

5-11-3 Project Benefits

Annual benefits attainable under the implementation of this project would amount to ₱2,691,000 which is made up of ₱2,590,000 by agricultural production increase and ₱101,000 by subsistence water supply.

The ratio of the total benefits (B) to the total project costs (C) is estimated at 0.031.

Table 5-2-1 Meteorological Data for the Period 1951-1980

Temperature (°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean	21.6	24.1	27.1	28.7	28.0	27.9	27.6	27.0	26.4	25.7	23.6	21.7	25.8
Ext. Max.	35.9	38.5	40.6	43.1	41.2	38.7	36.8	36.3	36.2	34.9	35.6	34.9	43.1
Ext. Min.	0.1	6.2	7.7	14.4	18.2	19.7	20.4	20.5	16.9	12.8	5.6	2.2	0.1

Relative Humidity (%)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean	65.0	61.0	59.0	64.0	75.0	78.0	78.0	80.0	83.0	79.0	74.0	70.0	72.0
Mean Max.	92.4	89.8	88.5	89.6	92.1	92.8	92.5	93.5	95.5	95.3	94.6	93.7	92.5
Mean Min.	40.4	36.7	35.9	42.0	56.1	61.4	61.6	65.0	67.4	60.6	51.9	45.1	52.0

Evaporation (mm.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean-Piché	No-observation												
Mean-Pan	124.4	134.4	160.9	175.7	155.9	139.9	138.0	123.7	106.2	122.4	113.8	117.3	1612.6

Rainfall (mm.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean	5.8	16.4	47.2	87.6	195.3	174.7	159.0	193.0	247.0	94.8	11.7	3.7	1236.2
Mean Rainy Days	1.5	3.0	5.7	9.6	18.7	17.9	18.1	20.5	21.3	11.2	2.7	0.8	131.0
Daily Maximum	17.0	41.7	61.8	101.2	139.1	110.6	125.0	148.2	148.6	102.5	34.1	25.4	148.6
Day/Year	19/69 11/75	9/79	26/55	25/74	22/79	13/79	13/78	12/78	23/67	9/64	5/74	12/72	23/67

Sunshine Duration (hr.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean	251.8	228.7	224.2	230.2	203.1	160.5	155.7	139.5	146.9	210.9	221.8	240.9	2413.4

Wind (Knots)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Prevailing Wind	E	E	E	E	N	W	W	N	N	N	N	N	-
Mean Wind Speed	3.3	3.7	3.6	3.8	3.6	3.3	3.7	3.5	3.1	2.8	2.8	3.0	-
Max. Wind Speed	30	32	45	47	45	40	33	30	35	33	21	27	47
	NW	W	N	W	N	SW	NW	W	NW	N,E	N,E,SE	E	W

Monthly Rainfall (Loei)

Table 5-2-2

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Rainy Season	Dry Season	Total
69/70	87.1	157.4	193.9	187.8	102.7	212.9	85.9	53.8	0.0	4.2	4.4	55.0	854.7	290.4	1145.1
70/71	166.7	277.9	338.9	52.0	264.1	296.3	41.5	5.8	2.0	0.8	8.3	30.8	1229.2	255.9	1485.1
71/72	20.1	158.1	151.0	98.1	248.9	225.3	102.8	3.4	5.3	0.0	24.7	27.9	881.4	184.2	1065.6
72/73	73.1	77.5	211.7	88.8	119.6	245.9	189.2	21.8	33.8	0.0	0.0	62.0	743.5	379.9	1123.4
73/74	48.8	184.5	242.4	158.8	158.1	465.2	20.2	0.6	0.0	3.1	4.6	67.1	1209.0	144.4	1353.4
74/75	178.3	152.8	49.3	120.2	350.7	197.8	163.5	45.1	1.9	43.1	32.0	52.8	870.8	516.7	1387.5
75/76	31.9	304.2	135.1	176.6	103.0	263.5	117.6	1.3	0.0	0.0	53.1	4.5	982.4	208.4	1190.8
76/77	67.0	165.5	144.5	162.4	150.3	178.5	123.5	8.4	0.0	12.0	0.0	42.2	801.2	253.1	1054.3
77/78	153.0	106.5	66.1	173.5	179.1	165.8	85.8	4.1	2.0	3.0	7.9	71.4	691.0	327.2	1088.2
78/79	52.2	228.1	199.6	508.5	281.4	293.2	41.9	0.0	0.0	0.0	79.6	8.3	1510.8	182.0	1692.8
79/80	68.4	272.7	442.2	121.3	142.2	165.3	5.4	2.7	0.0	0.0	23.3	67.4	1143.7	167.2	1310.9

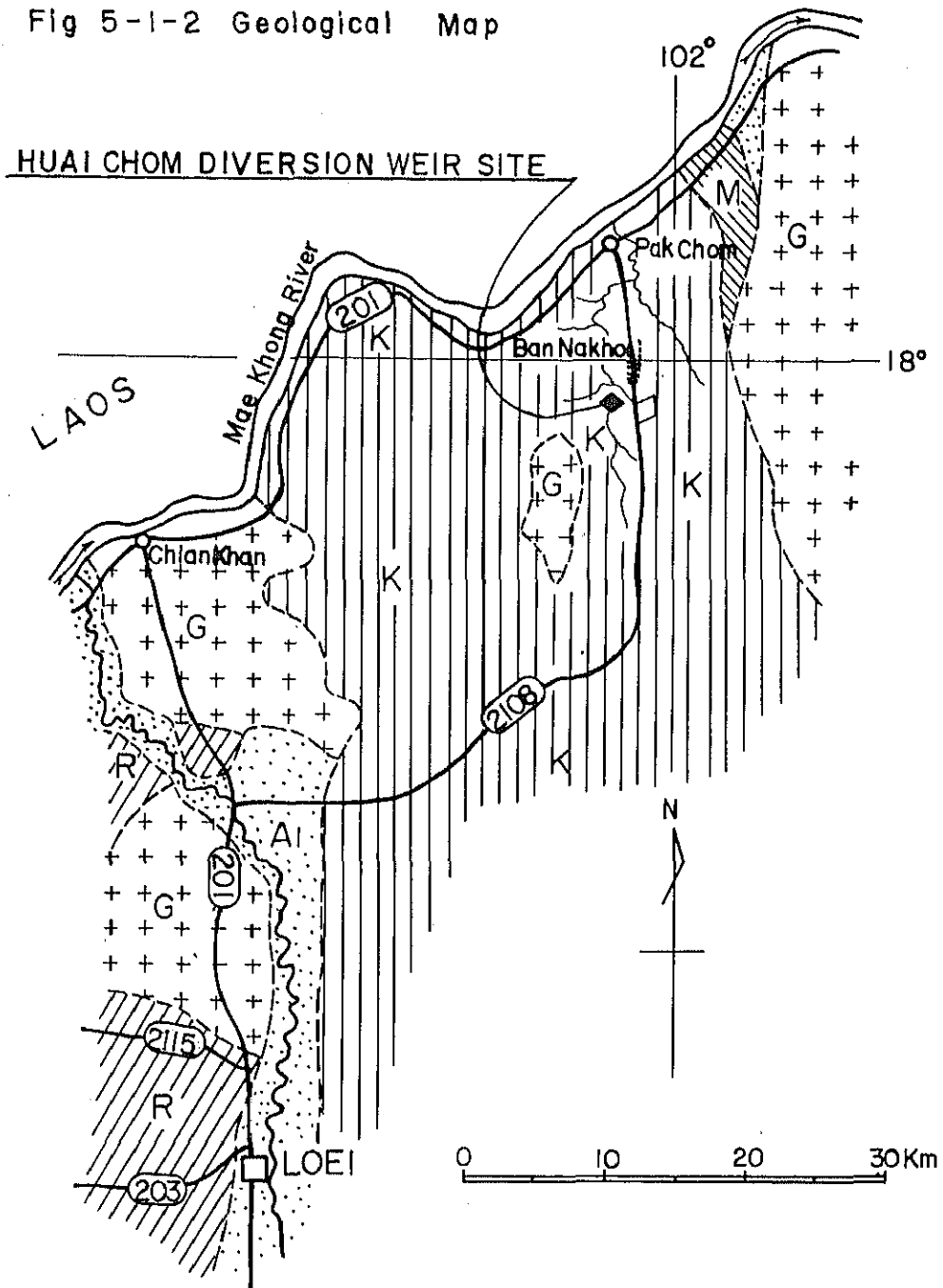
Rainy Season ; May - Sep

Dry Season ; Oct - Apr

Table 5-7-1 Computation Sheet of Net Water Requirement (Loei)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Cropping Pattern												
Evapotranspiration (mm/day)	6.8	5.8	4.9	5.3	4.9	4.3	4.2	3.4	3.5	3.5	4.9	6.0
(mm/mon)	204	180	147	164	152	129	130	102	109	109	137	186
Crop Coefficient	0.30	1.10	1.10	1.10	1.08	1.05	1.00	0.95	0.35	0.70	1.05	0.30
Crop Consumptive Use (mm/mon)	61	198	180	180	164	135	130	97	38	76	144	56
Percolation (mm/mon)	30	16	15	16	16	15	16	30	31	31	28	31
Net Water Requirement (mm/mon)	91	214	177	196	180	150	146	127	69	107	172	87
Water Requirement for Land Preparation (mm)			200						40			
Net Irrigation Area (ha/100ha)	50	3	100	100	100	100	100	100	100	100	100	100
			53						50			
Weighted NWR (mm/mon)	46	6	293	196	180	150	146	127	75	107	172	87

Fig 5-1-2 Geological Map



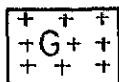
Alluvium Deluvium, vaileyfill and river gravel(Quaternary to Recent)



Mudstone, conglomerate, tuff and limestone-interbedded shale (Carboniferous and Permian)



Greywacke mudston and slate (Carboniferous, Devonian and Silurian)

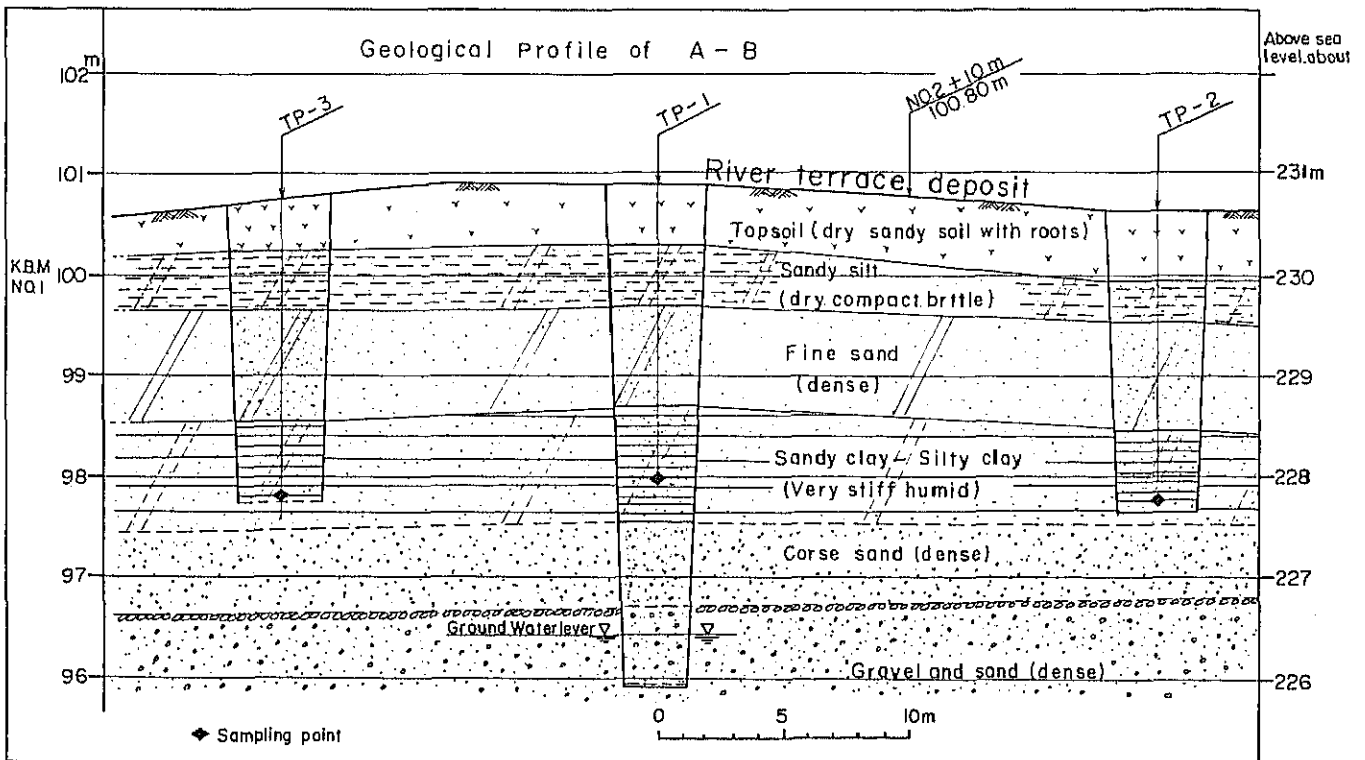
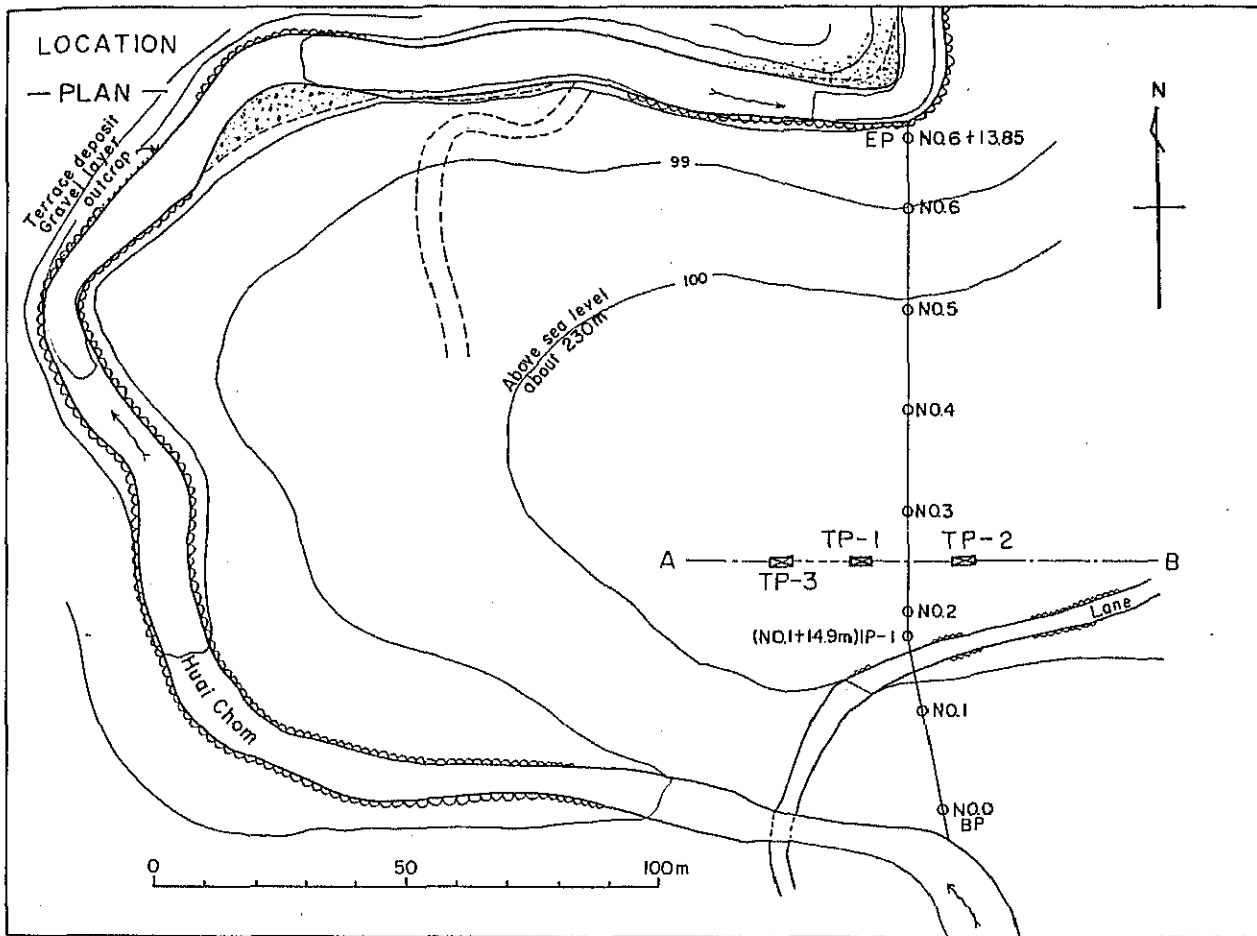


Granite and granodiorite. (Triassic)



Mafic and ultramafic. (Carboniferous)

Fig 5-3-1 Location and Geological Profile of Huai Chom Diversion Weir Site



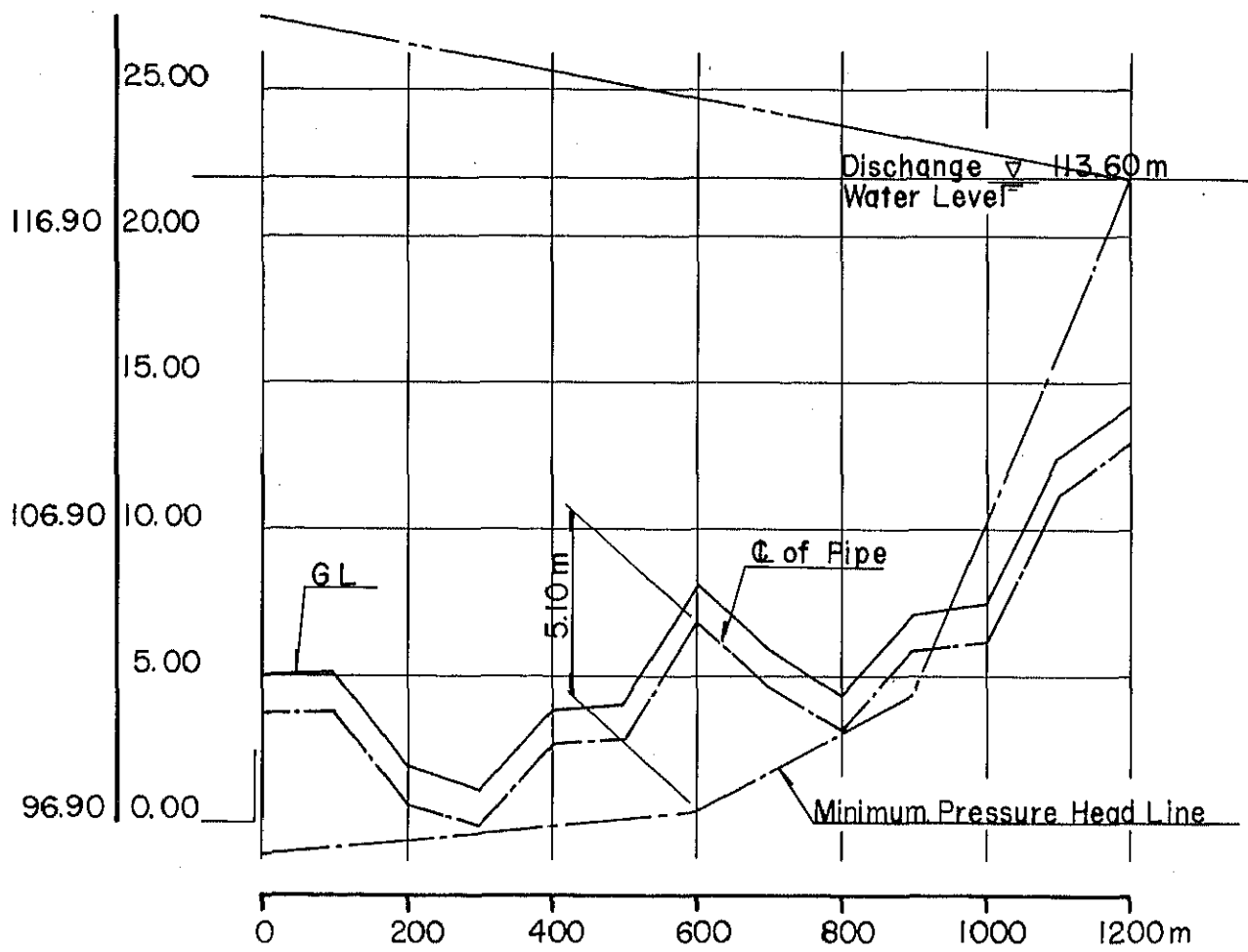


Fig 5-5-1 Minimum Pressure Head Line

Fig 5-6-1 Water Distribution Chart

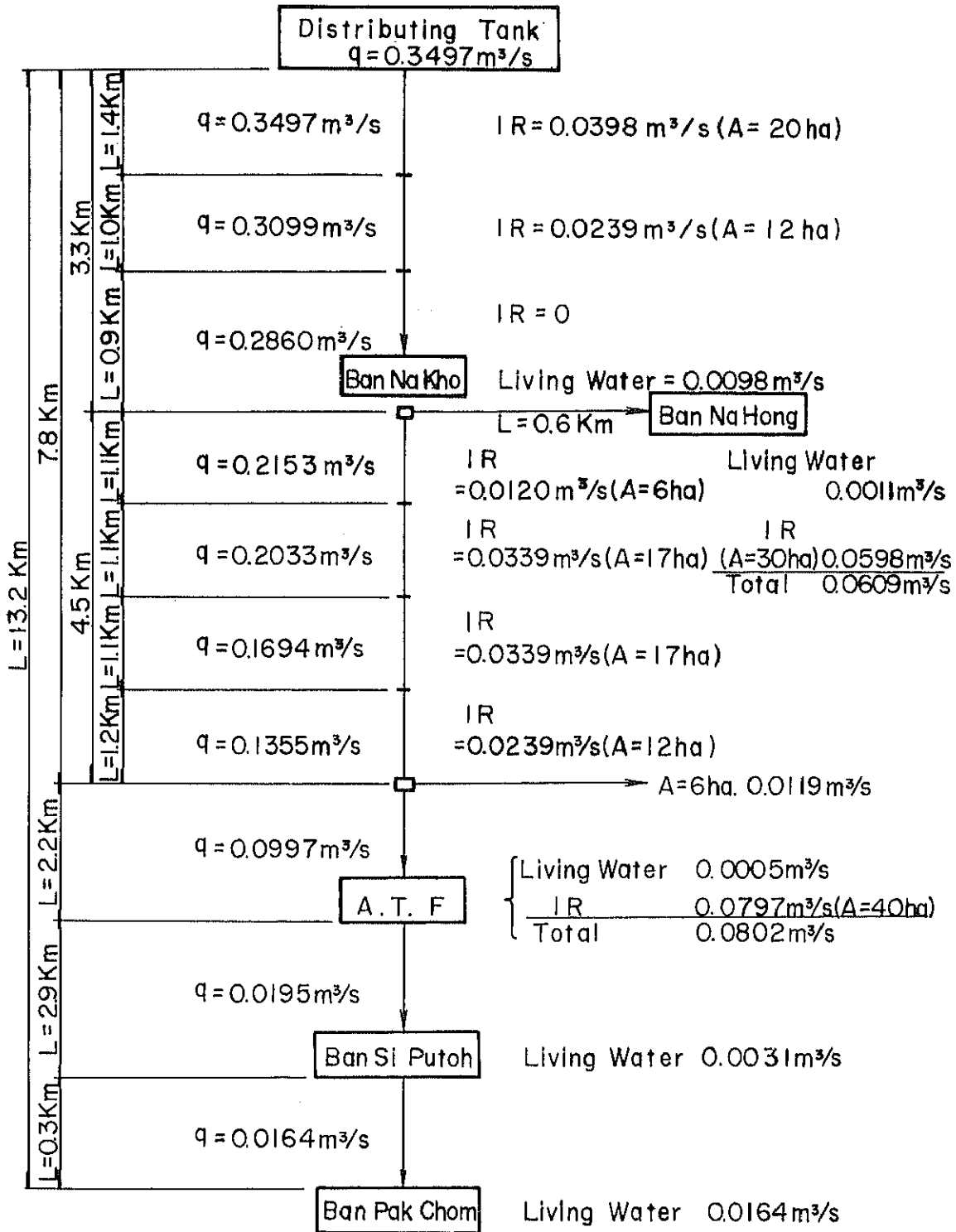


Fig 5-6-2 Location Map of Benefited Area

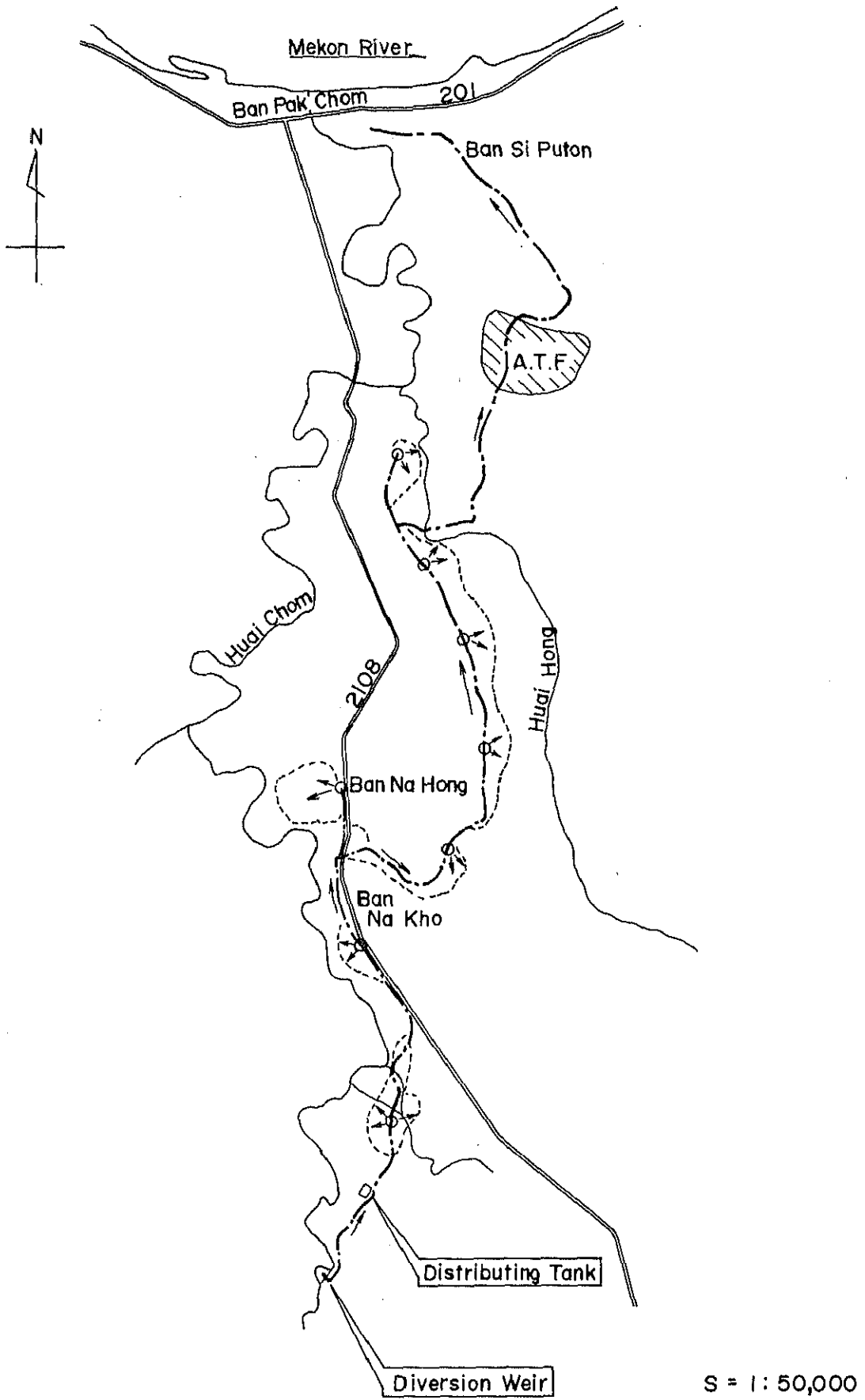


Fig. 5-6-3 Profile of Pipeline (1/5)

