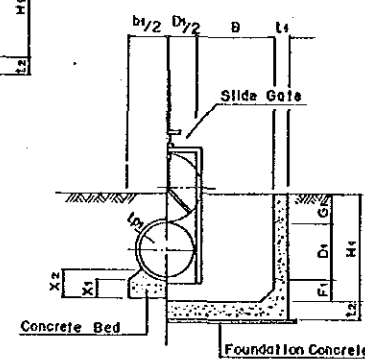
SECTION C-C



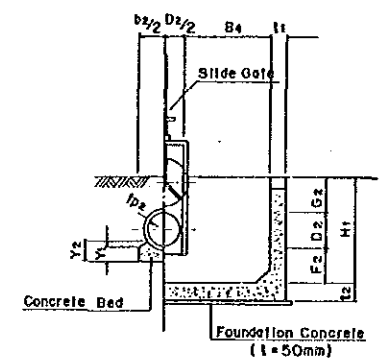
SECTION L-L



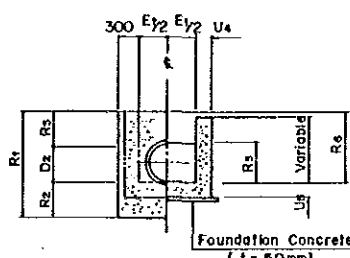
SECTION D-D



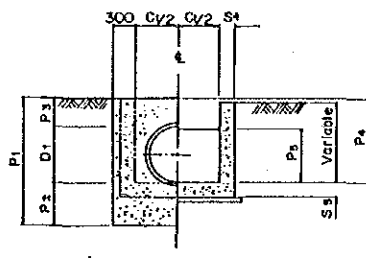
SECTION O-O



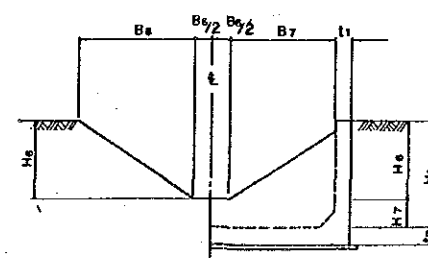
SECTION J-J



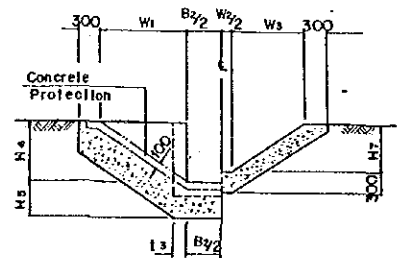
SECTION K-K



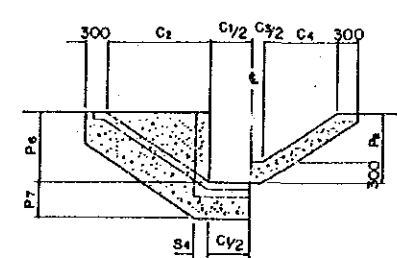
SECTION H-H



SECTION F-F

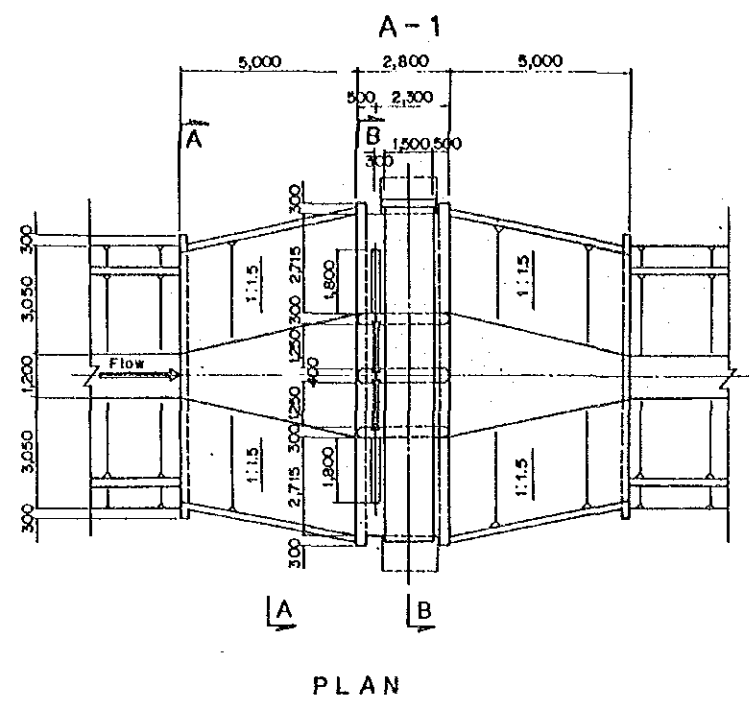


SECTION E-E



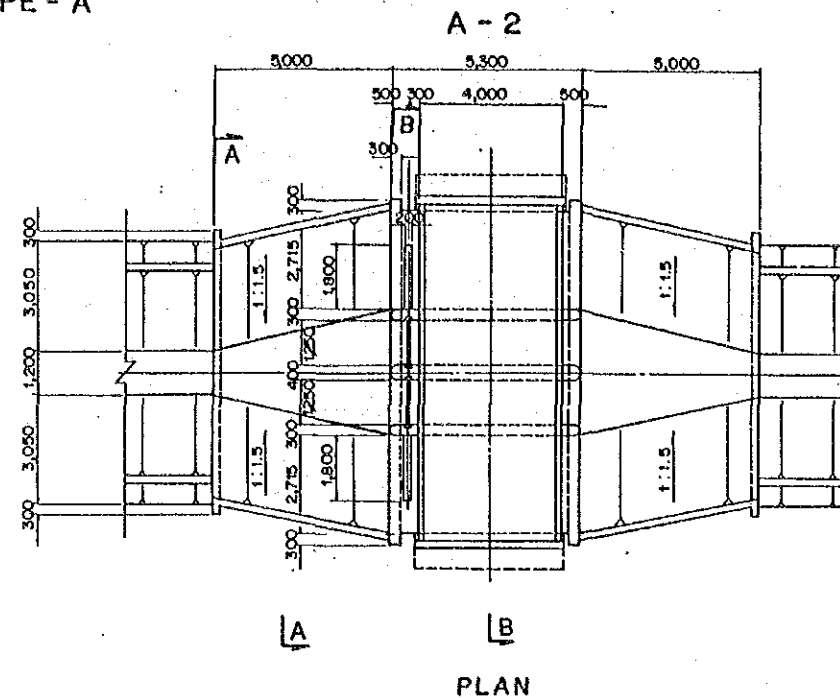
SECTION I-I

LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS TURNOUTS (2/2)		
Date	Drawing No.	3009
JAPAN INTERNATIONAL COOPERATION AGENCY		



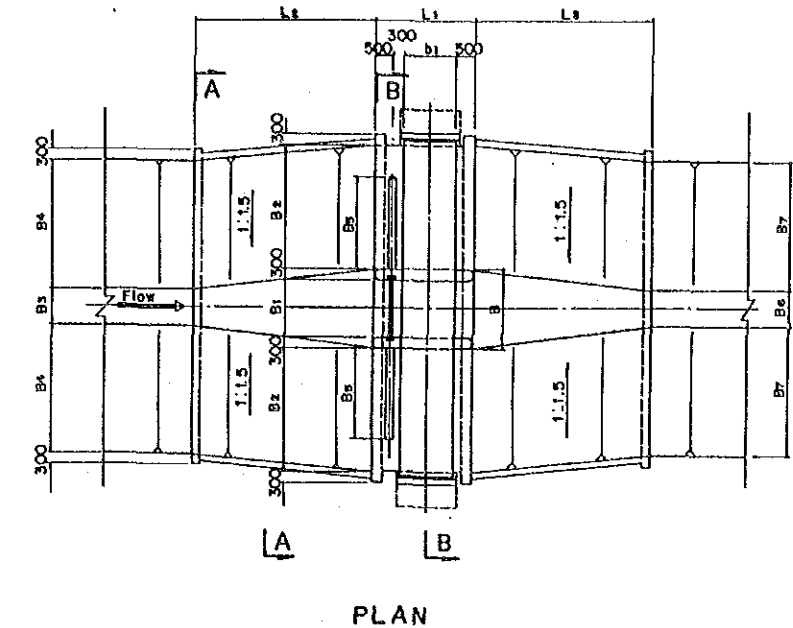
PLAN

TYPE - A

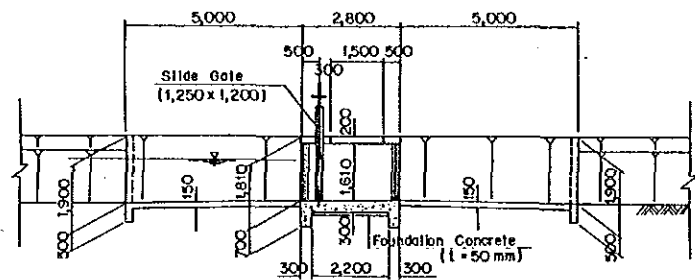


PLAN

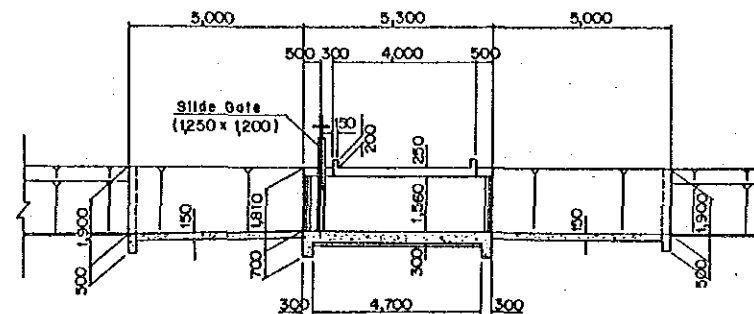
TYPE - B



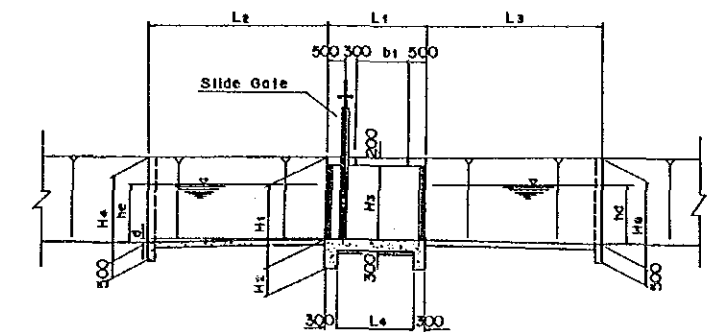
PLAN



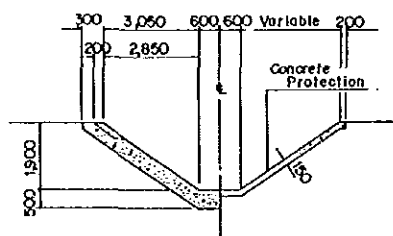
PROFILE



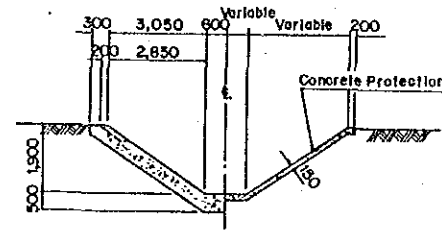
PROFILE



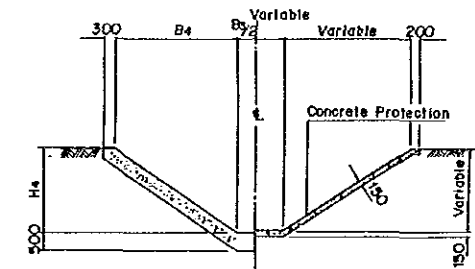
PROFILE



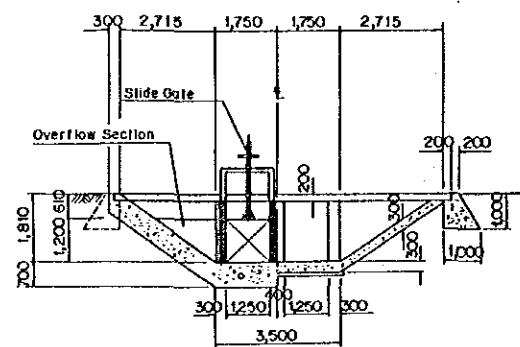
SECTION A-A



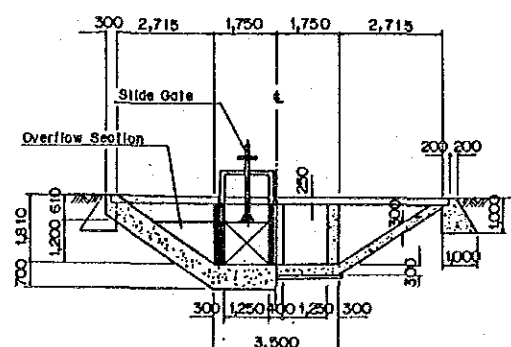
SECTION A-A



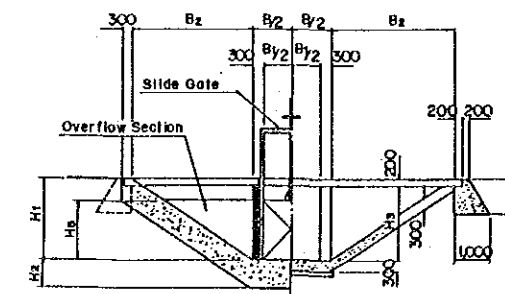
SECTION A-A



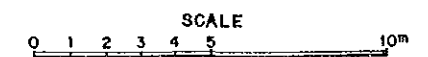
SECTION B-B



SECTION B-B

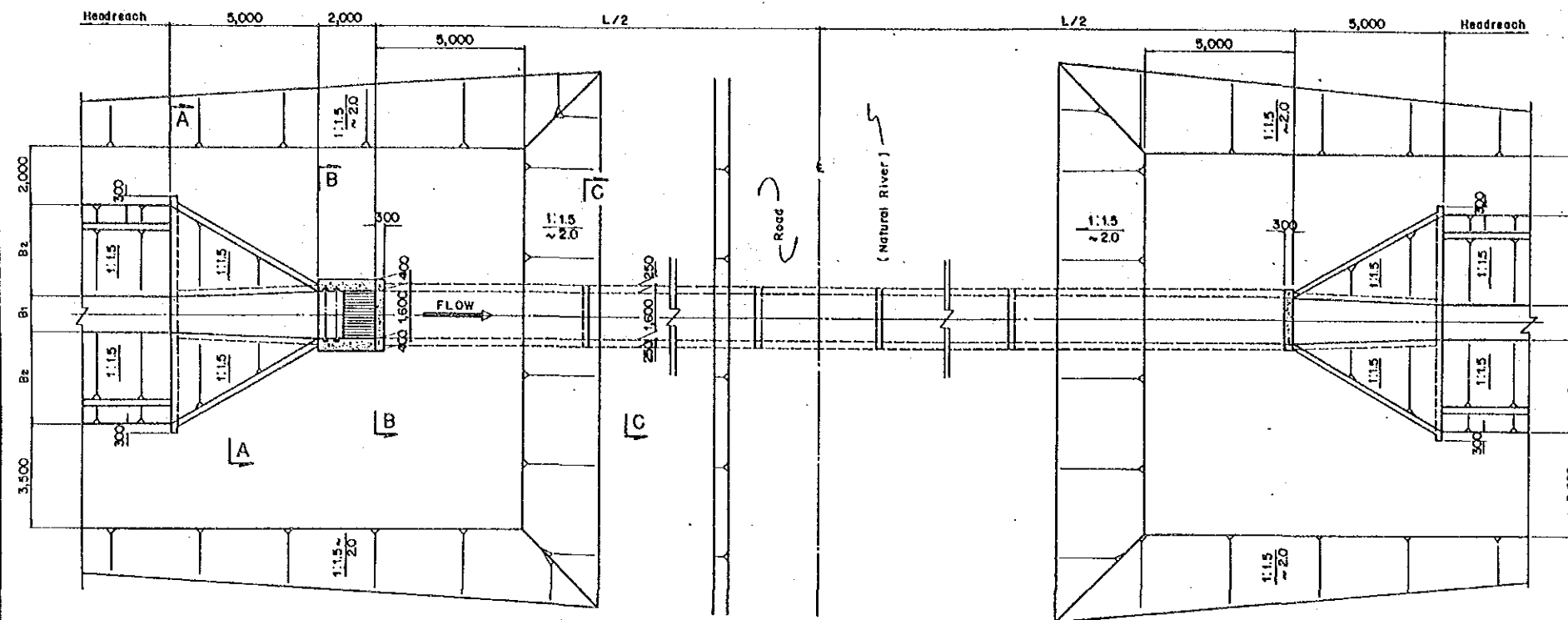


SECTION B-B

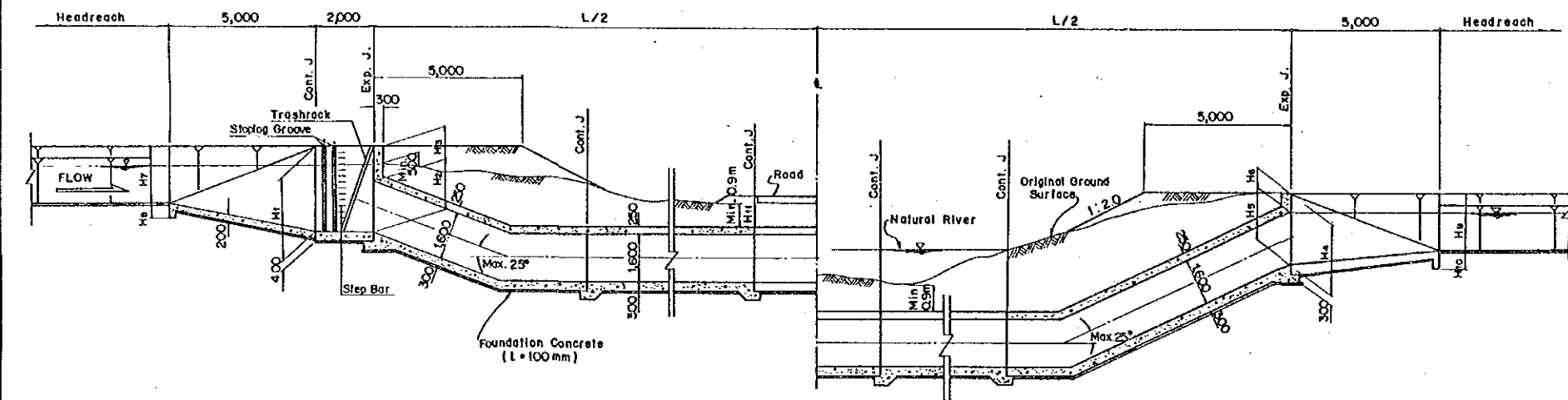


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
IRRIGATION CANALS AND FARM ROADS		
CHECKS		
Date	Drawing No.	3010
JAPAN INTERNATIONAL COOPERATION AGENCY		

