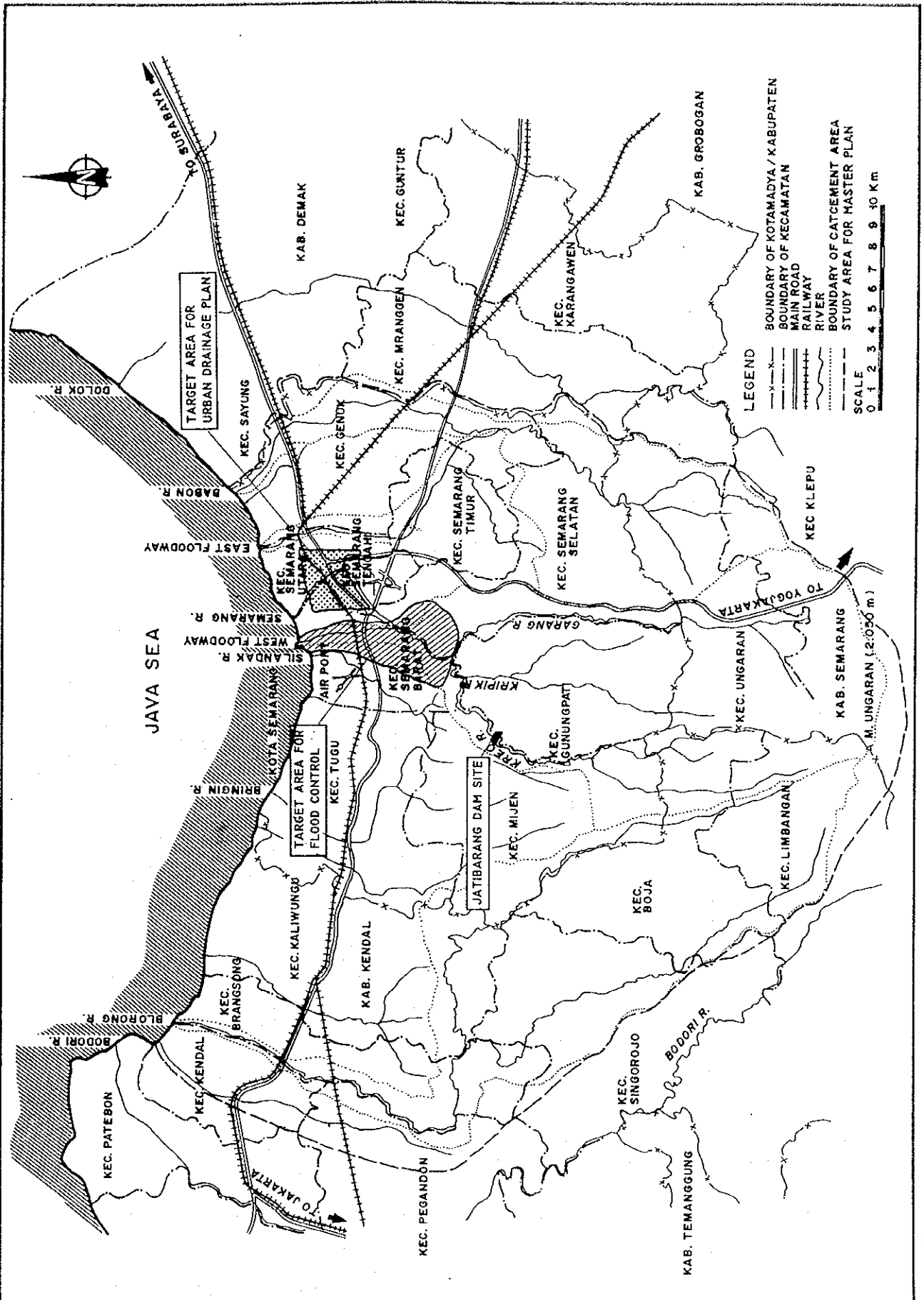


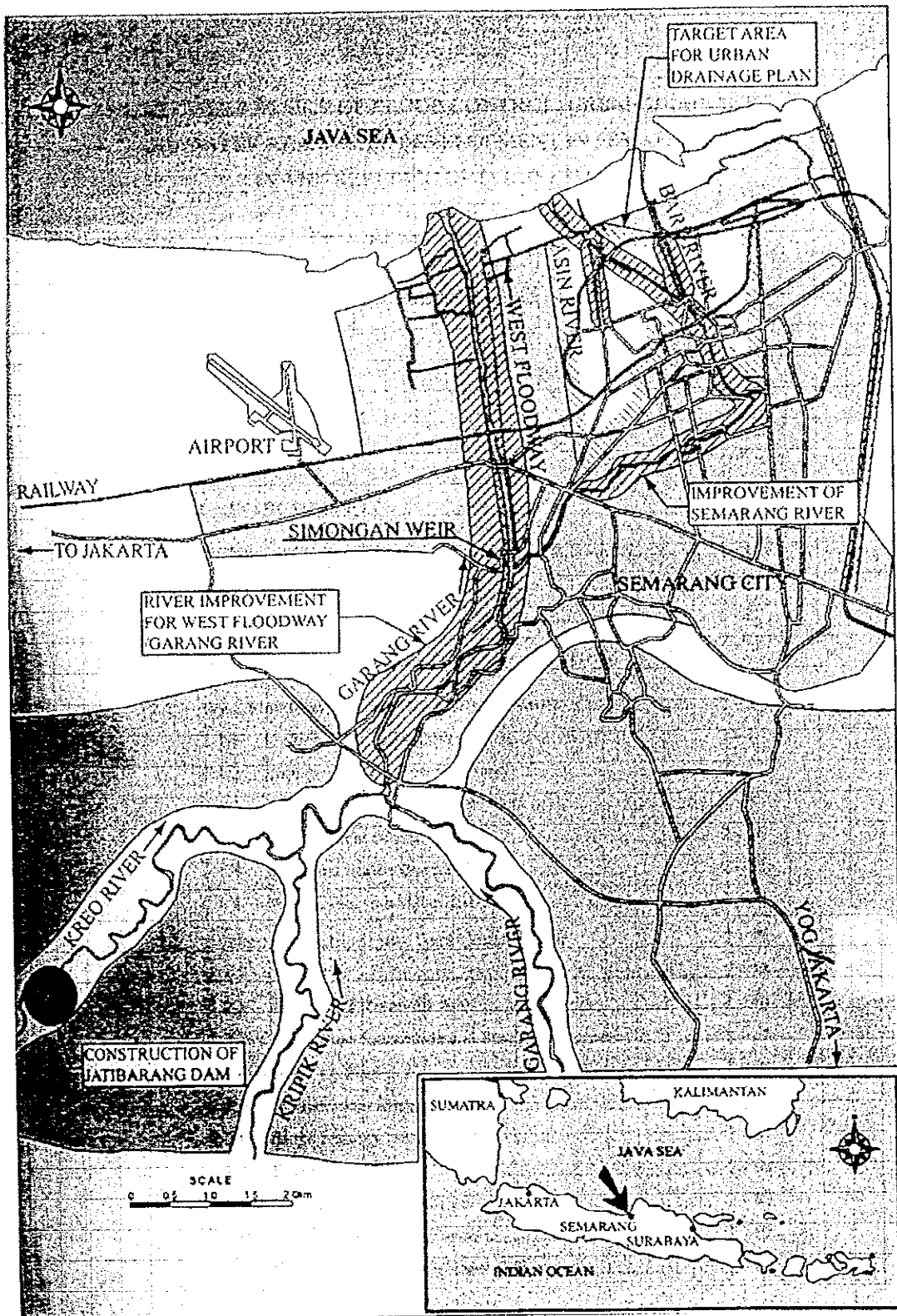
FIGURES



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

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 1.1 Study Area for Master Plan and Feasibility Study on Flood Control and Urban Drainage in Semarang

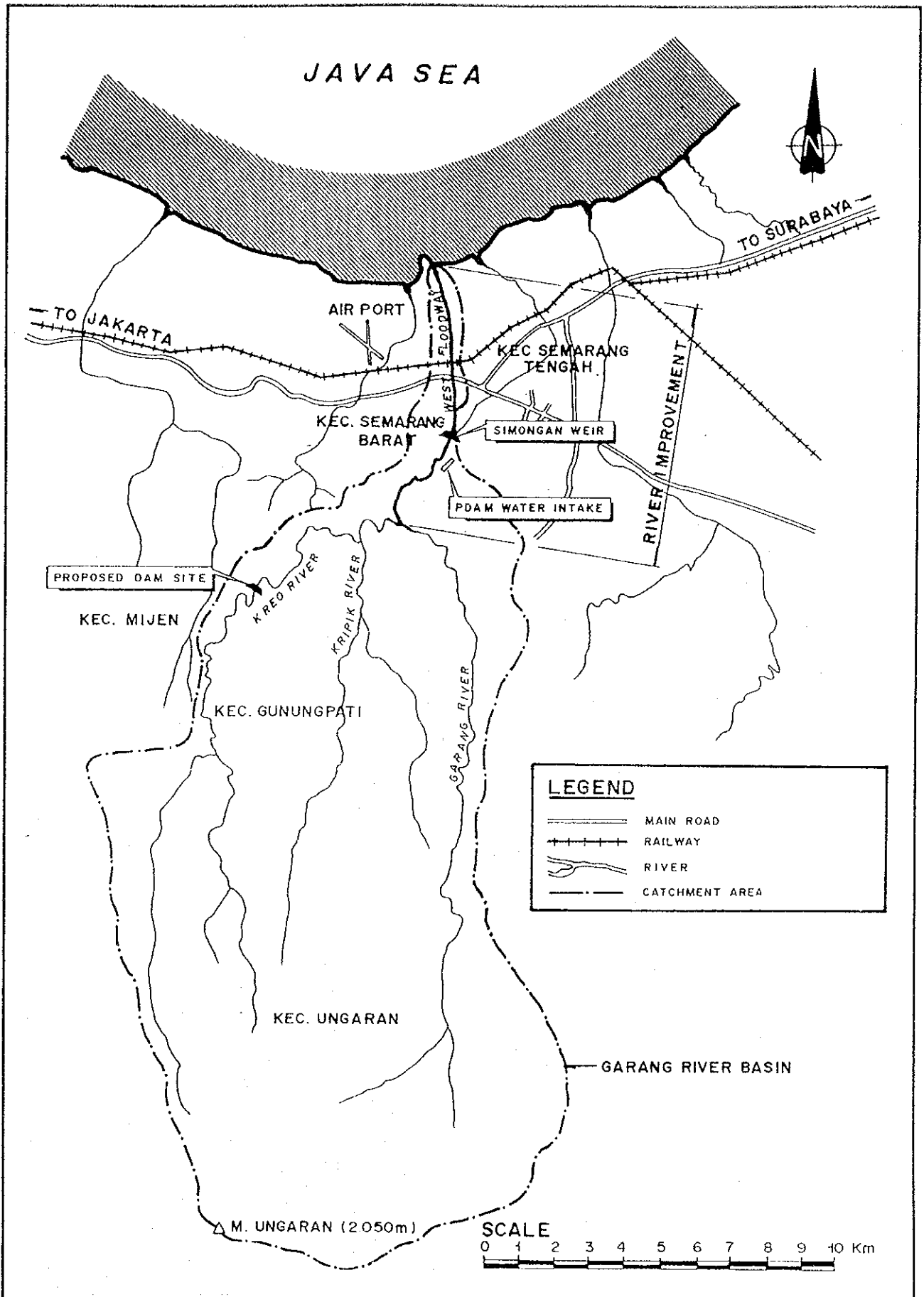


THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

Fig. 1.2

STUDY AREA FOR DETAILED DESIGN

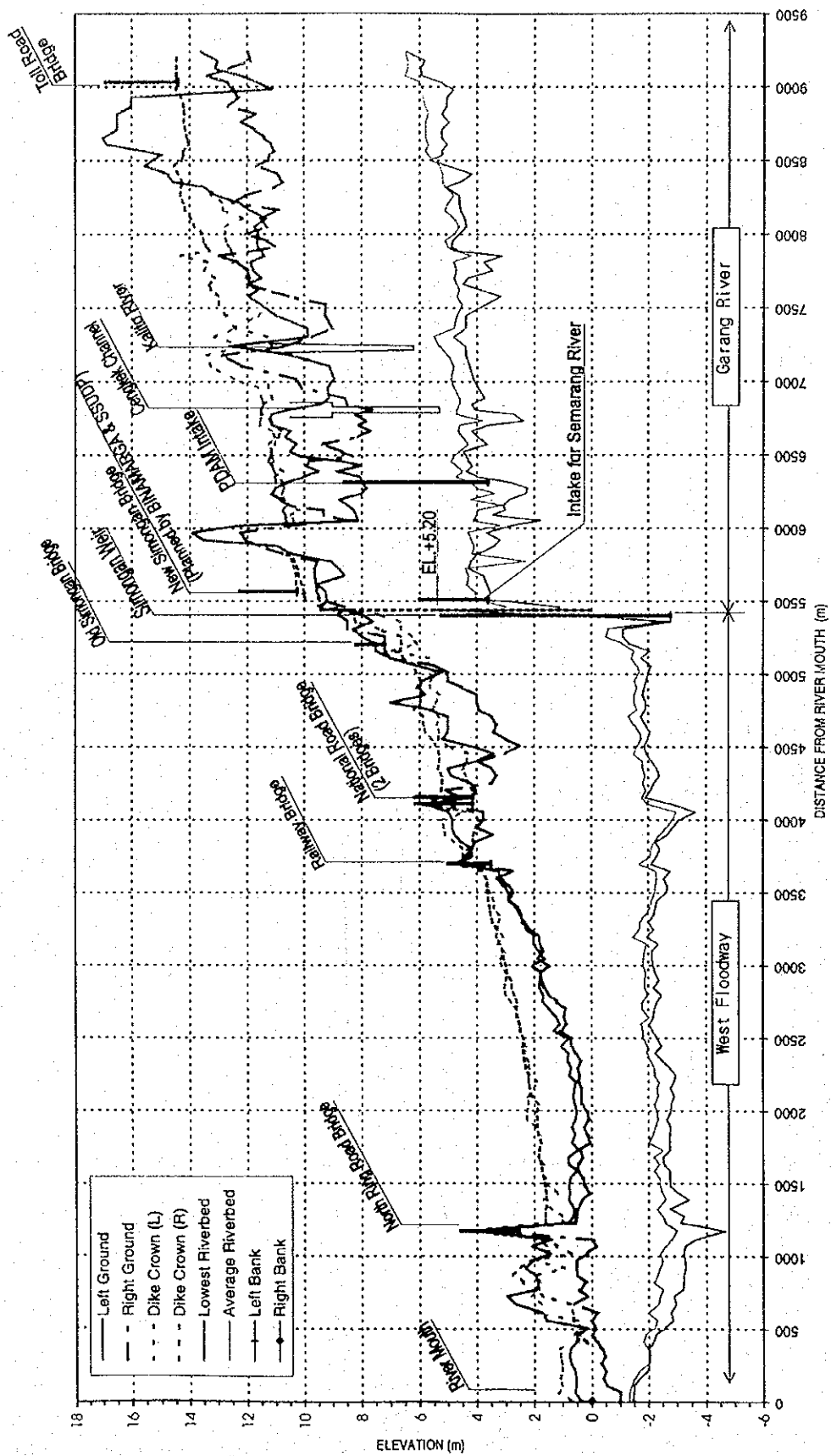
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THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