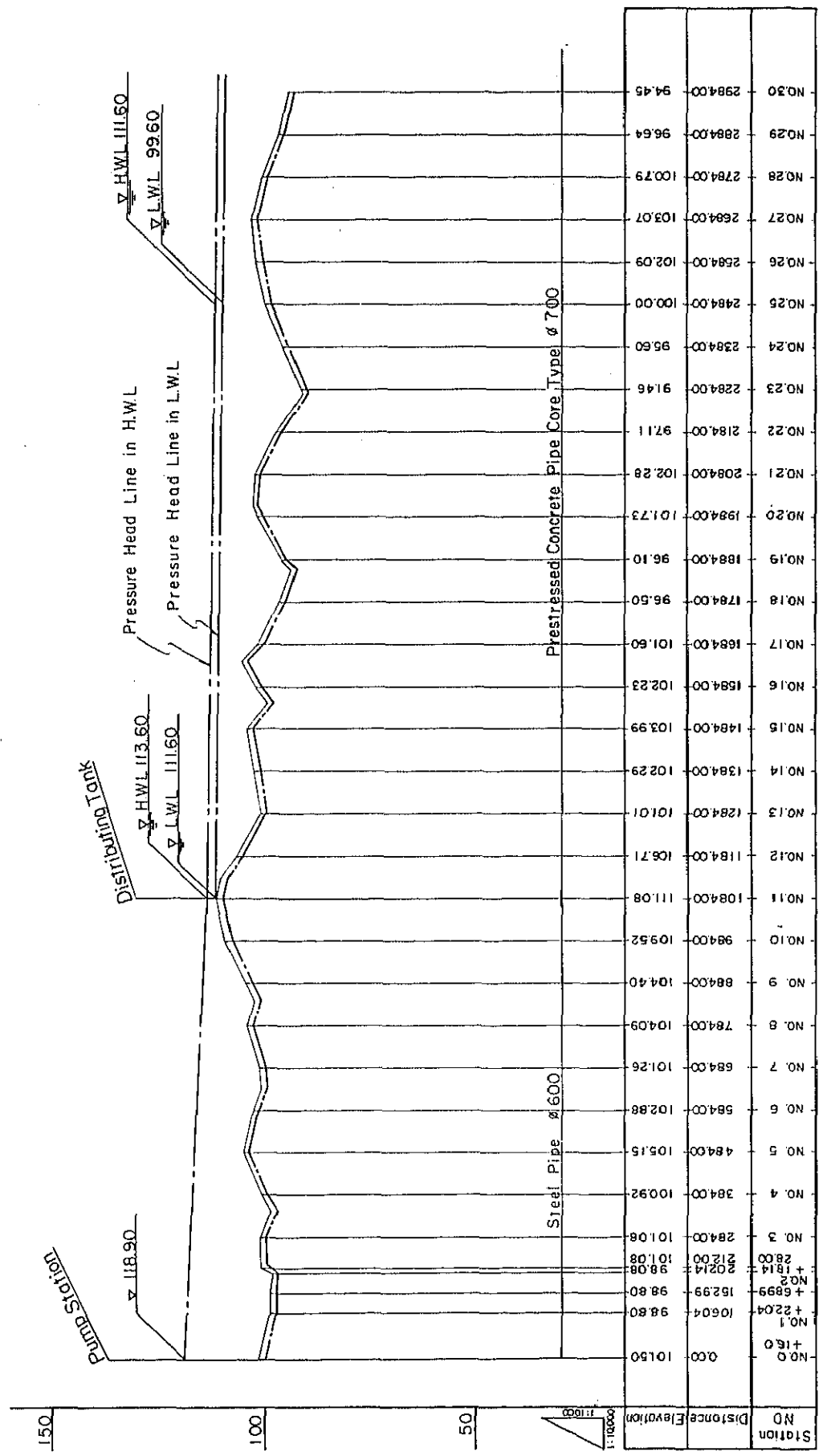


Fig. 5-6-4 Profile of Pipeline (2/5)

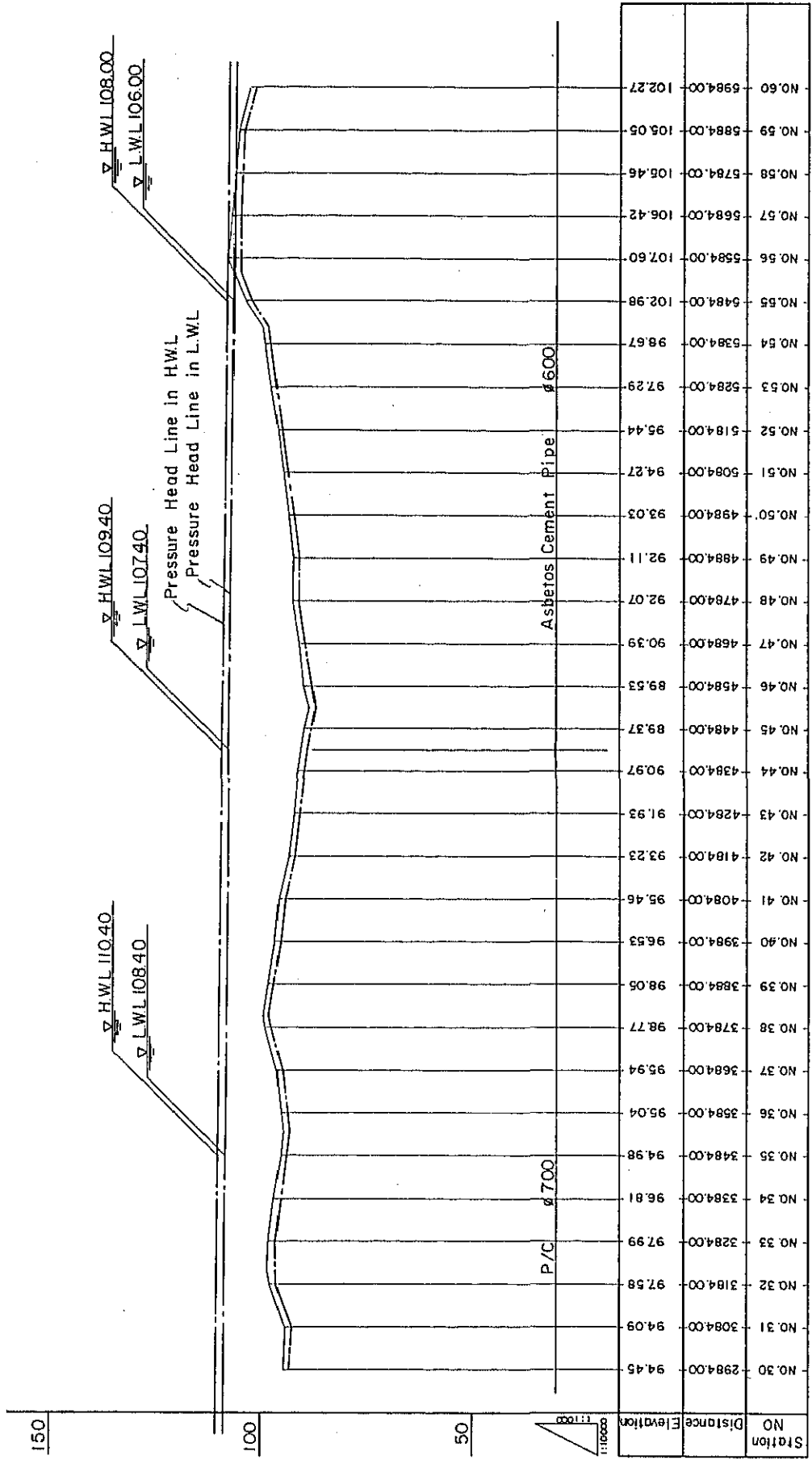
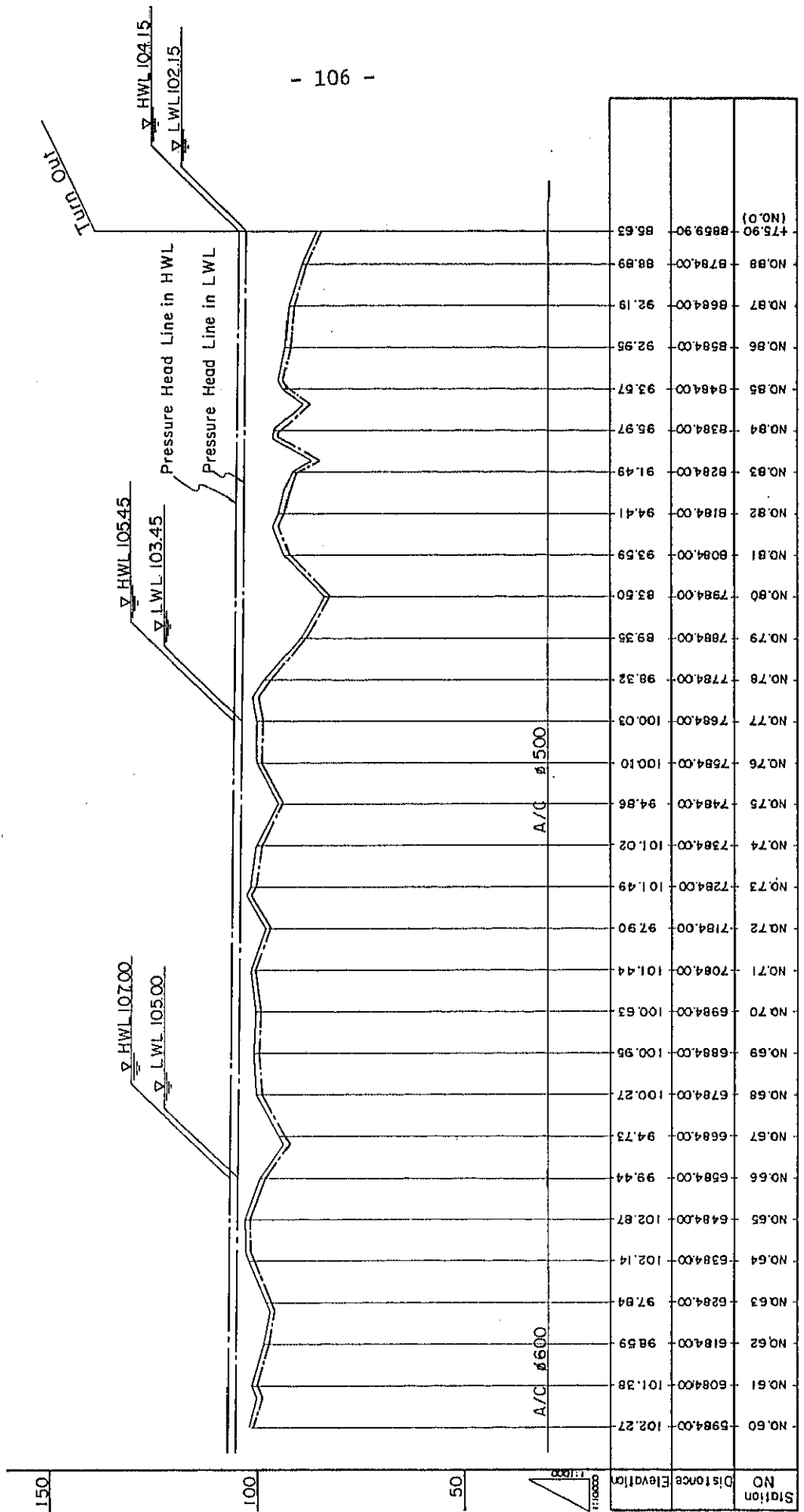


Fig 5-6-5 Profile of Pipeline (3/5)



Station NO	Distance	Elevation (NO. 0)
NO. 60	5984.00	102.27
NO. 61	6084.00	101.38
NO. 62	6184.00	98.59
NO. 63	6284.00	97.84
NO. 64	6384.00	102.14
NO. 65	6484.00	102.87
NO. 66	6584.00	99.44
NO. 67	6684.00	94.73
NO. 68	6784.00	100.27
NO. 69	6884.00	100.96
NO. 70	6984.00	100.63
NO. 71	7084.00	101.44
NO. 72	7184.00	97.90
NO. 73	7284.00	101.49
NO. 74	7384.00	101.02
NO. 75	7484.00	94.86
NO. 76	7584.00	100.10
NO. 77	7684.00	100.03
NO. 78	7784.00	98.32
NO. 79	7884.00	89.36
NO. 80	7984.00	83.50
NO. 81	8084.00	93.59
NO. 82	8184.00	94.41
NO. 83	8284.00	91.49
NO. 84	8384.00	95.97
NO. 85	8484.00	93.57
NO. 86	8584.00	92.95
NO. 87	8684.00	92.19
NO. 88	8784.00	88.89
NO. 89	8884.00	85.63
NO. 90	8984.00	85.63

Fig 5-6-6 Profile of Pipeline (4/5)

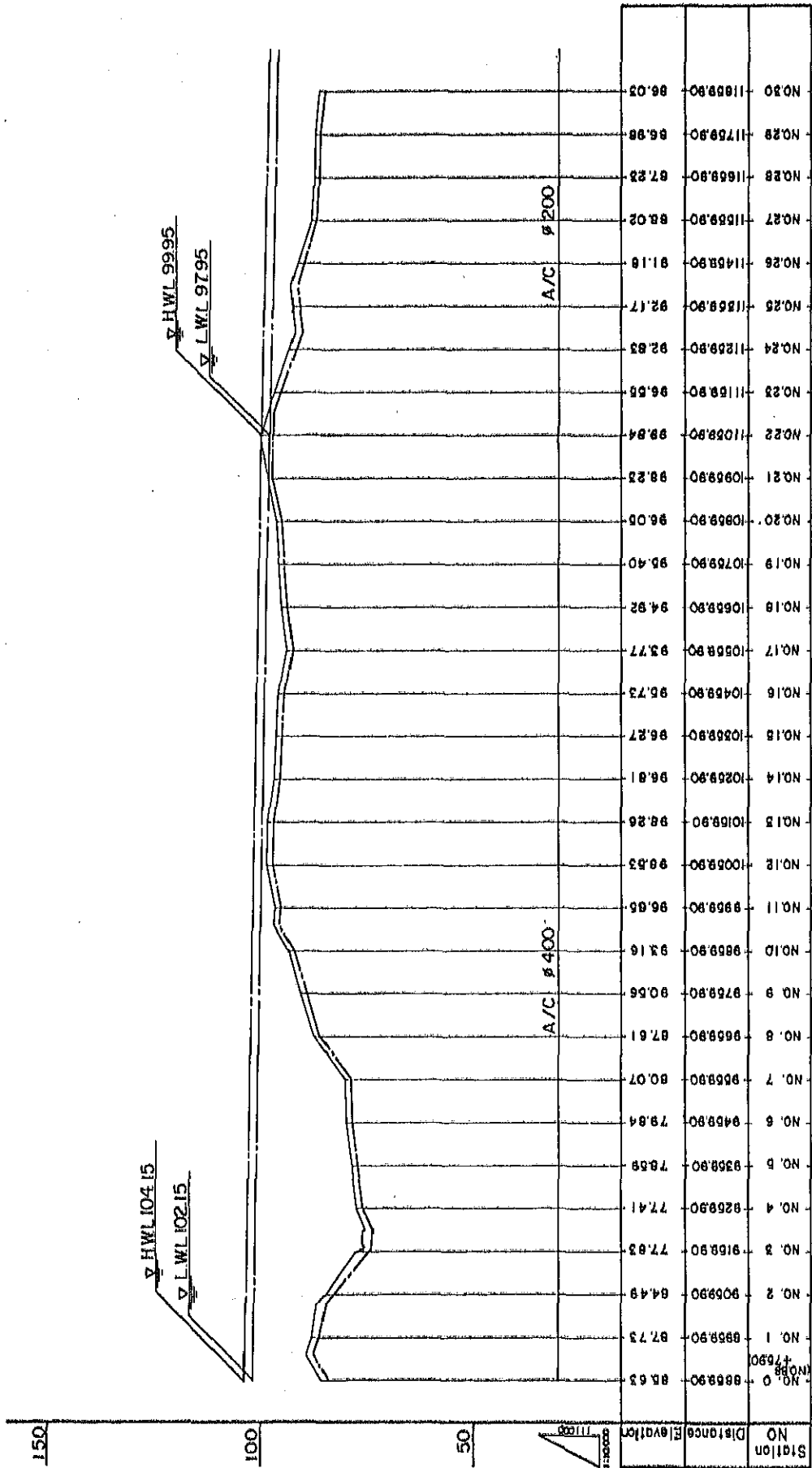
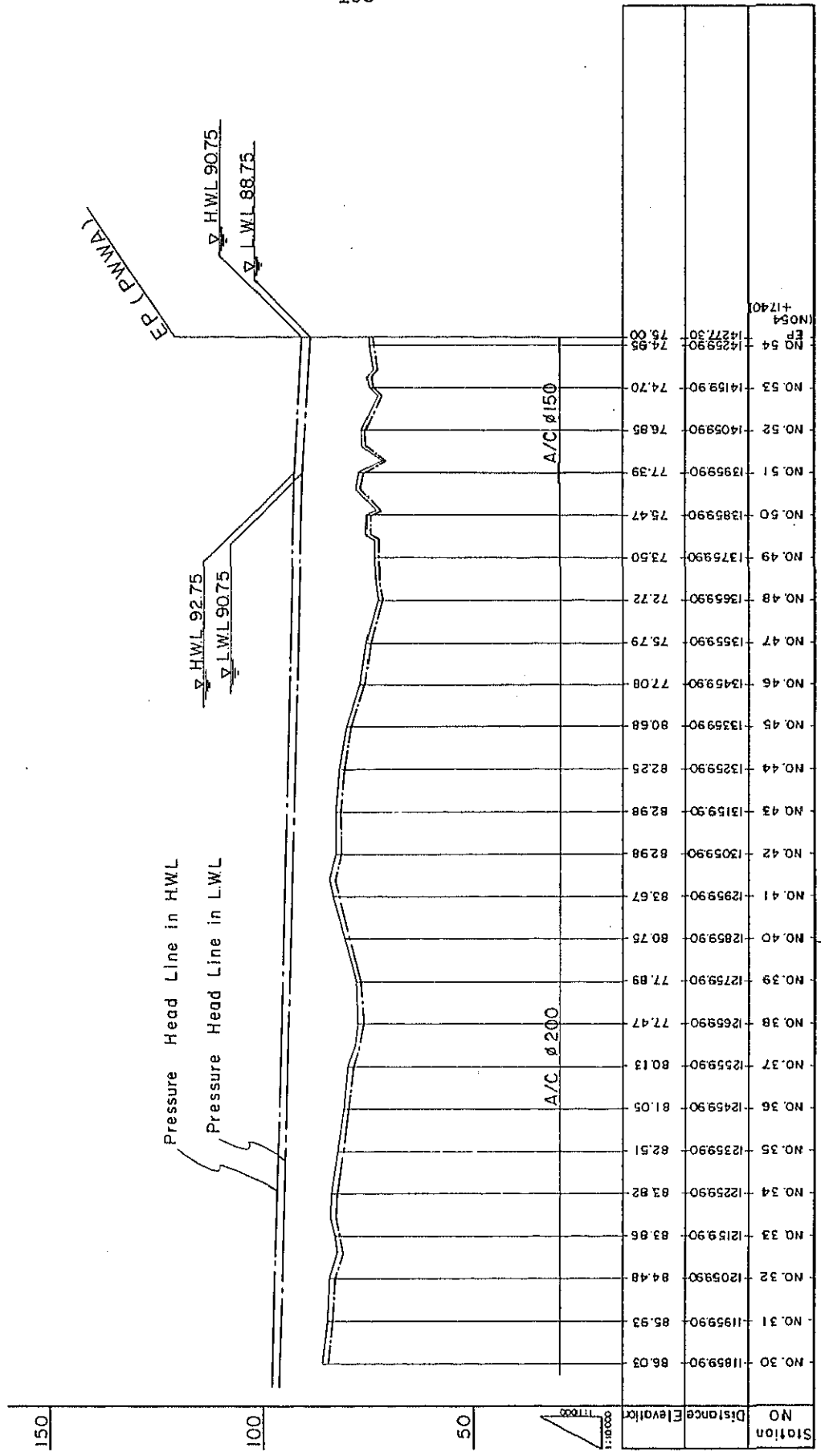


Fig 5-6-7 Profile of Pipeline (5/5)



CHAPTER 6 CONCLUSION AND RECOMMENDATION

6-1 Conclusion

The field survey, studies and analysis were conducted by the current survey team to work out water supply plans for the following two projects:

- (1) Huai Laeng Yai Reservoir Construction Project
- (2) Huai Chom Diversion Weir Construction Project

As a result of the survey and studies, continuous domestic water supply in those projects will be secured and contributes not only to upgrading of the living conditions and improvement of the health conditions of inhabitants in villages around the Nakhon Phanom and Pak Chom camps of displaced persons, but also to encouraging villagers to accelerate rural development by supplying irrigation water and making self-helping efforts of the villagers.

Especially, the Government of the Kingdom of Thailand set the "Rural Poverty Eradication Plan" as one of the targets formulated in the 5-year plan started in 1982. The major objective of the plan is to upgrade living conditions, education, health, income, etc. of the inhabitants through the development of underdeveloped areas.

As those projects are inconformity with the objective of the "Rural Poverty Eradication Plan", the Government of the Kingdom of Thailand and the local authorities are vigorously desiring the prompt implementation of the projects.

Based on the above consideration, Huai Laeng Yai Reservoir Construction Project and Huai Chom Diversion Weir Construction Project will be deemed justifiable enough to be implemented under the grant aid of the Government of Japan.

6-2 Recommendation

Prior to commencement of the construction works, the Government of the Kingdom of Thailand is requested kindly to take necessary

measures under full consideration for prompt settlement of the following matters even if diplomatic formality has been completed between the Government of the Kingdom of Thailand and the Government of Japan.

Huai Laeng Yai Reservoir Construction Project

- (1) Compensation or land acquisition for the proposed dam site, the proposed borrow area, the inundated area, and the proposed sites for a pumping station and a water distribution tank;
- (2) Approval of a road inspector for laying pipelines under the ground or alternatively in case of changing the original pipeline route, agreement with landowners by making compensation or others in determining a new pipeline route and cutting and removal of trees within the route to conduct the topographical survey;
- (3) Land acquisition for a field office, labours' houses, stock-wards of construction machinery and materials, and other facilities necessary for the construction work;
- (4) Agreement with the concerned villages for improvement of an access road; and
- (5) Completion of all formalities as stipulated under the laws of Thailand for the implementation of the construction work and the work for transmission lines, if any.

Huai Chom Diversion Weir Construction Project

- (1) Compensation and land acquisition for the proposed diversion weir site and the proposed sites for a pumping station, a water distribution tank and water supply tanks;
- (2) Compensation for the site for the proposed pipeline route within private lands (farmhouse area, paddy and upland fields, orchards, etc);
- (3) Approval of a road inspector for laying pipelines under the ground along the roads or crossing the road-bed, or alternatively in case of changing the original pipeline route, agreement with landowners by making compensation or others in determining a new pipeline route and cutting and removal of trees within the route

- to conduct the topographical survey;
- (4) Land acquisition for widening of an access road between Ban Na Kho and the proposed diversion weir site for construction purpose;
 - (5) Land acquisition for a field office, labours' houses, stock-wards of construction machinery and materials, and other facilities necessary for the construction work; and
 - (6) Completion of all formalities as stipulated under the laws of Thailand for the implementation of the construction work and the work for transmission lines, if any.

APPENDIX I

- I-1. Members' List of the Survey Team
- I-2. Work Record
- I-3. Interviewees
- I-4. Collected Data

I-1. Member's List of Survey Team

Team Leader	Fumio TAMURA	Japan Engineering Consultants Co., Ltd.
Dam Engineer	Kazuo MIBAYASHI	- Do -
Weir Engineer	Chu NAKAJIMA	- Do -
Hydrologist	Seishiro SUZUKI	- Do -
Design Engineer	Koji SHINOHARA	- Do -
Geologist & Soil Mechanical Engineer	Terukazu HAGIWARA	- Do -
Surveyer	Kenichi SUENAGA	- Do -
Project Evaluation Engineer	Junji OHAMA	- Do -

I-2 Work Record

Day in () indicates a holiday

No.	Date/Day	Bangkok	Nakhon Phanom (NP)	Pak Chom (PC)
1	Nov 24 Wed	Lv. Tokyo Ar. Bangkok		
2	25 Thu	Coutasy call to Embassy of Japan, JICA, MOI & DTEC		
3	26 Fri	Discussion with MOI & RID Data collection		
4	27 Sat	Data collection and preparation of field survey		
5	28(Sun)	- do -		
6	29 Mon	Discussion with MOI & JICA Contract with Geological & Topografic Survey Contractor		
7	30 Tue	Lv. Bangkok	Ar. Nakhon Phanom	
8	Dec 1 Wed		Coutesy call to NP Provincial Office, RID Office and NP Camp	
9	2 Thu		Discussion with Provincial Office, District Office, RID and ARD	
10	3 Fri		Field reconnaissance at dam site	
11	4 Sat		Geological & Topographic survey	
12	5(Sun)		- do - Field reconnaissance of pipeline route	
13	6 Mon		Geological & Topographic survey Hydrological analysis 4 members Lv. NP	4 members Ar. Loei
14	7 Tue		Geological & Topographic survey Hydrological analysis	Courtesy call to Loei Provincial Office & PC District Office
15	8 Wed		- do -	Field reconnaissance of Weir site
16	9 Thu		- do -	- do -
17	10 Fri		- do - Hagiwara Ar. NP	- do - Leveling of existing village road Hagiwara Lv. Loei
18	11 Sat		Geological & Topographic survey Hydrological analysis	Survey for pipeline route Leveling of existing provincial road
19	12(Sun)		- do -	- do -
20	13 Mon		- do - Survey for Camp	- do - Survey for alternative weir site
21	14 Tue		- do -	Survey for pipeline route and Topographic survey
22	15 Wed		Geological & Topographic survey Hydrological analysis	- do - Survey for river cross section

No.	Date/Day	Bangkok	Nakhon Phanom (NP)	Pak Chom (PC)
23	Dec 16 Thu		Geological & Topographic survey Hydrological analysis	Survey for pipeline route and Topographic survey
24	17 Fri		Interview on agriculture products and market price Hydrological analysis Hagiwara Lv. NP	- do - Discussion at PC District Office Hagiwara Ar. Loei
25	18 Sat		Interview on market price at NP market Embankment design.	Topographic survey for pipeline route
26	19(Sun)		Interview in villages along Mekong River Suzuki Lv. NP	- do - Suzuki Ar. Loei
27	20 Mon		Embankment & Spillway design	Topographic survey for pipeline route Test pit digging
28	21 Tue		- do - 2 members Ar. NP	- do - Courtesy call to Governor of Loei 2 members Lv. Loei
29	22 Wed		Report writing on the outline of Huai Laeng Yai Reservoir	Drawing of Topographic Survey Design
30	23 Thu		Meeting with Provincial Officer, RID, ARD & HD	- do -
31	24 Fri		3 members Lv. NP	- do - 3 members Ar. Loei
32	25 Sat			Design
33	26(Sun)	2 members Ar. Bangkok		- do - 2 members Lv. Loei
34	27 Mon	Interim Report to Embassy of Japan and JICA		Design
35	28 Tue	2 members Lv. Bangkok		- do - 2 members Ar. Loei
36	29 Wed			Desing
37	30 Thu			- do -
38	31(Fri)			- do -
39	Jan 1(Sat)			off
40	2(Sun)			Basic design of structures
41	3(Mon)			- do -
42	4 Tue			- do -
43	5 Wed	3 members Ar. Bangkok		- do - 3 members Lv. Loei Discussion at PC District Office
44	6 Thu	Report the result to JICA		Report writing on the outline of Huai Chom Diversion project
45	7 Fri	Hagiwara Lv. Bangkok 2 members Lv. Bangkok Ar. Tokyo		Discussion with Provincial Officer, ARD, etc. Hagiwara Ar. Loei
46	8 Sat			Basic design of structures

<u>No.</u>	<u>Date/Day</u>	<u>Bangkok</u>	<u>Nakhon Phanom (NP)</u>	<u>Pak Chom (PC)</u>
47	Jan 9(Sun)			Basic Design of structures
48	10			- do - Additional field reconnaissance
49	11 Tue			- do -
50	12 Wed	All members Ar. Bangkok		All members Lv. Loei
51	13 Thu	Report the result of reconnaissance to Embassy of Japan, JICA and MOI		
52	14 Fri	Report writing		
53	15 Sat	- do -		
54	16(Sun)	- do -		
55	17 Mon	- do -		
56	18 Tue	Submission of Draft Report to MOI and DTEC		
57	19 Wed	Discussion with MOI & DTEC		
58	20 Thu	Report the result to Embassy of Japan and JICA Discussion with MOI		
59	21 Fri	Discussion with Embassy of Japan and JICA		
60	22 Sat	All members Lv. Bangkok Ar. Tokyo		

I-3. Interviewees

- 1) Ministry of Interior
Operation Center for Displaced Persons

Mr. Charoenjit Na Sangkhla	Director
Mr. Virachai Naewboonnien	Deputy Director
Mr. Pranai Suwanrath	Chief, Foreign Affairs Section
Mr. Praphakorn Smiti	Chief of Operation Section
Mr. Santi Kardintra	Chief Assistant, Welfare Division
Mr. Soon Than Surintha	Chief, Welfare Section

- 2) Department of Technical and Economic Cooperation (DTEC)
Colombo Plan Sub-Division

Mr. Apilas Ostananda	Director General
Mr. Kasem Unahasuvan	Deputy Director
Mr. Thawal Polpuech	Director of Colombo Plan Sub-Division
Mr. Surayuth Kungsadan	Member
Mr. Sutin Susila	Member

- 3) Royal Irrigation Department

Mr. Boonthai Otaganonta	Director, Design Division
Mr. Suha Thanomsingha	Bang-Pra Project, A. Sriraja P. Chunburi
Mr. Prasert Milintangul	Hydrogy Division
Mr. Somneuk Sungsuwan	Nakhon Phanom Office
Mr. Nirundi Narttatim	Nakhon Phanom Office
Mr. Nirun Naktubtin	Nakhon Phanom Office