TYPE - A

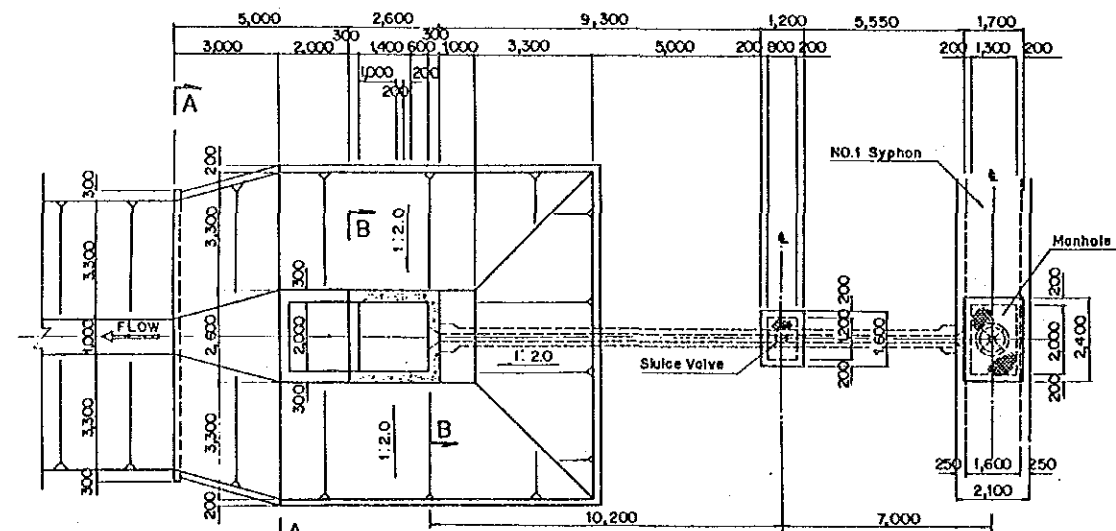


PLAN

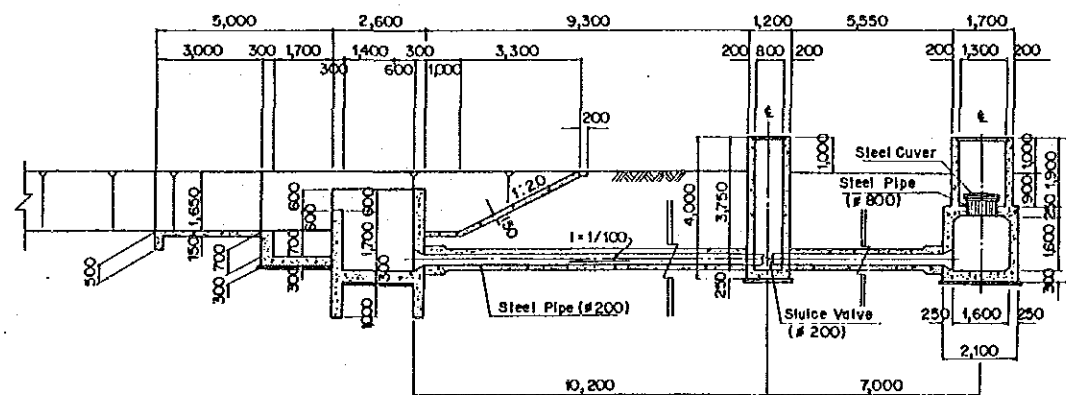


PROFILE

BLOW OFF

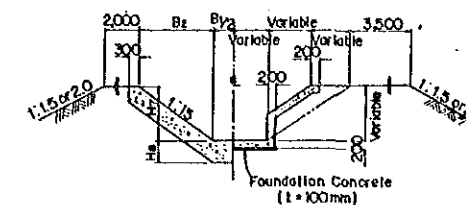


PLAN

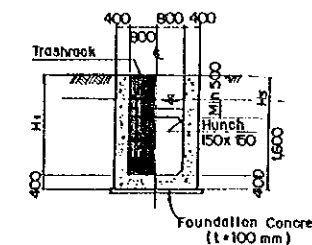


PROFILE

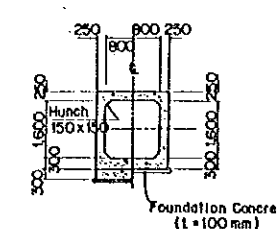
SYPHON TYPE - A



SECTION A-A

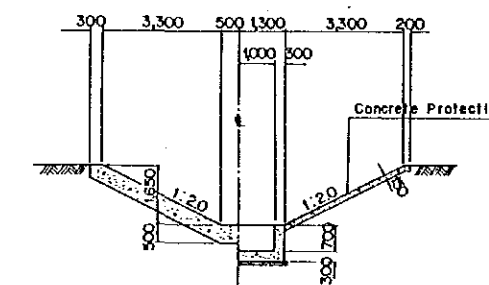


SECTION B-B

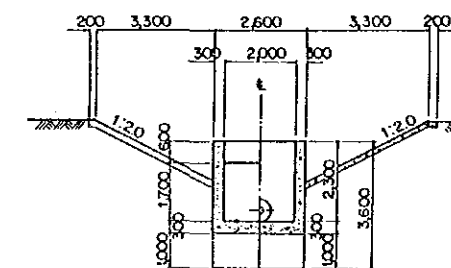


SECTION C-C

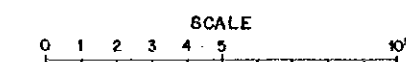
BLOW OFF



SECTION A-A

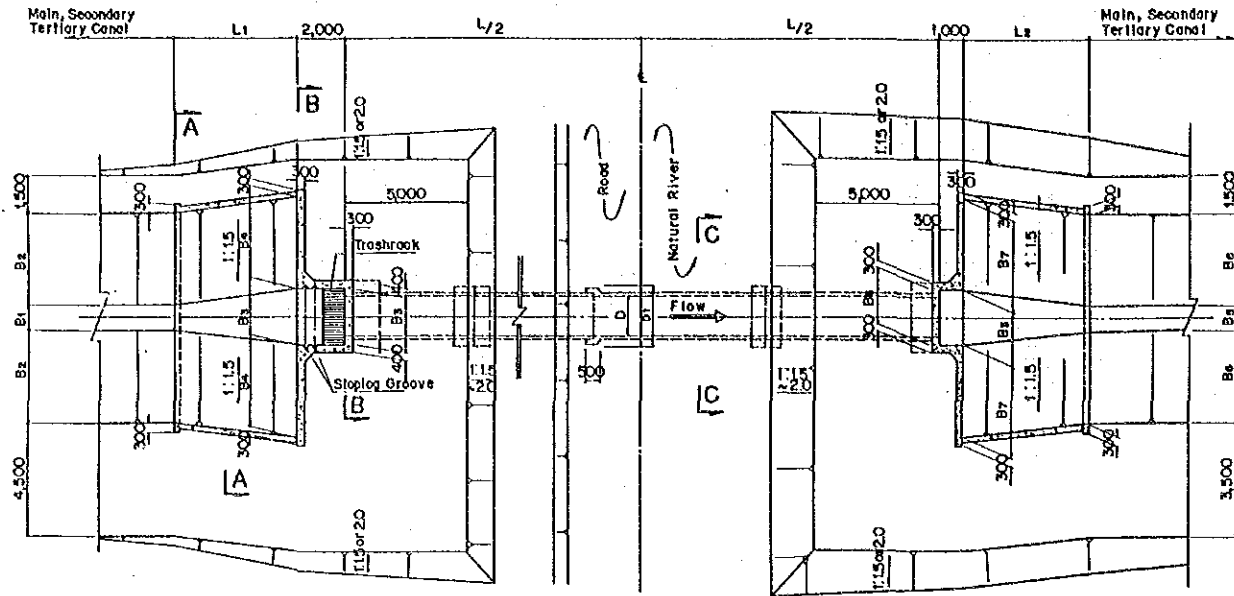


SECTION B-B

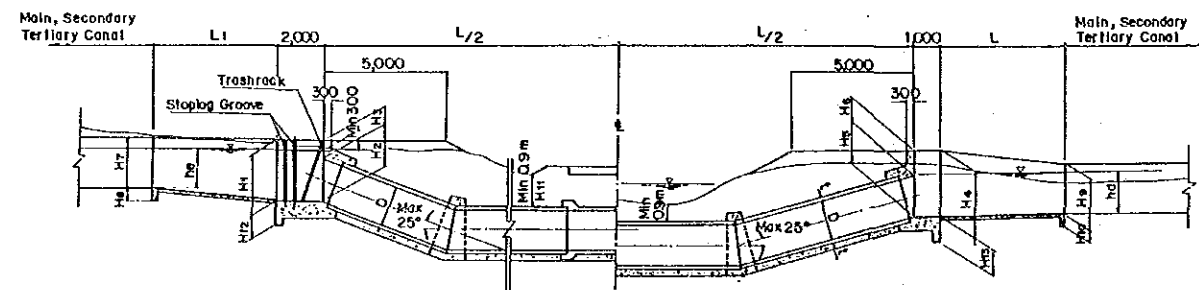


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS SYPHONS (1/2)		
Date	Drawing No.	3011
JAPAN INTERNATIONAL COOPERATION AGENCY		

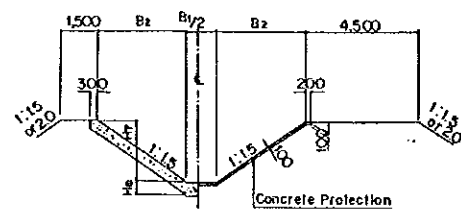
TYPE - B



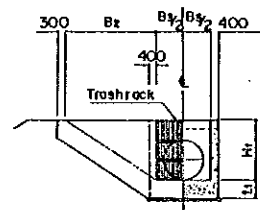
PLAN



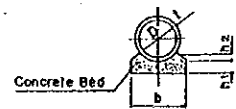
PROFILE



SECTION A-A

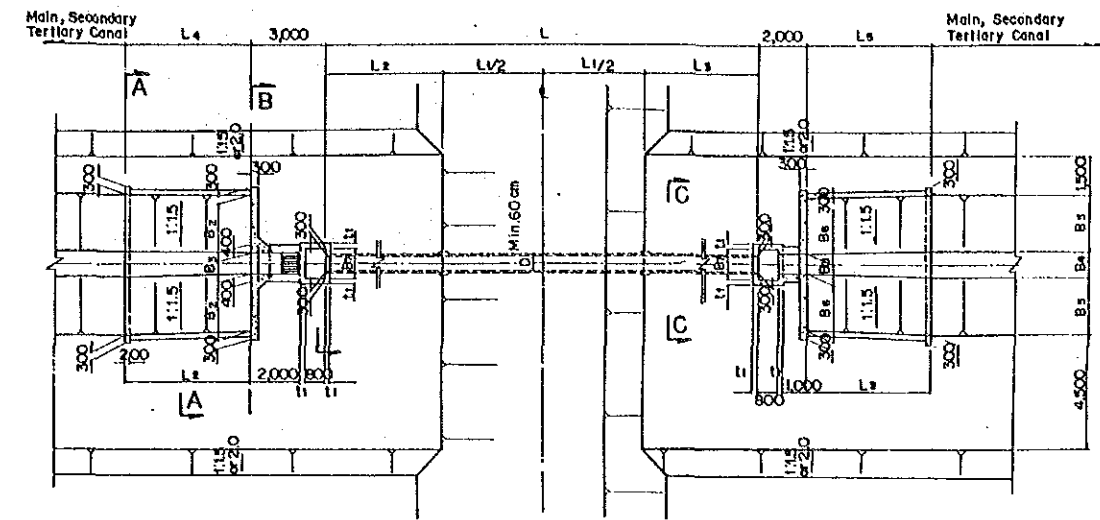


SECTION B-B

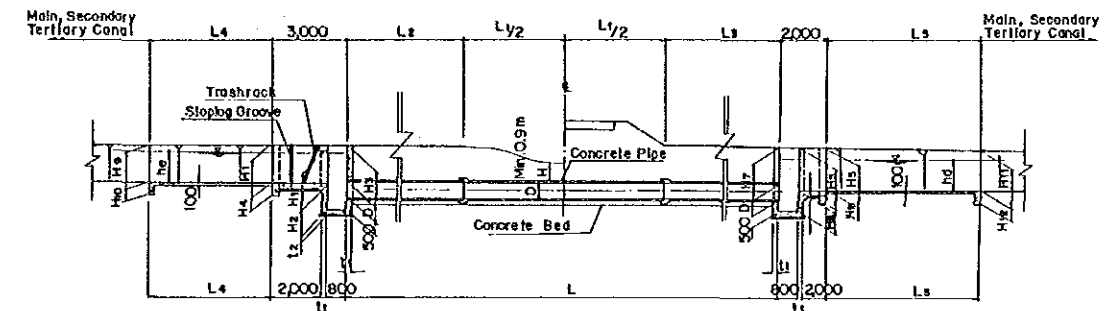


SECTION C-C

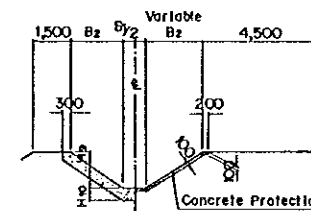
TYPE - C



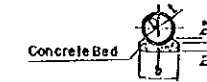
PLAN



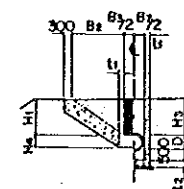
PROFILE



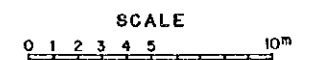
SECTION A-A



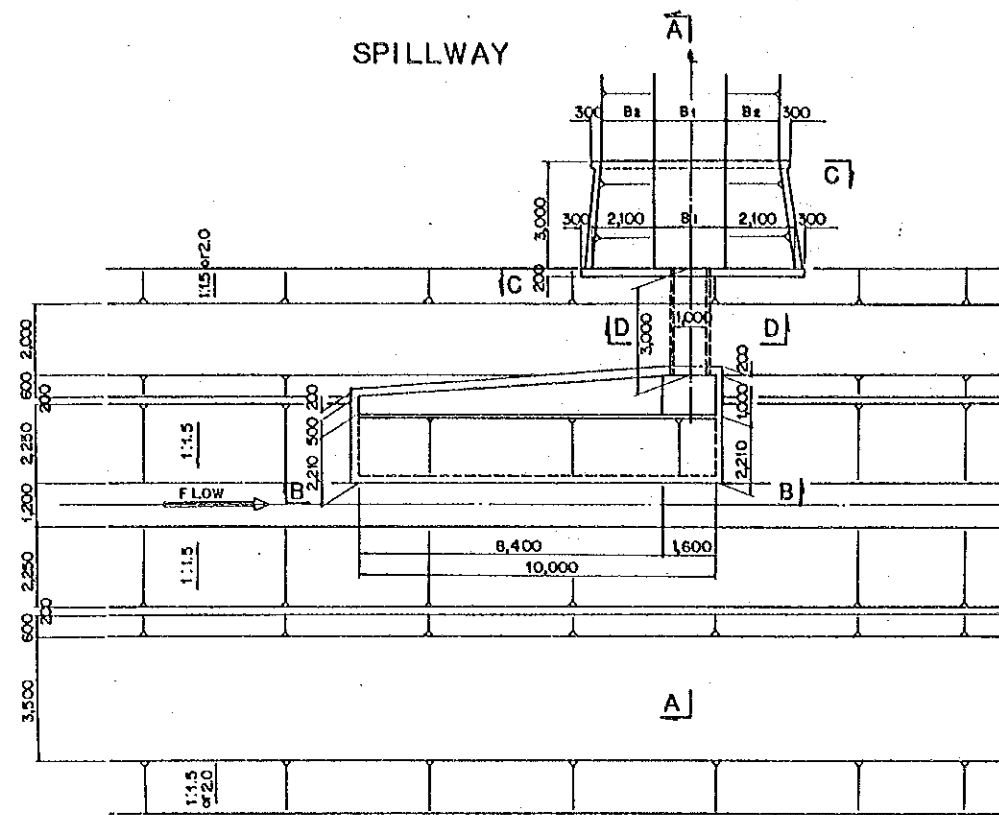
SECTION C-C



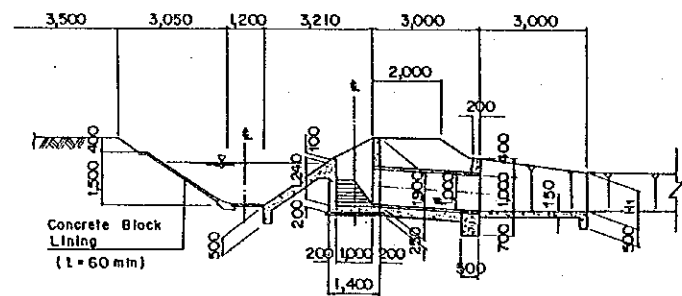
SECTION B-B



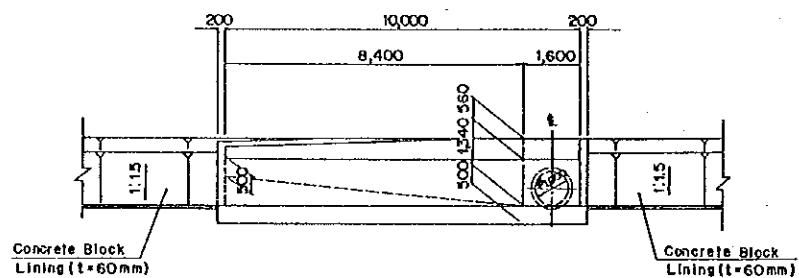
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS SYPHONS (2/2)		
Date	Drawing No.	3012
JAPAN INTERNATIONAL COOPERATION AGENCY		



