

No. 02

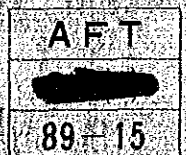
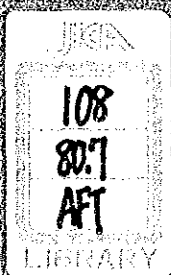
REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE OF WATER RESOURCES DEVELOPMENT

FEASIBILITY STUDY
ON
BATANG KUMU IRRIGATION PROJECT
IN RIAU PROVINCE

VOLUME III
DRAWINGS

MARCH 1989

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO, JAPAN



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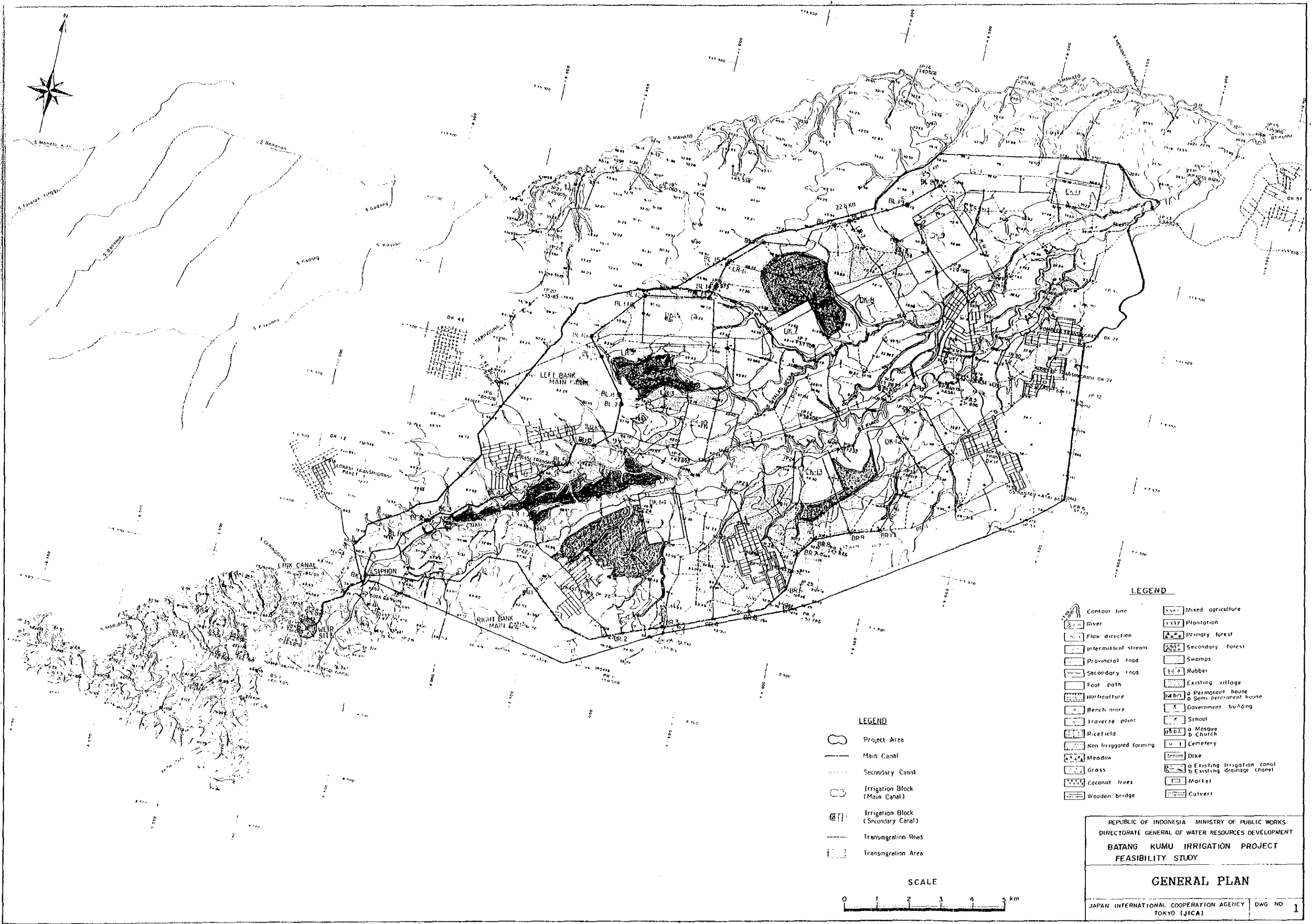
国際協力事業団

19337

BATANG KUMU IRRIGATION PROJECT

LIST OF DRAWINGS

<u>DWG. NO.</u>	<u>TITLE</u>
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5	PRESENT LAND USE MAP
6	LAND SUITABILITY MAP FOR PADDY
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8	GEOLOGICAL MAP
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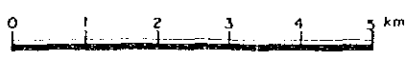
LEGEND

- Contour line
- River
- Flow direction
- Intermittent stream
- Provincial road
- Secondary road
- Foot path
- Horticulture
- Bench mark
- Traverse point
- Ricefield
- Non irrigated farming
- Meadow
- Grass
- Coconut trees
- Wooden bridge
- Mixed agriculture
- Plantation
- Primary forest
- Secondary forest
- Swamps
- Rubber
- Existing village
- Permanent house
- Semi permanent house
- Government building
- School
- Mosque
- Church
- Cemetery
- Dike
- Existing irrigation canal
- Existing drainage channel
- Market
- Culvert

LEGEND

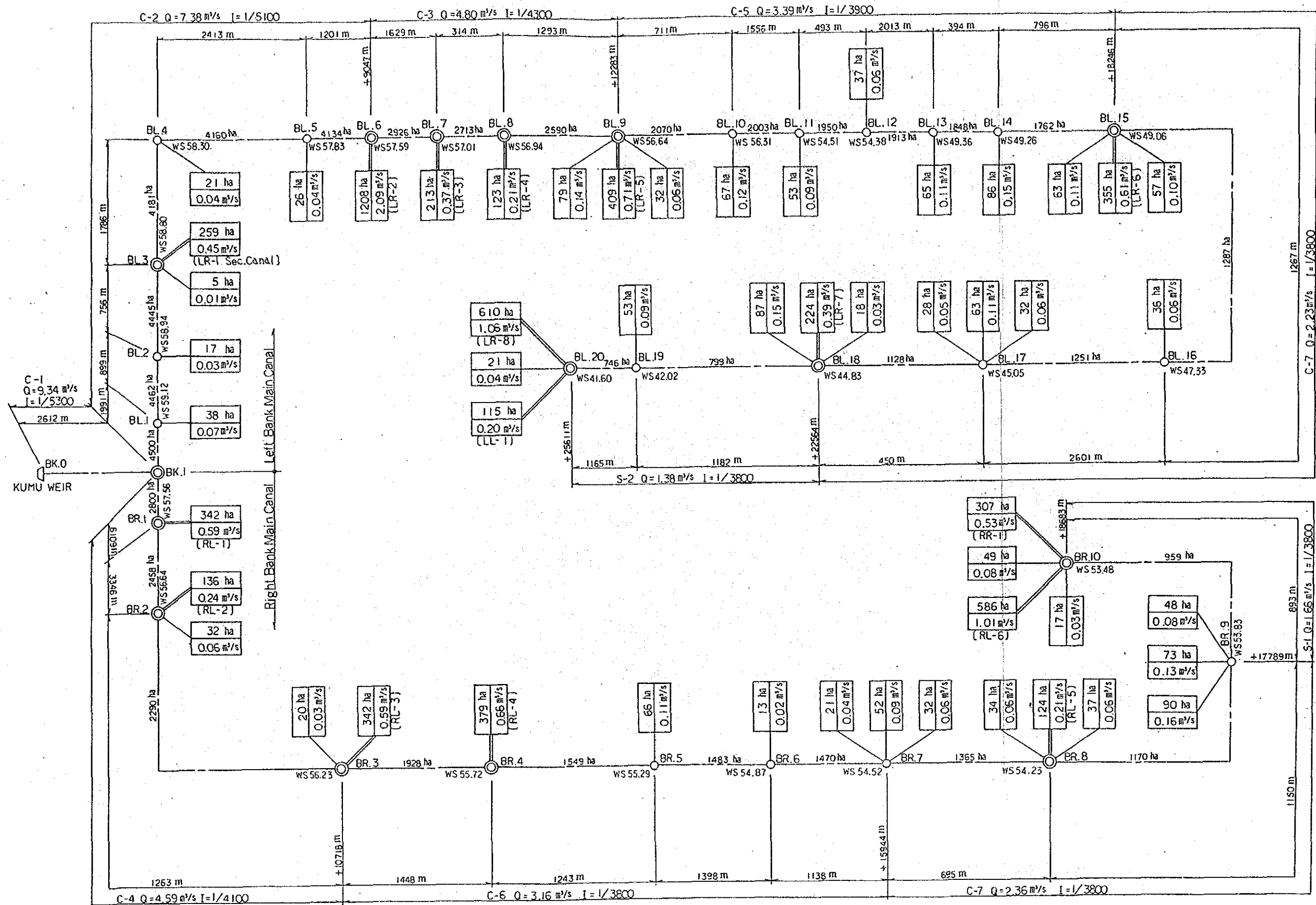
- Project Area
- Main Canal
- Secondary Canal
- Irrigation Block (Main Canal)
- Irrigation Block (Secondary Canal)
- Transmigration Road
- Transmigration Area

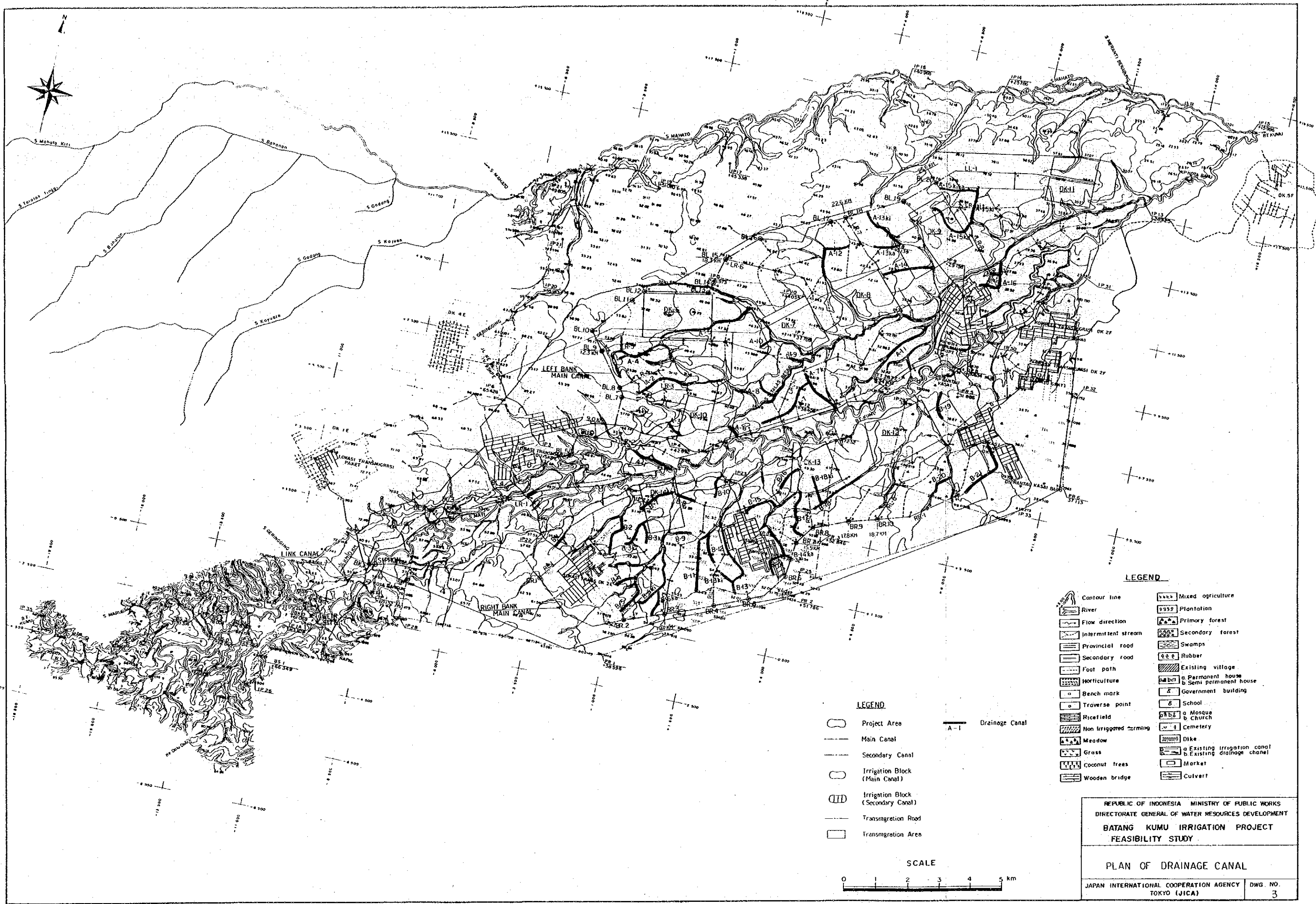
SCALE



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 FEASIBILITY STUDY

GENERAL PLAN





LEGEND

- Contour line
- River
- Flow direction
- Intermittent stream
- Provincial road
- Secondary road
- Foot path
- Horticulture
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LEGEND