- 4) Nakhon Phanom Provincial Office

Mr. Wirote Amarat	Governor
Maj. Prasit Poonsawat	Deputy Governor
Mr. Theranont Voraprakun	Director of Civil Division
Mr. Kimo Look	Civil Division (U.S. Peace Corps)
Mr. Prayursuk Sakronwansuk	Deputy Highway District Engineer

- | | |
|--|--|
| Mr. Jumroon Panichying | Forest Office, Forest Office |
| Mr. Pongton Palivanik | Officer of Land |
| 5) Amphur Muang Distric Office | |
| Mr. Payungsak Supehusang | District Officer |
| Mr. Battamasak Aswanuwat | Assistant District Officer |
| Mr. Anirut Chartavaraha | Community Development |
| Mr. Chaovalit Chamkrom | Assistant District Officer |
| 6) ARD (Accelerated Rural Development) Nakhon Phnom | |
| Mr. Veerapol Thepratra | Chief Engineer |
| Sub-LT. Vijitr Thommachart | Chief Construction Technician |
| 7) PEA (Provincial Electric Authority) Nakhon Phanom | |
| Mr. Rai Suwannasub | Supervisor |
| Mr. Prakrit Boongun | Power Distribution Reinforcement Project |
| 8) Highway Department | |
| Mr. Bunjong Chareanphanich | Engineer, Nakhon Phanom |
| 9) Na Pho Camp | |
| Mr. Thamrongsak Buranaphalin | Na pho Camp Commander |
| Mr. Sahob Sittikorakan | Deputy Camp Commander |
| Mr. Pipat Greigarn | Field Officer (Napho), UNHCR |
| Miss Wanee Wattanahsetpono | IRC Sanitarian NAPHO |
| 10) Loei Provincial Office | |
| Mr. Thengdum Bancheun | Governor |
| Mr. Napadol Hengchareon | Chief of Governor's Office |
| Mr. Preecha Butrasri | Officer of the Governor |
| 11) Pak Chom District Office | |
| Mr. Narait Jitsujaritwong | District Officer |
| Mr. Wisa Yayaluksana | Deputy District Officer |

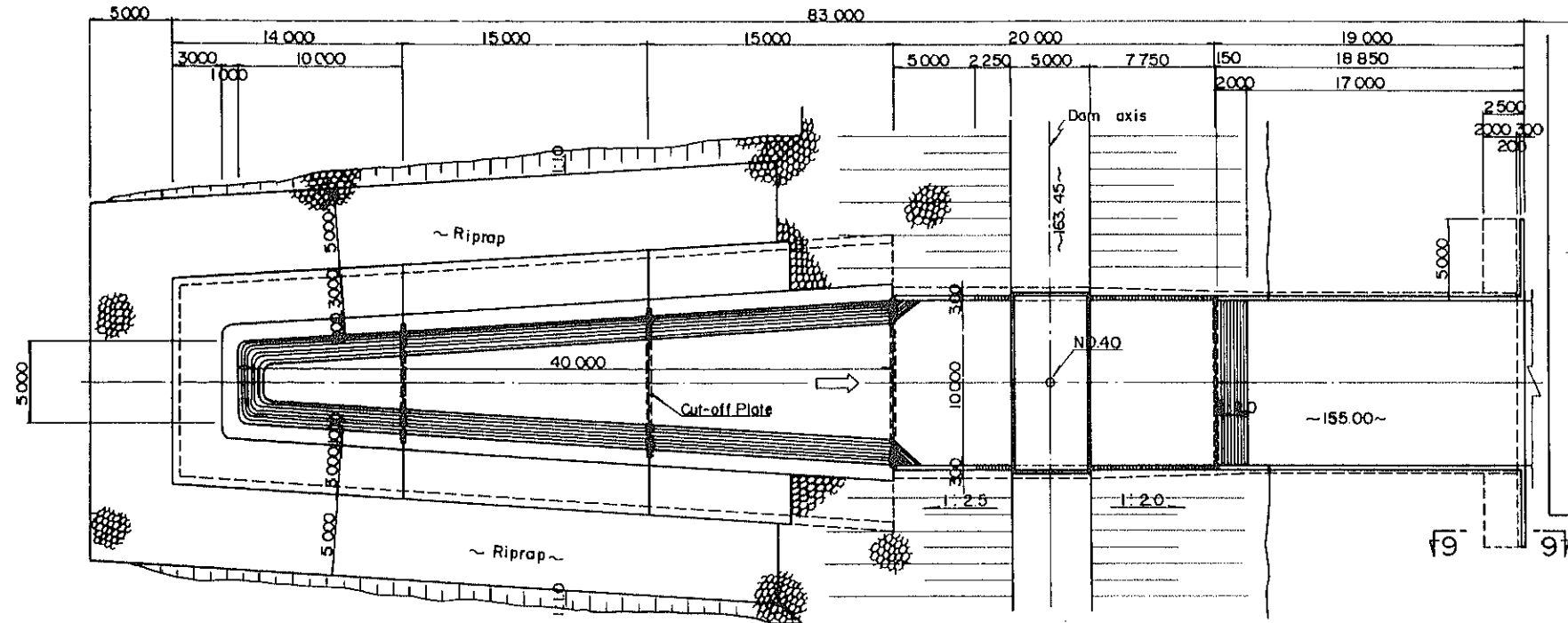
APPENDIX II DRAWINGS



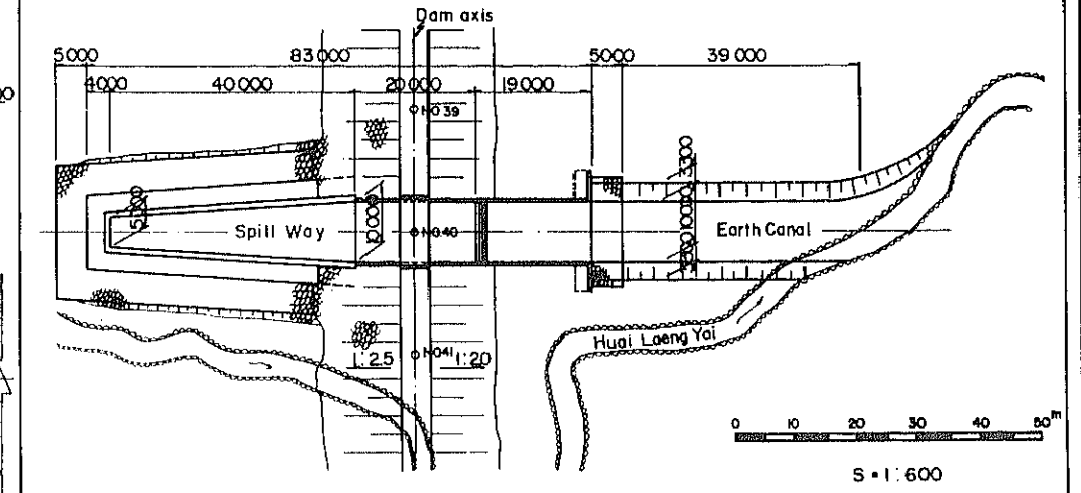
THE KINGDOM OF THAILAND	
THE ENVIRONMENTAL IMPROVEMENT PROJECT	
IN THAI-LAO BORDER REGION	
HUAI LAENG YAI RESERVOIR	
DAM GENERAL PLAN	
Date	Mar. 1983
Drawing NO.	N-1
JAPAN INTERNATIONAL COOPERATION AGENCY	

SPILLWAY

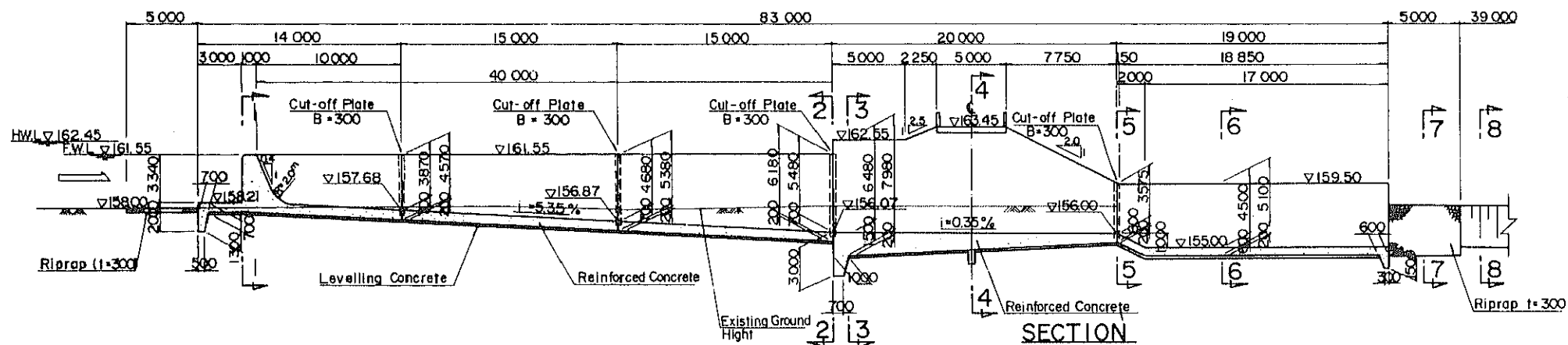
PLAN



GENERAL PLAN

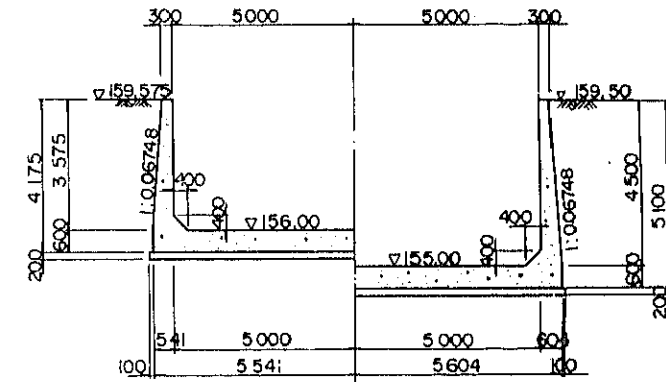


PROFILE



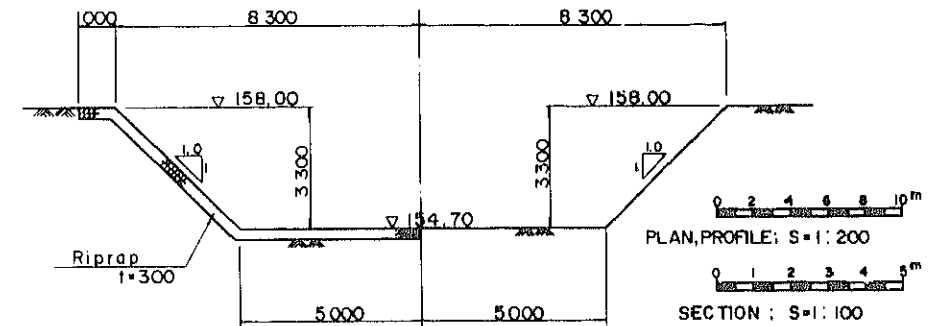
SECTION

5-5 6-6



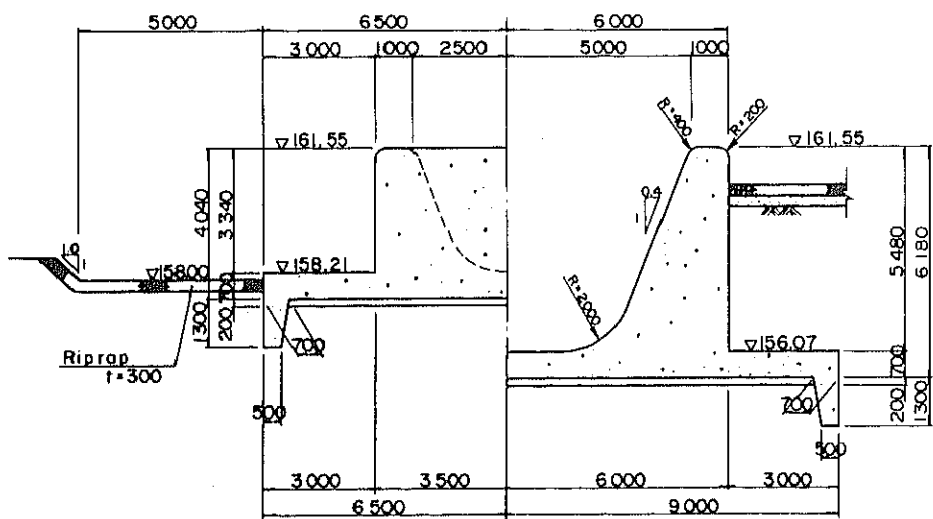
SECTION

7-7 8-8



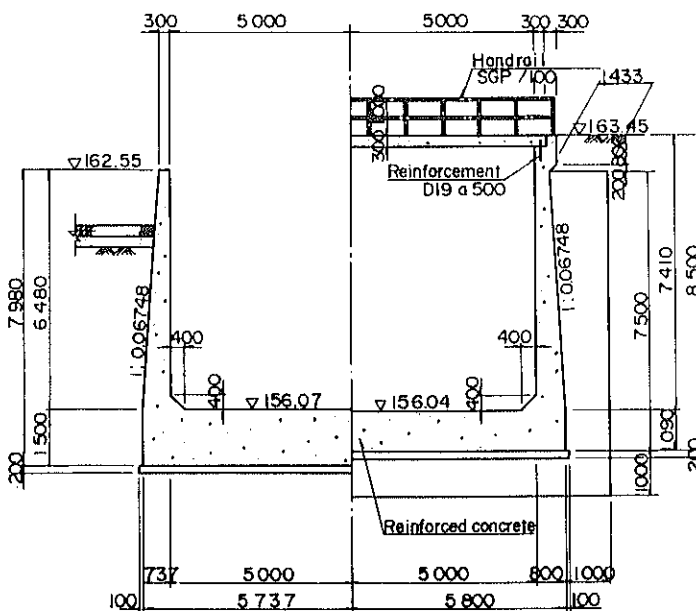
SECTION

1-1 2-2

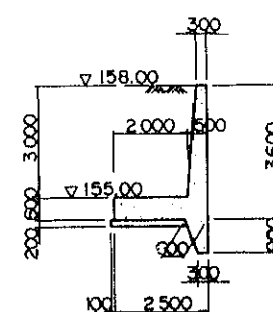


SECTION

3-3 4-4



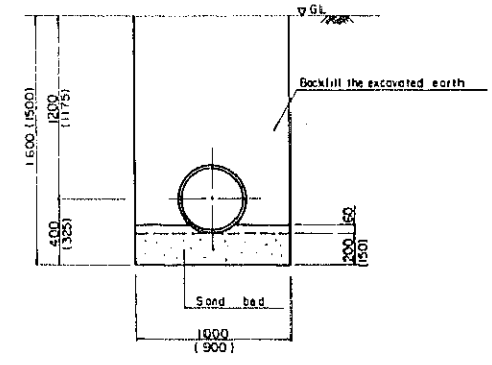
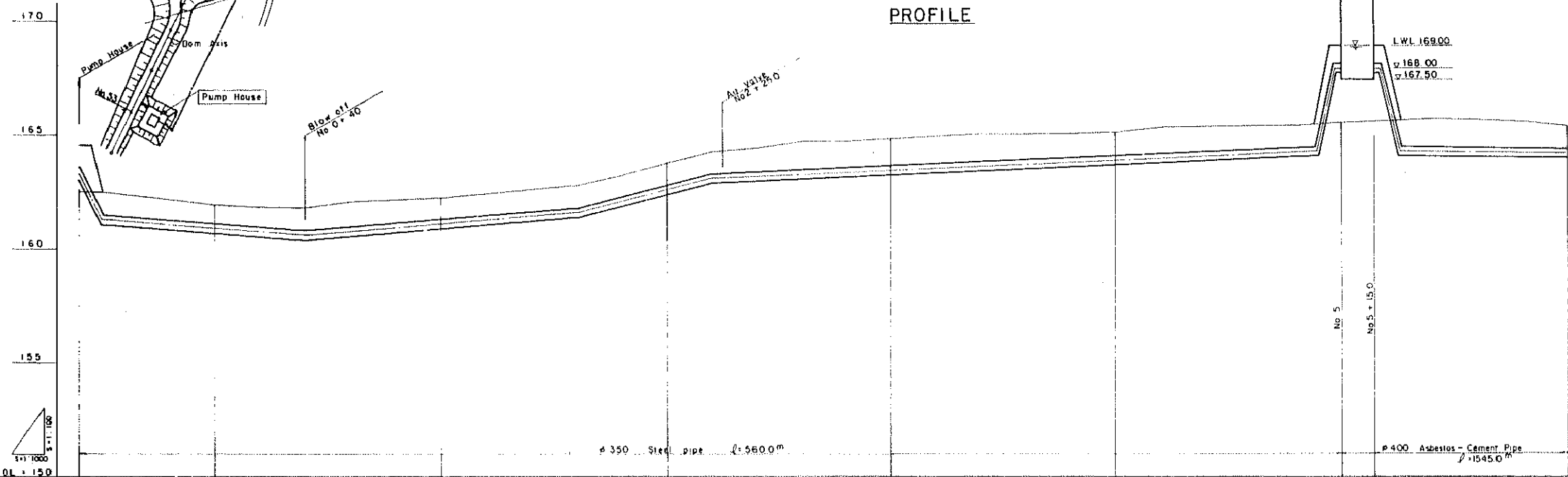
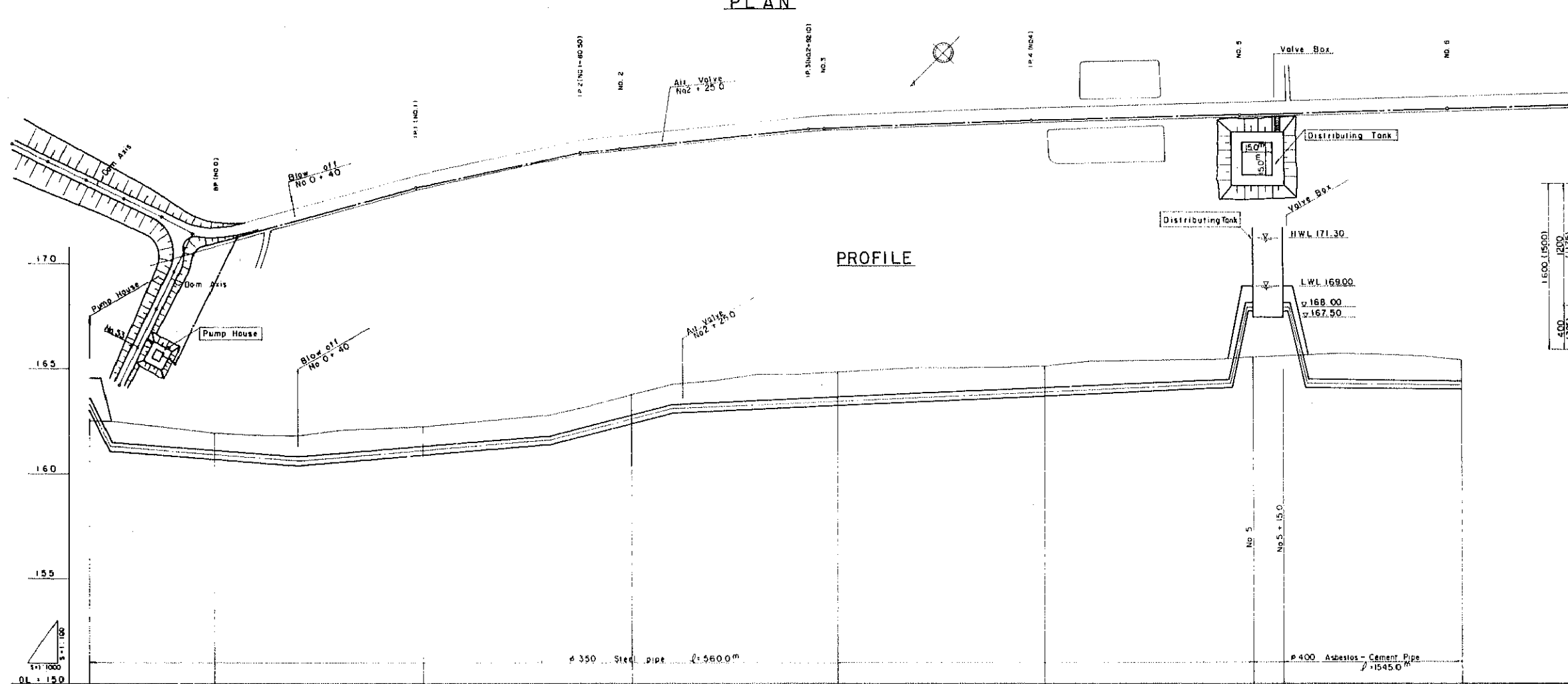
SECTION 9-9



THE KINGDOM OF THAILAND		
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI-LAO BORDER REGION		
Hwai LAENG YAI RESERVOIR		
SPILLWAY, PLAN AND SECTION		
Date	Mar. 1983	Drawing No
		N-3
JAPAN INTERNATIONAL COOPERATION AGENCY		

MAIN ROUTE (1/5)

PLAN



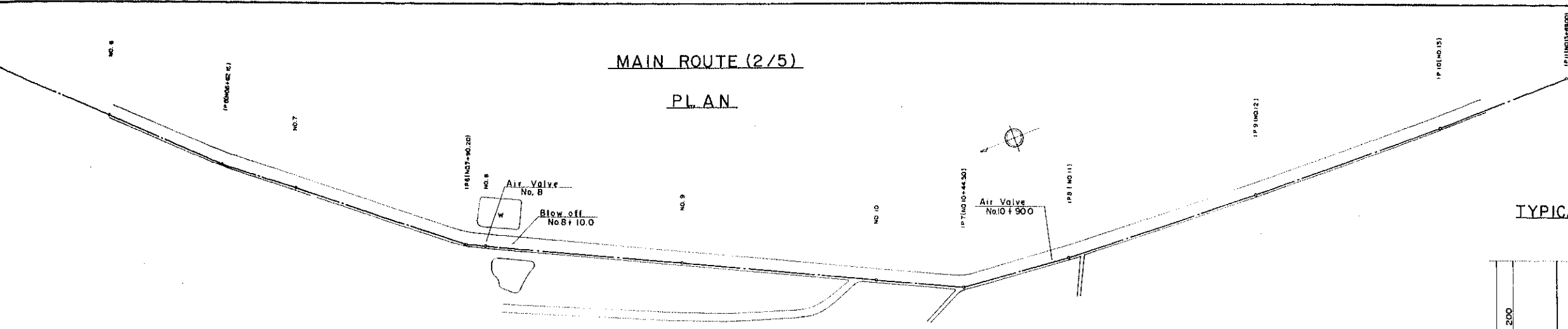
X () = 350

SLOPE															
DEPTH	1.05	1.00	1.00	1.01	1.02	1.02	1.02	1.02	1.02	1.00					
CENTER ELEVATION	163.90	161.91	160.90	161.10	161.60	162.11	162.60	163.10	163.44	163.47	163.94	164.35	164.00	164.27	164.30
GROUND ELEVATION	162.50	162.90	161.94	162.25	163.81	163.81	164.30	164.30	164.88	164.88	165.16	165.60	165.60	165.45	165.45
ACCUMULATIVE DISTANCE	0.00	10.00	60.00	100.00	160.00	250.00	260.00	260.00	322.10	350.00	400.00	500.00	500.00	500.00	640.00
DISTANCE	0.00	10.00	50.00	40.00	60.00	20.00	19.50	20.00	72.10	7.90	100.00	90.00	10.00	25.00	70.00
NO.	NO. 0 150.00	NO. 1 150.00	NO. 2 150.00	NO. 3 150.00	NO. 4 150.00	NO. 5 150.00	NO. 6 150.00	NO. 7 150.00	NO. 8 150.00	NO. 9 150.00	NO. 10 150.00	NO. 11 150.00	NO. 12 150.00	NO. 13 150.00	NO. 14 150.00
CURVE	NO. 0 BP 136°12'20"		IP. 1 165°28'10"		IP. 2 168°55'40"		IP. 3 163°16'40"		IP. 4 160°44'40"						

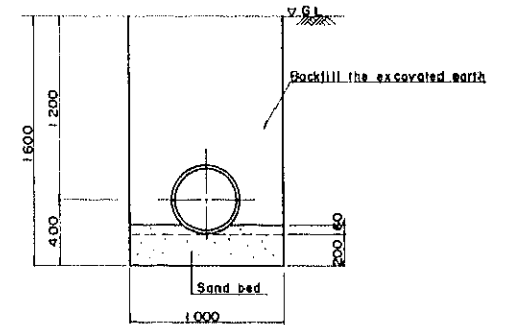
THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 PIPELINE PLAN & PROFILE (1/7)
 Date: Mar 1983 Drawing No: N-5
 JAPAN INTERNATIONAL COOPERATION AGENCY

MAIN ROUTE (2/5)

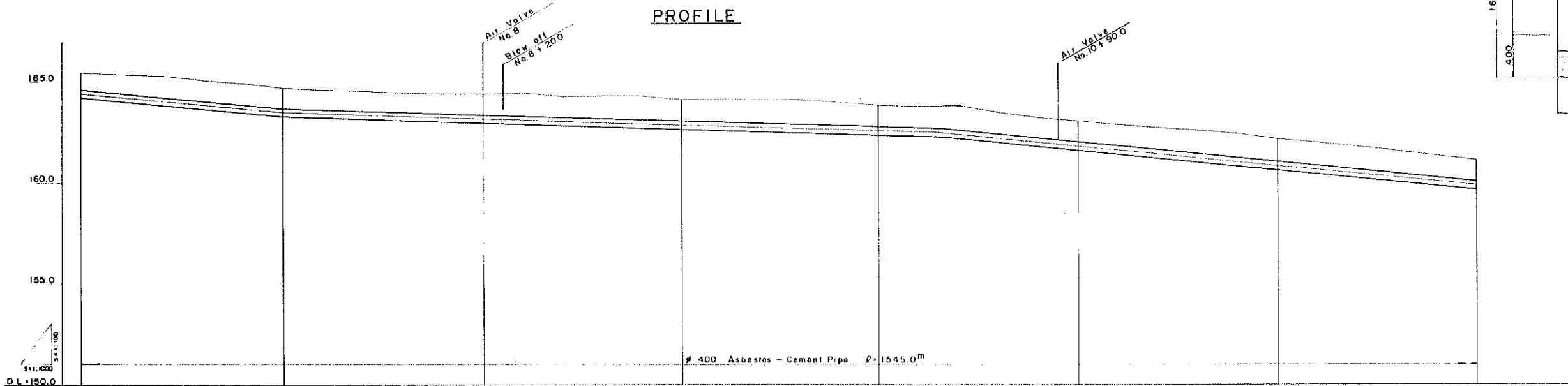
PLAN



TYPICAL SECTION s=1:20



PROFILE



φ 400 Asbestos - Cement Pipe L = 1545.0m

SLOPE	1:1000		1:1000		1:1000		1:1000		1:1000		1:1000	
DEPTH	1.00		1.01		1.06		1.08		1.09		1.07	1.04
CENTER ELEVATION	164.30	163.80	163.80	163.25	163.20	162.89	162.98	162.50	162.50	161.83	160.87	159.90
GROUND ELEVATION	165.45		164.71	164.46	164.17	163.86	163.86	163.10	162.10	162.22	161.14	160.00
ACCUMULATIVE DISTANCE	0.00	72.15	790.00	850.20	860.00	960.00	1060.00	1090.00	1104.50	1160.00	1200.00	1360.00
DISTANCE	0.00	62.15	37.85	90.20	9.80	100.00	100.00	30.00	14.50	55.00	100.00	100.00
NO.	NO. 6	IP. 6	NO. 7	IP. 6	NO. 8	NO. 9	NO. 10	IP. 7	IP. 7	NO. 11	IP. 9	IP. 10
CURVE		17.9 174° 58' 0"		17.8 167° 0' 30"				17.7 159° 35' 40"		17.6 175° 14' 40"		17.9 178° 34' 00"

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 PIPELINE PLAN & PROFILE (2/7)
 Date Mar 1983 Drawing No. N-6
 JAPAN INTERNATIONAL COOPERATION AGENCY

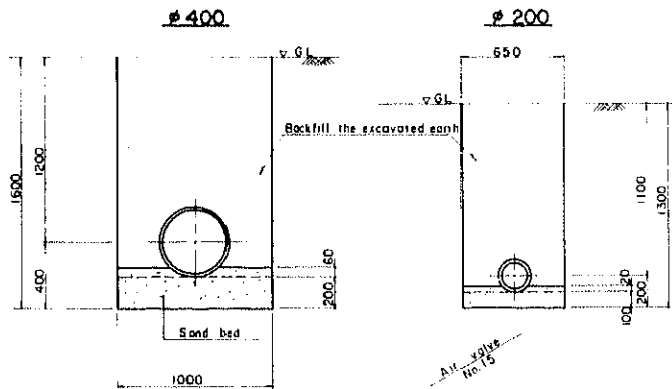
MAIN ROUTE (3/5)

