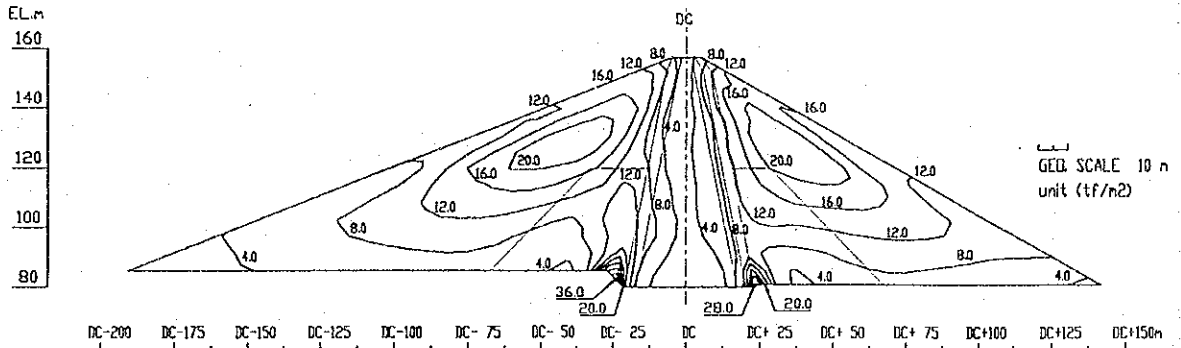


# DYNAMIC ANALYSIS FOR DAM

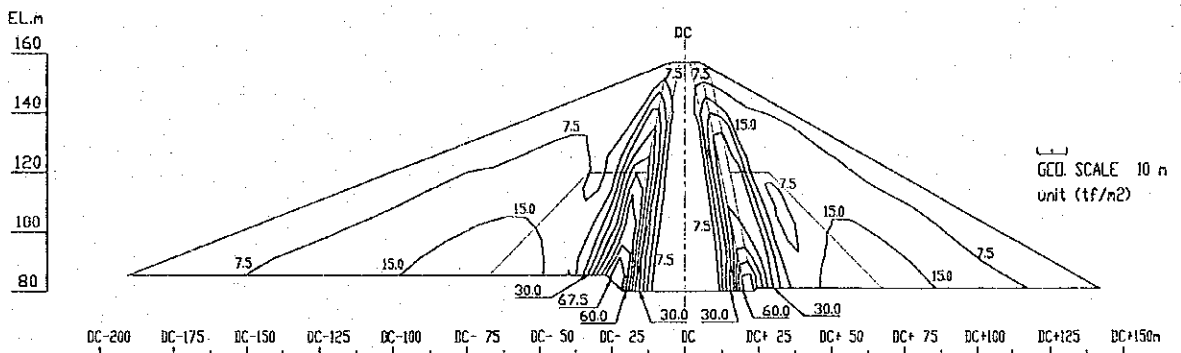
## Stress Contour

Maximum Credible Earthquake (380.0 gal)

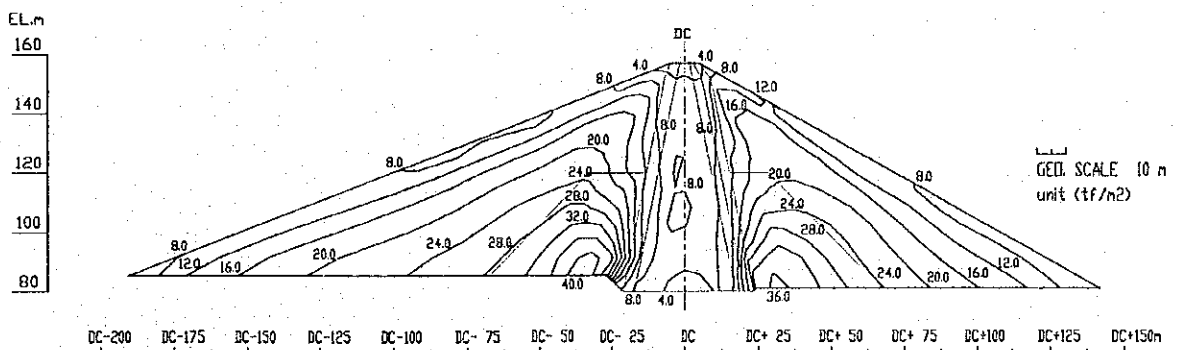
### Horizontal Stress



### Vertical Stress



### Shear Stress



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

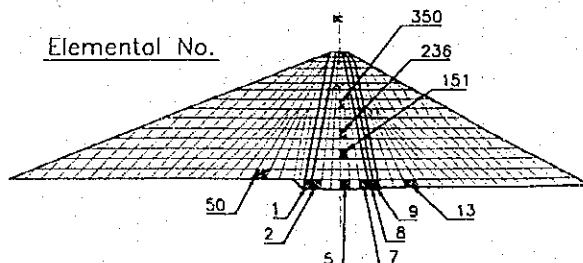
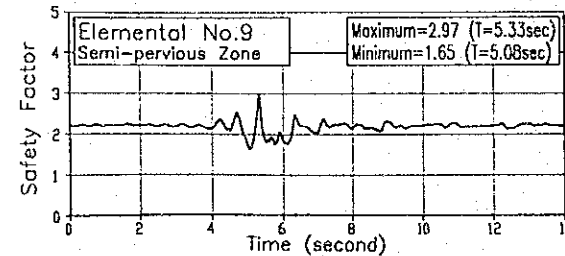
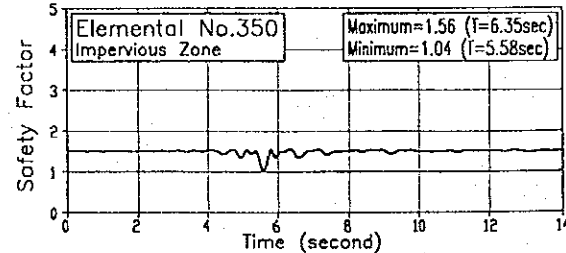
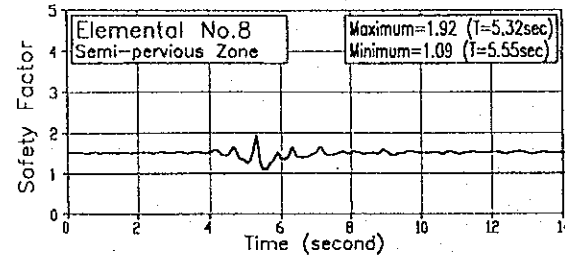
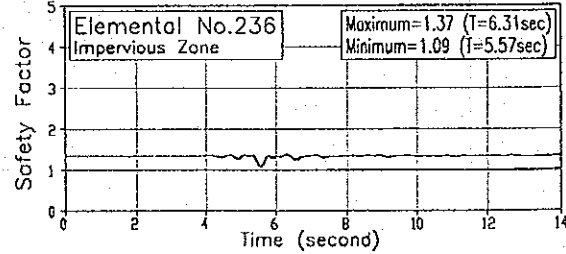
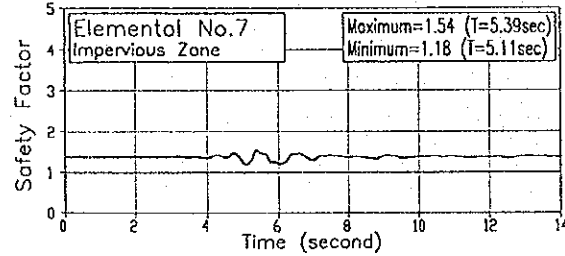
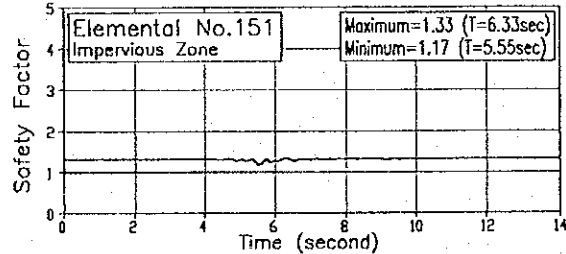
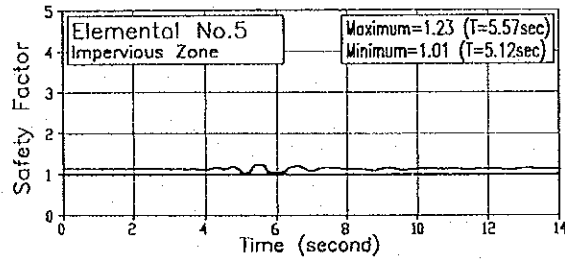
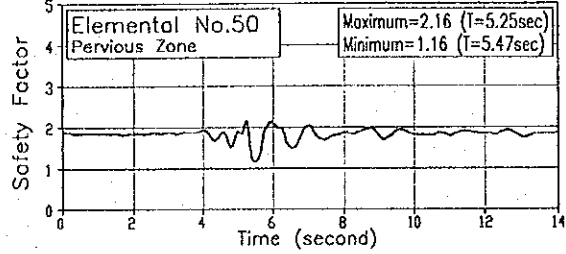
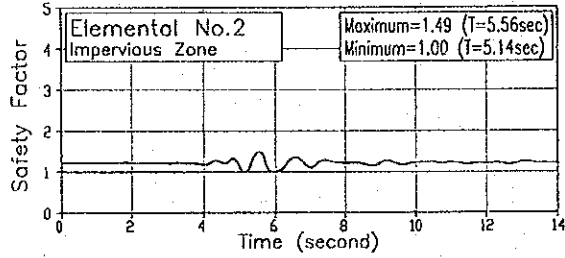
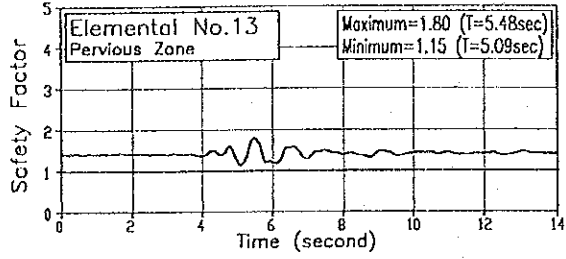
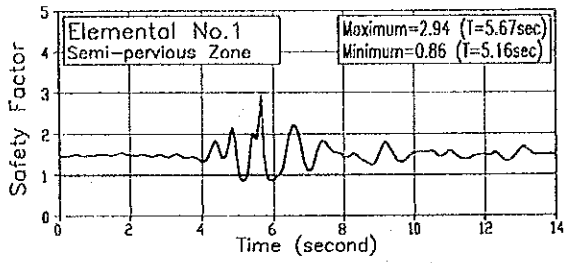
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.3.17 (22)

RESULTS OF DYNAMIC ANALYSIS (DYNAMIC STRESS CONTOUR)

# SEISMIC STABILITY

## Elemental Safety Factor Design Basis Earthquake (189.1gal)



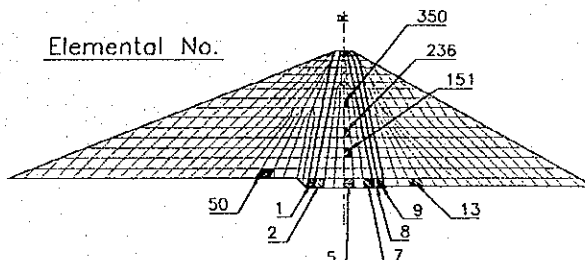
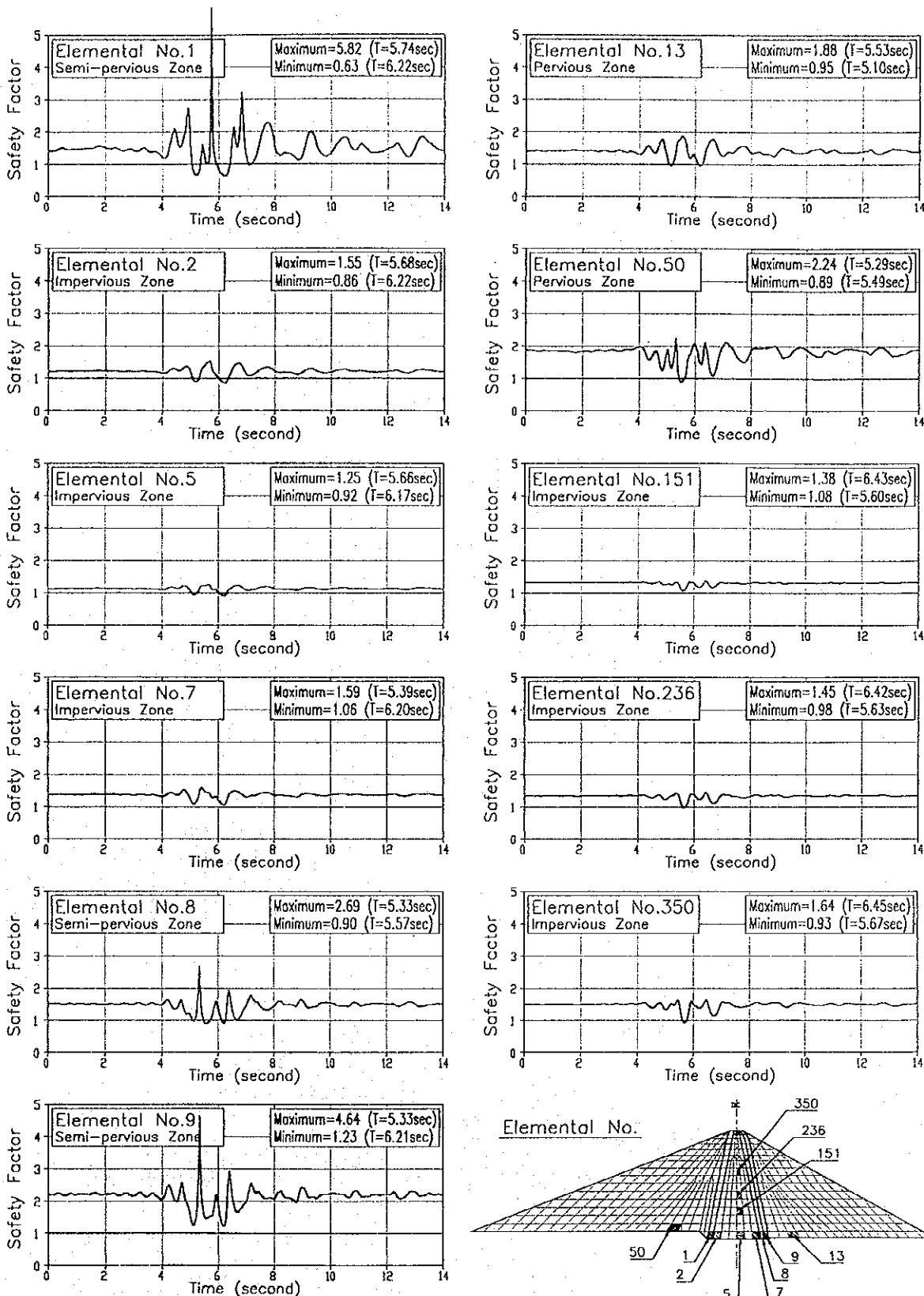
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.3.18 (1/2)  
**STUDY ON SEISMIC STABILITY (ELEMENTAL SAFETY FACTOR)**

# SEISMIC STABILITY

Elemental Safety Factor  
Maximum Credible Earthquake (380.0gal)



