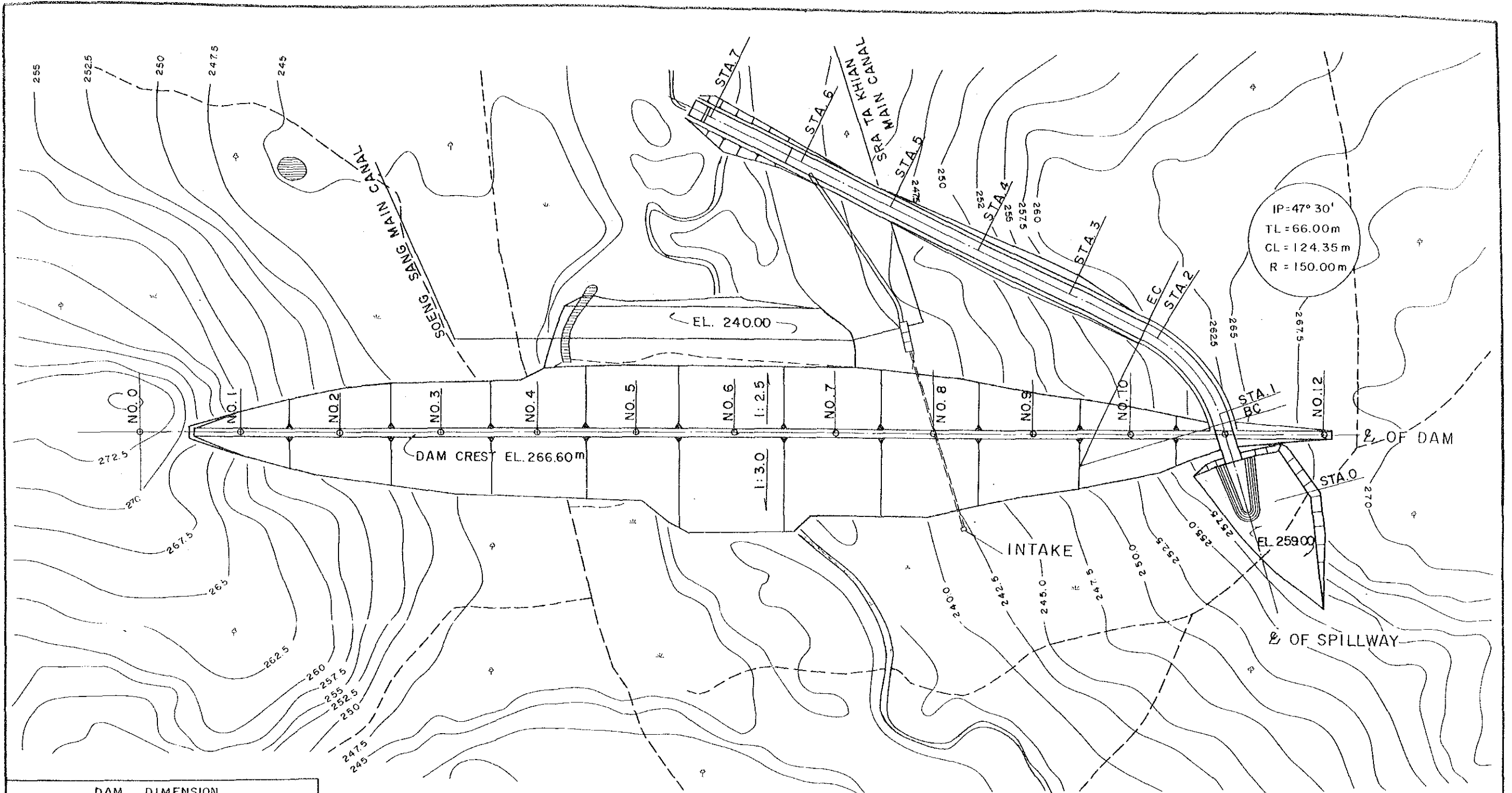
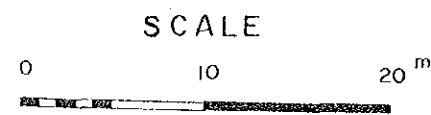
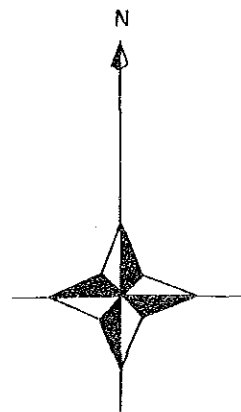


LIST OF DRAWINGS

- DWG. 1. LAM PLAI MAT DAM (1/4)
2. LAM PLAI MAT DAM (2/4)
3. LAM PLAI MAT DAM (3/4)
4. LAM PLAI MAT DAM (4/4)
5. NONG LUM PUK DAM (1/4)
6. NONG LUM PUK DAM (2/4)
7. NONG LUM PUK DAM (3/4)
8. NONG LUM PUK DAM (4/4)
9. HUAI PHLU DAM (1/4)
10. HUAI PHLU DAM (2/4)
11. HUAI PHLU DAM (3/4)
12. HUAI PHLU DAM (4/4)
13. PA KHAM DIVERSION WEIR (1/2)
14. PA KHAM DIVERSION WEIR (2/2)
15. PROPOSED IRRIGATION SYSTEM - LAM PLAI MAT & NONG
LUM PUK
16. PROPOSED IRRIGATION SYSTEM - HUAI PHLU
17. CANAL PROFILE - SSMC, STMC, NLMC
18. CANAL PROFILE - PKMC, HPLMC, HPRMC
19. CANAL PROFILE - TCMC
20. TYPICAL CANAL SECTION
21. CANAL RELATED STRUCTURES (1/4)
22. CANAL RELATED STRUCTURES (2/4)
23. CANAL RELATED STRUCTURES (3/4)
24. CANAL RELATED STRUCTURES (4/4)
25. MUBAN COOPERATIVE POND

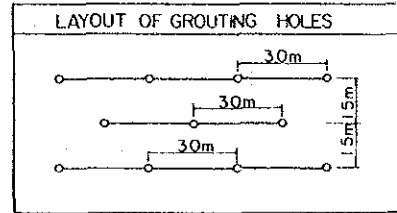
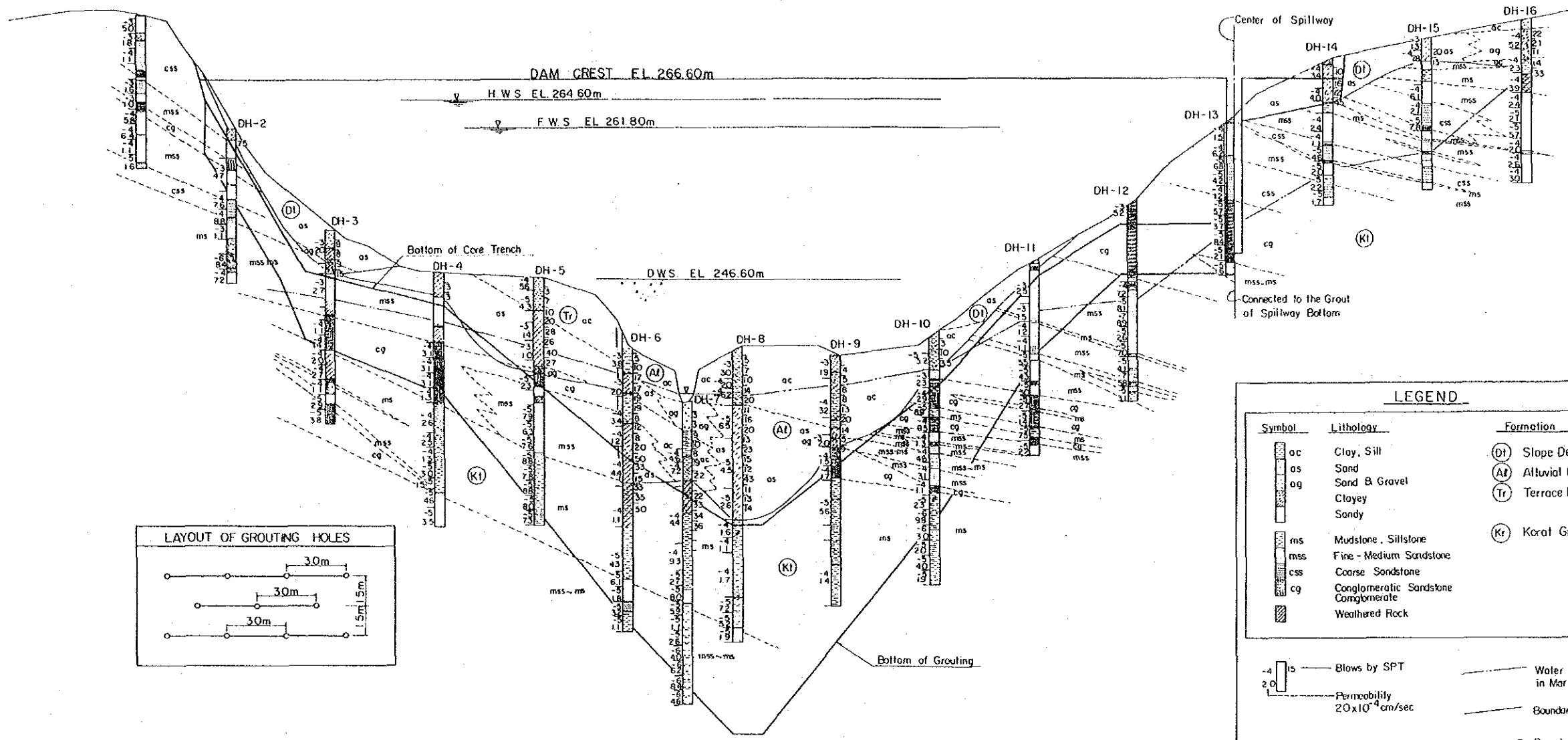


DAM DIMENSION	
Catchment Area	485 km ²
Gross Reservoir Capacity	97.3 MCM
Effective Capacity	90.0 MCM
Sediment Volume	7.3 MCM
High Water Level	264.60 m
Full Water Level	261.80 m
Dead Water Level	246.00 m
Dam Type	Zone Type Fill Dam
Dam Height	44.6 m
Dam Length	1,160 m
Dam Crest Elevation	266.60 m
Embankment Volume	1,656,000 m ³
Design Flood	1,366 m ³ /sec
Spillway Capacity	984 m ³ /sec
Spillway Type	Side Channel
Overflow Depth	2.8 m
Spillway Crest Length	100 m
Intake Capacity	11.83 m ³ /sec



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
LAM PLAI MAT DAM (1/4)		
DATE	DWG	I
JAPAN INTERNATIONAL COOPERATION AGENCY		

EL 280m
 EL 275
 EL 270
 EL 265
 EL 260
 EL 255
 EL 250
 EL 245
 EL 240
 EL 235
 EL 230
 EL 225
 EL 220
 EL 215
 EL 210



Symbol	Lithology	Formation
oc	Clay, Silt	(D1) Slope Deposit
os	Sand	(At) Alluvial Deposit
og	Sand & Gravel	(Tr) Terrace Deposit
	Clayey Sandy	(Kr) Korat Groupe
ms	Mudstone, Siltstone	
mss	Fine - Medium Sandstone	
css	Coarse Sandstone	
cg	Conglomeratic Sandstone Conglomerate	
	Weathered Rock	
-4 20	Blows by SPT	Water Level in Mar to May 1981
	Permeability 20×10^{-4} cm/sec	Boundary of Formation
		Boundary of Stratume

STATION	DISTANCE (m.)	ACCUMULATED DISTANCE (m.)	ORIGINAL GROUND ELEVATION (m.)	CORE TRENCH ELEVATION (m.)	DAM CREST ELEVATION (m.)
NO 0	0.00	0.00	273.00	—	—
+50.00	50.00	50.00	268.00	266.60	266.0
NO 1	50.00	100.00	260.00	257.81	266.0
+60.00	60.00	160.00	244.00	247.50	266.0
NO 2	40.00	200.00	250.80	246.50	266.0
NO 3	100.00	300.00	247.30	244.00	266.0
NO 4	100.00	400.00	246.80	235.67	266.60
+80.00	80.00	480.00	241.20	229.00	266.60
NO 5	20.00	500.00	239.00	227.75	266.60
+90.00	90.00	590.00	239.40	222.00	266.60
NO 6	10.00	600.00	240.00	222.00	266.60
+20.00	20.00	620.00	240.00	222.00	266.60
NO 7	80.00	700.00	239.00	228.00	266.60
NO 8	100.00	800.00	241.50	236.00	266.60
NO 9	100.00	900.00	248.60	247.00	266.60
+90.00	90.00	990.00	243.80	252.00	266.60
NO 10	10.00	1,000.00	254.50	252.00	266.60
NO 11	100.00	1,100.00	262.70	249.00	—
NO 12	100.00	1,200.00	268.60	264.00	266.60
+10.00	10.00	1,210.00	268.80	266.60	266.60

KINGDOM OF THAILAND
 MINISTRY OF AGRICULTURE AND COOPERATIVES
 ROYAL IRRIGATION DEPARTMENT

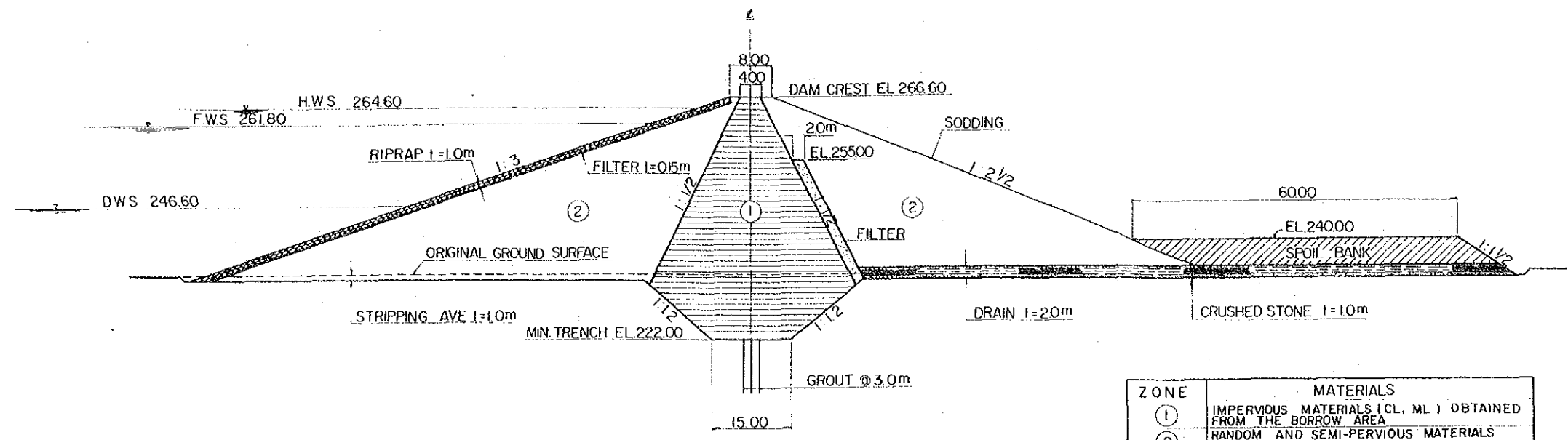
LOWER NORTHEAST IRRIGATION PROJECT

LAM PLAI MAT DAM (2/4)

DATE: _____ DWG: 2

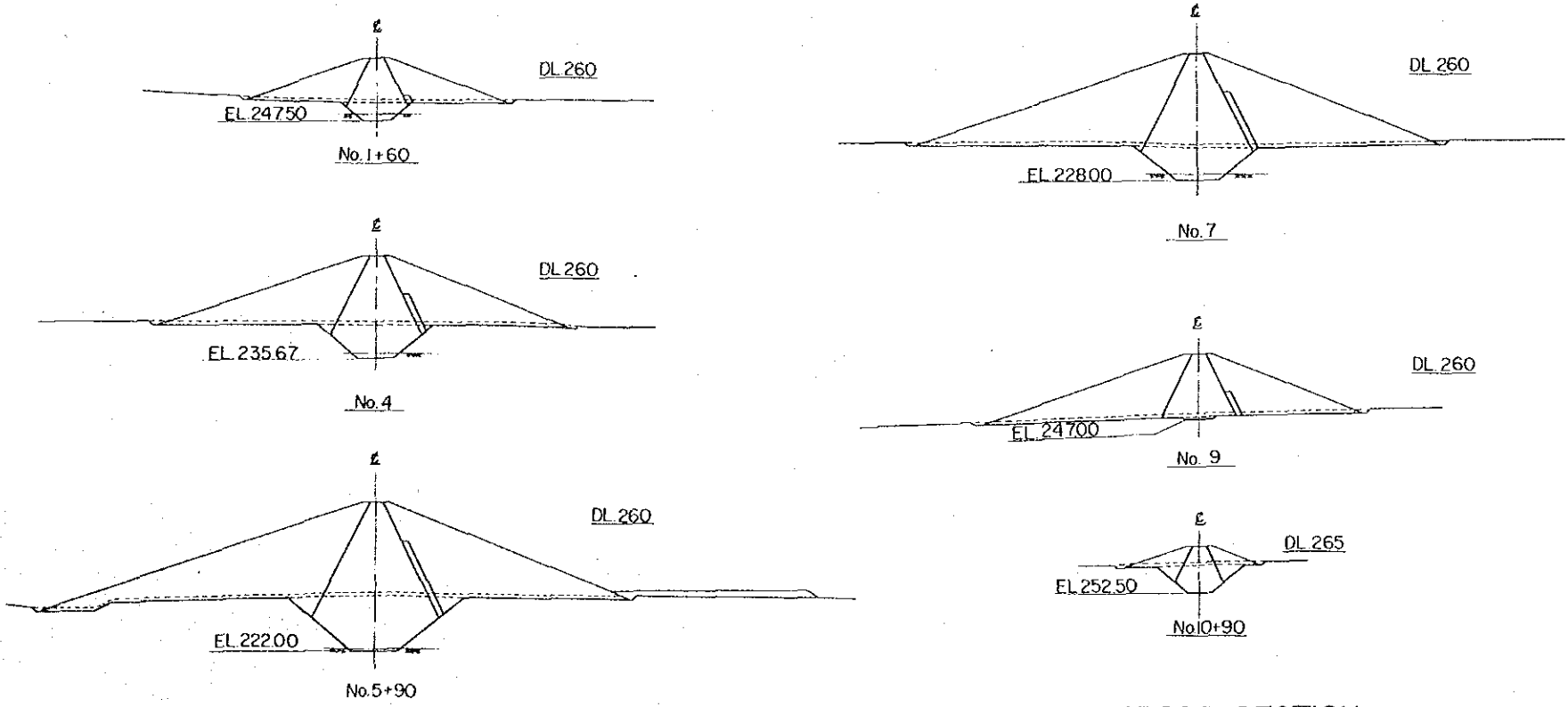
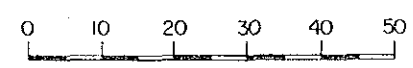
JAPAN INTERNATIONAL COOPERATION AGENCY

EL 280
 EL 270
 EL 260
 EL 250
 EL 240
 EL 230
 EL 220

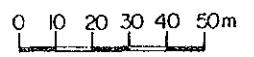


ZONE	MATERIALS
①	IMPERVIOUS MATERIALS (CL, ML) OBTAINED FROM THE BORROW AREA
②	RANDOM AND SEMI-PERVIOUS MATERIALS EXCAVATED AT SPILLWAY, CORE TRENCH AND OTHERS
RIPRAP	SAND STONE FROM QUARRY AND SELECTED HARD SAND STONE EXCAVATED AT SPILLWAY
FILTER	WELL-GRADED MIXTURES OF SAND AND GRAVEL OBTAINED FROM THE MUN RIVER
DRAIN	CRUSHED STONE

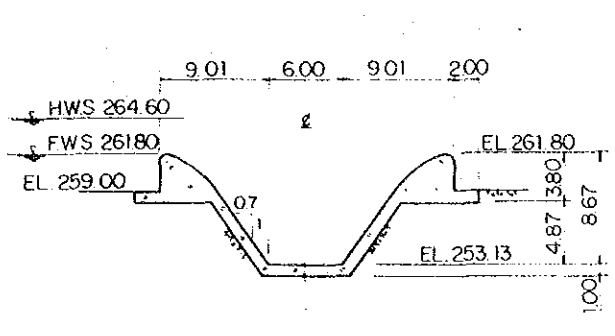
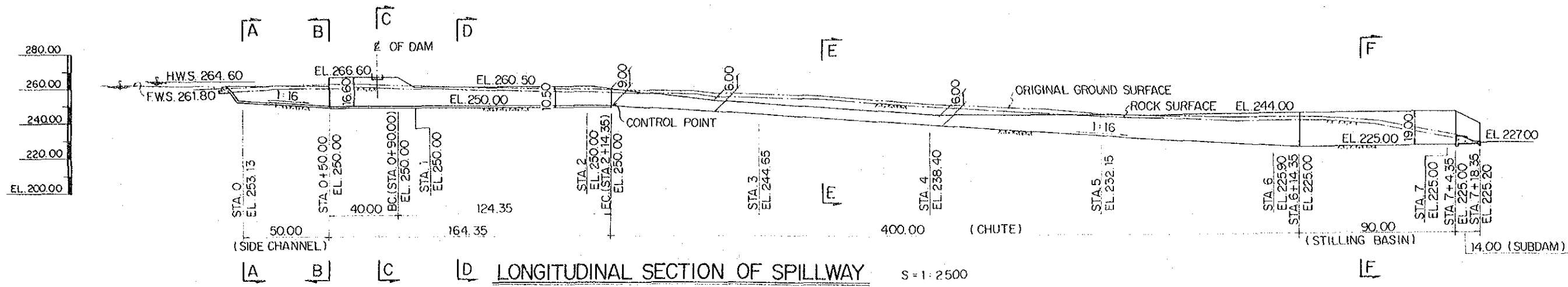
TYPICAL CROSS SECTION