PLAN

L.I. ROUTE

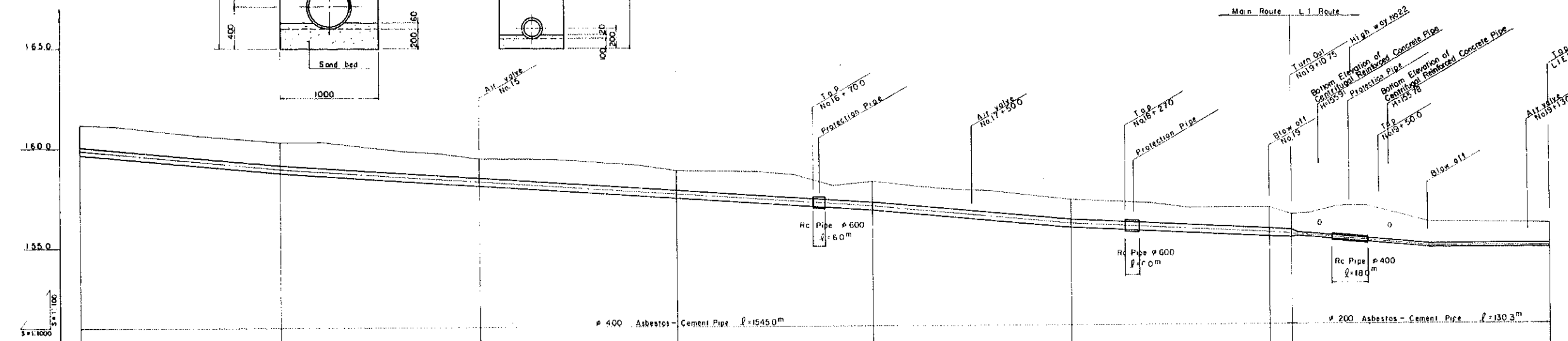
PLAN

TYPICAL SECTION S=1:20



PROFILE

PROFILE

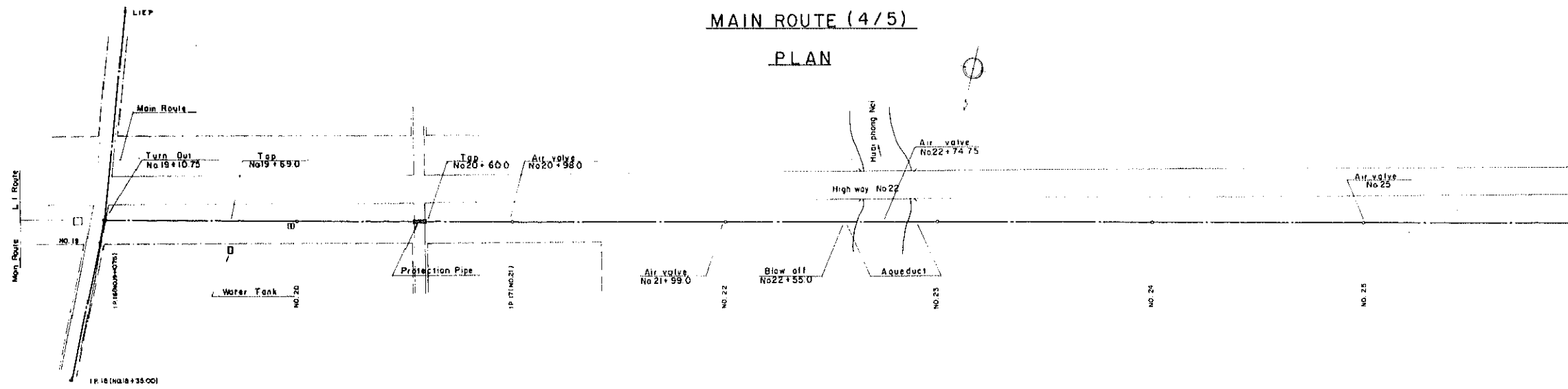


SLOPE	1:1.008 L=497.0m		1:1.158 L=300.0m		1:1.108 L=100.0m		1:1.225 L=100.0m		1:1.167 L=40.0m		LEVEL L=61.05m
DEPTH	1.04	1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	
CENTER ELEVATION	159.96	158.84	158.31	157.87	157.54	156.10	155.65	155.55	154.90	154.90	
GROUND ELEVATION	161.14	160.29	159.47	158.85	158.24	157.30	156.65	156.51	154.90	156.01	
ACCUMULATIVE DISTANCE	0.00	1429.00	1480.00	1564.90	1627.90	1650.00	1750.00	1895.00	1960.00	1975.00	2015.00
DISTANCE	0.00	69.00	51.00	84.40	62.90	32.20	100.00	30.00	65.00	10.75	61.05
NO	IP.10 NO.13	IP.11 NO.14	IP.12 NO.15	IP.13 NO.16	IP.14 NO.17	IP.15 NO.18	IP.16 NO.19	IP.17 NO.20	IP.18 NO.21	IP.19 NO.22	IP.20 NO.23
CURVE	IP.10 174° 35' 20"	IP.11 178° 40' 00"	IP.12 182° 33' 50"	IP.13 178° 20' 10"	IP.14 183° 11' 50"	IP.15 178° 03' 40"	IP.16 174° 47' 10"				

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 PIPELINE PLAN & PROFILE (3/7)
 Date Mar. 1983 Drawing No. N-7
 JAPAN INTERNATIONAL COOPERATION AGENCY

MAIN ROUTE (4/5)

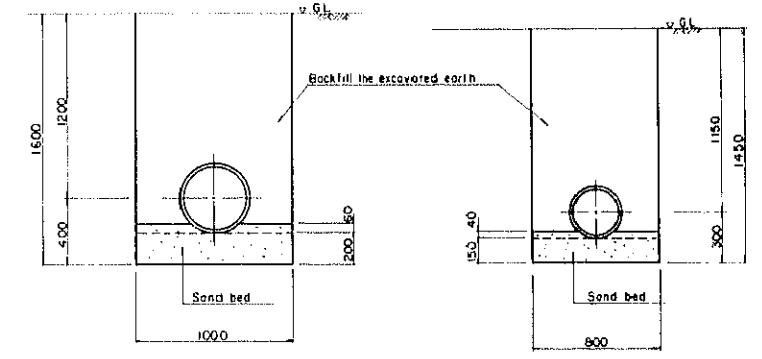
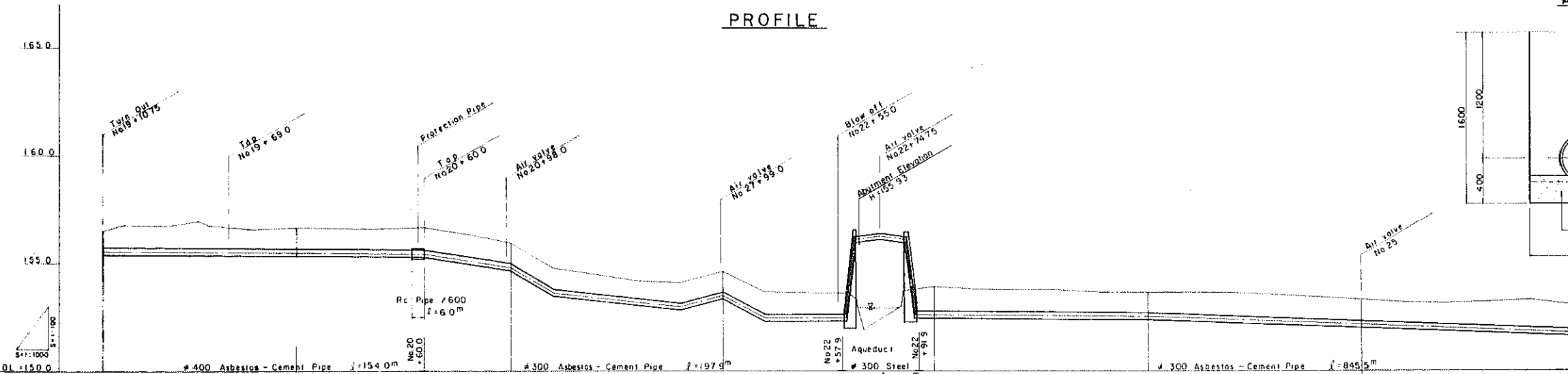
PLAN



TYPICAL SECTION S=1:20

ø 400 ø 300

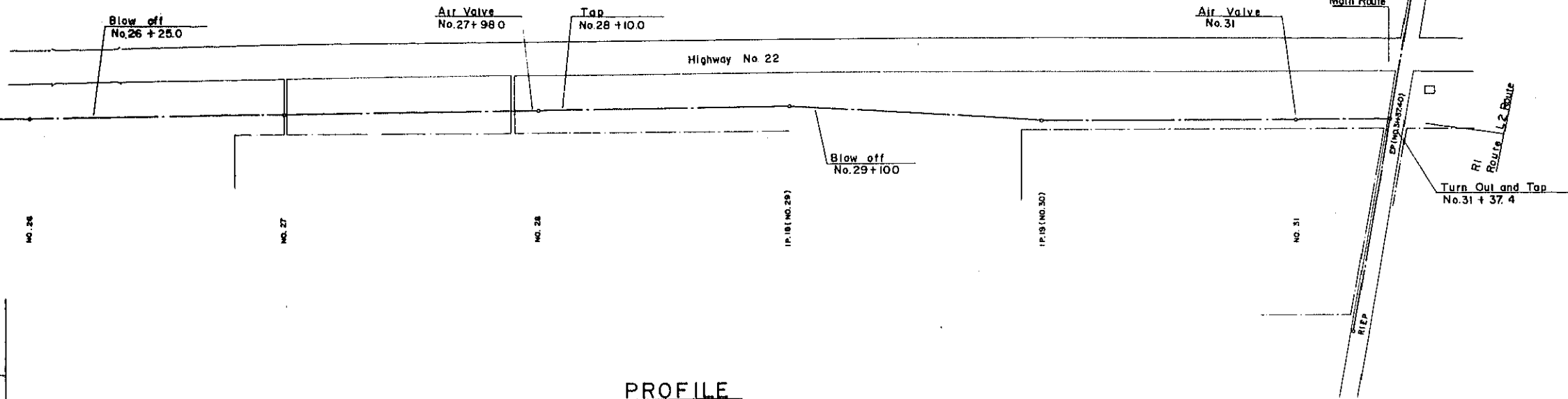
PROFILE



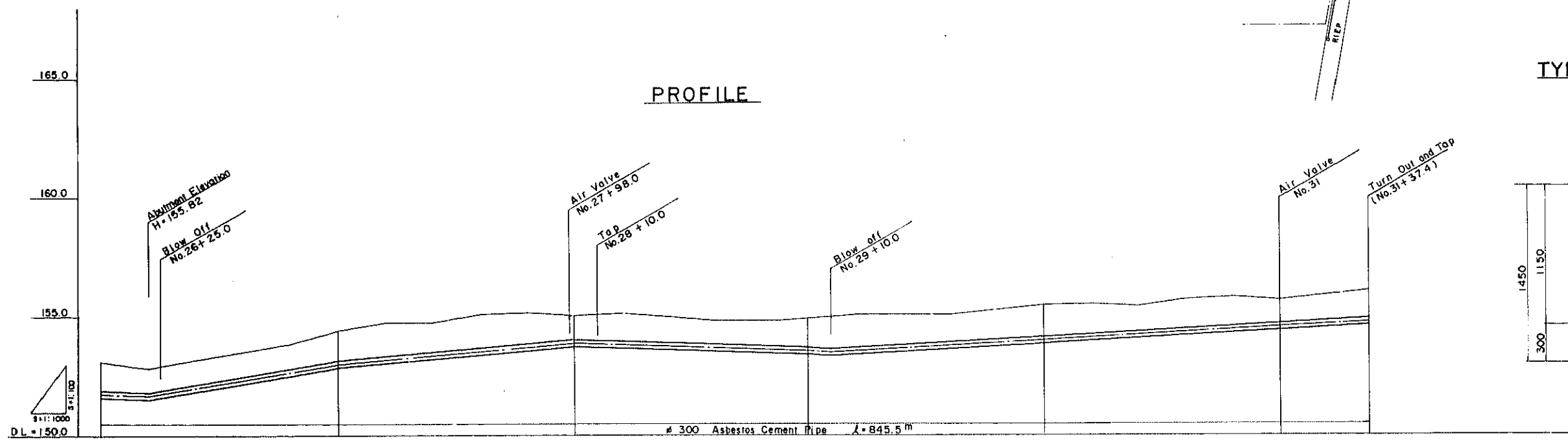
STATION	18+00	19+00	20+00	21+00	22+00	23+00	24+00	25+00	26+00
DEPTH	1.00	1.03	1.03	1.00	1.15	1.00	1.01	1.17	
CENTER ELEVATION	155.25	155.48	155.45	154.80	153.85	152.50	152.16	151.78	
GROUND ELEVATION	156.25	156.51	156.48	155.80	154.85	153.50	153.16	152.78	
ACCUMULATIVE DISTANCE	0.00	2000.00	2100.00	2160.00	2240.00	2300.00	2360.00	2440.00	2500.00
DISTANCE	0.00	89.25	60.00	40.00	20.00	20.00	100.00	100.00	100.00
NO	18	19	20	21	22	23	24	25	26
CURVE	IP. 16 268° 17' 30"		IP. 17 180° 00' 00"						

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 PIPELINE PLAN & PROFILE (4/7)
 Date Mar 1983 Drawing No N-B
 JAPAN INTERNATIONAL COOPERATION AGENCY

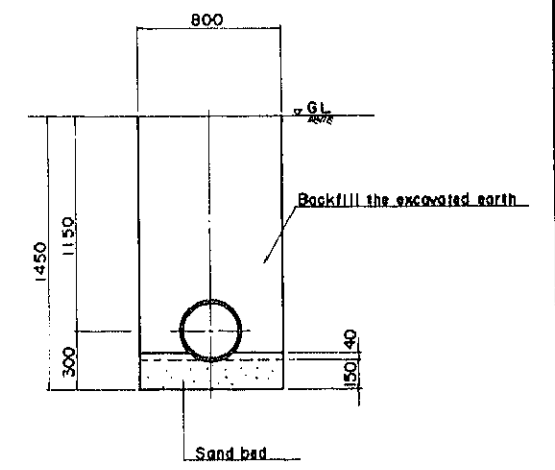
MAIN ROUTE (5/5) PLAN



PROFILE



TYPICAL SECTION S=1:20



SLOPE	$\frac{1}{1} \frac{1}{82}$ $L = 800.0 \text{ m}$		$\frac{1}{1} \frac{1}{111}$ $L = 1000.0 \text{ m}$		$\frac{1}{1} \frac{1}{289}$ $L = 110.0 \text{ m}$		$\frac{1}{1} \frac{1}{184}$ $L = 227.4 \text{ m}$	
EMBANKMENT								
DEPTH	1.17		1.27		1.00		1.22	
CENTER ELEVATION	151.78	151.70	153.00		153.90		155.95	155.52
GROUND ELEVATION	153.10		154.42		155.05		154.82	155.48
ACCUMULATIVE DISTANCE	2060.00	2660.00	2760.00		2860.00		2970.00	3090.00
DISTANCE	0.00	20.00	80.00		100.00		10.00	90.00
NO.	NO. 26	NO. 26 + 25.00	NO. 27		NO. 28		NO. 29 (IP. 18) + 10.00	NO. 30 (IP. 19)
CURVE					IP. 18 184° 10'		IP. 19 176° 12' 00"	

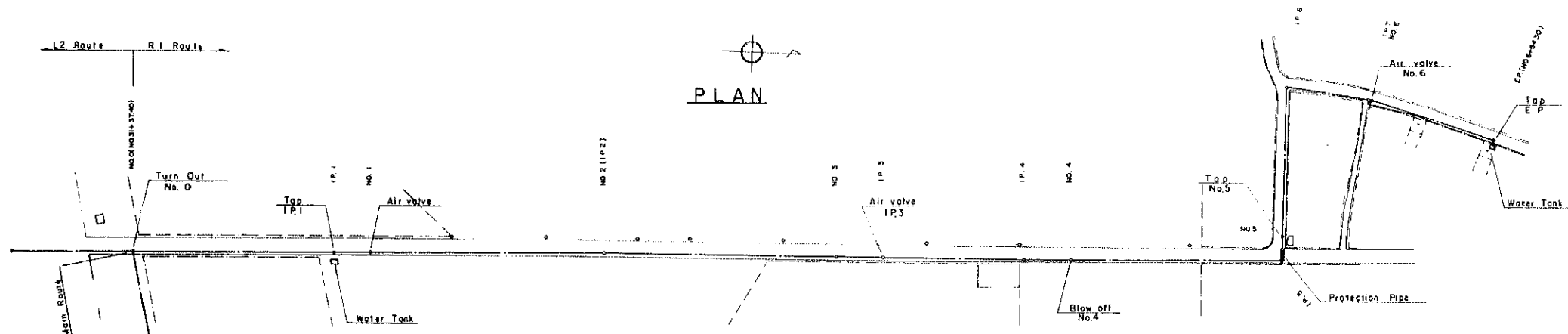
THE KINGDOM OF THAILAND
THE ENVIRONMENTAL IMPROVEMENT PROJECT
IN THAI-LAO BORDER REGION
HUAI LAENG YAI RESERVOIR

PIPELINE PLAN & PROFILE (5/7)

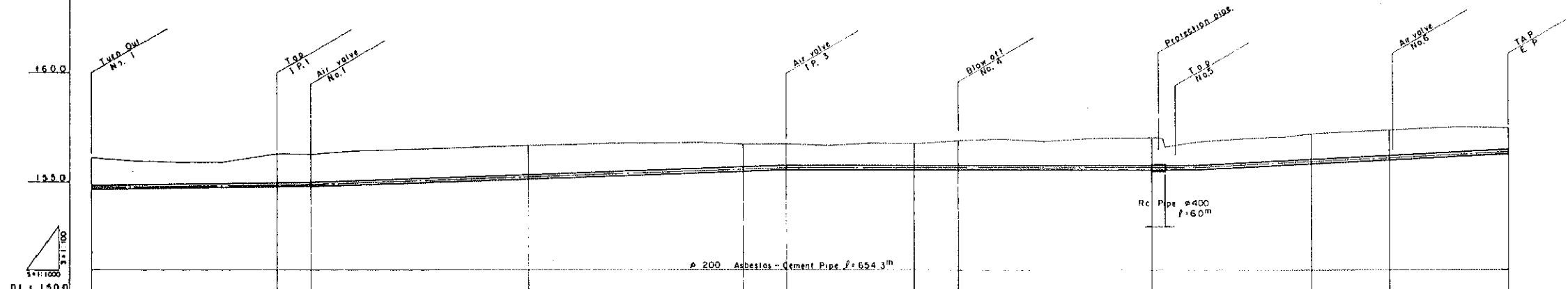
Date: Mar. 1983 Drawing No: N-9
JAPAN INTERNATIONAL COOPERATION AGENCY

R I ROUTE

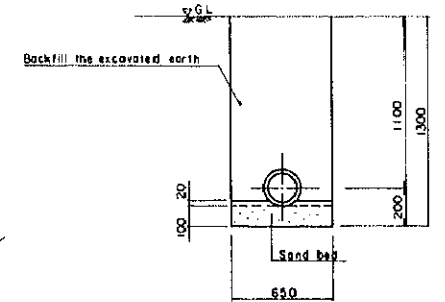
PLAN



PROFILE



TYPICAL SECTION S=1:20

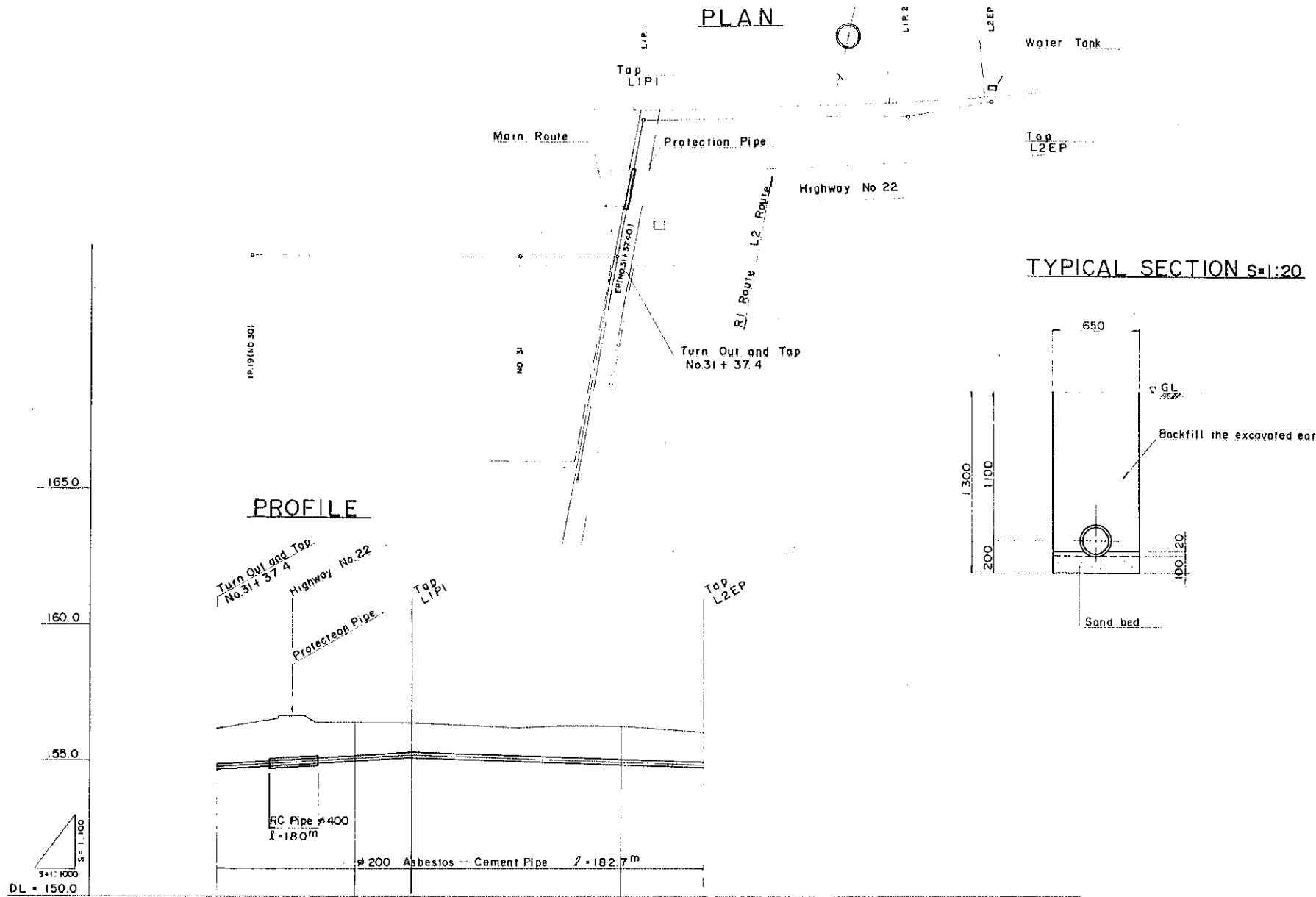


SLOPE	1:1/114 f=100.0m		1:1/216 f=230.0m		LEVEL f=190.0m		1:1/192 f=144.0m	
DEPTH	1.24	1.35	1.28	1.35	1.04	1.00	1.01	1.15
CENTER ELEVATION	154.78	154.88	154.90	155.26	155.83	155.70	155.70	156.70
GROUND ELEVATION	154.10	154.31	154.28	156.71	154.77	156.80	156.81	151.03
ACCUMULATIVE DISTANCE	0.00	84.00	100.00	200.00	300.00	320.00	360.00	480.00
DISTANCE	0.00	84.00	100.00	100.00	100.00	20.00	40.00	80.00
NO.	NO. 0	IP 1	NO. 1	NO. 2	NO. 3	IP 3	IP 4	NO. 4
CURVE								

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 PIPELINE PLAN & PROFILE (6/7)
 Date Mar 1983 Drawing No N-10
 JAPAN INTERNATIONAL COOPERATION AGENCY

L2 ROUTE

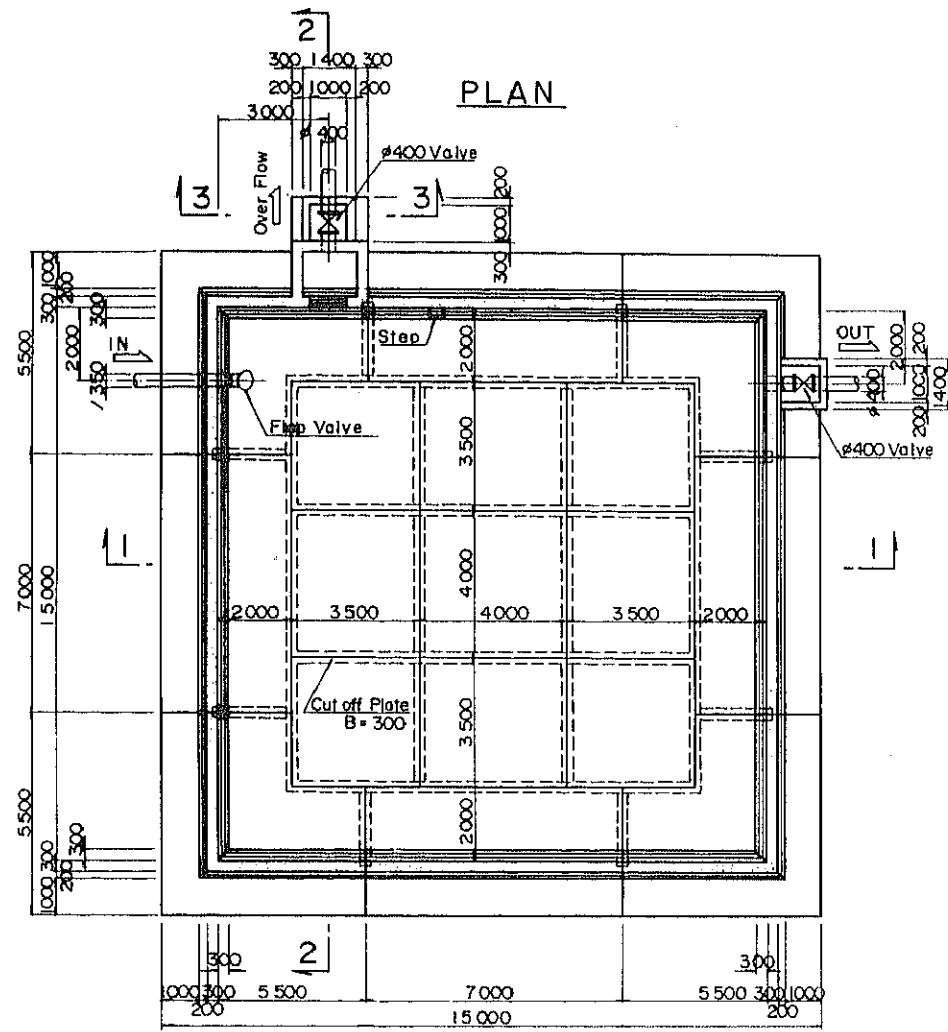
PLAN



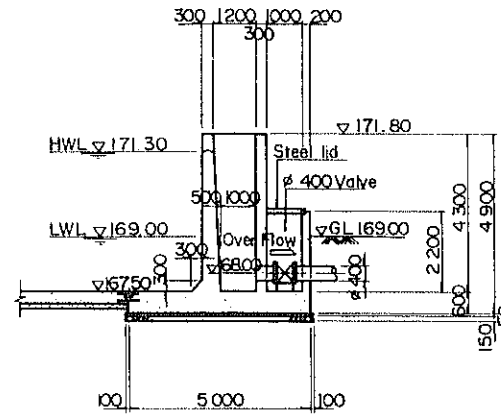
SLOPE	1:1/162 L=71.3m		1:1/338 L=111.4m	
EMBANKMENT				
DEPTH	1.19	1.13	1.19	1.05
CENTER ELEVATION	154.76	155.08	154.96	154.87
GROUND ELEVATION	156.70	156.31	156.25	156.02
ACCUMULATIVE DISTANCE	0.00	51.30	151.30	182.70
DISTANCE	0.00	51.30	80.00	31.40
NO.	EP No.31+37.4	LIP.1	LIP.2	L2EP
CURVE	IP.19	EP 100°40'10"	LIP.1 259°14'00"	LIP.2 169°47'00"

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 PIPELINE PLAN & PROFILE (7 / 7)
 Date Mar 1983 Drawing No N-11
 JAPAN INTERNATIONAL COOPERATION AGENCY