- Project Area
- Main Canal
- Secondary Canal
- Irrigation Block (Main Canal)
- Irrigation Block (Secondary Canal)
- Transmigration Road
- Transmigration Area
- Drainage Canal

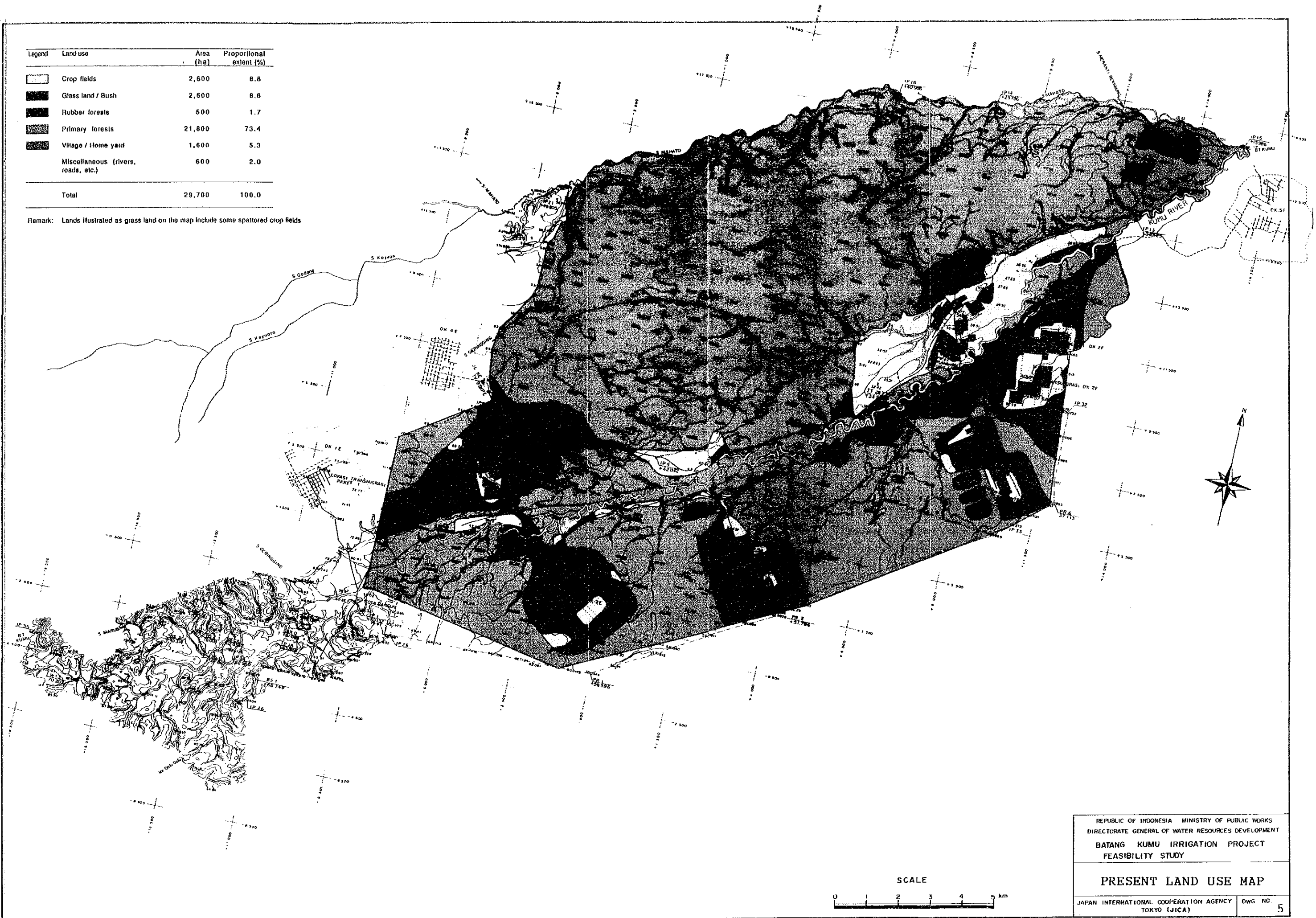
SCALE



REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
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PLAN OF DRAINAGE CANAL
 JAPAN INTERNATIONAL COOPERATION AGENCY
 TOKYO (JICA)

Legend	Land use	Area (ha)	Proportional extent (%)
	Crop fields	2,600	8.8
	Grass land / Bush	2,600	8.8
	Rubber forests	500	1.7
	Primary forest	21,800	73.4
	Village / Home yard	1,600	5.3
	Miscellaneous (rivers, roads, etc.)	600	2.0
	Total	29,700	100.0

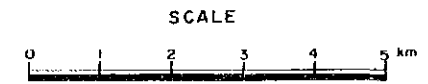
Remark: Lands illustrated as grass land on the map include some spattered crop fields



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 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 BATANG KUMU IRRIGATION PROJECT
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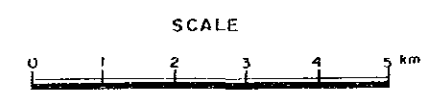
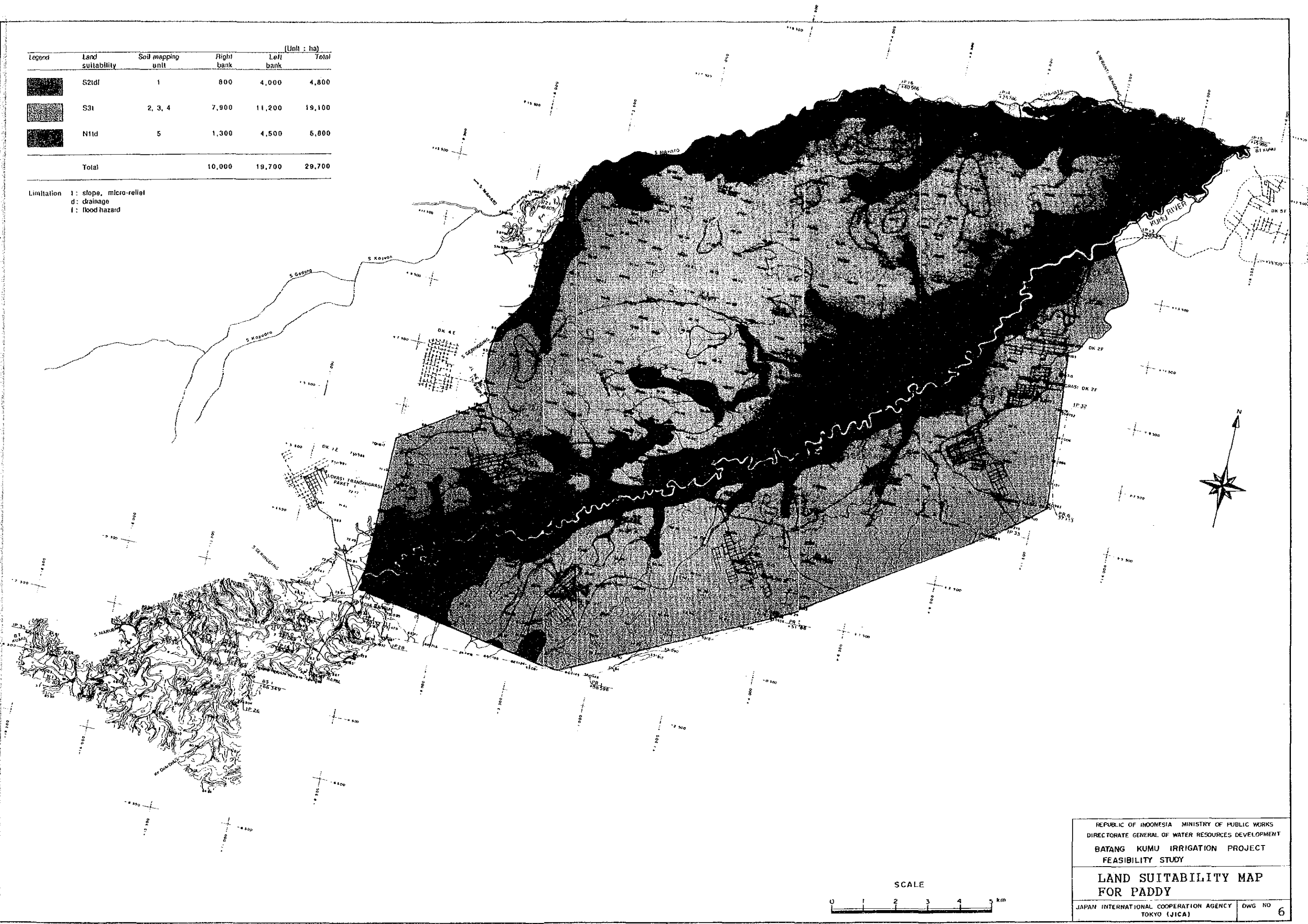
PRESENT LAND USE MAP

JAPAN INTERNATIONAL COOPERATION AGENCY DWG NO.
 TOKYO (JICA) 5



Legend	Land suitability	Soil mapping unit	(Unit : ha)		
			Right bank	Left bank	Total
	S2td	1	800	4,000	4,800
	S3i	2, 3, 4	7,900	11,200	19,100
	N1td	5	1,300	4,500	5,800
	Total		10,000	19,700	29,700