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

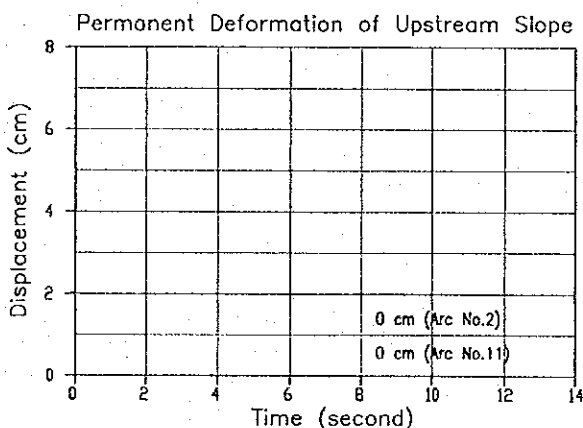
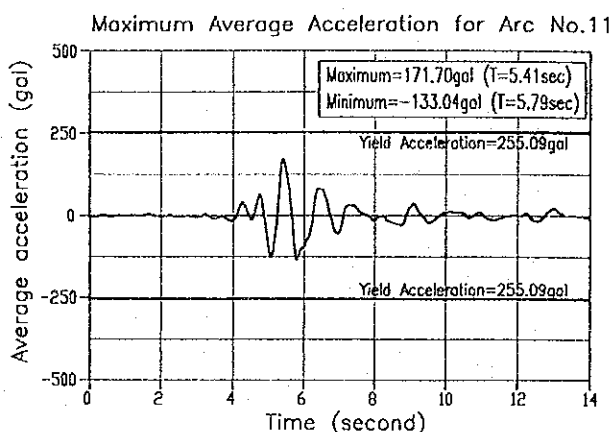
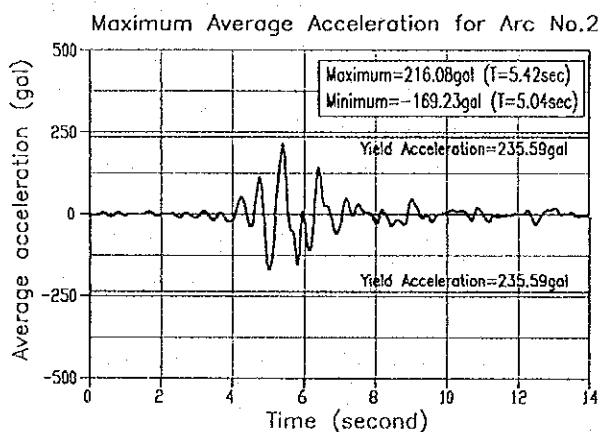
Fig. 7.3.18 (2/2)

**STUDY ON SEISMIC STABILITY (ELEMENTAL SAFETY FACTOR)**

# SEISMIC STABILITY

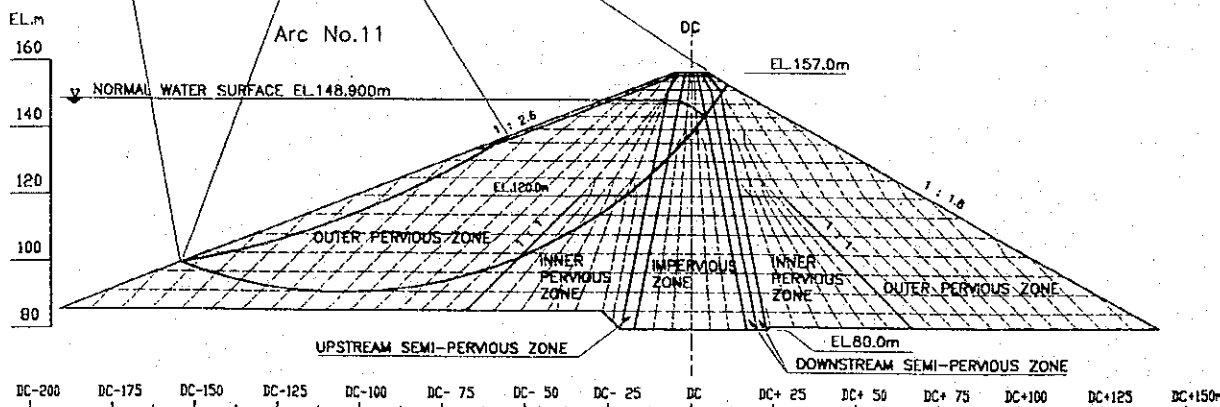
Permanent Deformation  
Design Basis Earthquake (189.1gal)

## Upstream Slope



### Arc Shapes

Arc No.	Coordinates		Radius (m)	Static Stability		Yield Acceleration (gal)
	X	Y		k	SF	
2	-205.2	380.0	285.004	0.18	1.22	235.59 (0.240 $\times$ xg)
11	-105.2	230.0	139.104	0.18	1.28	255.09 (0.2603 $\times$ xg)



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

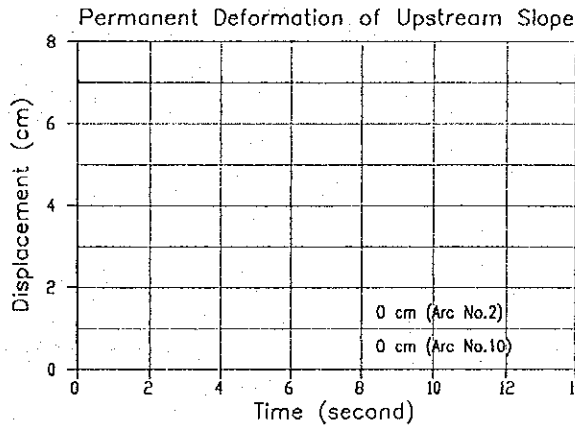
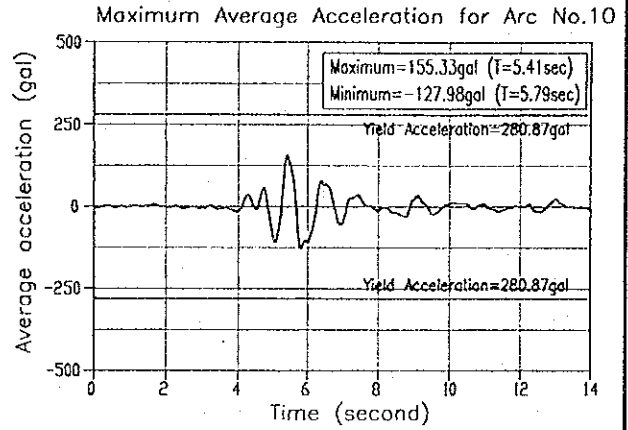
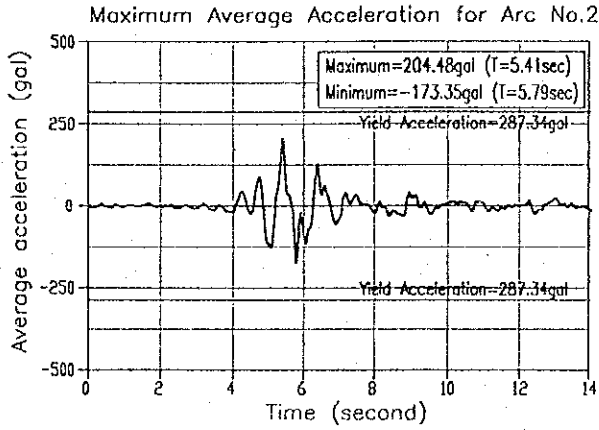
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.3.19 (1/4)  
**STUDY ON SEISMIC STABILITY (PERMANENT DEFORMATION)**

# SEISMIC STABILITY

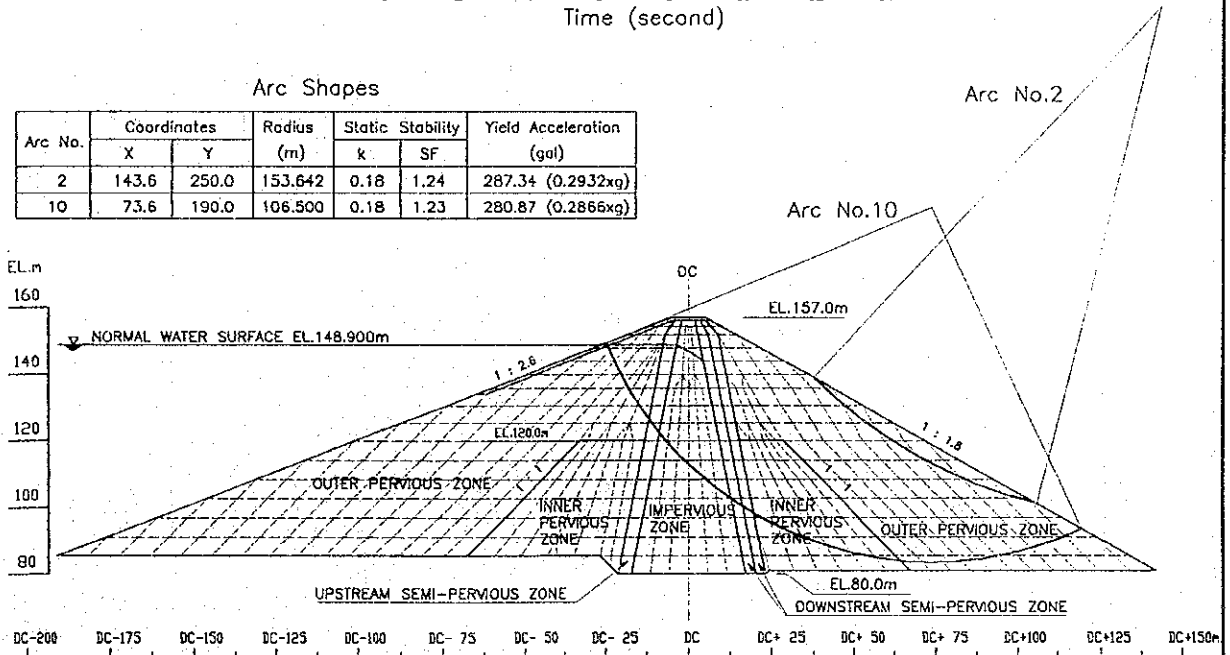
Permanent Deformation  
Design Basis Earthquake (189.1gal)

## Downstream Slope



Arc Shapes

Arc No.	Coordinates		Radius (m)	Static Stability		Yield Acceleration (gal)
	X	Y		k	SF	
2	143.6	250.0	153.642	0.18	1.24	287.34 (0.2932xg)
10	73.6	190.0	106.500	0.18	1.23	280.87 (0.2866xg)



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

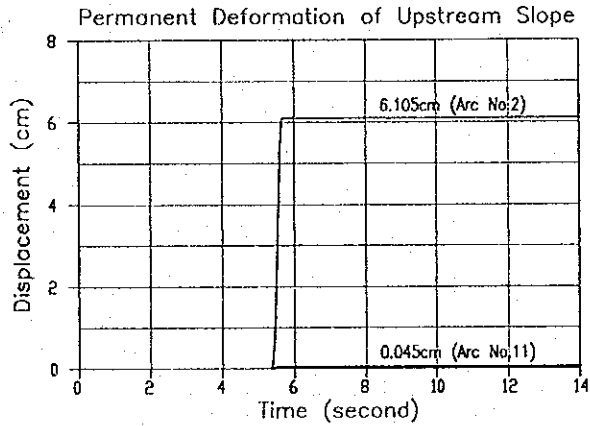
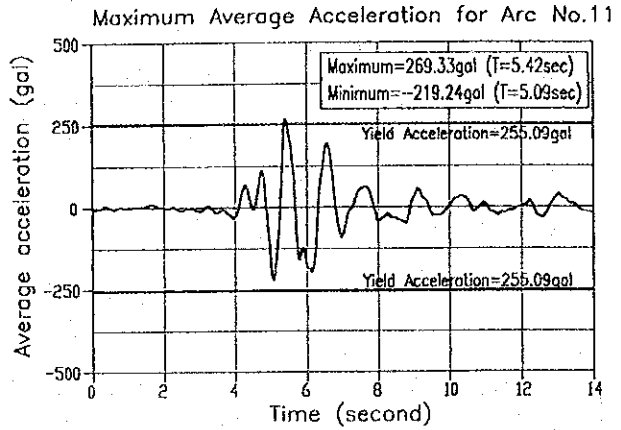
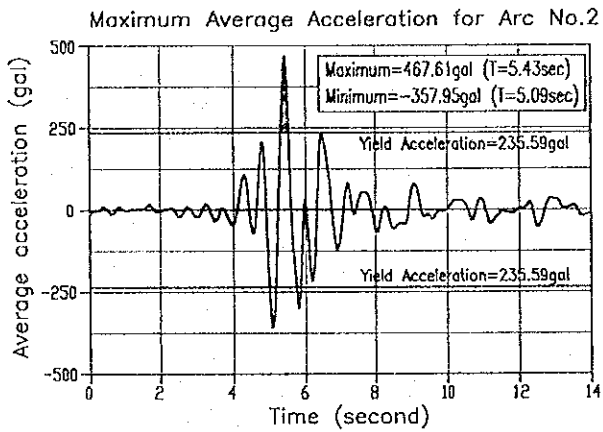
Fig. 7.3.19 (2/4)

**STUDY ON SEISMIC STABILITY (PERMANENT DEFORMATION)**

# SEISMIC STABILITY

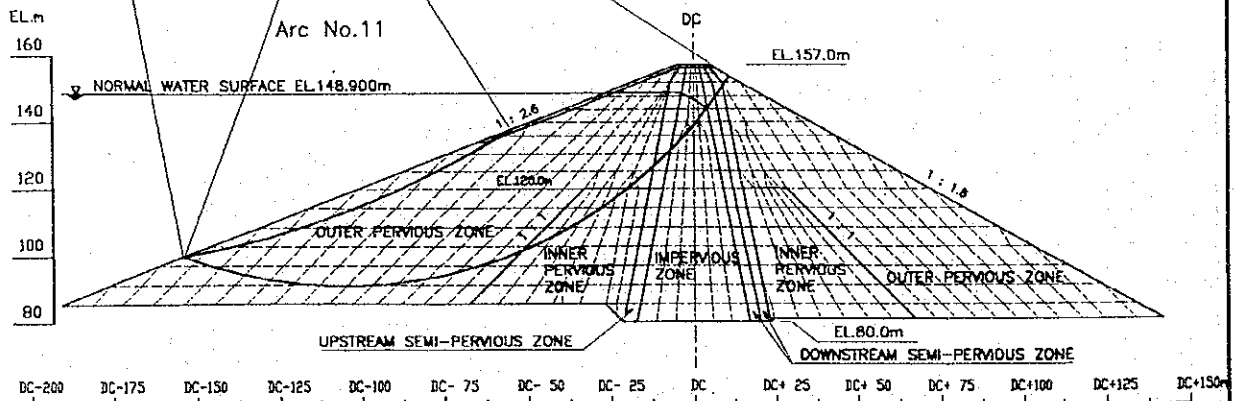
Permanent Deformation  
Maximum Credible Earthquake (380.0gal)

## Upstream Slope



Arc Shapes

Arc No.	Coordinates		Radius (m)	Static Stability		Yield Acceleration (gal)
	X	Y		k	SF	
2	-205.2	380.0	285.004	0.18	1.22	235.59 (0.2404xg)
11	-105.2	230.0	139.104	0.18	1.28	255.09 (0.2603xg)



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

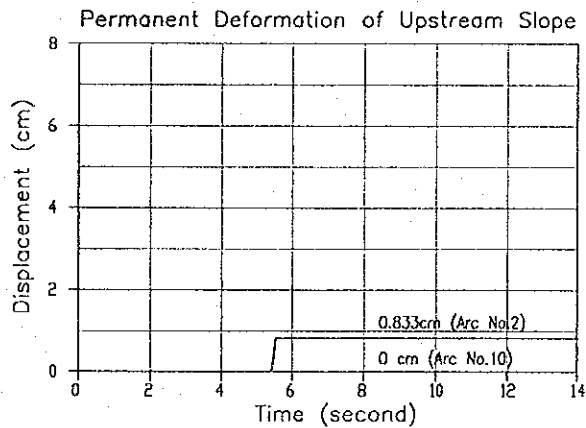
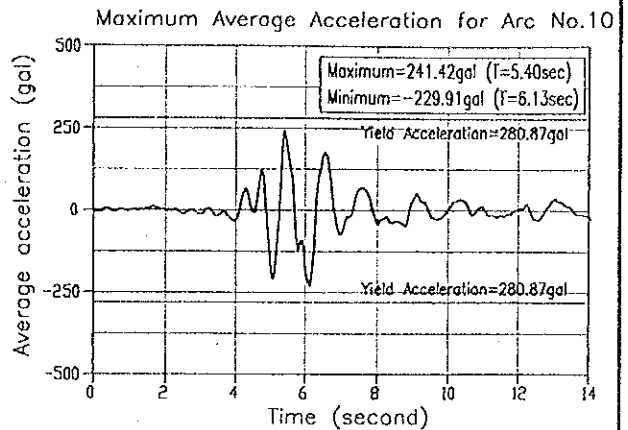
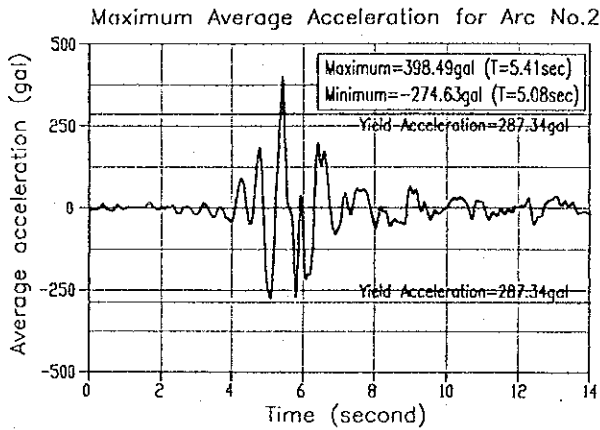
Fig. 7.3.19 (3/4)