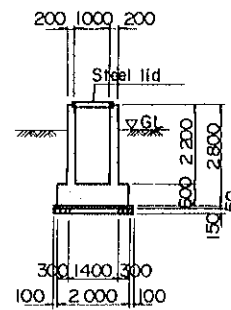
DISTRIBUTING TANK



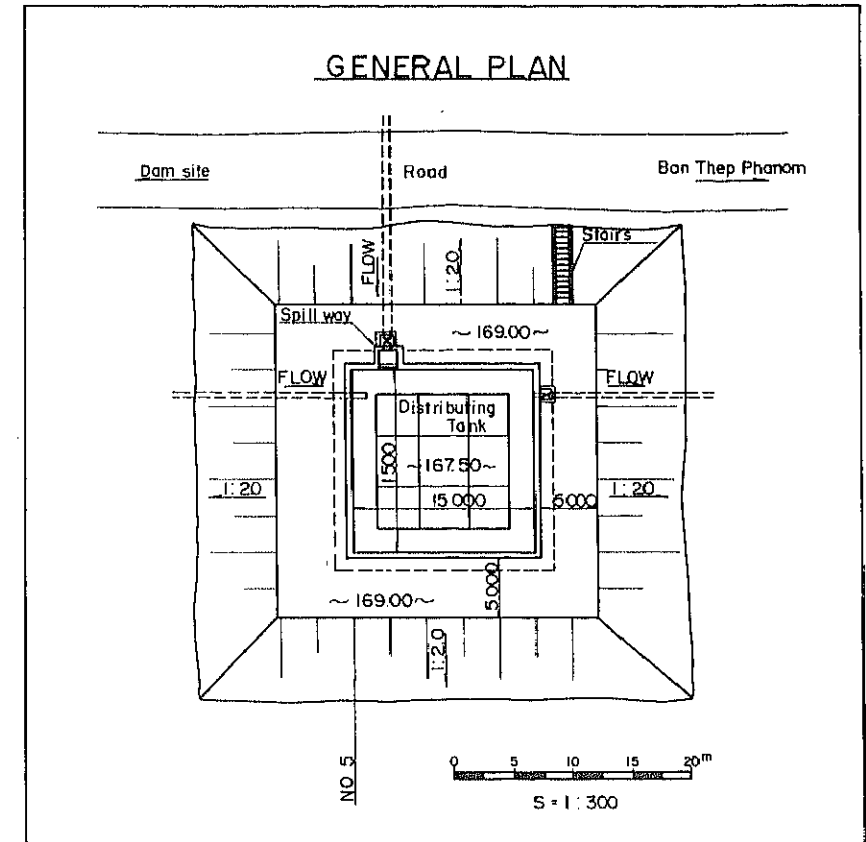
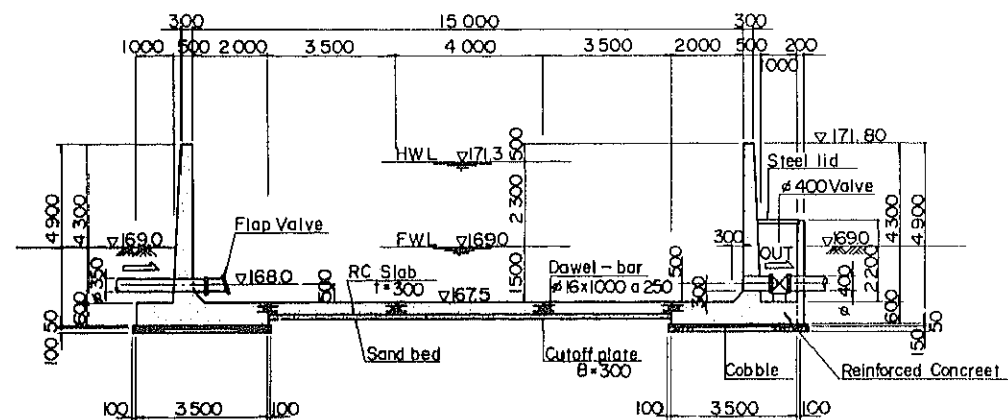
SECTION 2-2



SECTION 3-3



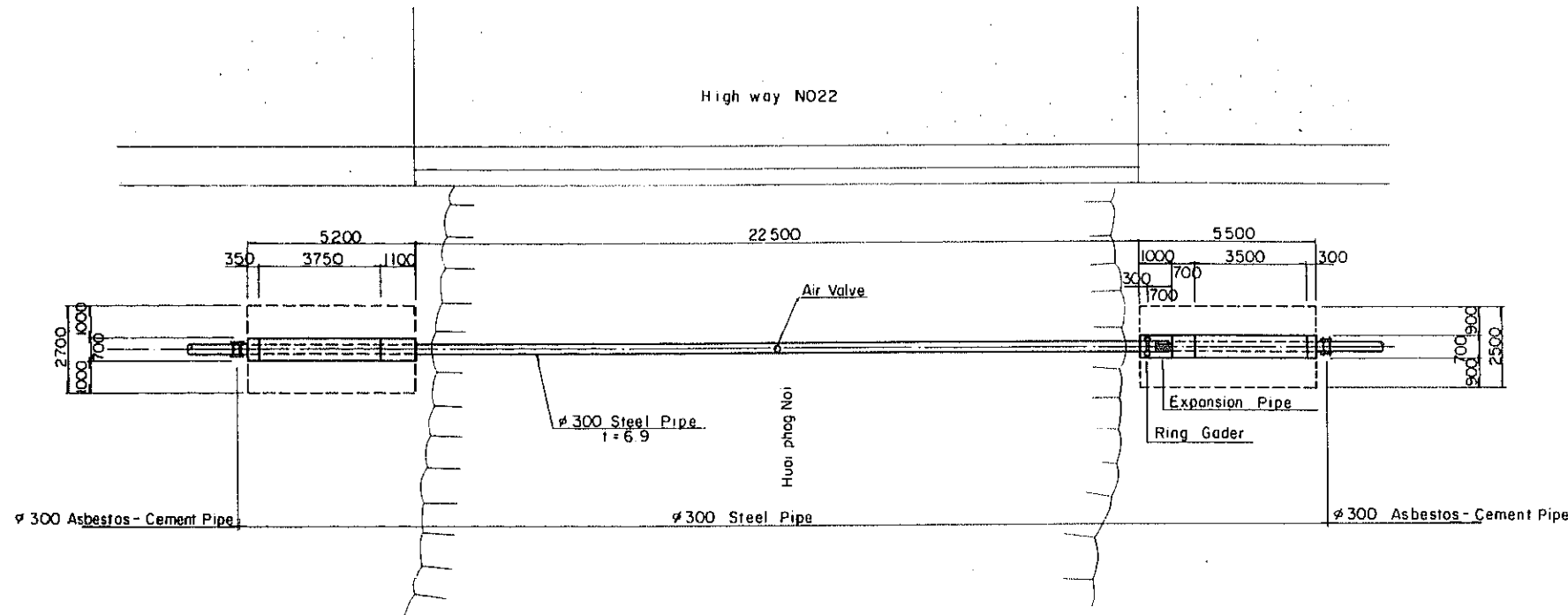
SECTION 1-1



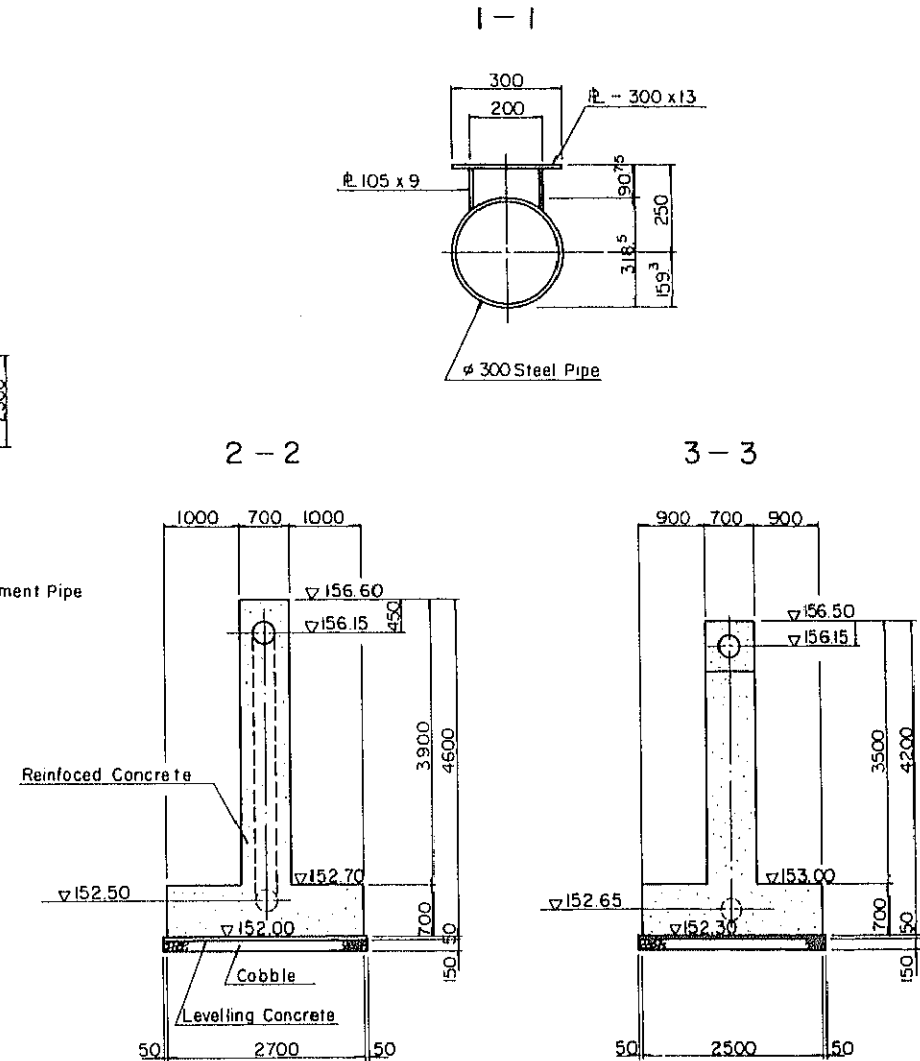
THE KINGDOM OF THAILAND	
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI-LAO BORDER REGION	
HUAI LAENG YAI RESERVOIR	
DISTRIBUTING TANK PLAN AND SECTIONS	
Date Mar 1983	Drawing No. N-12
JAPAN INTERNATIONAL COOPERATION AGENCY	

AQUEDUCT

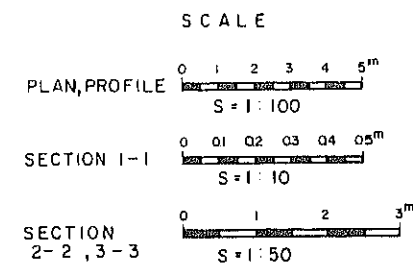
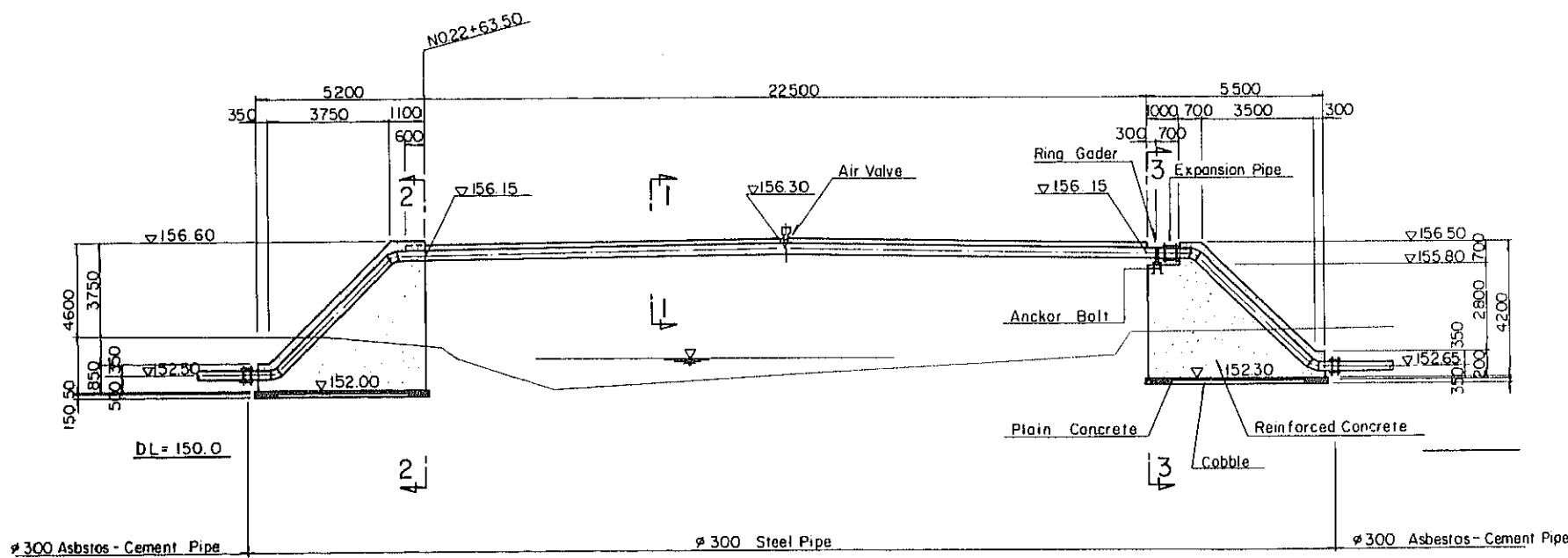
PLAN



SECTION



PROFILE

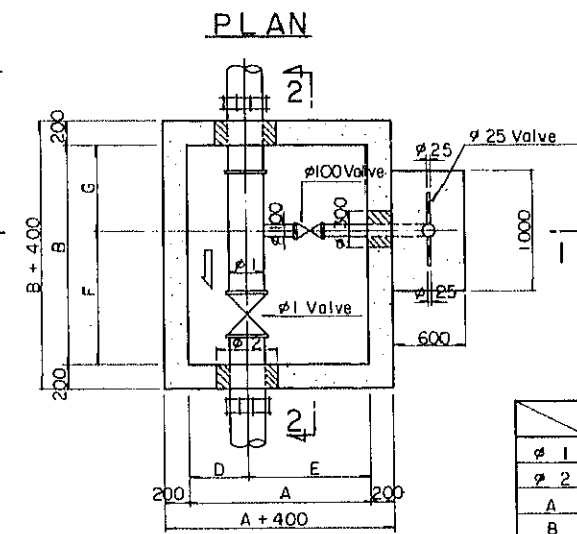
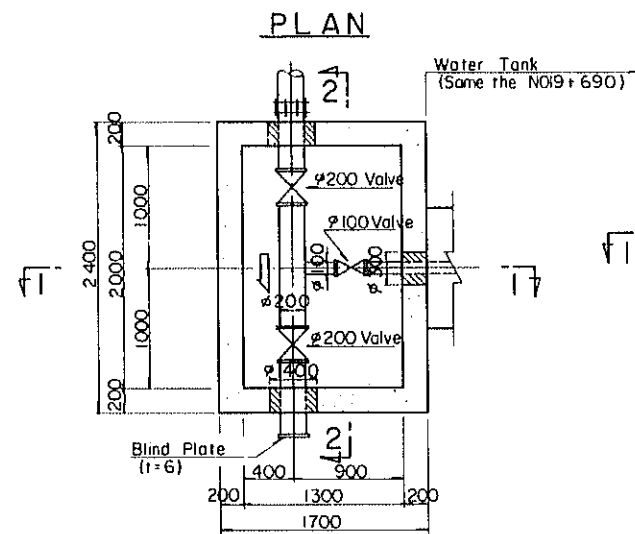
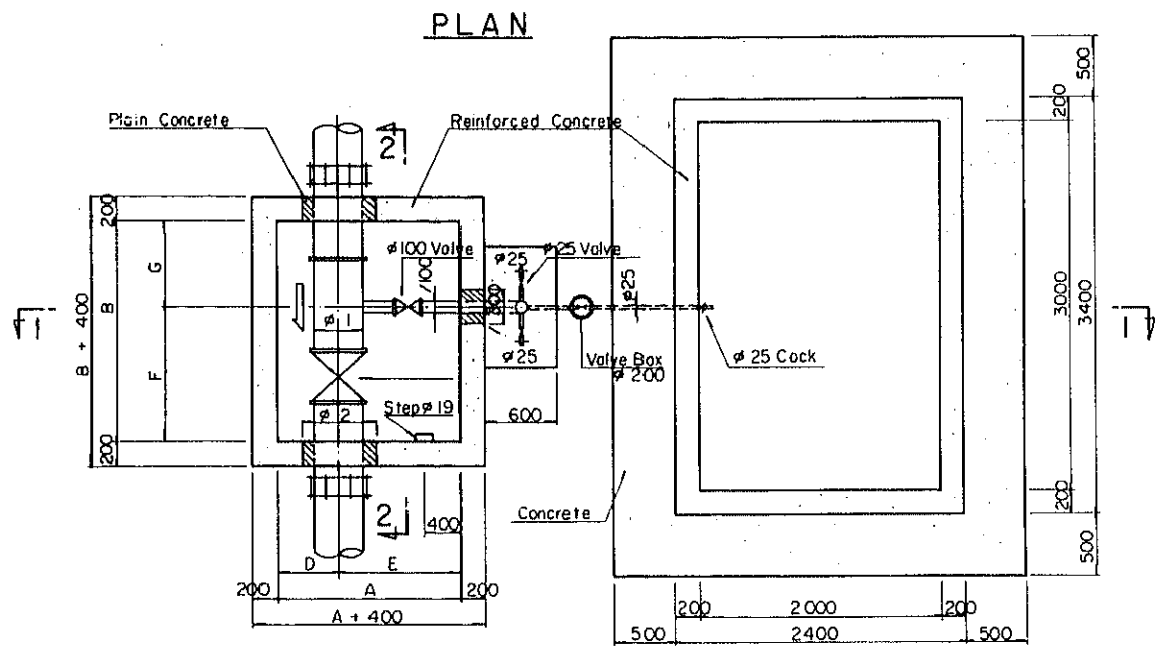


THE KINGDOM OF THAILAND		
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI-LAO BORDER REGION		
HUA LAENG YAI RESERVOIR		
AQUEDUCT PLAN AND SECTIONS		
Date Mar 1983	Drawing No	N - 13
JAPAN INTERNATIONAL COOPERATION AGENCY		

TAP & WATER TANK

TAP & WATER TANK (LIEP, 2EP, RIEP)

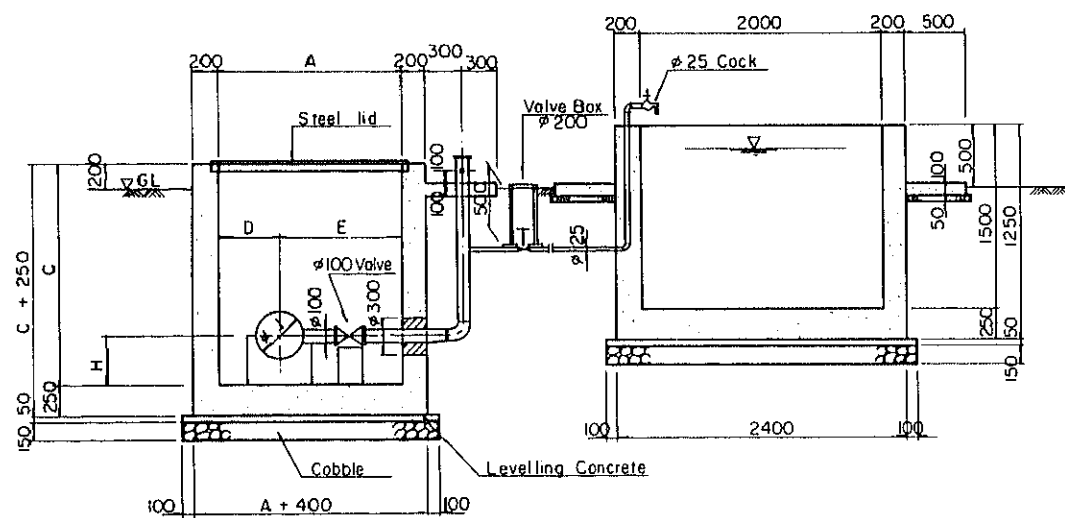
TAP



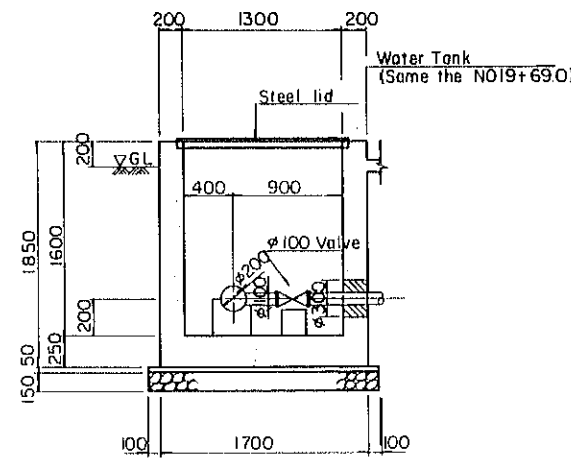
Dimension Table

Dimension				
φ 1	300	200	400	
φ 2	500	400	600	
A	1500	1300	1500	
B	1800	1650	1800	
C	1650	1600	1800	
D	500	400	500	
E	1000	900	1000	
F	1100	1000	1100	
G	700	650	700	
H	300	300	400	
Position	NO28+10.0 (Main Route)	NO19+50.0 (L1 Route) LIP1 (L2 Route) NO5 (R1 Route)	NO16+70.0 NO8+27.0 NO20+60.0 (Main Route)	

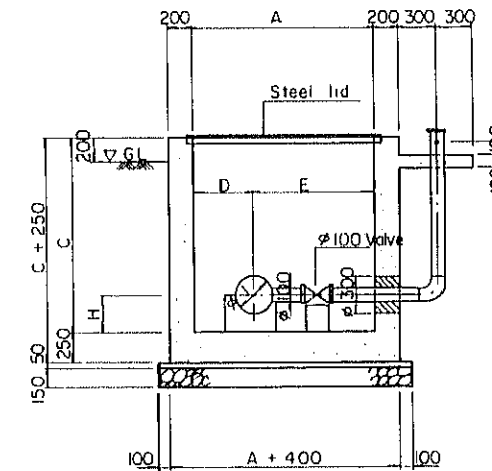
SECTION I-I



SECTION I-I



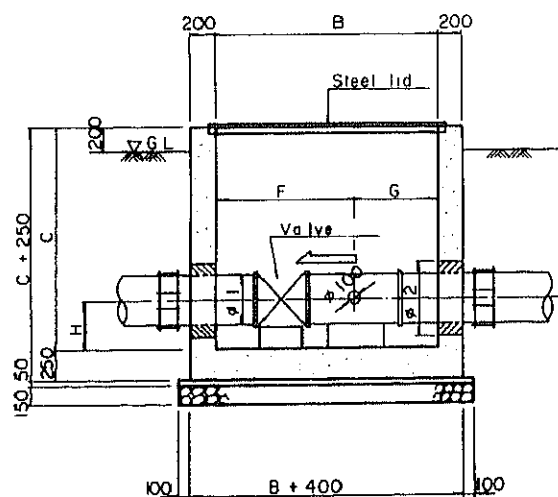
SECTION I-I



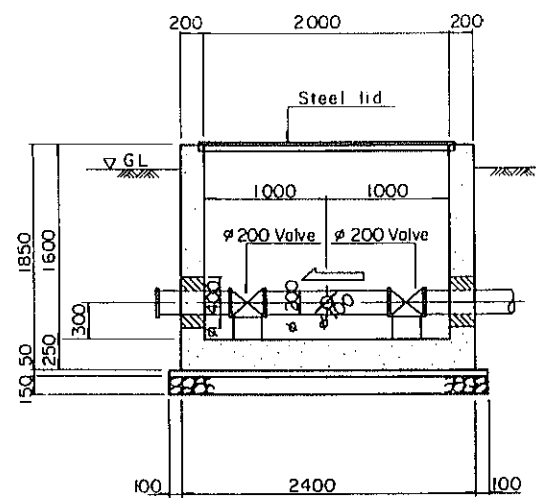
Dimension Table

Dimension				
φ 1	200	400		
φ 2	400	600		
A	1300	1500		
B	1650	1800		
C	1600	1800		
D	400	500		
E	900	1000		
F	1000	1100		
G	650	700		
H	300	400		
Position	RTIP1 (R1 Route)	NO19+690 (Main Route)		

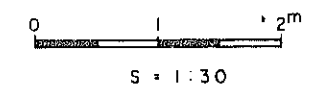
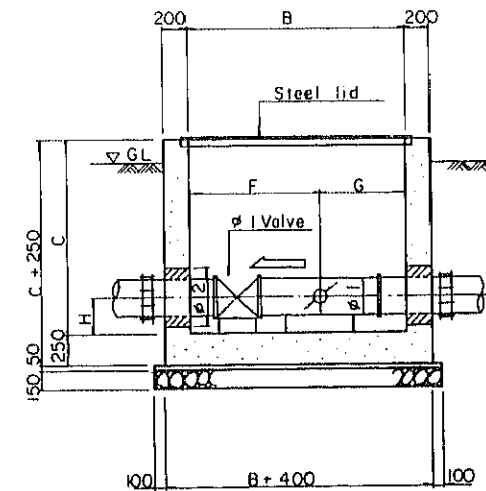
SECTION 2-2



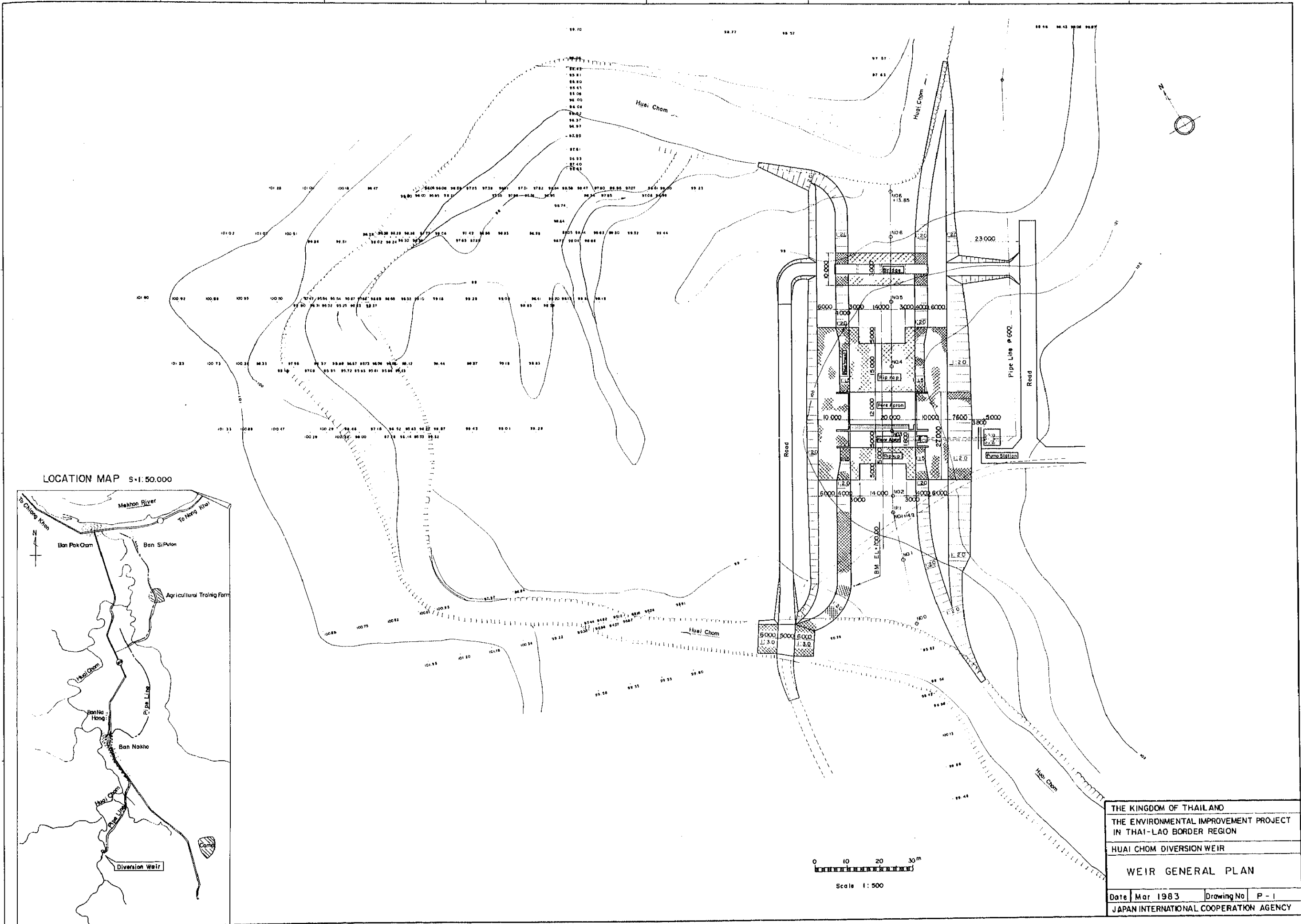
SECTION 2-2



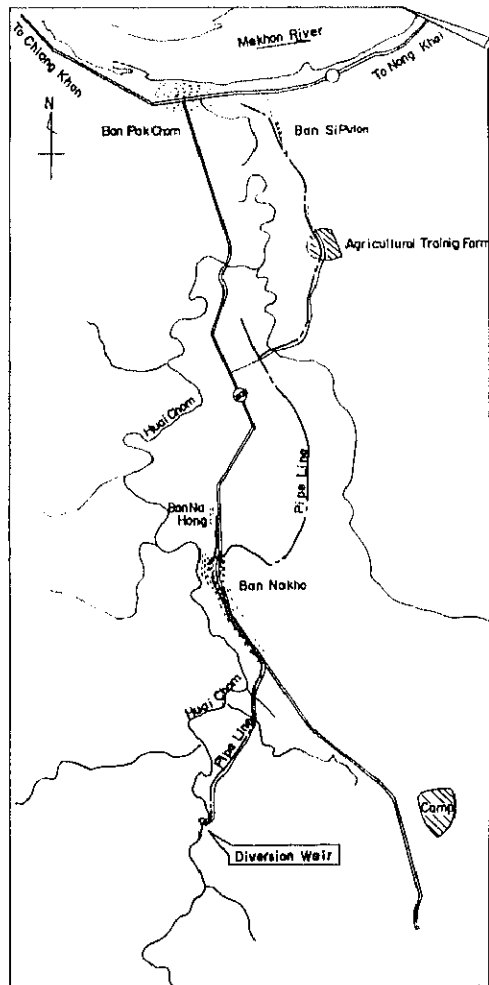
SECTION 2-2



THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI LAENG YAI RESERVOIR
 TAP & WATER TANK
 PLAN AND SECTIONS
 Date: Mar. 1983 Drawing No: N-14
 JAPAN INTERNATIONAL COOPERATION AGENCY