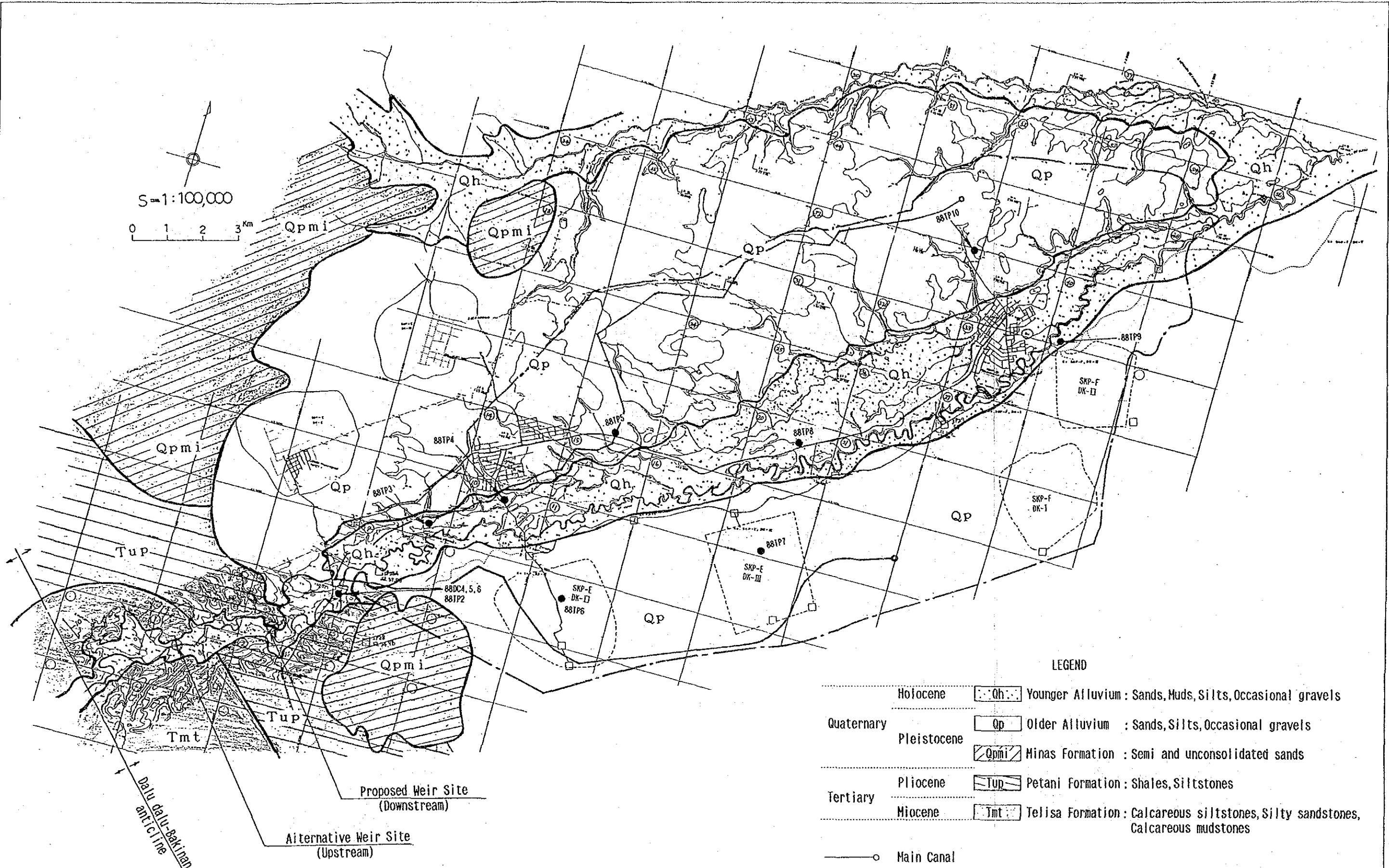
Limitation
 1: slope, micro-relief
 d: drainage
 f: flood hazard



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 BATANG KUMU IRRIGATION PROJECT
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**LAND SUITABILITY MAP
 FOR PADDY**

JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG NO 6



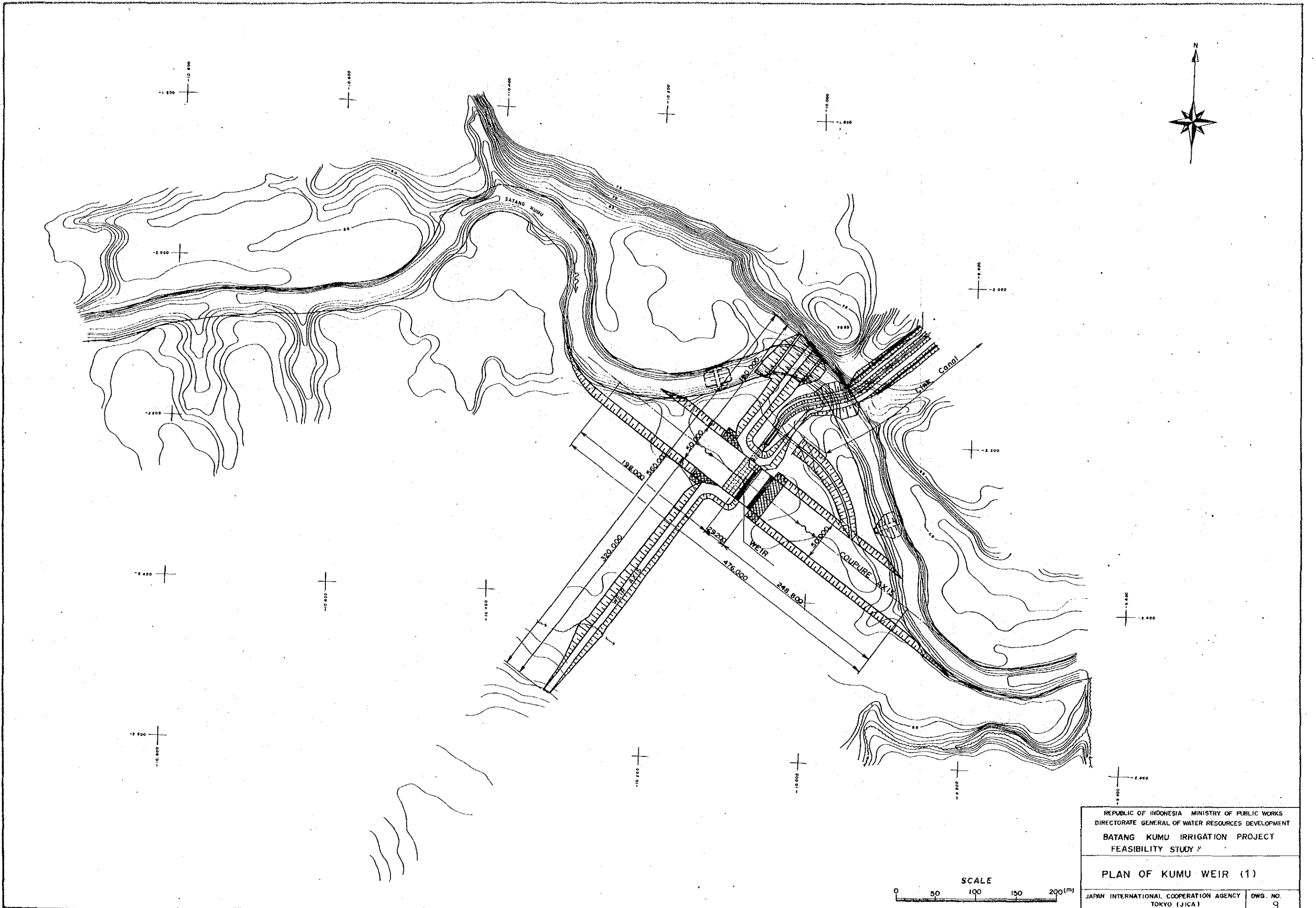
LEGEND

Holocene	Qh	Younger Alluvium : Sands, Muds, Silts, Occasional gravels
Quaternary	Qp	Older Alluvium : Sands, Silts, Occasional gravels
	Qpmi	Minas Formation : Semi and unconsolidated sands
Pleistocene		
Pliocene	Tup	Petani Formation : Shales, Siltstones
Tertiary		
Miocene	Tmt	Telisa Formation : Calcareous siltstones, Silty sandstones, Calcareous mudstones
	—○—	Main Canal
	○	Project Area

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 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

GEOLOGICAL MAP

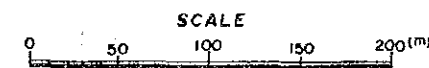
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 8



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 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

PLAN OF KUMU WEIR (1)

JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA)