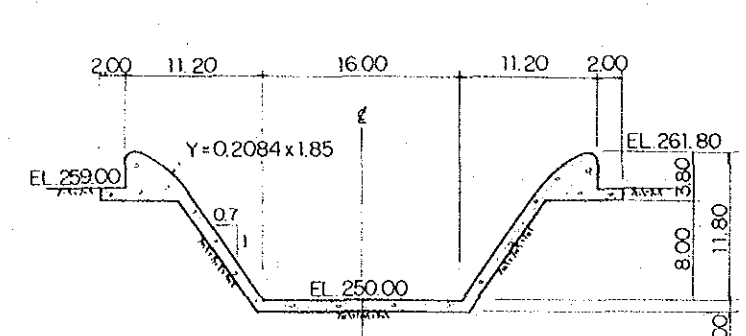
CROSS SECTION



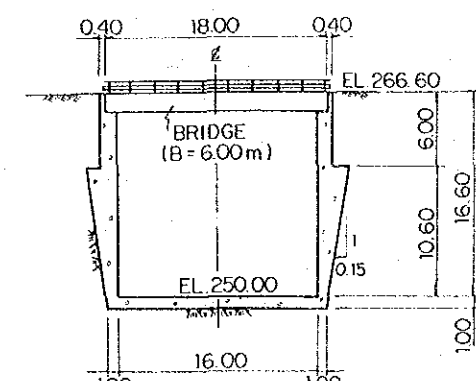
KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT			
LOWER NORTHEAST IRRIGATION PROJECT			
LAM PLAI MAT DAM (3/4)			
DATE		DWG	3
JAPAN INTERNATIONAL COOPERATION AGENCY			



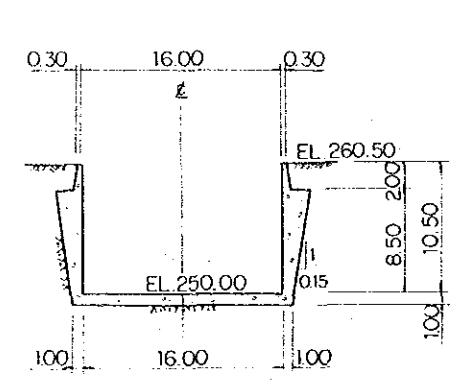
SECTION A-A S=1:600



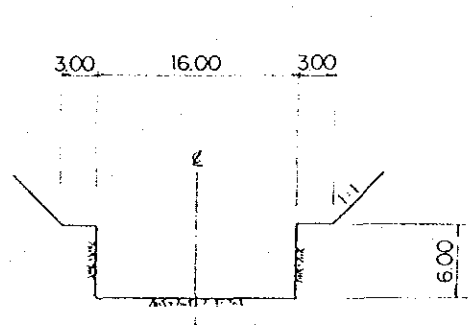
SECTION B-B S=1:600



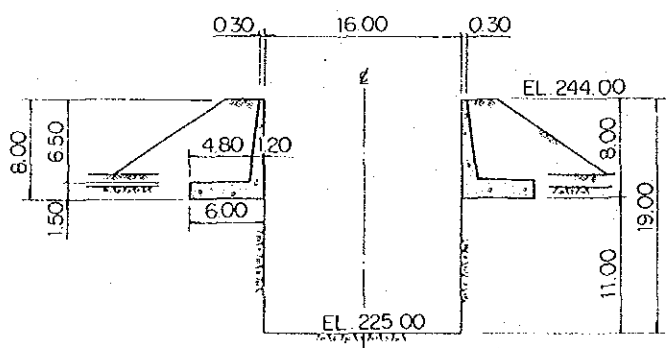
SECTION C-C S=1:600



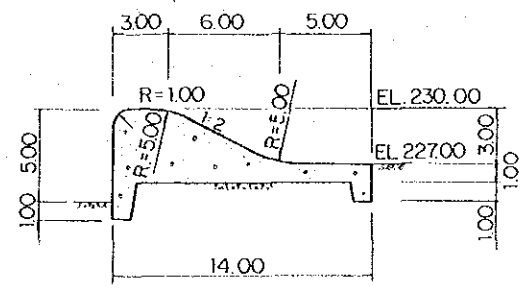
SECTION D-D S=1:600



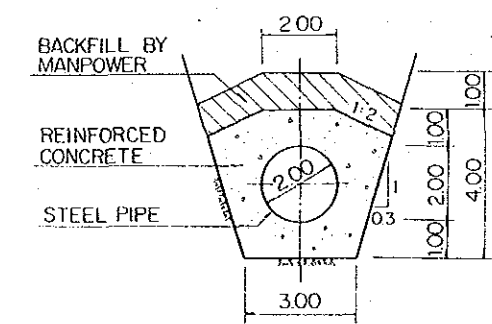
SECTION E-E S=1:600



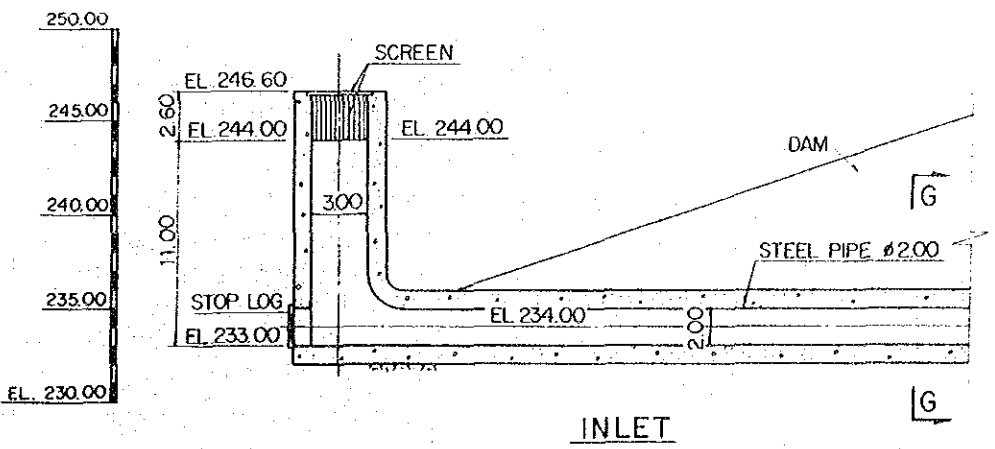
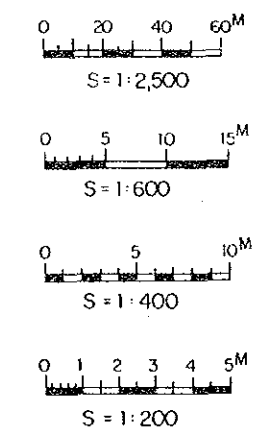
SECTION F-F S=1:600



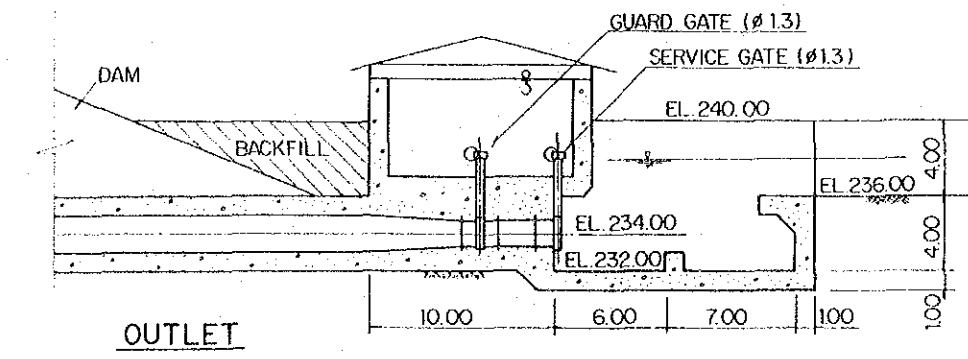
PROFILE OF SUBDAM S=1:400



SECTION G-G S=1:200



INLET

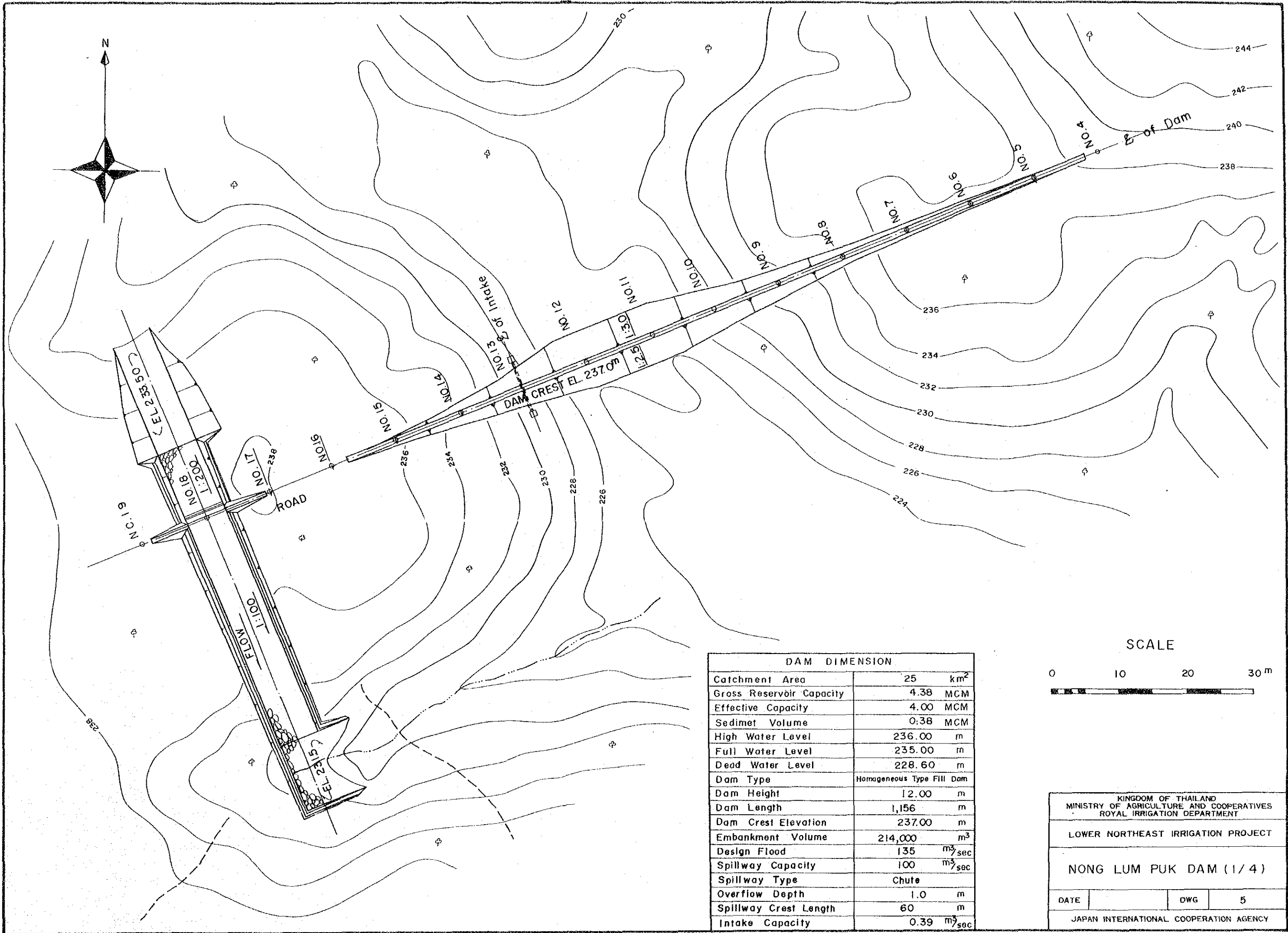


OUTLET

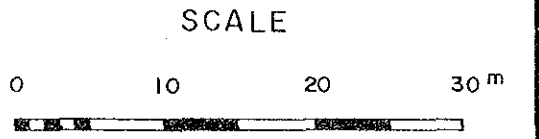
INTAKE FACILITY S=1:400

NOTE 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED
 2. ALL ELEVATIONS (EL) ARE IN METERS

KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
LAM PLAI MAT DAM (4/4)		
DATE	DWG	4
JAPAN INTERNATIONAL COOPERATION AGENCY		

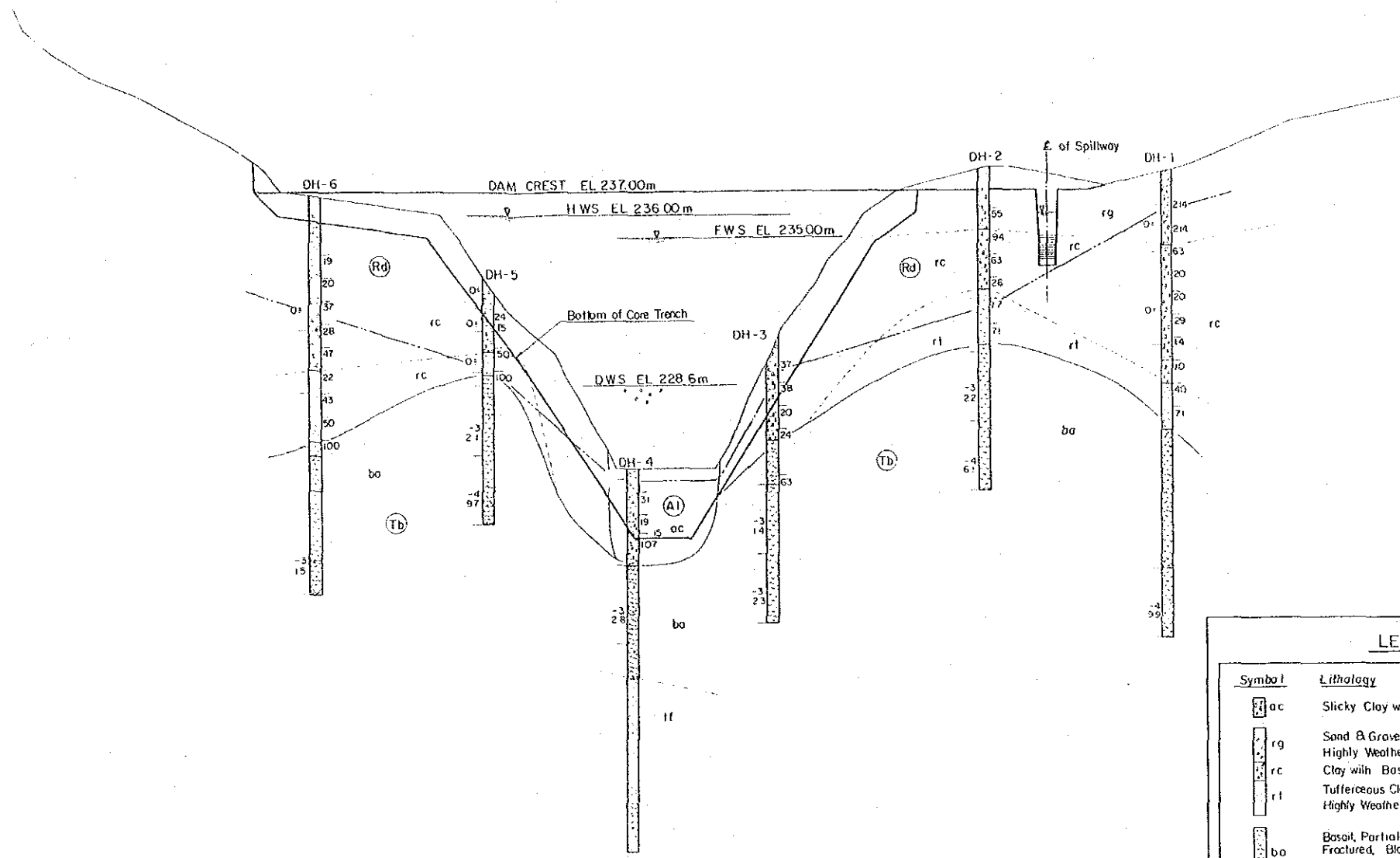


DAM DIMENSION	
Catchment Area	25 km ²
Gross Reservoir Capacity	4.38 MCM
Effective Capacity	4.00 MCM
Sediment Volume	0.38 MCM
High Water Level	236.00 m
Full Water Level	235.00 m
Dead Water Level	228.60 m
Dam Type	Homogeneous Type Fill Dam
Dam Height	12.00 m
Dam Length	1,156 m
Dam Crest Elevation	237.00 m
Embankment Volume	214,000 m ³
Design Flood	135 m ³ /sec
Spillway Capacity	100 m ³ /sec
Spillway Type	Chute
Overflow Depth	1.0 m
Spillway Crest Length	60 m
Intake Capacity	0.39 m ³ /sec



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT			
LOWER NORTHEAST IRRIGATION PROJECT			
NONG LUM PUK DAM (1/4)			
DATE		DWG	5
JAPAN INTERNATIONAL COOPERATION AGENCY			

EL 245m
 EL 240
 EL 235
 EL 230
 EL 225
 EL 220
 EL 215
 EL 210
 EL 205



LEGEND

Symbol	Lithology	Formation
ac	Slickly Clay with Pebble	(Al) Alluvial Deposits
rg	Sand & Gravel Originated Highly Weathered Basalt	(Rd) Slope and Residual Deposit
rc	Clay with Basalt Pebble	(Tb) Basalt
ri	Tuffaceous Clay Originated Highly Weathered Tuff	
ba	Basalt, Partially Porous Fractured, Blocky Highly Weathered	
tf	Tuff	

- - - Blows by SPT
 - - - Water Level in Sep-Oct 1983
 - - - Permeability 2×10^{-4} cm/sec
 - - - Boundary of Formation
 - - - Boundary of Stratum

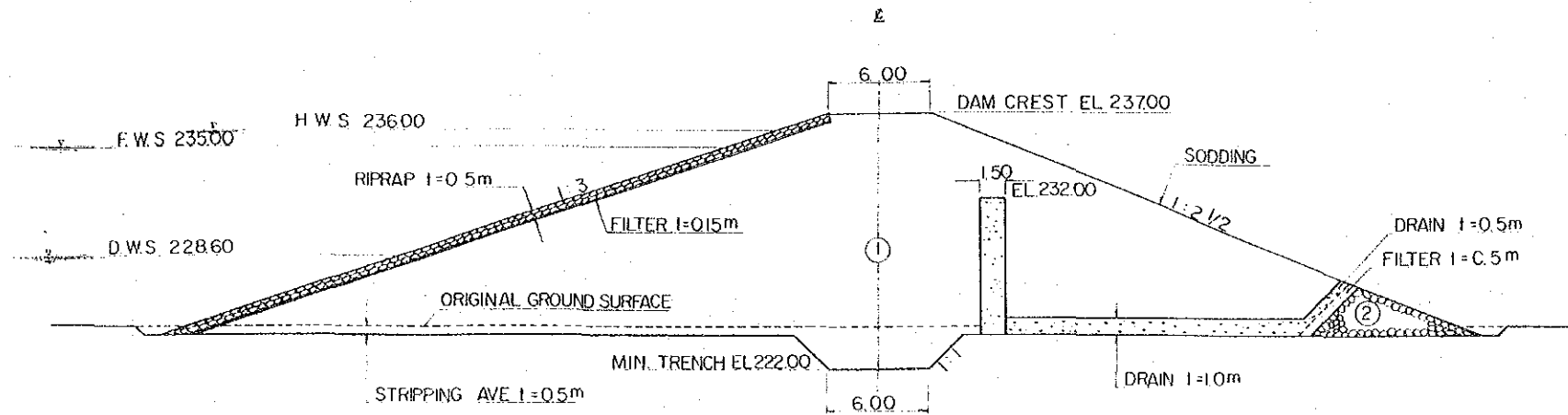
STATION	DISTANCE (m)	ACCUMULATED DISTANCE (m)	ORIGINAL ELEVATION (m)	CORE TRENCH ELEVATION (m)	DAWY TEST ELEVATION (m)
NO 0	0.00	0.00	245.00	-	-
NO 1	100.00	100.00	242.50	-	-
NO 2	100.00	200.00	241.30	-	-
NO 3	100.00	300.00	240.00	-	-
NO 4	100.00	400.00	238.60	237.00	237.00
+20.00	20.00	420.00	238.20	237.00	237.00
+80.00	40.00	460.00	237.20	236.00	237.00
NO 5	40.00	500.00	236.90	235.80	237.00
NO 6	100.00	600.00	236.50	235.40	237.00
NO 7	100.00	700.00	236.20	235.10	237.00
+20.00	20.00	720.00	236.10	235.00	237.00
NO 8	80.00	800.00	234.00	232.33	237.00
NO 9	100.00	900.00	230.90	229.00	237.00
NO 10	100.00	1,000.00	227.30	225.89	237.00
+80.00	80.00	1,080.00	225.00	222.00	237.00
NO 11	20.00	1,100.00	225.00	222.00	237.00
+80.00	80.00	1,180.00	225.00	222.00	237.00
NO 12	20.00	1,200.00	225.00	222.80	237.00
NO 13	100.00	1,300.00	229.00	226.80	237.00
NO 14	100.00	1,400.00	233.20	230.80	237.00
NO 15	100.00	1,500.00	236.30	234.80	237.00
+75.00	75.00	1,575.00	237.40	237.00	237.00
NO 16	240.00	1,600.00	237.40	-	-
NO 17	100.00	1,700.00	238.00	-	-
NO 18	100.00	1,800.00	237.70	-	-
NO 19	100.00	1,900.00	237.20	-	-
NO 20	100.00	2,000.00	237.80	-	-
NO 21	100.00	2,100.00	238.70	-	-
NO 22	100.00	2,200.00	239.70	-	-

KINGDOM OF THAILAND
 MINISTRY OF AGRICULTURE AND COOPERATIVES
 ROYAL IRRIGATION DEPARTMENT
 LOWER NORTHEAST IRRIGATION PROJECT
 NONG LUM PUK DAM (2/4)