Fig. 3.1 Existing Garang River System

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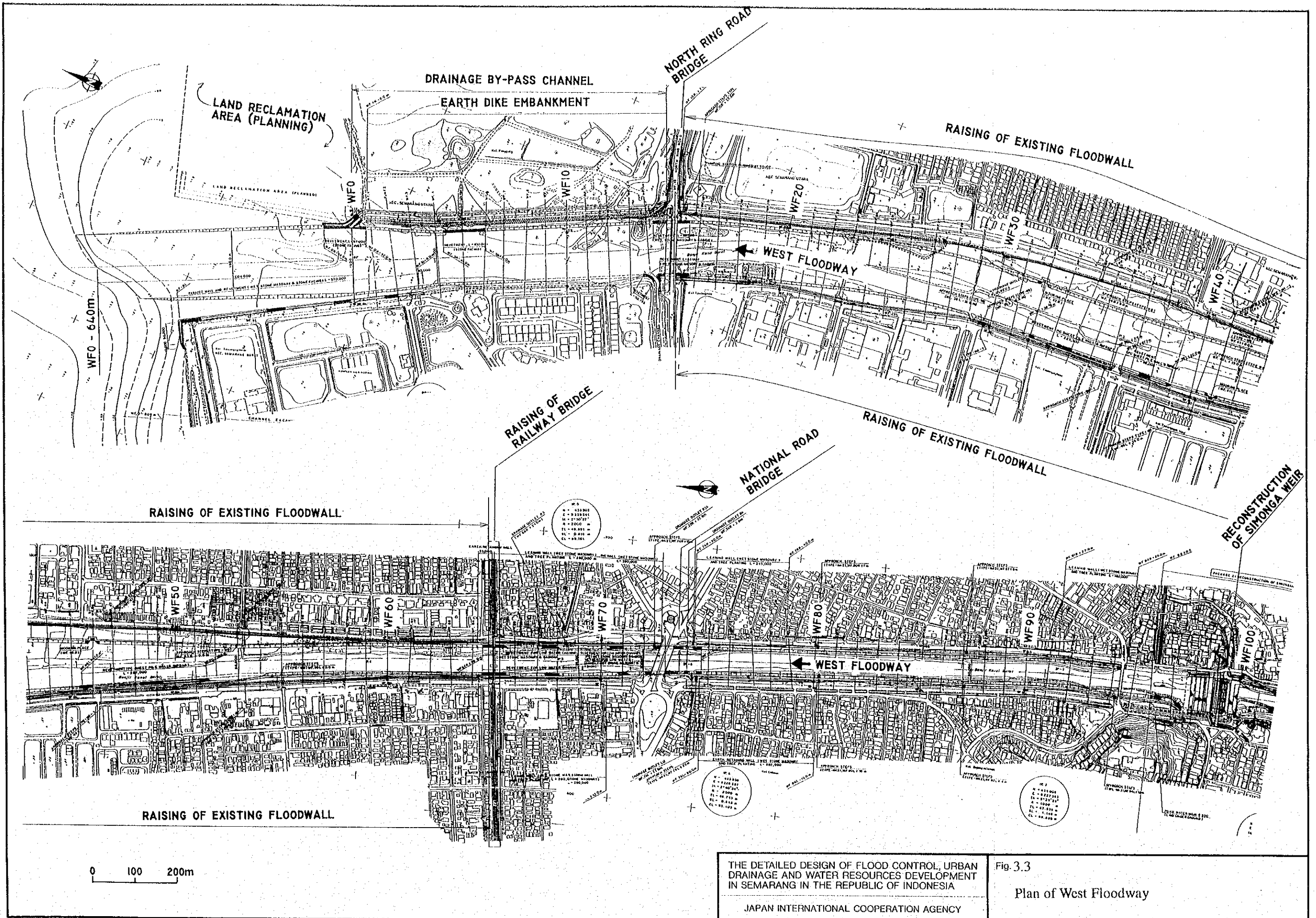


THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

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Fig. 3.2

Existing Longitudinal Profile of West Floodway and Garang River Channels



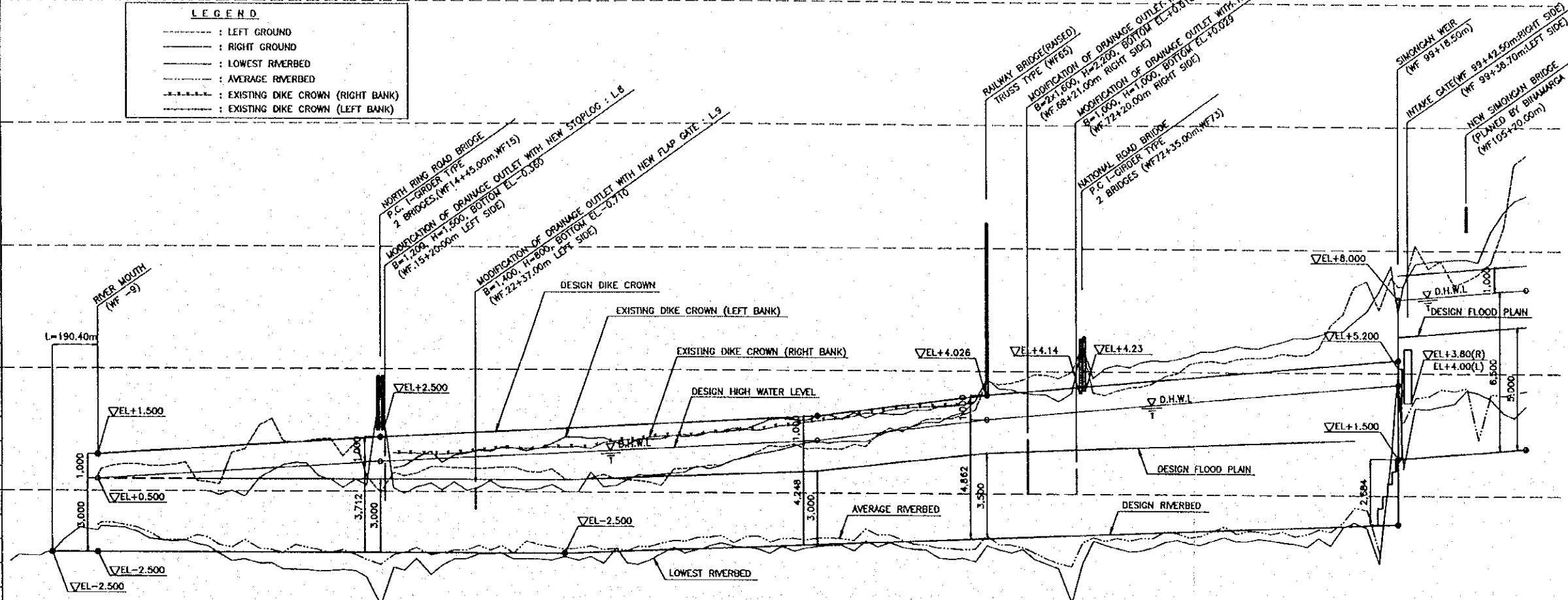
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 3.3
 Plan of West Floodway

(EL. m) 20.00

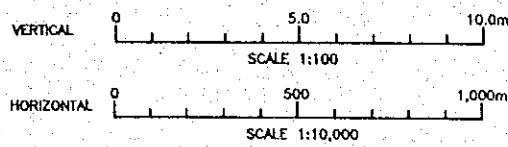
LEGEND

- : LEFT GROUND
- : RIGHT GROUND
- : LOWEST RIVERBED
- : AVERAGE RIVERBED
- : EXISTING DIKE CROWN (RIGHT BANK)
- : EXISTING DIKE CROWN (LEFT BANK)



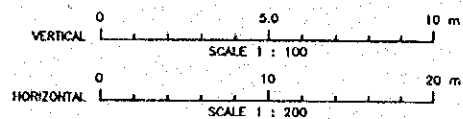
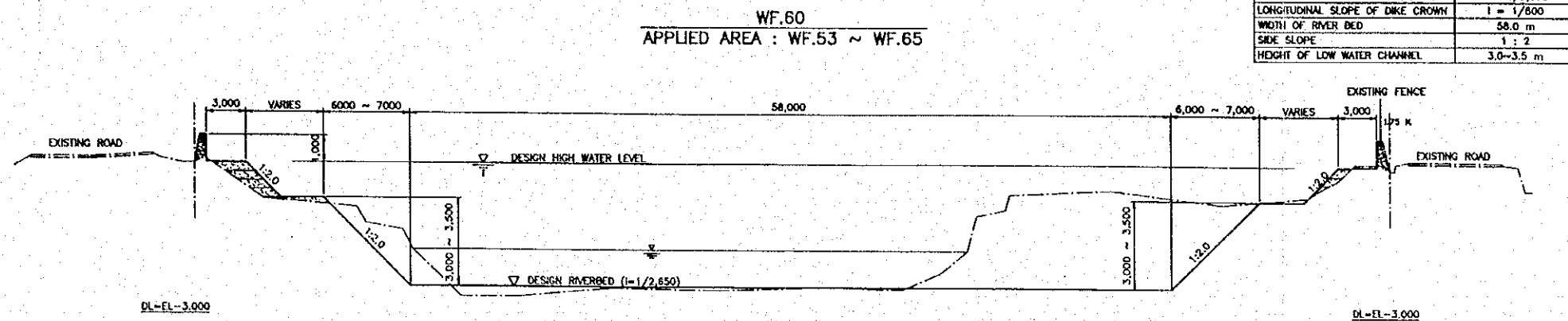
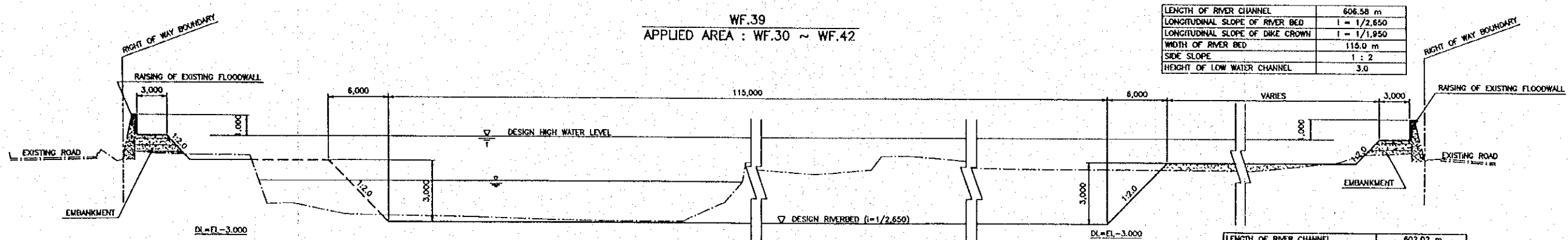
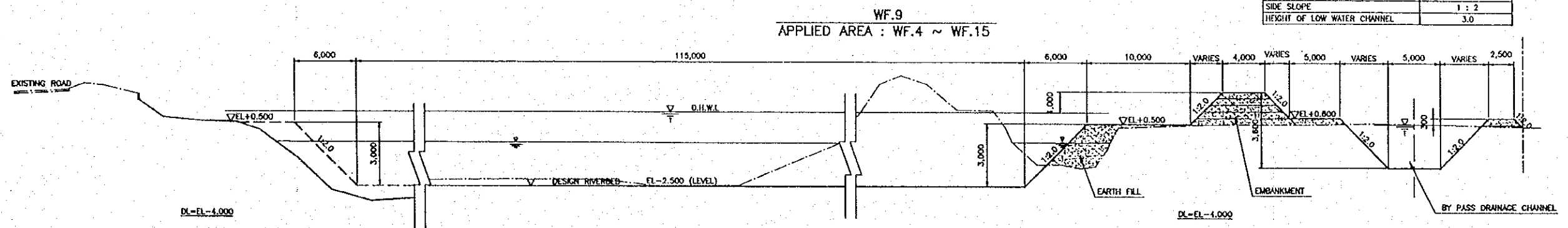
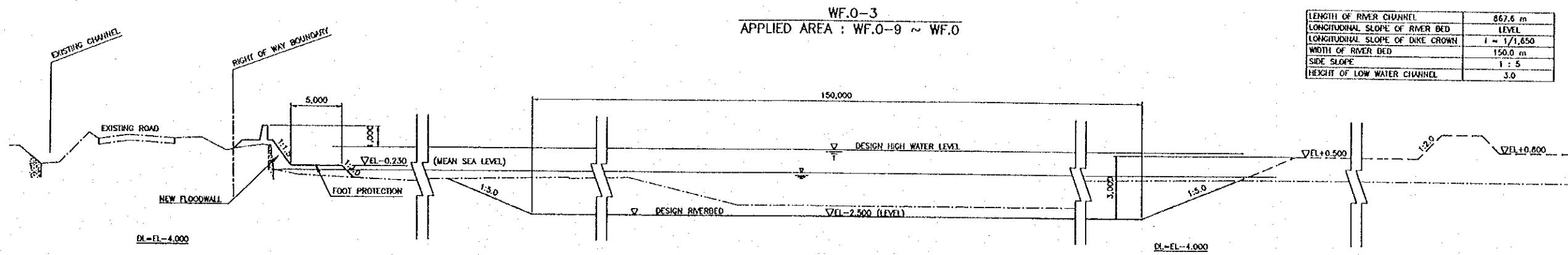
DL = -5.000m