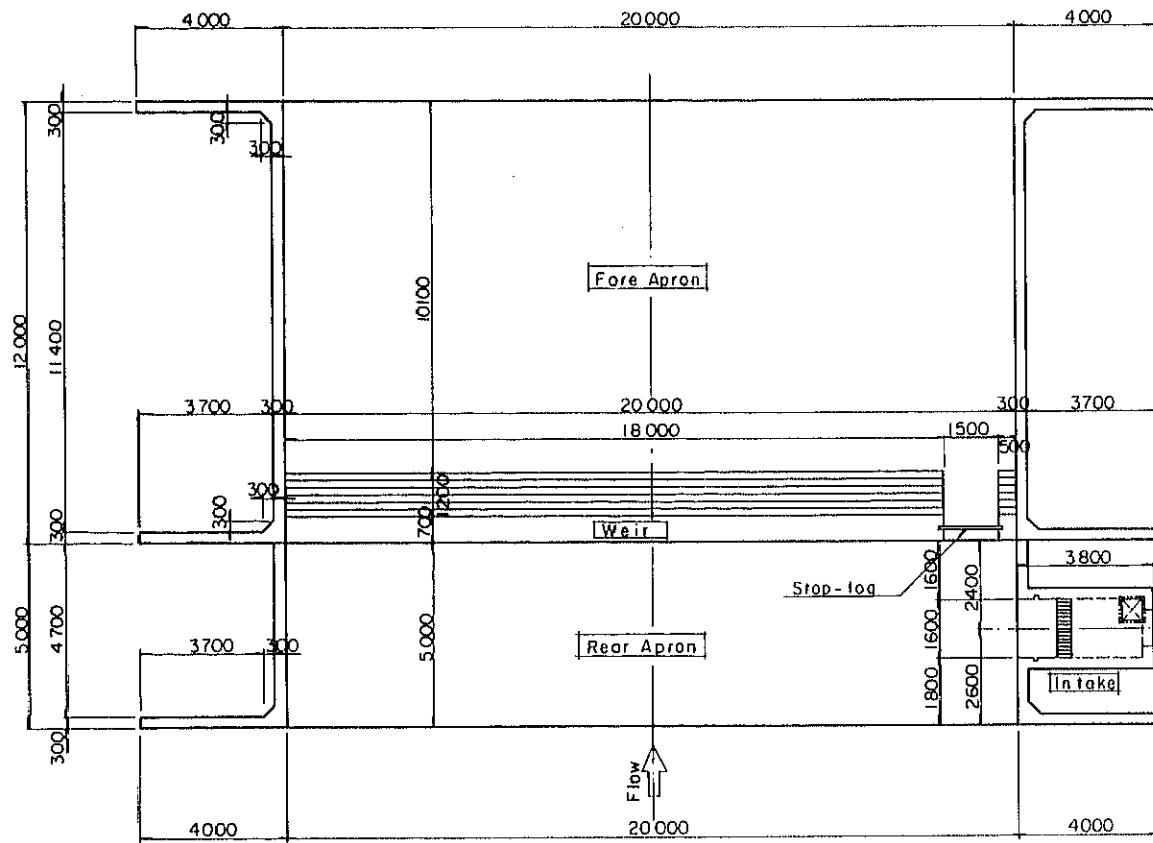


LOCATION MAP S:1:50,000

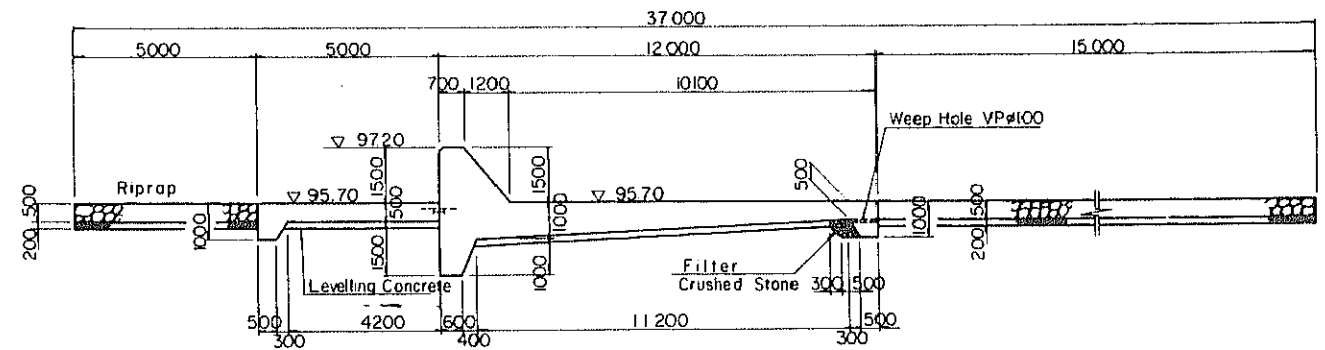


THE KINGDOM OF THAILAND	
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI-LAO BORDER REGION	
HUI CHOM DIVERSION WEIR	
WEIR GENERAL PLAN	
Date Mar 1983	Drawing No P-1
JAPAN INTERNATIONAL COOPERATION AGENCY	

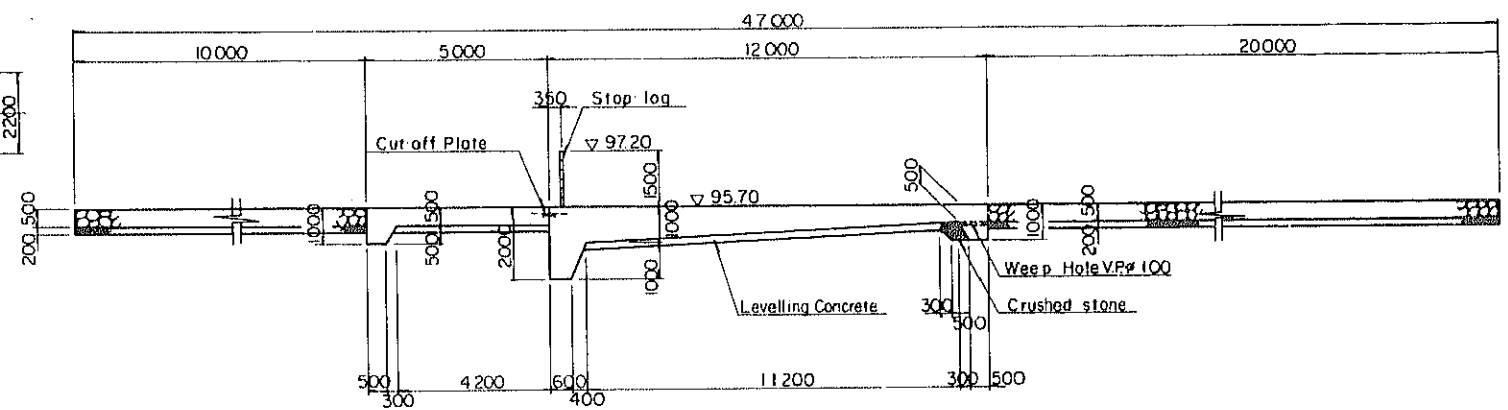
PLAN



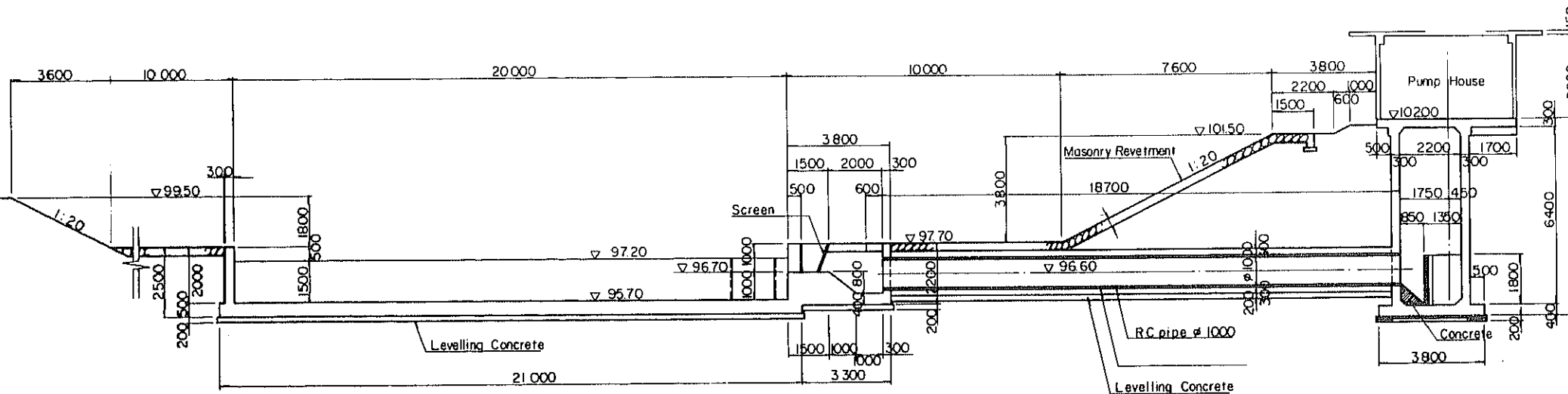
PROFILE (t)



PROFILE



CROSS SECTION

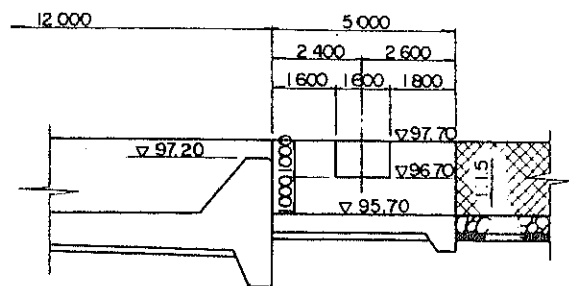


Pump

Type	Vertical Mixed Flow Pump
Capacity	10.5 m ³ /min x 2
NO	2 Set
Bore	300mm
Motor	63 Kw x 2
Total Pump Head	24m
L.W.L. (Pump Stop Level)	EL. 96.90

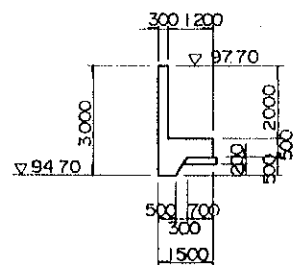
THE KINGDOM OF THAILAND		
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI - LAO BORDER REGION		
HUAI CHOM DIVERSION WEIR		
WEIR AND PUMPING STATION PLAN AND SECTIONS (1/2)		
Date	Mar. 1983	Drawing No
		P-2
JAPAN INTERNATIONAL COOPERATION AGENCY		

INTAKE
SIDE VIEW

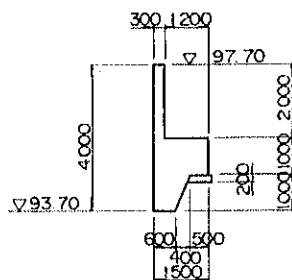


WING WALL

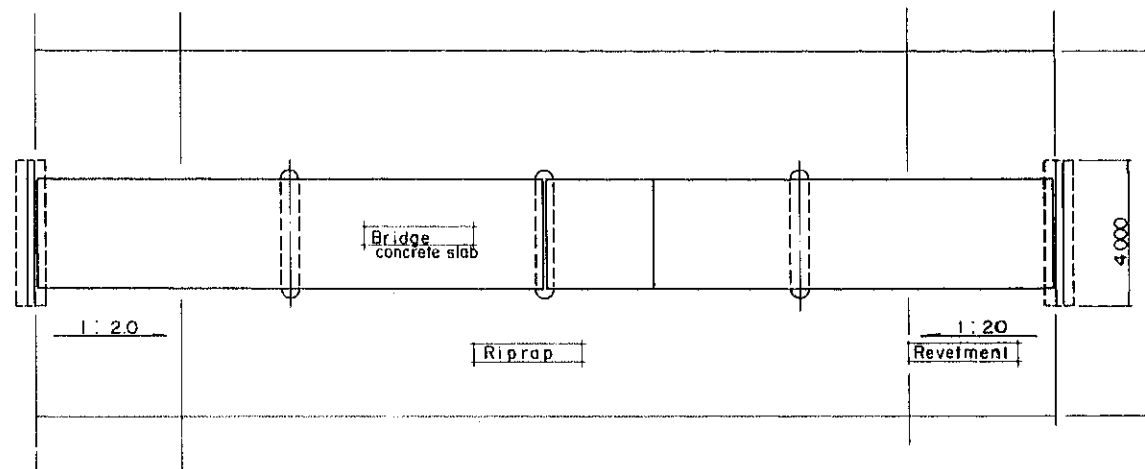
APRON



WEIR

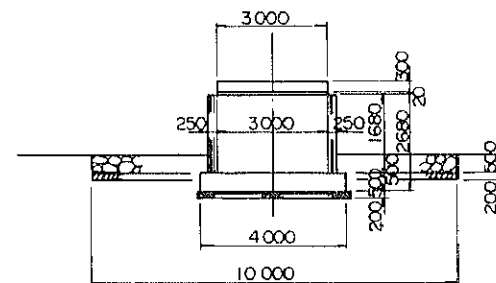
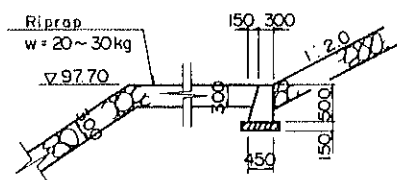
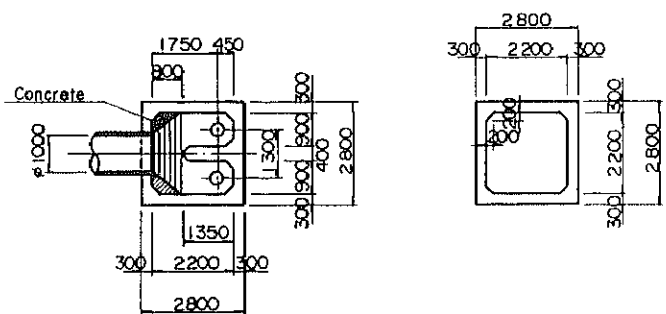
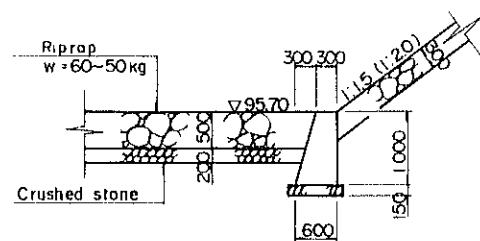
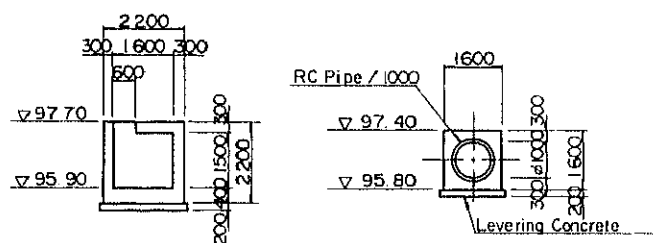
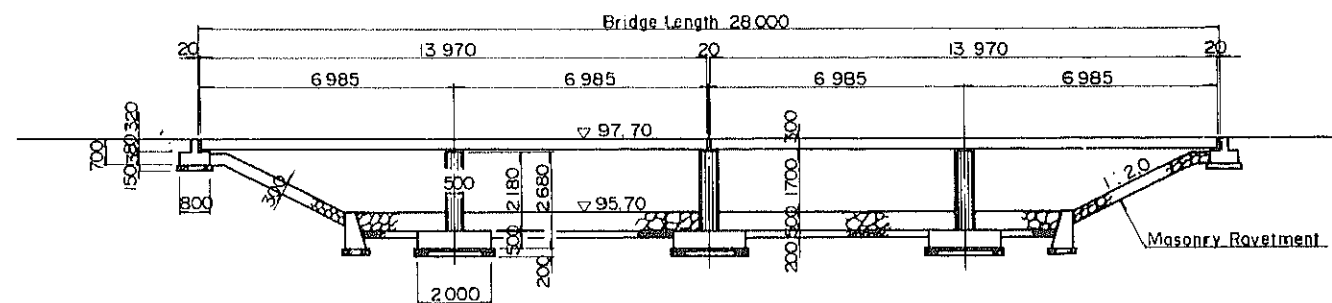


BRIDGE
PLAN

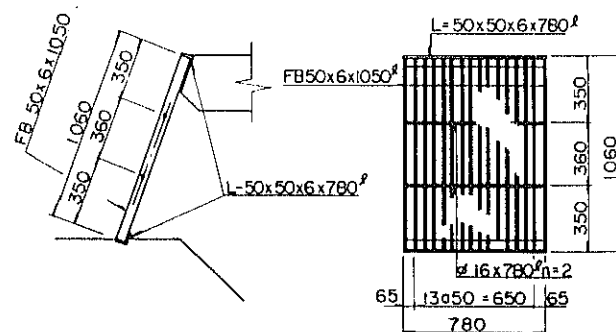
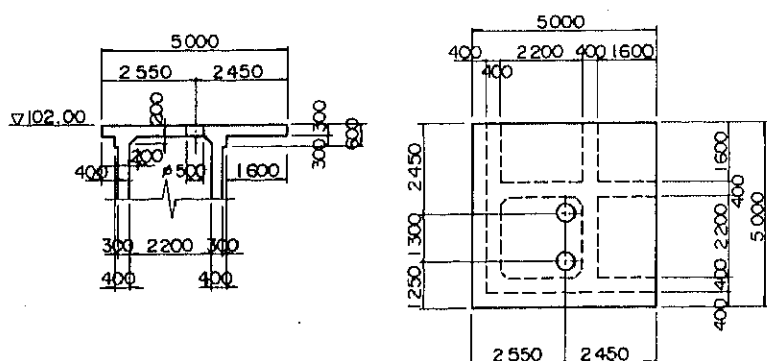


RIPRAP & REVETMENT

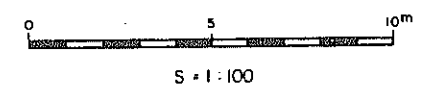
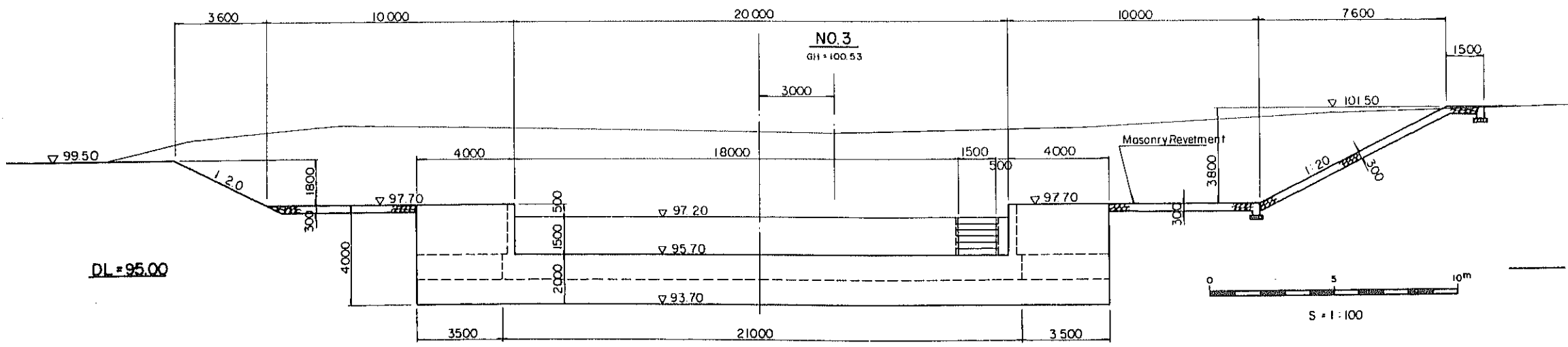
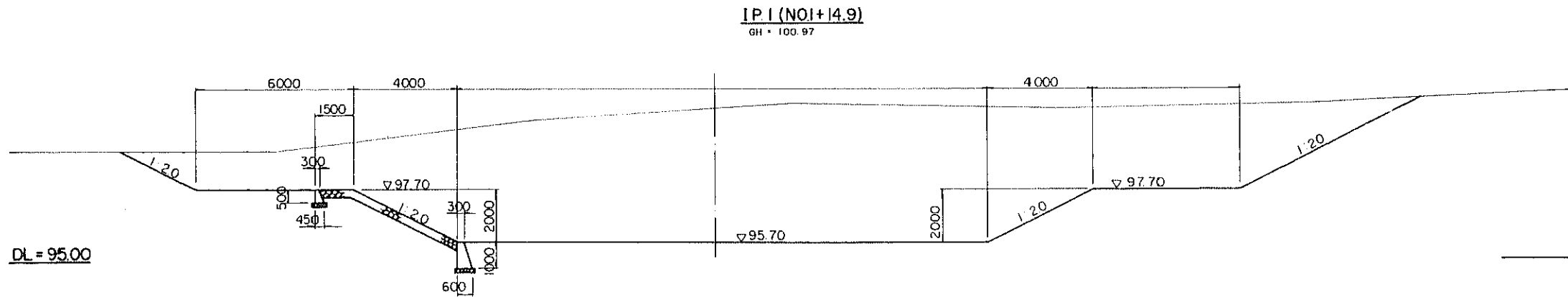
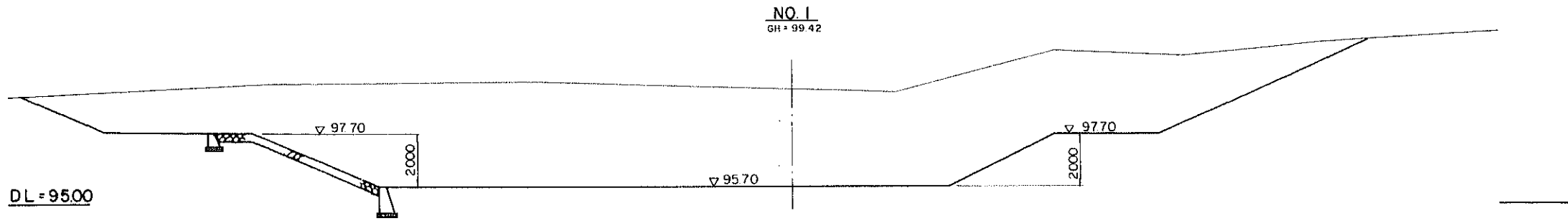
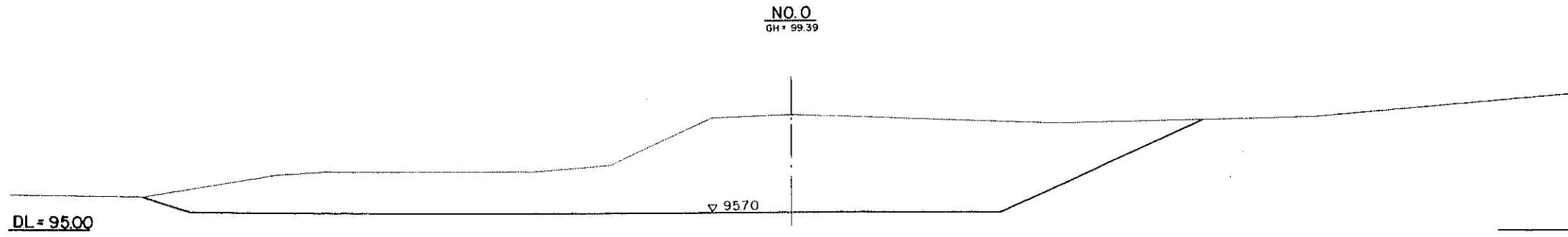
SIDE VIEW SECTION



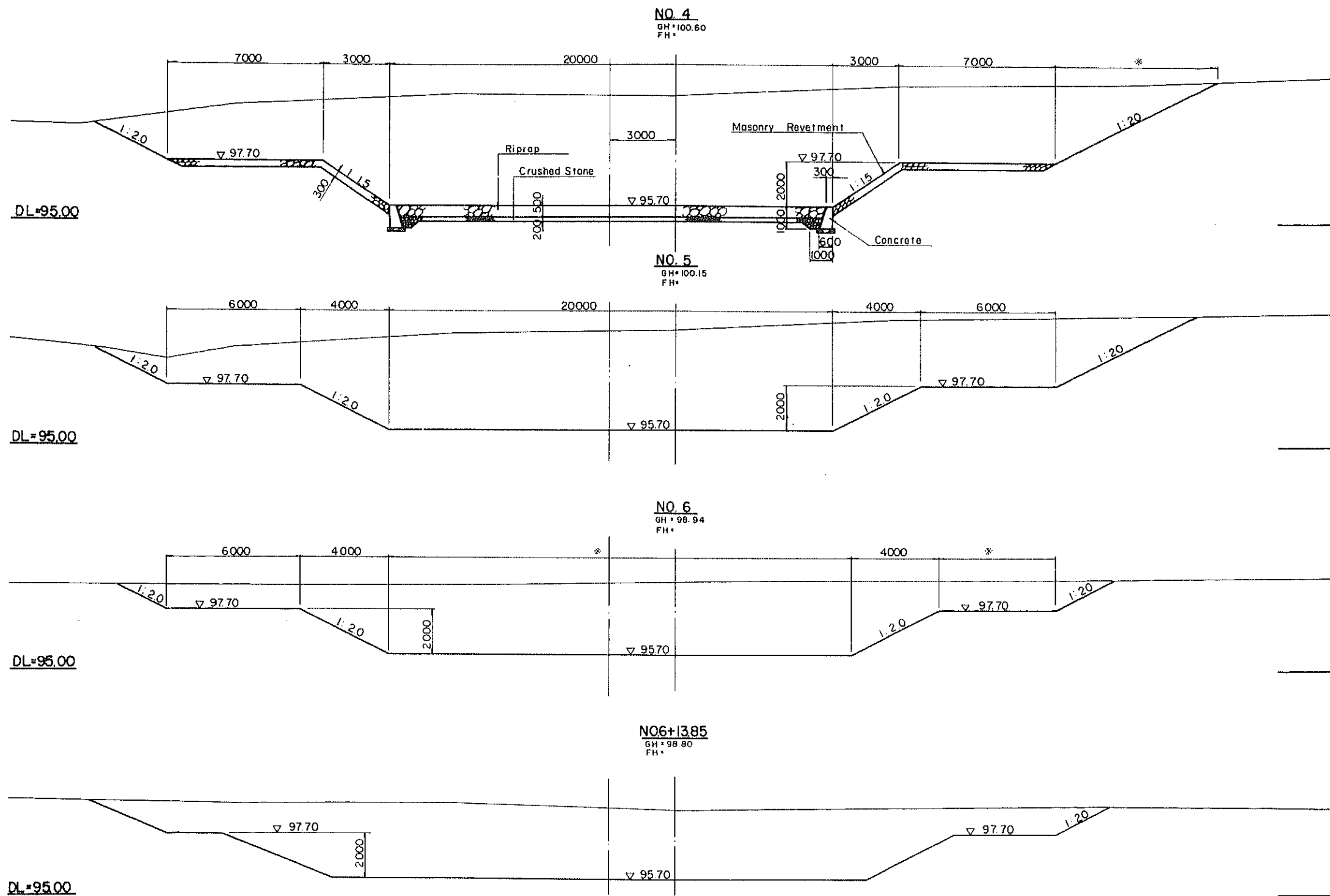
DETAIL OF SCREEN
S = 1:20



THE KINGDOM OF THAILAND
THE ENVIRONMENTAL IMPROVEMENT PROJECT
IN THAI-LAO BORDER REGION
HUAI CHOM DIVERSION WEIR
WEIR AND PUMPING STATION
PLAN AND SECTIONS (2/2)
Date Mar. 1983 Drawing No. P-3
JAPAN INTERNATIONAL COOPERATION AGENCY