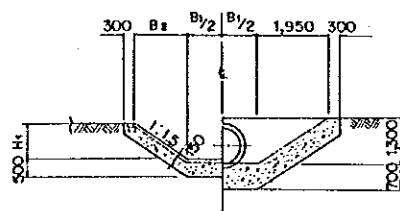
PLAN



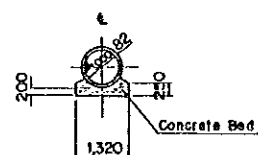
SECTION A-A



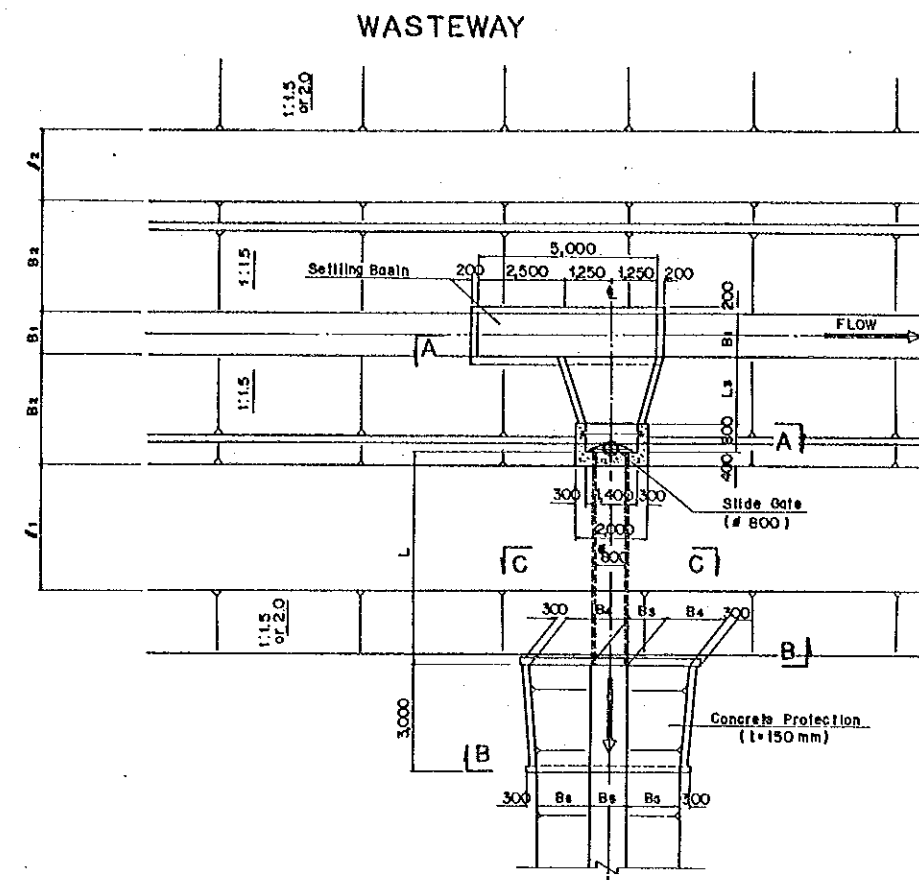
SECTION B-B



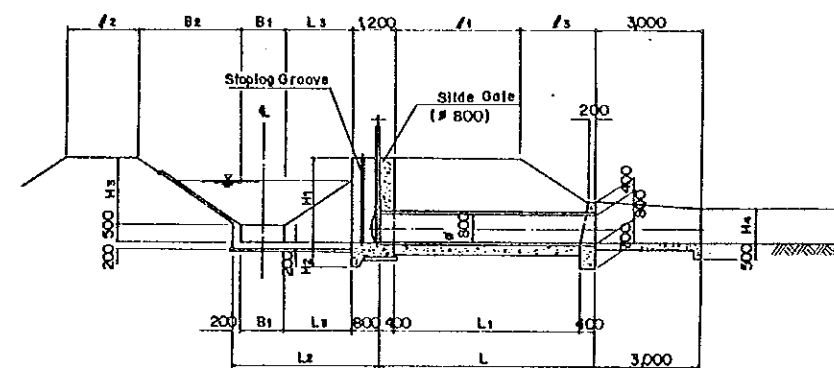
SECTION C-C



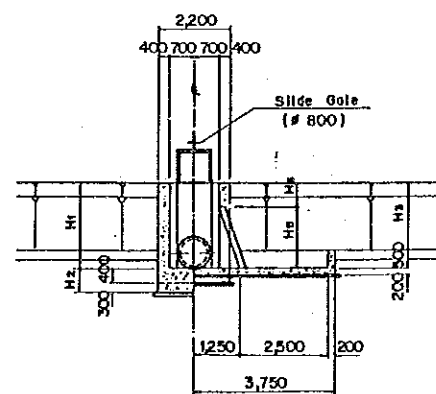
SECTION D-D



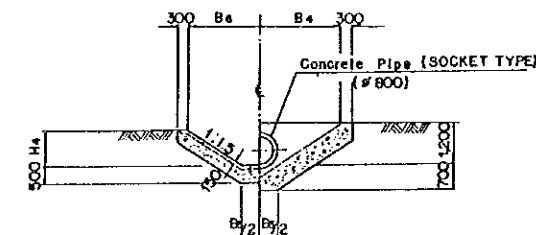
PLAN



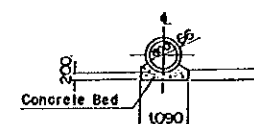
PROFILE



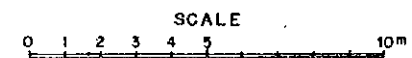
SECTION A-A



SECTION B-B

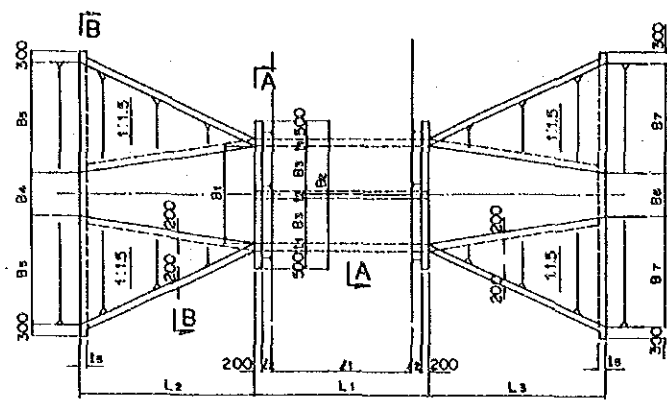


SECTION C-C

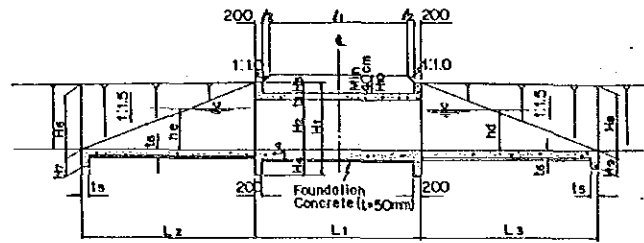


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING IRRIGATION CANALS AND FARM ROADS SPILLWAYS / WASTEWAY		
Date	Drawing No.	3013
JAPAN INTERNATIONAL COOPERATION AGENCY		