**STUDY ON SEISMIC STABILITY (PERMANENT DEFORMATION)**

# SEISMIC STABILITY

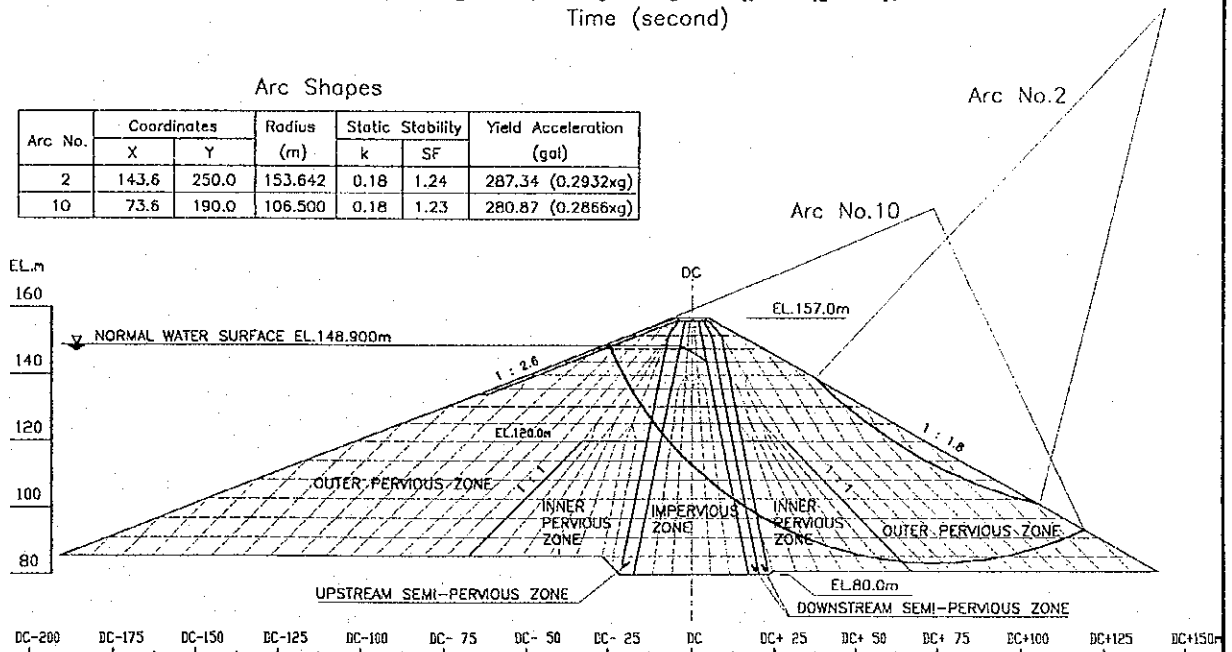
Permanent Deformation  
Maximum Credible Earthquake (380.0gal)

## Downstream Slope



### Arc Shapes

Arc No.	Coordinates		Radius (m)	Static Stability		Yield Acceleration (gal)
	X	Y		k	SF	
2	143.6	250.0	153.642	0.18	1.24	287.34 (0.2932xg)
10	73.6	190.0	106.500	0.18	1.23	280.87 (0.2866xg)



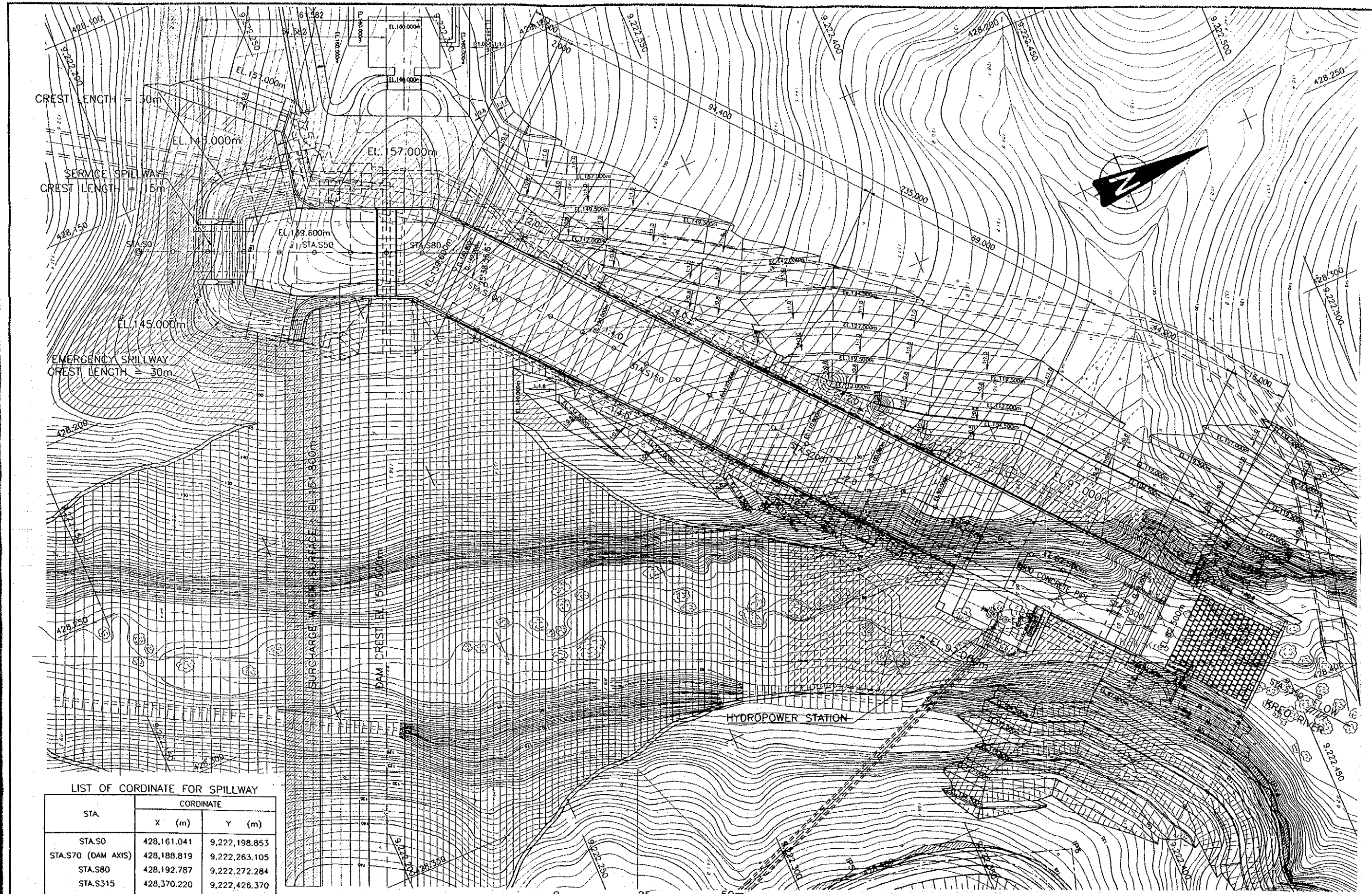
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.3.19 (4/4)

**STUDY ON SEISMIC STABILITY (PERMANENT DEFORMATION)**





LIST OF COORDINATE FOR SPILLWAY

STA.	COORDINATE	
	X (m)	Y (m)
STA.50	428,161.041	9,222,198.853
STA.570 (DAM AXIS)	428,188.819	9,222,263.105
STA.580	428,192.787	9,222,272.284
STA.5315	428,370.220	9,222,426.370
STA.5323	428,376.261	9,222,431.615

SCALE 0 25 50m

NOTE  
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA  
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.1 (1/2)  
PLAN OF SPILLWAY (GENERAL PLAN)





LIST OF COORDINATE FOR SPILLWAY

STA.	COORDINATE	
	X (m)	Y (m)
STA.S0	428.161.041	9.222.198.853
STA.S70 (DAM AXIS)	428.188.819	9.222.263.105
STA.S80	428.192.787	9.222.272.284
STA.S315	428.370.220	9.222.426.370
STA.S323	428.376.261	9.222.431.615

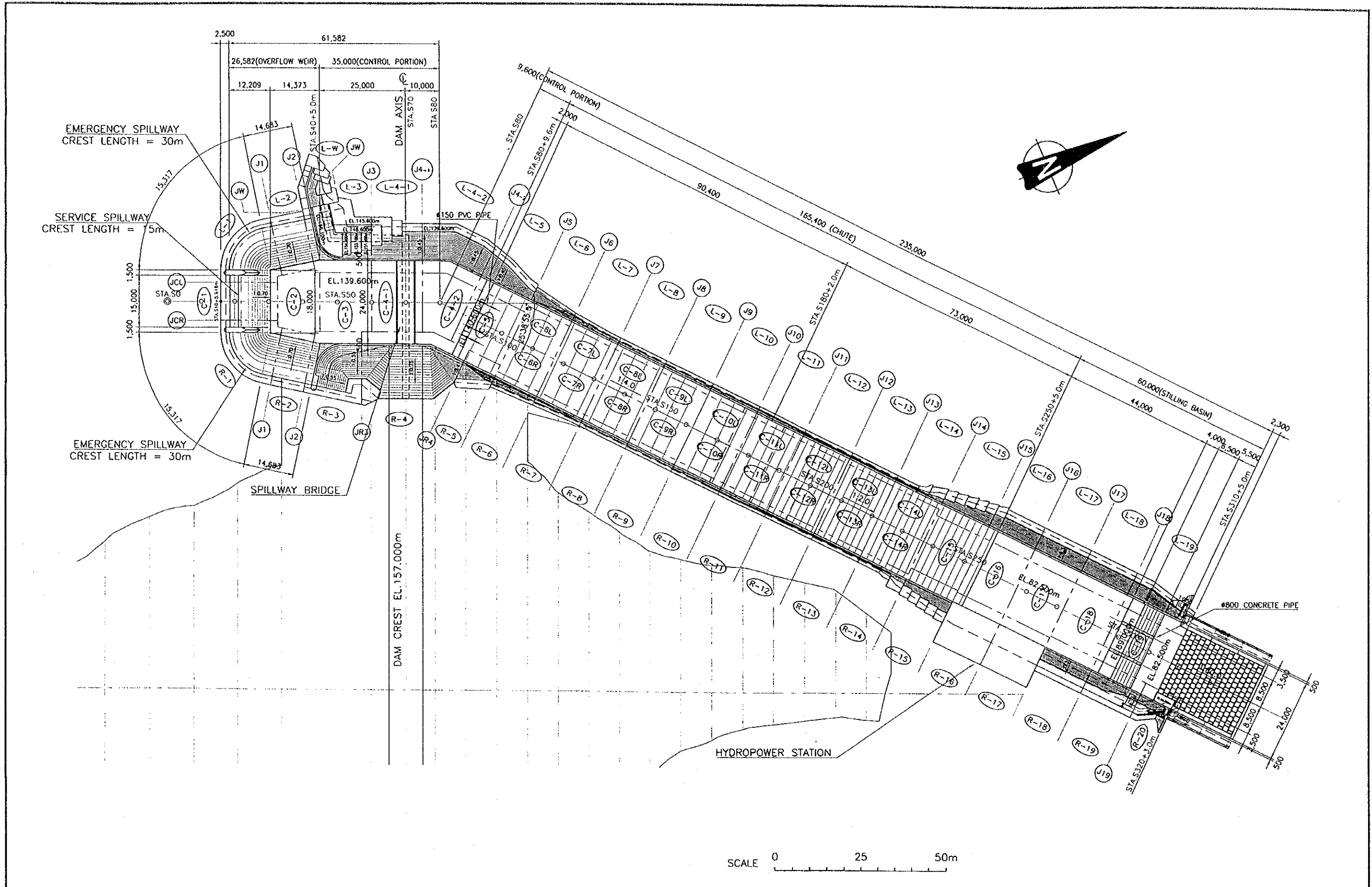
SCALE 0 25 50m

NOTE  
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.1 (1/2)  
PLAN OF SPILLWAY (GENERAL PLAN)



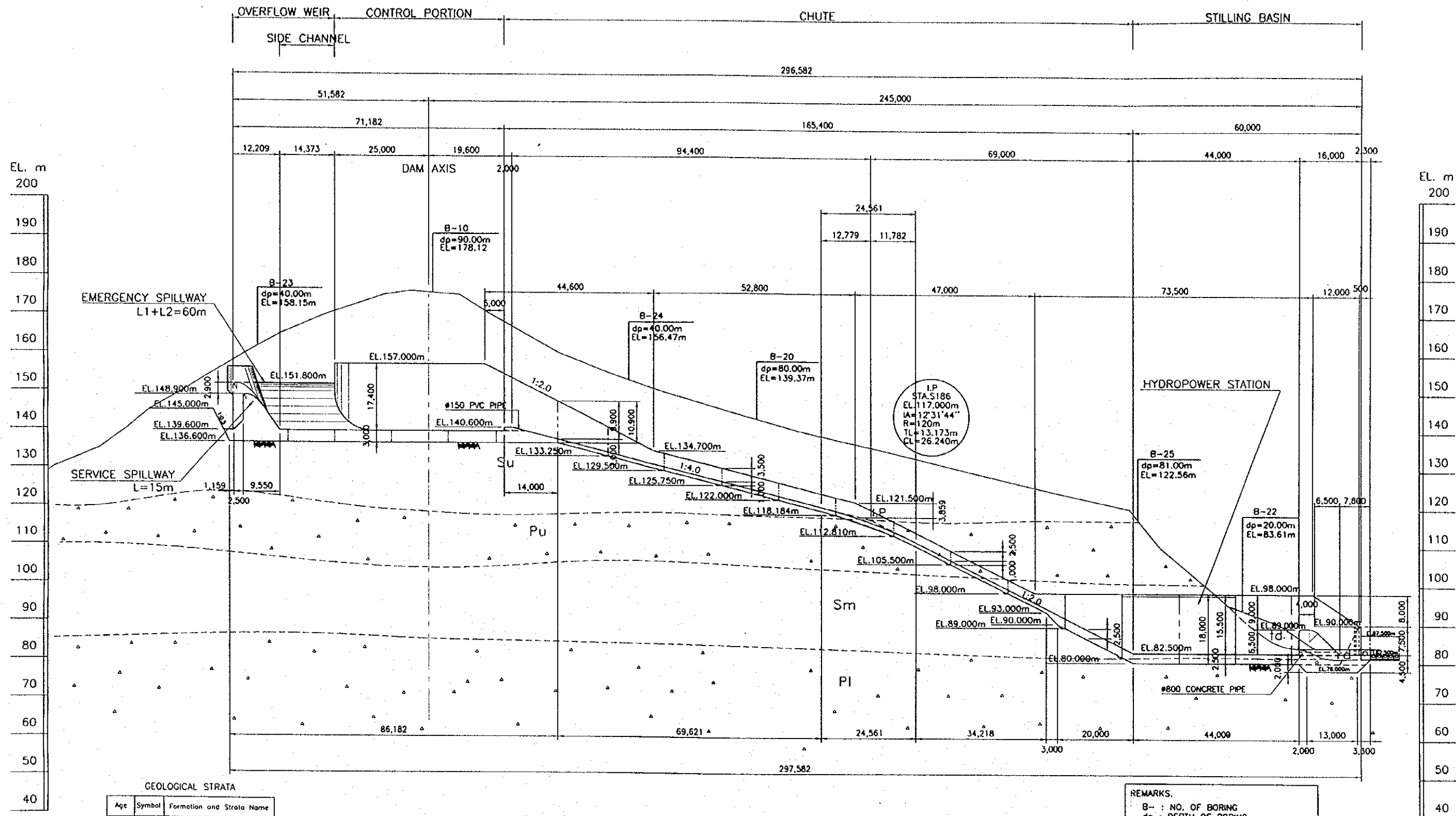
SCALE 0 25 50m

**NOTE**  
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.1 (2/2)  
PLAN OF SPILLWAY (STRUCTURAL PLAN)



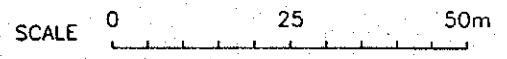
**GEOLOGICAL STRATA**

Age	Symbol	Formation and Strata Name
Quaternary	rd	Riverbed deposit
	td	Talus deposit
Tertiary-Quaternary	Su	Upper Sedimentary Rock Unit
	Pu	Upper Pyroclastic Rock Unit
	Sm	Middle Sedimentary Rock Unit
	Pl	Lower Pyroclastic Rock Unit
	Sl	Lower Sedimentary Rock Unit

**NOTES**  
 1. REFER TO THE LEGEND ON REFERENCE DRAWING MENTIONED BELOW FOR SYMBOLS OF ROCKS AND ROCK CLASSIFICATION IN DRILLING LOG.