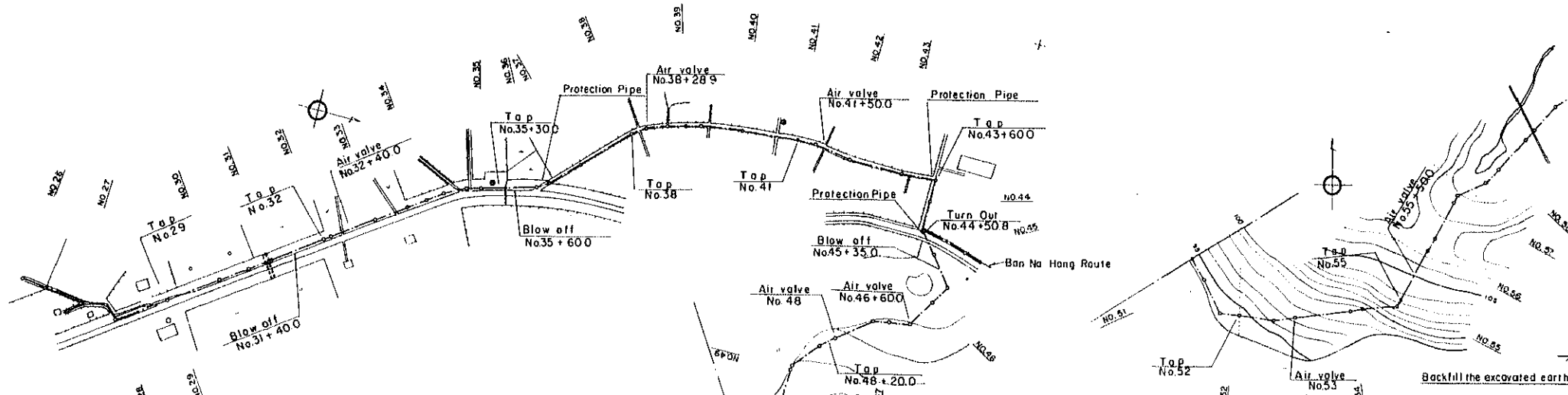
THE KINGDOM OF THAILAND			
THE ENVIRONMENTAL IMPROVEMENT PROJECT			
IN THAI-LAO BORDER REGION			
HUAI CHOM DIVERSION WEIR			
WEIR CROSS SECTION (1 / 2)			
Date	Mar. 1983	Drawing No.	P - 4
JAPAN INTERNATIONAL COOPERATION AGENCY			



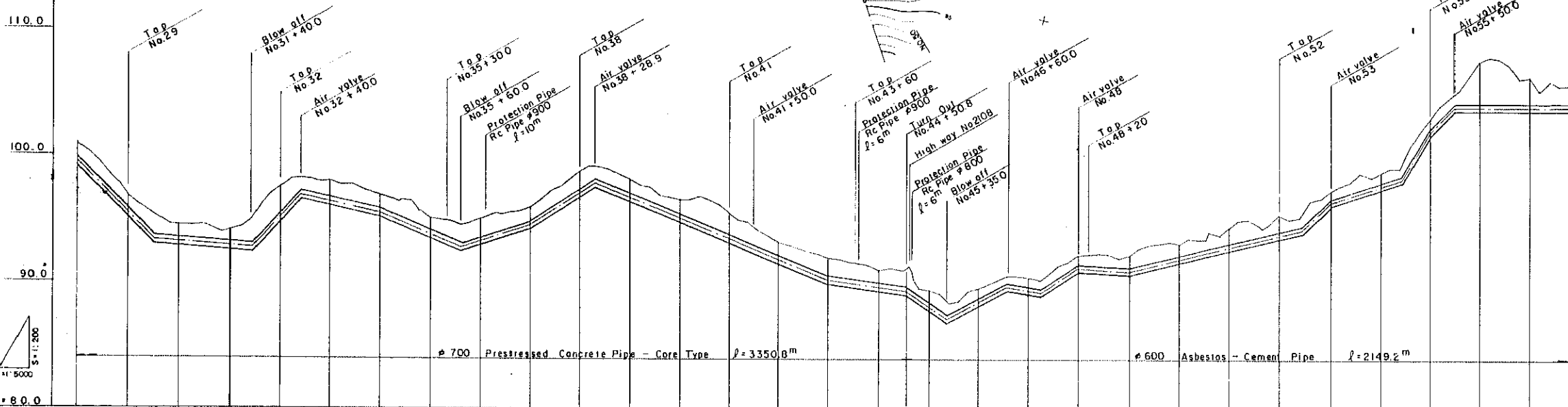
THE KINGDOM OF THAILAND			
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI-LAO BORDER REGION			
HUAJ CHOM DIVERSION WEIR			
WEIR CROSS SECTION (2/2)			
Date	Mar 1983	Drawing No	P-5
JAPAN INTERNATIONAL COOPERATION AGENCY			

MAIN ROUTE (2/3)

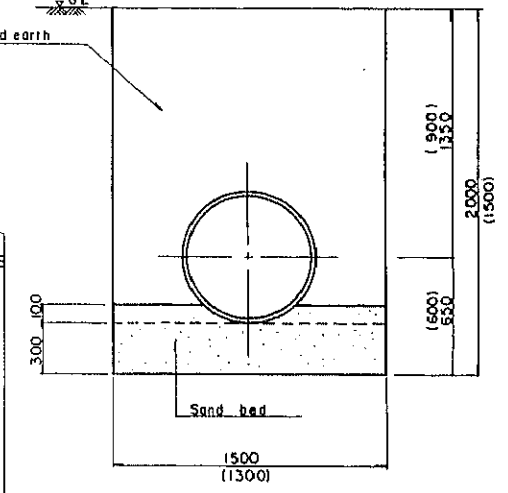
PLAN



PROFILE



TYPICAL SECTION s=1:20

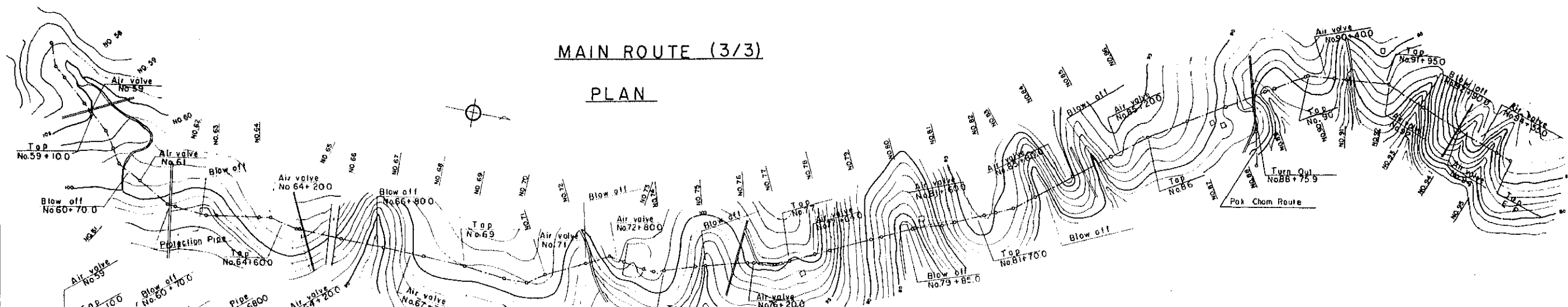


NO.	CURVE	DISTANCE	ACCUMULATIVE DISTANCE	GROUND ELEVATION	CENTER ELEVATION	DEPTH	EMBANKMENT	SLOPE	PIPE SPECIFICATION	
									DIAMETER	LENGTH
NO. 26		0.00	2764.00	102.75	99.44	1.00		1:1/250	700	3350.0m
NO. 29		100.00	2864.00	96.69	95.27	1.02		1:1/271	700	3350.0m
NO. 30		50.00	2936.00	94.45	93.07	1.13		1:1/235	700	3350.0m
IP. 1		55.35	3039.35	94.31	92.86	1.10		1:1/188	700	3350.0m
NO. 31		44.65	3094.00	94.09	92.70	1.04		1:1/257	700	3350.0m
NO. 32		60.00	3184.00	97.58	95.16	2.07		1:1/172	700	3350.0m
NO. 35		60.00	3284.00	97.99	96.33	1.31		1:1/140	700	3350.0m
IP. 3		63.90	3347.90	97.34	95.77	1.22		1:1/109	700	3350.0m
NO. 34		36.10	3384.00	96.81	95.66	1.00		1:1/140	700	3350.0m
IP. 4		33.70	3417.70	96.38	94.87	1.16		1:1/109	700	3350.0m
IP. 5		41.40	3459.10	95.81	94.14	1.32		1:1/140	700	3350.0m
NO. 36		24.90	3484.00	94.98	93.71	0.92		1:1/109	700	3350.0m
NO. 37		60.00	3544.00	95.04	93.21	1.48		1:1/140	700	3350.0m
NO. 38		20.00	3629.00	95.53	93.55	1.63		1:1/109	700	3350.0m
NO. 39		75.00	3684.00	95.94	94.59	1.00		1:1/140	700	3350.0m
IP. 6		100.00	3784.00	98.72	97.12	1.30		1:1/109	700	3350.0m
IP. 7		28.90	3812.90	99.19	97.85	1.00		1:1/140	700	3350.0m
IP. 8		36.10	3852.00	98.62	97.21	1.06		1:1/109	700	3350.0m
NO. 39		32.00	3894.00	98.05	96.66	1.02		1:1/140	700	3350.0m
IP. 9		26.40	3910.40	97.60	96.25	1.00		1:1/109	700	3350.0m
NO. 40		73.60	3984.00	96.53	95.05	1.13		1:1/140	700	3350.0m
NO. 41		100.00	4084.00	95.45	93.41	1.70		1:1/109	700	3350.0m
IP. 10		35.00	4117.00	94.78	92.86	1.87		1:1/140	700	3350.0m
NO. 42		67.00	4184.00	93.23	91.77	1.11		1:1/109	700	3350.0m
NO. 43		100.00	4284.00	91.93	90.15	1.43		1:1/140	700	3350.0m
IP. 11		59.00	4343.00	91.46	89.82	1.29		1:1/109	700	3350.0m
NO. 44		41.00	4384.00	90.97	89.59	1.03		1:1/140	700	3350.0m
IP. 12		50.80	4434.80	90.96	89.30	1.31		1:1/109	700	3350.0m
NO. 45		49.20	4484.00	89.37	87.97	1.10		1:1/140	700	3350.0m
IP. 13		34.00	4519.00	87.00	87.00	1.81		1:1/109	700	3350.0m
IP. 14		27.70	4546.70	89.51	87.60	1.81		1:1/140	700	3350.0m
NO. 46		37.30	4584.00	89.53	88.41	0.82		1:1/109	700	3350.0m
IP. 15		56.30	4642.30	90.58	89.68	0.60		1:1/140	700	3350.0m
NO. 47		41.70	4684.00	90.39	89.35	0.74		1:1/109	700	3350.0m
IP. 16		23.60	4707.60	90.07	89.17	0.60		1:1/140	700	3350.0m
NO. 48		76.40	4784.00	92.07	91.17	0.60		1:1/109	700	3350.0m
IP. 17		33.80	4817.80	92.16	91.04	0.82		1:1/140	700	3350.0m
IP. 18		59.20	4877.00	91.90	90.82	0.79		1:1/109	700	3350.0m
NO. 49		7.00	4884.00	92.11	90.80	1.01		1:1/140	700	3350.0m
IP. 19		65.00	4947.00	93.14	91.40	1.44		1:1/109	700	3350.0m
NO. 50		37.00	4984.00	93.03	91.75	0.98		1:1/140	700	3350.0m
IP. 20		36.30	5040.30	93.39	92.29	0.80		1:1/109	700	3350.0m
NO. 51		43.70	5084.00	94.27	92.70	1.27		1:1/140	700	3350.0m
IP. 21		65.00	5149.00	94.30	93.32	0.68		1:1/109	700	3350.0m
NO. 52		35.00	5184.00	93.44	93.66	1.48		1:1/140	700	3350.0m
IP. 22		45.00	5229.00	96.50	94.10	1.43		1:1/109	700	3350.0m
NO. 53		38.80	5284.00	97.29	96.39	0.60		1:1/140	700	3350.0m
IP. 23		100.00	5384.00	98.67	97.64	0.73		1:1/109	700	3350.0m
IP. 24		23.40	5407.40	98.96	98.20	0.74		1:1/140	700	3350.0m
NO. 54		41.60	5470.00	101.17	101.17	0.79		1:1/109	700	3350.0m
IP. 25		13.40	5484.00	102.98	102.08	0.60		1:1/140	700	3350.0m
NO. 55		50.00	5534.00	104.00	104.00	3.30		1:1/109	700	3350.0m
IP. 26		24.70	5558.70	107.96	104.00	3.68		1:1/140	700	3350.0m
NO. 56		73.30	5634.00	105.42	104.00	2.12		1:1/109	700	3350.0m
IP. 27		12.60	5646.60	105.77	104.00	1.47		1:1/140	700	3350.0m
NO. 57		36.30	5702.90	105.75	104.00	1.45		1:1/109	700	3350.0m
IP. 28		31.10	5734.00	105.46	104.00	1.16		1:1/140	700	3350.0m

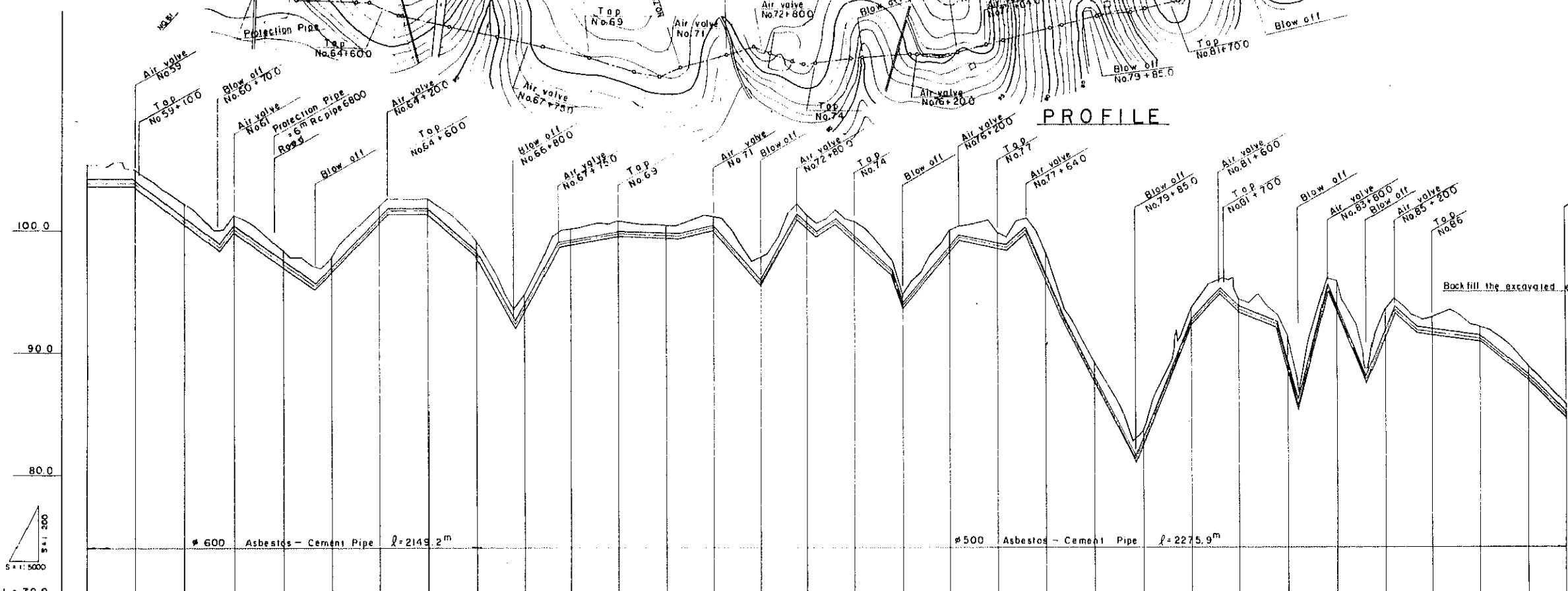
THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI CHOM DIVERSION WEIR
 PIPELINE PLAN & PROFILE (2/6)
 Date: Mar. 1983 Drawing No. P-7
 JAPAN INTERNATIONAL COOPERATION AGENCY

MAIN ROUTE (3/3)

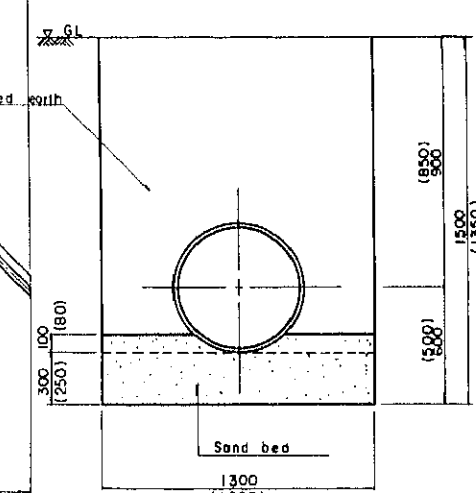
PLAN



PROFILE



TYPICAL SECTION S=1:20



X(1) = # 500

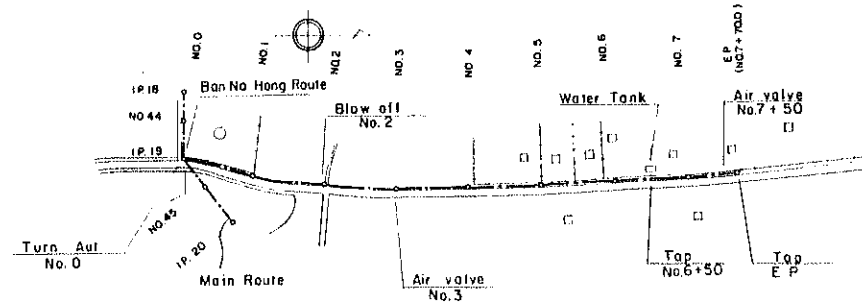
SLOPE	LEVEL		EMBAKMENT	DEPTH	CENTER ELEVATION	GROUND ELEVATION	ACCUMULATIVE DISTANCE	DISTANCE	NO.	CURVE
	1	2								
1:1.35 l=170.0m	104.00	103.67		1.16	104.00	103.46	3784.00	0.00	NO.58	
1:1.35 l=170.0m	104.00	103.05		1.37	104.00	103.57	3857.80	73.80	1P.34 NO.59	
1:1.35 l=170.0m	102.37	102.01		0.60	102.37	102.01	3937.80	53.80	1P.35 NO.60	
1:1.35 l=170.0m	100.97	101.11		0.96	100.97	101.11	4021.00	45.20	1P.36 +70.00 NO.61	
1:1.35 l=170.0m	98.80	101.39		0.73	98.80	101.39	4094.00	30.00		
1:1.35 l=170.0m	97.49	99.01		0.68	97.49	99.01	4163.20	81.20	1P.37 NO.62	
1:1.35 l=170.0m	95.76	97.49		0.80	95.76	97.49	4242.00	18.80	1P.38 NO.63	
1:1.35 l=170.0m	94.80	97.84		0.74	94.80	97.84	4324.00	25.10		
1:1.35 l=170.0m	92.76	102.76		0.87	92.76	102.76	4411.00	74.30	1P.39 NO.64	
1:1.35 l=170.0m	91.85	101.85		0.63	91.85	101.85	4494.00	20.00	1P.40 NO.65	
1:1.35 l=170.0m	89.80	101.85		0.92	89.80	101.85	4586.00	6.35		
1:1.35 l=170.0m	87.49	99.35		0.75	87.49	99.35	4684.00	88.20	NO.66 (1P.41)	
1:1.35 l=170.0m	85.76	94.73		0.70	85.76	94.73	4784.00	80.00	+80.00 NO.67	
1:1.35 l=170.0m	83.80	94.73		0.87	83.80	94.73	4894.00	20.00	+75.00 (1P.42)	
1:1.35 l=170.0m	81.85	100.27		0.87	81.85	100.27	5014.00	75.00	+70.00 (1P.43)	
1:1.35 l=170.0m	79.80	99.15		0.75	79.80	99.15	5144.00	25.00	NO.68 (1P.44)	
1:1.35 l=170.0m	77.49	99.15		0.75	77.49	99.15	5284.00	100.00	+80.00 (1P.45)	
1:1.35 l=170.0m	75.76	97.49		0.80	75.76	97.49	5434.00	100.00	NO.69 (1P.46)	
1:1.35 l=170.0m	74.80	95.76		0.67	74.80	95.76	5594.00	20.00	NO.70 +20.00	
1:1.35 l=170.0m	72.76	100.03		0.67	72.76	100.03	5764.00	32.40	1P.47	
1:1.35 l=170.0m	70.80	100.45		0.74	70.80	100.45	5944.00	47.60	NO.71 (1P.48)	
1:1.35 l=170.0m	68.80	95.90		1.75	68.80	95.90	6144.00	100.00	NO.72 (1P.49)	
1:1.35 l=170.0m	66.80	99.95		1.46	66.80	99.95	6364.00	80.00	1P.48 +80.00	
1:1.35 l=170.0m	64.80	101.40		0.60	64.80	101.40	6604.00	19.20	+80.00 NO.73	
1:1.35 l=170.0m	62.76	100.46		0.60	62.76	100.46	6804.00	20.00	NO.74 +20.00	
1:1.35 l=170.0m	60.80	99.96		0.96	60.80	99.96	7024.00	20.00	+80.00 NO.75	
1:1.35 l=170.0m	58.80	101.02		1.25	58.80	101.02	7284.00	15.70	+80.00 NO.76	
1:1.35 l=170.0m	56.80	100.42		0.74	56.80	100.42	7544.00	24.30	1P.50 NO.77	
1:1.35 l=170.0m	54.80	99.52		0.94	54.80	99.52	7824.00	24.30	+20.00 NO.78	
1:1.35 l=170.0m	52.76	94.00		0.61	52.76	94.00	8124.00	75.70	1P.51 NO.79	
1:1.35 l=170.0m	50.80	98.75		1.09	50.80	98.75	8484.00	44.30	NO.80 (1P.52)	
1:1.35 l=170.0m	48.80	94.00		0.86	48.80	94.00	8924.00	13.30	1P.53 NO.81	
1:1.35 l=170.0m	46.80	99.25		0.82	46.80	99.25	9384.00	33.70	+80.00 NO.82	
1:1.35 l=170.0m	44.80	98.80		0.60	44.80	98.80	9944.00	20.00	NO.83 +20.00	
1:1.35 l=170.0m	42.76	100.20		1.44	42.76	100.20	10624.00	44.30	1P.54 NO.84	
1:1.35 l=170.0m	40.80	96.63		1.02	40.80	96.63	11384.00	35.70	NO.85 +40.00	
1:1.35 l=170.0m	38.80	92.70		1.19	38.80	92.70	12244.00	40.00	NO.86 +40.00	
1:1.35 l=170.0m	36.80	88.08		0.65	36.80	88.08	13204.00	60.00	NO.87 (1P.55)	
1:1.35 l=170.0m	34.80	86.12		1.19	34.80	86.12	14284.00	25.30	1P.55 NO.88	
1:1.35 l=170.0m	32.76	81.10		0.65	32.76	81.10	15484.00	60.00	+80.00 NO.89	
1:1.35 l=170.0m	30.80	82.19		0.65	30.80	82.19	16804.00	28.50	1P.56 NO.90	
1:1.35 l=170.0m	28.80	89.62		0.90	28.80	89.62	18264.00	64.30	NO.91 (1P.57)	
1:1.35 l=170.0m	26.80	92.74		0.60	26.80	92.74	19864.00	29.80	NO.92 (1P.58)	
1:1.35 l=170.0m	24.80	94.41		1.31	24.80	94.41	21604.00	80.00	+60.00 NO.93	
1:1.35 l=170.0m	22.76	93.50		0.66	22.76	93.50	23484.00	10.20	1P.59 NO.94	
1:1.35 l=170.0m	20.80	92.80		1.50	20.80	92.80	25504.00	29.80	NO.95 (1P.60)	
1:1.35 l=170.0m	18.80	82.25		2.26	18.80	82.25	27664.00	44.50	+80.00 NO.96	
1:1.35 l=170.0m	16.80	85.76		2.39	16.80	85.76	29964.00	38.00	NO.97 (1P.61)	
1:1.35 l=170.0m	14.80	83.33		1.12	14.80	83.33	32404.00	60.00	+80.00 NO.98	
1:1.35 l=170.0m	12.76	87.60		0.97	12.76	87.60	35004.00	40.00	+30.00 NO.99	
1:1.35 l=170.0m	10.80	91.85		0.74	10.80	91.85	37764.00	50.00	+70.00 NO.100	
1:1.35 l=170.0m	8.80	91.73		0.60	8.80	91.73	40684.00	30.00	NO.101 (1P.62)	
1:1.35 l=170.0m	6.80	91.34		0.60	6.80	91.34	43764.00	60.00	NO.102 (1P.63)	
1:1.35 l=170.0m	4.80	87.90		0.63	4.80	87.90	47004.00	100.00	+75.00 NO.103	

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI CHOM DIVERSION WEIR
 PIPELINE PLAN & PROFILE (3/6)

Date: Mar 1983 Drawing No. P-8
 JAPAN INTERNATIONAL COOPERATION AGENCY

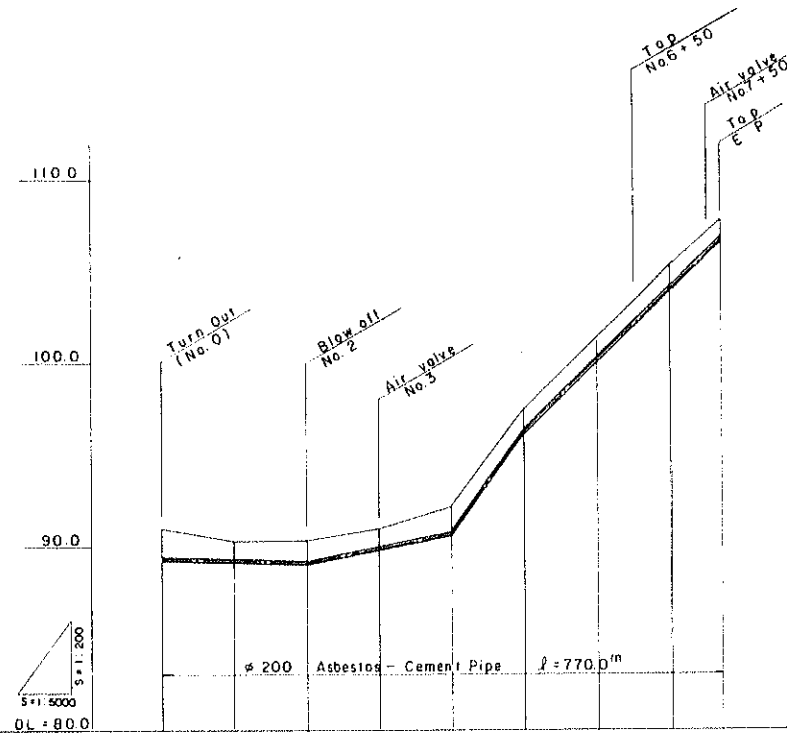
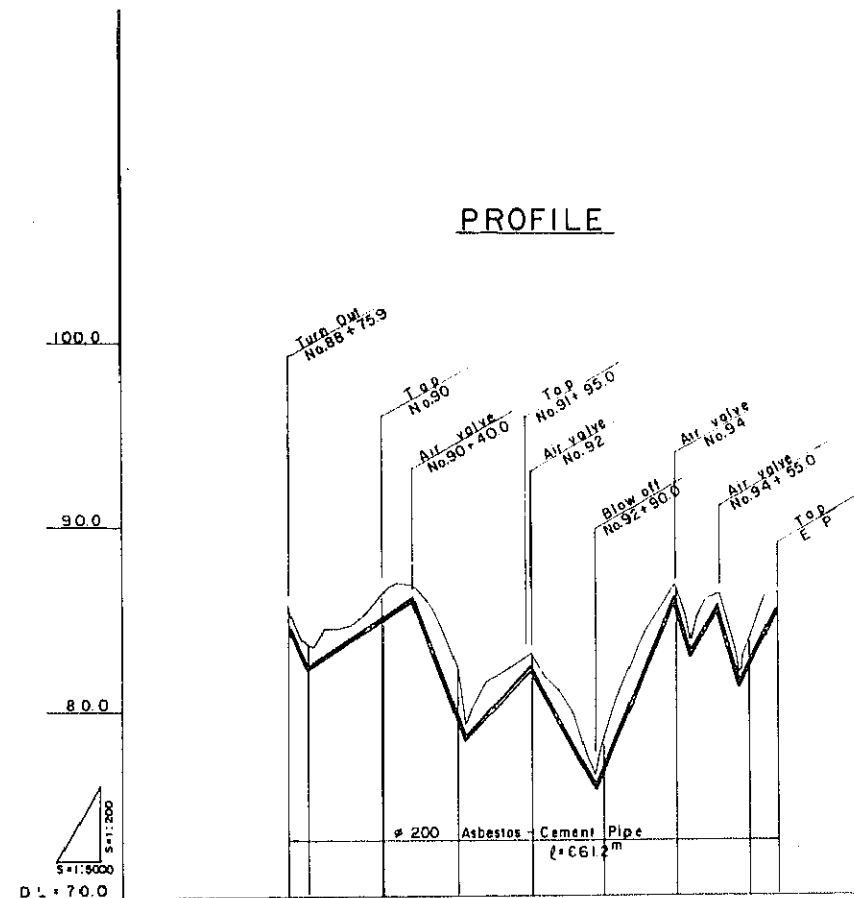
BAN NA HONG ROUTE