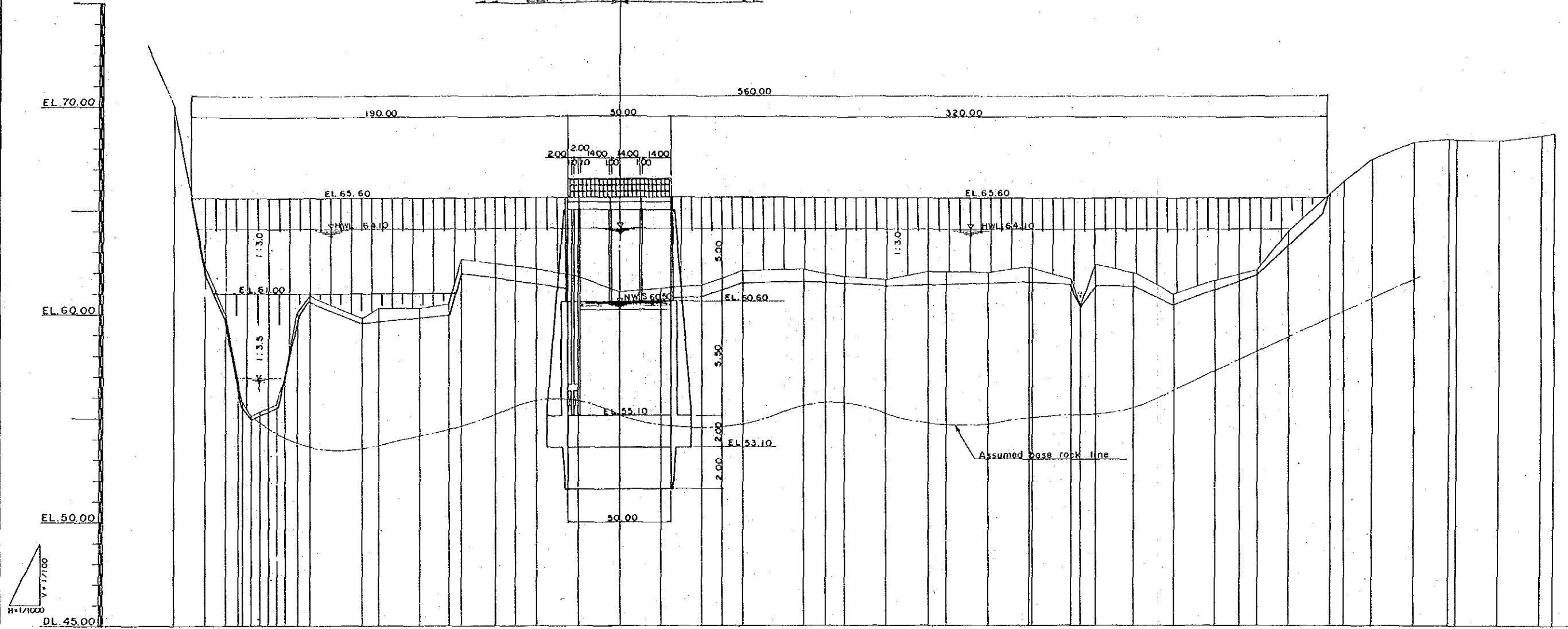


DWG. NO. 9

PROFILE OF WEIR AXIS

SCALE: H= 1/1000, V= 1/100

LEFT SIDE RIGHT SIDE

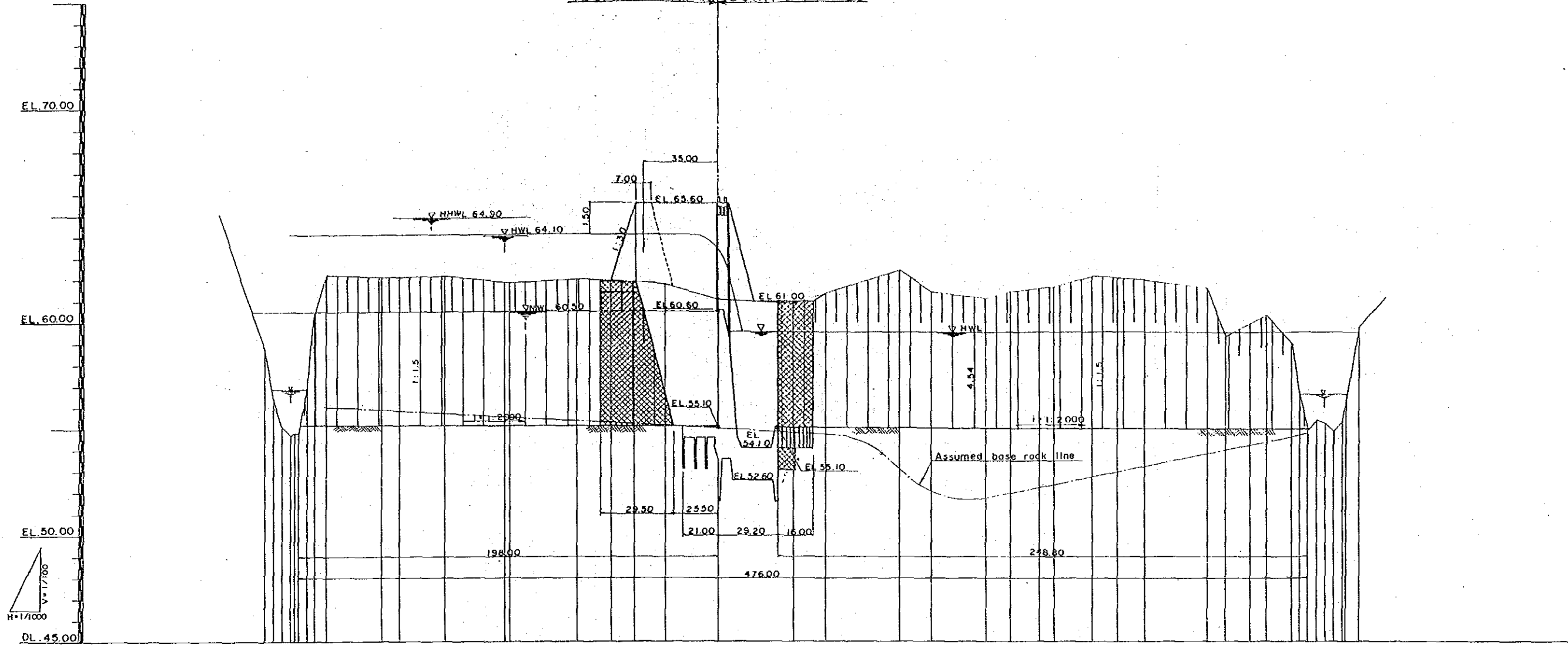


STATION	DISTANCE	TOTAL DISTANCE	EXISTING GROUND HEIGHT	DESIGN	
				CANAL BED EL	TOP-EL
-15.0	15.0	215.0	70.05	65.60	65.60
+NO.4	10.0	200.0	62.30	65.60	65.60
-40.0	6.0	190.0	60.02	65.60	65.60
-37.0	3.0	187.0	59.87	65.60	65.60
-35.0	1.0	186.0	59.85	65.60	65.60
-32.0	1.0	185.0	59.85	65.60	65.60
-28.0	4.0	181.0	55.31	65.60	65.60
-24.0	4.0	177.0	55.51	65.60	65.60
-16.0	4.0	169.0	55.63	65.60	65.60
-12.0	6.0	163.0	57.10	65.60	65.60
-6.0	6.0	157.0	60.13	65.60	65.60
+NO.3	25.3	150.0	60.91	65.60	65.60
-24.5	8.0	124.5	59.81	65.60	65.60
-18.5	16.5	116.5	60.32	65.60	65.60
+NO.2	2.3	100.0	60.32	65.60	65.60
-46.5	14.1	86.5	60.32	65.60	65.60
-32.4	5.9	82.4	60.47	65.60	65.60
-28.5	16.5	76.5	62.65	65.60	65.60
-10.0	10.0	60.0	62.41	65.60	65.60
+NO.1	10.0	50.0	62.28	65.60	65.60
-40.0	20.0	40.0	62.15	65.60	65.60
-20.0	20.0	20.0	61.79	65.60	65.60
+NO.0	0.0	0.0	61.04	65.60	65.60
+20.0	20.0	20.0	61.22	65.60	65.60
+40.0	20.0	40.0	61.37	65.60	65.60
+NO.1	10.0	50.0	61.71	65.60	65.60
+9.5	9.5	59.5	62.04	65.60	65.60
+39.5	30.0	89.5	62.14	65.60	65.60
+NO.2	10.5	100.0	61.95	65.60	65.60
+9.5	9.5	109.5	61.78	65.60	65.60
+29.5	20.0	129.5	61.65	65.60	65.60
+NO.3	20.5	150.0	62.05	65.60	65.60
+8.6	8.6	158.6	62.04	65.60	65.60
+28.6	20.0	170.0	62.01	65.60	65.60
+48.6	20.0	190.0	62.73	65.60	65.60
+18.5	18.5	218.5	61.71	65.60	65.60
+23.1	4.6	223.1	60.42	65.60	65.60
+30.4	7.3	230.4	62.38	65.60	65.60
+48.5	18.1	248.5	62.02	65.60	65.60
+NO.5	11.5	260.0	61.94	65.60	65.60
+18.5	18.5	268.5	60.93	65.60	65.60
+38.5	20.0	288.5	61.60	65.60	65.60
+NO.6	11.5	300.0	61.89	65.60	65.60
+8.5	8.5	308.5	62.11	65.60	65.60
+23.5	15.0	323.5	64.01	65.60	65.60
+43.5	20.0	343.5	65.80	65.60	65.60
+NO.7	6.5	350.0	66.33	65.60	65.60
+13.5	13.5	363.5	67.44	65.60	65.60
+33.5	20.0	383.5	66.26	65.60	65.60
+NO.8	16.5	400.0	68.34	65.60	65.60
+3.5	3.5	403.5	68.36	65.60	65.60
+23.5	20.0	423.5	68.29	65.60	65.60
+43.5	20.0	443.5	68.51	65.60	65.60
+NO.9	6.5	450.0	68.63	65.60	65.60

PROFILE OF COUPURE AXIS

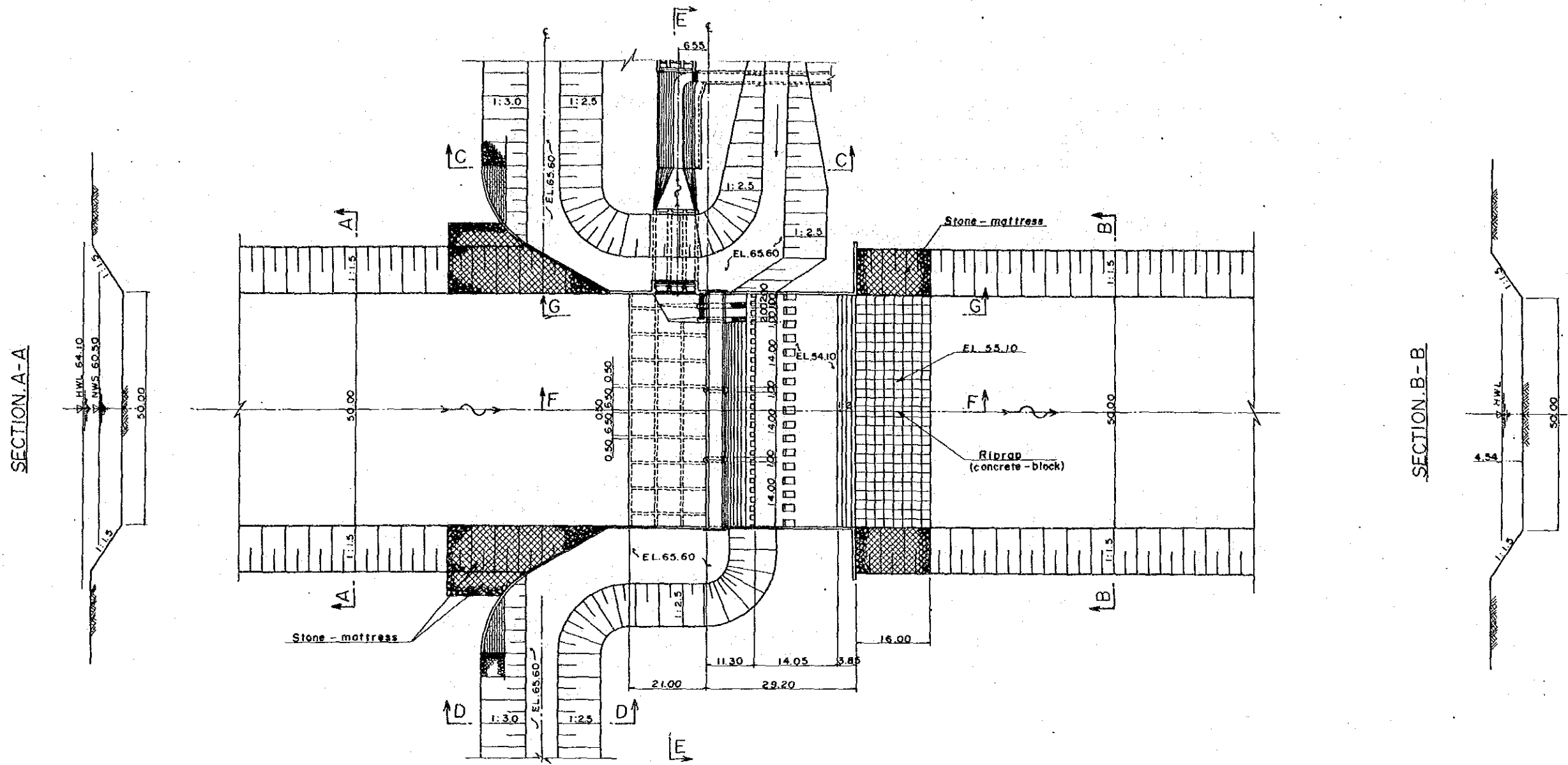
UPPER STREAM DOWN STREAM

SCALE: H=1/1000, V=1/100

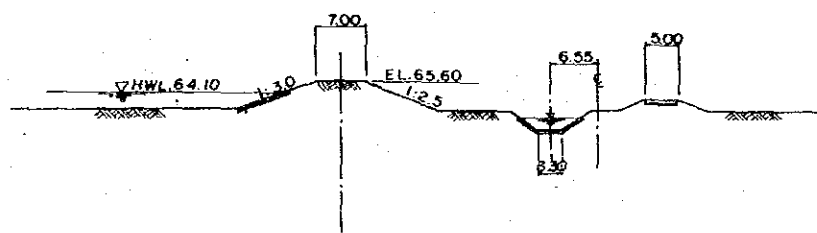


STATION	DISTANCE	TOTAL DISTANCE	EXISTING GROUND HEIGHT	DESIGN	
				CANAL BED. EL	TOP. EL
-14.1	4.0	214.1	58.76		
-16.1	4.0	218.1	59.5		
-18.1	4.0	222.1	60.2		
-20.1	4.0	226.1	61.0		
-22.1	4.0	230.1	61.8		
-24.1	4.0	234.1	62.6		
-26.1	4.0	238.1	63.4		
-28.1	4.0	242.1	64.2		
-30.1	4.0	246.1	65.0		
-32.1	4.0	250.1	65.8		
-34.1	4.0	254.1	66.6		
-36.1	4.0	258.1	67.4		
-38.1	4.0	262.1	68.2		
-40.1	4.0	266.1	69.0		
-42.1	4.0	270.1	69.8		
-44.1	4.0	274.1	70.6		
-46.1	4.0	278.1	71.4		
-48.1	4.0	282.1	72.2		
-50.1	4.0	286.1	73.0		
-52.1	4.0	290.1	73.8		
-54.1	4.0	294.1	74.6		
-56.1	4.0	298.1	75.4		
-58.1	4.0	302.1	76.2		
-60.1	4.0	306.1	77.0		
-62.1	4.0	310.1	77.8		
-64.1	4.0	314.1	78.6		
-66.1	4.0	318.1	79.4		
-68.1	4.0	322.1	80.2		
-70.1	4.0	326.1	81.0		
-72.1	4.0	330.1	81.8		
-74.1	4.0	334.1	82.6		
-76.1	4.0	338.1	83.4		
-78.1	4.0	342.1	84.2		
-80.1	4.0	346.1	85.0		
-82.1	4.0	350.1	85.8		
-84.1	4.0	354.1	86.6		
-86.1	4.0	358.1	87.4		
-88.1	4.0	362.1	88.2		
-90.1	4.0	366.1	89.0		
-92.1	4.0	370.1	89.8		
-94.1	4.0	374.1	90.6		
-96.1	4.0	378.1	91.4		
-98.1	4.0	382.1	92.2		
-100.1	4.0	386.1	93.0		
-102.1	4.0	390.1	93.8		
-104.1	4.0	394.1	94.6		
-106.1	4.0	398.1	95.4		
-108.1	4.0	402.1	96.2		
-110.1	4.0	406.1	97.0		
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-114.1	4.0	414.1	98.6		
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-232.1	4.0	650.1	145.8		
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-236.1	4.0	658.1	147.4		
-238.1	4.0	662.1	148.2		
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-332.1	4.0	850.1	185.8		
-334.1	4.0	854.1	186.6		
-336.1	4.0	858.1	187.4		
-338.1	4.0	862.1	188.2		
-340.1	4.0	866.1	189.0		
-342.1	4.0	870.1	189.8		
-344.1	4.0	874.1	190.6		
-346.1	4.0	878.1	191.4		
-348.1	4.0	882.1	192.2		
-350.1	4.0	886.1	193.0		
-352.1	4.0	890.1	193.8		
-354.1	4.0	894.1	194.6		
-356.1	4.0	898.1	195.4		
-358.1	4.0	902.1	196.2		
-360.1	4.0	906.1	197.0		
-362.1	4.0	910.1	197.8		
-364.1	4.0	914.1	198.6		
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-370.1	4.0	926.1	201.0		
-372.1	4.0	930.1	201.8		
-374.1	4.0	934.1	202.6		
-376.1	4.0	938.1	203.4		
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-406.1	4.0	998.1	215.4		
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-410.1	4.0	1006.1	217.0		
-412.1	4.0	1010.1	217.8		
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-422.1	4.0	1030.1	221.8		
-424.1	4.0	1034.1	222.6		
-426.1	4.0	1038.1	223.4		
-428.1	4.0	1042.1	224.2		
-430.1	4.0	1046.1	225.0		
-432.1	4.0	1050.1	225.8		
-434.1	4.0	1054.1	226.6		
-436.1	4.0	1058.1	227.4		
-438.1	4.0	1062.1	228.2		
-440.1	4.0	1066.1	229.0		
-442.1	4.0	1070.1	229.8		
-444.1	4.0	1074.1	230.6		
-446.1	4.0	1078.1	231.4		
-448.1	4.0	1082.1	232.2		
-450.1	4.0	1086.1	233.0		
-452.1	4.0	1090.1	233.8		
-454.1	4.0	1094.1	234.6		
-456.1	4.0	1098.1	235.4		
-458.1	4.0	1102.1	236.2		
-460.1	4.0	1106.1	237.0		
-462.1	4.0	1110.1	237.8		
-464.1	4.0	1114.1	238.6		
-466.1	4.0	1118.1	239.4		
-468.1	4.0	1122.1	240.2		
-470.1	4.0	1126.1	241.0		
-472.1	4.0	1130.1	241.8		
-474.1	4.0	1134.1	242.6		
-476.1	4.0	1138.1	243.4		
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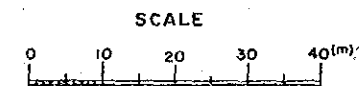
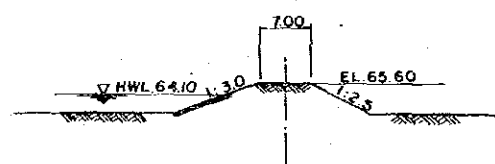
PLAN