DATE: _____ DWG: 6

JAPAN INTERNATIONAL COOPERATION AGENCY

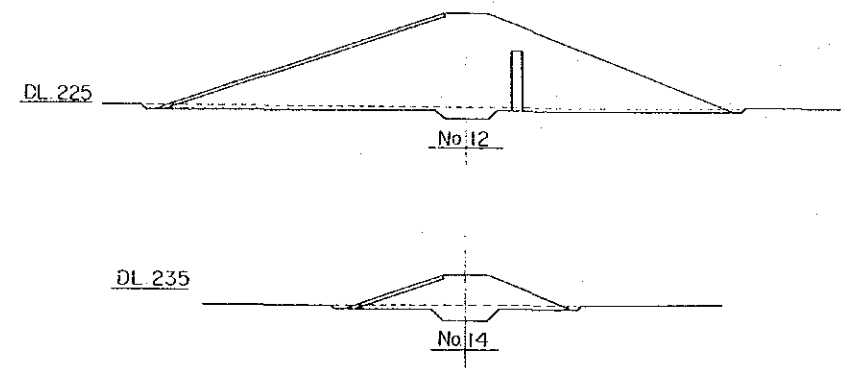
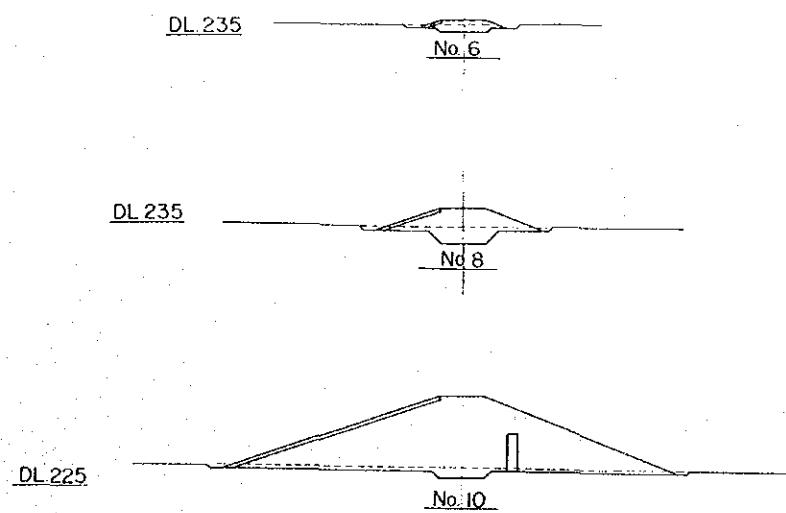
EL240
 EL235
 EL230
 EL225
 EL220



TYPICAL CROSS SECTION



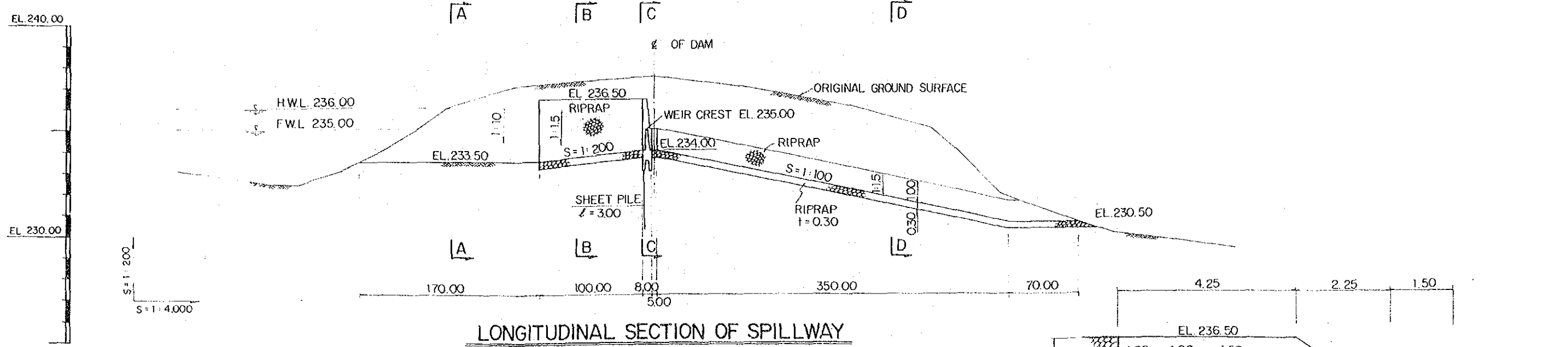
ZONE	MATERIALS
①	IMPERVIOUS MATERIALS (GM.MH) OBTAINED FROM THE BORROW AREA
②	PERVIOUS MATERIALS (ROCK), BASALT OBTAINED FROM QUARRY AND/OR EXCAVATION OF SPILLWAY
RIPRAP	BASALT FROM QUARRY AND SELECTED HARD BASALT EXCAVATED AT SPILLWAY
FILTER	WELL-GRADED MIXTURES OF SAND AND GRAVEL OBTAINED FROM THE MUN RIVER
DRAIN	CRUSHED STONE



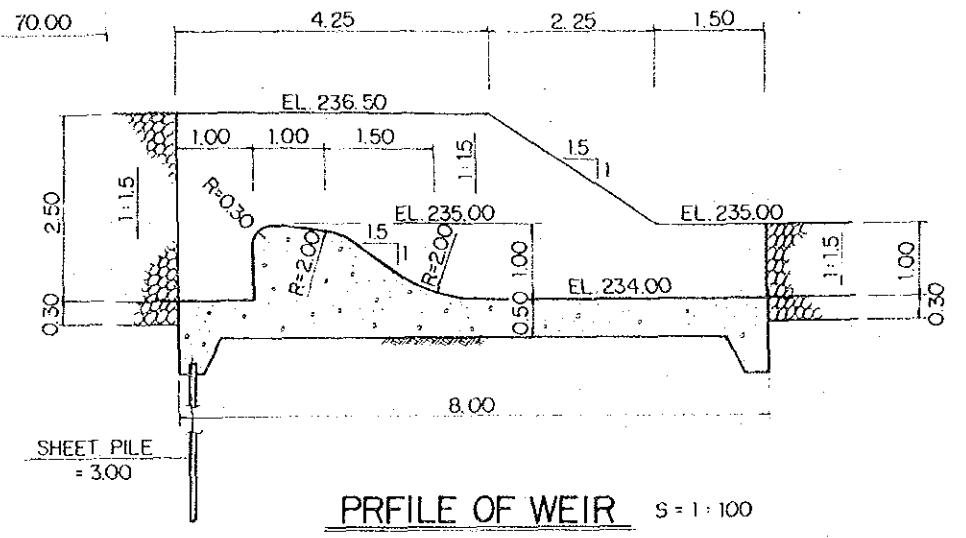
CROSS SECTION



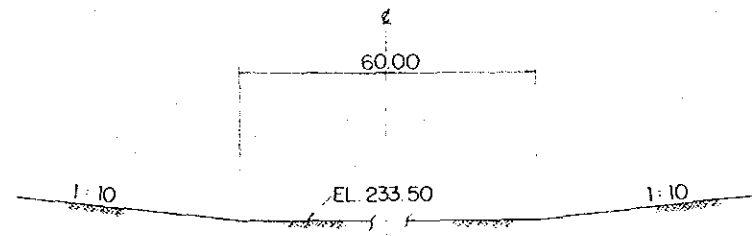
KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT			
LOWER NORTHEAST IRRIGATION PROJECT			
NONG LUM PUK DAM (3/4)			
DATE		DWG	7
JAPAN INTERNATIONAL COOPERATION AGENCY			



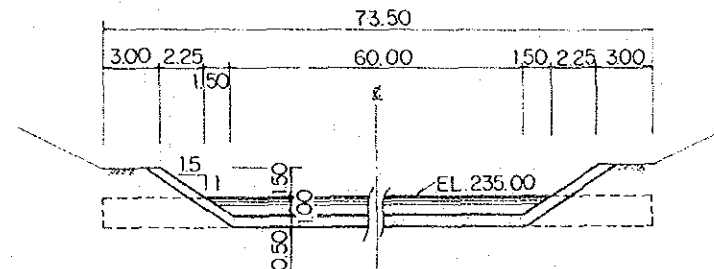
LONGITUDINAL SECTION OF SPILLWAY



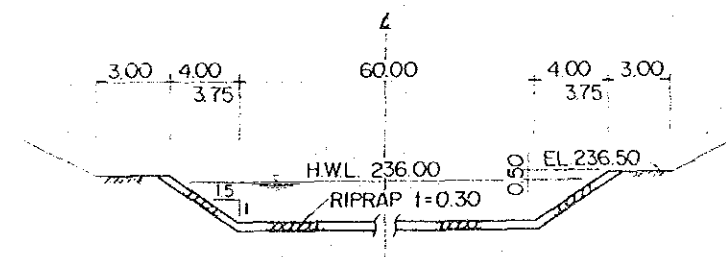
PROFILE OF WEIR S = 1:100



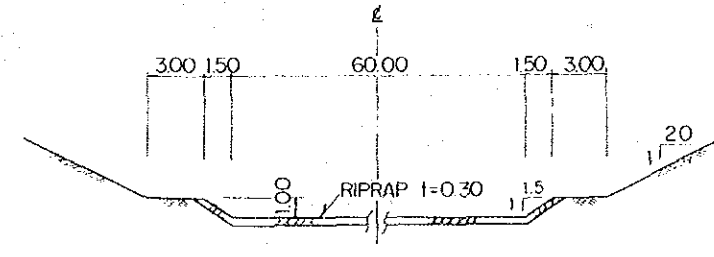
SECTION A-A S = 1:400



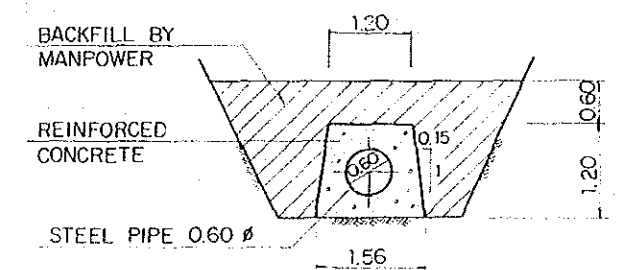
SECTION C-C S = 1:400



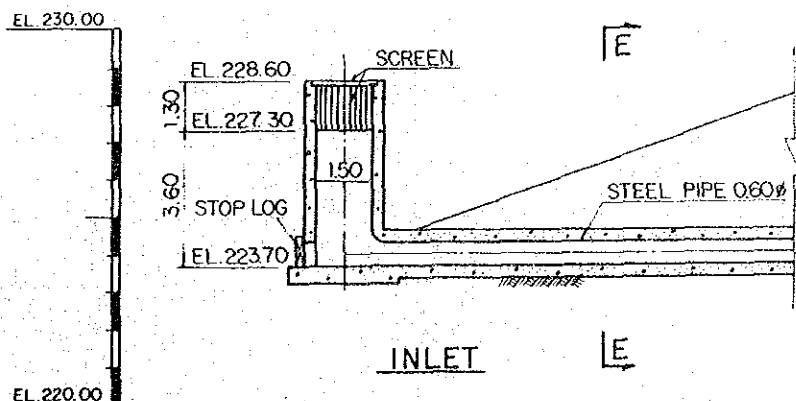
SECTION B-B S = 1:400



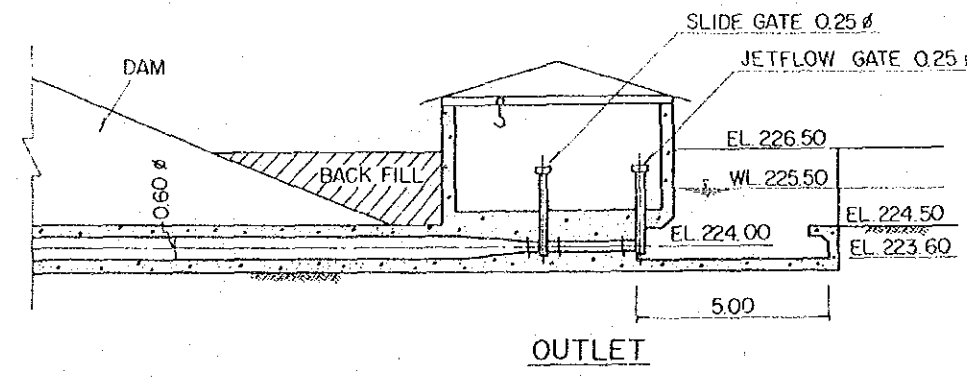
SECTION D-D S = 1:400



SECTION E-E S = 1:100

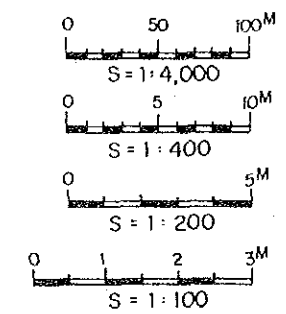


INLET

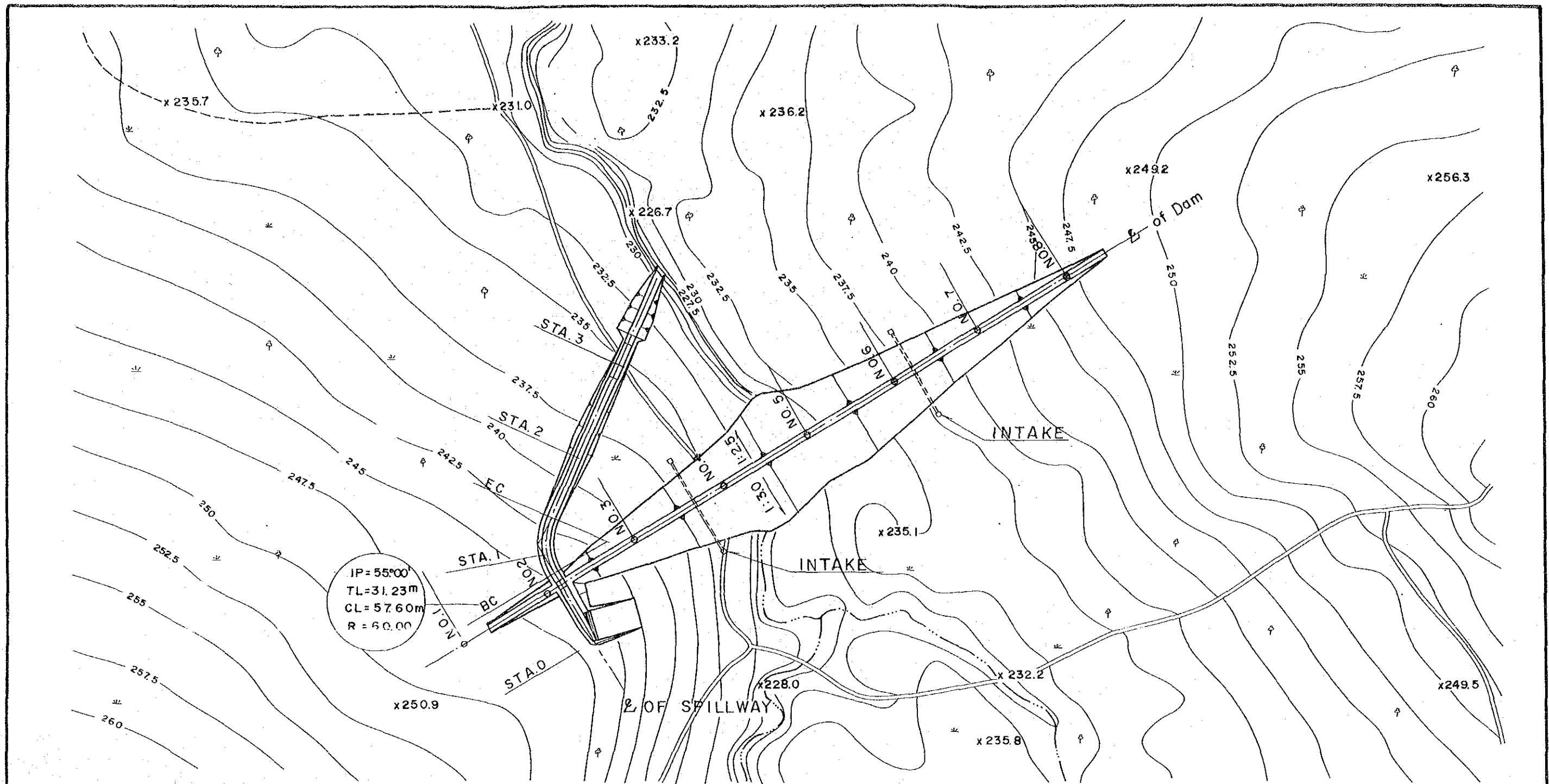


OUTLET

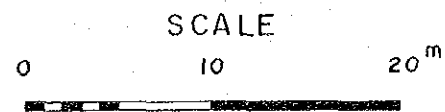
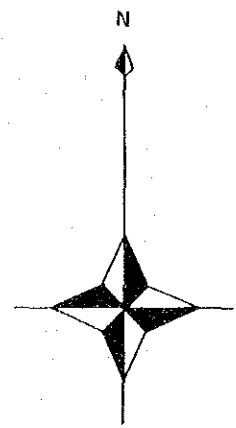
INTAKE FACILITY S = 1:200



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
NONG LUM PUK DAM (4/4)		
DATE	DWG	8
JAPAN INTERNATIONAL COOPERATION AGENCY		

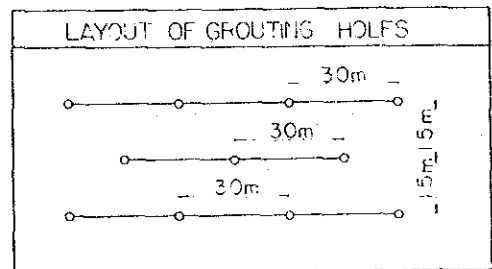
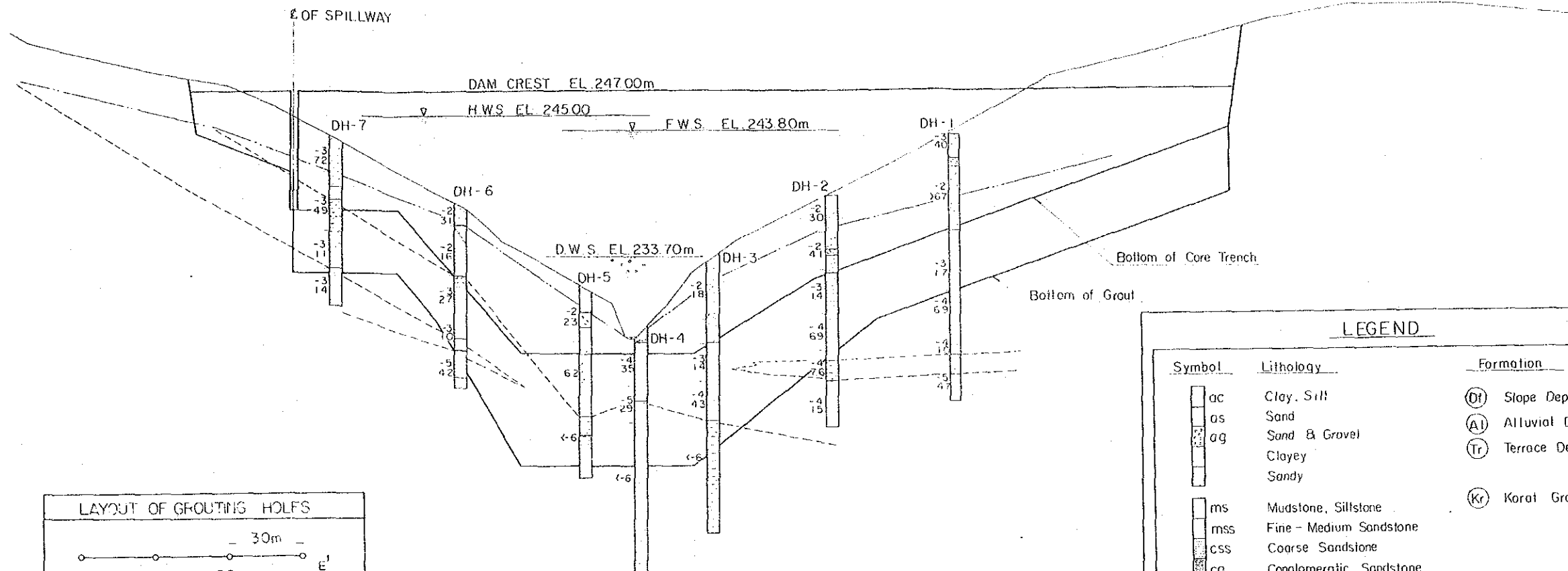


DAM DIMENSION	
Catchment Area	21 km ²
Gross Reservoir Capacity	6.32 MCM
Effective Capacity	6.00 MCM
Sediment Volume	0.32 MCM
High Water Level	245.00 m
Full Water Level	243.80 m
Dead Water Level	233.70 m
Dam Type	Homogeneous Type Fill Dam
Dam Height	20.0 m
Dam Length	844 m
Dam Crest Elevation	247.00 m
Embankment Volume	297,000 m ³
Design Flood	140 m ³ /sec
Spillway Capacity	83 m ³ /sec
Spillway Type	Side Channel
Overflow Depth	1.2 m
Spillway Crest Length	30 m
Intake Capacity	0.91 m ³ /sec



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT			
LOWER NORTHEAST IRRIGATION PROJECT			
HUI PHLU DAM (1/4)			
DATE		DWG	9
JAPAN INTERNATIONAL COOPERATION AGENCY			

EL. 260
 EL. 255
 EL. 250
 EL. 245
 EL. 240
 EL. 235
 EL. 230
 EL. 225
 EL. 220
 EL. 215
 EL. 210



LEGEND

Symbol	Lithology	Formation
ac	Clay, Silt	(Dt) Slope Deposit
as	Sand	(Al) Alluvial Deposit
ag	Sand & Gravel	(Tr) Terrace Deposit
	Clayey	
	Sandy	(Kr) Korat Groupe
ms	Mudstone, Siltstone	
mss	Fine - Medium Sandstone	
css	Coarse Sandstone	
cg	Conglomeratic Sandstone Conglomerate	
	Weathered Rock	