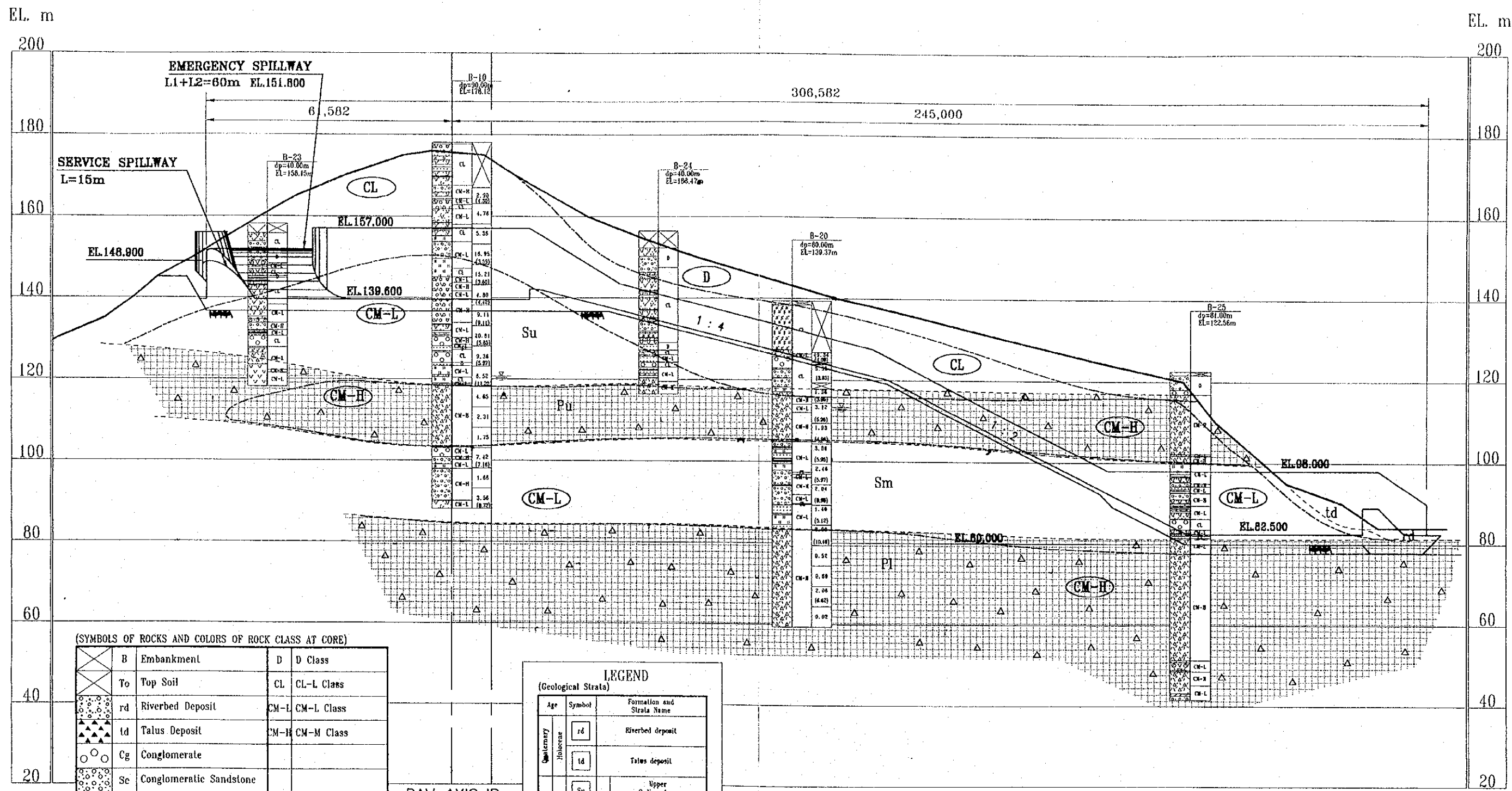
**REFERENCE DRAWINGS**  
 JD-P1-GE-Pr-1 GEOLOGICAL PROFILE ALONG DAM AXIS

**REMARKS.**  
 B- : NO. OF BORING  
 dp : DEPTH OF BORING  
 EL : ELEVATION OF GROUND SURFACE



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA  
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.2  
 PROFILE OF SPILLWAY



(SYMBOLS OF ROCKS AND COLORS OF ROCK CLASS AT CORE)

	B Embankment		D D Class
	To Top Soil		CL CL-L Class
	rd Riverbed Deposit		CM-L CM-L Class
	td Talus Deposit		CM-M CM-M Class
	Cg Conglomerate		
	Sc Conglomeratic Sandstone		
	Ss Sandstone		
	Si Siltstone		
	St Tuffaceous Sandstone		
	Ts Sandy Tuff		
	Tf Tuff		
	Cv Volcanic Conglomerate		
	Bb Volcanic Breccia		
	La Andesite Lava		

**LEGEND**  
(Geological Strata)

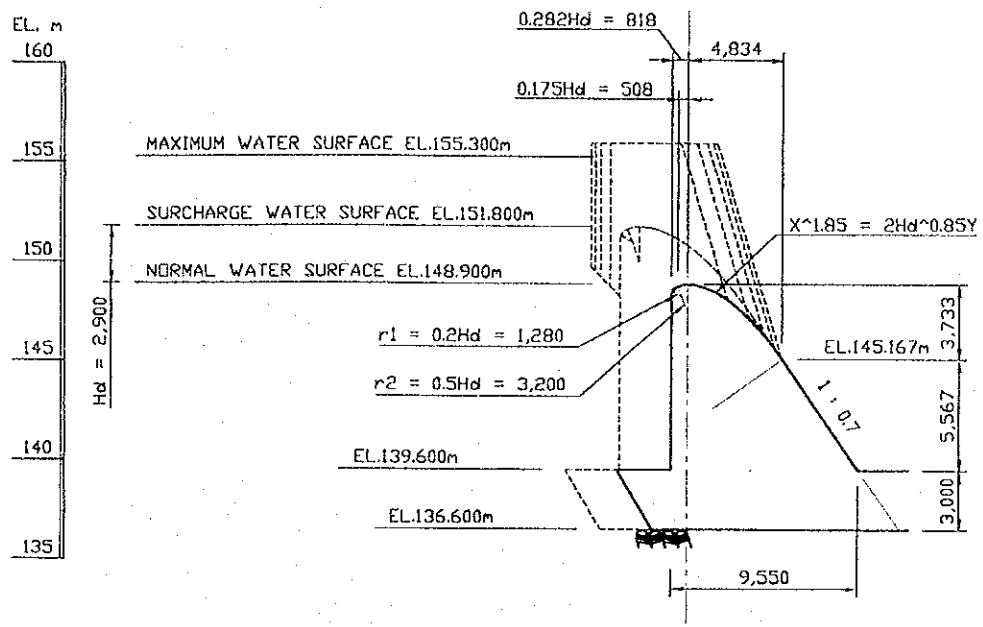
Age	Symbol	Formation and Strata Name
Quaternary	rd	Riverbed deposit
	td	Talus deposit
Tertiary-Quaternary	Su	Upper Sedimentary Rock Unit
	Pu	Upper Pyroclastic Rock Unit
	Sm	Middle Sedimentary Rock Unit
	Pl	Lower Pyroclastic Rock Unit
	Sl	Lower Sedimentary Rock Unit

(Note)  
 Boundary of Geological Unit  
 Boundary of Rock Class

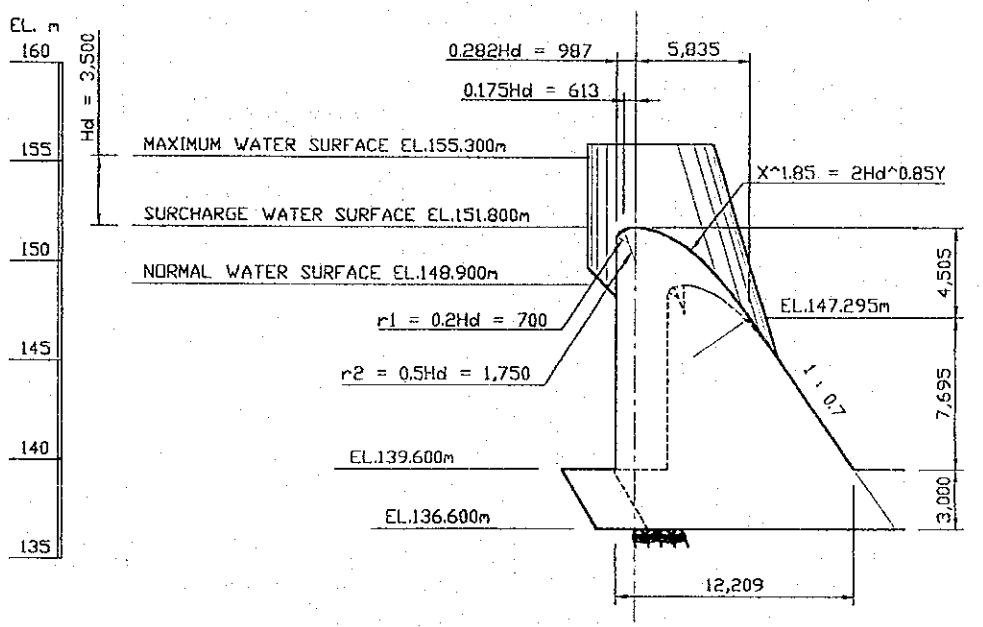
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA  
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.3  
 GEOLOGICAL PROFILE ALONG CENTERLINE OF SPILLWAY

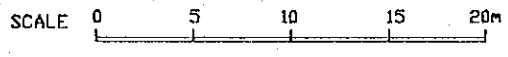




SERVICE SPILLWAY



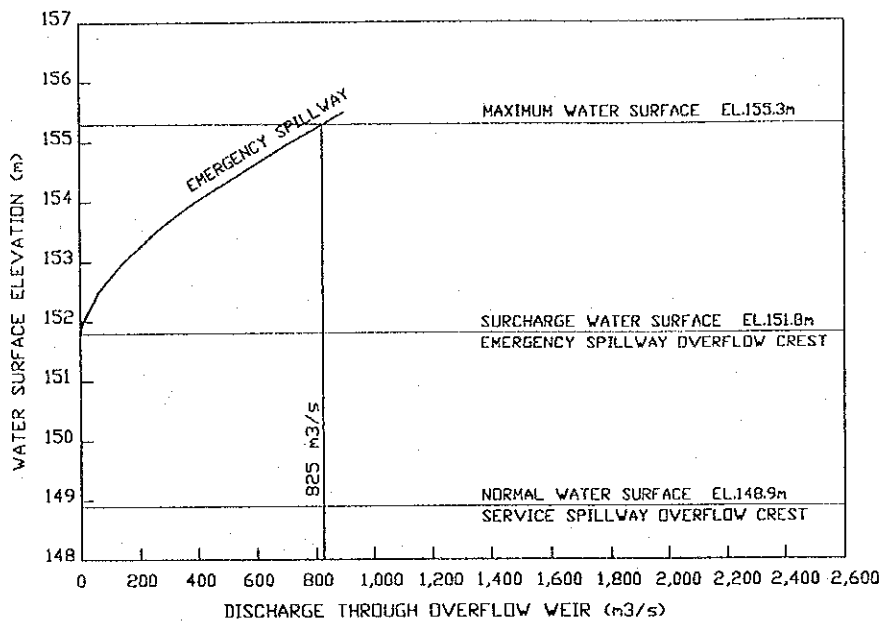
EMERGENCY SPILLWAY



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

Fig. 7.4.4 TYPICAL CROSS SECTION OF OVERFLOW WEIR

JAPAN INTERNATIONAL COOPERATION AGENCY



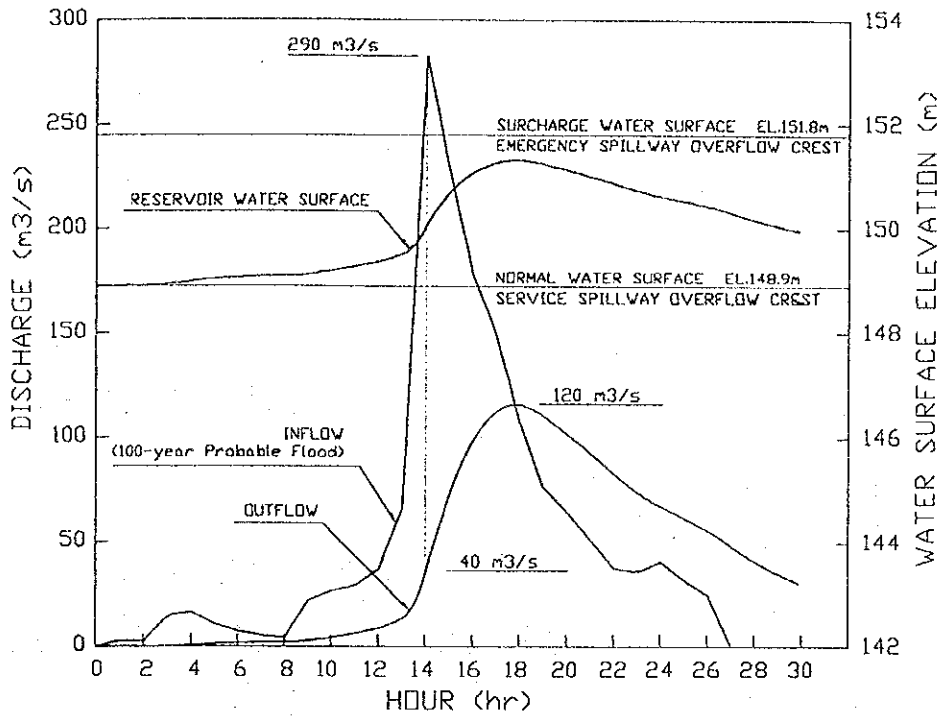
DISCHARGE-ELEVATION CURVES

OVERFLOW DISCHARGE

Elevation (m)	Depth H (m)	Crest Length B (m)	Discharge Coefficient C	Outflow Discharge Q (m³/s)	Remarks
148.90	0.0	60	1.600	0.0	Normal Water Surface
149.00	0.0	60	1.600	0.0	
149.50	0.0	60	1.600	0.0	
150.00	0.0	60	1.600	0.0	
150.50	0.0	60	1.600	0.0	
151.00	0.0	60	1.600	0.0	
151.50	0.0	60	1.600	0.0	
151.80	0.0	60	1.600	0.0	Surcharge Water Surface
152.00	0.2	60	1.650	8.9	
152.50	0.7	60	1.759	61.8	
153.00	1.2	60	1.850	146.0	
153.50	1.7	60	1.928	256.4	Maximum Water Surface
154.00	2.2	60	1.994	390.4	
154.50	2.7	60	2.050	545.7	
155.00	3.2	60	2.097	720.4	
155.30	3.5	60	2.100	825.0	
155.50	3.7	60	2.100	896.8	

Note: design head (Hd) = 3.5 m  
 Height of Weir (W) = 6.8 m  
 Discharge Coefficient is not more than 2.100.