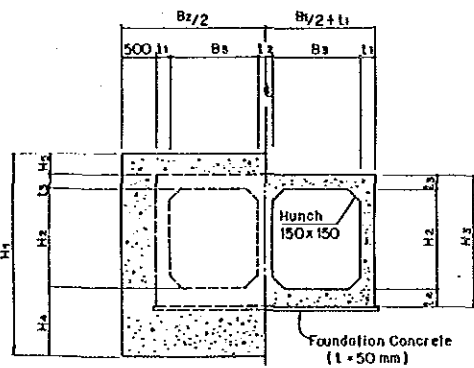
TYPE - A



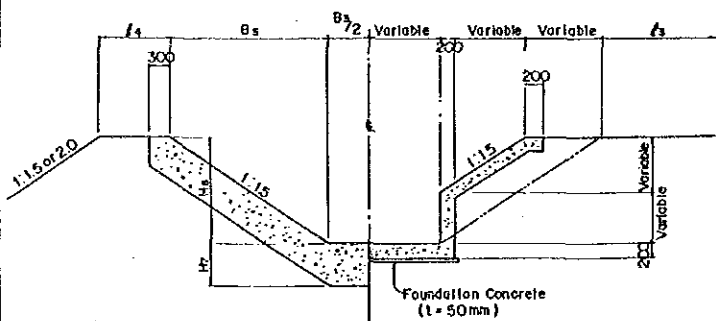
PLAN SCALE - A



PROFILE SCALE - A

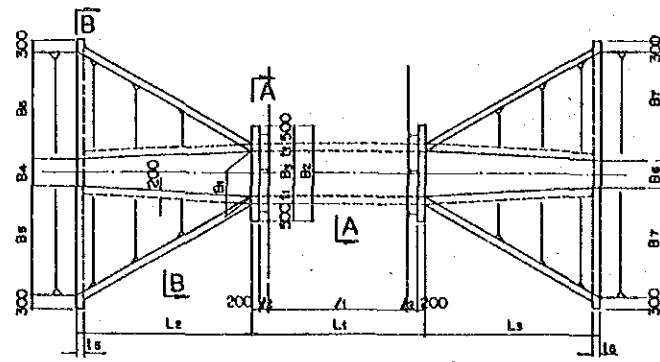


SECTION A-A SCALE - B

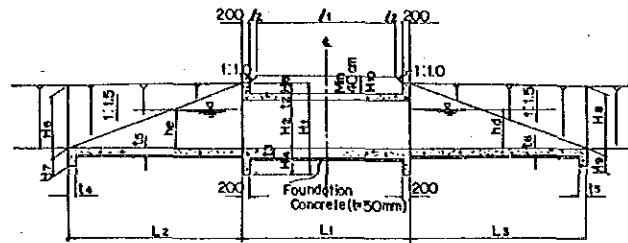


SECTION B-B SCALE - B

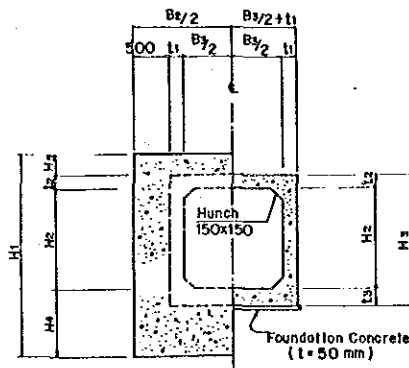
TYPE - B



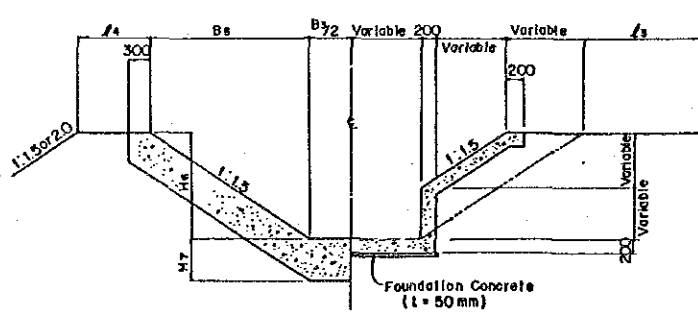
PLAN SCALE - A



PROFILE SCALE - A

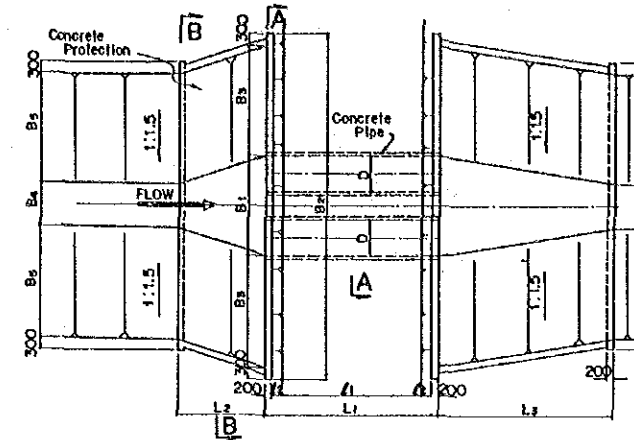


SECTION A-A SCALE - B

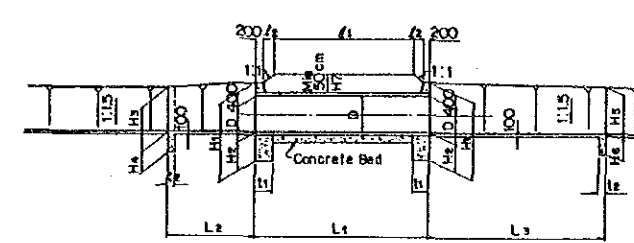


SECTION B-B SCALE - B

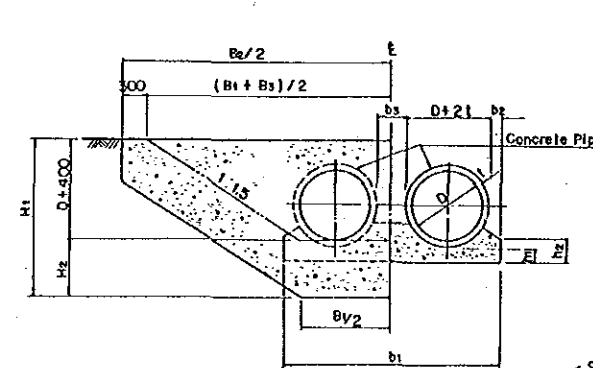
TYPE - C



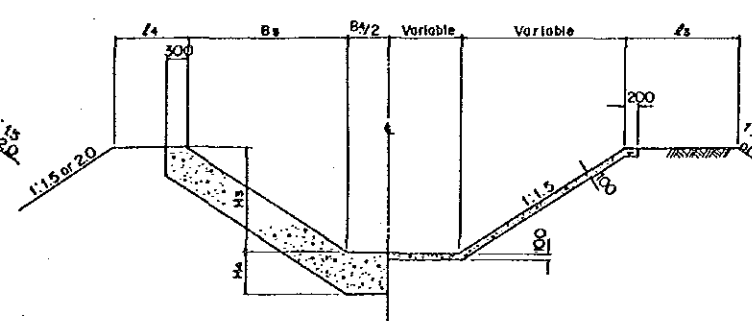
PLAN SCALE - A



PROFILE SCALE - A

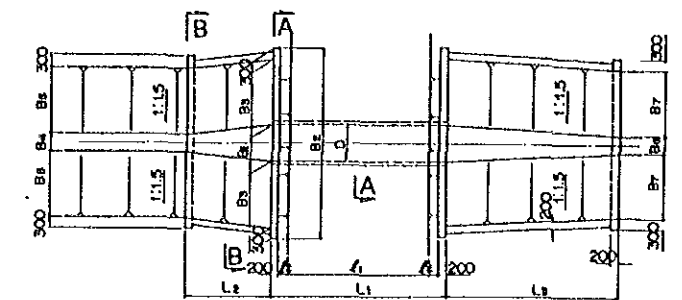


SECTION A-A SCALE - B

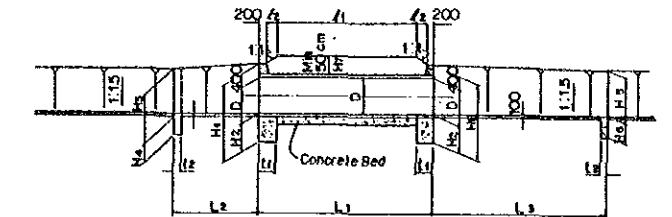


SECTION B-B SCALE - B

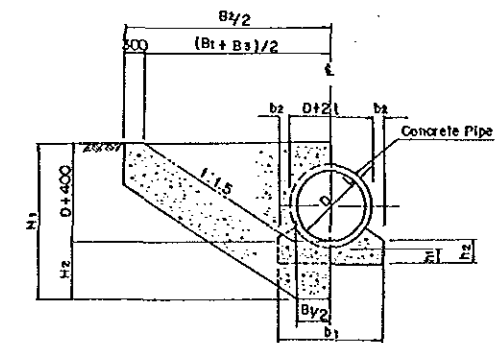
TYPE - D



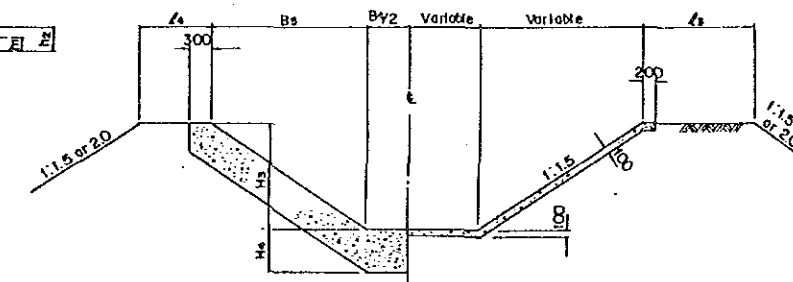
PLAN SCALE - A



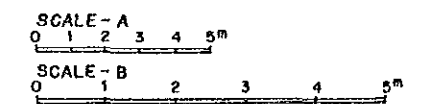
PROFILE SCALE - A



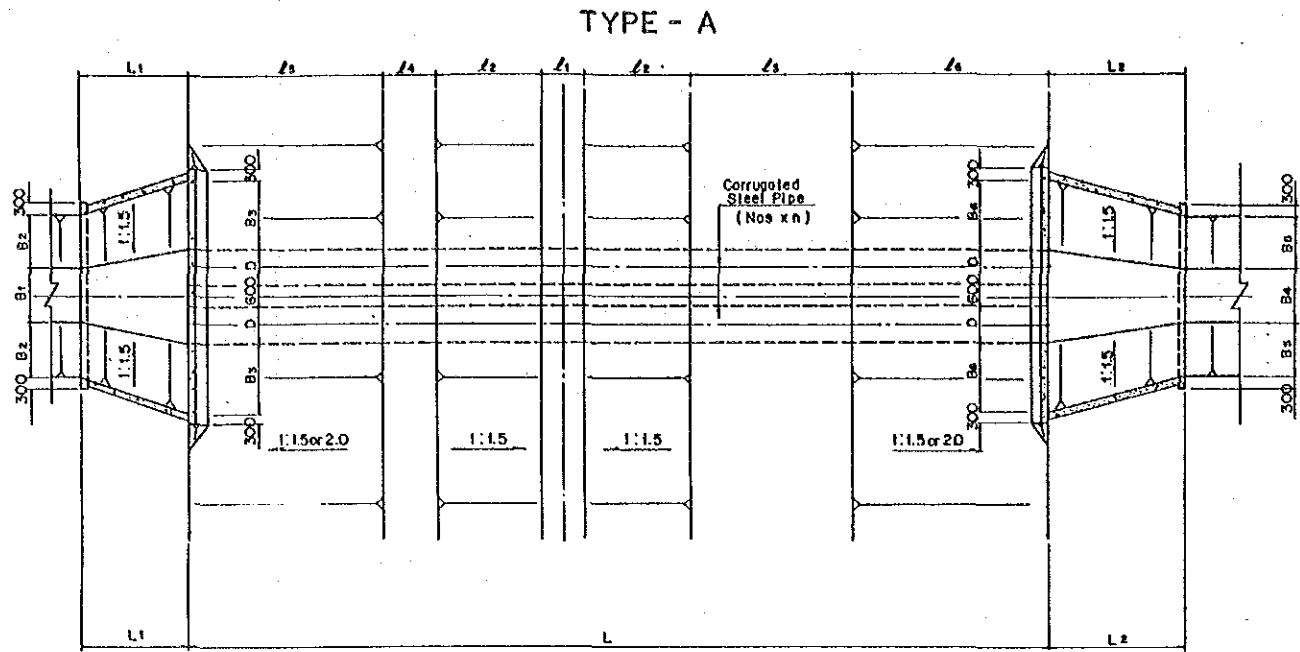
SECTION A-A SCALE - B



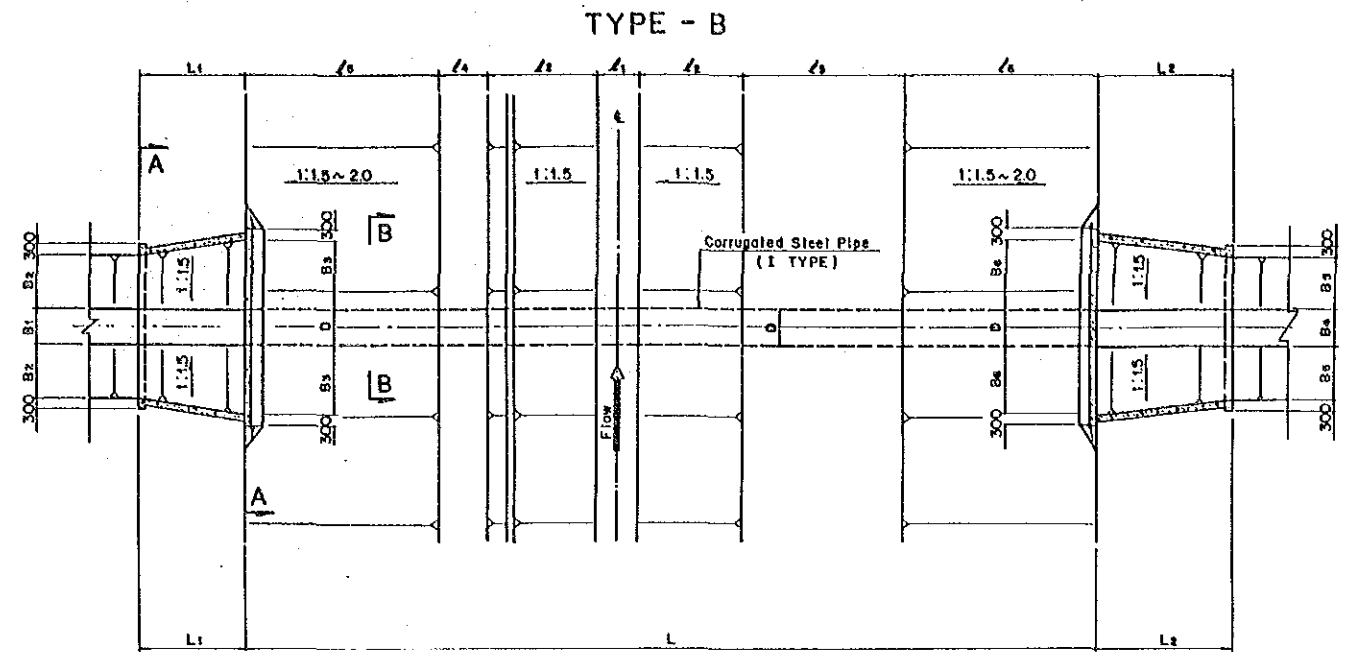
SECTION B-B SCALE - B



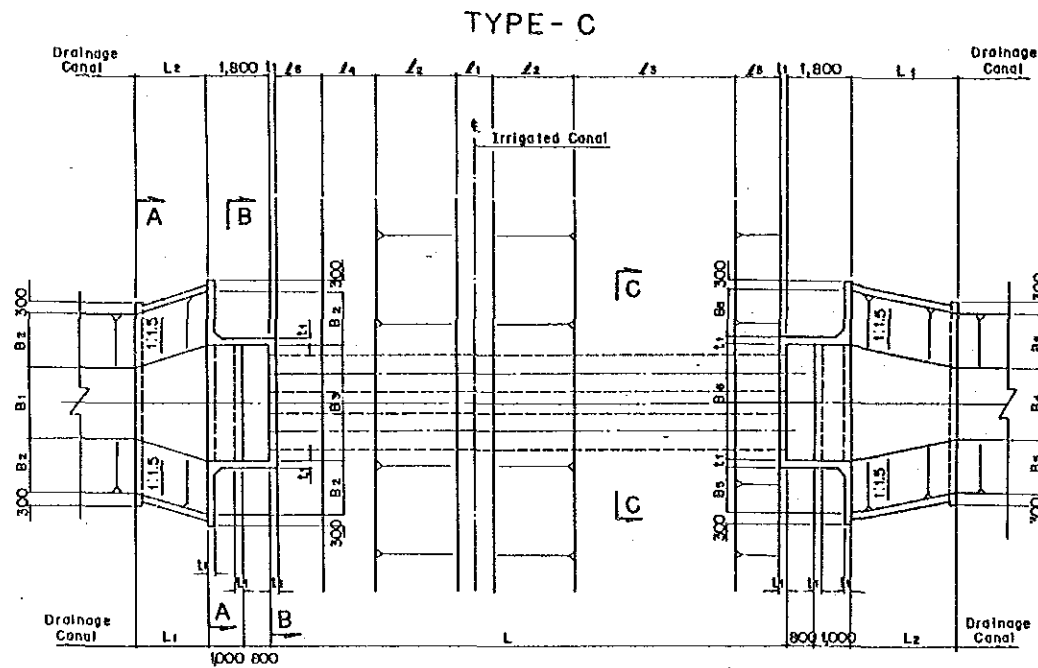
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
IRRIGATION CANALS AND FARM ROADS		
CULVERTS		
Date	Drawing No.	3014
JAPAN INTERNATIONAL COOPERATION AGENCY		



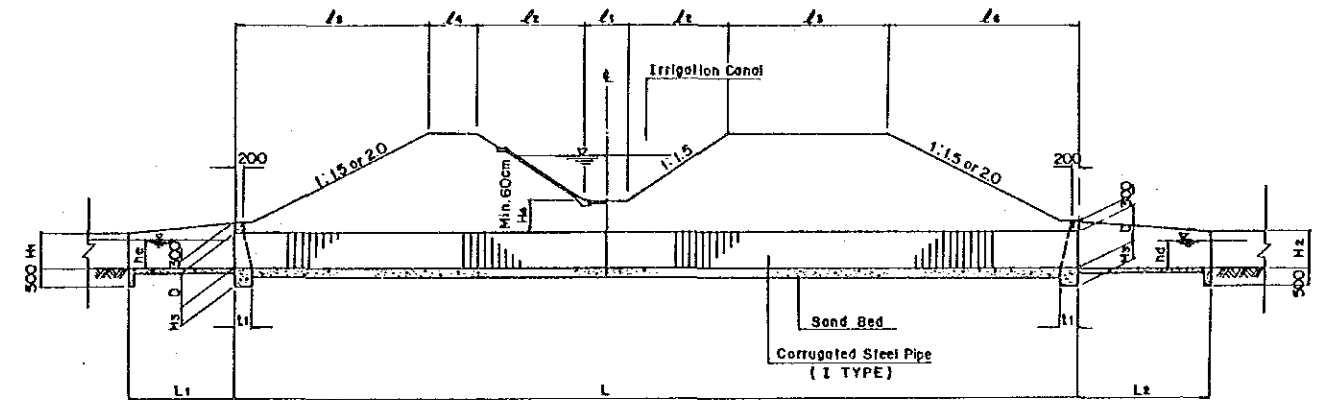
PLAN SCALE - A



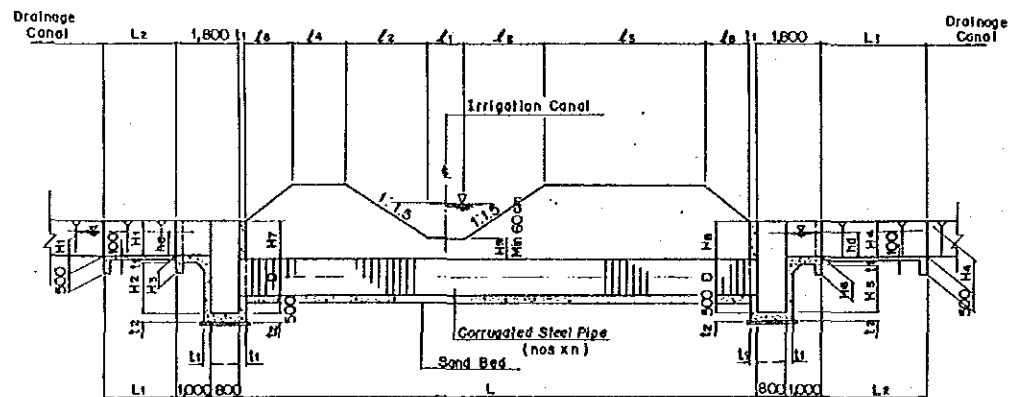
PLAN SCALE - A



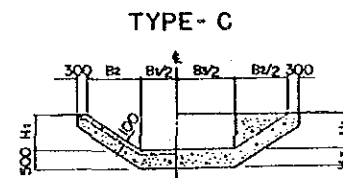
PLAN SCALE - A



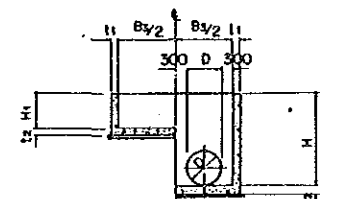
PROFILE (TYPE A and B) SCALE - A



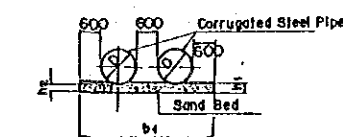
PROFILE SCALE - A



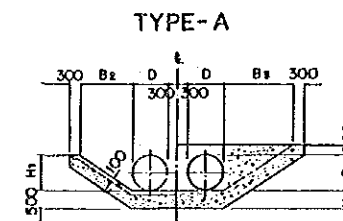
SECTION A-A SCALE - A



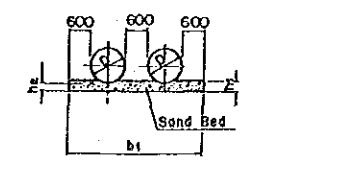
SECTION B-B SCALE - A



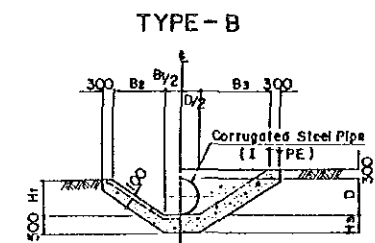
SECTION C-C SCALE - A



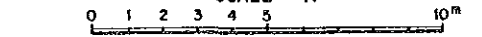
SECTION A-A SCALE - A



SECTION B-B SCALE - A

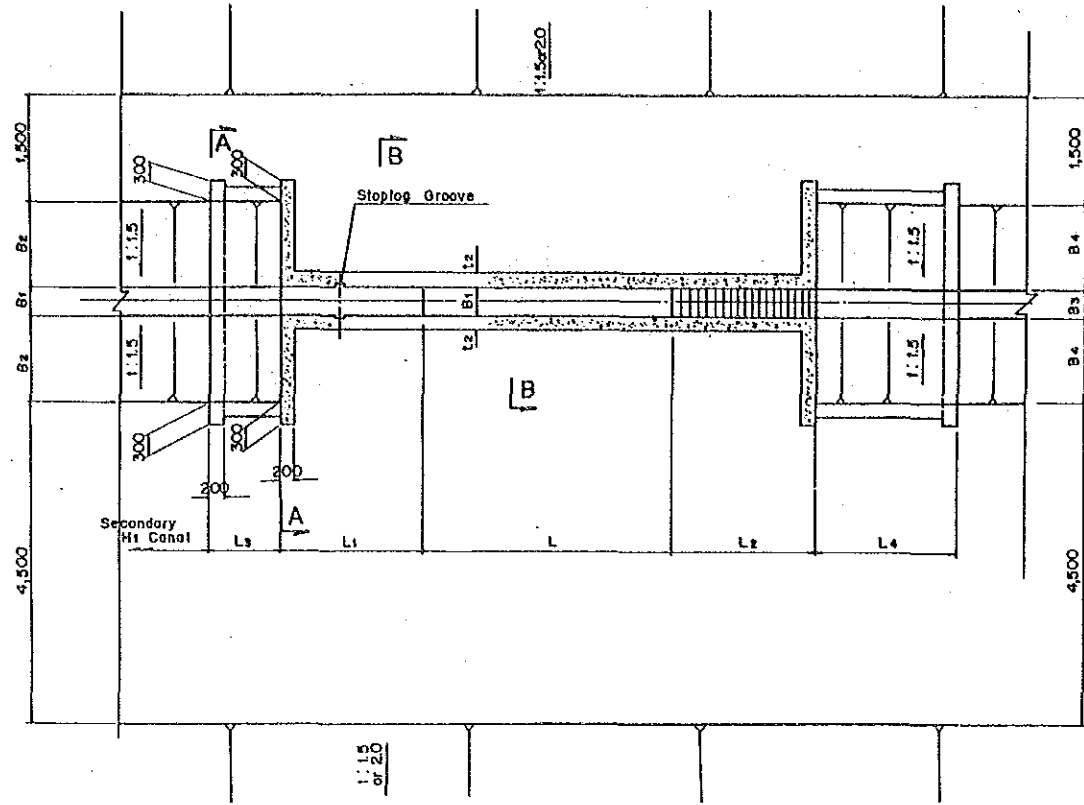


SECTION A-A SCALE - A

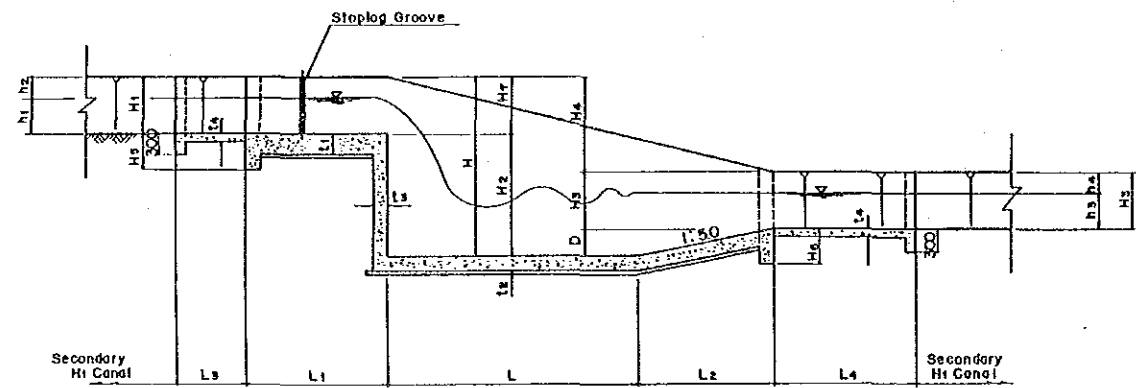


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
IRRIGATION CANALS AND FARM ROADS		
CROSS DRAINS		
Date	Drawing No.	3015
JAPAN INTERNATIONAL COOPERATION AGENCY		

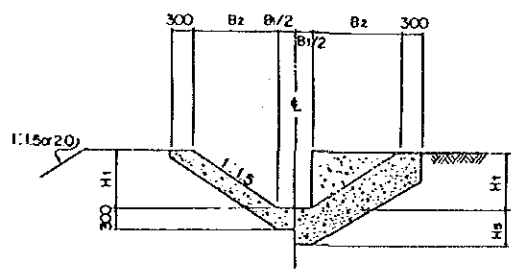
DROP



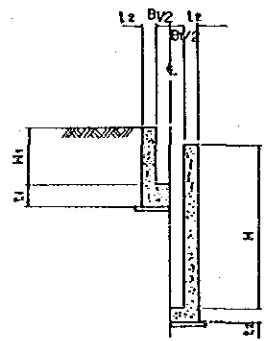
PLAN SCALE - A



PROFILE SCALE - A

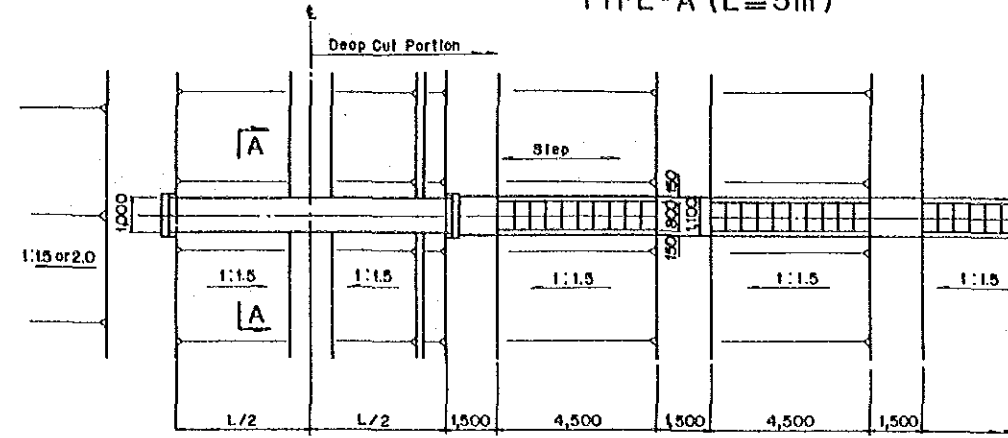


SECTION A-A SCALE - A

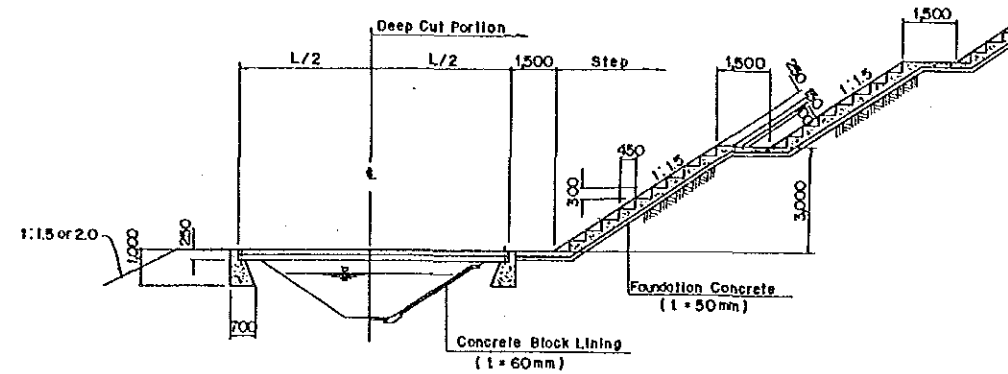


SECTION B-B SCALE - A

FOOTPATH BRIDGE
TYPE-A ($L \geq 5m$)

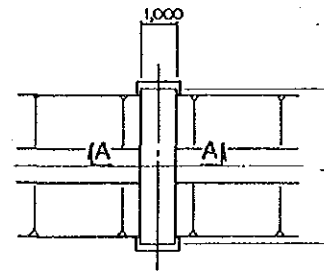


PLAN SCALE - B

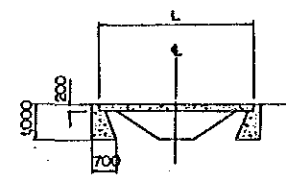


PROFILE SCALE - B

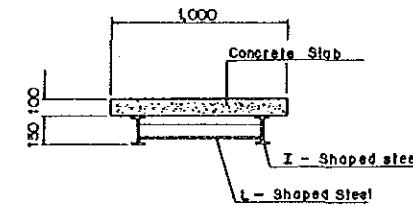
TYPE-B ($L < 5m$)