-4 15 - - - - Blows by SPT
 20
 - - - - Permeability 2.0×10^{-4} cm/sec
 - - - - Water Level in Mar to May 1981
 - - - - Boundary of Formation
 - - - - Boundary of Stratum

STATION	DISTANCE (m)	ACCUMULATED DISTANCE (m)	ORIGINAL GROUND ELEVATION (m)	CORE TRENCH ELEVATION (m)	DAM CREST ELEVATION (m)
NO 0	0.00	0.00	250.70		247.00
NO 1	100.00	100.00	248.50	247.00	247.00
+30.00	30.00	130.00	248.00	241.00	247.00
NO 2	70.00	200.00	245.80	237.50	247.00
NO 3	100.00	300.00	240.50	226.00	247.00
NO 4	100.00	400.00	234.20	226.00	247.00
NO 5	100.00	500.00	228.00	226.00	247.00
+40.00	40.00	540.00	232.60	229.60	247.00
NO 6	60.00	600.00	236.30	232.00	247.00
+40.00	40.00	640.00	238.20	234.20	247.00
NO 7	60.00	700.00	241.20	237.80	247.00
NO 8	100.00	800.00	246.50	241.40	247.00
NO 9	100.00	900.00	249.70	247.00	247.00
+74.00	74.00	974.00	254.00		

KINGDOM OF THAILAND
 MINISTRY OF AGRICULTURE AND COOPERATIVES
 ROYAL IRRIGATION DEPARTMENT

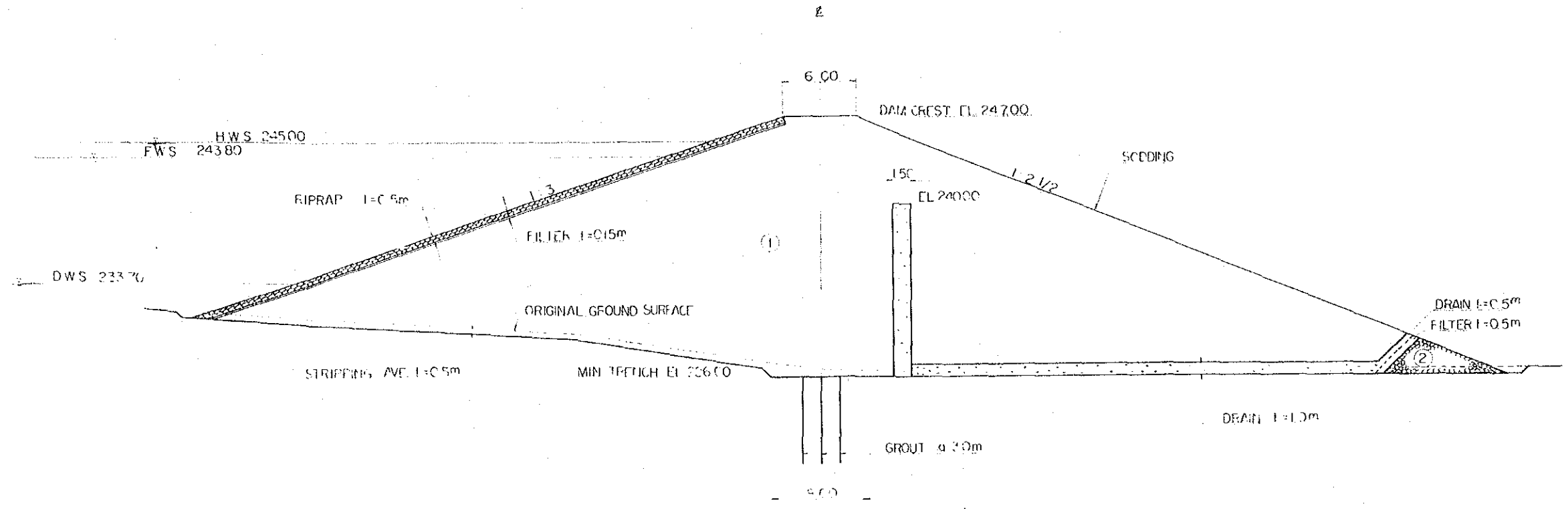
LOWER NORTHEAST IRRIGATION PROJECT

HUAI PHLU DAM (2/4)

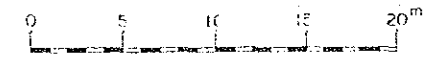
DATE: _____ DWG: 10

JAPAN INTERNATIONAL COOPERATION AGENCY

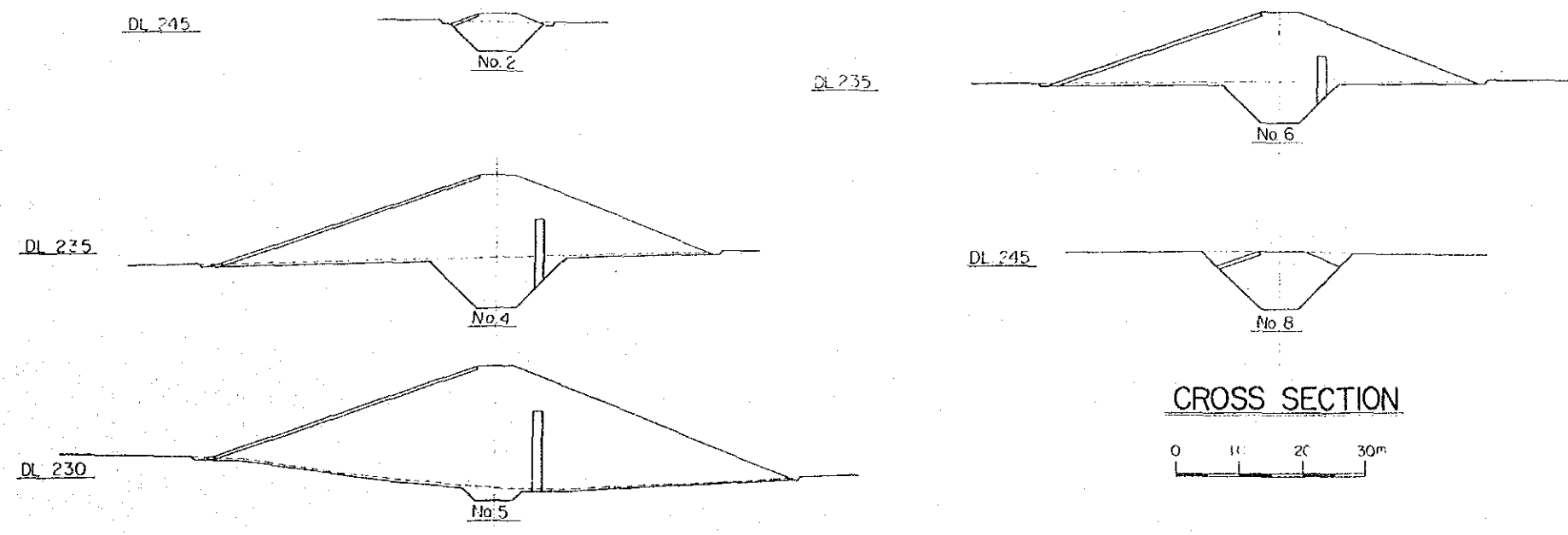
EL 255
 EL 250
 EL 245
 EL 240
 EL 235
 EL 230
 EL 225
 EL 220



TYPICAL CROSS SECTION



ZONE	MATERIALS
①	IMPERVICUS MATERIALS (CL) OBTAINED FROM THE BORROW AREA
②	PERVICUS MATERIALS (PCC) SANDSTONE OBTAINED FROM QUARRY AND/OR EXCAVATION OF SPILLWAY
RIPRAP	SAND STONE FROM QUARRY AND SELECTED HARD SAND STONE EXCAVATED AT SPILLWAY
FILTER	WELL-GRADED MIXTURES OF SAND AND GRAVEL OBTAINED FROM THE MUN RIVER
DRAIN	CRUSHED STONE



CROSS SECTION



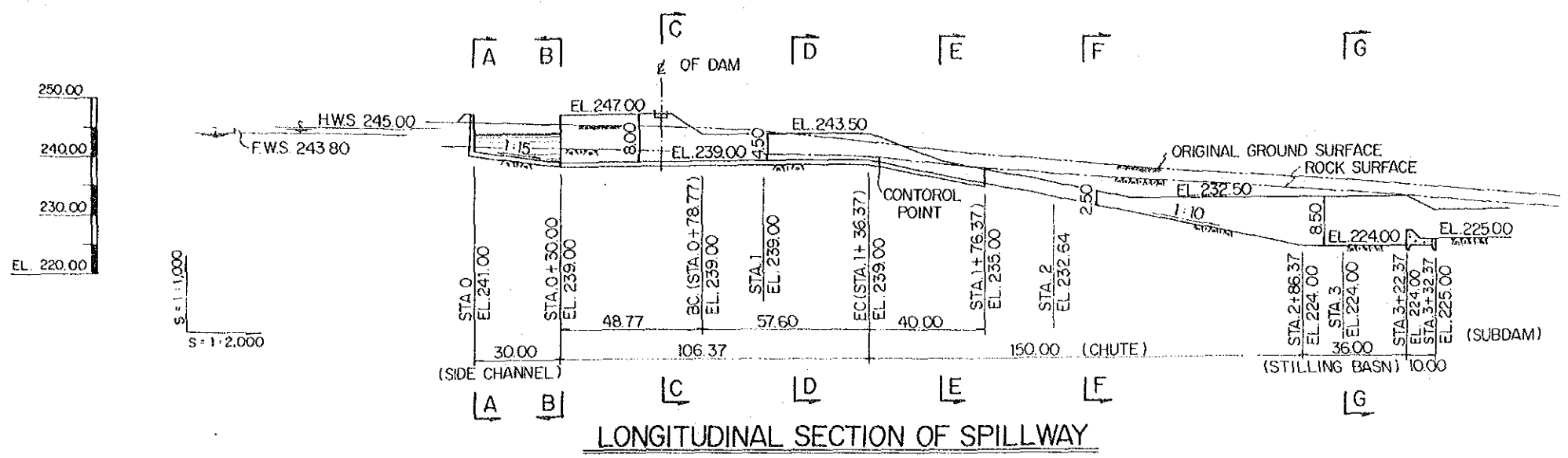
KINGDOM OF THAILAND
 MINISTRY OF AGRICULTURE AND COOPERATIVES
 ROYAL IRRIGATION DEPARTMENT

LOWER NORTHEAST IRRIGATION PROJECT

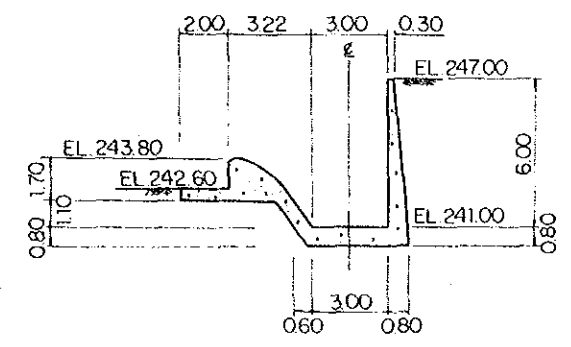
HUAI PHLU DAM (3/4)