GRADIENT OF DESIGN H.W.L.		0.500	$\frac{1}{1850}$ L=1174.38m	1.212	$\frac{1}{1950}$ L=1822.42m	2.14	$\frac{1}{800}$ L=703.39m	3.028	$\frac{1}{1150}$ L=1728.00m	4.329	$\frac{1}{1250}$
GRADIENT OF DESIGN RIVERBED		2.500	LEVEL L=1940.73m			2.500	$\frac{1}{2650}$ L=3487.46m		1.500	$\frac{1}{1250}$	1.500
DESIGN ELEVATION	DIKE CROWN	1.500	1.539	1.578	1.617	1.656	1.695	1.734	1.773	1.812	1.851
	HIGH WATER LEVEL	0.500	0.539	0.578	0.617	0.656	0.695	0.734	0.773	0.812	0.851
	RIVERBED	-2.500	-2.500	-2.500	-2.500	-2.500	-2.500	-2.500	-2.500	-2.500	-2.500
EXISTING ELEVATION	RIGHT GROUND	0.00	-0.18	-0.32	-0.42	-0.48	-0.51	-0.52	-0.51	-0.48	-0.42
	LEFT GROUND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LOWEST RIVERBED	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50	-2.50
DISTANCE	ACCUMULATED (m)	-66.00	-71.00	-76.00	-81.00	-86.00	-91.00	-96.00	-101.00	-106.00	-111.00
	PARTIAL (m)	-66.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
STATION NO.		TT	TT	TT	TT	TT	TT	TT	TT	TT	TT



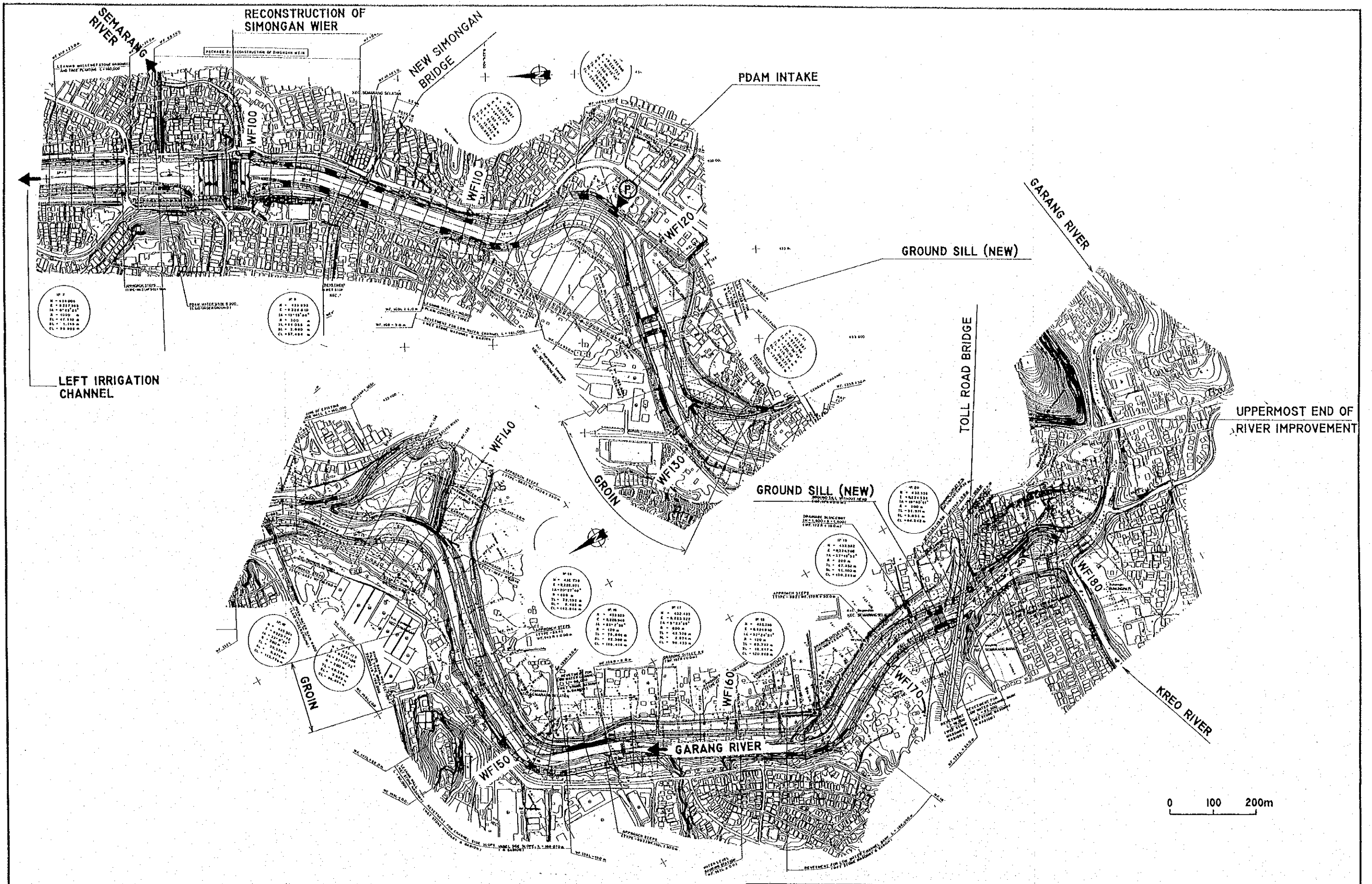
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 3.4
 Longitudinal Profile of West Floodway