SECTION C-C



SECTION D-D

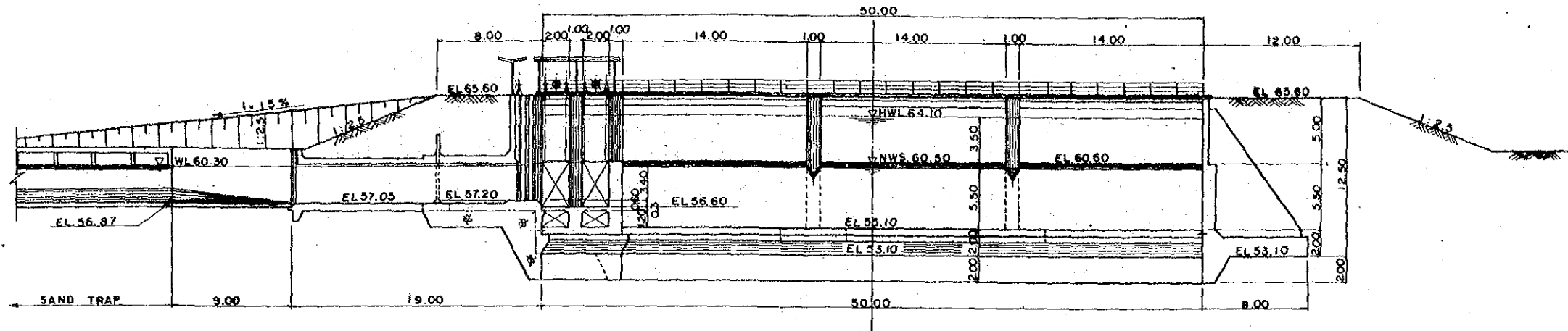


REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

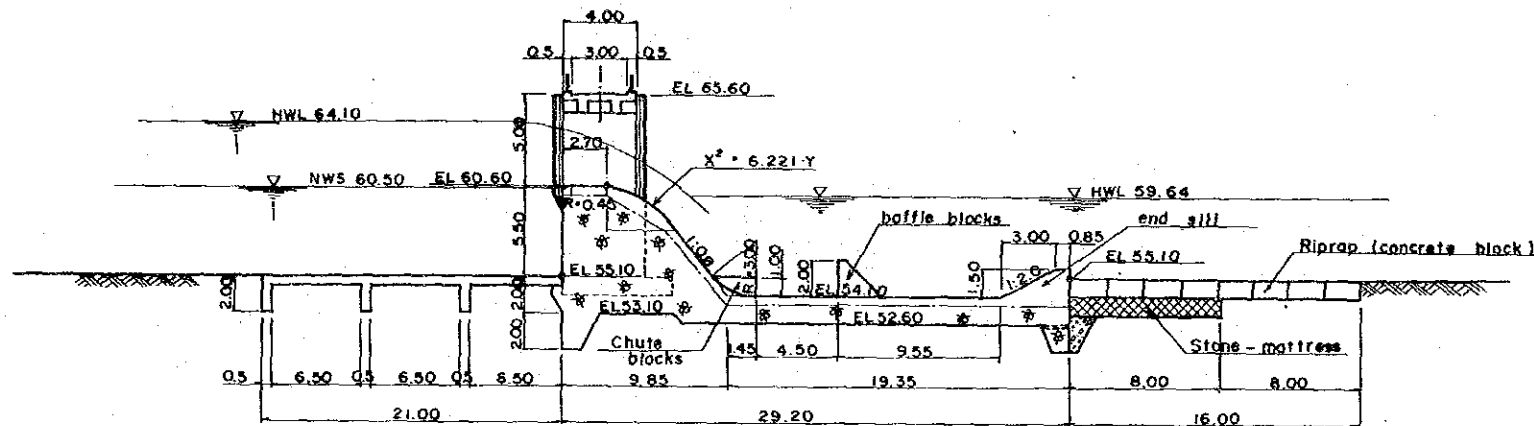
PLAN OF KUMU WEIR (2)

JAPAN INTERNATIONAL COOPERATION AGENCY DWG. NO
 TOKYO (JICA) 12

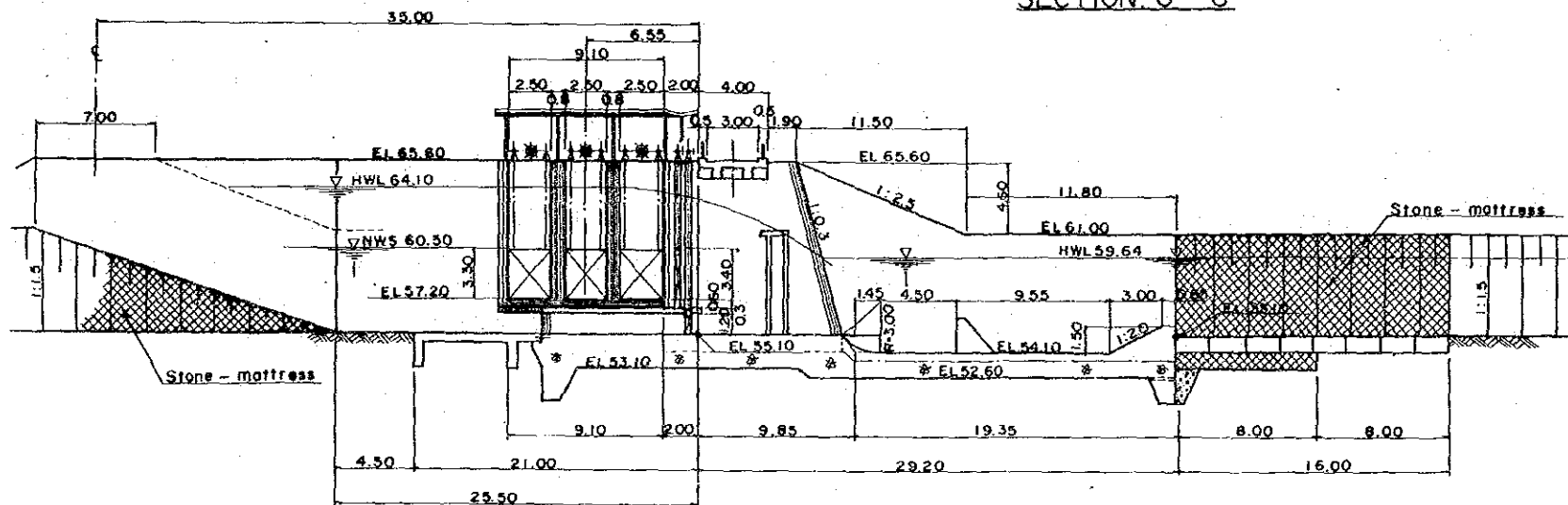
SECTION E-E



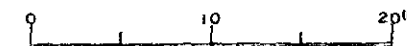
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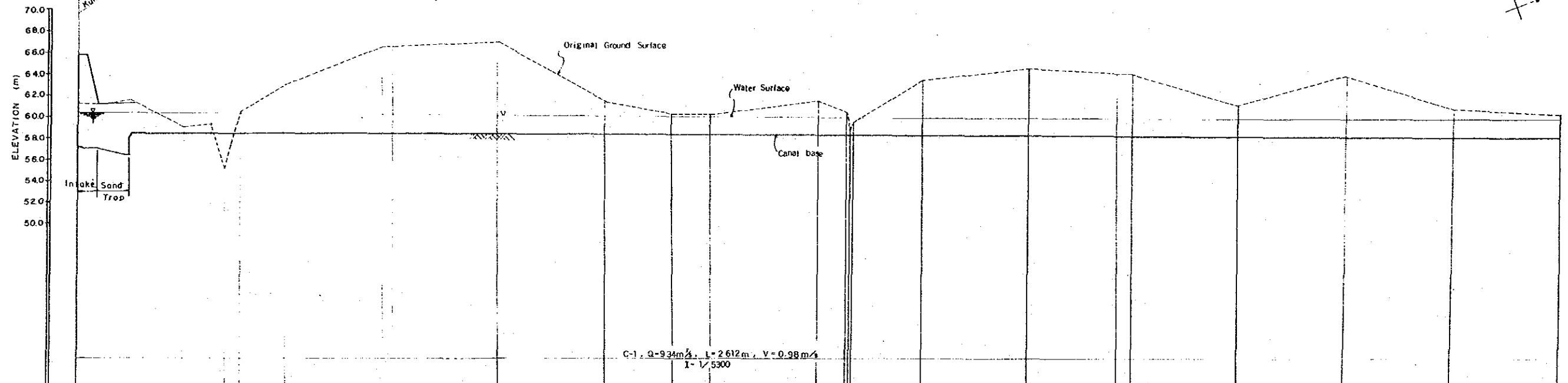
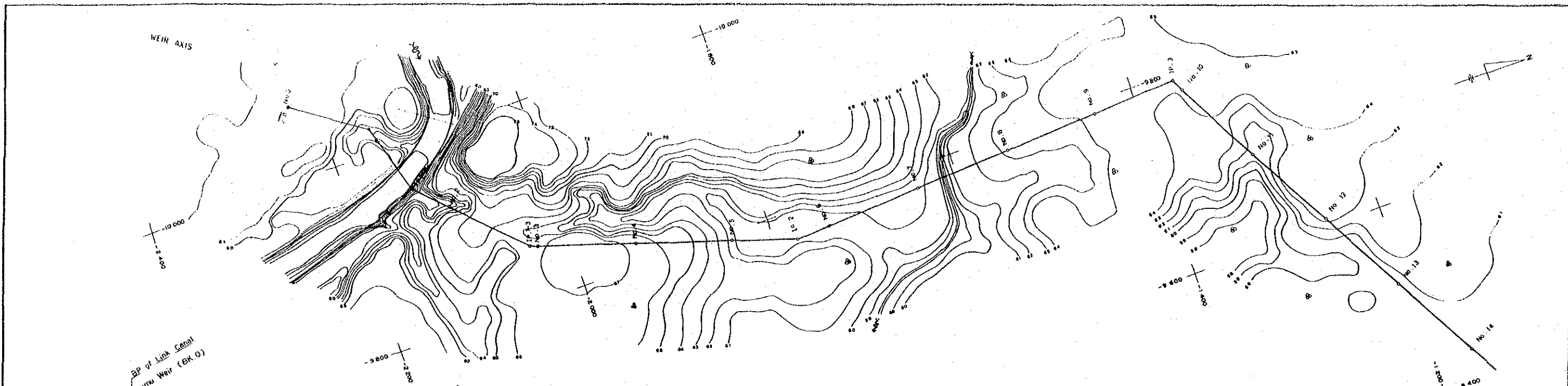
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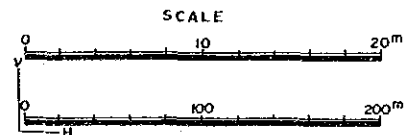
SCALE



REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT	
BATANG KUMU IRRIGATION PROJECT FEASIBILITY STUDY	
SECTION OF KUMU WEIR	
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA)	DWG. NO. 13



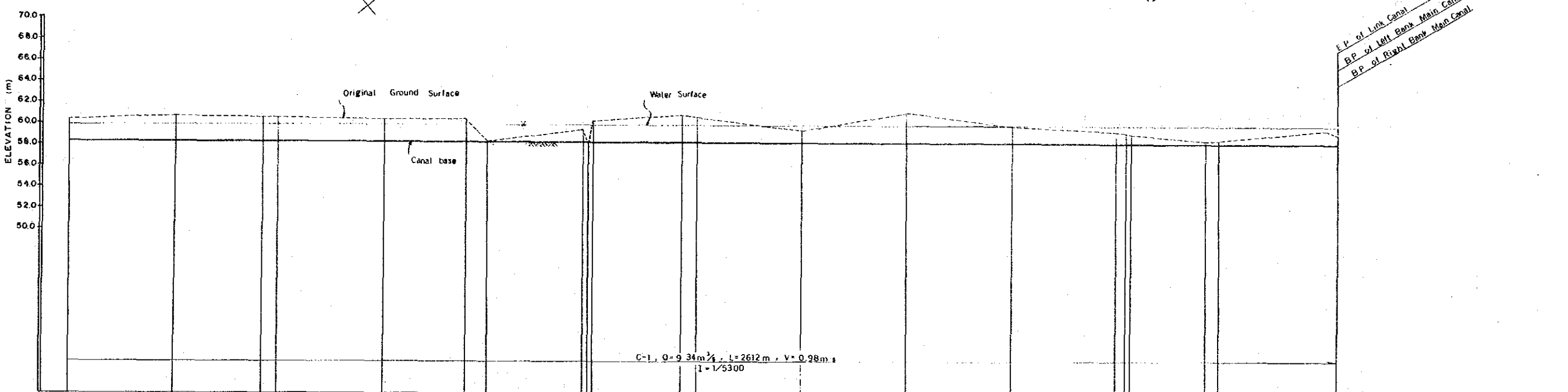
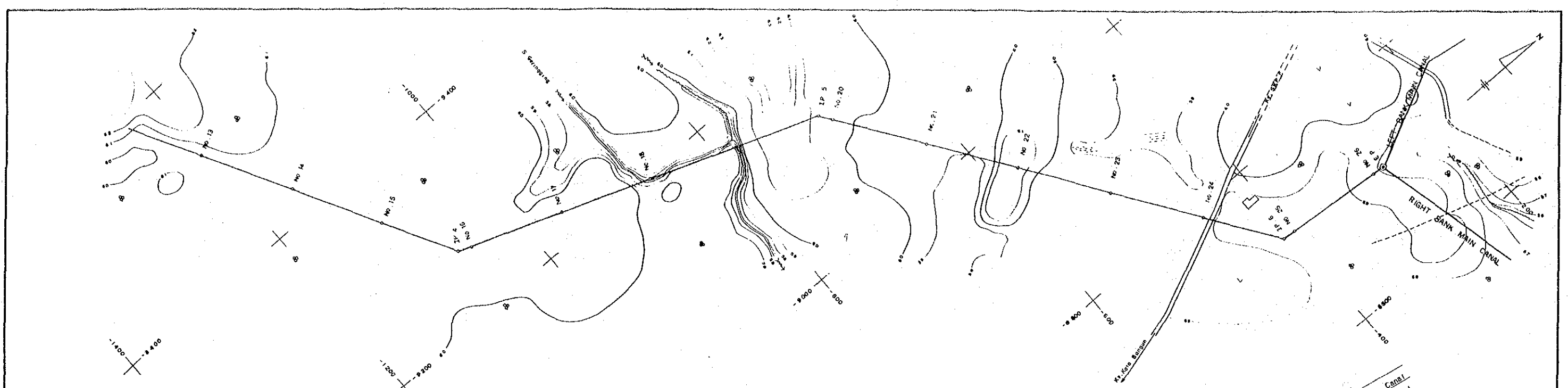
CANAL BASE ELEVATION	58.55	58.53	58.53	58.52	58.52	58.51	58.50	58.49	58.47	58.46	58.44	58.44	58.42	58.41	58.40	58.38	58.36	58.36	58.34	58.32	58.30	58.29	
WATER SURFACE ELEVATION	60.20	60.18	60.18	60.17	60.17	60.16	60.15	60.14	60.12	60.11	60.09	60.09	60.07	60.06	60.05	60.03	60.01	60.01	59.99	59.97	59.95	59.94	
GROUND SURFACE ELEVATION	61.20	61.16	61.49	61.08	60.32	60.18	60.15	60.14	60.95	61.40	60.30	60.28	61.50	60.40	63.30	64.50	64.10	64.00	61.20	63.90	60.87	60.24	
TOTAL DISTANCE	0.00	27.86	51.04	100.00	127.00	142.00	155.06	200.00	400.00	500.00	563.27	600.00	700.00	727.00	800.00	900.00	986.07	1000.00	1100.00	1200.00	1300.00	1400.00	
DISTANCE	0.00	27.86	23.18	46.98	27.00	15.00	13.86	44.14	100.00	100.00	63.27	34.73	100.00	27.00	100.00	100.00	86.07	13.93	100.00	100.00	100.00	100.00	
STATION	NO. 0			NO. 1	+27.00	+42.00	+55.86	NO. 2		NO. 3	IP. 1	NO. 4		NO. 5	NO. 6	NO. 7	NO. 8	NO. 9	NO. 10	NO. 11	NO. 12	NO. 13	NO. 14



REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

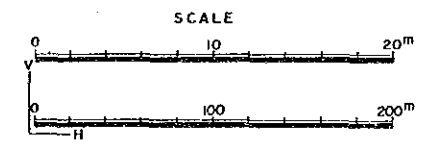
LINK CANAL PROFILE (1/2)

JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 14

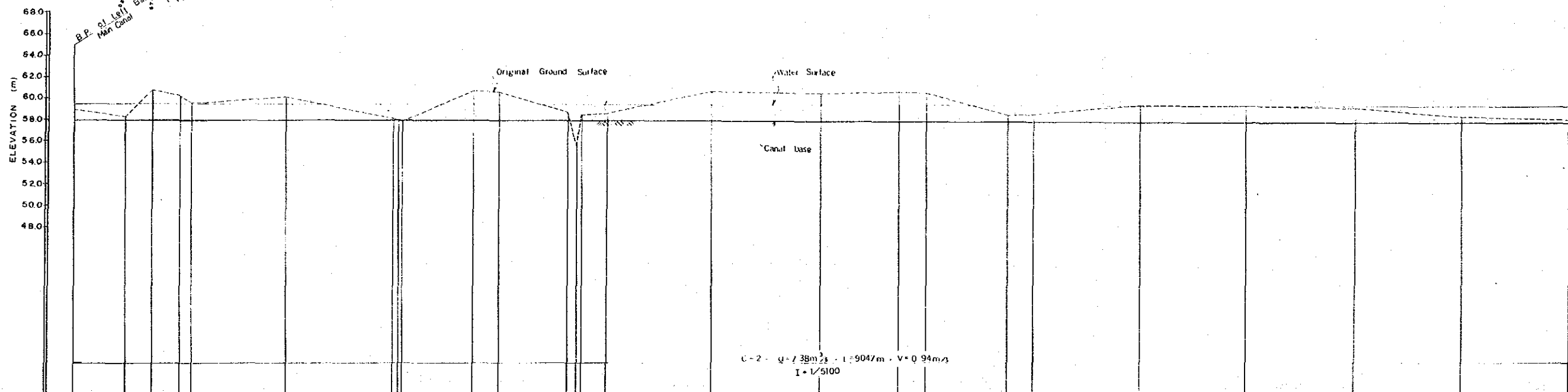
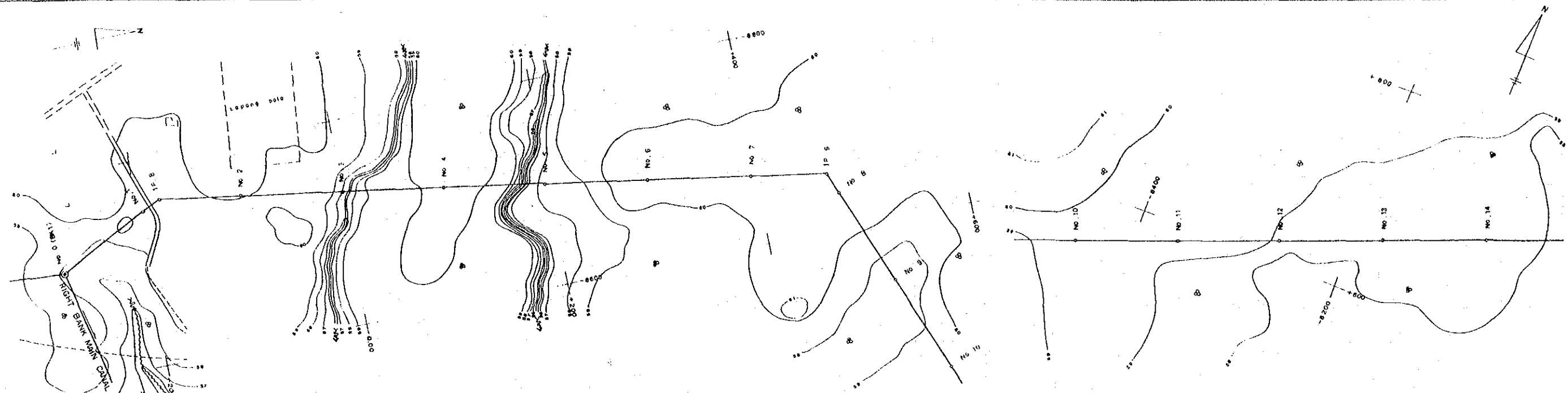


CANAL BASE ELEVATION	58.23	58.27	58.25	58.25	58.23	58.21	58.21	58.19	58.18	58.17	58.15	58.13	58.12	58.10	58.08	58.06	58.06
WATER SURFACE ELEVATION	59.94	59.92	59.90	59.90	59.88	59.86	59.86	59.84	59.83	59.82	59.80	59.78	59.77	59.75	59.74	59.73	59.71
GROUND SURFACE ELEVATION	60.24	60.38	60.53	60.48	60.30	60.34	60.27	60.21	60.78	60.53	59.31	61.00	59.63	59.15	58.94	58.29	59.34
TOTAL DISTANCE	1400.00	1500.00	1584.74	1600.00	1700.00	1780.00	1800.00	1800.00	1884.70	2000.00	2100.00	2200.00	2300.00	2400.00	2415.00	2488.66	2600.00
DISTANCE	100.00	100.00	84.74	15.26	100.00	80.00	20.00	91.00	84.70	15.30	100.00	100.00	100.00	100.00	15.00	83.66	100.00
STATION	NO. 14	NO. 15	IP. 4	NO. 16	NO. 17	+80.00	NO. 18	NO. 19	IP. 5	NO. 20	NO. 21	NO. 22	NO. 23	NO. 24	+15.00	IP. 6	NO. 25
																	NO. 26