DATE: _____ DWG: 11

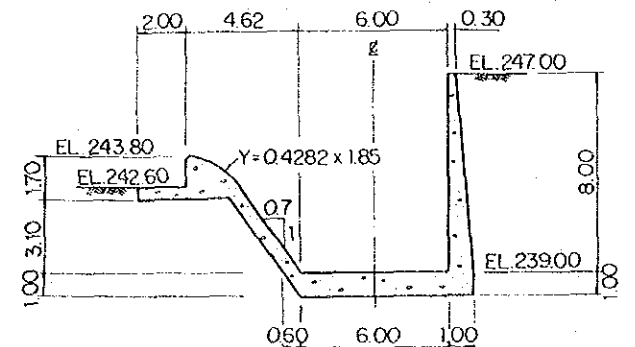
JAPAN INTERNATIONAL COOPERATION AGENCY



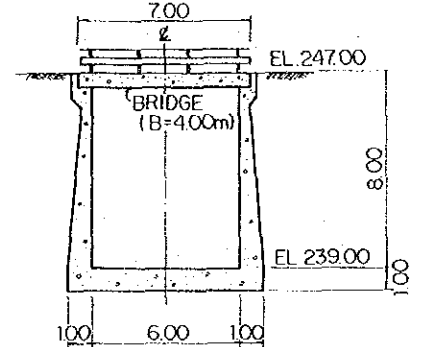
LONGITUDINAL SECTION OF SPILLWAY



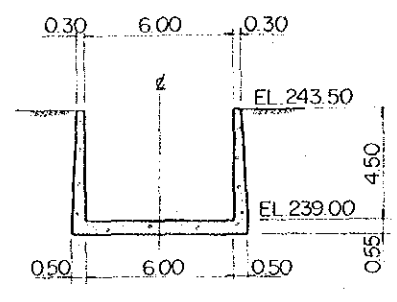
SECTION A-A S=1:300



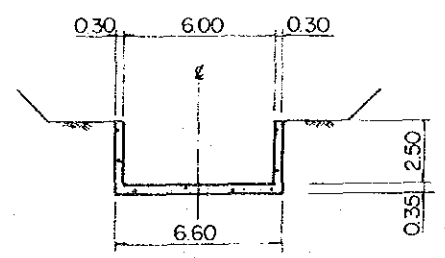
SECTION B-B S=1:300



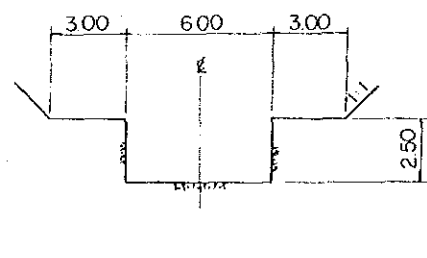
SECTION C-C S=1:300



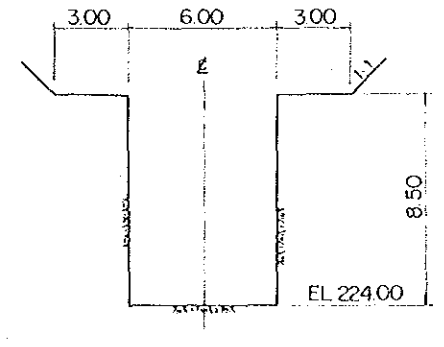
SECTION D-D S=1:300



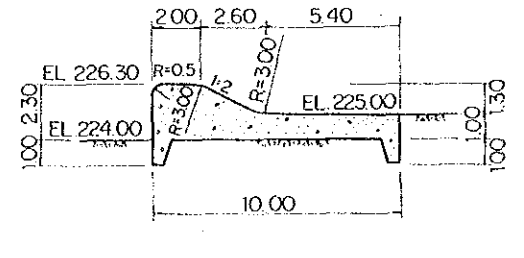
SECTION E-E S=1:300



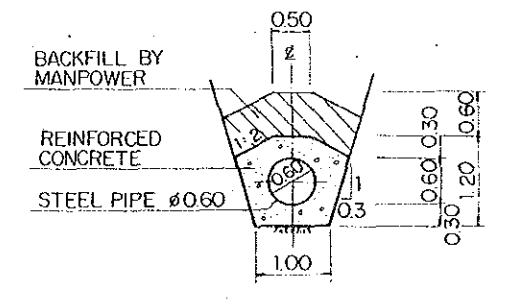
SECTION F-F S=1:300



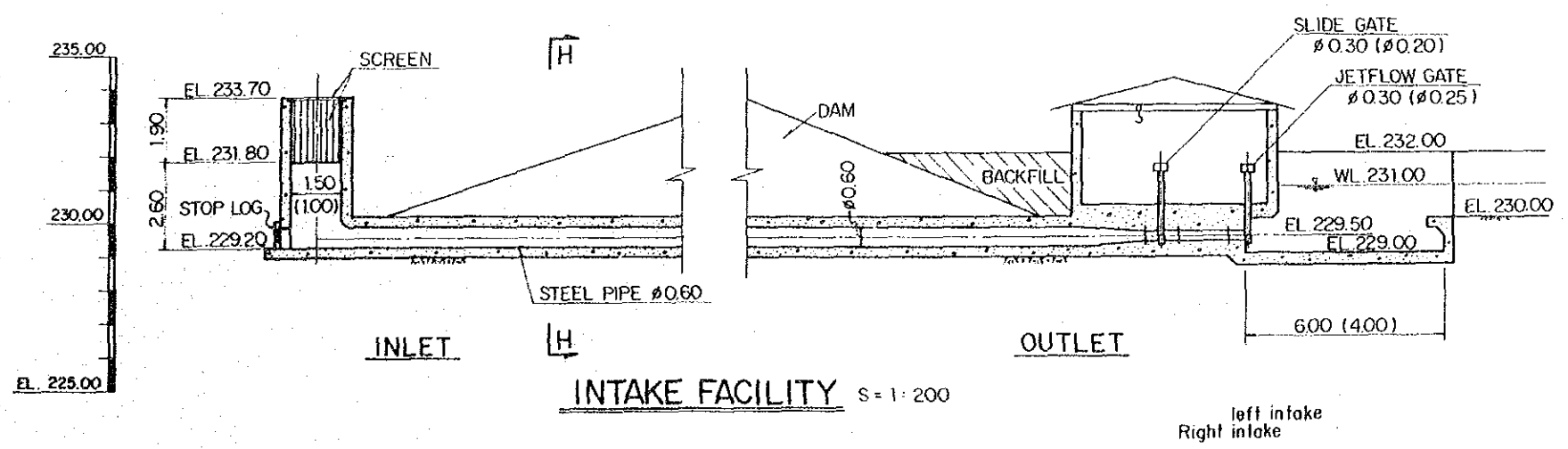
SECTION G-G S=1:300



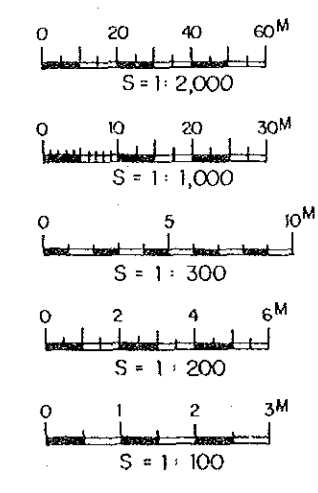
PROFILE OF SUBDAM S=1:300



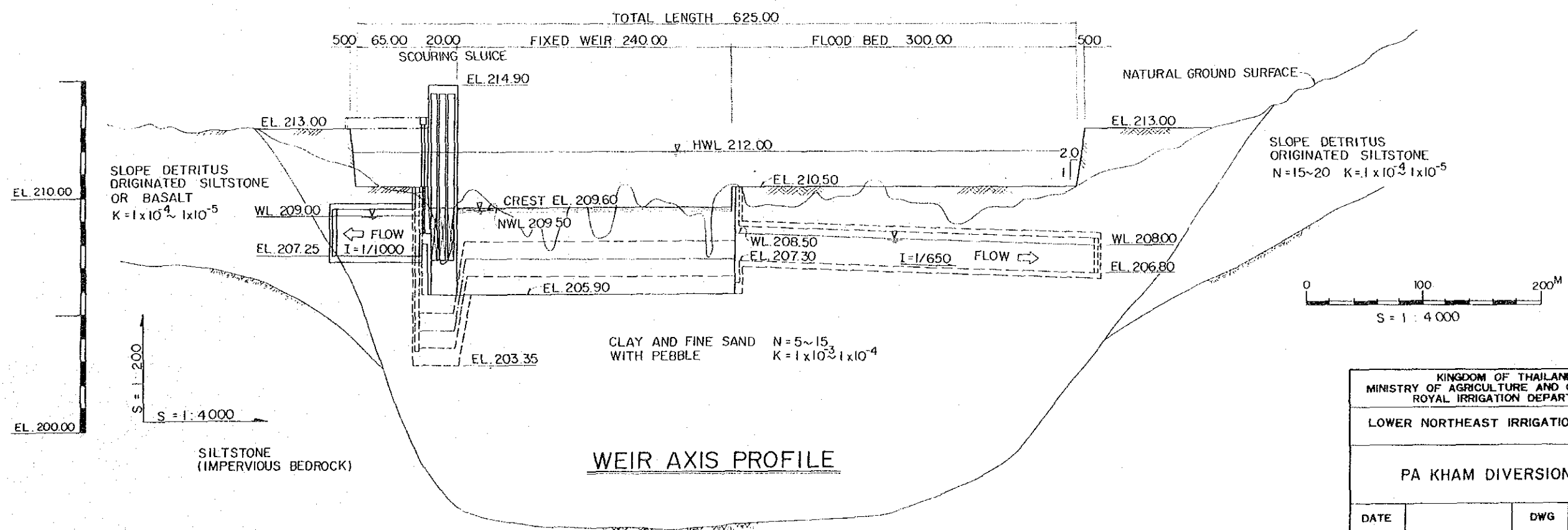
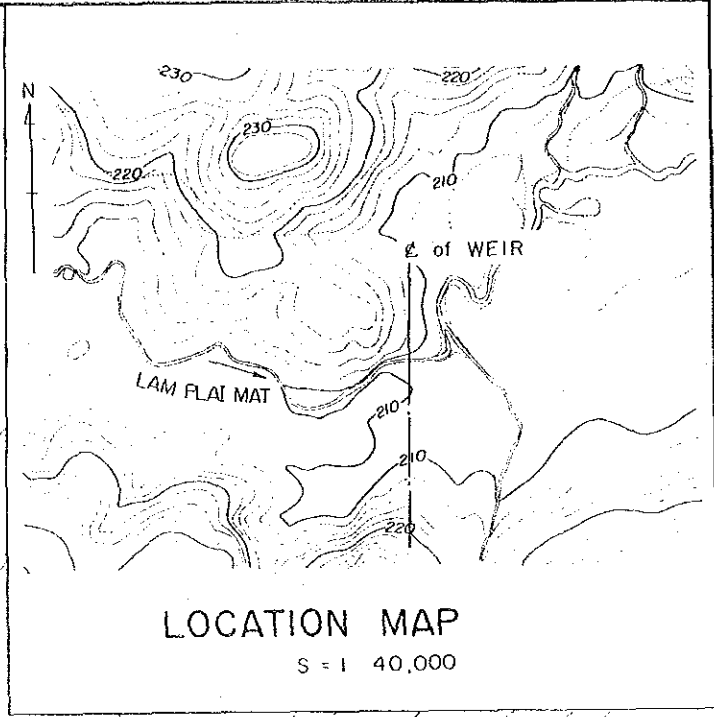
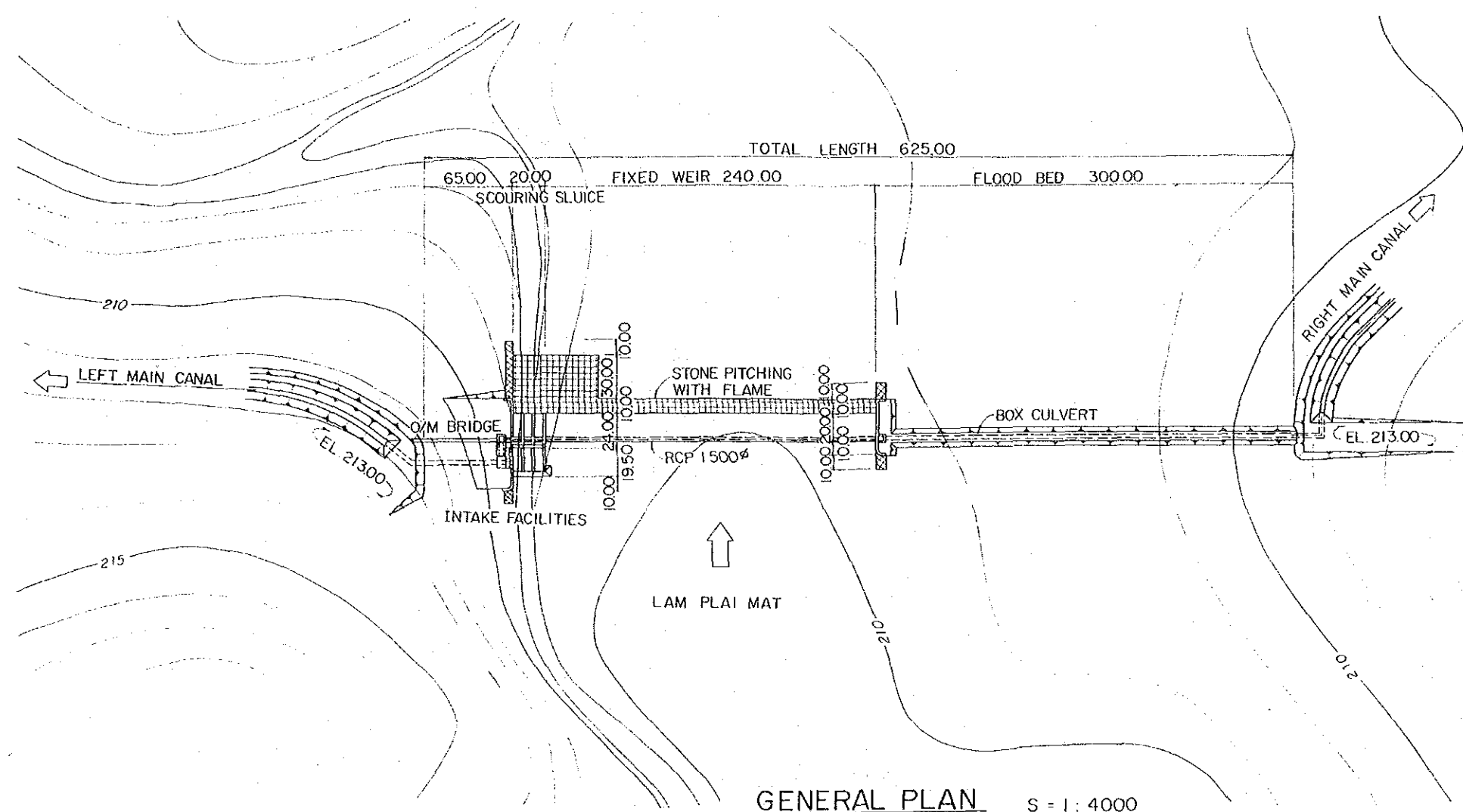
SECTION H-H S=1:100



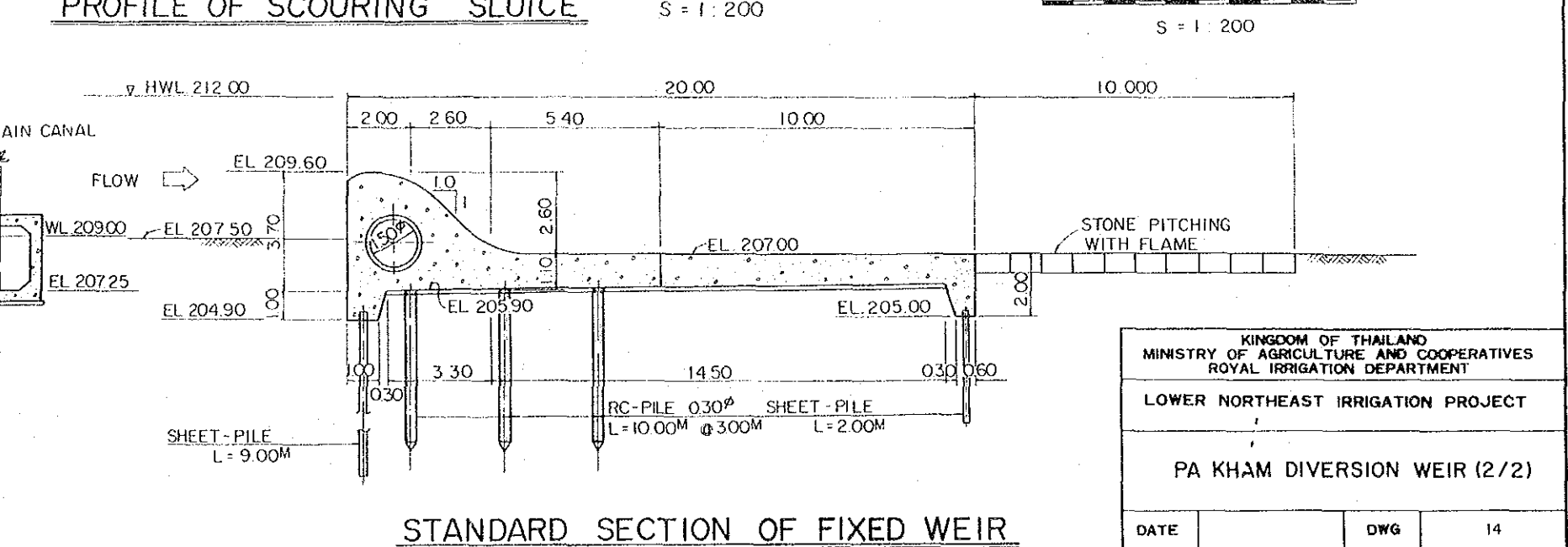
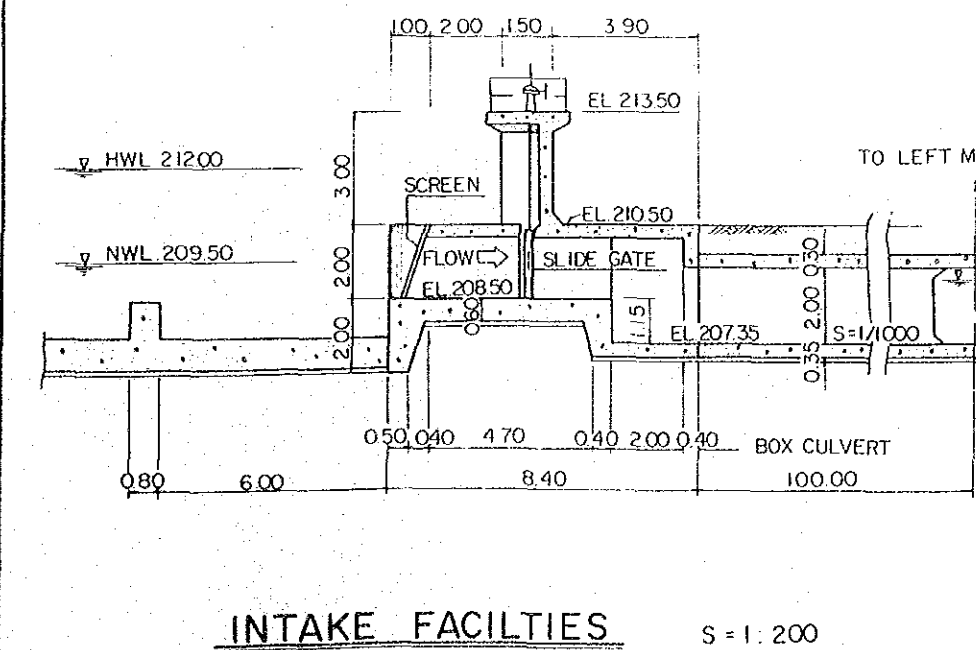
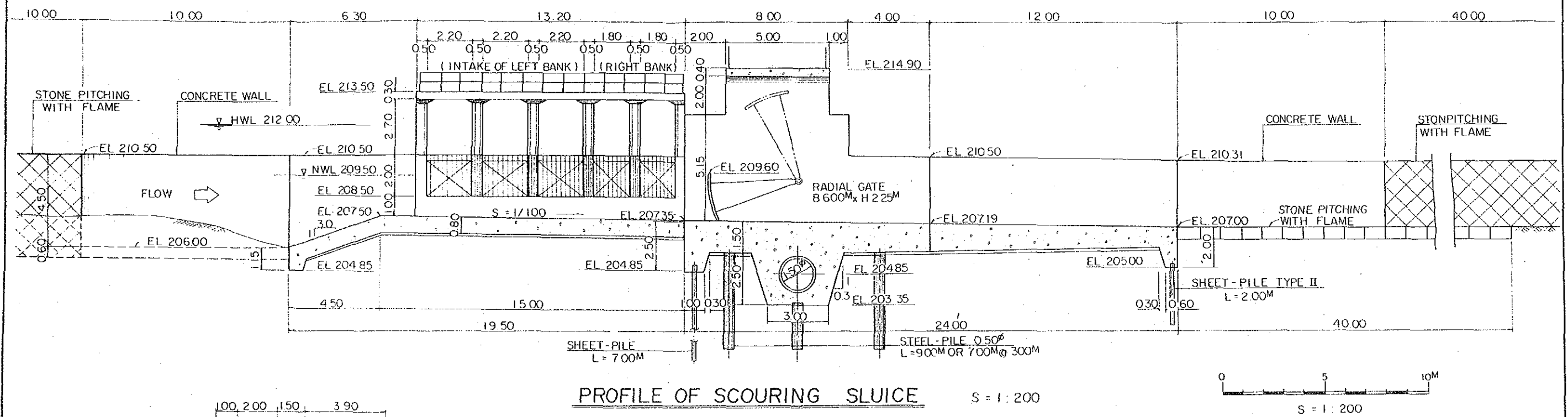
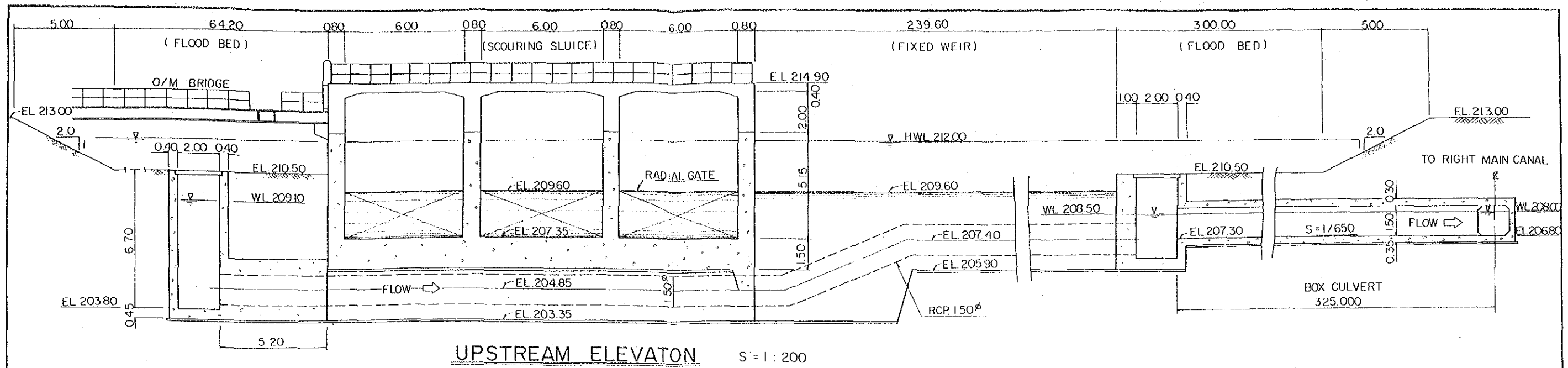
INTAKE FACILITY S=1:200



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
HUAI PHLU DAM (4/4)		
DATE	DWG	12
JAPAN INTERNATIONAL COOPERATION AGENCY		



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
PA KHAM DIVERSION WEIR (1/2)		
DATE	DWG	13
JAPAN INTERNATIONAL COOPERATION AGENCY		



KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
PA KHAM DIVERSION WEIR (2/2)		
DATE	DWG	14
JAPAN INTERNATIONAL COOPERATION AGENCY		

Soeng Song Main Canal
 Q = 1.31 m³/sec
 L = 12.3 km
 A = 1010 ha

Nong Lum Phuk Main Canal
 Q = 0.39 m³/sec
 L = 10.2 km
 A = 300 ha

Nong Lum Phuk Dam

Sra Ta Khian Main Canal
 Q = 1.22 m³/sec
 L = 25.8 km
 A = 940 ha








Lam Plai Mat Dam

Thaj choraen Main Canal
 Q = 6.69 m³/sec
 L = 26.4 km
 A = 5150 ha

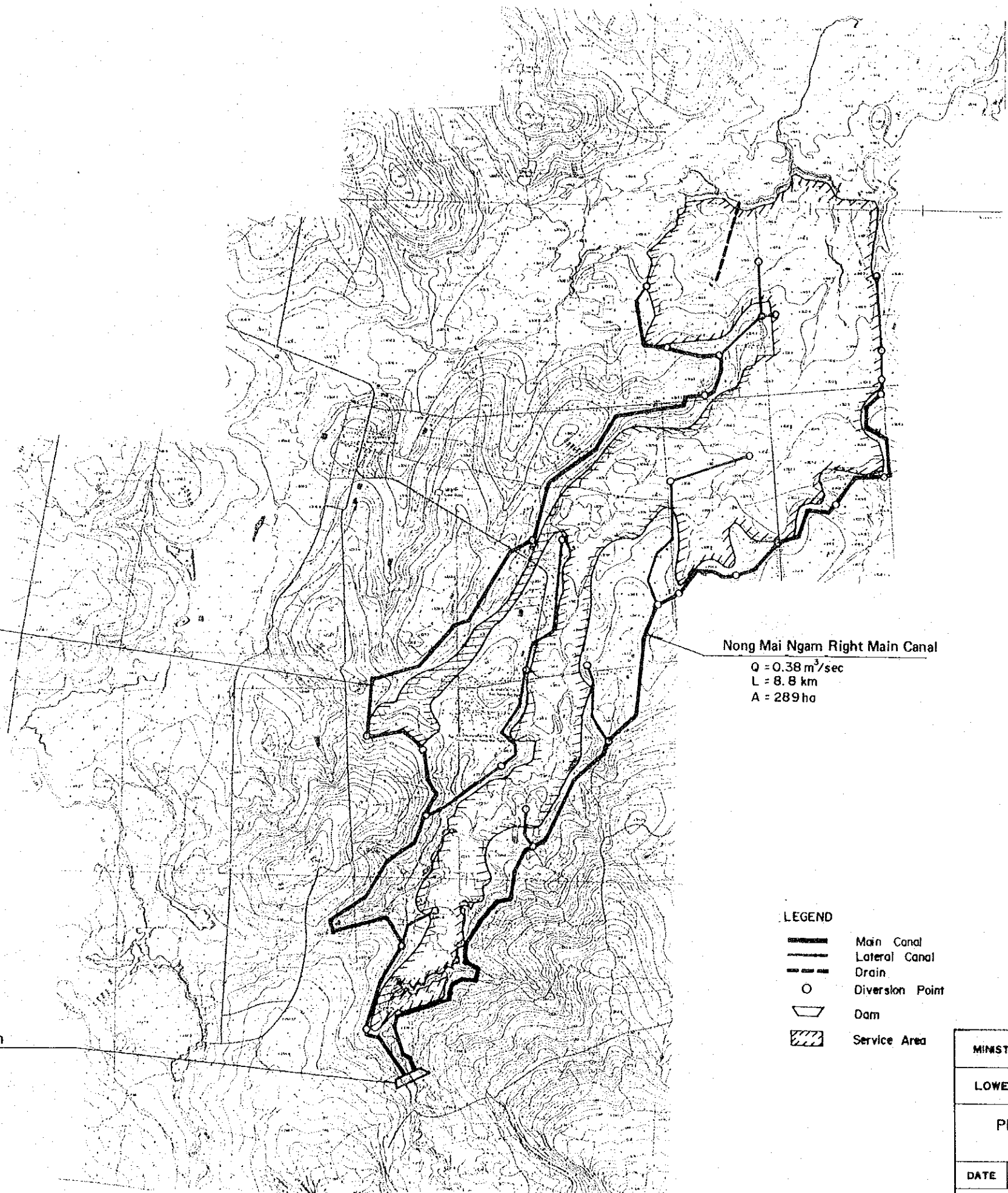
Pa Kham Diversion Weir

Pa Kham Main Canal
 Q = 2.60 m³/sec
 L = 30.4 km
 A = 2000 ha

LEGEND

-  Main Canal
-  Lateral Canal
-  Drain
-  Diversion Point
-  Diversion Weir
-  Dam
-  Service Area

KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
PROPOSED IRRIGATION SYSTEM -- LAM PLAI MAT & NONG LUM PHUK --		
DATE	DWG	15
JAPAN INTERNATIONAL COOPERATION AGENCY		



Nong Mai Ngam Left Main Canal
 $Q = 0.53 \text{ m}^3/\text{sec}$
 $L = 11.0 \text{ km}$
 $A = 411 \text{ ha}$

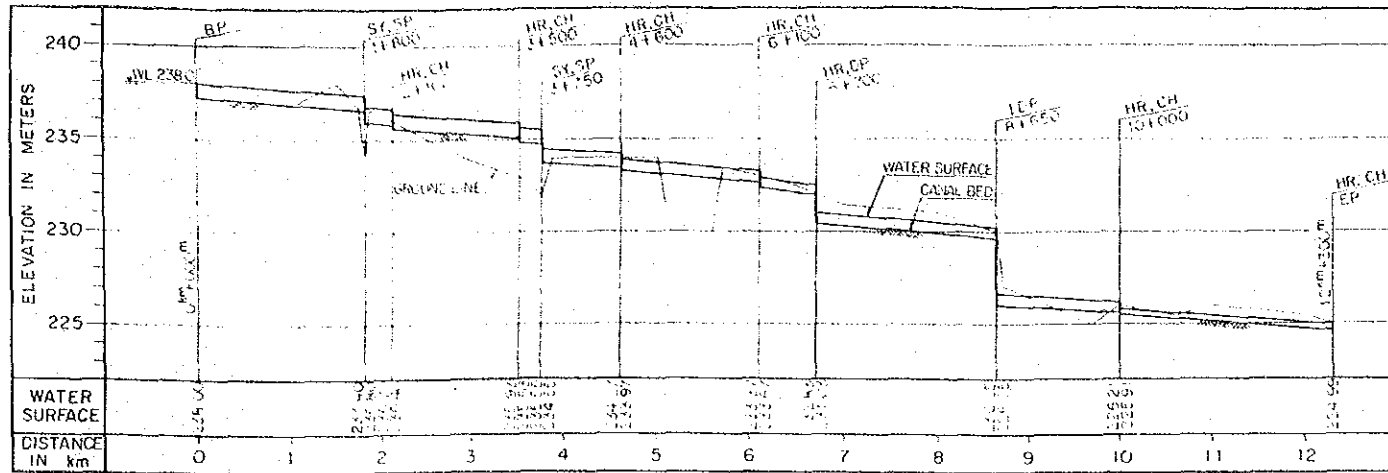
Nong Mai Ngam Right Main Canal
 $Q = 0.38 \text{ m}^3/\text{sec}$
 $L = 8.8 \text{ km}$
 $A = 289 \text{ ha}$