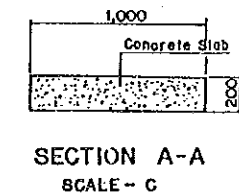
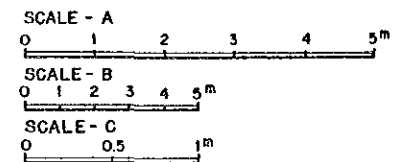
PLAN SCALE - B



PROFILE SCALE - B

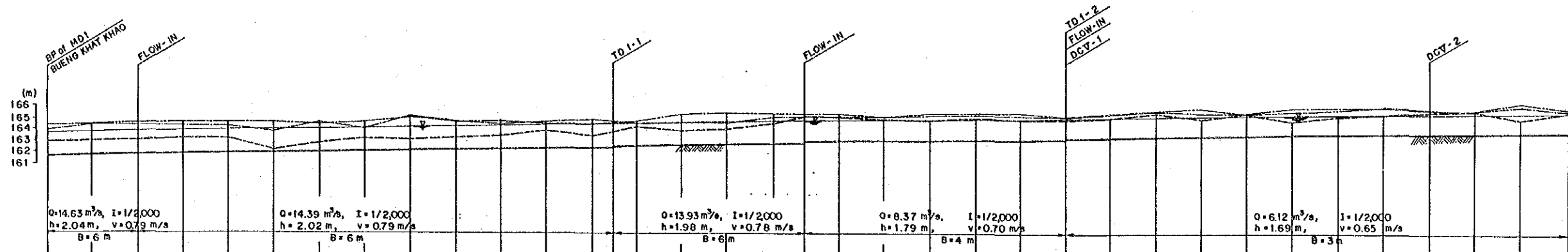


SECTION A-A SCALE - C

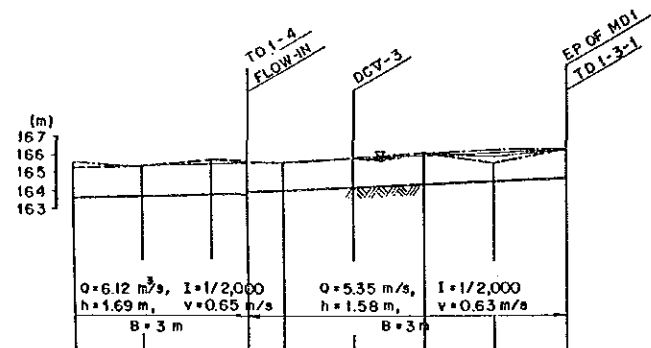


SECTION A-A SCALE - C

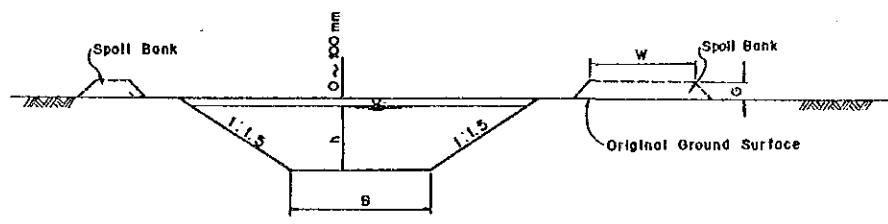
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
IRRIGATION CANALS AND FARM ROADS DROPS / FOOTPATH BRIDGES		
Date	Drawing No.	3016
JAPAN INTERNATIONAL COOPERATION AGENCY		



STATION	DISTANCE	ACCUMULATED DISTANCE	GROUND SURFACE ELEVATION			PROPOSED ELEVATION	
			RIGHT BANK	LEFT BANK	BASE	CANAL BASE	WATER SURFACE
BP	0	0	163.89	164.25	162.86	161.54	163.38
No. 1	100	100	164.28	164.31	162.87	161.59	163.63
No. 2	100	200	164.28	164.41	162.90	161.66	163.68
No. 3	100	300	164.24	164.44	163.15	161.71	163.73
No. 4	100	400	164.13	164.46	163.15	161.76	163.78
No. 5	100	500	163.75	164.56	162.08	161.81	163.85
No. 6	100	600	164.50	164.40	162.75	161.86	163.88
No. 7	100	700	163.96	164.44	163.04	161.91	163.93
No. 8	100	800	164.83	164.85	162.97	161.96	163.98
No. 9	100	900	164.41	164.46	163.11	162.01	164.03
No. 10	100	1000	164.36	164.49	163.29	162.06	164.08
No. 11	100	1100	164.41	164.29	163.71	162.11	164.13
No. 12	100	1200	164.64	164.01	163.21	162.16	164.18
+ 50	50	1250	162.18	162.22	162.18	162.22	164.20
No. 13	50	1300	164.25	164.33	164.03	162.25	164.23
No. 14	100	1400	164.40	164.93	163.67	162.30	164.28
No. 15	100	1500	164.21	165.09	163.75	162.35	164.33
No. 16	100	1600	164.84	165.04	164.21	162.40	164.38
+ 74	74	1674	164.80	165.05	164.75	162.43	164.41
No. 17	75	1749	164.84	164.99	164.69	162.65	164.45
No. 18	100	1849	164.80	164.73	164.50	162.71	164.50
No. 19	100	1949	165.00	165.16	164.50	162.76	164.55
No. 20	100	2049	165.12	165.13	164.62	162.81	164.60
No. 21	100	2149	165.03	165.15	164.58	162.86	164.65
No. 22	100	2249	164.76	164.74	164.57	162.91	164.70
No. 23	100	2349	165.19	165.00	164.66	163.06	164.75
No. 24	100	2449	165.02	165.02	165.02	163.11	164.80
No. 25	100	2549	165.03	165.49	164.47	163.16	164.85
No. 26	100	2649	164.99	164.98	165.00	163.21	164.90
No. 27	100	2749	165.55	165.28	164.36	163.26	164.95
No. 28	100	2849	165.50	165.36	164.82	163.31	165.00
No. 29	100	2949	164.57	165.48	164.98	163.36	165.05
No. 30	100	3049	165.20	165.20	165.20	163.41	165.10
No. 31	100	3149	165.36	165.32	165.32	163.46	165.15
No. 32	100	3249	165.86	166.03	164.53	163.51	165.20
No. 33	100	3349	165.48	165.56	165.52	163.56	165.25



STATION	DISTANCE	ACCUMULATED DISTANCE	GROUND SURFACE ELEVATION			PROPOSED ELEVATION	
			RIGHT BANK	LEFT BANK	BASE	CANAL BASE	WATER SURFACE
No. 33	100	3349	165.48	165.56	165.21	163.56	165.25
No. 34	100	3449	165.28	165.28	165.28	163.61	165.30
No. 35	100	3549	165.43	165.43	165.43	163.66	165.35
+ 50	51	3600	163.69	163.69	163.69	163.69	165.38
No. 36	49	3649	165.37	165.37	165.37	163.82	165.40
No. 37	100	3749	165.52	165.52	165.52	163.87	165.45
No. 38	100	3849	165.79	165.50	165.86	163.92	165.50
No. 39	100	3949	165.79	165.50	165.79	163.97	165.55
EP	100	4049	165.60	165.60	165.60	164.02	165.60



Note: for Main and Secondary drains - W = 2,000 ~ 4,500 mm
 - h > 300 mm

TYPICAL CROSS SECTION OF DRAIN

- LEGEND**
- PROPOSED WATER SURFACE
 - PROPOSED CANAL BASE
 - ORIGINAL GROUND SURFACE
 - ORIGINAL RIGHT BANK
 - ORIGINAL LEFT BANK
 - DRAINAGE CULVERT

HORIZONTAL SCALE
 0 100 200m

VERTICAL SCALE
 0 2 4 6 8m

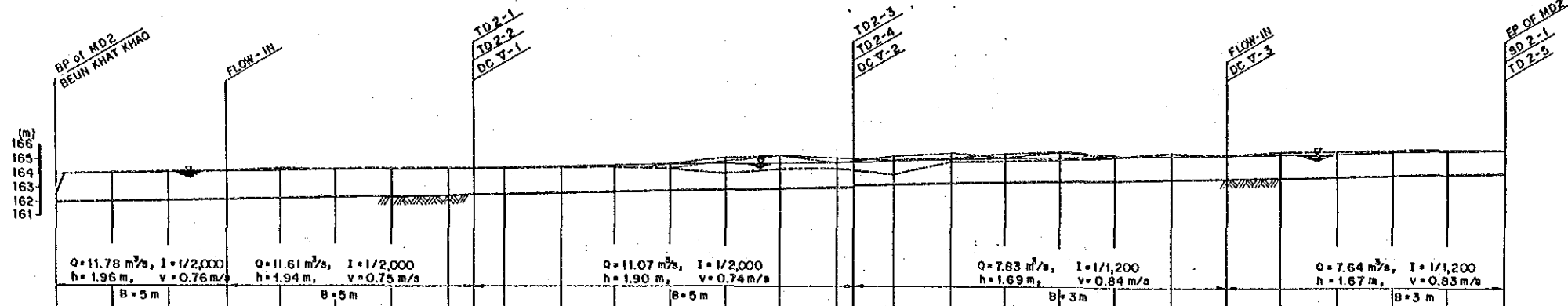
LAO PEOPLE'S DEMOCRATIC REPUBLIC

AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
 IN THE SUBURBS OF VIENTIANE

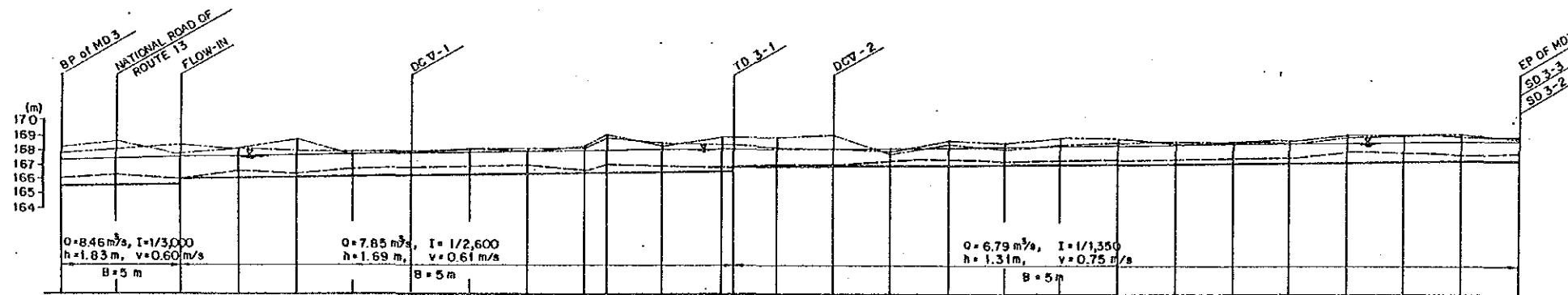
TITLE OF DRAWING
 DRAINAGE CANALS
 PROFILE OF MAIN DRAINAGE CANALS
 (MD1) AND TYPICAL CROSS SECTION

Date	Drawing No.	4001
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JAPAN INTERNATIONAL COOPERATION AGENCY

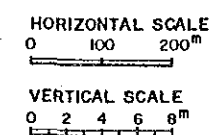


STATION	DISTANCE	ACCUMULATED DISTANCE	GROUND SURFACE ELEVATION				PROPOSED ELEVATION	
			RIGHT BANK	LEFT BANK	BASE	CANAL BASE	CANAL BASE	WATER SURFACE
BP 12	0	0	163.89	162.39	161.86	161.86	163.31	163.31
No. 1	88	100	163.88	163.88	161.90	161.90	163.86	163.86
No. 2	100	200	163.94	163.94	161.95	161.95	163.91	163.91
No. 3	100	300	163.96	163.96	162.00	162.00	163.96	163.96
No. 4	100	400	164.16	164.16	162.07	162.07	164.01	164.01
No. 5	100	500	164.12	164.12	162.12	162.12	164.06	164.06
No. 6	100	600	164.17	164.17	162.17	162.17	164.11	164.11
No. 7	100	700	164.19	164.19	162.22	162.22	164.16	164.16
No. 7 + 50	50	750	164.18	164.18	162.25	162.25	164.18	164.18
No. 8	50	800	164.16	164.16	162.31	162.31	164.21	164.21
No. 9	100	900	164.15	164.15	162.36	162.36	164.25	164.25
No. 10	100	1000	164.21	164.21	162.41	162.41	164.31	164.31
No. 11	100	1100	164.14	164.14	162.46	162.46	164.36	164.36
No. 12	100	1200	164.68	164.77	163.81	162.51	164.41	164.41
No. 13	100	1300	165.04	165.02	163.88	162.56	164.46	164.46
No. 14	100	1400	164.81	164.33	163.99	162.61	164.51	164.51
No. 14 + 30	30	1430	164.82	164.32	162.62	162.62	164.52	164.52
No. 15	70	1500	164.68	163.03	163.55	162.89	164.58	164.58
No. 16	100	1600	164.85	165.26	164.50	162.98	164.57	164.57
No. 17	100	1700	165.20	164.85	164.62	163.06	164.75	164.75
No. 18	100	1800	165.33	165.29	164.69	163.14	164.83	164.83
No. 19	100	1900	165.31	165.04	164.90	163.23	164.92	164.92
No. 20	100	2000	165.15	165.15	165.15	163.31	165.00	165.00
No. 21	100	2100	165.07	165.07	165.07	163.39	165.08	165.08
No. 22	100	2200	165.27	165.27	165.27	163.50	165.17	165.17
No. 23	100	2300	165.42	165.42	165.42	163.58	165.25	165.25
No. 24	100	2400	165.42	165.42	165.42	163.66	165.33	165.33
No. 25	100	2500	165.44	165.44	165.44	163.75	165.42	165.42
EP.	100	2600	165.46	165.46	165.46	163.83	165.50	165.50



STATION	DISTANCE	ACCUMULATED DISTANCE	GROUND SURFACE ELEVATION				PROPOSED ELEVATION	
			RIGHT BANK	LEFT BANK	BASE	CANAL BASE	CANAL BASE	WATER SURFACE
BP.	0	0	168.20	167.74	166.04	165.50	167.33	167.33
No. 1	100	100	168.55	168.03	166.18	165.53	167.36	167.36
No. 2	100	200	167.56	168.23	165.94	165.57	167.40	167.40
No. 3	100	300	167.89	167.94	166.42	165.75	167.44	167.44
No. 4	100	400	167.67	168.61	166.21	165.78	167.47	167.47
No. 5	100	500	167.69	167.49	166.54	165.82	167.51	167.51
No. 6	100	600	167.72	167.35	166.55	165.86	167.55	167.55
No. 7	100	700	167.77	167.80	166.55	165.90	167.59	167.59
No. 8	100	800	167.50	167.78	166.71	165.94	167.63	167.63
No. 9	100	900	168.04	167.79	166.25	165.98	167.67	167.67
No. 10	37	937	168.89	168.62	166.65	165.99	167.68	167.68
No. 11	150	1037	168.12	168.17	166.58	166.03	167.72	167.72
No. 12 + 24	24	1137	168.71	168.29	166.37	166.07	167.76	167.76
No. 13	76	1237	168.73	168.04	166.84	166.52	167.83	167.83
No. 14	100	1337	168.90	168.04	166.79	166.59	167.90	167.90
No. 15	98	1435	167.63	167.68	167.14	166.66	167.97	167.97
No. 16	100	1535	168.29	168.60	167.25	166.74	168.05	168.05
No. 17	100	1635	168.04	168.35	167.05	166.81	168.12	168.12
No. 18	100	1735	168.40	168.83	167.26	166.89	168.20	168.20
No. 19	100	1835	168.48	168.81	167.26	166.96	168.27	168.27
No. 20	100	1935	168.33	168.48	167.39	167.03	168.34	168.34
No. 21	100	2035	168.59	168.64	167.42	167.11	168.42	168.42
No. 22	100	2135	168.52	168.68	167.62	167.18	168.49	168.49
No. 23	100	2235	168.96	169.14	167.94	167.26	168.57	168.57
No. 24	100	2335	169.17	169.24	168.12	167.33	168.64	168.64
No. 25	100	2435	169.21	169.27	167.87	167.40	168.71	168.71
EP.	100	2535	169.08	168.96	168.03	167.48	168.79	168.79

- LEGEND**
- PROPOSED WATER SURFACE
 - PROPOSED CANAL BASE
 - ORIGINAL GROUND SURFACE
 - ORIGINAL RIGHT BANK
 - ORIGINAL LEFT BANK
 - DRAINAGE CULVERT



LAO PEOPLE'S DEMOCRATIC REPUBLIC

AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
IN THE SUBURBS OF VIENTIANE

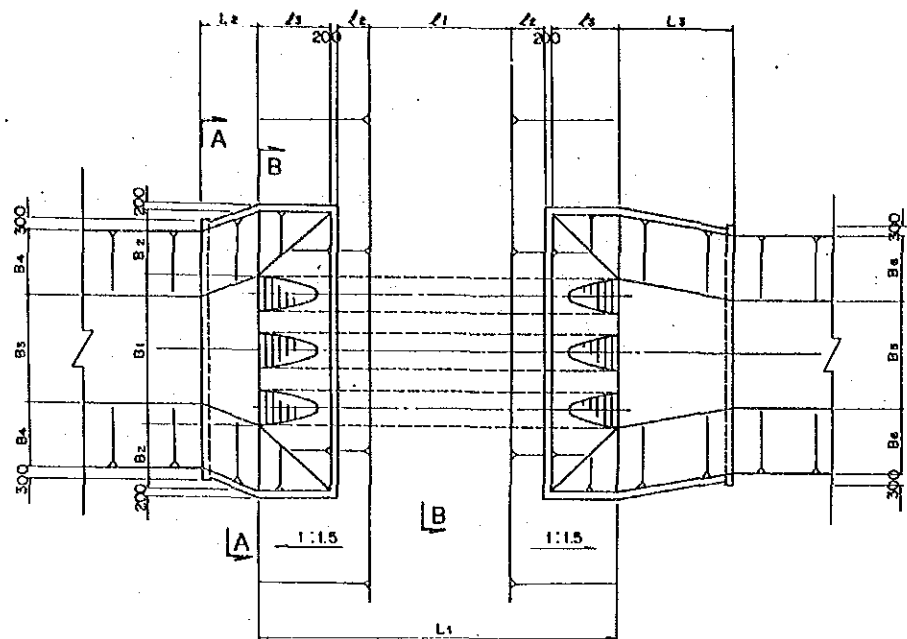
TITLE OF DRAWING
DRAINAGE CANALS
PROFILES OF MAIN DRAINAGE CANALS
(MD2 & MD3)