INFLOW AND OUTFLOW HYDROGRAPHS

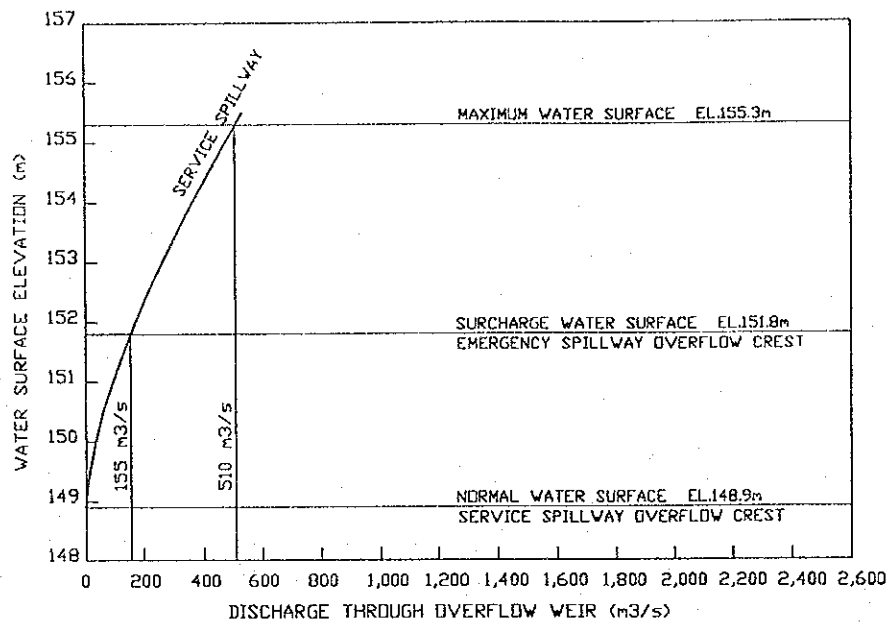
Hour (hr)	100-year Probable Flood		Reservoir Water Surface (EL. m)	Reservoir Storage Volume (m <sup>3</sup> )
	Inflow (m <sup>3</sup> /s)	Outflow (m <sup>3</sup> /s)		
0.0	0.0	0.0	148.90	0
1.0	2.7	0.0	148.90	4,817
2.0	2.7	0.1	148.91	14,273
3.0	15.1	0.4	148.95	45,613
4.0	16.4	0.8	149.00	100,308
5.0	10.8	1.4	149.05	145,165
6.0	7.4	1.8	149.07	172,023
7.0	5.5	2.1	149.09	188,142
8.0	4.3	2.2	149.10	197,976
9.0	22.3	3.0	149.14	236,822
10.0	26.9	4.5	149.21	312,027
11.0	29.5	6.4	149.30	393,855
12.0	37.2	9.0	149.39	486,340
13.0	66.7	13.6	149.54	633,717
14.0	282.7	36.3	150.08	1,182,957
15.0	226.4	73.2	150.73	1,900,060
16.0	177.8	98.9	151.10	2,313,700
17.0	149.1	112.7	151.28	2,518,409
18.0	107.6	116.0	151.32	2,565,697
19.0	76.7	110.6	151.25	2,487,776
20.0	64.7	101.9	151.14	2,359,584
21.0	51.7	92.7	151.01	2,218,483
22.0	37.7	83.0	150.87	2,062,896
23.0	35.7	74.0	150.74	1,912,974
24.0	40.8	67.3	150.63	1,797,058
25.0	32.0	61.7	150.54	1,695,779
26.0	25.0	55.9	150.44	1,586,830
27.0	1.0	48.6	150.32	1,444,866
28.0	1.0	41.0	150.18	1,287,704
29.0	1.0	35.0	150.06	1,154,788
30.0	1.0	30.0	149.95	1,041,440

Maximum Reservoir Storage Volume + 20 % Allowance = 2,565,697 m<sup>3</sup> x 1.2  
= 3,100,000 m<sup>3</sup>

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.6  
INFLOW AND OUTFLOW HYDROGRAPHS OF 100-YEARS PROBABLE FLOOD

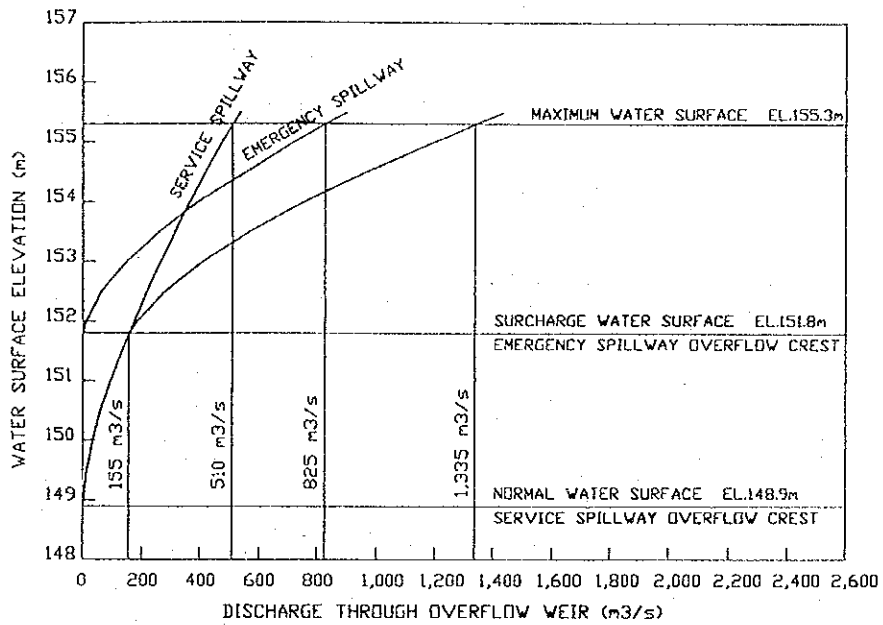


DISCHARGE-ELEVATION CURVES

OVERFLOW DISCHARGE

Elevation (m)	Depth H (m)	Crest Length B (m)	Discharge Coefficient C	Outflow Discharge Q (m³/s)	Remarks
148.90	0.0	15	1.600	0.0	Normal Water Surface
149.00	0.1	15	1.630	0.8	
149.50	0.6	15	1.758	12.3	
150.00	1.1	15	1.862	32.2	
150.50	1.6	15	1.947	59.1	
151.00	2.1	15	2.015	92.0	
151.50	2.6	15	2.070	130.1	
151.80	2.9	15	2.097	155.3	Surcharge Water Surface
152.00	3.1	15	2.100	171.9	
152.50	3.6	15	2.100	215.2	
153.00	4.1	15	2.100	261.5	
153.50	4.6	15	2.100	310.8	
154.00	5.1	15	2.100	362.8	
154.50	5.6	15	2.100	417.4	
155.00	6.1	15	2.100	474.6	Maximum Water Surface
155.30	6.4	15	2.100	510.0	
155.50	6.6	15	2.100	534.1	

Note: design head (Hd) = 2.9 m  
 Height of Weir (W) = 3.9 m  
 Discharge Coefficient is not more than 2.100.



DISCHARGE-ELEVATION CURVES

OVERFLOW DISCHARGE

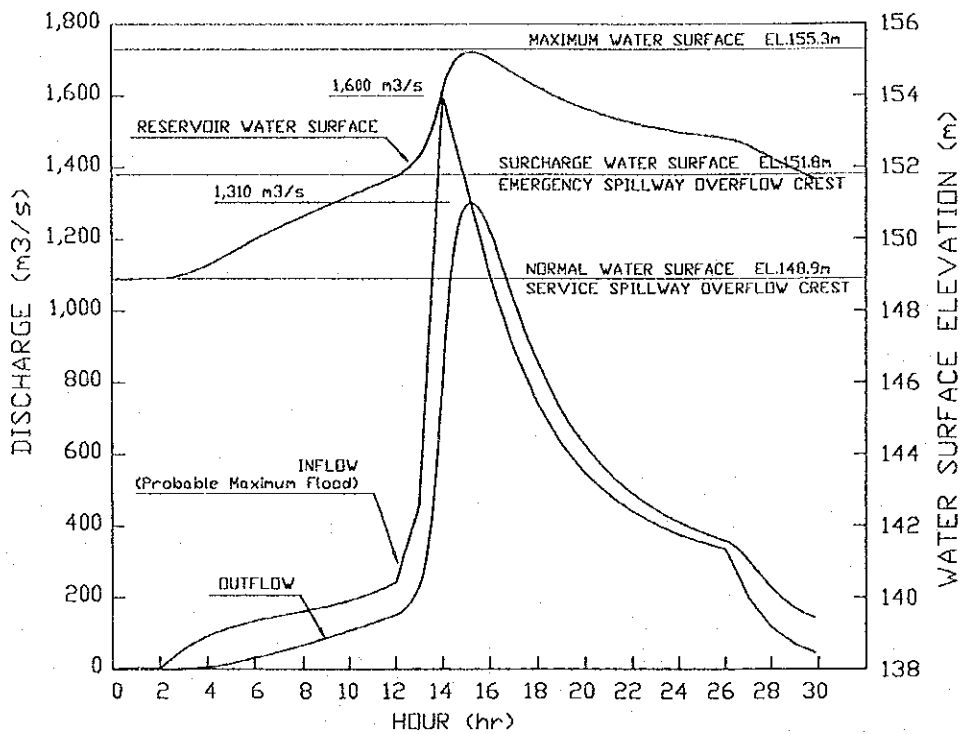
Elevation (m)	Service Spillway Discharge Qs (m³/s)	Emergency Spillway Discharge Qe (m³/s)	Total Discharge Q (m³/s)	Remarks
148.90	0.00	0.00	0.00	Normal Water Surface
149.00	0.80	0.00	0.80	
149.50	12.30	0.00	12.30	
150.00	32.20	0.00	32.20	
150.50	59.10	0.00	59.10	
151.00	92.00	0.00	92.00	
151.50	130.10	0.00	130.10	Surcharge Water Surface
151.80	155.30	0.00	155.30	
152.00	171.90	8.85	180.75	
152.50	215.20	61.80	277.00	
153.00	261.50	145.95	407.45	
153.50	310.80	256.42	567.22	
154.00	362.80	390.40	753.20	
154.50	417.40	545.67	963.07	
155.00	474.60	720.35	1,194.95	
155.30	510.00	825.04	1,335.04	
155.50	534.10	896.75	1,430.85	

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.8

DISCHARGE-ELEVATION CURVES IN COMBINED OPERATION



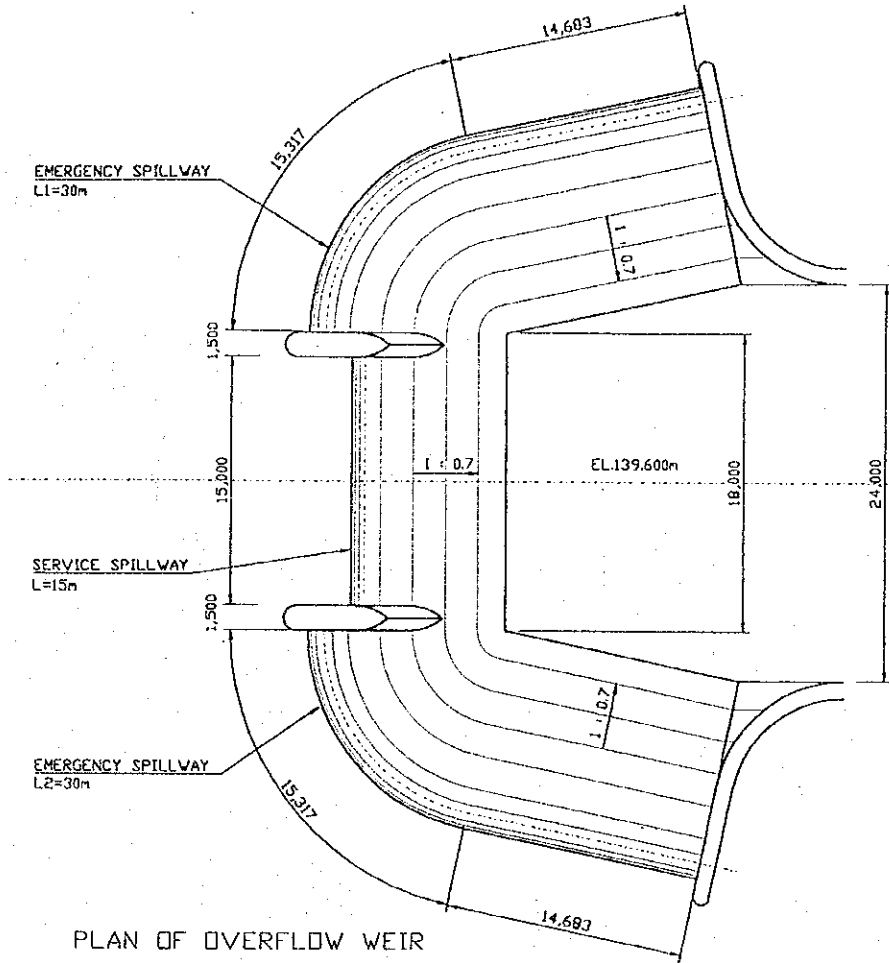
INFLOW AND OUTFLOW HYDROGRAPHS

Hour (hr)	Probable Maximum Flood		Reservoir Water Surface (EL. m)	Reservoir Storage Volume (m <sup>3</sup> )
	Inflow (m <sup>3</sup> /s)	Outflow (m <sup>3</sup> /s)		
0.0	0.00	0.00	148.90	0
1.0	2.70	0.04	148.90	4,817
2.0	2.70	0.11	148.91	14,273
3.0	57.60	1.10	149.02	121,311
4.0	93.20	6.13	149.28	381,230
5.0	116.90	16.63	149.63	720,014
6.0	134.20	32.03	150.00	1,085,628
7.0	148.20	48.80	150.32	1,449,081
8.0	161.30	67.35	150.63	1,797,512
9.0	175.30	86.90	150.93	2,125,991
10.0	191.60	107.14	151.21	2,437,338
11.0	212.70	128.45	151.48	2,741,417
12.0	242.80	152.06	151.76	3,057,354
13.0	459.60	233.71	152.30	3,663,048
14.0	1,599.30	813.84	154.15	5,751,728
15.0	1,355.10	1,302.05	155.23	7,003,193
16.0	1,099.00	1,225.36	155.07	6,793,842
17.0	894.10	1,030.17	154.65	6,315,097
18.0	741.10	857.94	154.26	5,871,456
19.0	629.00	724.53	153.93	5,499,992
20.0	546.90	623.84	153.66	5,198,066
21.0	486.00	547.89	153.44	4,954,506
22.0	440.00	490.08	153.27	4,757,620
23.0	404.60	445.46	153.13	4,597,258
24.0	376.50	410.35	153.01	4,465,084
25.0	354.00	382.32	152.91	4,354,784
26.0	335.30	359.54	152.83	4,261,398
27.0	199.20	302.96	152.61	4,013,762
28.0	117.30	228.16	152.27	3,630,632
29.0	69.60	171.91	151.94	3,254,233
30.0	41.70	140.02	151.62	2,898,763

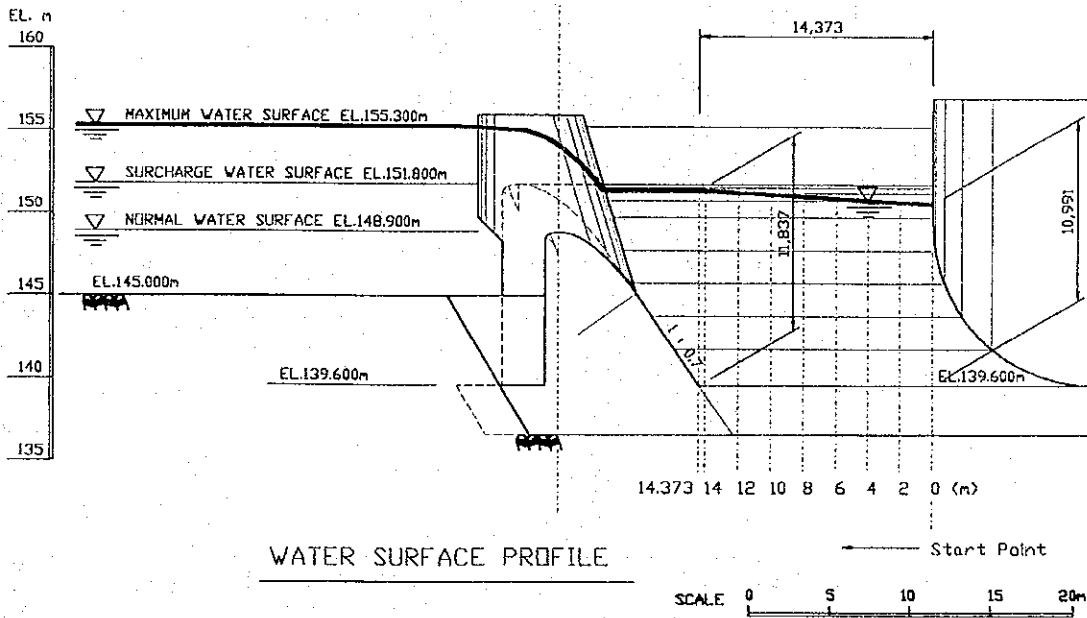
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.9  
INFLOW AND OUTFLOW HYDROGRAPHS OF  
PROBABLE MAXIMUM FLOOD