Huai Phlu Dam

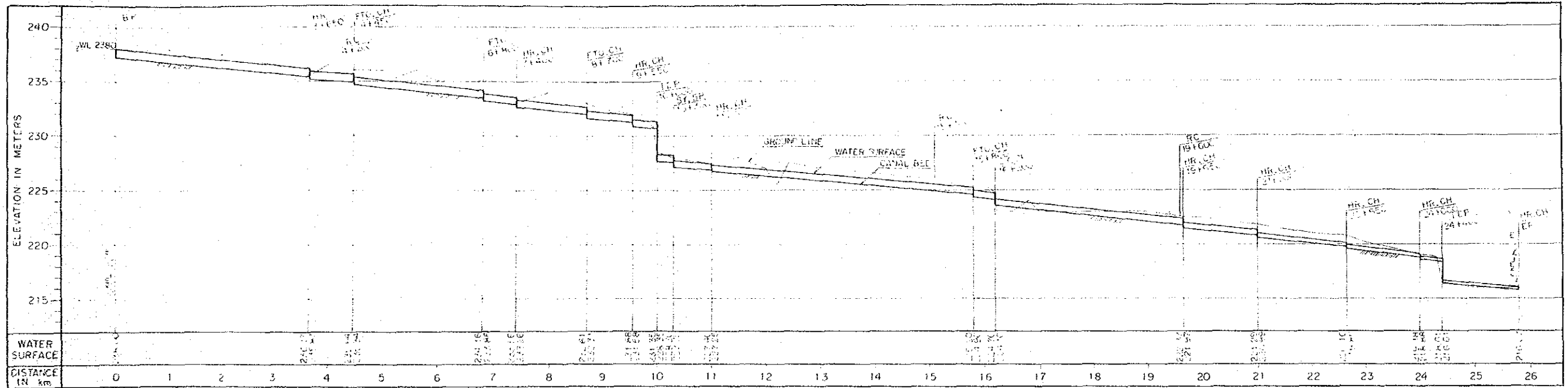
- LEGEND
- Main Canal
 - Lateral Canal
 - Drain
 - Diversion Point
 - Dam
 - Service Area

KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT		
LOWER NORTHEAST IRRIGATION PROJECT		
PROPOSED IRRIGATION SYSTEM - HUAI PHLU -		
DATE	DWG	16
JAPAN INTERNATIONAL COOPERATION AGENCY		

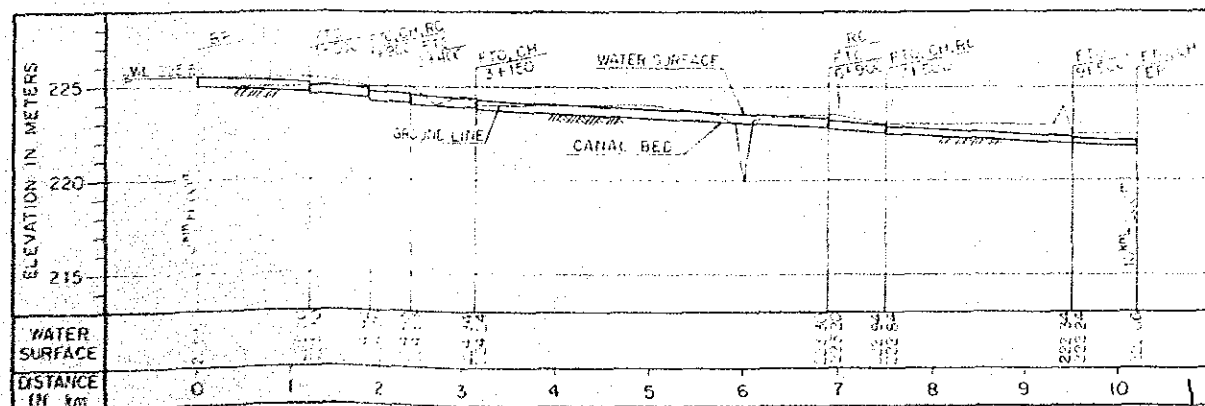
SOENG SANG MAIN CANAL



SRA TA KHIAN MAIN CANAL



NONG LUM PUK MAIN CANAL



- LEGEND
- HR Head Regulator
 - FTO Form Turnout
 - CH Check Structure
 - IDP Inclined Drop
 - RC Crossing Structure
 - SY Syphon
 - SP Spill way

 - BP Beginning point
 - EP End point

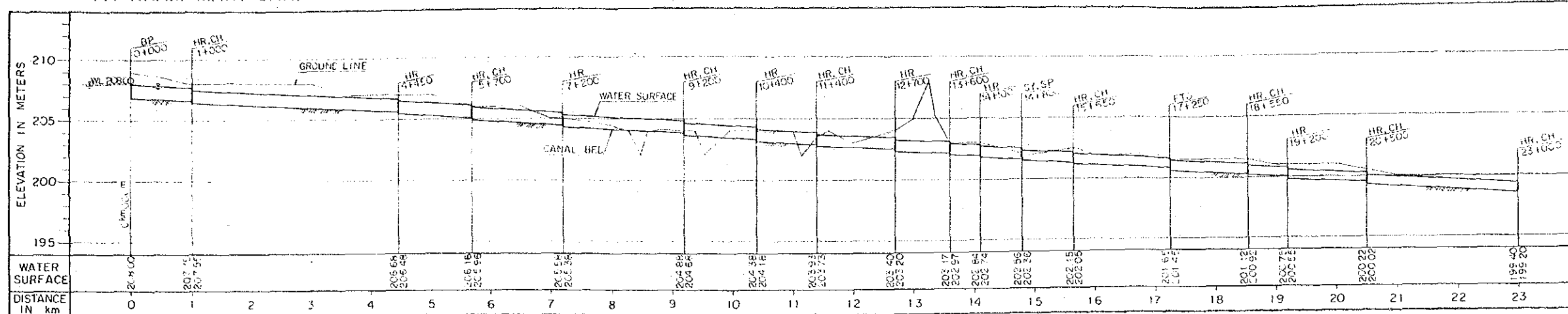
KINGDOM OF THAILAND
MINISTRY OF AGRICULTURE AND COOPERATIVES
ROYAL IRRIGATION DEPARTMENT

LOWER NORTHEAST IRRIGATION PROJECT

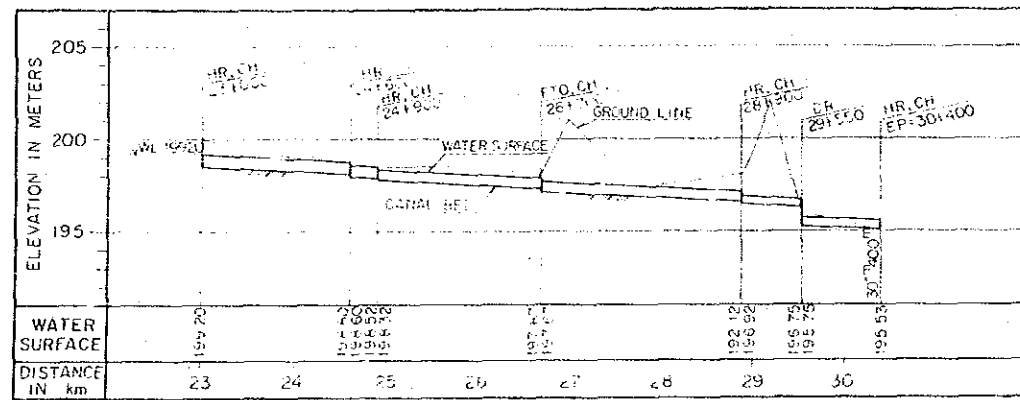
CANAL PROFILE
- SSMC, STMC, NLMC -

DATE	DWG	17
JAPAN INTERNATIONAL COOPERATION AGENCY		

PA KHAM MAIN CANAL (1)



PA KHAM MAIN CANAL (2)



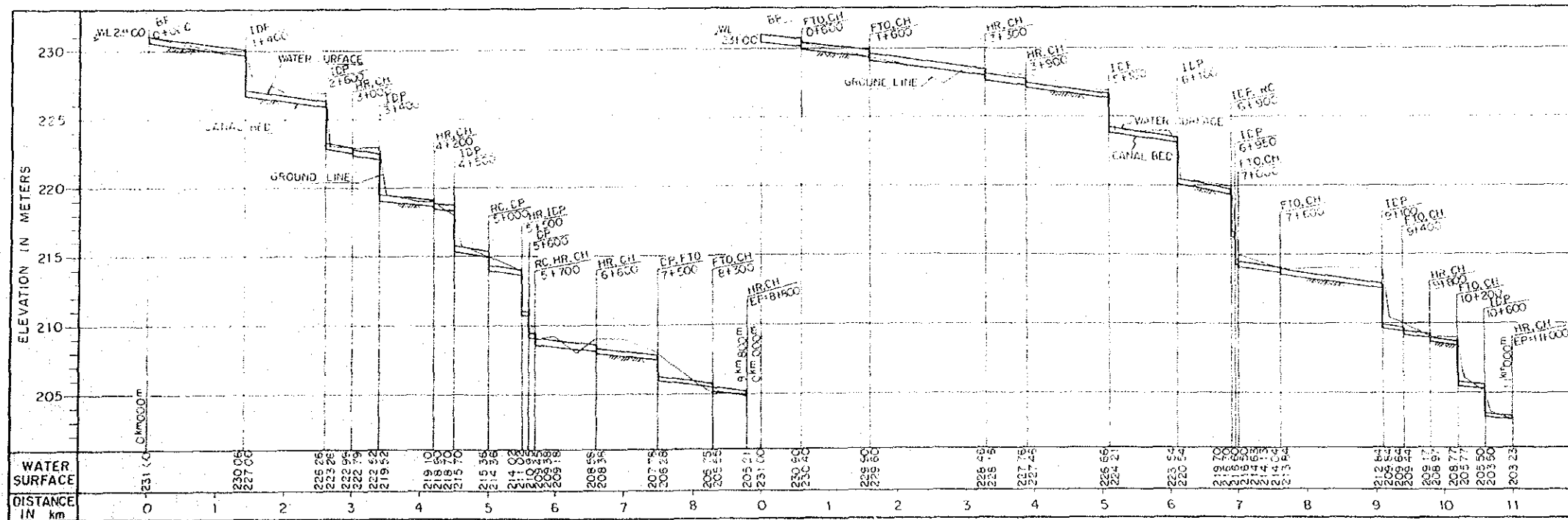
LEGEND

- HR : Head Regulator
- FTO : Farm Turnout
- CH : Check Structure
- DR : Vertical Drop
- IDP : Inclined Drop
- RC : Crossing Structure
- SY : Syphon
- SP : Spill way

- BP : Beginning point
- EP : End point

HUAI PHLU RIGHT MAIN CANAL

HUAI PHLU LEFT MAIN CANAL



KINGDOM OF THAILAND
MINISTRY OF AGRICULTURE AND COOPERATIVES
ROYAL IRRIGATION DEPARTMENT

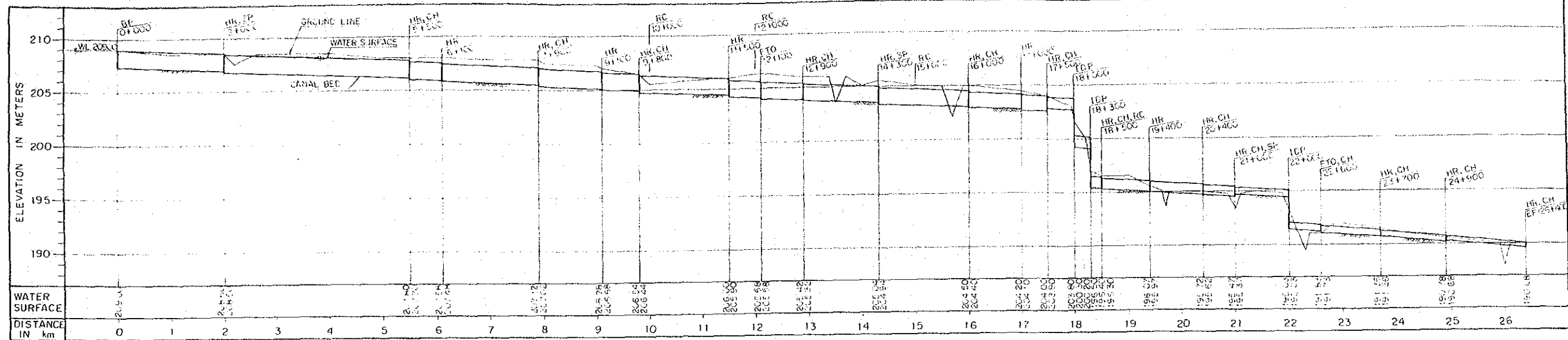
LOWER NORTHEAST IRRIGATION PROJECT

CANAL PROFILE
- PKMC, HPLMC, HPRMC -

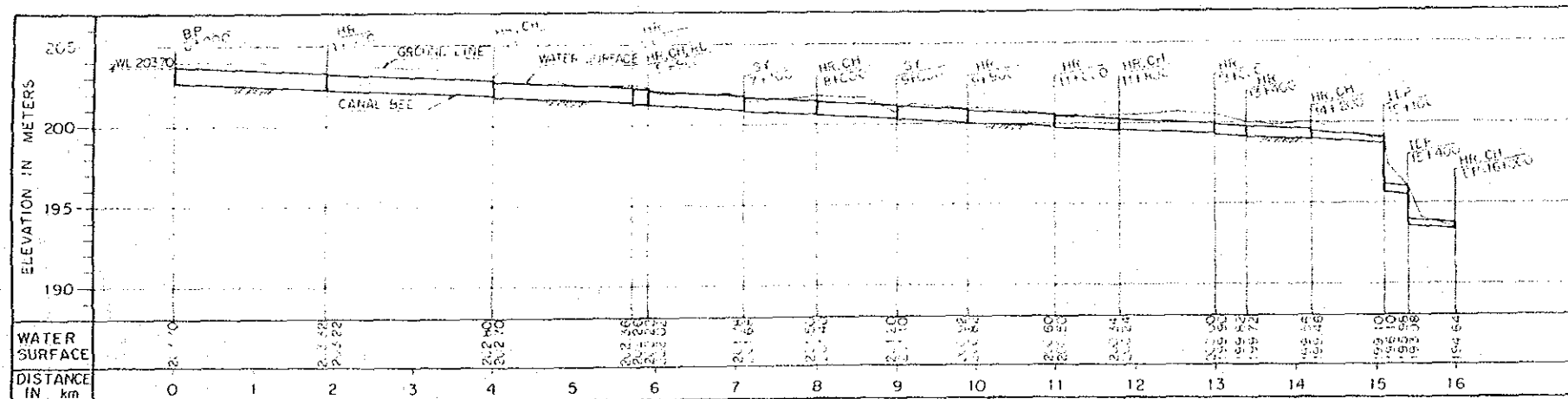
DATE	DWG	18
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JAPAN INTERNATIONAL COOPERATION AGENCY

THAI CHAROEN MAIN CANAL



THAI CHAROEN LATERAL CANAL

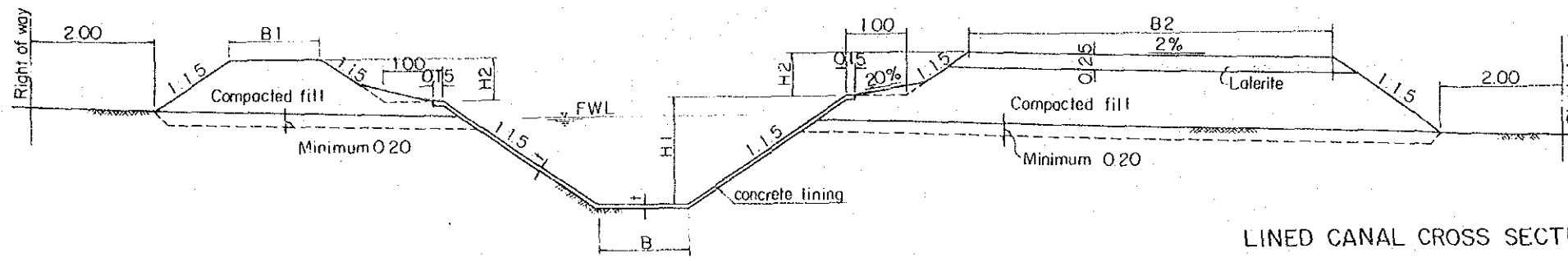


LEGEND

- HR : Head Regulator
- FTO : Form Turnout
- CH : Check Structure
- IDP : Inclined Drop
- RC : Crossing Structure
- SP : Spill way
- SY : Syphon

- BP : Beginning Point
- EP : End point

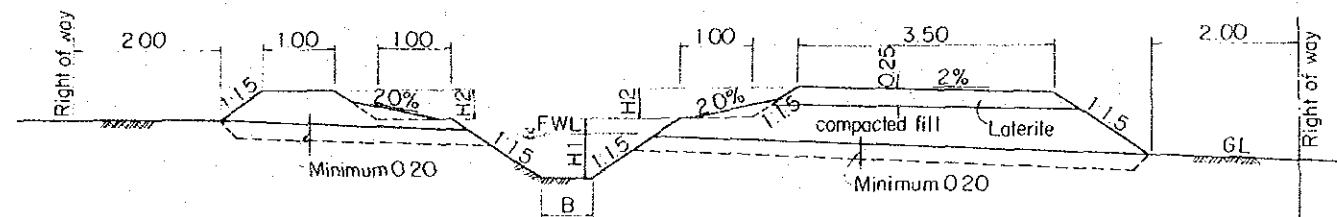
KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT			
LOWER NORTHEAST IRRIGATION PROJECT			
CANAL PROFILE - TCMC -			
DATE		DWG	19
JAPAN INTERNATIONAL COOPERATION AGENCY			



LINED CANAL

LINED CANAL CROSS SECTION DETAILS

TYPE	Q m ³ /sec	B _m	B1 _m	B2 _m	H1 _m	H2 _m	l _{cm}
L 1	6.63~6.37	1.80	1.50	6.00	2.00	0.80	7
L 2	6.04~5.69	1.70	1.50	6.00	1.95	0.75	7
L 3	5.59~5.02	1.60	1.50	6.00	1.90	0.75	7
L 4	4.49~4.37	1.50	1.50	6.00	1.75	0.70	6
L 5	2.60~2.55	1.20	1.50	6.00	1.40	0.60	6
L 6	2.24~1.74	1.10	1.00	3.50	1.30	0.60	5
L 7	1.89~1.46	1.00	1.00	3.50	1.25	0.55	5
L 8	1.30~1.00	0.90	1.00	3.50	1.10	0.50	5
L 9	1.22~0.66	0.80	1.00	3.50	1.05	0.50	5
L10	0.80~0.52	0.70	1.00	3.50	0.85	0.45	5
L11	0.60~0.32	0.60	1.00	3.50	0.80	0.45	5
L12	0.46~0.06	0.50	1.00	3.50	0.65	0.40	5

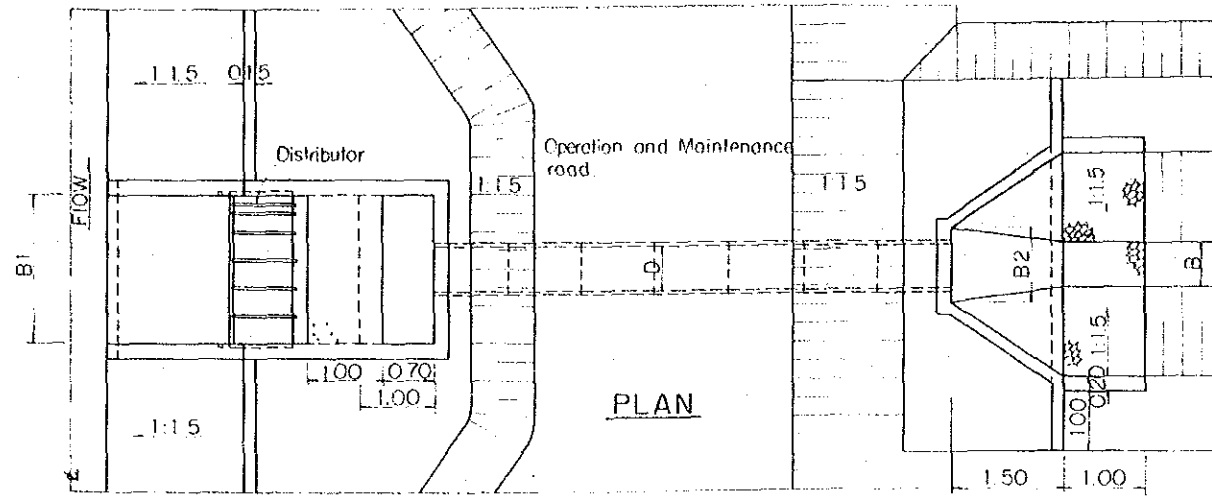


UNLINED CANAL

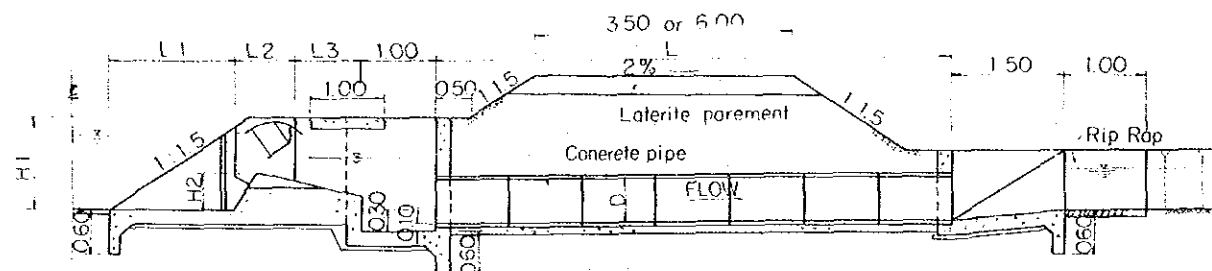
UNLINED CANAL CROSS SECTION DETAILS

TYPE	Q m ³ /sec	B _m	H1 _m	H2 _m
E 1	0.01~0.05	0.30	0.45	0.35
E 2	0.05~0.10	0.40	0.55	0.35
E 3	0.10~0.20	0.50	0.65	0.35
E 4	0.20~0.30	0.60	0.75	0.40
E 5	0.30~0.40	0.70	0.80	0.40
E 6	0.40~0.50	0.70	0.85	0.40

KINGDOM OF THAILAND MINISTRY OF AGRICULTURE AND COOPERATIVES ROYAL IRRIGATION DEPARTMENT			
LOWER NORTHEAST IRRIGATION PROJECT			
TYPICAL CANAL SECTION			
DATE		DWG	20
JAPAN INTERNATIONAL COOPERATION AGENCY			