Date	Drawing No.	4002
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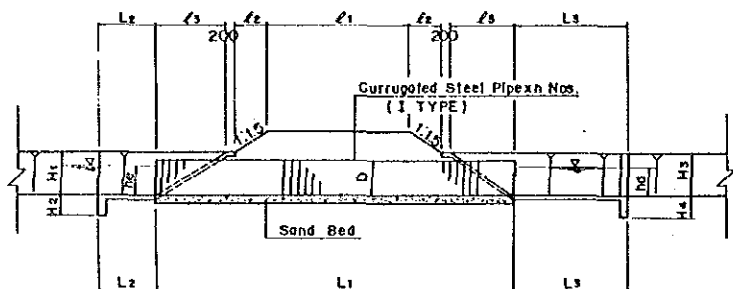
JAPAN INTERNATIONAL COOPERATION AGENCY

CULVERTS

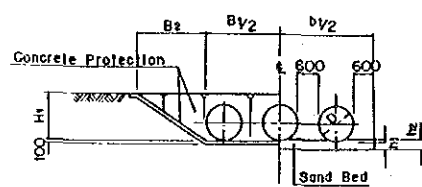
TYPE - A



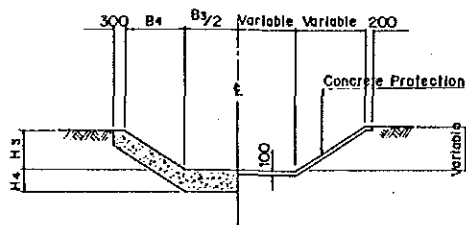
PLAN



PROFILE

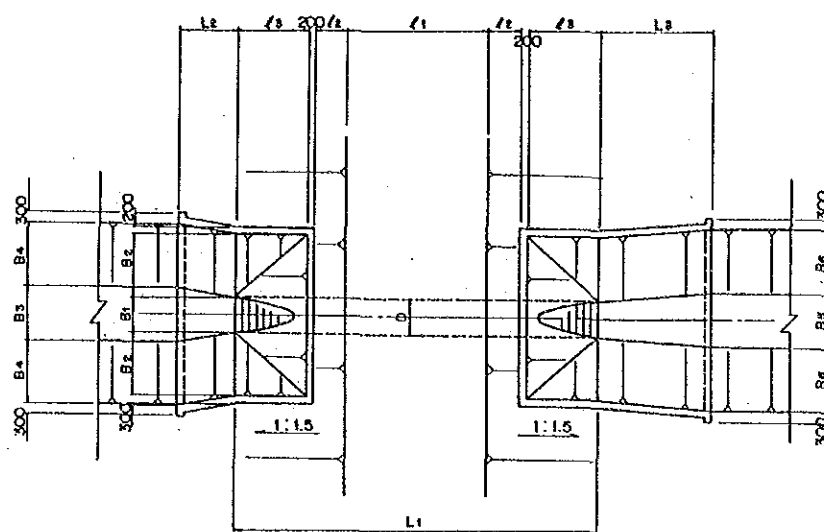


SECTION A-A

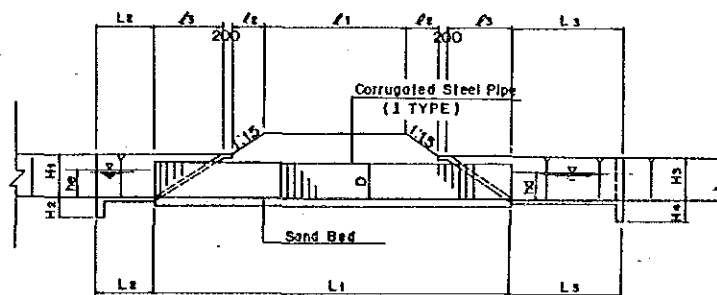


SECTION B-B

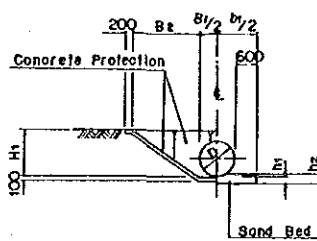
TYPE - B



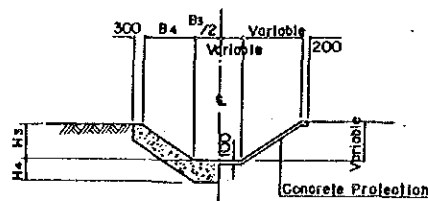
PLAN



PROFILE

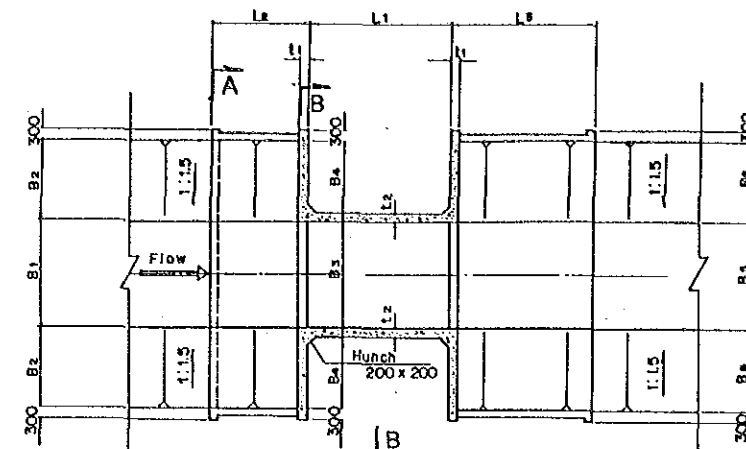


SECTION A-A

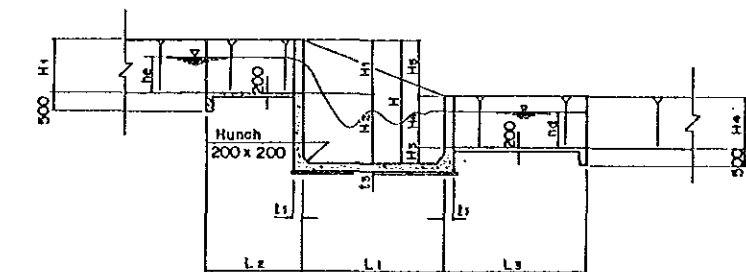


SECTION B-B

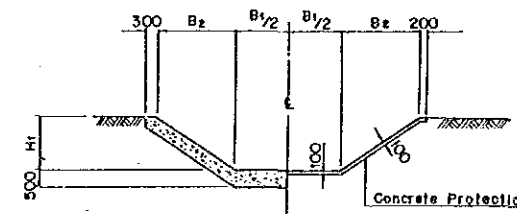
DROPS



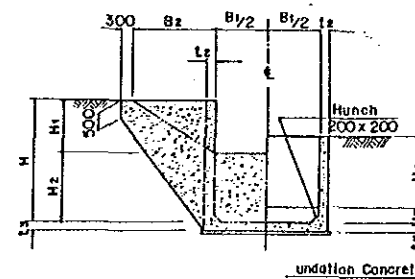
PLAN



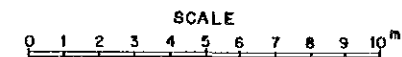
PROFILE



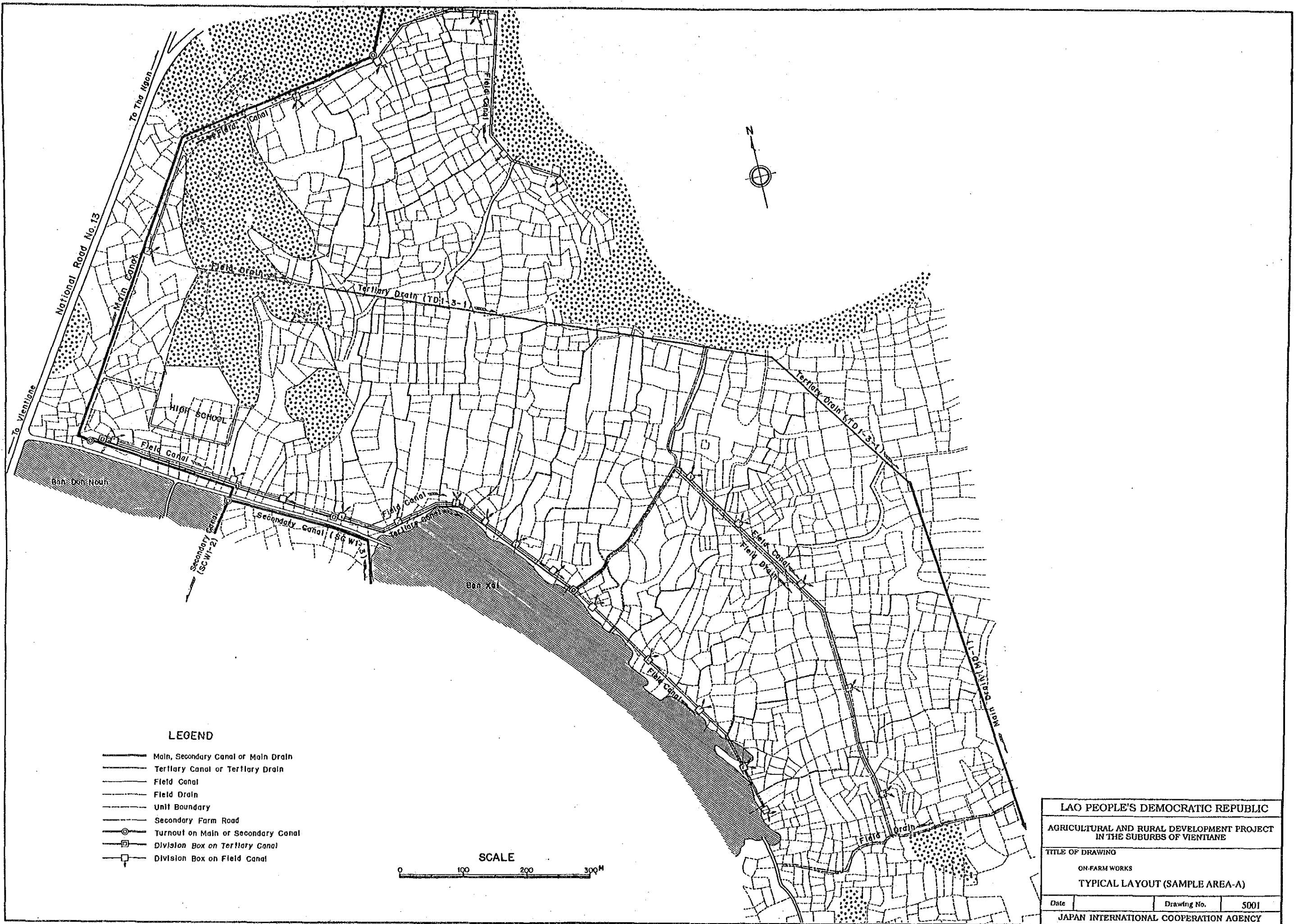
SECTION A-A



SECTION B-B



LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING DRAINAGE CANALS DRAINAGE CULVERTS / DRAIANGE DROPS		
Date	Drawing No.	4003
JAPAN INTERNATIONAL COOPERATION AGENCY		



LEGEND

- Main, Secondary Canal or Main Drain
- Tertiary Canal or Tertiary Drain
- Field Canal
- Field Drain
- Unit Boundary
- Secondary Farm Road
- Turnout on Main or Secondary Canal
- Division Box on Tertiary Canal
- Division Box on Field Canal

SCALE

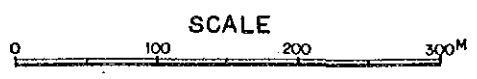


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
ON-FARM WORKS		
TYPICAL LAYOUT (SAMPLE AREA-A)		
Date	Drawing No.	5001
JAPAN INTERNATIONAL COOPERATION AGENCY		



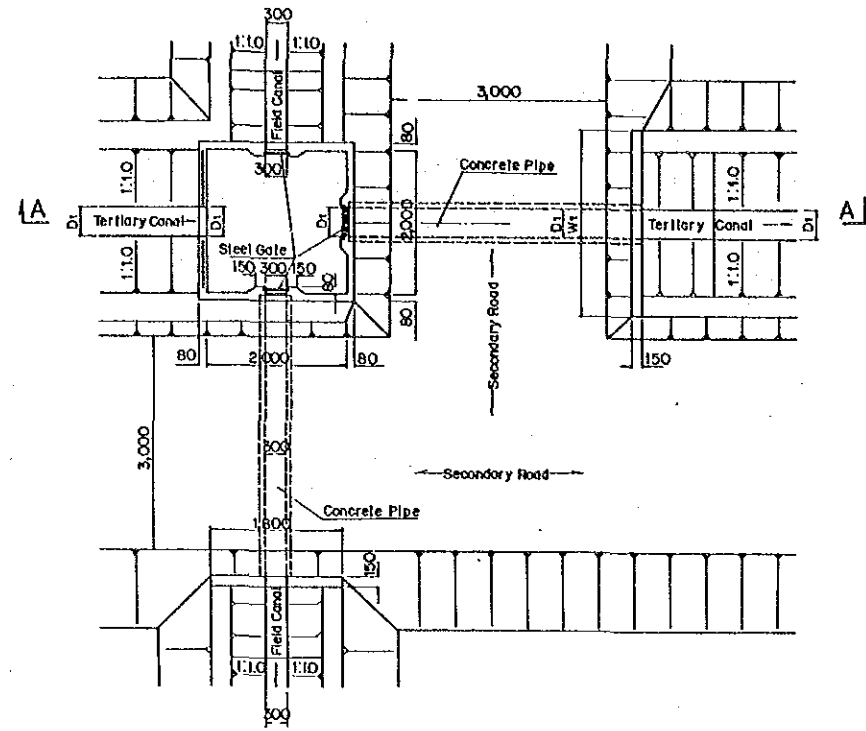
LEGEND

- Main, Secondary Canal or Main Drain
- Tertiary Canal or Tertiary Drain
- Field Canal
- Field Drain
- - - Unit Boundary
- - - Secondary Farm Road
- ⊙ Turnout on Main or Secondary Canal
- Division Box on Tertiary Canal
- Division Box on Field Canal

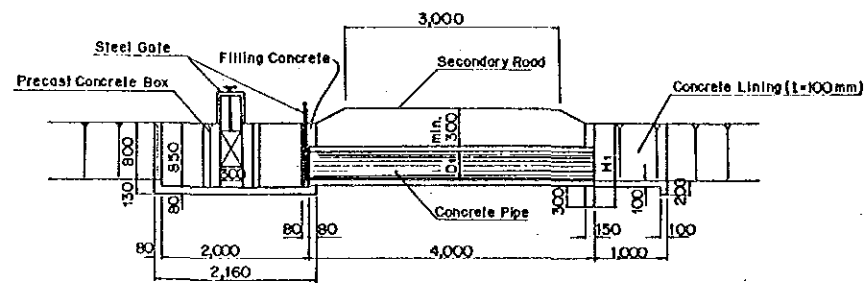


LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING ON-FARM WORKS TYPICAL LAYOUT (SAMPLE AREA-B)		
Date	Drawing No.	5002
JAPAN INTERNATIONAL COOPERATION AGENCY		