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

Fig. 3.5
Standard Cross Section of West Floodway

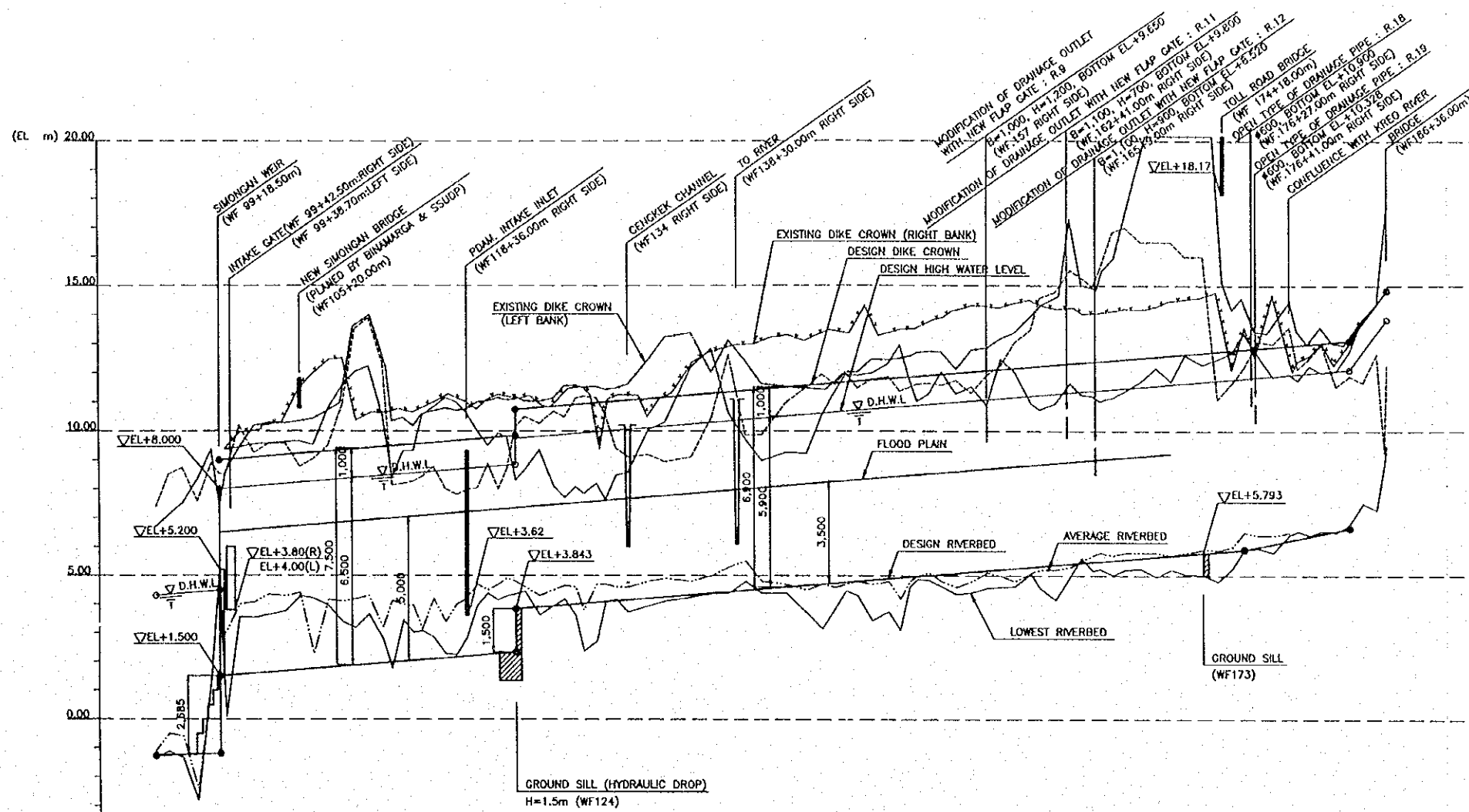


THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

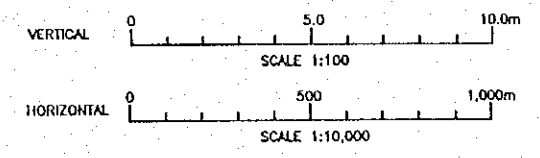
Fig. 3.6

Plan of Garang River



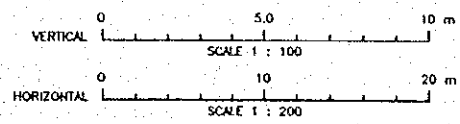
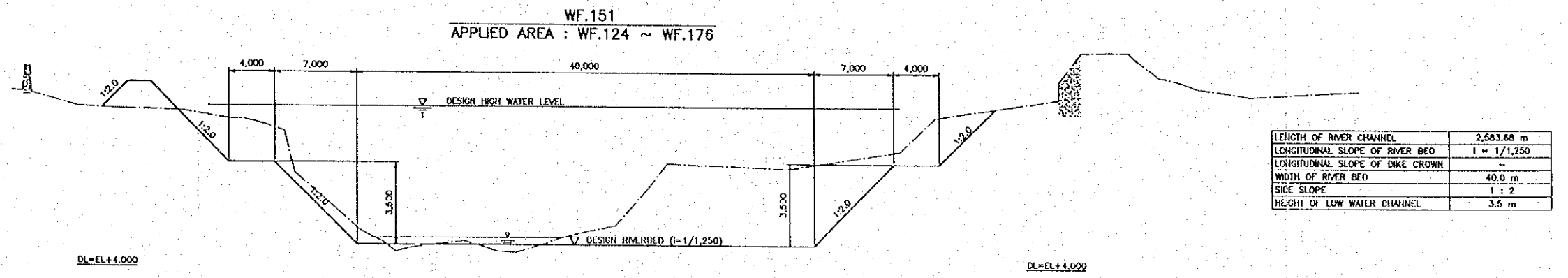
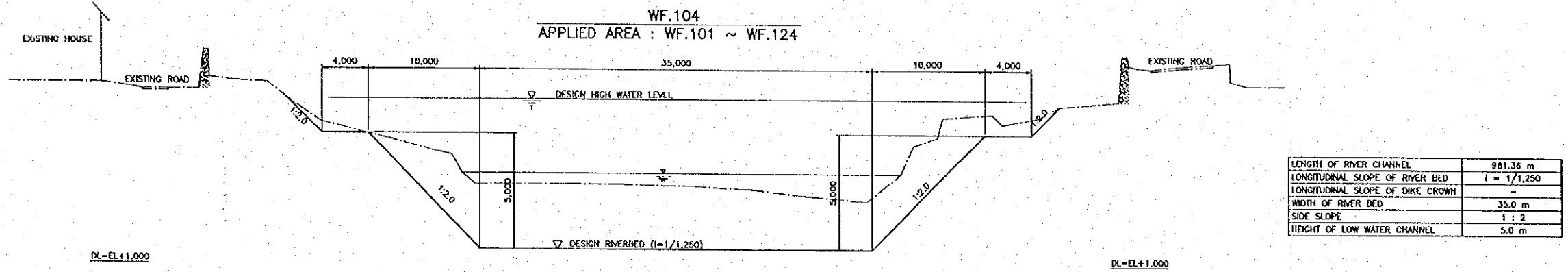
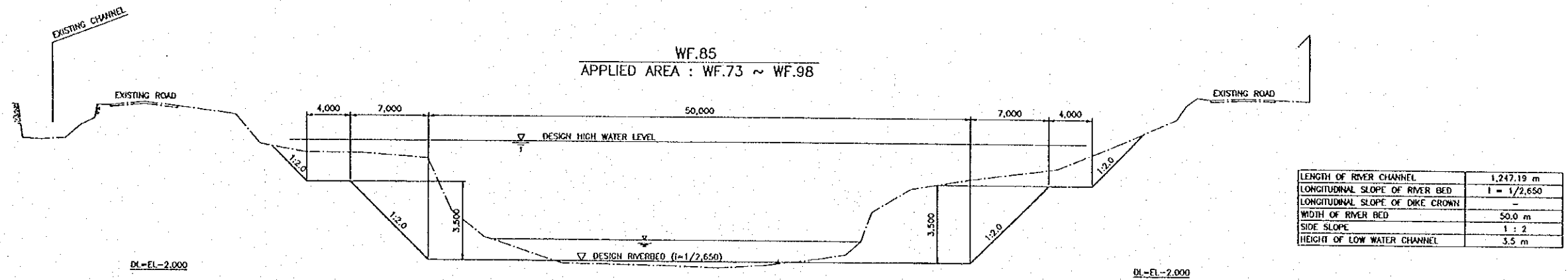
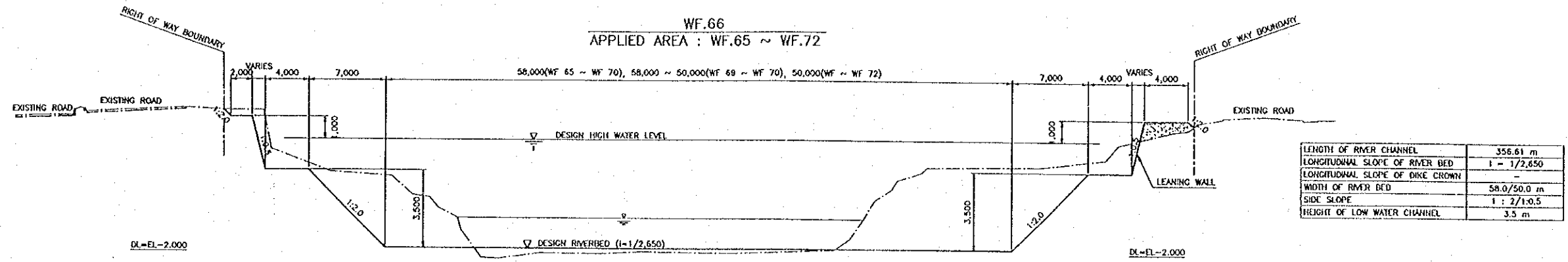
LEGEND	
---	LEFT GROUND
---	RIGHT GROUND
---	LOWEST RIVERBED
---	AVERAGE RIVERBED
---	EXISTING DIKE CROWN (RIGHT BANK)
---	EXISTING DIKE CROWN (LEFT BANK)

DI = -5.000m		I = 1/75 L = 129.52m	
GRADIENT OF DESIGN H.W.L.		0.239 L=1053.35m	0.742 L=2959.68m
GRADIENT OF DESIGN RIVERBED		0.184 L=1053.35m	0.882 L=376.00m
DESIGN ELEVATION	DIKE CROWN	8.300	12.110
	HIGH WATER LEVEL	4.371	12.837
	RIVERBED	-1.270	5.810
EXISTING ELEVATION	RIGHT GROUND	8.270	12.110
	LEFT GROUND	7.280	11.870
	LOWEST RIVERBED	-1.120	5.810
DISTANCE	ACCUMULATED (m)	4,796.14	5,095.14
	PARTIAL (m)	32.40	32.40
STATION NO.		99	173



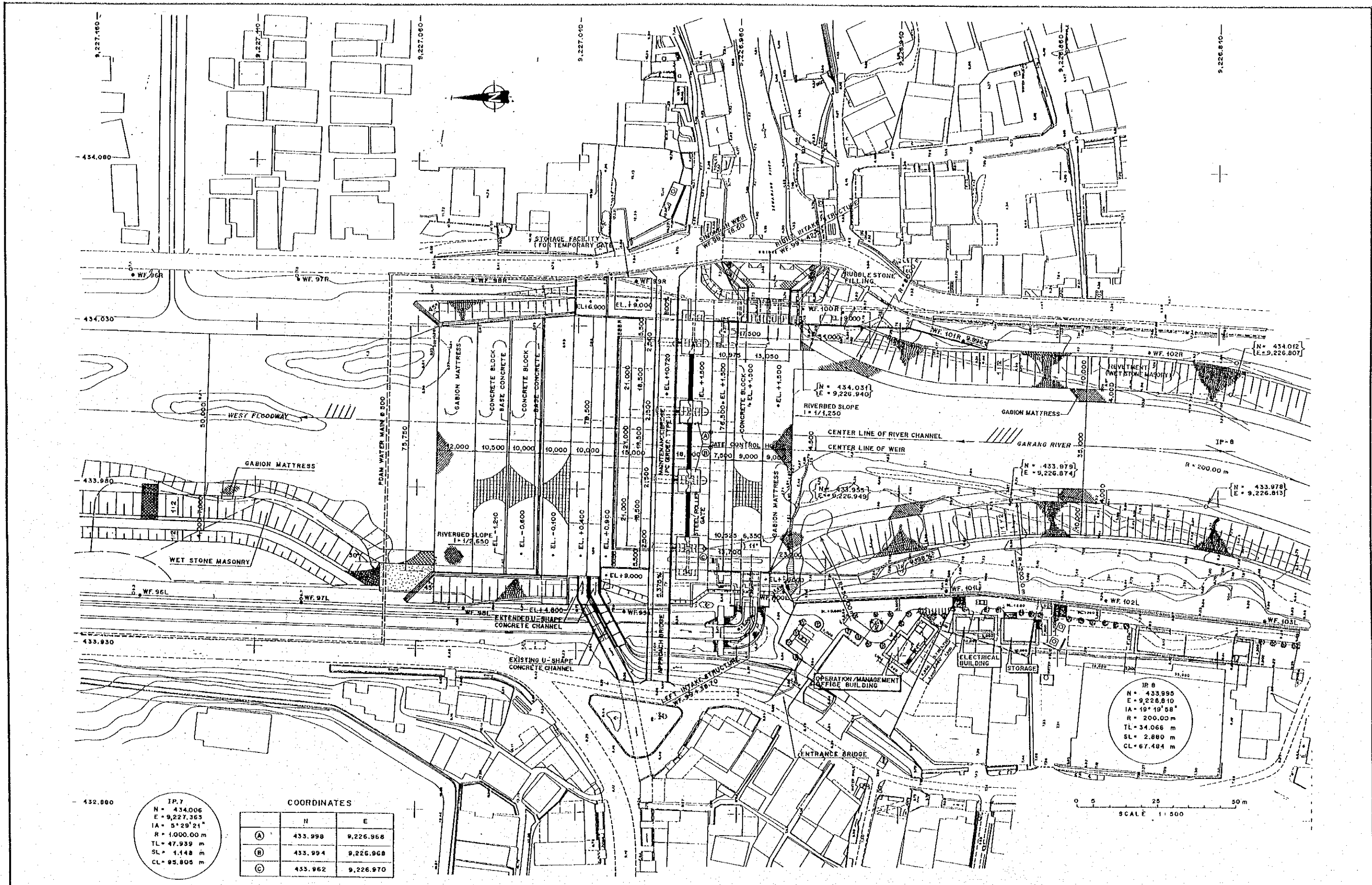
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 3.7
Longitudinal Profile of Garang River



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

Fig 3.8
Standard Cross Section of Garang River



IP.7
 N = 434.006
 E = 9,227.363
 IA = 5° 29' 21"
 R = 1,000.00 m
 TL = 47.939 m
 SL = 1.148 m
 CL = 95.805 m

COORDINATES

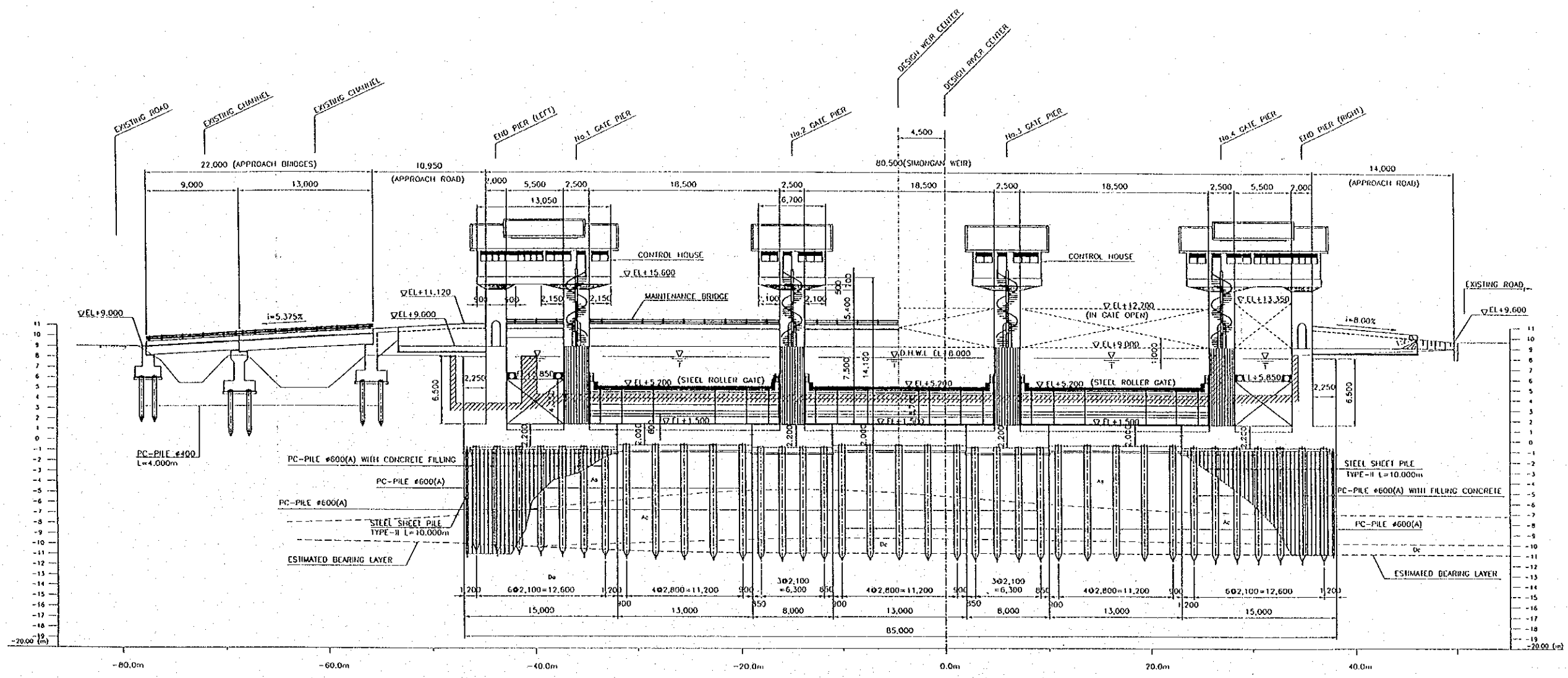
	N	E
(A)	433.998	9,226.968
(B)	433.994	9,226.968
(C)	433.962	9,226.970

IP.8
 N = 433.995
 E = 9,226.840
 IA = 19° 19' 58"
 R = 200.00 m
 TL = 34.066 m
 SL = 2.880 m
 CL = 67.484 m

0 5 25 50 m
 SCALE 1:500

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

Fig. 3.9
 Plan of Simongan Weir

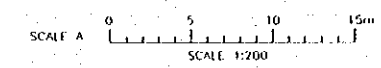


NOTE:

- PILE LENGTH SHOWN ON THIS DRAWING IS TENTATIVE. THE CONTRACTOR SHALL DETERMINE THE LENGTH OF PILE BY TEST PILING.
- THE ESTIMATED FORMATION OF GEOLOGICAL LAYER IS SHOWN ON THE DRAWING FOR REFERENCE.