PLAN OF OVERFLOW WEIR

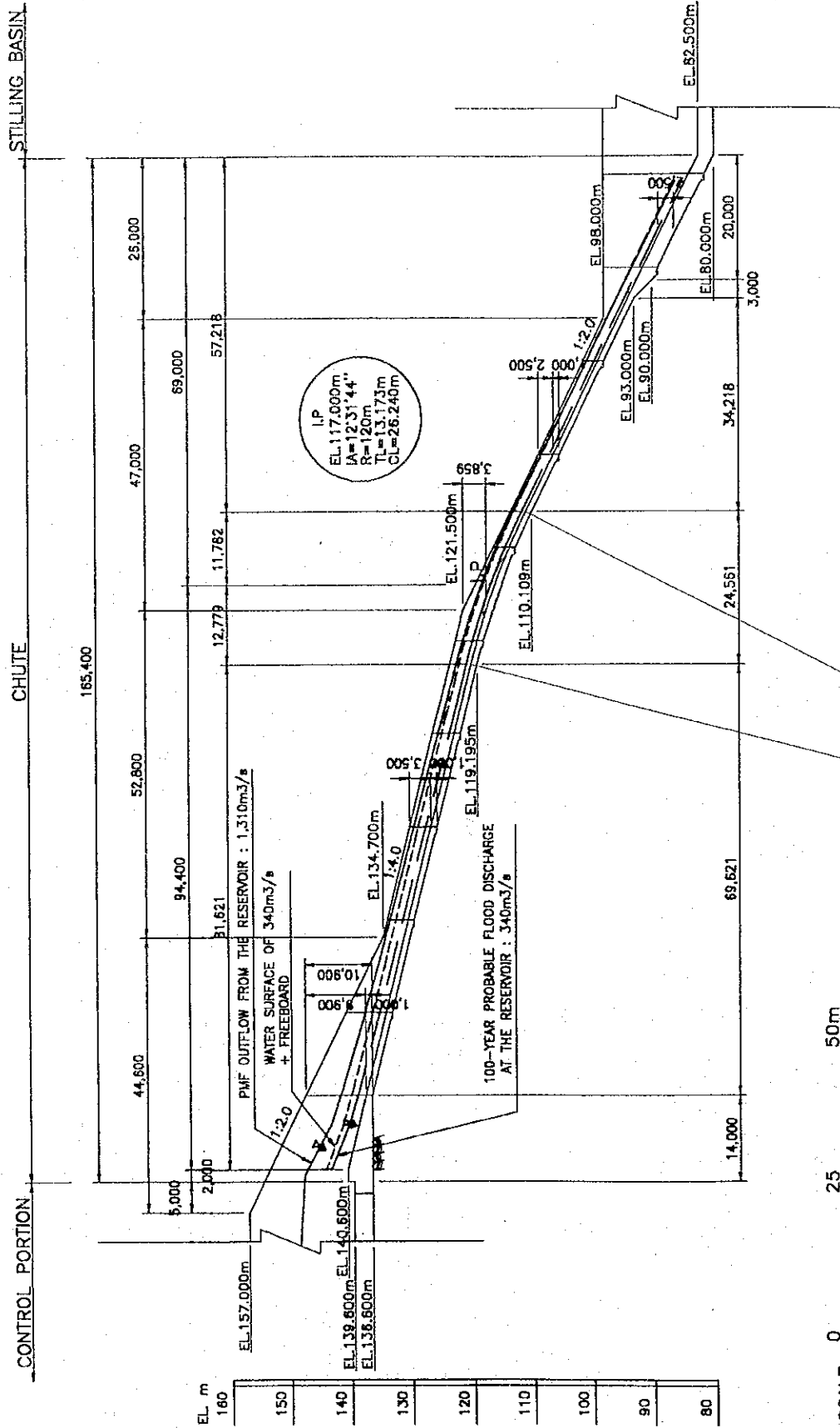


WATER SURFACE PROFILE

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.10 WATER SURFACE PROFILE IN SIDE CHANNEL

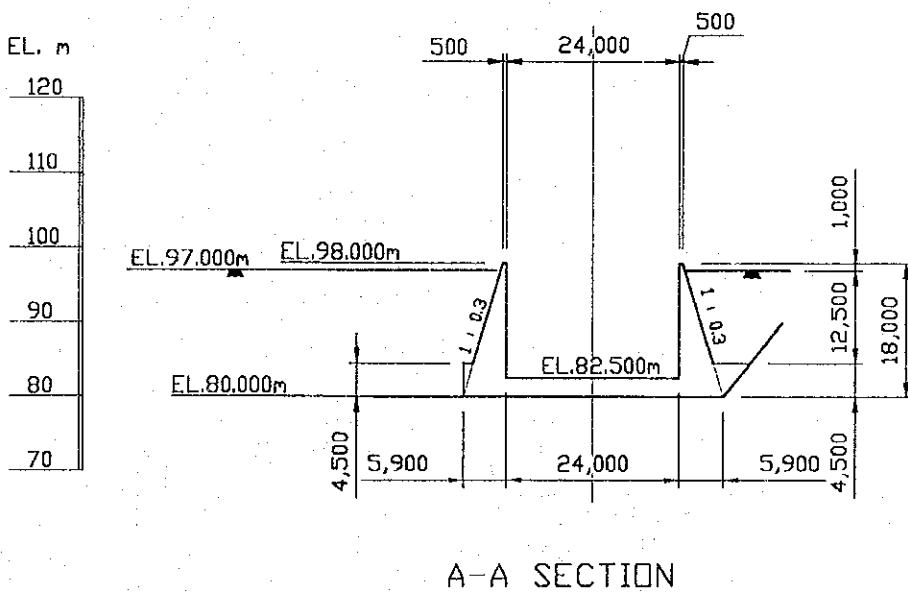
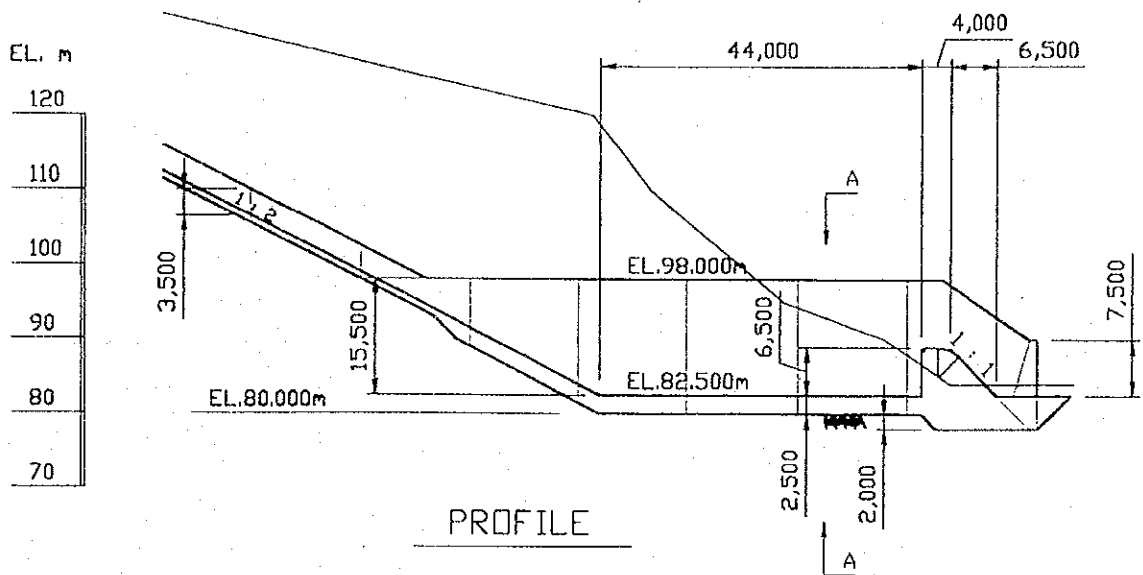


THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.11

WATER SURFACE PROFILE IN CHUTE



SCALE 0 10 20 40 60m

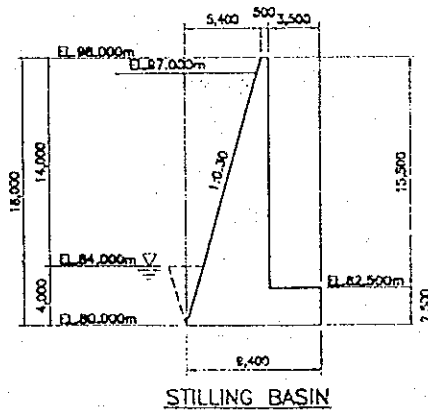
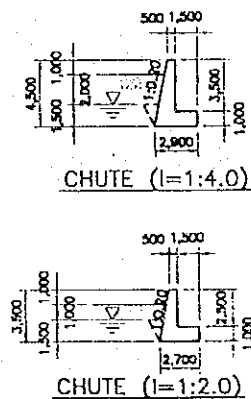
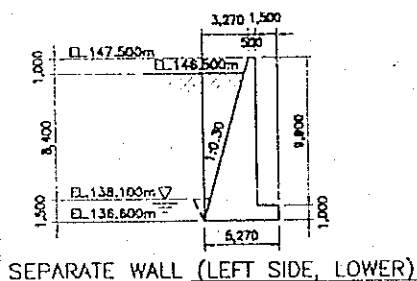
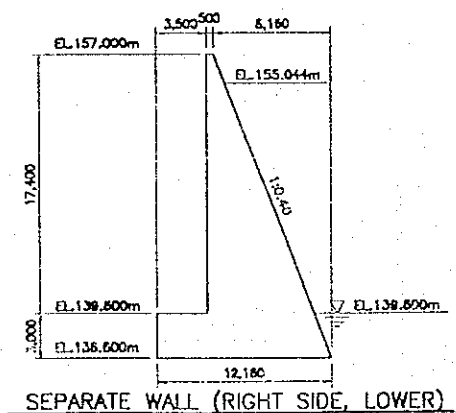
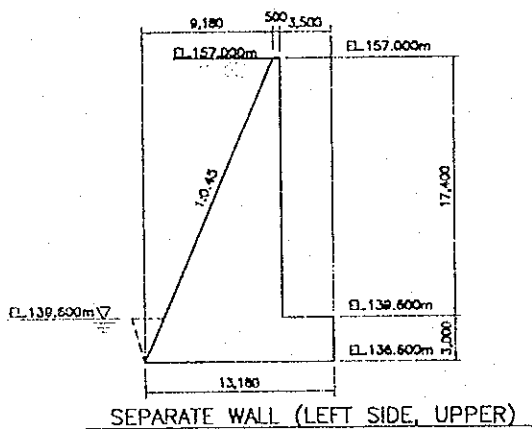
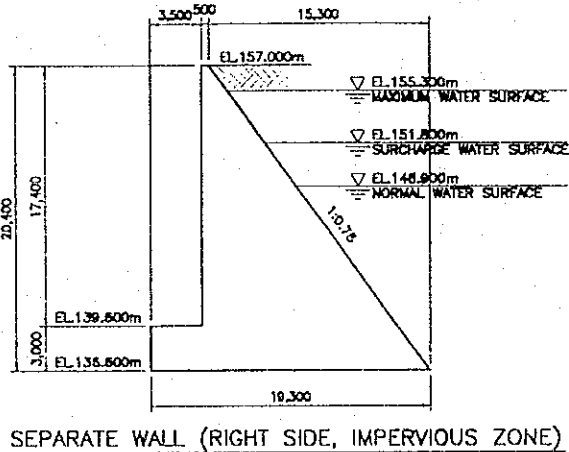
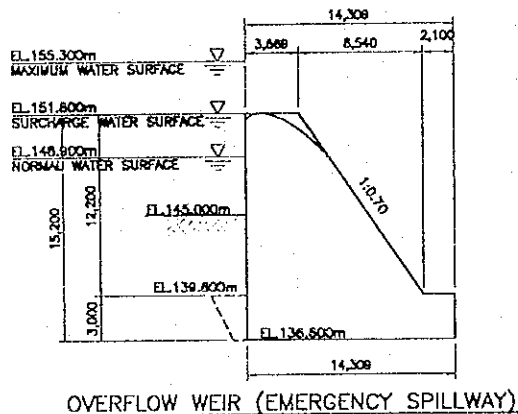
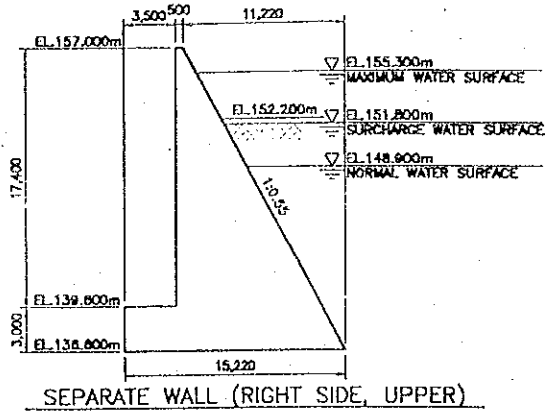
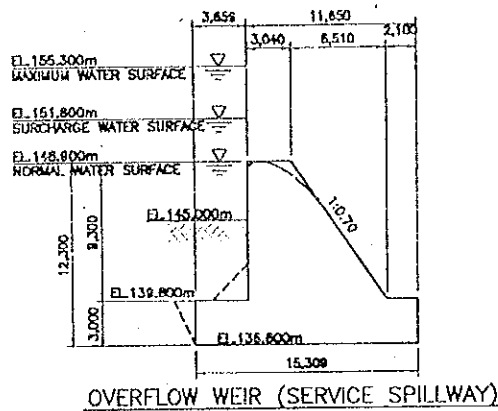
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.12