DIVISION BOX on TERTIARY CANAL

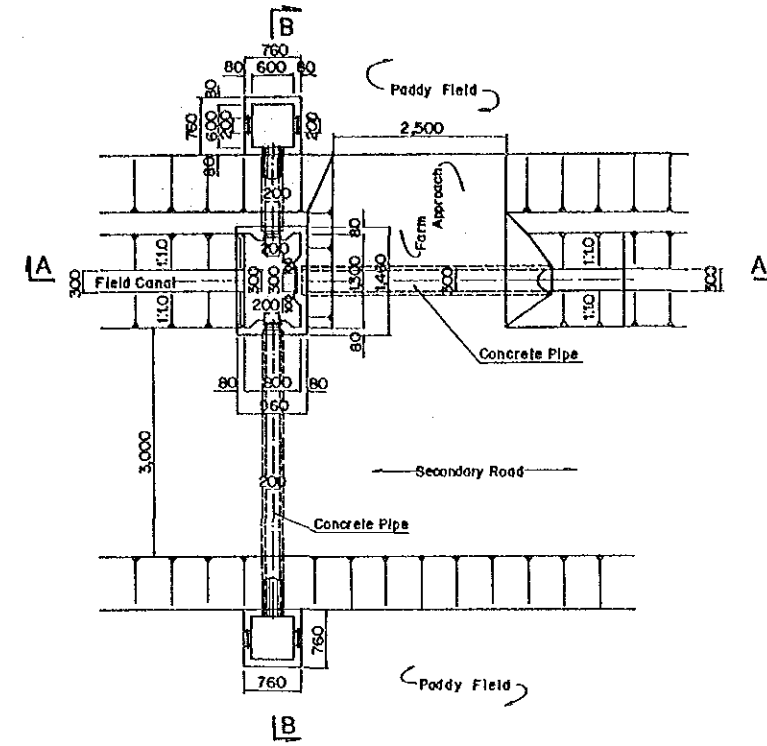


PLAN

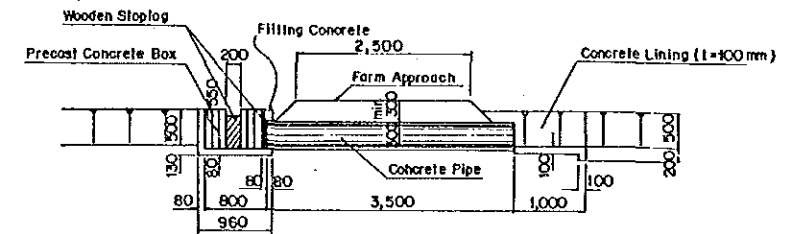


SECTION A-A

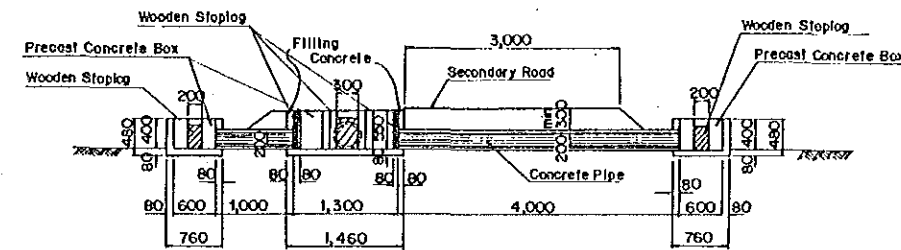
DIVISION BOX on FIELD CANAL



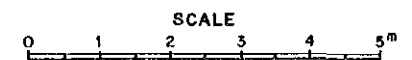
PLAN



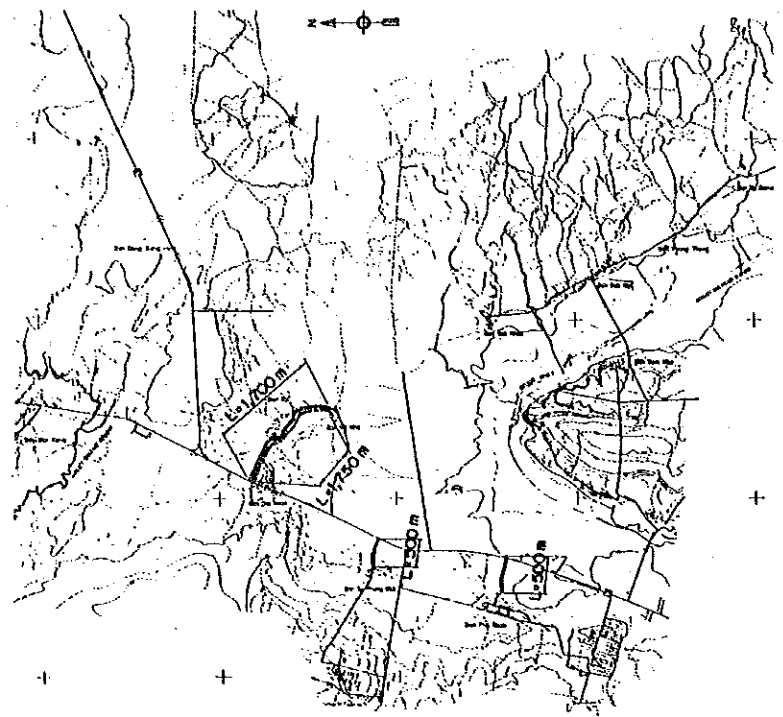
SECTION A-A



SECTION B-B

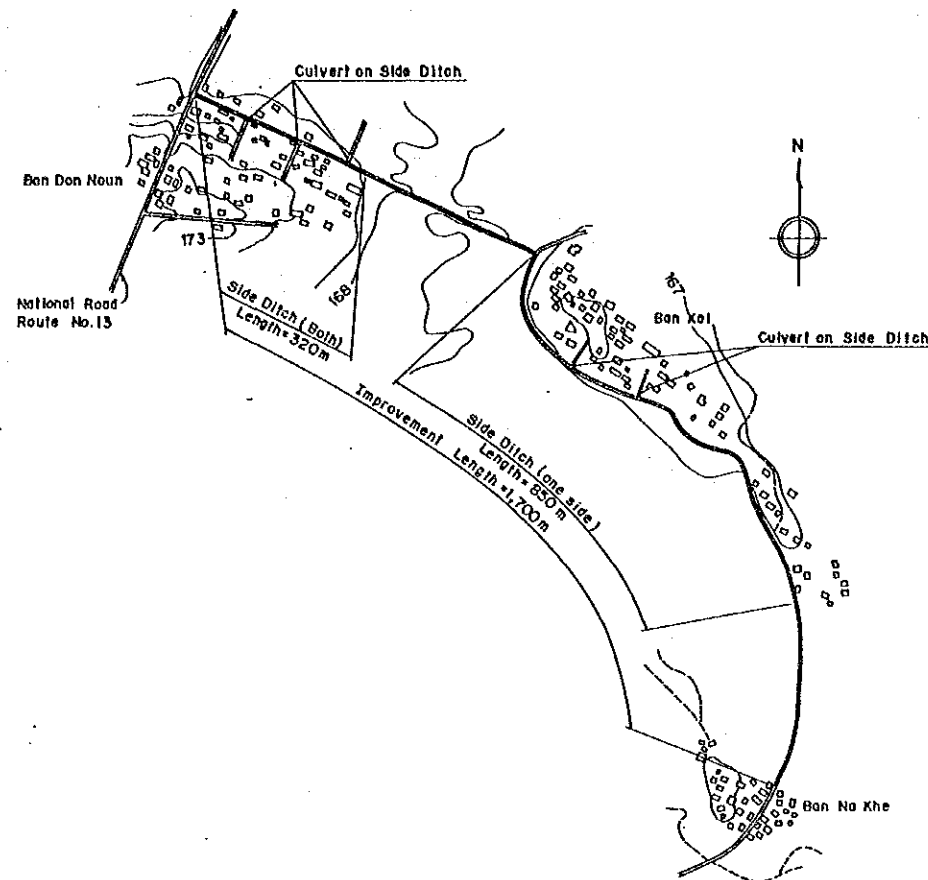


LAO PEOPLE'S DEMOCRATIC REPUBLIC			
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE			
TITLE OF DRAWING			
ON-FARM WORKS DIVISION BOXES			
Date	Drawing No.	5003	
JAPAN INTERNATIONAL COOPERATION AGENCY			

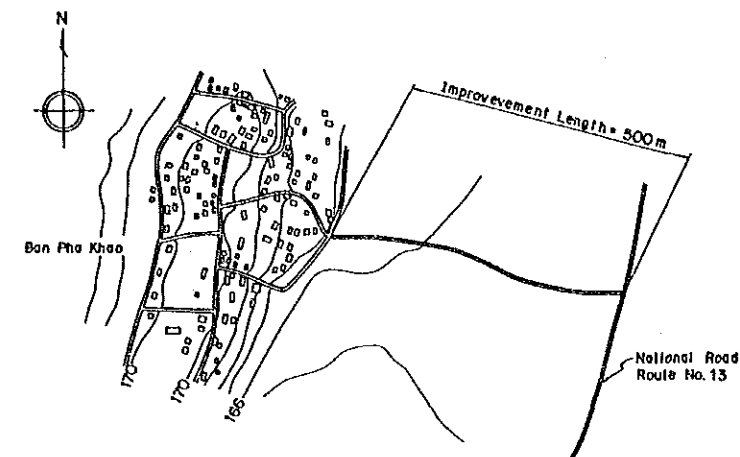


LEGEND
 - - - Village Road to be Improved
 - - - Proposed Pipe Line of Water Supply

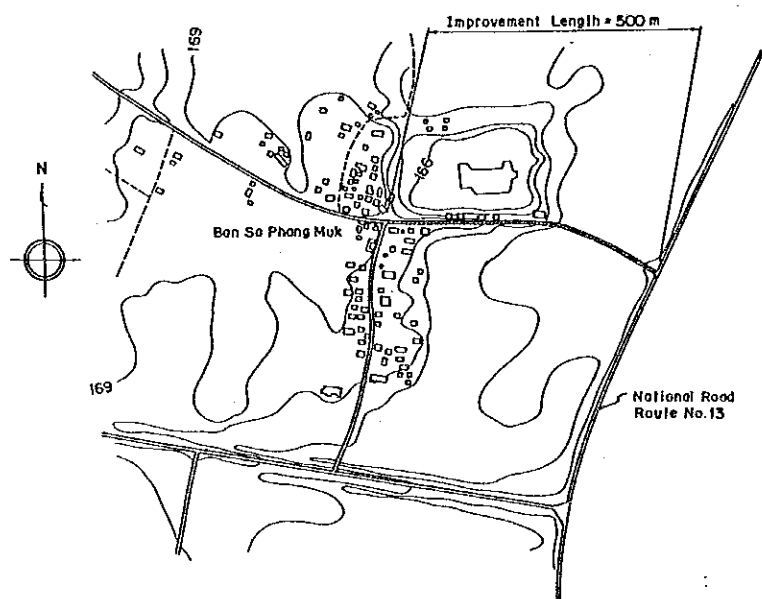
GENERAL LAYOUT OF RURAL INFRASTRUCTURES



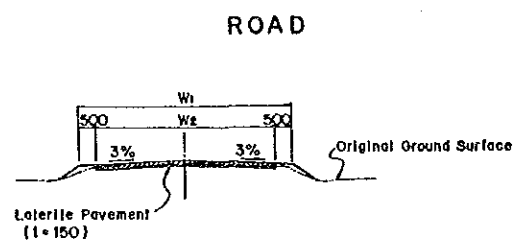
PLAN
 (Route 13 to Ban Don Noun - Ban Xai - Ban Na Khe)



PLAN
 (Route 13 to Ban Pha Khao)

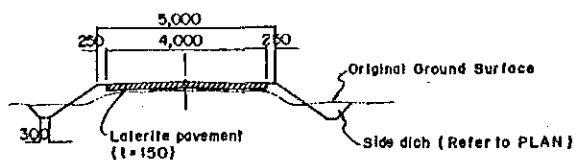


PLAN
 (Route 13 to Ban Sa Phang Muk)

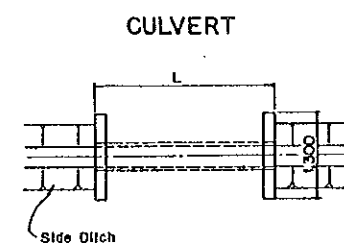
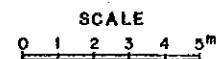


TYPICAL SECTION

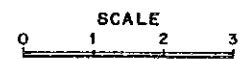
Location of Village	W ₁	W ₂
Route No.13 to Ban Pha Khao	7,000	6,000
Route No.13 to Ban Sa Phang Muk	6,000	5,000



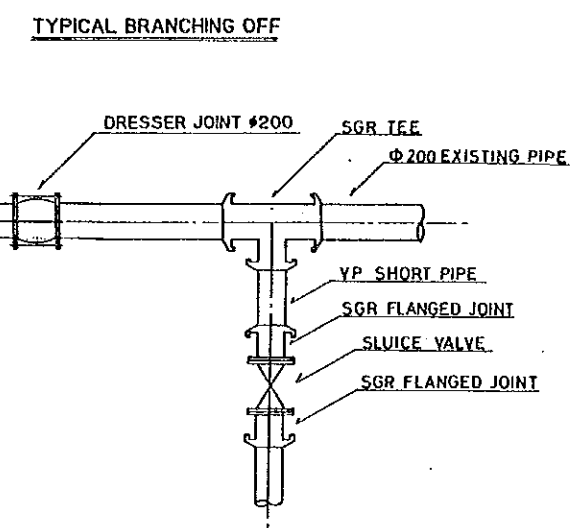
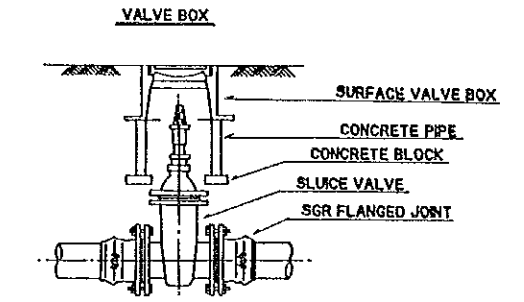
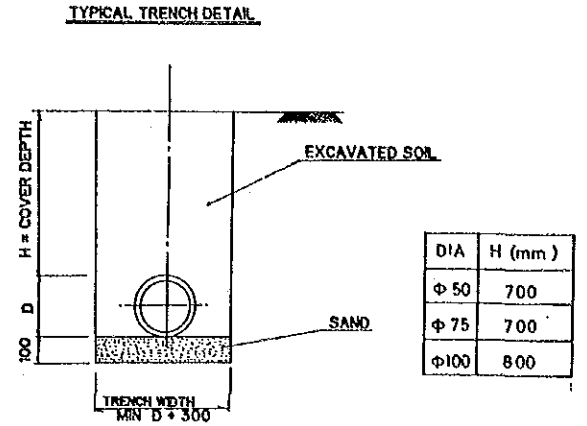
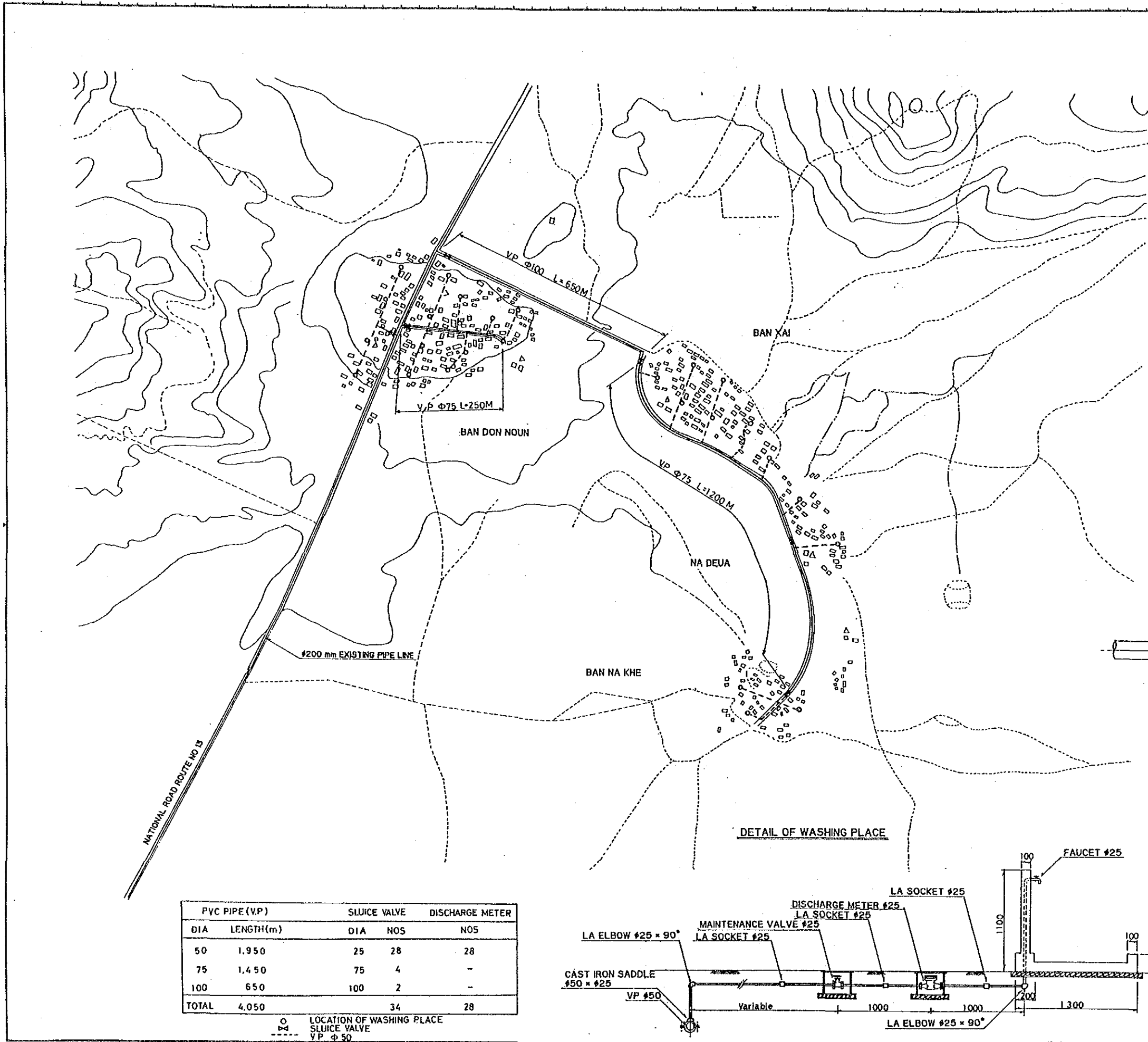
TYPICAL SECTION
 (Route 13 to Ban Don Noun - Ban Xai - Ban Na Khe)



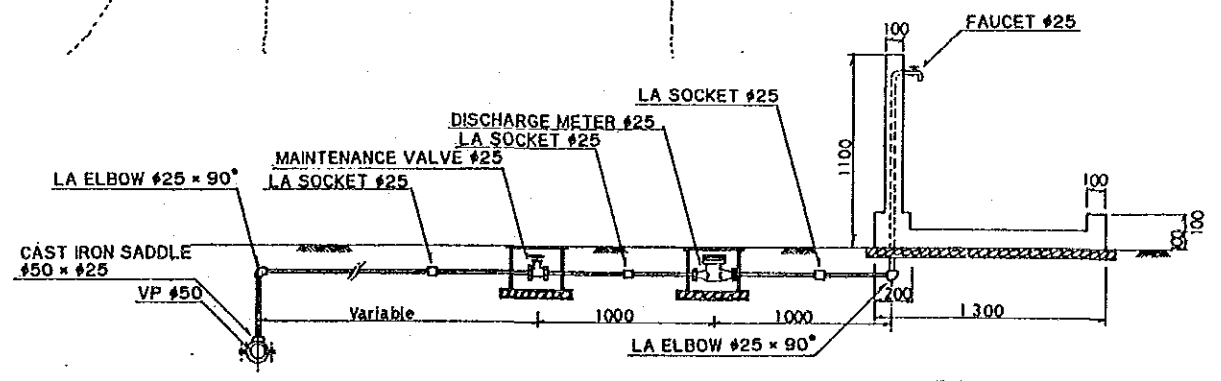
TYPICAL SECTION



LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
RURAL INFRASTRUCTURES GENERAL LAYOUT / VILLAGE ROADS		
Date	Drawing No.	6001
JAPAN INTERNATIONAL COOPERATION AGENCY		



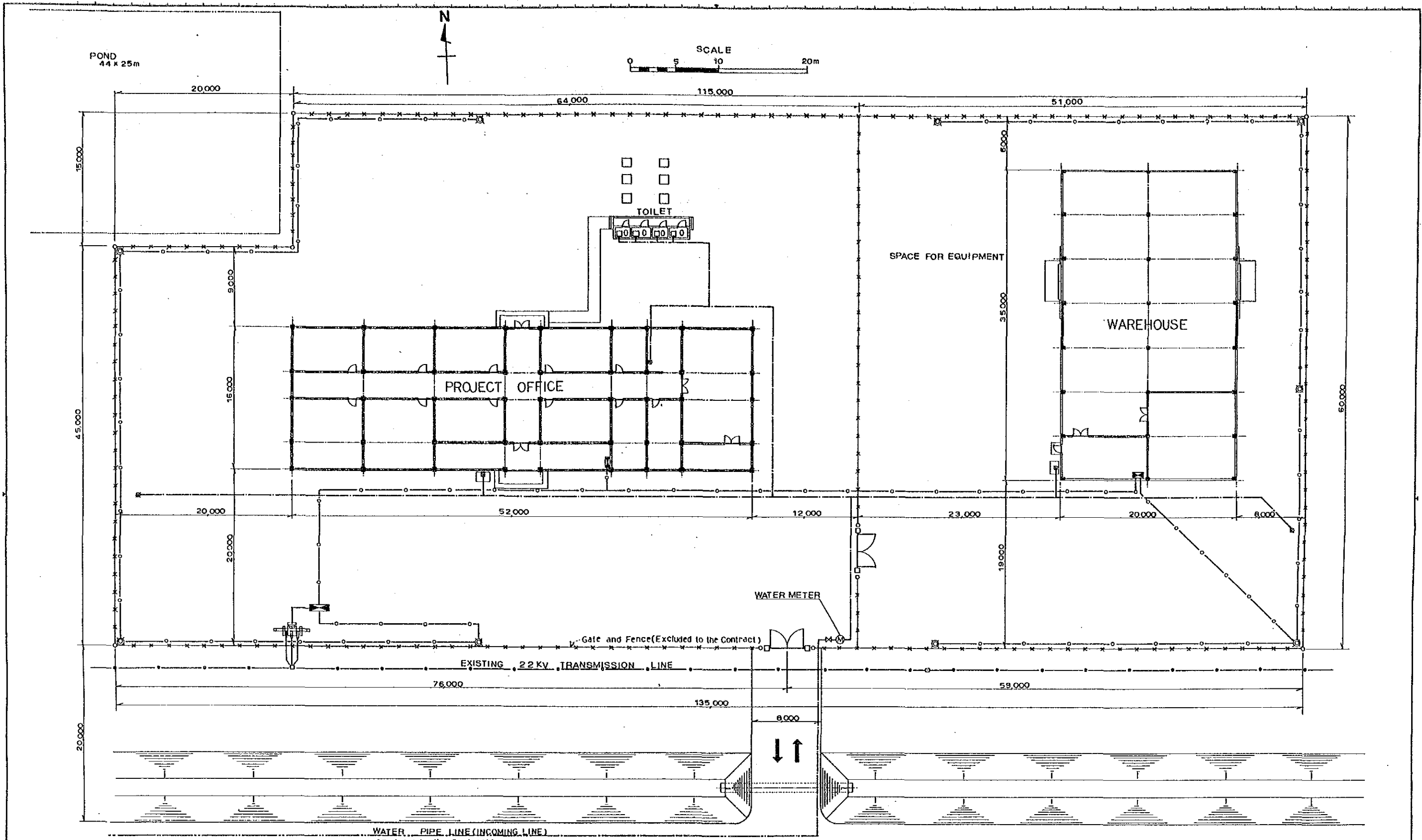
DETAIL OF WASHING PLACE



PVC PIPE (VP)		SLUICE VALVE		DISCHARGE METER
DIA	LENGTH(m)	DIA	NOS	NOS
50	1,950	25	28	28
75	1,450	75	4	-
100	650	100	2	-
TOTAL	4,050		34	28