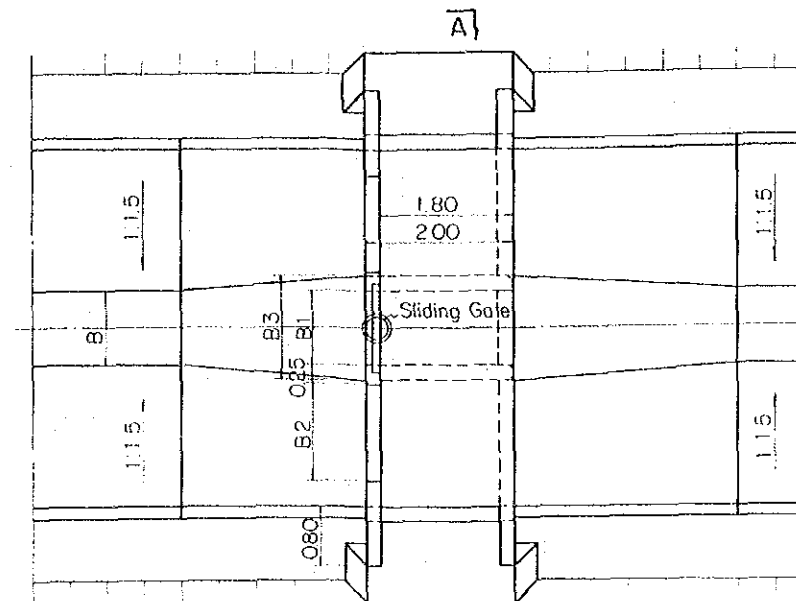
PLAN



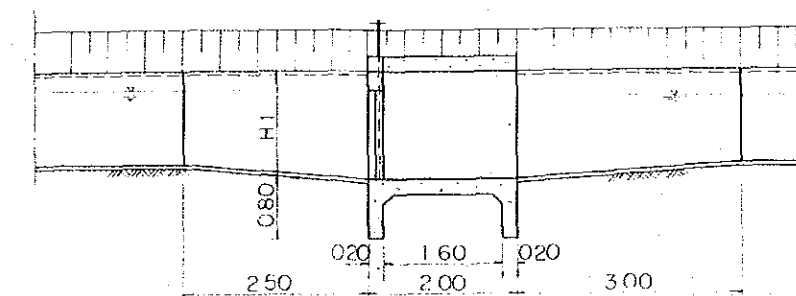
PROFILE

HEAD REGULATOR

Not to scale



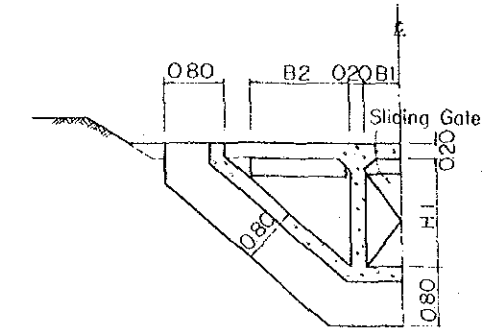
PLAN



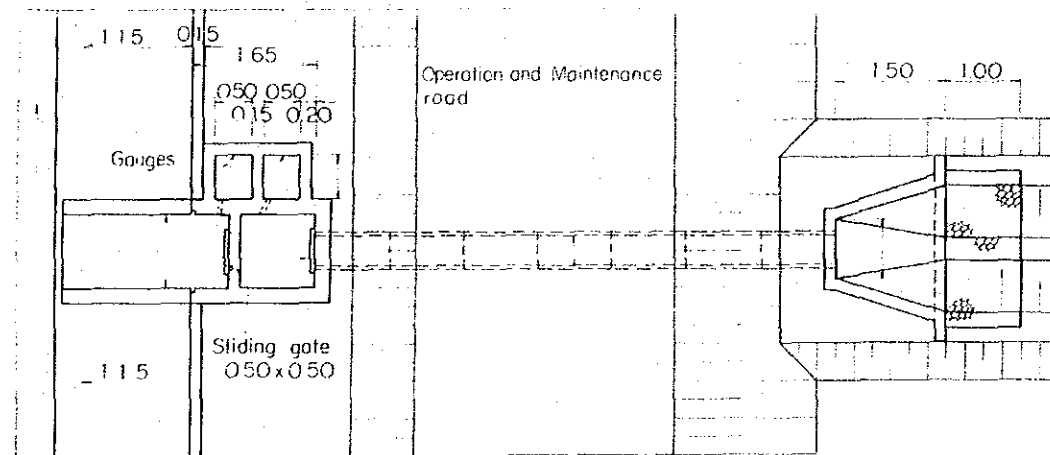
PROFILE

CHECK STRUCTURE

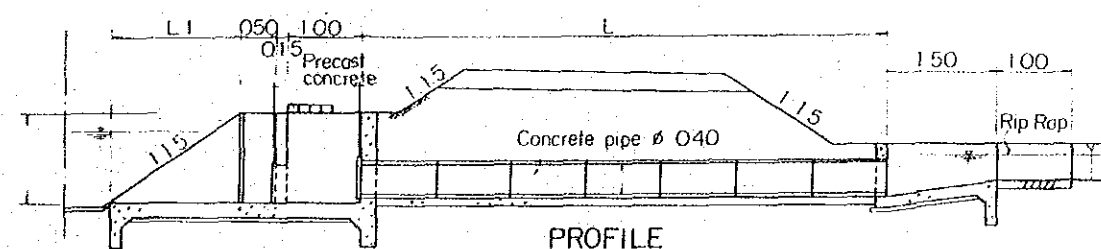
Not to scale



SECTION "A"



PLAN



PROFILE

FARM TURNOUT

Not to scale

TABLE OF DIMENSIONS FOR HEAD REGULATOR

TYPE	Q Max (CMS)	B1 _m	B2 _m	D _m	Nos of Pipe Barrels	H1 _m	H2 _m	L1 _m	L2 _m	L3 _m
HR1	Less than 0.15	0.80	0.90	0.50	1	1.10	0.40	1.65	0.30	0.50
HR2	0.15 ~ 0.30	1.60	0.90	0.50	1	1.30	0.50	1.95	0.40	0.60
HR3	0.30 ~ 0.50	2.00	1.00	0.60	1	1.30	0.50	1.95	0.80	1.00
HR4	0.50 ~ 1.00	2.00	1.80	0.60	2	1.30	0.50	1.95	0.80	1.00
HR5	1.00 ~ 1.50	3.00	2.40	0.80	2	1.40	0.60	2.10	0.80	1.00
HR6	1.50 ~ 3.00	3.00	2.80	1.00	2	1.75	0.65	2.63	1.25	1.50

TABLE OF DIMENSIONS FOR FARM TURNOUT

TYPE	H1 _m	L1 _m
F-1	0.80	1.20
F-2	1.20	1.80
F-3	1.60	2.40
F-4	2.00	3.00

TABLE OF DIMENSIONS FOR CHECK STRUC

TYPE	Q Max (CMS)	B1 _m	B2 _m	B3 _m	H1 _m	Nos of Gate
C-1	Less than 0.60	0.60	1.00	1.00	1.00	1
C-2	0.6 ~ 1.3	1.00	1.30	1.40	1.40	1
C-3	1.3 ~ 2.6	1.50	1.50	1.90	1.80	1
C-4	2.6 ~ 4.5	2.50	1.70	2.90	2.00	2
C-5	4.5 ~ 6.6	3.20	2.00	3.60	2.20	2

KINGDOM OF THAILAND
MINISTRY OF AGRICULTURE AND COOPERATIVES
ROYAL IRRIGATION DEPARTMENT

LOWER NORTHEAST IRRIGATION PROJECT

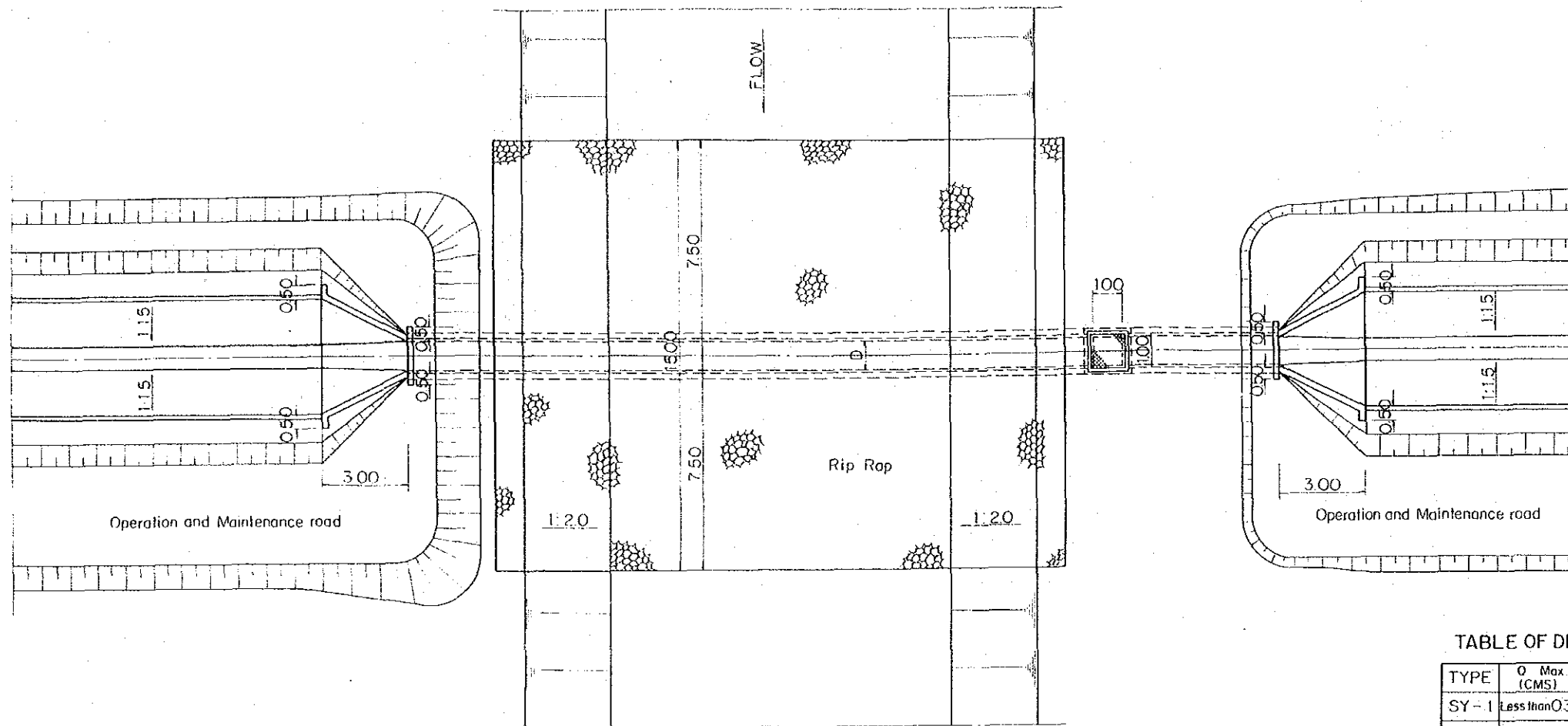
CANAL RELATED STRUCTURES (I/4)

DATE	DWG	21
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JAPAN INTERNATIONAL COOPERATION AGENCY

SYPHON

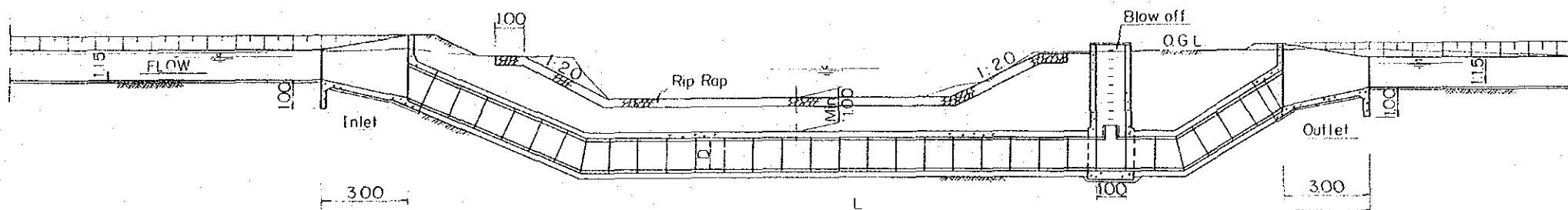
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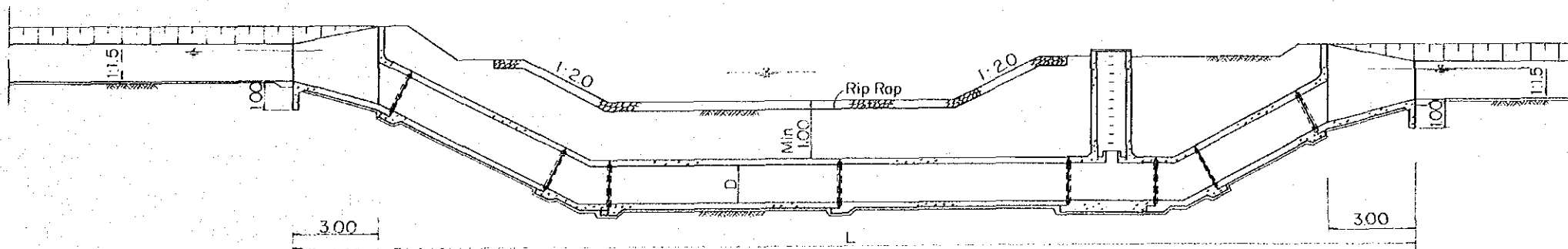
PLAN

TABLE OF DIMENSIONS FOR SYPHON

TYPE	D Max (CMS)	TYPE OF BARREL	D m
SY-1	Less than 0.30	Pre-Cast concrete pipe	0.60
SY-2	0.30-0.50	"	0.80
SY-3	0.50-0.80	"	1.00
SY-4	0.80-1.20	Cast-in-place concrete	1.10
SY-5	1.20-1.70	"	1.30



PROFILE (in case of pre-cast concrete pipe)



PROFILE (in case of cast in place concrete)

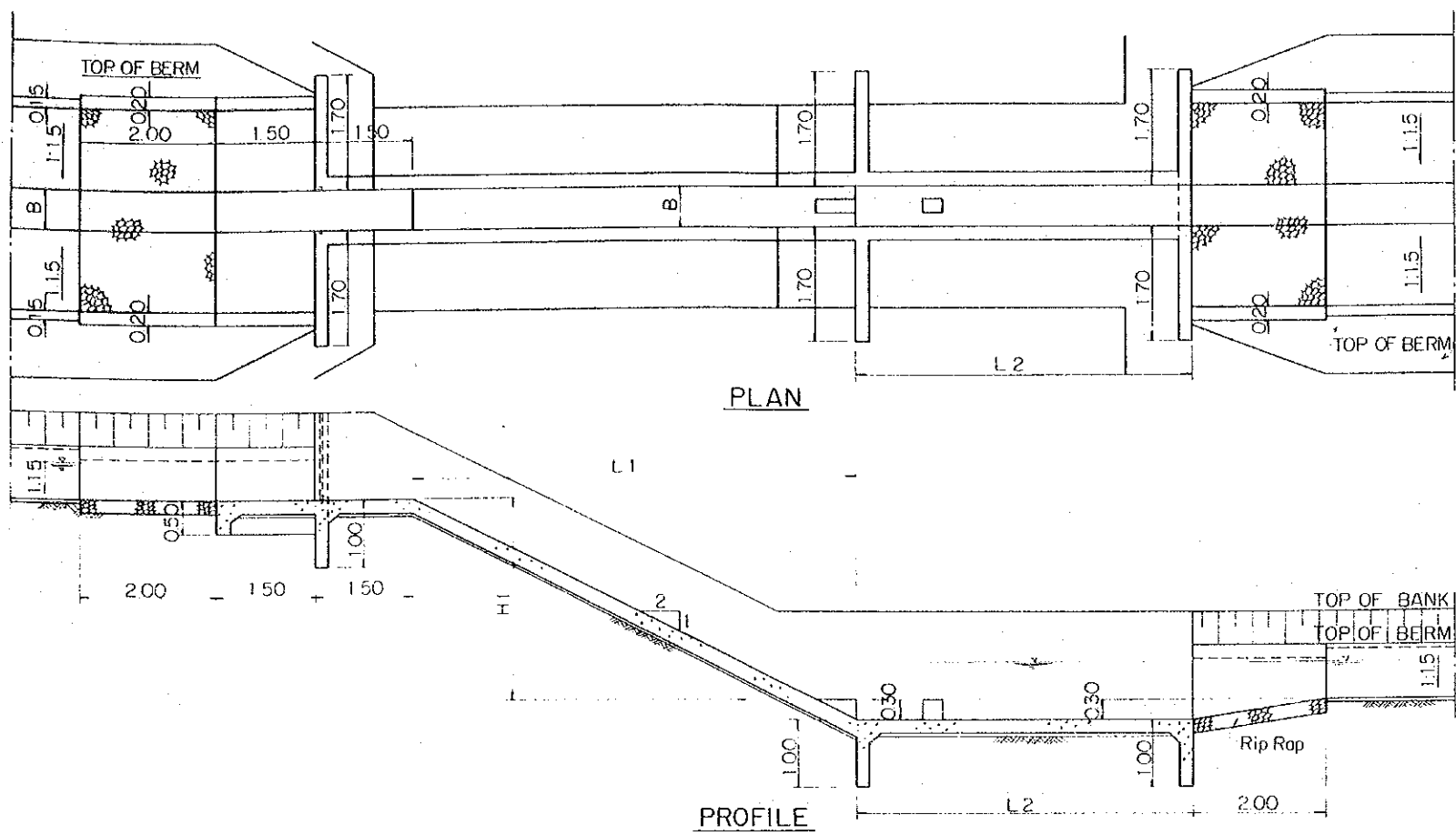
KINGDOM OF THAILAND
MINISTRY OF AGRICULTURE AND COOPERATIVES
ROYAL IRRIGATION DEPARTMENT

LOWER NORTHEAST IRRIGATION PROJECT

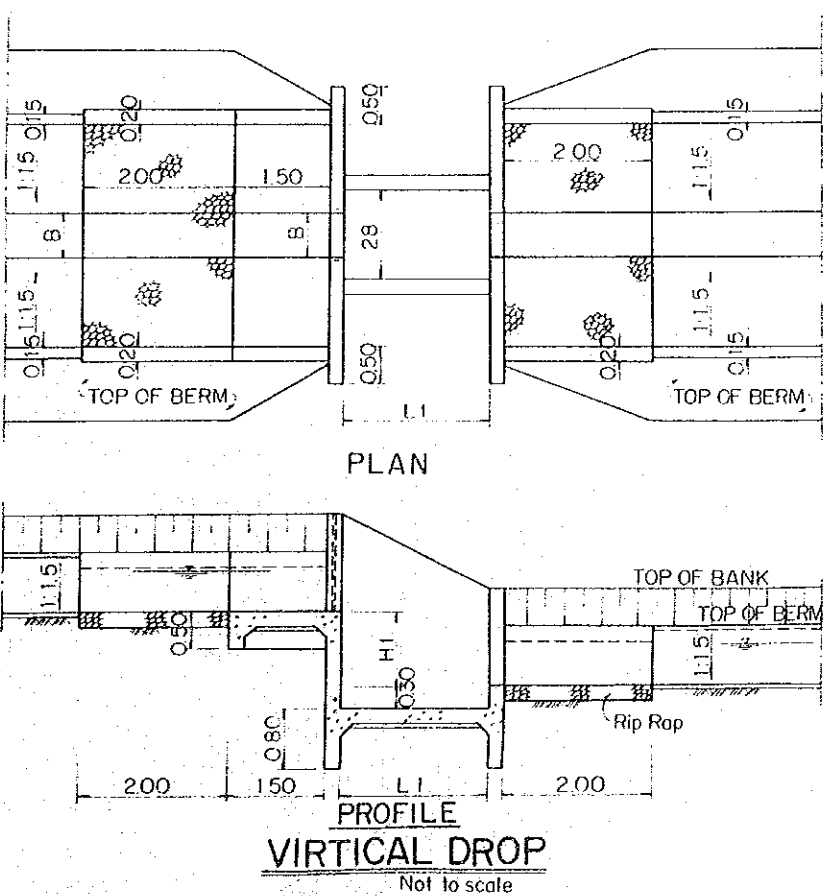
CANAL RELATED STRUCTURES (2/4)