A₁, A₂, D₁ AND D₂ SHOWN ON THE DRAWING INDICATE LAYER'S NAME AND ARE DESCRIBED AS FOLLOWS:

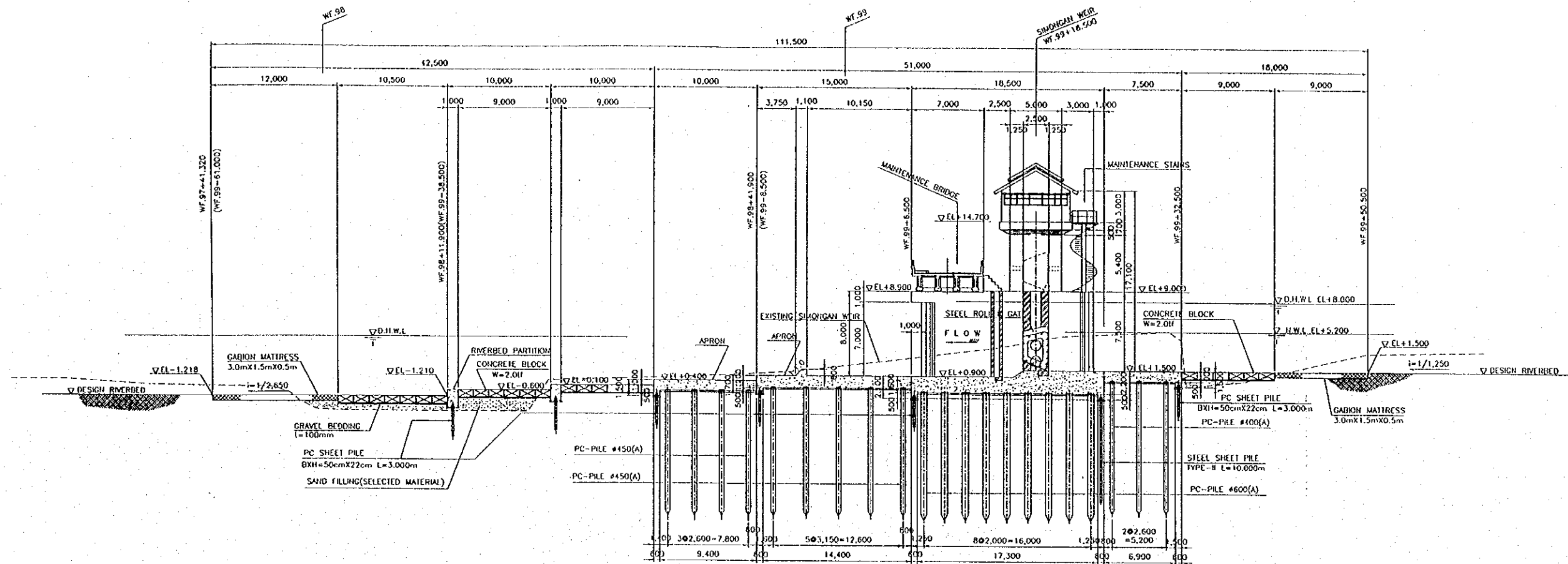
- A₁: ALLUVIUM SOIL CONSISTING OF FINE GRAIN TO MIDDLE GRAIN SAND, CONTAINING THE INTERCALATED CLAY AND SILT PARTIALLY. N-VALUE OF 15 ~ 30.
- A₂: SOFT ALLUVIUM SOIL CONSISTING OF CLAY AND SANDY CLAY. N-VALUE OF 10 ~ 20.
- D₁: DILUVIUM SOIL CONSISTING OF HARD CLAY, PARTLY CONTAINING CORAL LIMESTONE. N-VALUE OF 20 ~ 35.
- D₂: DAMAR FORMATION (SEDIMENTARY ROCK UNIT) WITH N-VALUE OF MORE THAN 50.



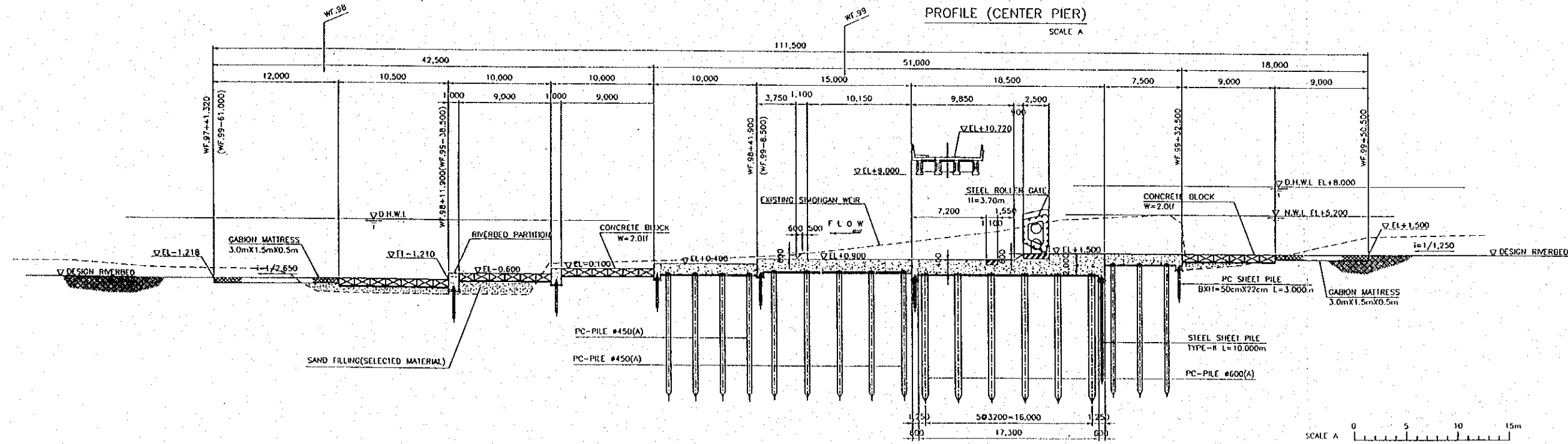
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 3.10
Upstream Elevation of Simongan Weir



PROFILE (CENTER PIER)
SCALE A



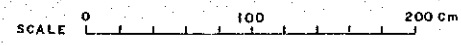
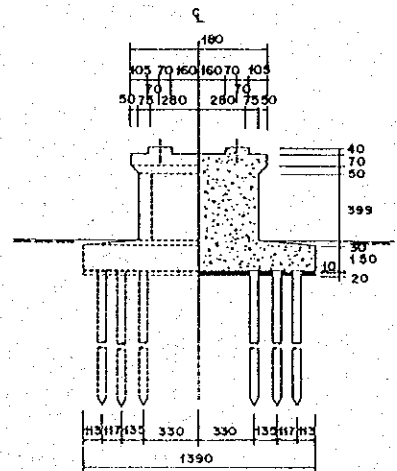
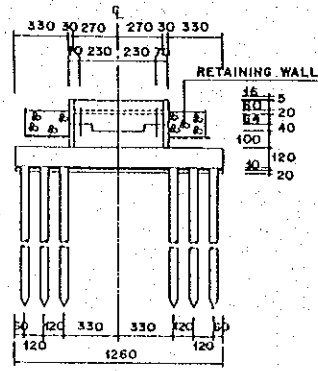
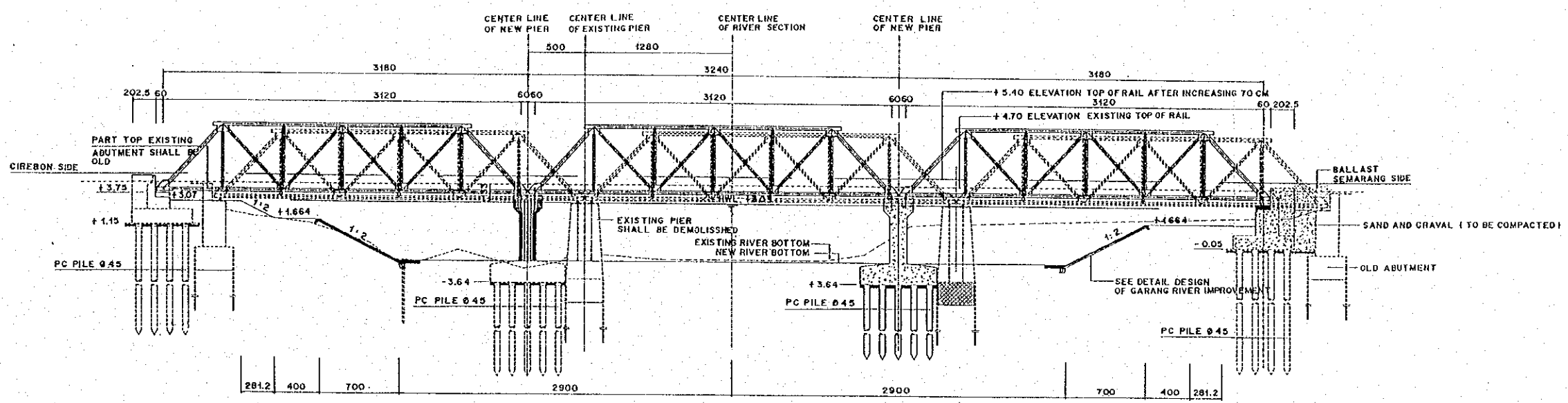
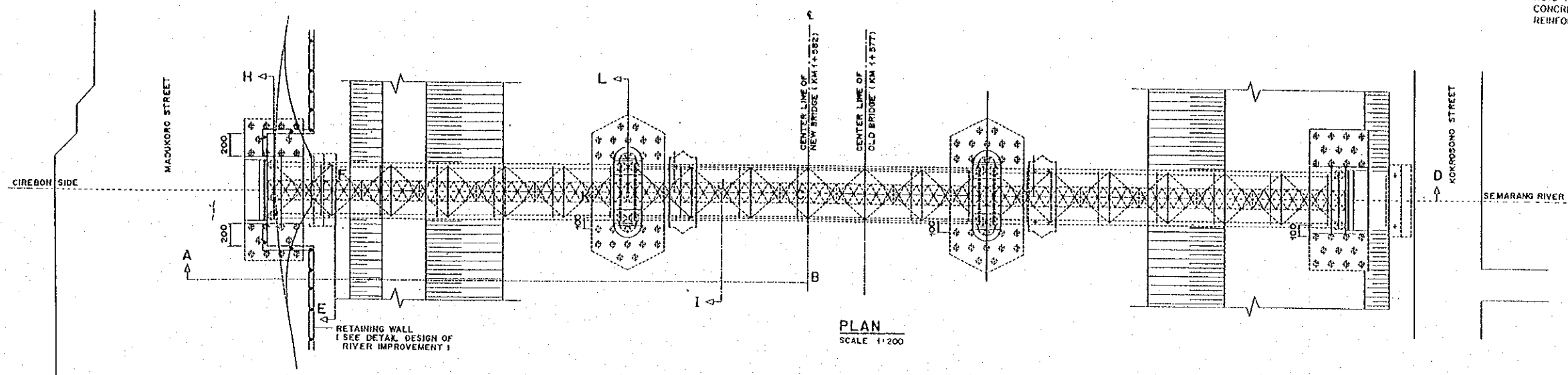
PROFILE (GATE FLOOR SLAB)
SCALE A

NOTE:
PILE LENGTH SHOWN ON THIS DRAWING IS TENTATIVE.
THE CONTRACTOR SHALL DETERMINE THE LENGTH OF PILE BY TEST PILING.

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

Fig. 3.11
Profile of Simongan Weir

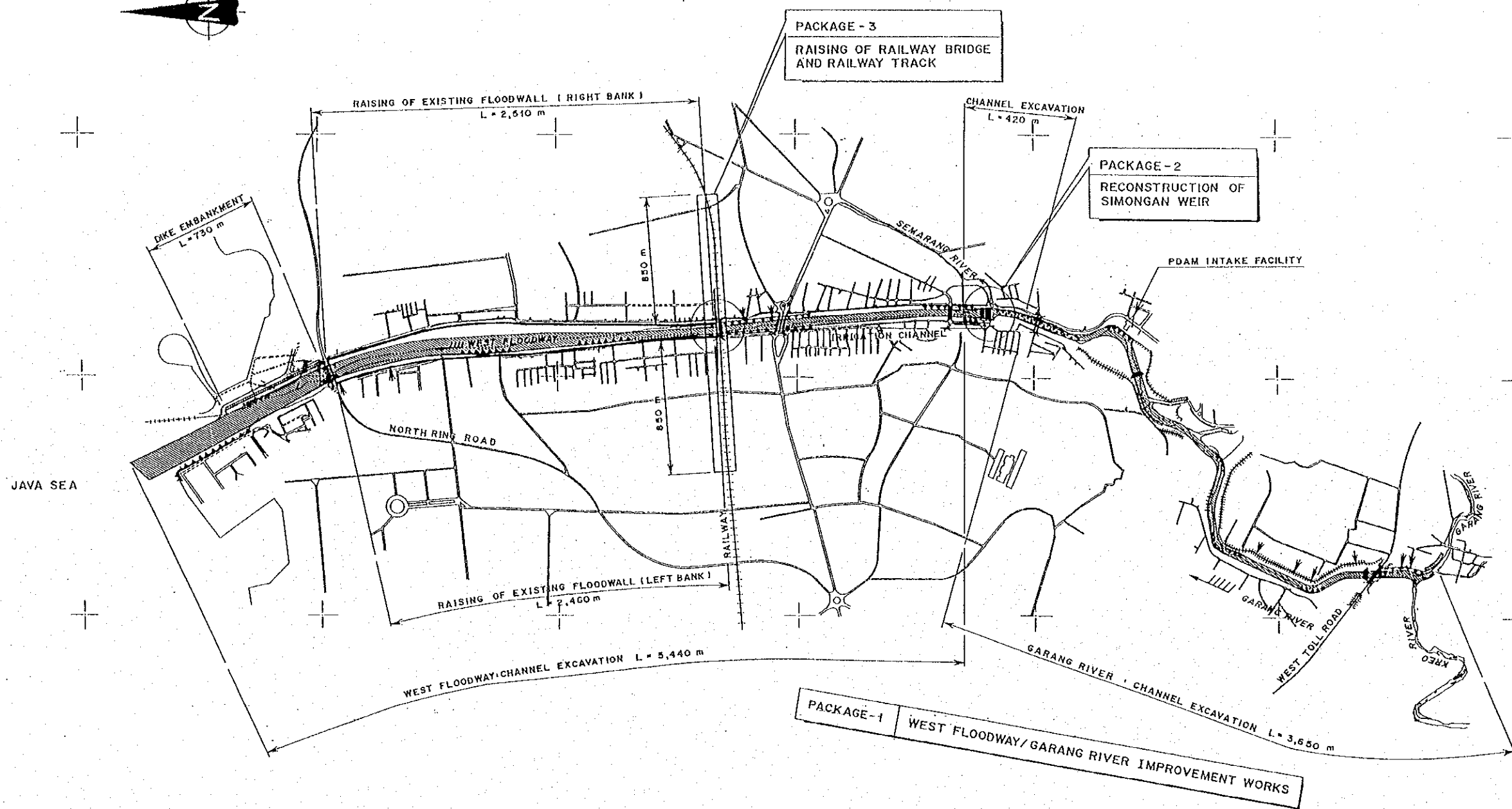
NOTE :
 CONCRETE K-225
 REINFORCED STEEL BAR U-39



NOTE :
 1. ALL DIMENSIONS SHOWN ON THE DRAWING ARE IN CENTIMETER.
 2. ELEVATIONS OF PILE TIPS SHOWN ON THE DRAWING ARE TENTATIVE.

THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
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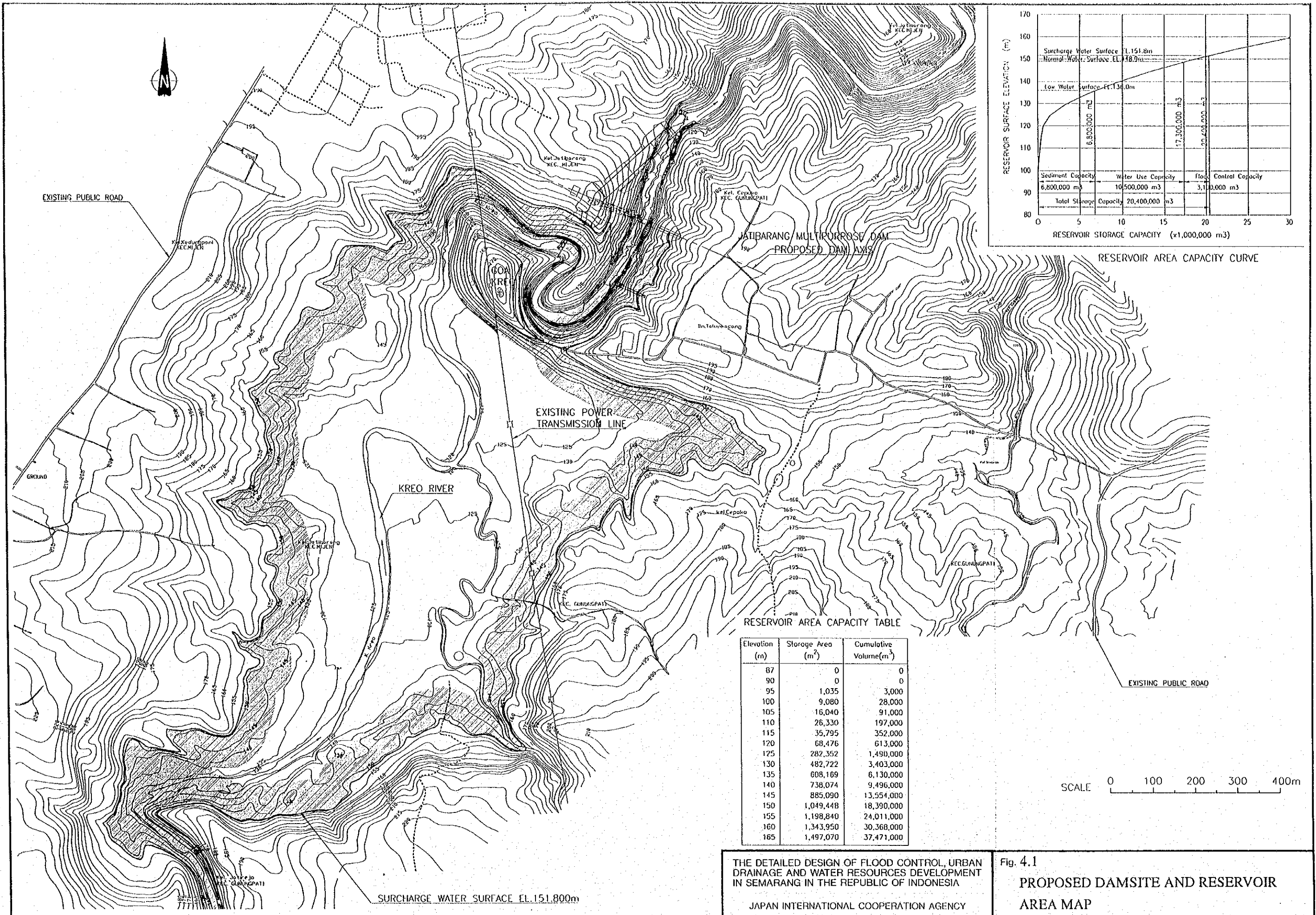
Fig. 3.12
 Profile of Railway Bridge



LEGEND	
	CHANNEL EXCAVATION
	DIKE EMBANKMENT
	RAISING OF EXISTING FLOODWALL
	GROUND SILL
	REVTMENT
	GROIN
	DRAINAGE SLUICWAY/OUTLET WITH GATE

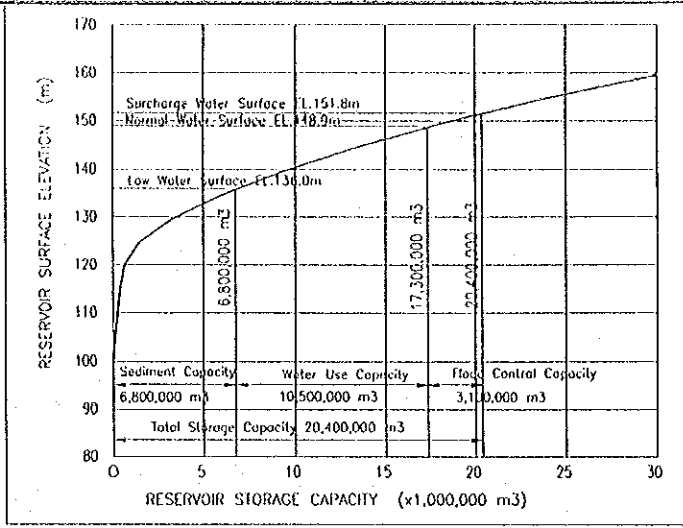
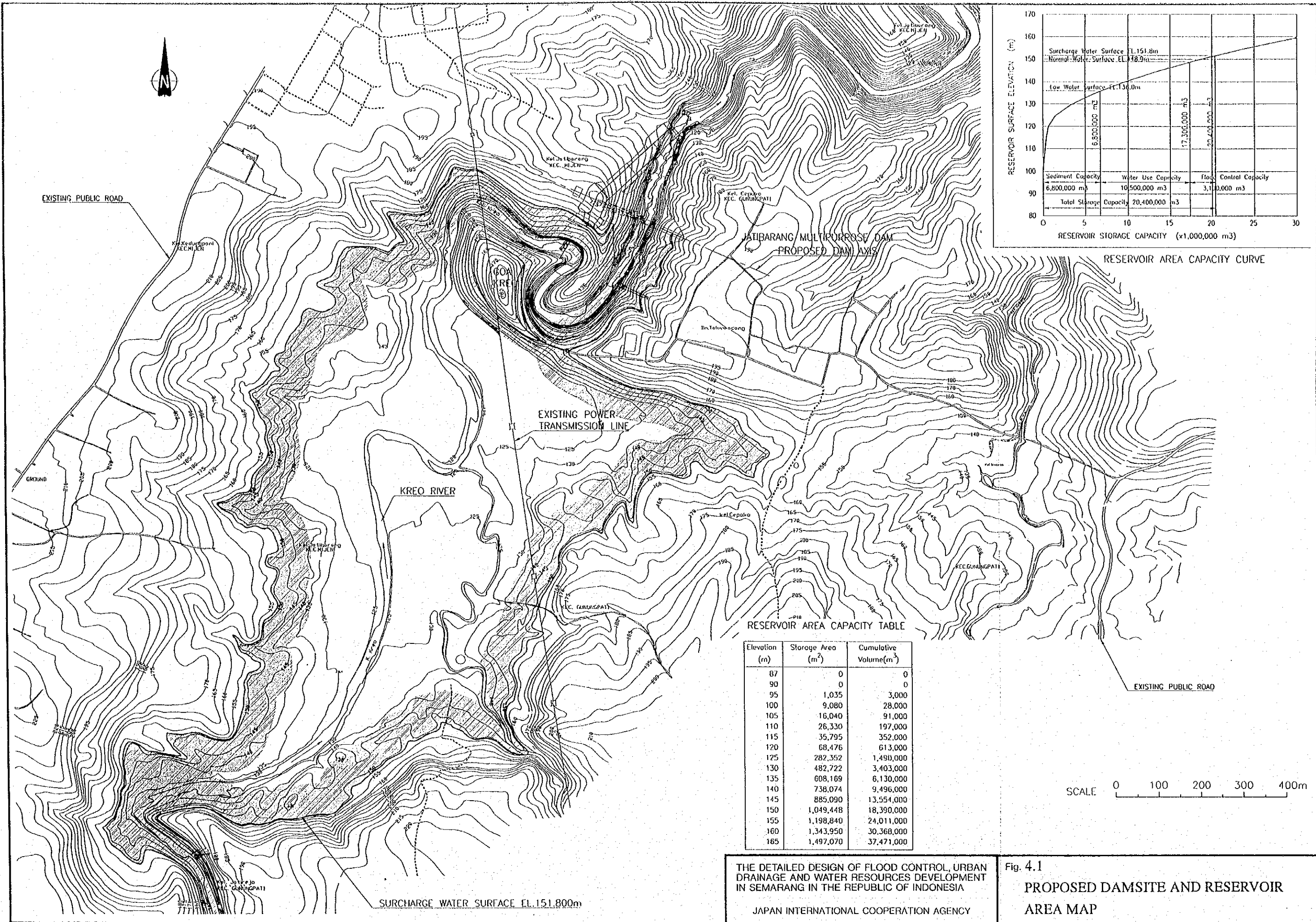
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 3.13
 General Plan For Packaging



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

Fig. 4.1
PROPOSED DAMSITE AND RESERVOIR AREA MAP

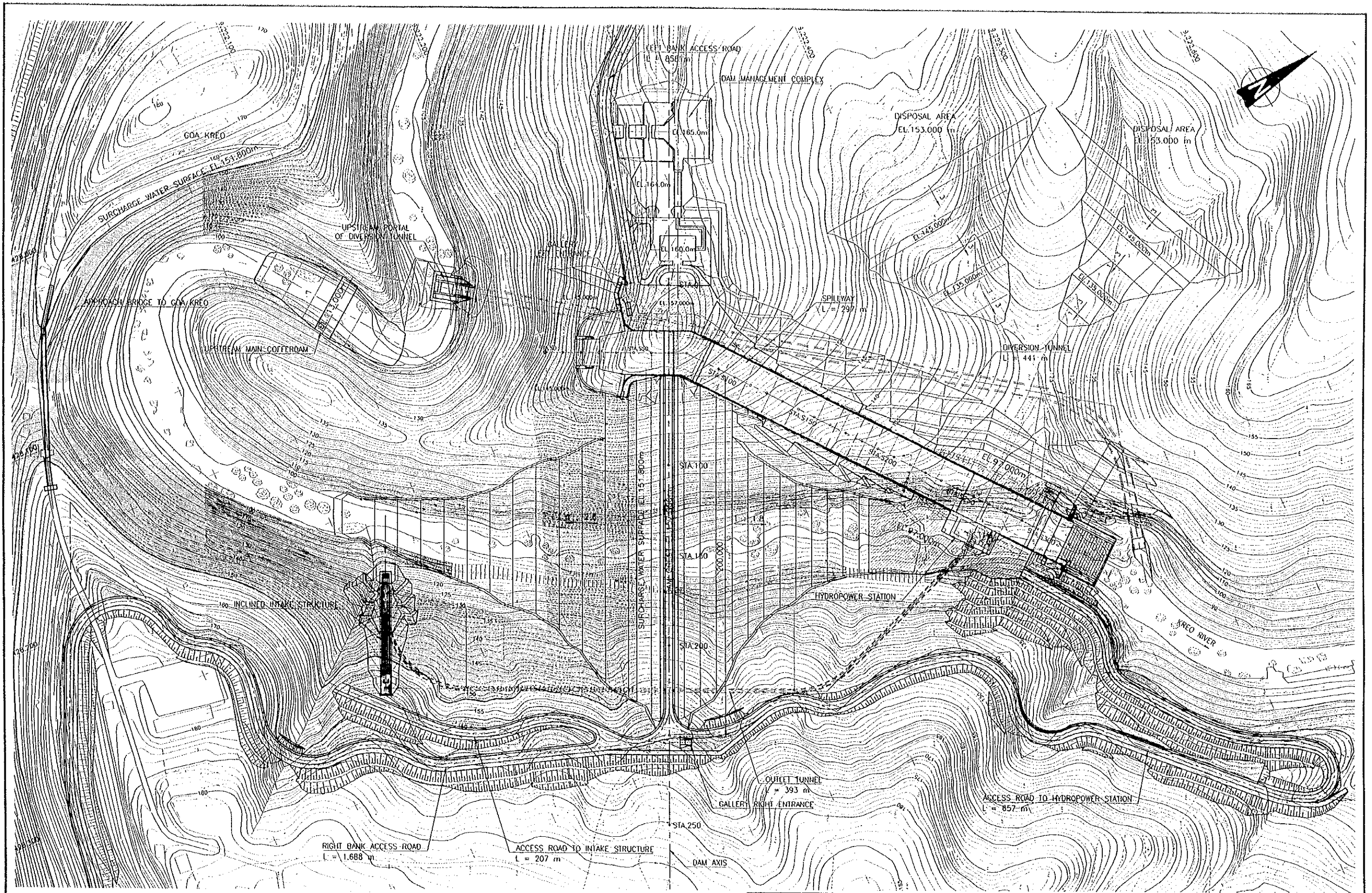


RESERVOIR AREA CAPACITY TABLE

Elevation (m)	Storage Area (m ²)	Cumulative Volume (m ³)
87	0	0
90	0	0
95	1,035	3,000
100	9,080	28,000
105	16,040	91,000
110	26,330	197,000
115	35,795	352,000
120	68,476	613,000
125	282,352	1,490,000
130	482,722	3,403,000
135	608,169	6,130,000
140	738,074	9,496,000
145	885,090	13,554,000
150	1,049,448	18,390,000
155	1,198,840	24,011,000
160	1,343,950	30,368,000
165	1,497,070	37,471,000