LAYOUT OF SPILLWAY STILLING BASIN





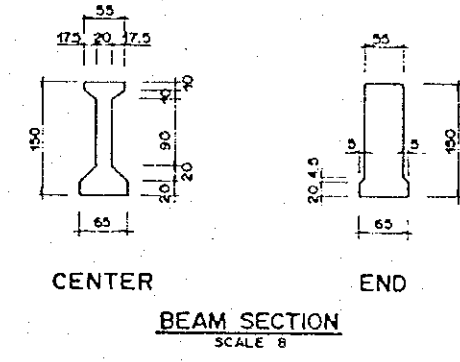
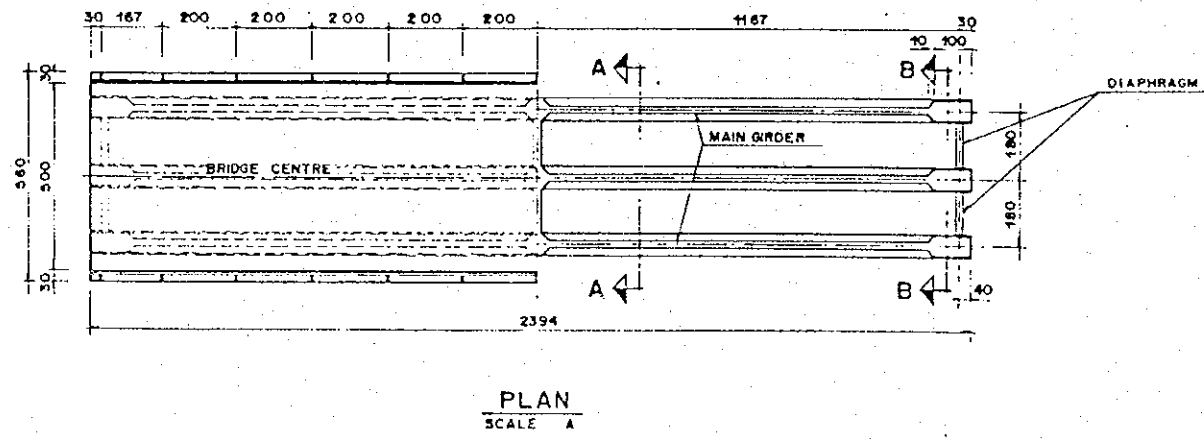
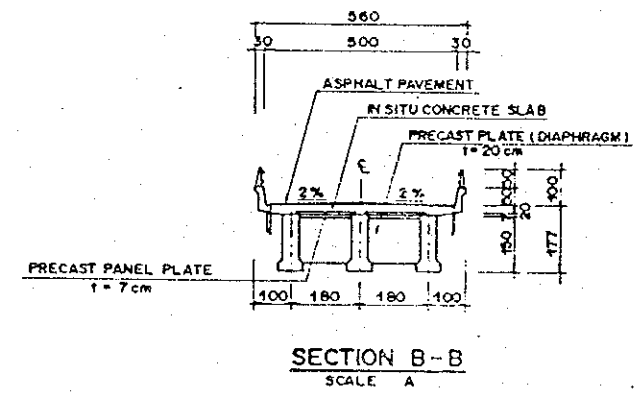
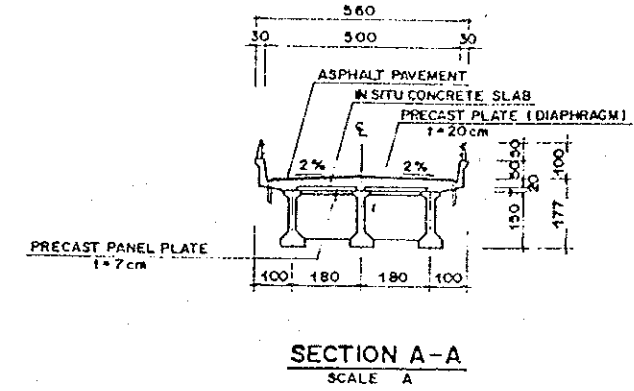
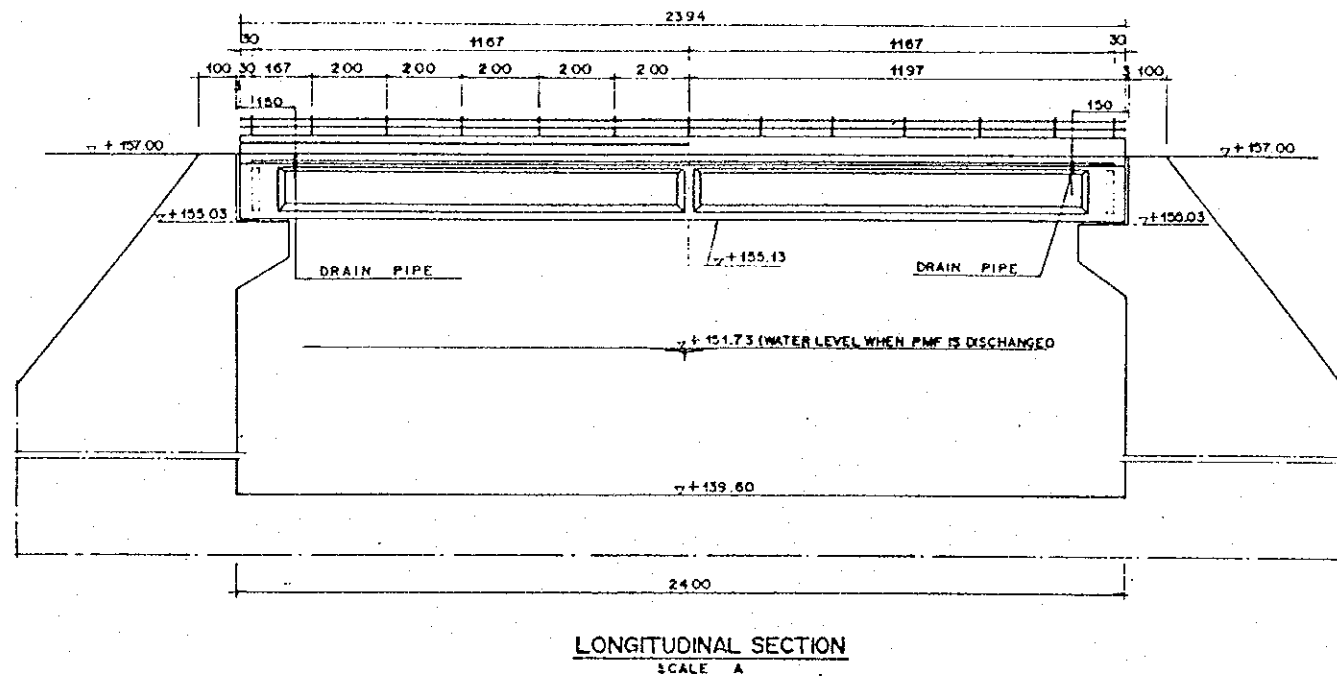
SCALE 0 10 20m

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

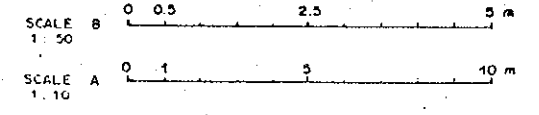
Fig. 7.4.13 ANALYZED WALL SECTIONS OF SPILLWAY

JAPAN INTERNATIONAL COOPERATION AGENCY





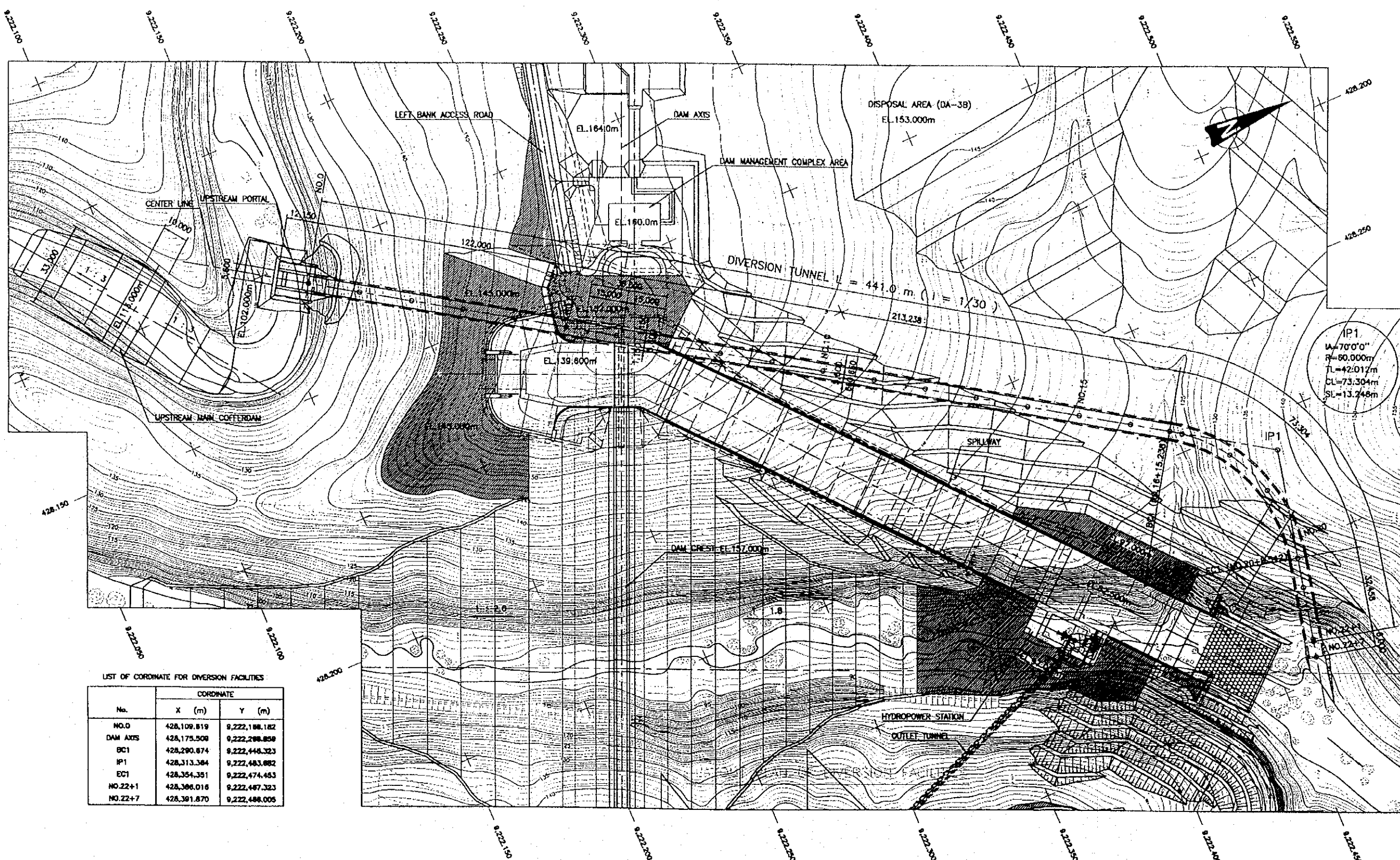
- NOTE :**
1. UNIT IN CENTIMETER
  2. CONCRETE QUALITY FOR MAIN GIRDER AND DIAPHRAGM K-400.
  3. CONCRETE QUALITY FOR SLAB K-250.
  4. PRECAST PANEL CONCRETE K-250



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.4.14 STRUCTURAL FEATURES OF SPILLWAY BRIDGE



LIST OF COORDINATE FOR DIVERSION FACILITIES

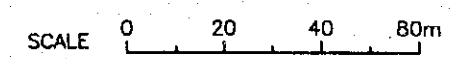
No.	COORDINATE	
	X (m)	Y (m)
NO.0	428,109.819	9,222,188.182
DAM AXIS	428,175.508	9,222,288.858
BC1	428,290.874	9,222,448.323
IP1	428,313.384	9,222,483.882
EC1	428,354.351	9,222,474.453
NO.22+1	428,368.018	9,222,497.323
NO.22+7	428,381.870	9,222,488.005

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

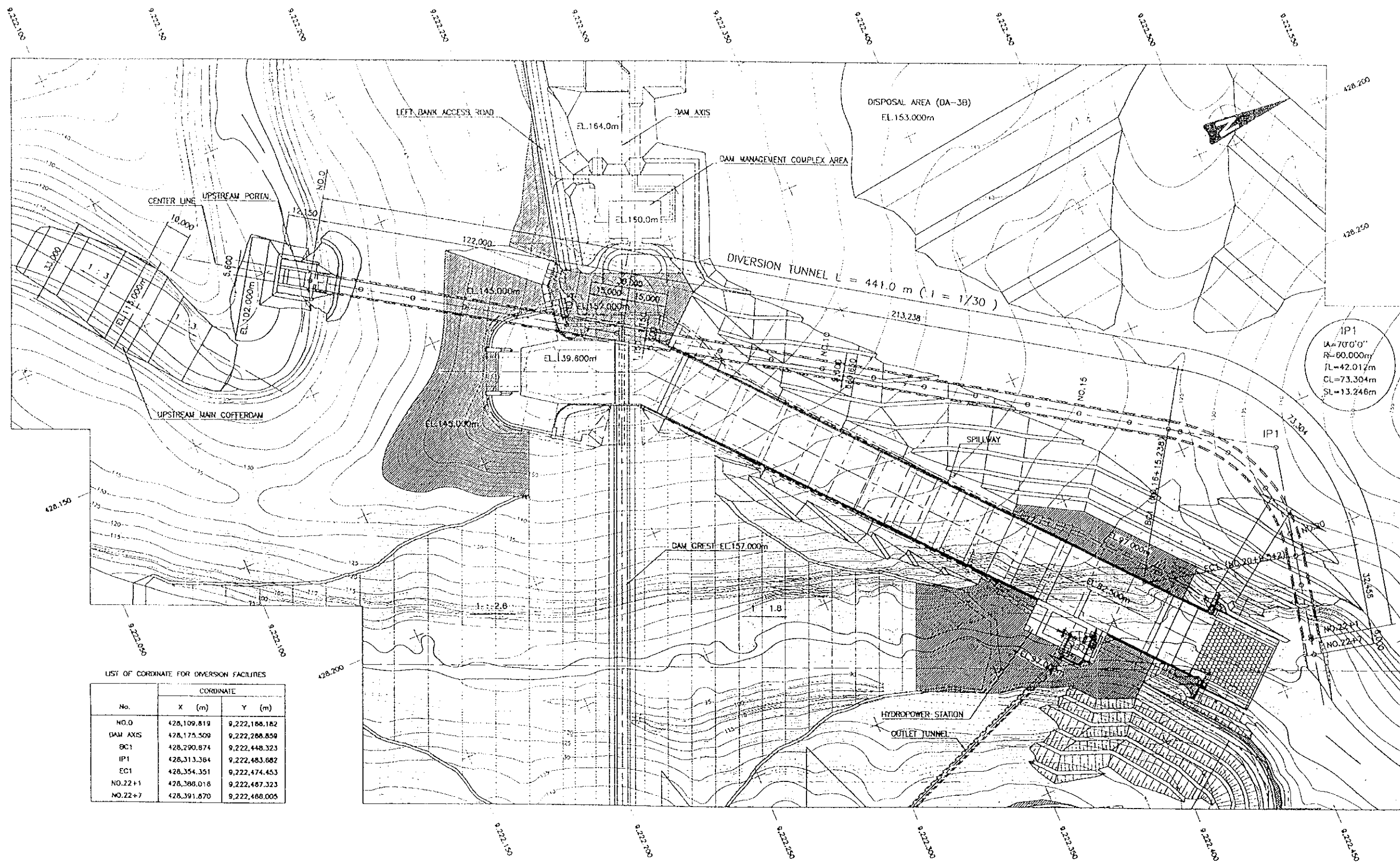
**REFERENCE DRAWINGS**

- JD-P1-DF-Tu-1 TUNNEL - PROFILE AND TYPICAL CROSS SECTIONS
- JD-P1-DF-Up-1 UPSTREAM PORTAL - LAYOUT PLAN
- JD-P1-DF-Pg-1 PLUG WORKS IN DIVERSION TUNNEL - CONCRETE PLUG DETAILS.