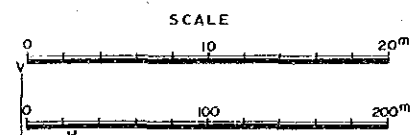
I.P. of Link Canal
 B.P. of Left Bank Main Canal
 B.P. of Right Bank Main Canal



REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY
 LINK CANAL PROFILE (2/2)
 JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 15



STATION	DISTANCE	TOTAL DISTANCE	GROUND SURFACE ELEVATION	WATER SURFACE ELEVATION	CANAL BASE ELEVATION
NO. 0 (I.P. 7)	0.00	0.00	58.81	59.51	57.97
+50.00	30.00	30.00	58.16	59.30	57.96
+75.00	25.00	75.00	60.74	59.30	57.96
NO. 1	23.00	100.00	60.16	59.45	57.95
+110.00	11.00	111.00	59.56	59.45	57.95
I.P. 8	13.98	124.98	59.56	59.45	57.95
NO. 2	75.02	200.00	60.03	59.47	57.93
NO. 3	100.00	300.00	57.98	59.45	57.91
+250.00	50.00	350.00	57.13	59.45	57.91
+74.92	65.92	374.92	60.82	59.44	57.90
NO. 4	25.07	400.00	60.40	59.43	57.89
+64.87	64.87	464.87	58.46	59.42	57.88
+77.87	4.00	473.87	58.46	59.42	57.88
+77.87	4.00	477.87	58.46	59.42	57.88
NO. 5	22.13	500.00	58.46	59.41	57.87
NO. 6	100.00	600.00	60.35	59.39	57.85
NO. 7	100.00	700.00	60.36	59.37	57.83
I.P. 9	74.41	774.41	60.59	59.36	57.82
NO. 8	25.59	800.00	60.48	59.35	57.81
+74.71	74.71	874.71	58.46	59.34	57.80
NO. 9	25.29	900.00	58.31	59.33	57.79
NO. 10	100.00	1000.00	58.33	59.31	57.77
NO. 11	100.00	1100.00	58.32	59.29	57.75
NO. 12	100.00	1200.00	58.10	59.27	57.73
NO. 13	100.00	1300.00	58.31	59.26	57.72
NO. 14	100.00	1400.00	57.89	59.24	57.70



REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

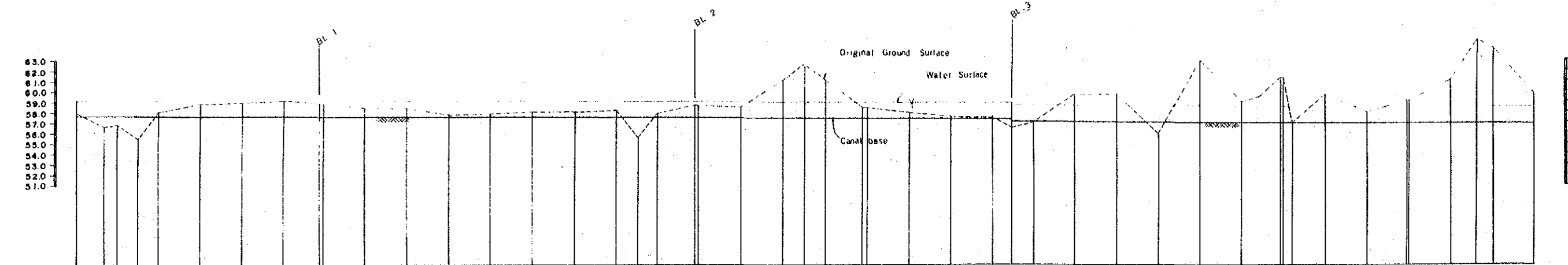
LEFT BANK MAIN CANAL (1 / 5)

JAPAN INTERNATIONAL COOPERATION AGENCY
 TOKYO (JICA)

DWG. NO.
 16

63.0
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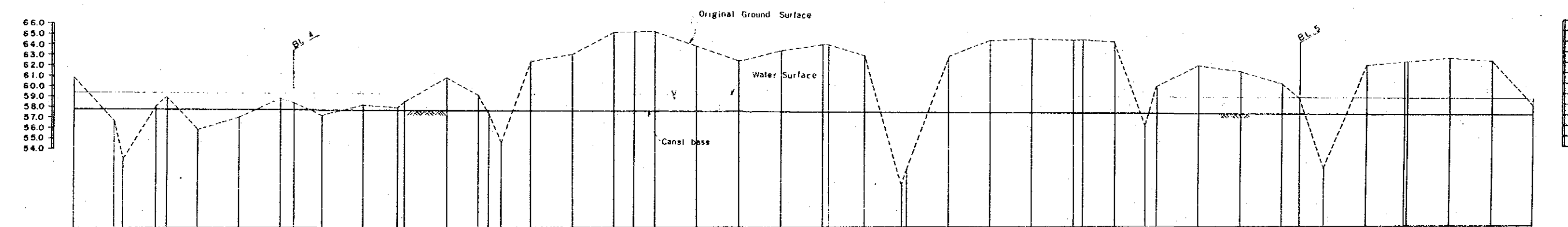
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CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
57.70	58.24	57.99	100.00	100.00	NO. 14
		56.67	167.50	167.50	IP. 10
		56.89	325.00	325.00	NO. 15
		55.50	500.00	500.00	NO. 16
		58.02	600.00	600.00	NO. 17
		58.83	700.00	700.00	NO. 18
		58.90	800.00	800.00	NO. 19
		58.08	900.00	900.00	NO. 20
		58.96	1000.00	1000.00	NO. 21
		58.71	1100.00	1100.00	NO. 22
		58.33	1200.00	1200.00	NO. 23
		57.69	1300.00	1300.00	NO. 24
		57.74	1400.00	1400.00	NO. 25
		57.91	1500.00	1500.00	NO. 26
		57.79	1600.00	1600.00	NO. 27
		58.10	1700.00	1700.00	NO. 28
		58.50	1800.00	1800.00	NO. 29
		57.80	1900.00	1900.00	NO. 30
		58.62	2000.00	2000.00	NO. 31
		58.62	2100.00	2100.00	NO. 32
		58.40	2200.00	2200.00	NO. 33
		61.00	2300.00	2300.00	NO. 34
		62.50	2400.00	2400.00	NO. 35
		61.00	2500.00	2500.00	NO. 36
		58.33	2600.00	2600.00	NO. 37
		58.33	2700.00	2700.00	NO. 38
		57.87	2800.00	2800.00	NO. 39
		57.50	2900.00	2900.00	NO. 40
		57.43	3000.00	3000.00	NO. 41
		58.47	3100.00	3100.00	NO. 42
		56.92	3200.00	3200.00	NO. 43
		59.67	3300.00	3300.00	NO. 44
		58.00	3400.00	3400.00	NO. 45
		58.92	3500.00	3500.00	NO. 46
		62.91	3600.00	3600.00	NO. 47
		61.39	3700.00	3700.00	NO. 48
		57.00	3800.00	3800.00	NO. 49
		59.67	3900.00	3900.00	NO. 50
		58.00	4000.00	4000.00	NO. 51
		58.00	4100.00	4100.00	NO. 52
		58.00	4200.00	4200.00	NO. 53
		58.00	4300.00	4300.00	NO. 54
		58.00	4400.00	4400.00	NO. 55
		58.00	4500.00	4500.00	NO. 56
		58.00	4600.00	4600.00	NO. 57
		58.00	4700.00	4700.00	NO. 58
		58.00	4800.00	4800.00	NO. 59
		58.00	4900.00	4900.00	NO. 60
		58.00	5000.00	5000.00	NO. 61

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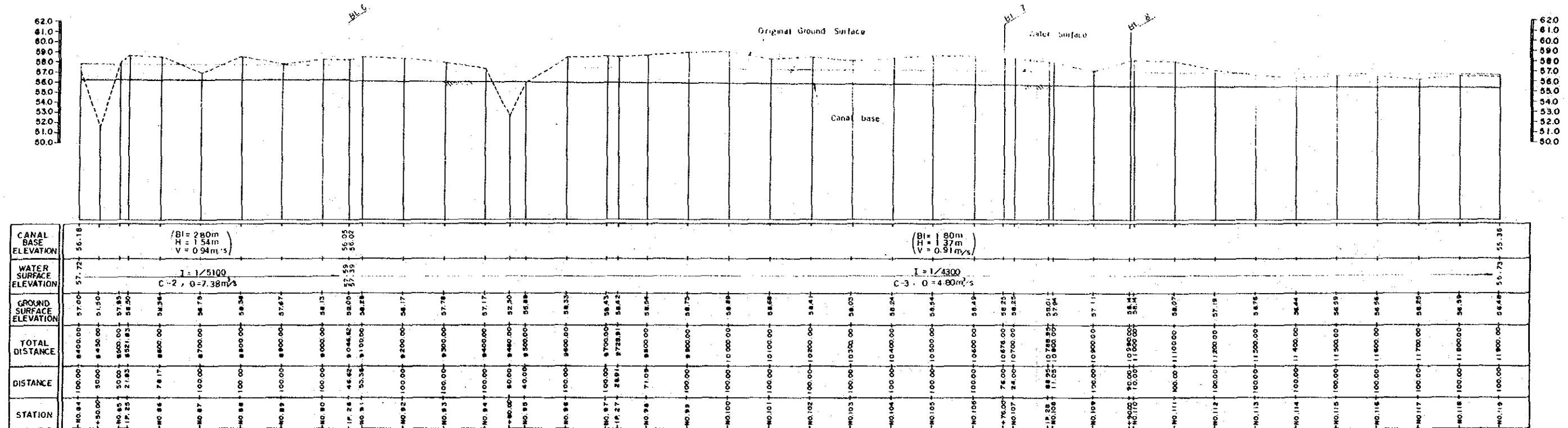


CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
56.86	58.40	59.81	100.00	100.00	NO. 59
		53.65	200.00	200.00	NO. 60
		52.00	300.00	300.00	NO. 61
		57.00	400.00	400.00	NO. 62
		57.33	500.00	500.00	NO. 63
		56.14	600.00	600.00	NO. 64
		57.13	700.00	700.00	NO. 65
		56.86	800.00	800.00	NO. 66
		57.38	900.00	900.00	NO. 67
		59.47	1000.00	1000.00	NO. 68
		58.00	1100.00	1100.00	NO. 69
		58.00	1200.00	1200.00	NO. 70
		58.00	1300.00	1300.00	NO. 71
		58.00	1400.00	1400.00	NO. 72
		58.00	1500.00	1500.00	NO. 73
		58.00	1600.00	1600.00	NO. 74
		58.00	1700.00	1700.00	NO. 75
		58.00	1800.00	1800.00	NO. 76
		58.00	1900.00	1900.00	NO. 77
		58.00	2000.00	2000.00	NO. 78
		58.00	2100.00	2100.00	NO. 79
		58.00	2200.00	2200.00	NO. 80
		58.00	2300.00	2300.00	NO. 81
		58.00	2400.00	2400.00	NO. 82
		58.00	2500.00	2500.00	NO. 83
		58.00	2600.00	2600.00	NO. 84
		58.00	2700.00	2700.00	NO. 85
		58.00	2800.00	2800.00	NO. 86
		58.00	2900.00	2900.00	NO. 87
		58.00	3000.00	3000.00	NO. 88
		58.00	3100.00	3100.00	NO. 89
		58.00	3200.00	3200.00	NO. 90
		58.00	3300.00	3300.00	NO. 91
		58.00	3400.00	3400.00	NO. 92
		58.00	3500.00	3500.00	NO. 93
		58.00	3600.00	3600.00	NO. 94
		58.00	3700.00	3700.00	NO. 95
		58.00	3800.00	3800.00	NO. 96
		58.00	3900.00	3900.00	NO. 97
		58.00	4000.00	4000.00	NO. 98
		58.00	4100.00	4100.00	NO. 99
		58.00	4200.00	4200.00	NO. 100