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

Fig. 4.1
 PROPOSED DAMSITE AND RESERVOIR AREA MAP



NOTES

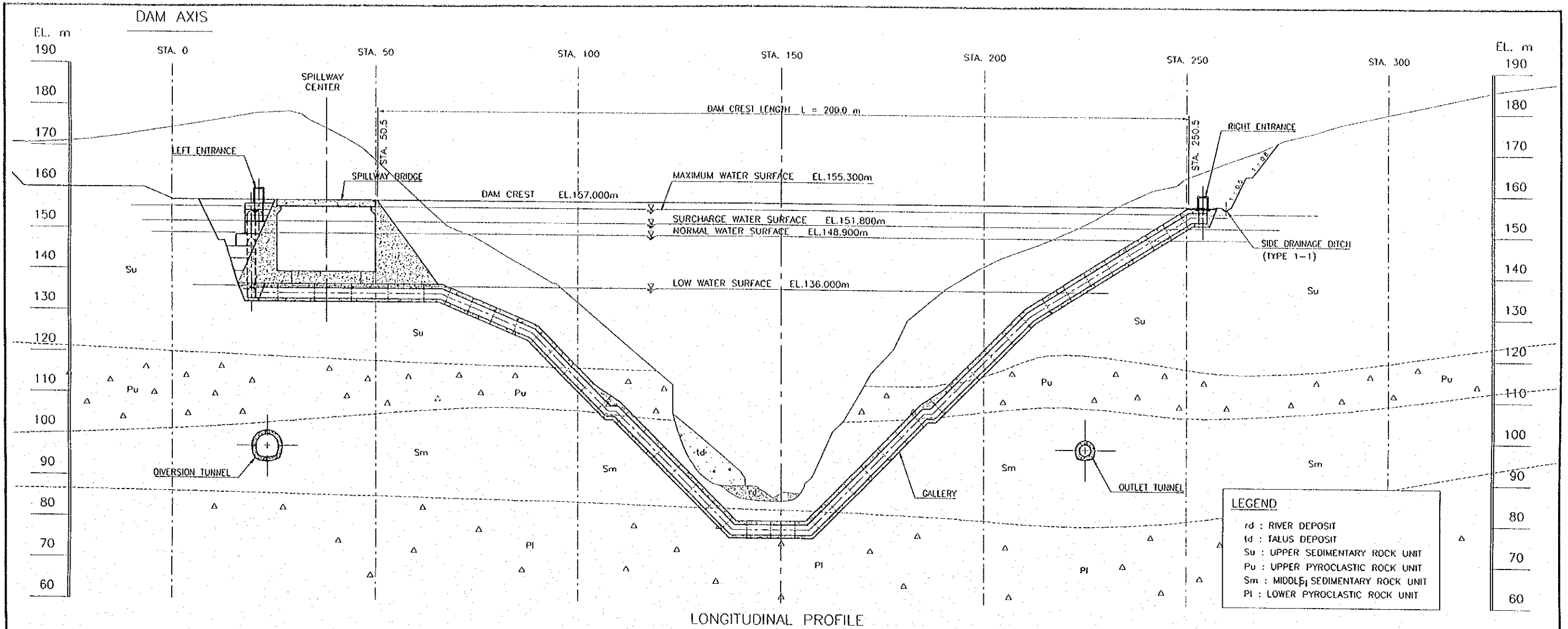
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.

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

JAPAN INTERNATIONAL COOPERATION AGENCY

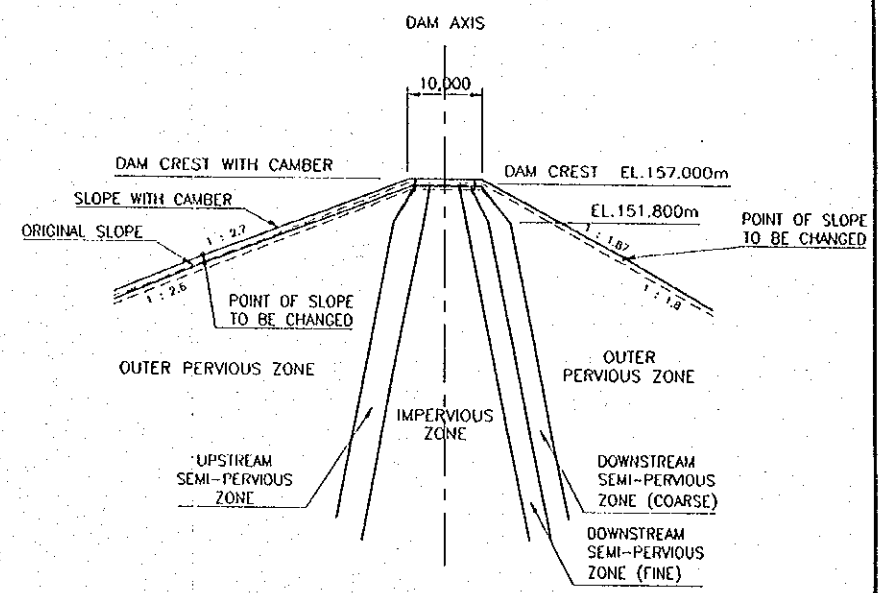
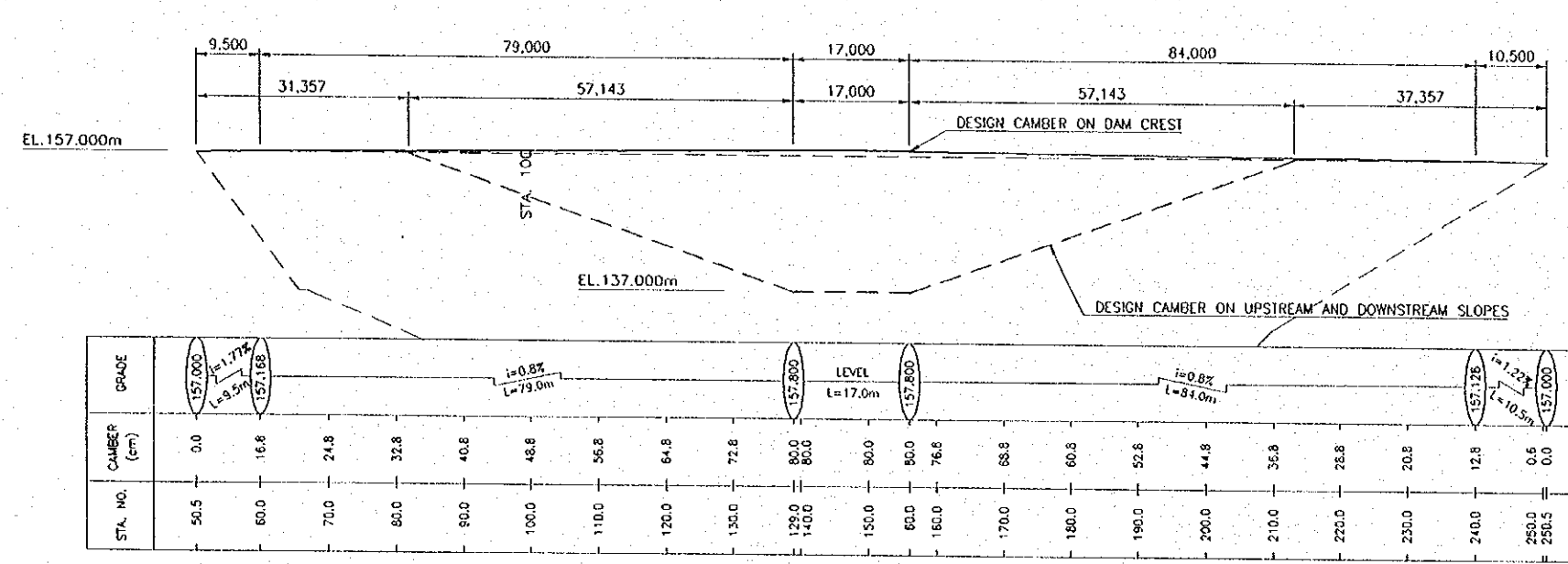
Fig. 4.2

LAYOUT PLAN OF JATIBARANG MULTIPURPOSE DAM



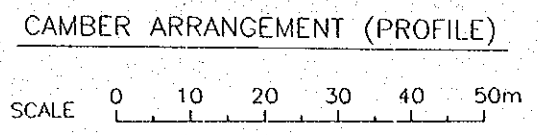
LEGEND

- rd : RIVER DEPOSIT
- ld : TALUS DEPOSIT
- Su : UPPER SEDIMENTARY ROCK UNIT
- Pu : UPPER PYROCLASTIC ROCK UNIT
- Sm : MIDDLE SEDIMENTARY ROCK UNIT
- Pl : LOWER PYROCLASTIC ROCK UNIT



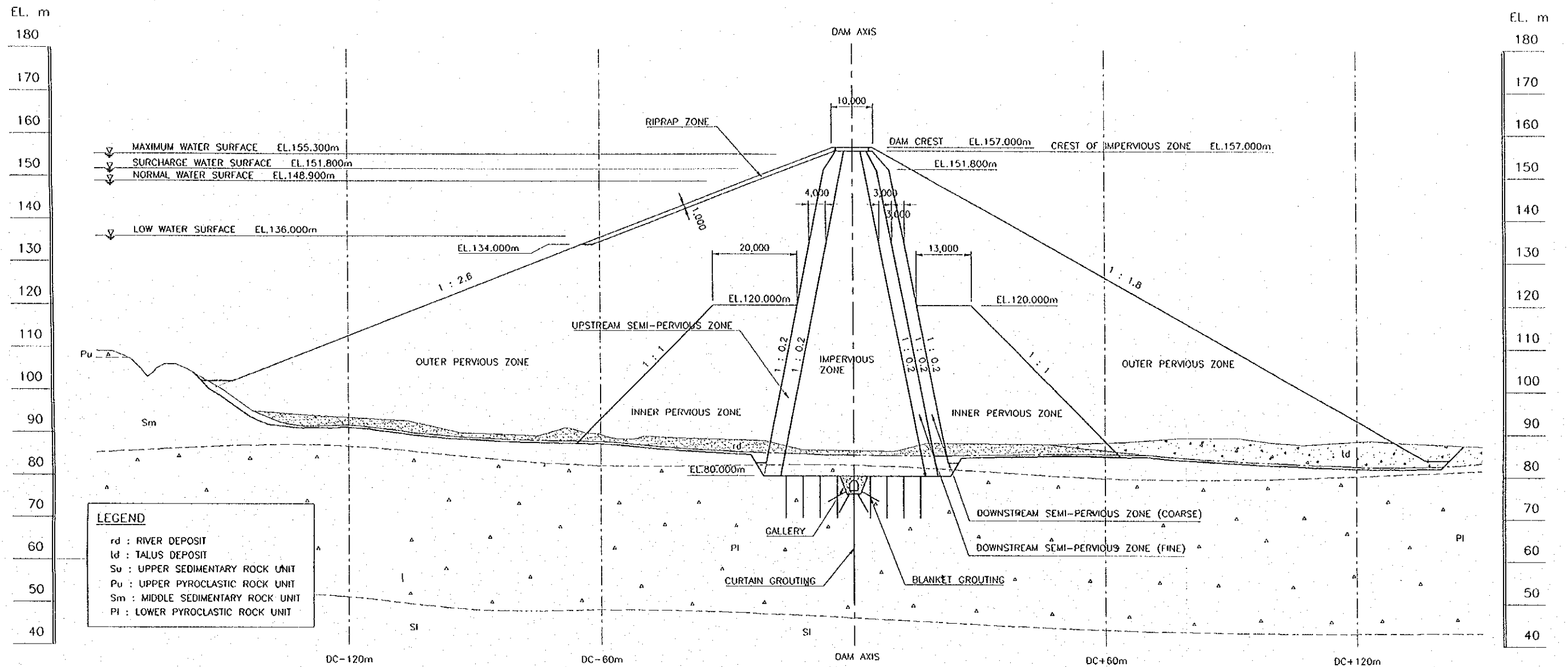
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. THE GEOLOGICAL INFORMATION IS ONLY FOR REFERENCE.