LOCATION OF WASHING PLACE
 SLUICE VALVE
 VP Φ 50

LAO PEOPLE'S DEMOCRATIC REPUBLIC
 AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
 IN THE SUBURBS OF VIENTIANE
 TITLE OF DRAWING
 RURAL INFRASTRUCTURES
 POTABLE WATER SUPPLY
 Date _____ Drawing No. 6002
 JAPAN INTERNATIONAL COOPERATION AGENCY



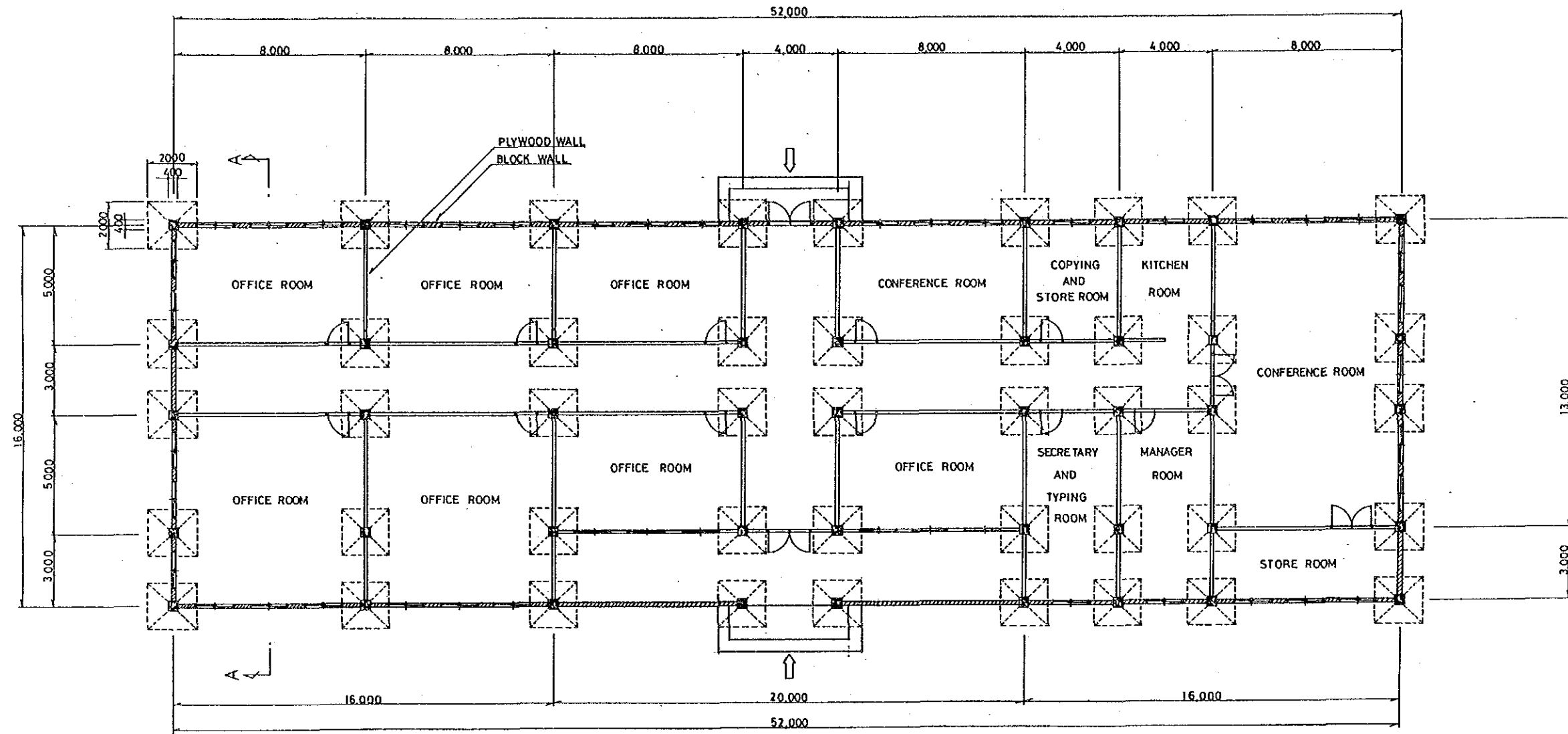
TO VIENTIANE

NATIONAL ROUTE No.13

- WATER SUPPLY LINE
- ELECTRICITY SUPPLY LINE
- ⊗ MERCURY LAMP WITH POLE
- ⊗ FAUCET
- ⊗ DISTRIBUTION BOARD

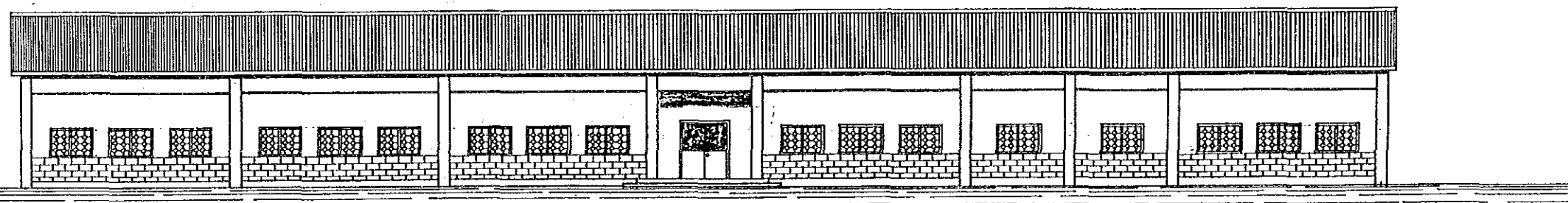
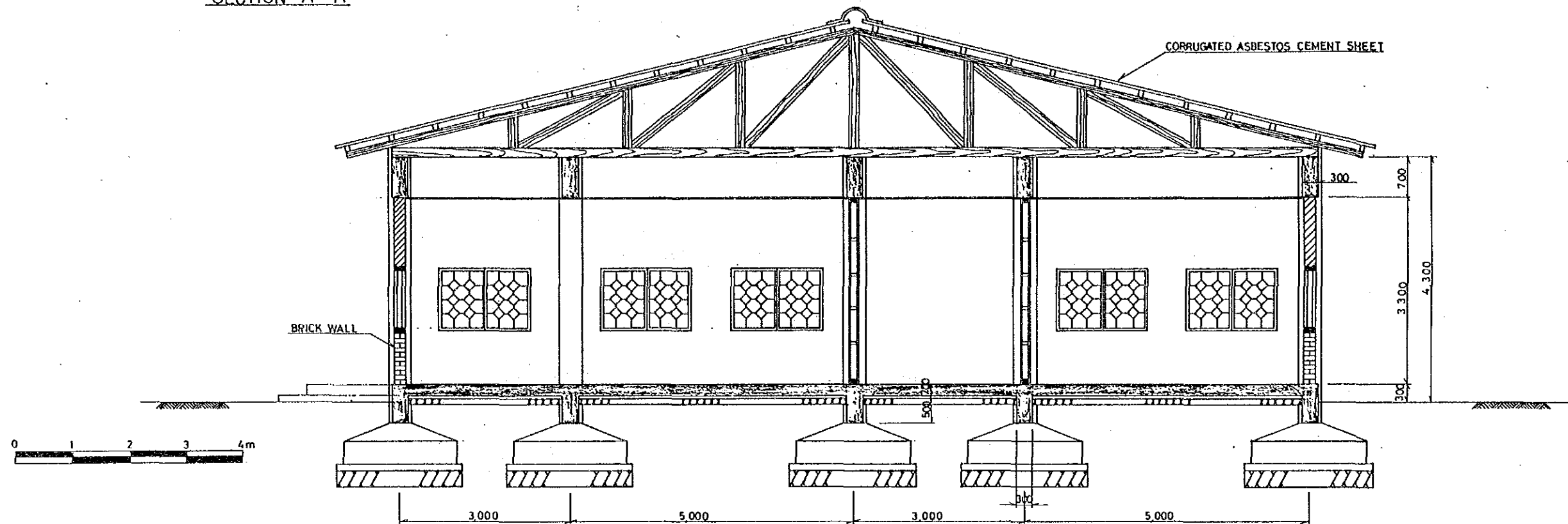
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
PROJECT OFFICE AND WAREHOUSE GENERAL LAYOUT		
Date	Drawing No.	7001
JAPAN INTERNATIONAL COOPERATION AGENCY		

PROJECT OFFICE



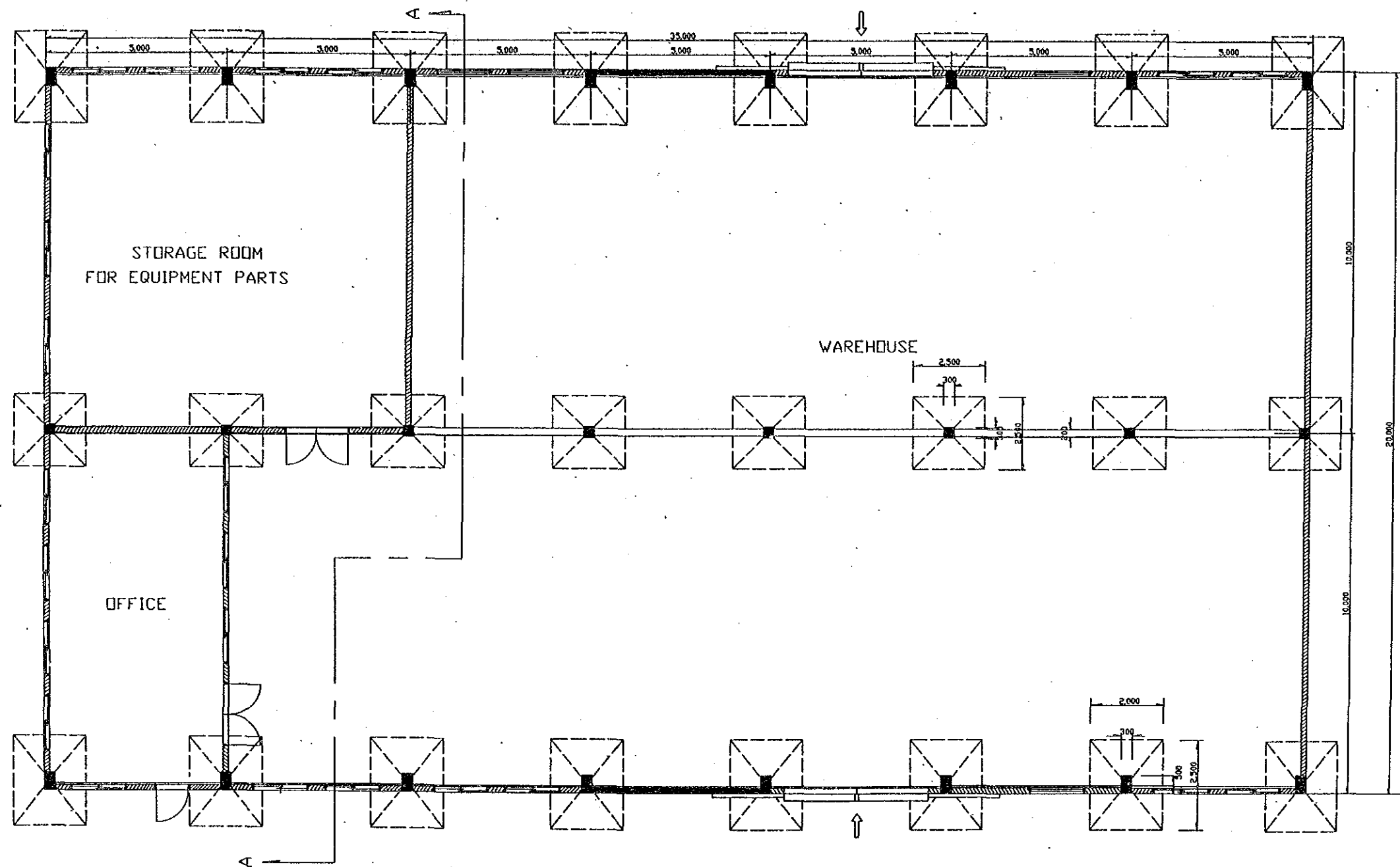
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
PROJECT OFFICE AND WAREHOUSE PROJECT OFFICE (1/2)		
Date	Drawing No.	7002
JAPAN INTERNATIONAL COOPERATION AGENCY		

SECTION A-A



FRONT VIEW

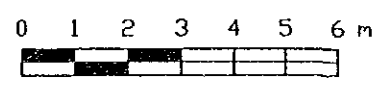
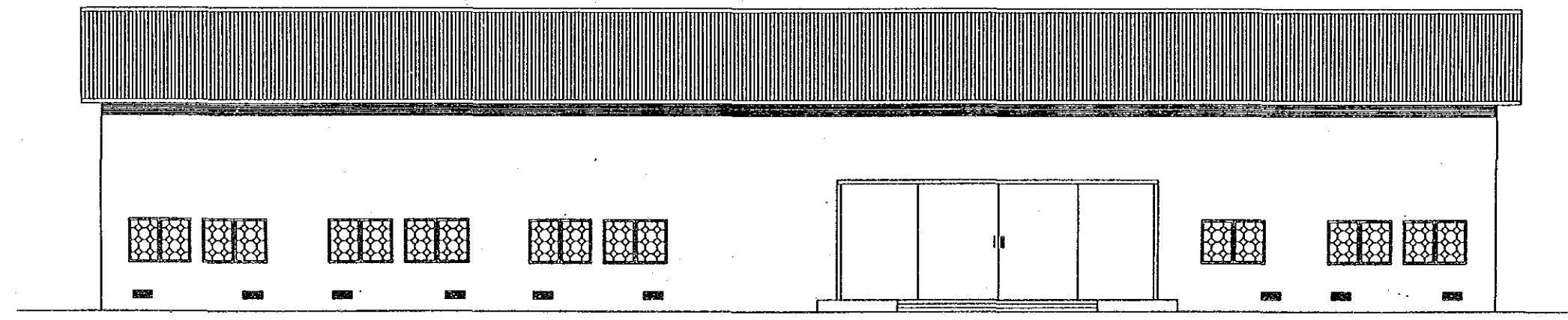
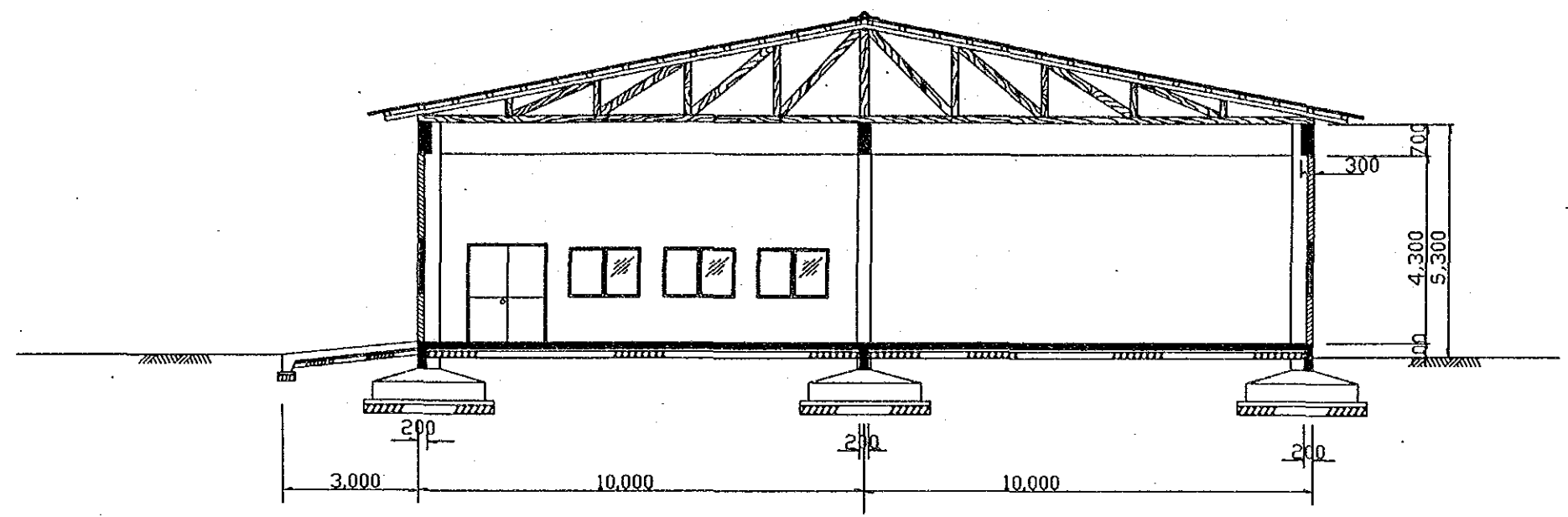
LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
PROJECT OFFICE AND WAREHOUSE PROJECT OFFICE (2/2)		
Date	Drawing No.	7003
JAPAN INTERNATIONAL COOPERATION AGENCY		



LAO PEOPLE'S DEMOCRATIC REPUBLIC		
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE		
TITLE OF DRAWING		
PROJECT OFFICE AND WAREHOUSE		
WAREHOUSE (1/2)		
Date	Drawing No.	7004
JAPAN INTERNATIONAL COOPERATION AGENCY		

WAREHOUSE

SECTION A-A



FRONT VIEW

LAO PEOPLE'S DEMOCRATIC REPUBLIC			
AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN THE SUBURBS OF VIENTIANE			
TITLE OF DRAWING			
PROJECT OFFICE AND WAREHOUSE WAREHOUSE (2/2)			
Date		Drawing No.	7005
JAPAN INTERNATIONAL COOPERATION AGENCY			

JICA