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA  
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.5.1  
 PLAN OF DIVERSION FACILITIES



**NOTES**

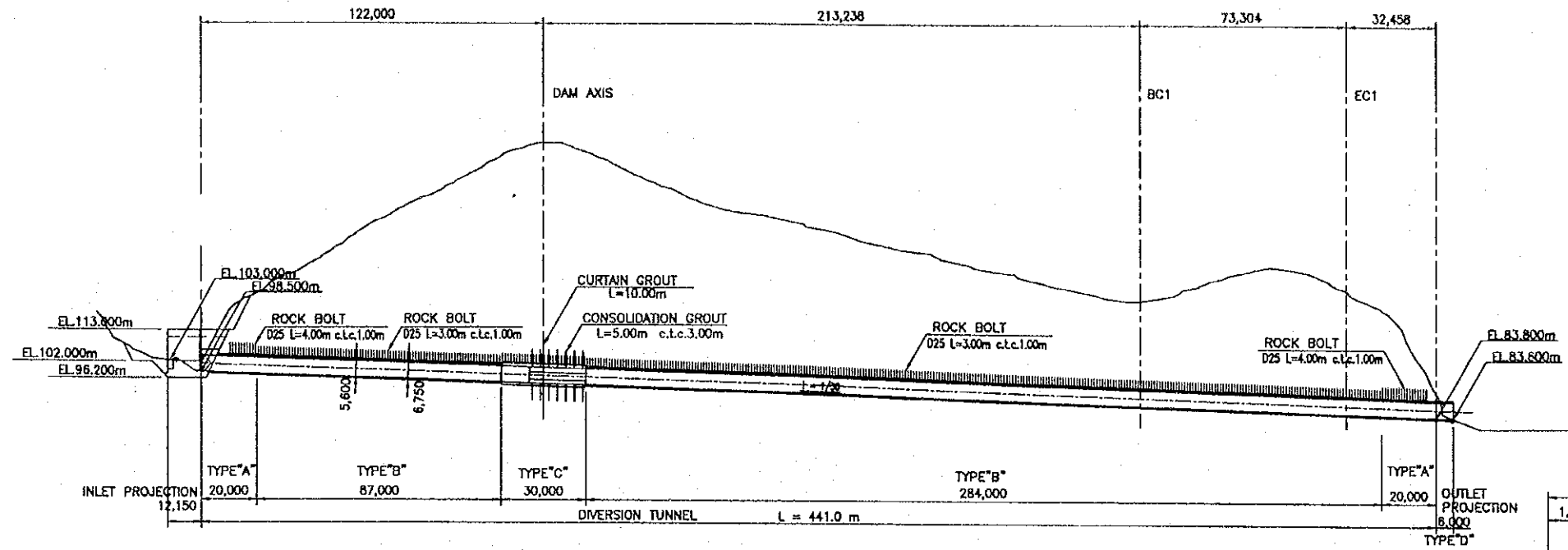
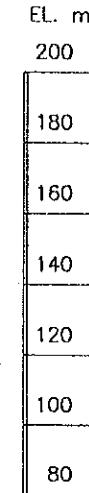
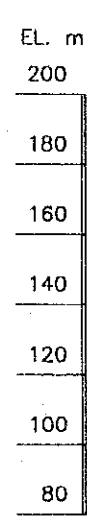
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

**REFERENCE DRAWINGS**

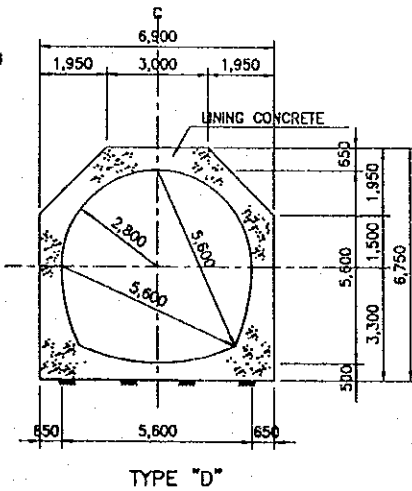
- JD-P1-DF-Tu-1 TUNNEL - PROFILE AND TYPICAL CROSS SECTIONS
- JD-P1-DF-Up-1 UPSTREAM PORTAL - LAYOUT PLAN
- JD-P1-DF-Pg-1 PLUG WORKS IN DIVERSION TUNNEL - CONCRETE PLUG DETAILS

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA  
JAPAN INTERNATIONAL COOPERATION AGENCY

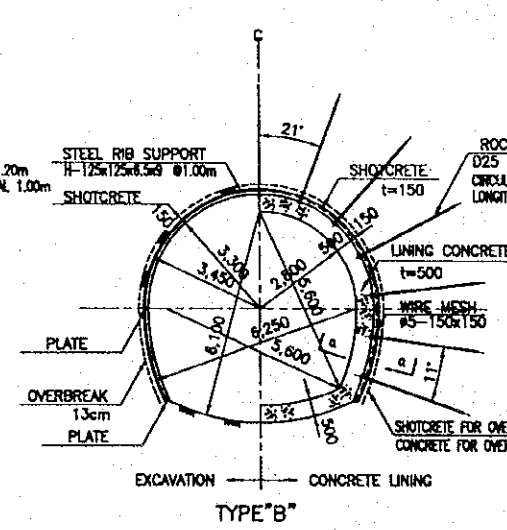
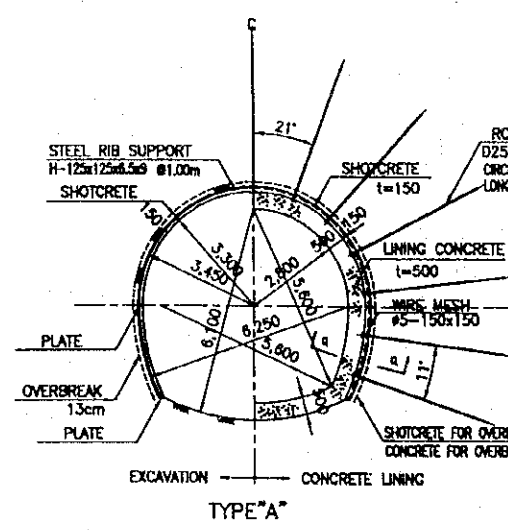
Fig. 7.5.1  
PLAN OF DIVERSION FACILITIES



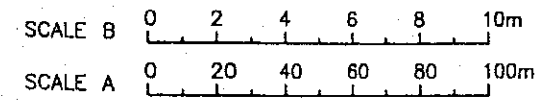
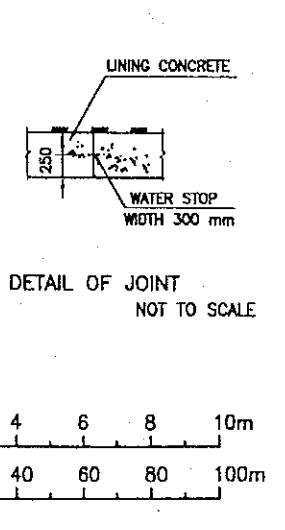
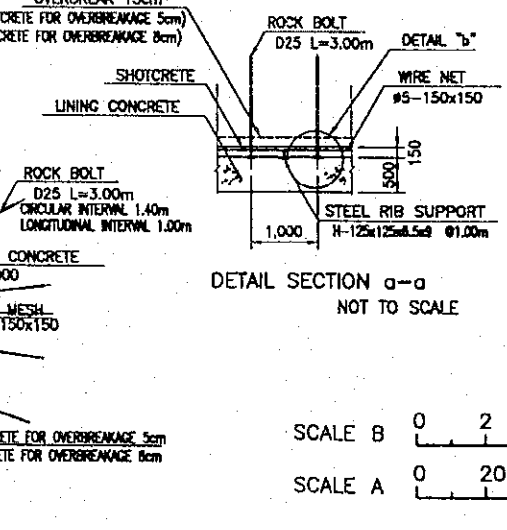
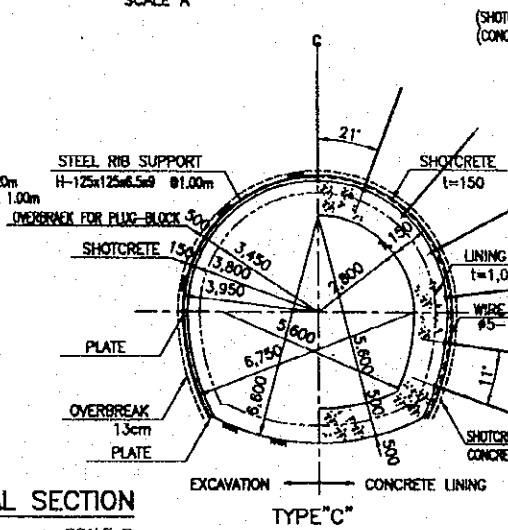
CURVE BAND	SURVEY POINT	DISTANCE	INCREASE IN DISTANCE	FINISHING POINT
	NO.0	2.000	2.000	98.567
	NO.1	6.000	6.000	98.560
	NO.2	20.000	20.000	97.833
	NO.3	20.000	40.000	97.167
	NO.4	20.000	60.000	96.500
	NO.5	20.000	80.000	95.833
	NO.6	7.000	100.000	95.167
	NO.7	13.000	107.000	94.833
	NO.8	2.000	120.000	94.500
	NO.9	3.000	122.000	94.433
	NO.10	3.000	125.000	93.933
	NO.11	3.000	130.000	93.833
	NO.12	20.000	140.000	93.167
	NO.13	20.000	160.000	92.500
	NO.14	20.000	180.000	91.833
	NO.15	20.000	200.000	91.167
	NO.16	20.000	220.000	90.500
	NO.17	20.000	240.000	89.833
	NO.18	20.000	260.000	89.167
	NO.19	20.000	280.000	88.500
	NO.20	20.000	300.000	87.833
	BC1	15.238	315.238	87.249
	EC1	4.762	340.000	87.167
	NO.21	20.000	360.000	86.500
	NO.22	8.542	408.542	85.833
	NO.23	11.458	420.000	85.167
	NO.24	1.000	421.000	84.882
	NO.25	1.000	422.000	84.500
	NO.26	1.000	423.000	84.467
	NO.27	1.000	424.000	83.833
	NO.28	1.000	425.000	83.600
	NO.29	1.000	426.000	83.600
	NO.30	1.000	427.000	83.600
	NO.31	1.000	428.000	83.600
	NO.32	1.000	429.000	83.600
	NO.33	1.000	430.000	83.600
	NO.34	1.000	431.000	83.600
	NO.35	1.000	432.000	83.600
	NO.36	1.000	433.000	83.600
	NO.37	1.000	434.000	83.600
	NO.38	1.000	435.000	83.600
	NO.39	1.000	436.000	83.600
	NO.40	1.000	437.000	83.600
	NO.41	1.000	438.000	83.600
	NO.42	1.000	439.000	83.600
	NO.43	1.000	440.000	83.600
	NO.44	1.000	441.000	83.600
	NO.45	1.000	442.000	83.600
	NO.46	1.000	443.000	83.600
	NO.47	1.000	444.000	83.600
	NO.48	1.000	445.000	83.600
	NO.49	1.000	446.000	83.600
	NO.50	1.000	447.000	83.600
	NO.51	1.000	448.000	83.600
	NO.52	1.000	449.000	83.600
	NO.53	1.000	450.000	83.600
	NO.54	1.000	451.000	83.600
	NO.55	1.000	452.000	83.600
	NO.56	1.000	453.000	83.600
	NO.57	1.000	454.000	83.600
	NO.58	1.000	455.000	83.600
	NO.59	1.000	456.000	83.600
	NO.60	1.000	457.000	83.600
	NO.61	1.000	458.000	83.600
	NO.62	1.000	459.000	83.600
	NO.63	1.000	460.000	83.600
	NO.64	1.000	461.000	83.600
	NO.65	1.000	462.000	83.600
	NO.66	1.000	463.000	83.600
	NO.67	1.000	464.000	83.600
	NO.68	1.000	465.000	83.600
	NO.69	1.000	466.000	83.600
	NO.70	1.000	467.000	83.600
	NO.71	1.000	468.000	83.600
	NO.72	1.000	469.000	83.600
	NO.73	1.000	470.000	83.600
	NO.74	1.000	471.000	83.600
	NO.75	1.000	472.000	83.600
	NO.76	1.000	473.000	83.600
	NO.77	1.000	474.000	83.600
	NO.78	1.000	475.000	83.600
	NO.79	1.000	476.000	83.600
	NO.80	1.000	477.000	83.600
	NO.81	1.000	478.000	83.600
	NO.82	1.000	479.000	83.600
	NO.83	1.000	480.000	83.600
	NO.84	1.000	481.000	83.600
	NO.85	1.000	482.000	83.600
	NO.86	1.000	483.000	83.600
	NO.87	1.000	484.000	83.600
	NO.88	1.000	485.000	83.600
	NO.89	1.000	486.000	83.600
	NO.90	1.000	487.000	83.600
	NO.91	1.000	488.000	83.600
	NO.92	1.000	489.000	83.600
	NO.93	1.000	490.000	83.600
	NO.94	1.000	491.000	83.600
	NO.95	1.000	492.000	83.600
	NO.96	1.000	493.000	83.600
	NO.97	1.000	494.000	83.600
	NO.98	1.000	495.000	83.600
	NO.99	1.000	496.000	83.600
	NO.100	1.000	497.000	83.600
	NO.101	1.000	498.000	83.600
	NO.102	1.000	499.000	83.600
	NO.103	1.000	500.000	83.600



PROFILE  
SCALE A



TYPICAL SECTION  
SCALE B

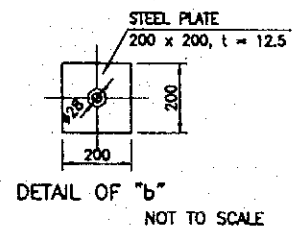


NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. LINING CONCRETE OF DIVERSION TUNNEL SHALL BE OF TYPE A AS PER SPECIFICATION.

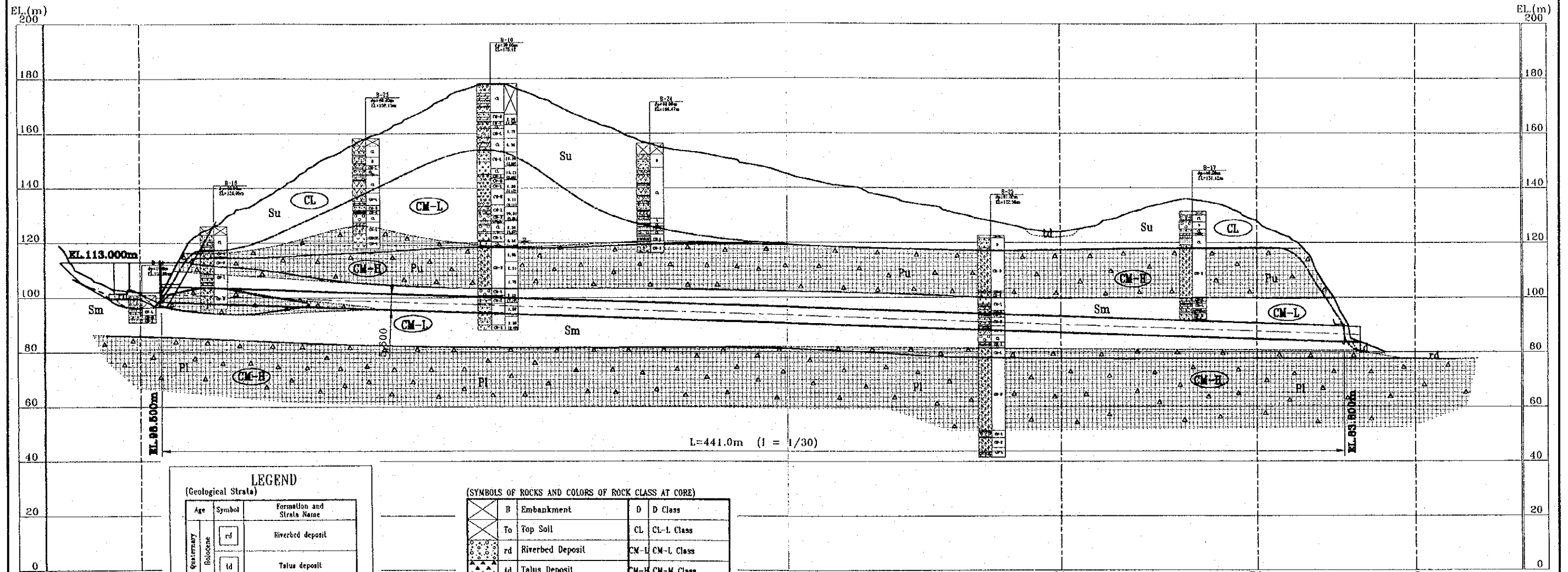
REFERENCE DRAWINGS

- JD-P1-DF-PI-1 DIVERSION FACILITIES - LAYOUT PLAN
- JD-P1-DF-TU-2 TUNNEL - REINFORCEMENT DETAILS AND STEEL RIB SUPPORT



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA  
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.5.2  
PROFILE OF DIVERSION FACILITIES



**LEGEND**  
(Geological Strata)

Age	Symbol	Formation and Strata Name
Quaternary	rd	Riverbed deposit
	td	Talus deposit
Tertiary-Quaternary	Su	Upper Sedimentary Rock Unit
	Pu	Upper Pyroclastic Rock Unit
	Sm	Middle Sedimentary Rock Unit
	Pl	Lower Pyroclastic Rock Unit
	Sl	Lower Sedimentary Rock Unit

(Note)

--- Boundary of Geological Unit  
 ~~~~~ Boundary of Rock Class

(SYMBOLS OF ROCKS AND COLORS OF ROCK CLASS AT CORE)

| Symbol | Rock Name               | Rock Class      |
|--------|-------------------------|-----------------|
| B      | Embankment              | D D Class       |
| To     | Top Soil                | CL CL-1 Class   |
| rd     | Riverbed Deposit        | CM-L CM-L Class |
| td     | Talus Deposit           | CM-H CM-M Class |
| Cg     | Conglomerate            |                 |
| Sc     | Conglomeratic Sandstone |                 |
| Ss     | Sandstone               |                 |
| Sl     | Siltstone               |                 |
| St     | Tuffaceous Sandstone    |                 |
| Ts     | Sandy Tuff              |                 |
| Tf     | Tuff                    |                 |
| Cv     | Volcanic Conglomerate   |                 |
| Bb     | Volcanic Breccia        |                 |
| La     | Andesite Lava           |                 |

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 7.5.3  
GEOLOGICAL PROFILE ALONG CENTERLINE OF DIVERSION TUNNEL