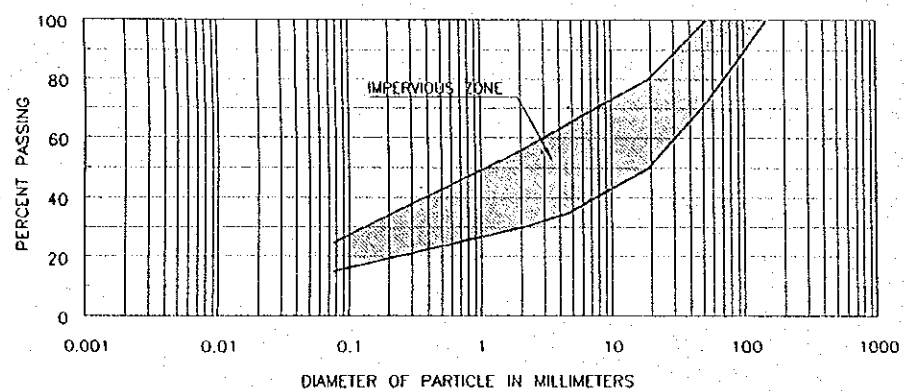


THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
 JAPAN INTERNATIONAL COOPERATION AGENCY

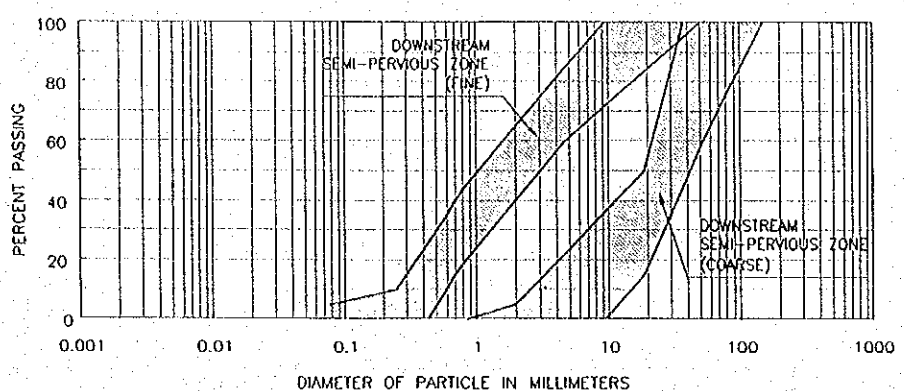
Fig. 4.3
PROFILE ALONG JATIBARANG MULTIPURPOSE DAM AXIS



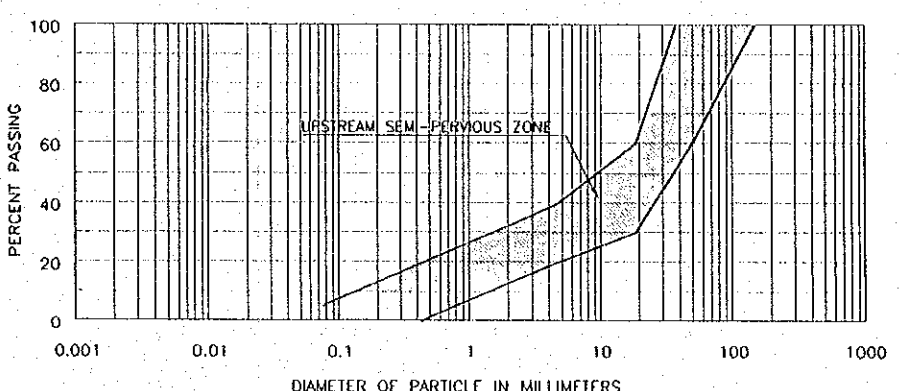
TYPICAL CROSS SECTION



GRADATION LIMIT FOR IMPERIOUS ZONE



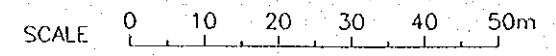
GRADATION LIMIT FOR DOWNSTREAM SEMI-PERVIOUS ZONE (FINE)



GRADATION LIMIT FOR UPSTREAM SEMI-PERVIOUS ZONE

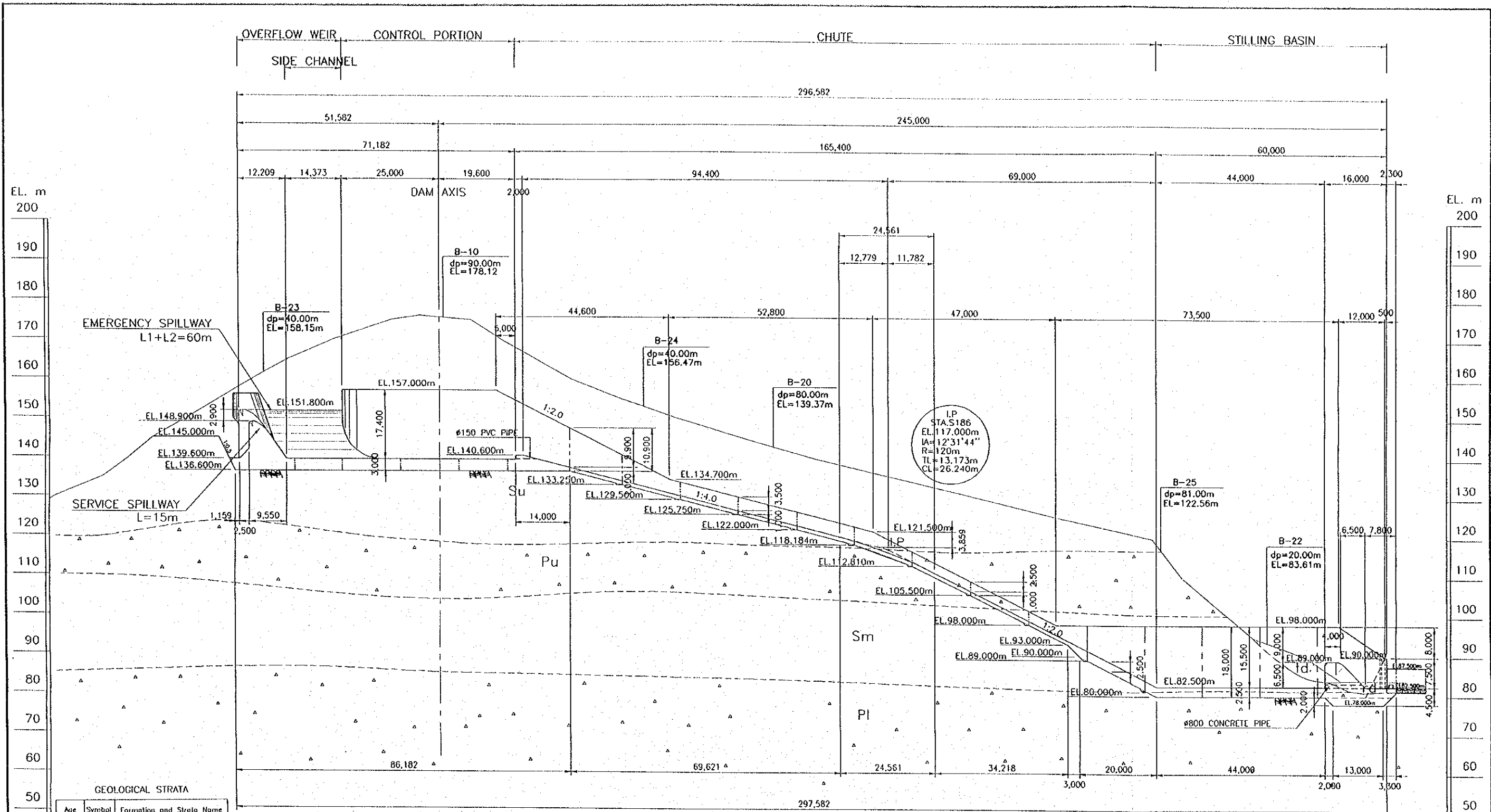
NOTES

1. INNER AND OUTER PERVIOUS ZONES AND RIP RAP ARE GRADATION AS PER SPECIFICATION.
2. THE CAMBER IS NOT SHOWN IN THIS DRAWING.
3. THE GEOLOGICAL INFORMATION IS ONLY FOR REFERENCE.



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

Fig. 4.4
 TYPICAL CROSS SECTION OF JATIBARANG MULTIPURPOSE DAM



EL. m
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40

EL. m
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40

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

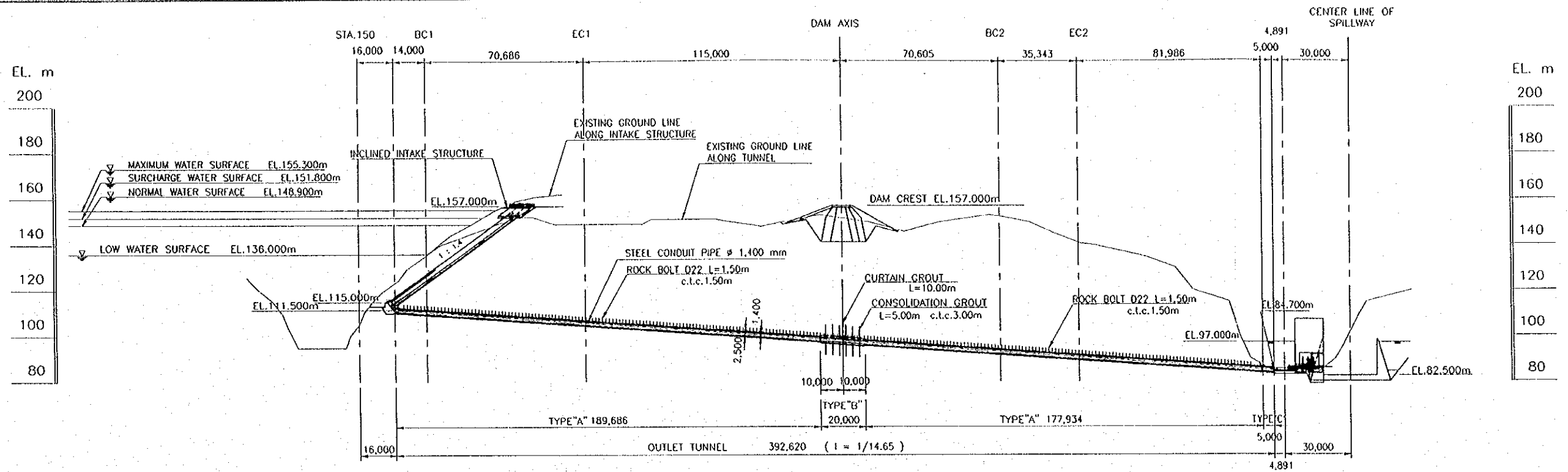
NOTE
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.



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

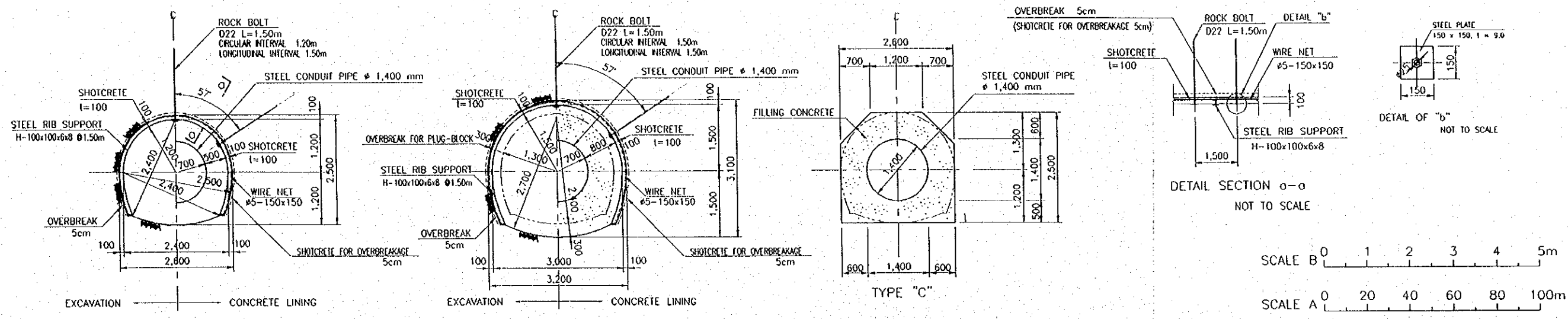
THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
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Fig. 4.5
PROFILE OF SPILLWAY



FINISHING HEIGHT	INCREASE THE DISTANCE	DISTANCE	SURVEY POINT	RADIUS OF CURVE
	16,000	16,000	No.0	IP1 IA=90°0'0" TL=45,000m R=45m CL=70,686m
	0,000	0,000	No.1	
	14,000	14,000	BC1	IP2 IA=45°0'0" TL=18,640m R=45m CL=35,343m
	6,000	6,000	No.1	
	40,000	20,000	No.2	
	60,000	20,000	No.3	
	106,039	20,000	No.4	
	105,719	4,886	EC1	
	104,674	15,314	No.5	
	103,309	20,000	No.6	
	101,944	20,000	No.7	
	100,578	20,000	No.8	
	99,213	20,000	No.9	
	98,552	9,686	+9,686	
	97,893	10,000	+10,000	
	97,343	200,000	No.10	
	97,186	9,686	+9,686	
	96,483	10,314	No.11	
	95,118	20,000	No.12	
	93,753	20,000	No.13	
	93,050	10,291	BC2	
	92,387	9,709	No.14	
	91,022	20,000	No.15	
	90,638	5,634	EC2	
	89,657	14,366	No.16	
	88,282	20,000	No.17	
	86,927	20,000	No.18	
	85,561	20,000	No.19	
	85,041	7,620	+7,620	
	84,700	5,000	+5,000	
	84,700	392,620	EC1	
	84,700	397,511	No.20	
	84,700	400,000	No.21	
	82,500	20,000	No.22	
	82,500	427,511	+7,511	

PROFILE SCALE A



- NOTES
- ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
 - FILLING CONCRETE OF OUTLET TUNNEL SHALL BE OF TYPE D AS PER SPECIFICATION.

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Fig. 4.6 PROFILE OF OUTLET FACILITIES