DATE _____ DWG 22

JAPAN INTERNATIONAL COOPERATION AGENCY



INCLINED DROP
Not to scale



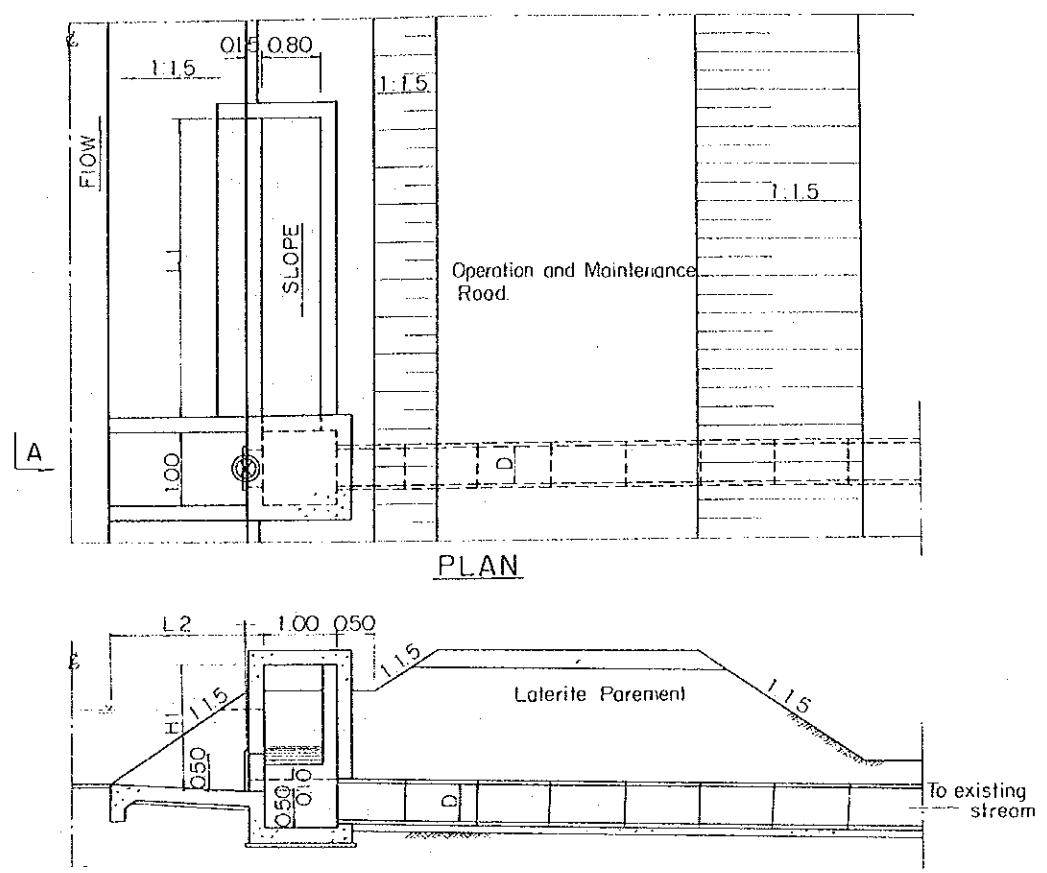
VERTICAL DROP
Not to scale

TABLE OF DIMENSIONS FOR INCLINED DROP

TYPE	H ₁ m	L ₁ m	L ₂ m	REMARKS
ID-1	2.00	4.60	3.50	-
ID-2	2.50	5.60	4.00	-
ID-3	3.00	6.60	5.00	-

TABLE OF DIMENSIONS FOR VERTICAL DROP

TYPE	H ₁ m	L ₁ m	REMARKS
VD-1	1.00	2.50	-
VD-2	1.50	3.00	-



SECTION "A"
SPILL WAY
Not to scale

TABLE OF DIMENSIONS FOR INCLINED DROP

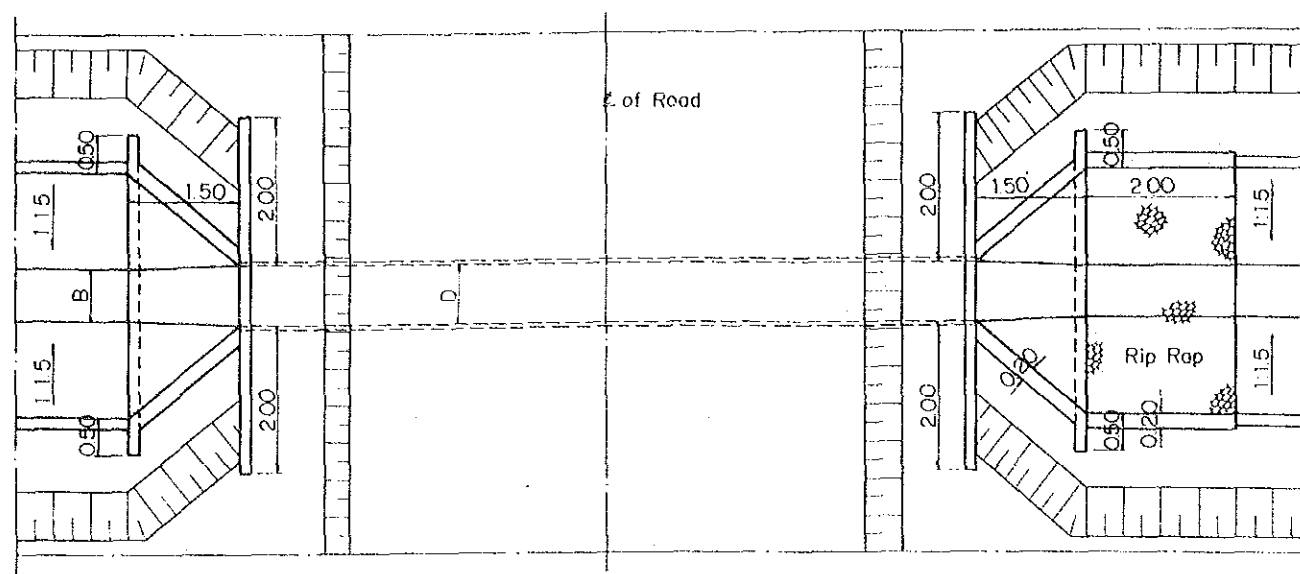
TYPE	Q _{Max} (CMS)	L ₁ m	D _m	H ₁	REMARKS
SW-1	Less than 0.50	3.00	0.50	1.00	-
SW-2	0.50~1.00	6.00	0.50	1.40	-
SW-3	1.00~1.50	8.00	0.60	1.80	-
SW-4	1.50~2.00	10.00	0.80	2.20	-

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ROYAL IRRIGATION DEPARTMENT

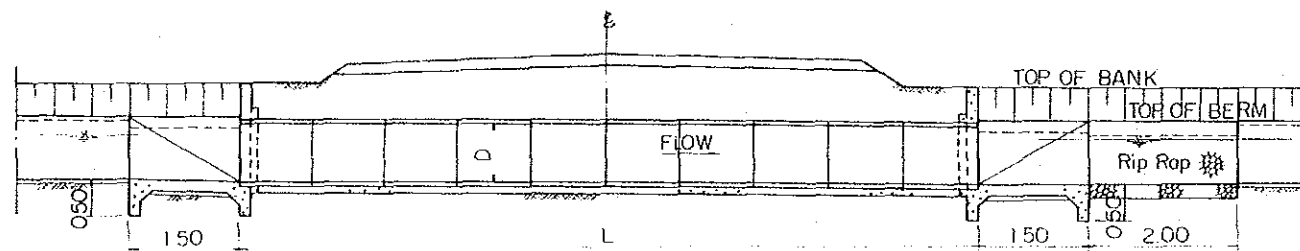
LOWER NORTHEAST IRRIGATION PROJECT

CANAL RELATED STRUCTURES (3/4)

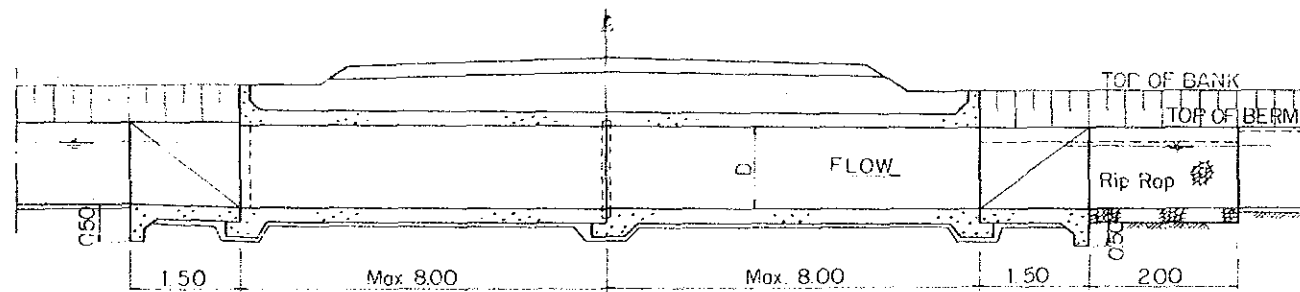
DATE		DWG	23
JAPAN INTERNATIONAL COOPERATION AGENCY			



PLAN



PROFILE (in case of pre-cast concrete pipe)



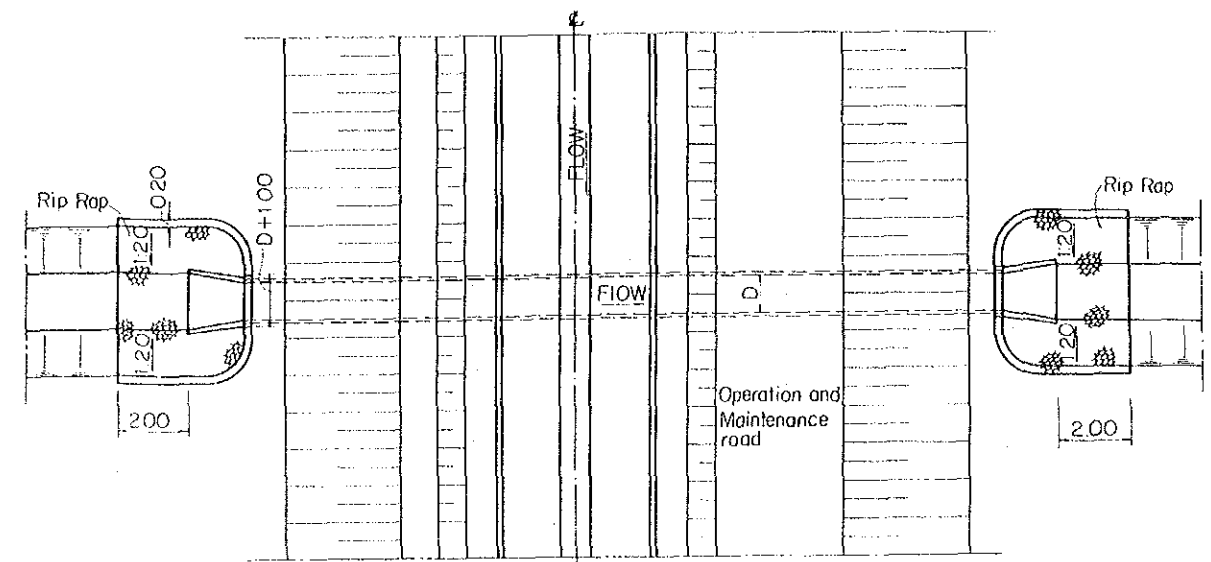
PROFILE (in case of cast in place concrete)

CROSSING STRUCTURE

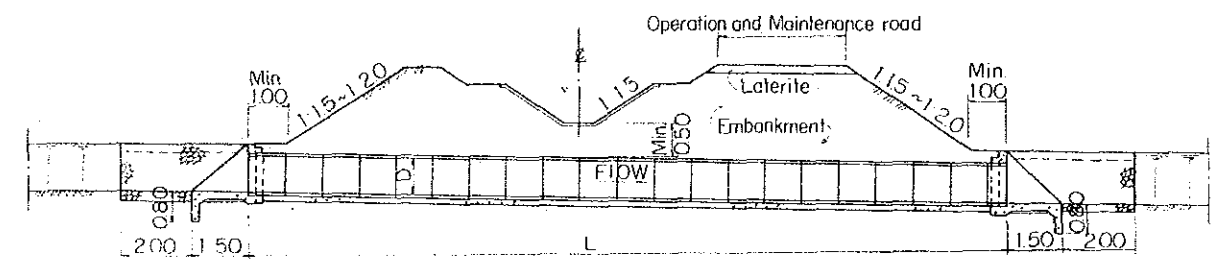
Not to scale

TABLE OF DIMENSIONS FOR CROSSING STRUCTURE

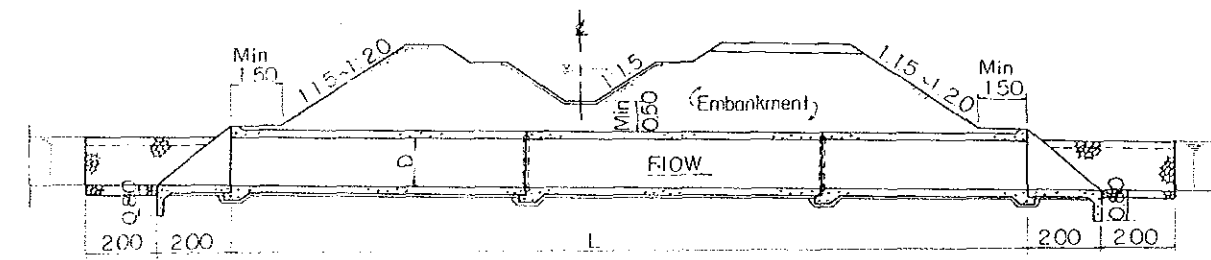
TYPE	D _{max} (CMS)	TYPE OF BARREL	D _m	REMARKS
CR-1	Less than 0.30	Pre-Cast-concrete pipe	0.60	--
CR-2	0.30-0.50	"	0.80	--
CR-3	0.50-0.80	"	1.00	--
CR-4	0.80-1.00	Cast-in-place concrete	1.00	--
CR-5	1.00-1.70	"	1.30	--
CR-6	1.70-2.50	"	1.50	--
--	more than 2.50	--	--	Bridge



PLAN



PROFILE (in case of pre-cast concrete pipe)



PROFILE (in case of cast-in-place concrete)

CROSS DRAIN

Not to scale

TABLE OF DIMENSIONS FOR CROSS DRAIN

TYPE	D _{max} (CMS)	TYPE OF BARREL	D _m	REMARKS
CD-1	Less than 1.00	Pre-Cast-concrete pipe	0.60	--
CD-2	1.00-1.50	"	0.80	--
CD-3	1.50-2.50	"	1.00	--
CD-4	2.50-3.00	Cast-in-place concrete	1.00	--
CD-5	3.00-4.00	"	1.30	--
CD-6	4.00-5.00	"	1.50	--
CD-7	5.00-10.00	"	2.00	--
CD-8	10.00-15.00	"	2.50	--
CD-9	15.00-20.00	"	3.00	--

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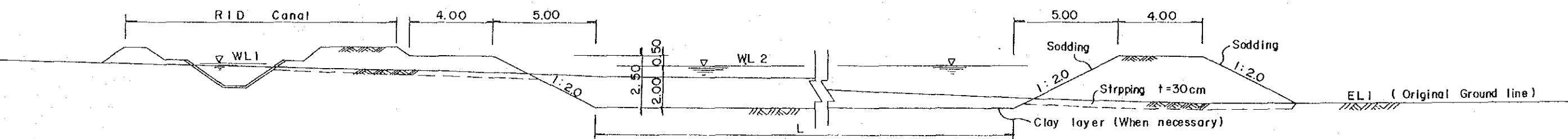
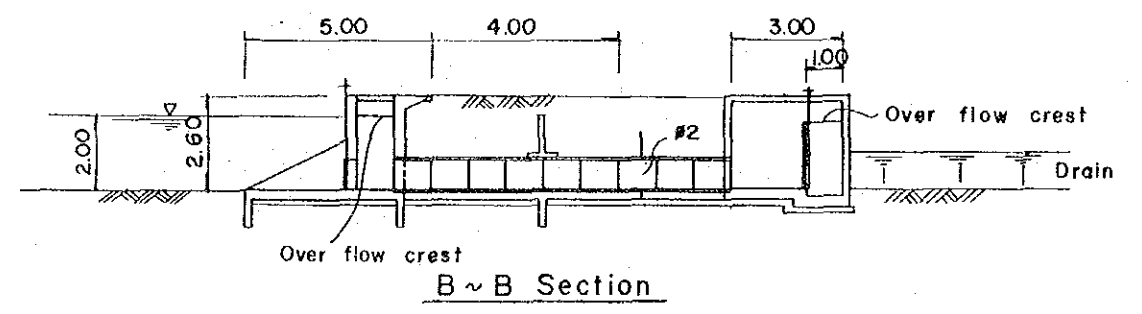
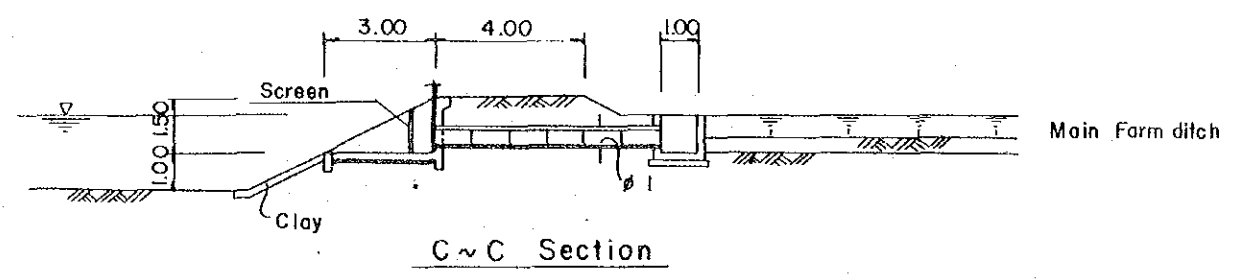
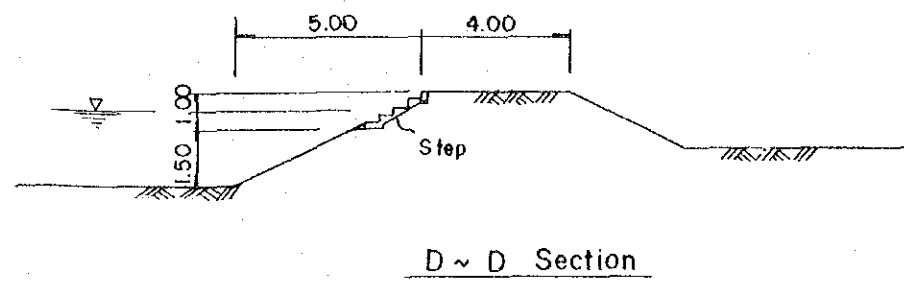
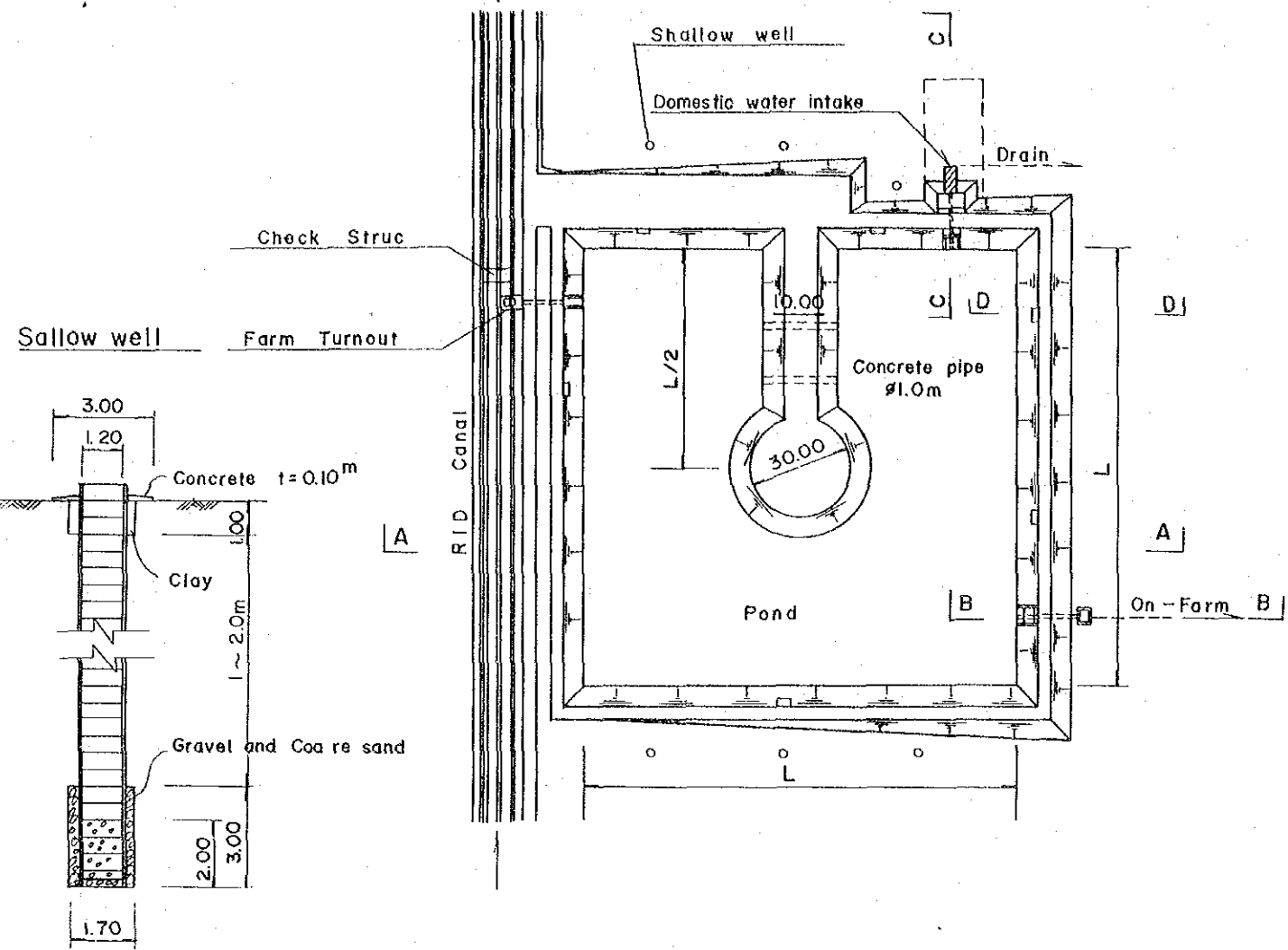
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CANAL RELATED STRUCTURES (4/4)

DATE	DWG	24
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Muban Cooperative Pond

PLAN



Dimension Table

TYPE	Area of Pond	L	φ 1	φ 2	WL1 - WL2	WL2 - EL1
MP - 1	2.4 ha	160 m	0.60m	1.00 m	Minimum	Minimum
MP - 2	1.6	130	0.50	1.00	0.50 m	0.50 m
MP - 3	0.8	100	0.30	0.60		

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 ROYAL IRRIGATION DEPARTMENT

LOWER NORTHEAST IRRIGATION PROJECT

MUBAN COOPERATIVE POND

DATE	DWG	25
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JAPAN INTERNATIONAL COOPERATION AGENCY