PLAN

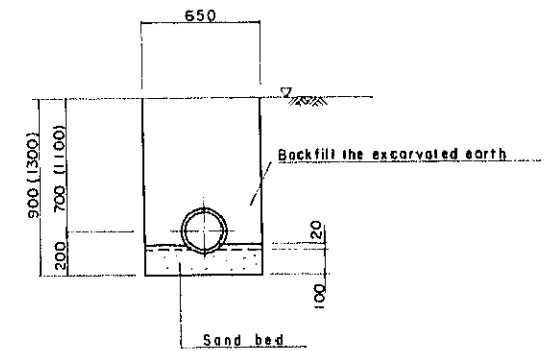


PROFILE

PROFILE



TYPICAL SECTION S=1:20



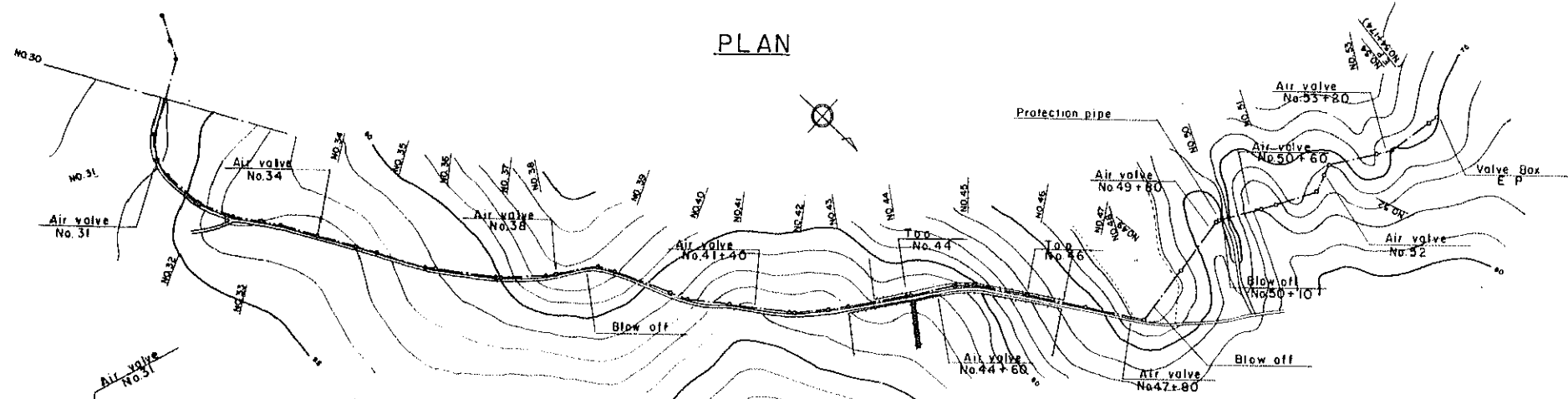
X: 1 = BAN NA HONG ROUTE

SLOPE	1:1/38 1:1/40 1:1/40 1:1/40 1:1/40 1:1/40 1:1/40 1:1/40 1:1/40 1:1/40										1:1/1000 1:1/1000 1:1/1000 1:1/1000 1:1/1000 1:1/1000 1:1/1000									
EMBANKMENT																				
DEPTH	0.63	1.21	1.39	1.23	2.19	2.47	0.61	1.49	0.60	1.33	0.60	1.56	1.00	1.10	1.00	1.42	1.00	1.21	1.00	
CENTER ELEVATION	84.75	82.30	82.91	84.93	85.15	85.00	82.35	78.76	85.13	83.10	85.60	89.30	89.20	89.10	89.83	90.56	96.31	100.16	104.01	106.70
GROUND ELEVATION	85.85	83.41	84.40	84.75	85.27	85.57	83.06	78.35	86.83	83.10	81.30	90.96	90.50	90.30	90.83	92.08	97.41	101.24	105.32	107.80
ACCUMULATIVE DISTANCE	8886.90	8890.00	8907.00	8944.00	9004.00	9034.00	9184.00	9274.00	9304.00	9434.00	9484.00	9584.00	9684.00	9784.00	9884.00	10034.00	10134.00	10234.00	10334.00	10434.00
DISTANCE	0.00	24.10	25.00	77.00	8.20	31.80	30.30	90.00	100.00	20.00	35.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00
NO.	NO. 0 NO. 01 IP. 18 IP. 19 IP. 20 NO. 90 +40.00 IP. 90 NO. 91 +10.00 NO. 92 IP. 92 NO. 93 NO. 94 +20.00 +35.00 +85.00 NO. 95 NO. 96 NO. 97 NO. 98 NO. 99 NO. 00																			
CURVE																				

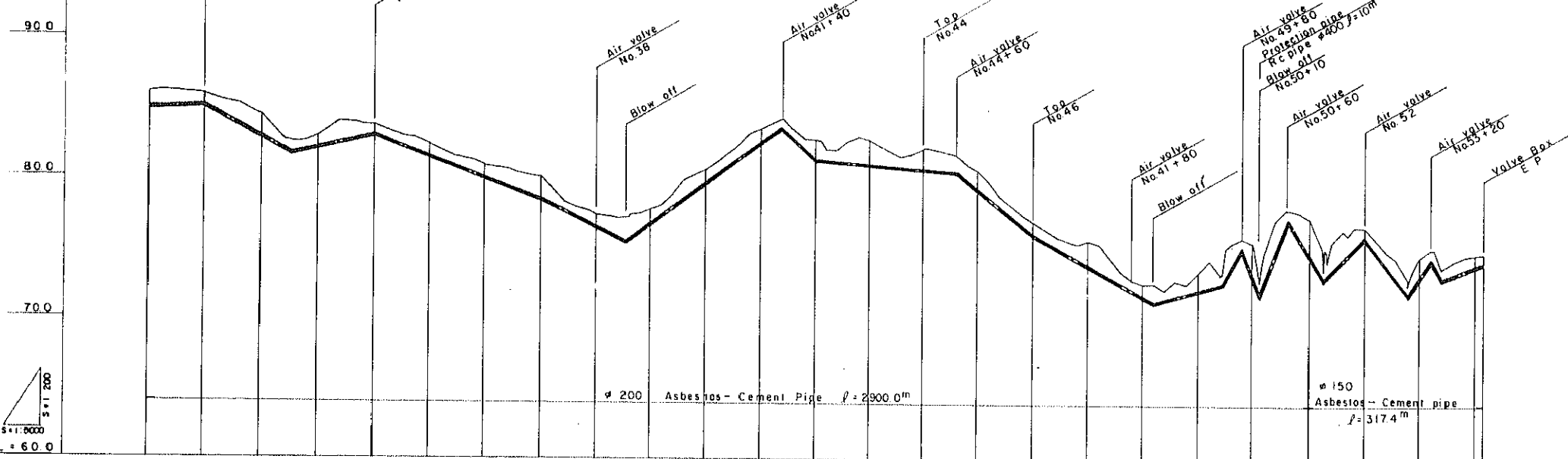
THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI CHOM DIVERSION WEIR
 PIPELINE PLAN & PROFILE (4/6)
 Date Mar. 1983 Drawing No. P-9
 JAPAN INTERNATIONAL COOPERATION AGENCY

PAK CHOM ROUTE (2/2)

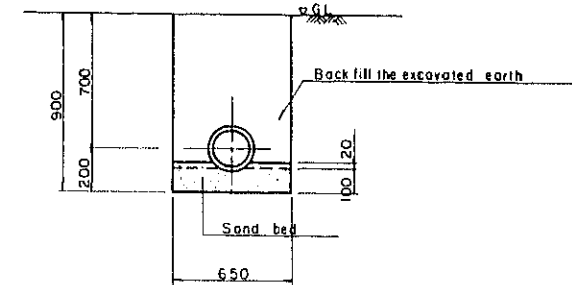
PLAN



PROFILE



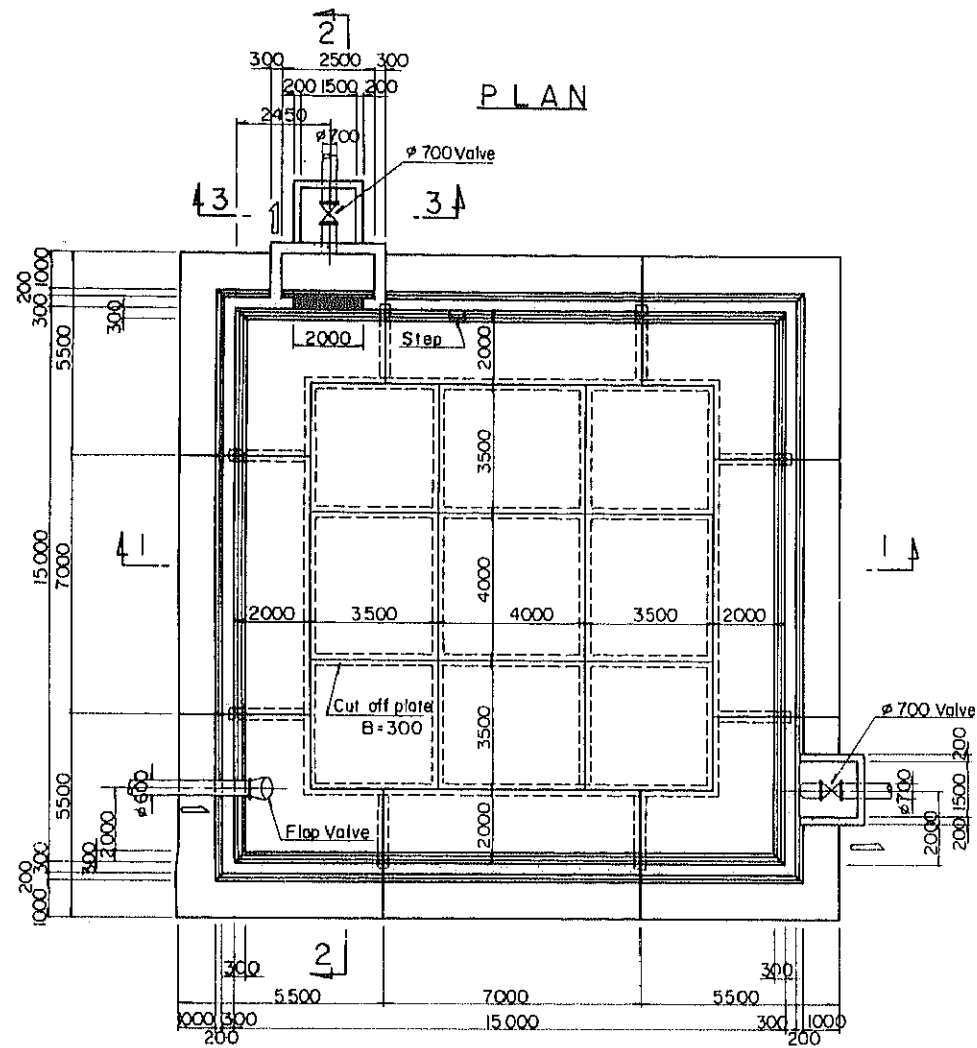
TYPICAL SECTION S=1:20



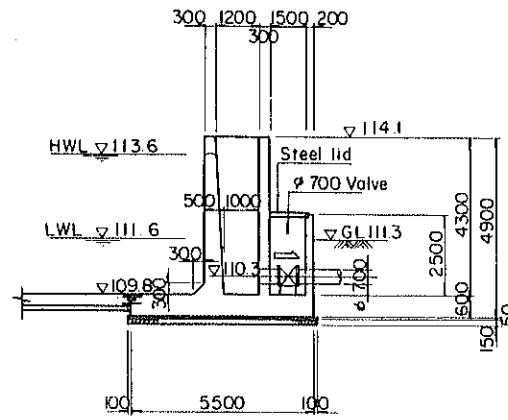
SLOPE	Slopes: 1:1.5/100.0, 1:1.5/145.0, 1:1.5/180.0, 1:1.5/200.0, 1:1.5/250.0, 1:1.5/300.0, 1:1.5/350.0, 1:1.5/400.0, 1:1.5/450.0, 1:1.5/500.0, 1:1.5/550.0, 1:1.5/600.0, 1:1.5/650.0, 1:1.5/700.0, 1:1.5/750.0, 1:1.5/800.0, 1:1.5/850.0, 1:1.5/900.0, 1:1.5/950.0, 1:1.5/1000.0																				
	EMBAKMENT																				
DEPTH	1.00	0.92	0.80	0.75	0.68	0.62	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	0.05	0.10	
CENTER ELEVATION	84.93	85.11	85.25	85.56	85.98	86.40	86.82	87.24	87.66	88.08	88.50	88.92	89.34	89.76	90.18	90.60	91.02	91.44	91.86	92.28	
GROUND ELEVATION	86.03	86.03	85.93	85.56	85.40	85.24	85.08	84.92	84.76	84.60	84.44	84.28	84.12	83.96	83.80	83.64	83.48	83.32	83.16	83.00	
ACCUMULATIVE DISTANCE	3000.00	3039.40	3100.00	3129.10	3191.50	3254.00	3316.50	3379.00	3441.50	3504.00	3566.50	3629.00	3691.50	3754.00	3816.50	3879.00	3941.50	4004.00	4066.50	4129.00	
DISTANCE	0.00	39.40	40.80	29.10	62.40	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	
NO	NO.30	IP.39	NO.31	IP.41	IP.42	IP.43	NO.33	IP.44	NO.34	IP.45	NO.35	IP.46	NO.36	NO.37	IP.48	NO.38	NO.39	NO.40	IP.50	NO.41	
CURVE																					

THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI CHOM DIVERSION WEIR
 PIPELINE PLAN & PROFILE (6/6)
 Date: Mar. 1983 Drawing No.: P-11
 JAPAN INTERNATIONAL COOPERATION AGENCY

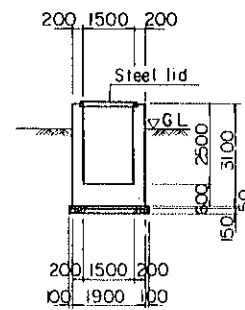
DISTRIBUTING TANK



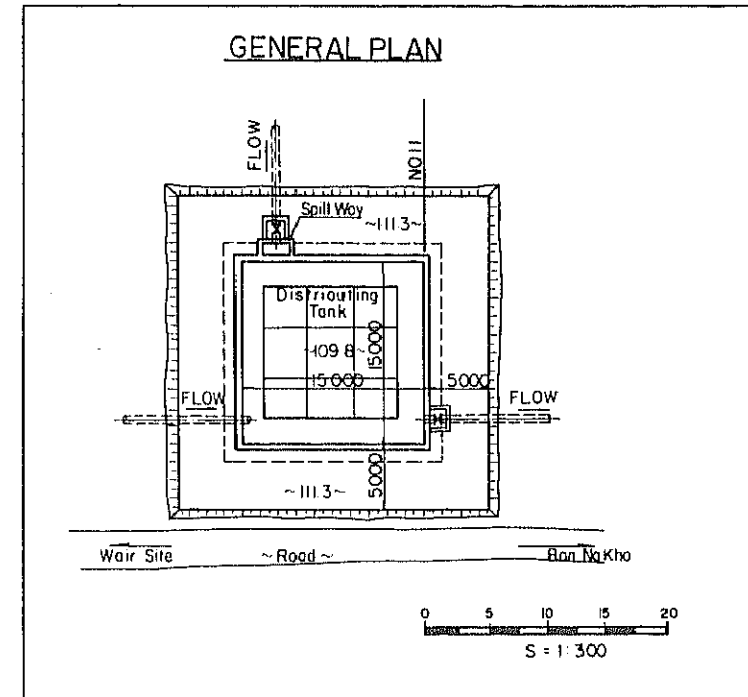
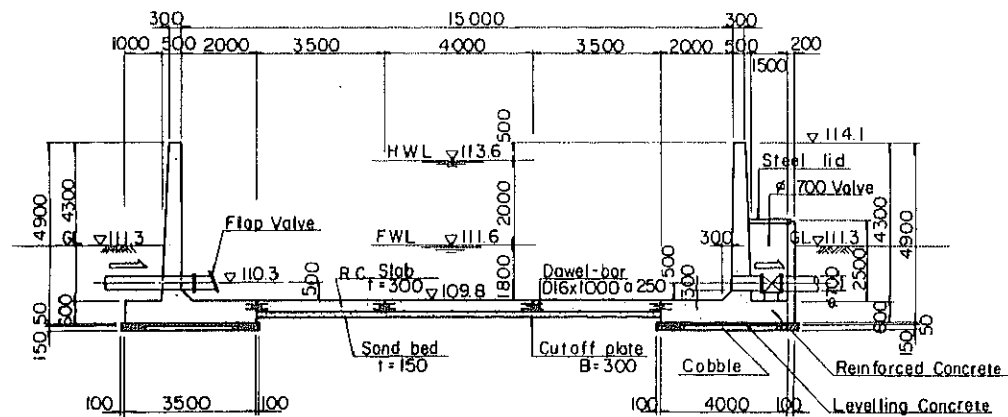
SECTION 2-2



SECTION 3-3



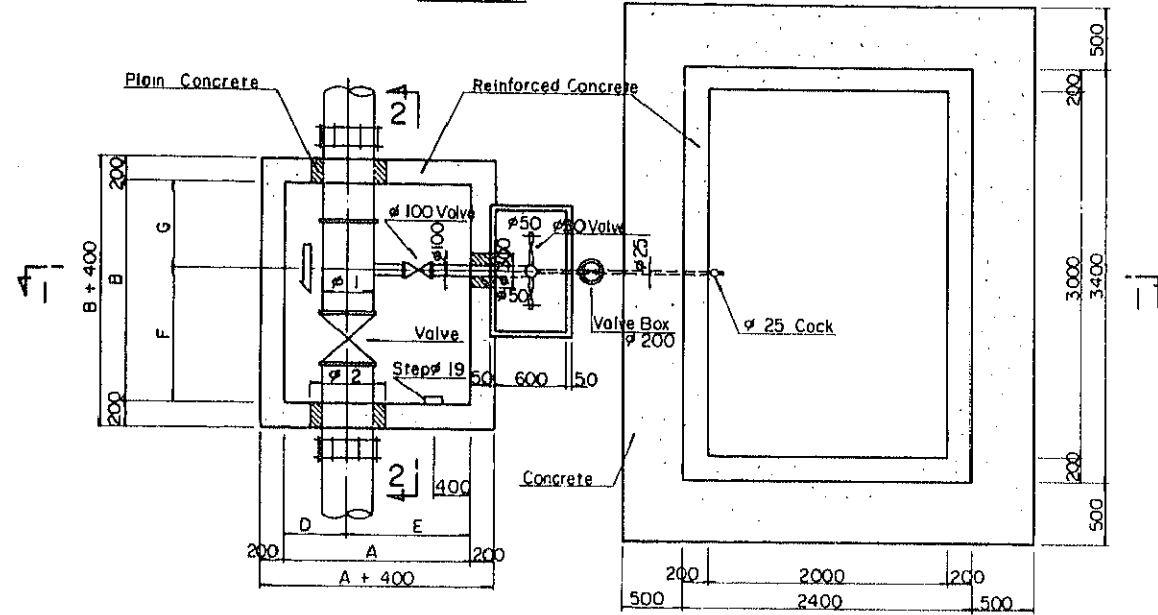
SECTION 1-1



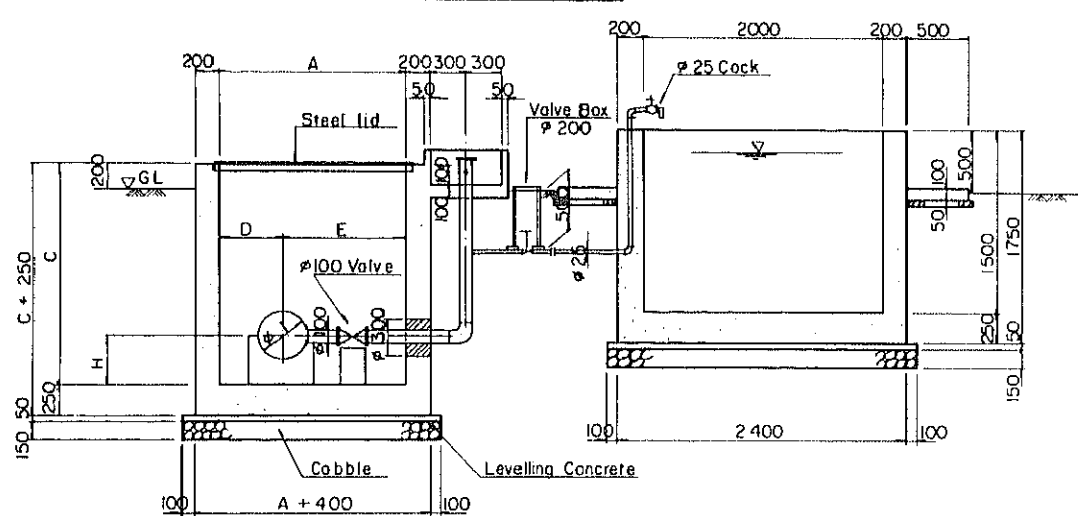
THE KINGDOM OF THAILAND		
THE ENVIRONMENTAL IMPROVEMENT PROJECT IN THAI-LAO BORDER REGION		
HUAI CHOM DIVERSION WEIR		
DISTRIBUTING TANK PLAN AND SECTIONS		
Date	Mar. 1983	Drawing No. P-12
JAPAN INTERNATIONAL COOPERATION AGENCY		

TAP & WATER TANK

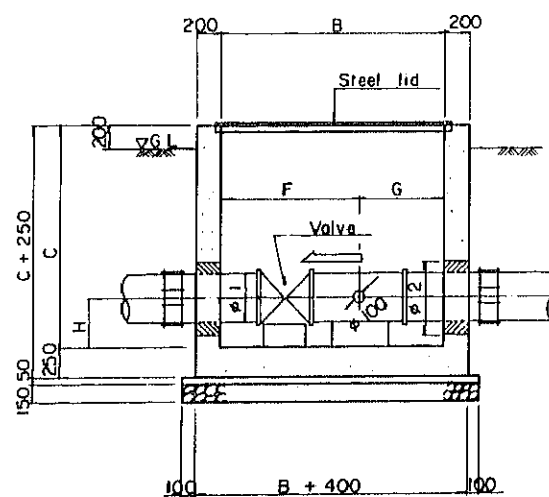
PLAN



SECTION I-I



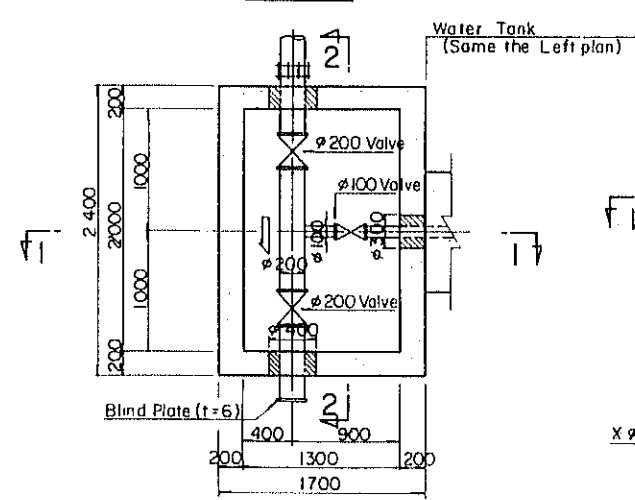
SECTION 2-2



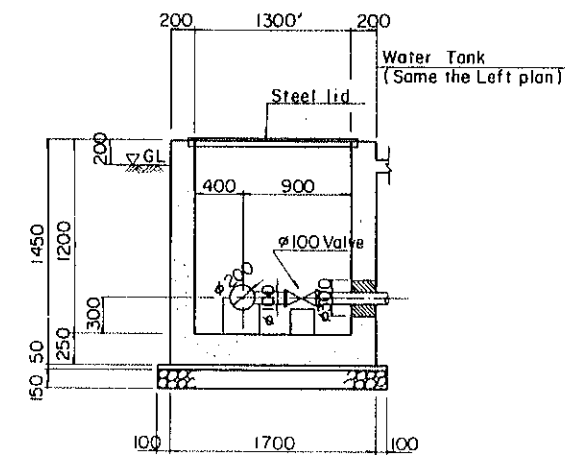
		Dimensions				
φ 1	200	400	500	600	700	
φ 2	400	600	700	800	900	
A	1300	1500	1700	1900	2100	
B	1650	1800	1950	2100	2300	
C	1200	1400	1550	1700	2200	
D	400	500	600	700	800	
E	900	1000	1100	1200	1300	
F	1000	1100	1200	1300	1400	
G	650	700	750	800	900	
H	300	400	500	600	650	
Position	N091 + 95 (Main Route) N06 + 50 (Ban na Ho Route)	N020 N044 (Pak chom Route)	N069, N074 N077 (Main Route)	N048 + 20 N052, N059 (Main Route)	N012 N016 + 50 N020 + 50 N025 + 50 N029, N032 N035 + 30 N043 + 60 (Main Route)	

TAP & WATER TANK (N095+37.1 MAIN ROUTE)

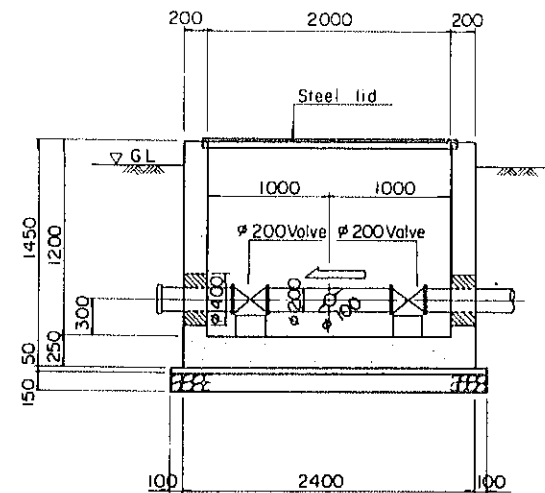
PLAN



SECTION I-I

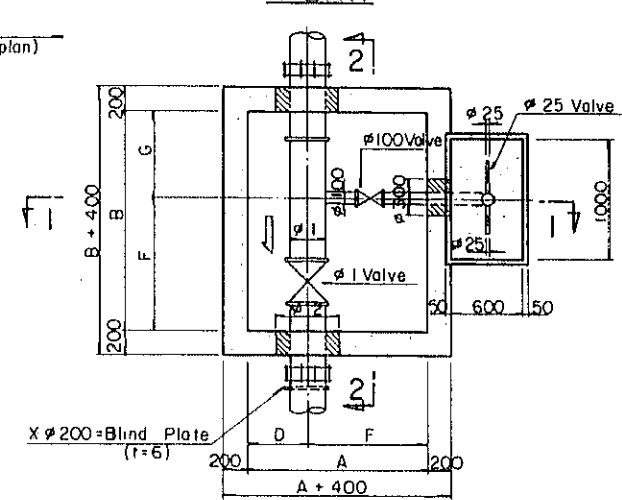


SECTION 2-2

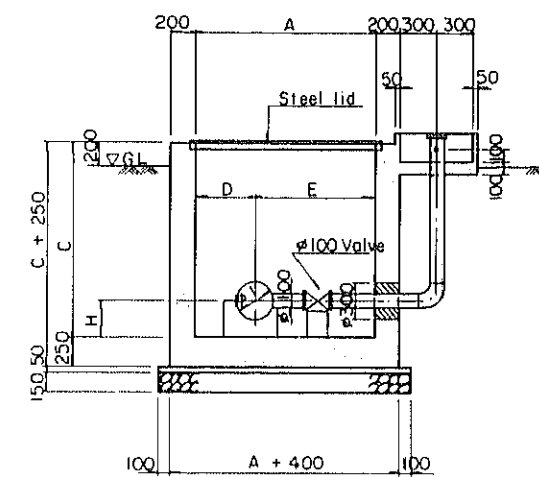


TAP

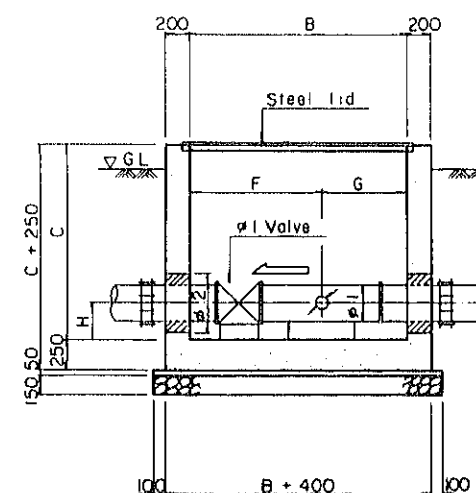
PLAN



SECTION I-I



SECTION 2-2



Dimension Table

		Dimensions	
φ 1	200	700	
φ 2	400	900	
A	1300	2100	
B	1650	2300	
C	1600	2200	
D	400	800	
E	900	1300	
F	1000	1400	
G	650	900	
H	300	650	
Position	N07 + 70 (Ban na Ho Route)	N038 N041 + 50 (Main Route)	



THE KINGDOM OF THAILAND
 THE ENVIRONMENTAL IMPROVEMENT PROJECT
 IN THAI-LAO BORDER REGION
 HUAI CHOM DIVERSION WEIR
 TAP & WATER TANK
 PLAN AND SECTIONS
 Date Mar. 1983 Drawing No. P-13
 JAPAN INTERNATIONAL COOPERATION AGENCY

マイクロ
フィルム作成

JICA