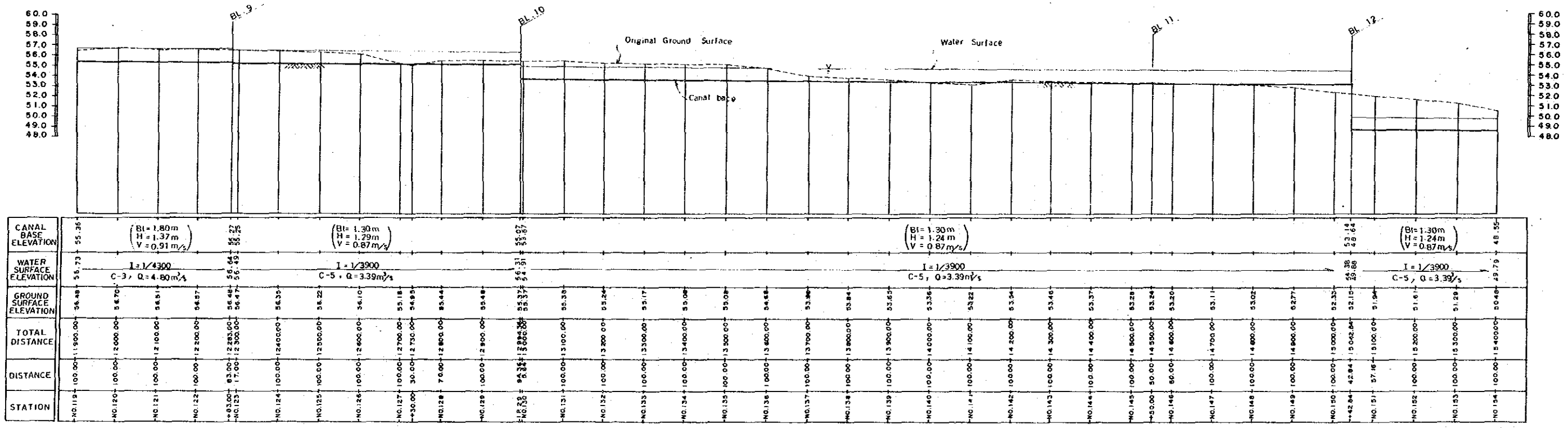
REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
BATANG KUMU IRRIGATION PROJECT
FEASIBILITY STUDY

LEFT BANK MAIN CANAL (2 / 5)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) DWG. NO. 17



CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
56.18	57.72	57.00	8400.00	100.00	+NO.84
(B=2.80m, H=1.54m, V=0.94m/s)					
I = 1/5100, C-2, Q=7.38m ³ /s					
(B=1.80m, H=1.37m, V=0.91m/s)					
I = 1/4300, C-3, Q=4.80m ³ /s					
55.36	56.73	56.48	11900.00	100.00	+NO.119

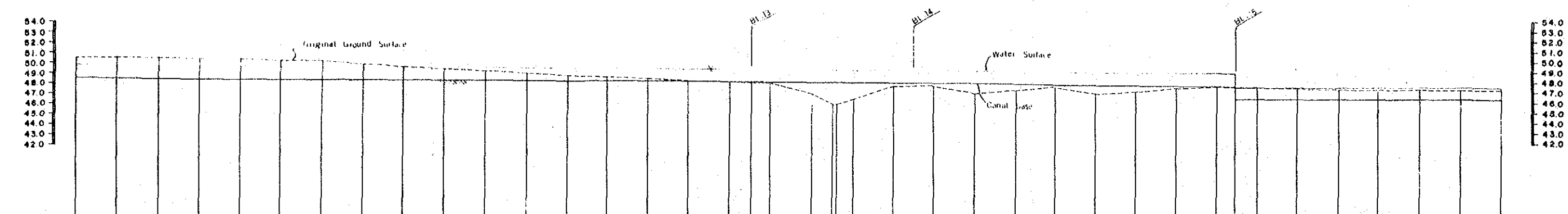


CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
55.36	56.73	56.48	11900.00	100.00	+NO.119
(B=1.80m, H=1.37m, V=0.91m/s)					
I = 1/4300, C-3, Q=4.80m ³ /s					
(B=1.30m, H=1.29m, V=0.67m/s)					
I = 1/3900, C-5, Q=3.39m ³ /s					
(B=1.30m, H=1.24m, V=0.87m/s)					
I = 1/3900, C-5, Q=3.39m ³ /s					
(B=1.30m, H=1.24m, V=0.87m/s)					
I = 1/3900, C-5, Q=3.39m ³ /s					
48.55	49.79	49.48	15400.00	100.00	+NO.154

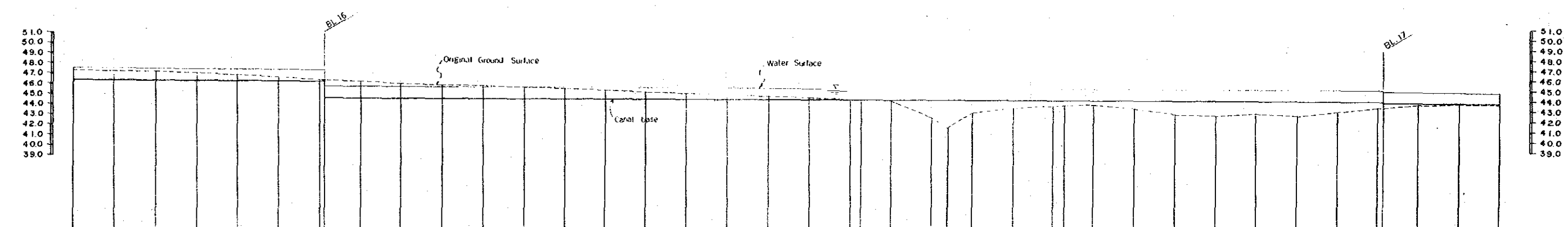
REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
 DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

LEFT BANK MAIN CANAL (3 / 5)

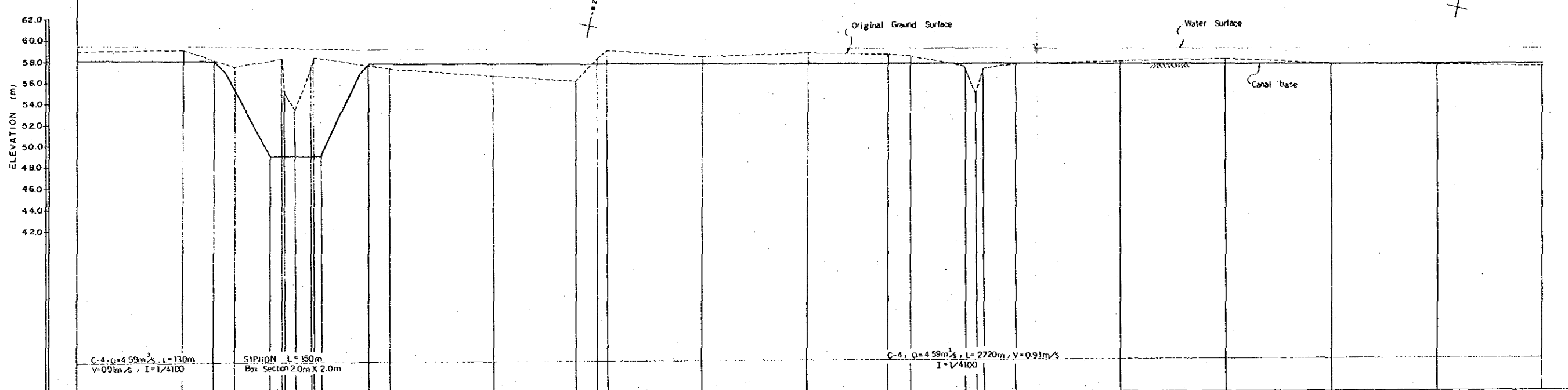
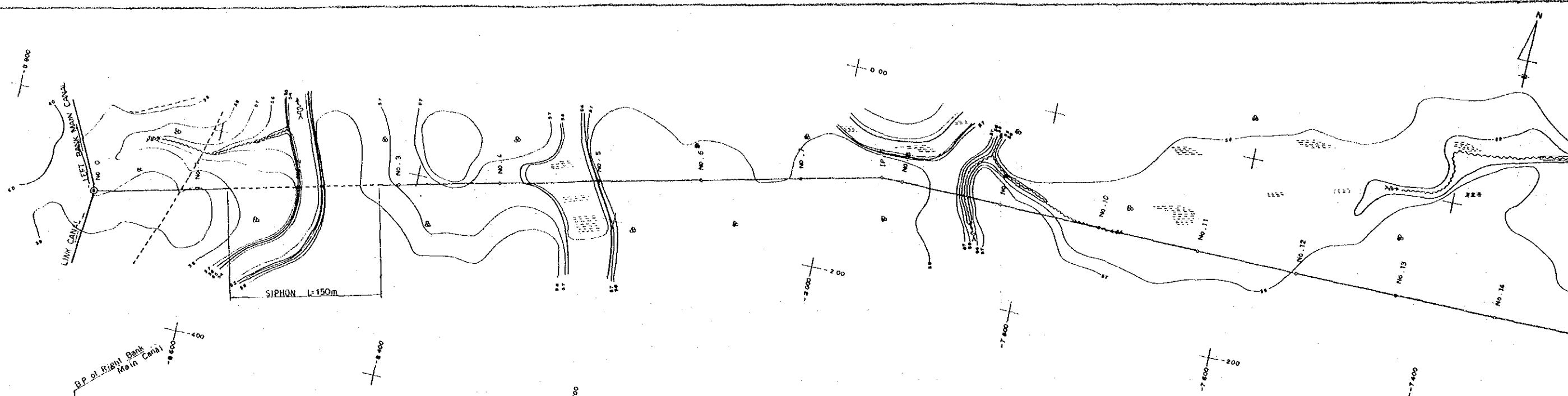
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 18



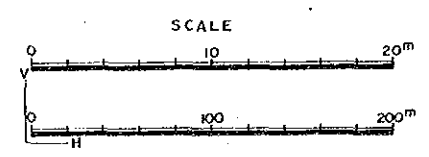
CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
48.55	49.73	50.48	15400.00	100.00	180+00
		50.48	15500.00	100.00	180+100
		50.49	15600.00	100.00	180+200
		50.49	15700.00	100.00	180+300
		50.42	15800.00	100.00	180+400
		50.34	15900.00	100.00	180+500
		50.27	16000.00	100.00	180+600
		49.94	16100.00	100.00	180+700
		49.71	16200.00	100.00	180+800
		49.47	16300.00	100.00	180+900
		49.24	16400.00	100.00	181+000
		48.00	16500.00	100.00	181+100
		48.84	16600.00	100.00	181+200
		48.67	16700.00	100.00	181+300
		48.10	16800.00	100.00	181+400
		48.07	16900.00	100.00	181+500
		47.90	17000.00	100.00	181+600
		46.03	17100.00	100.00	181+700
		46.56	17200.00	100.00	181+800
		47.77	17300.00	100.00	181+900
		47.40	17400.00	100.00	182+000
		47.82	17500.00	100.00	182+100
		47.76	17600.00	100.00	182+200
		47.10	17700.00	100.00	182+300
		47.40	17800.00	100.00	182+400
		47.13	17900.00	100.00	182+500
		47.20	18000.00	100.00	182+600
		47.64	18100.00	100.00	182+700
		47.79	18200.00	100.00	182+800
		47.78	18300.00	100.00	182+900
		47.77	18400.00	100.00	183+000
		47.56	18500.00	100.00	183+100
		47.45	18600.00	100.00	183+200
		47.33	18700.00	100.00	183+300
		47.28	18800.00	100.00	183+400
		47.24	18900.00	100.00	183+500
		47.28	19000.00	100.00	183+600



CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
45.41	47.49	47.26	18900.00	100.00	189+000
		47.19	19000.00	100.00	189+100
		47.11	19100.00	100.00	189+200
		47.00	19200.00	100.00	189+300
		46.74	19300.00	100.00	189+400
		46.53	19400.00	100.00	189+500
		46.23	19500.00	100.00	189+600
		46.23	19600.00	100.00	189+700
		46.13	19700.00	100.00	189+800
		45.98	19800.00	100.00	189+900
		45.85	19900.00	100.00	190+000
		45.70	20000.00	100.00	190+100
		45.35	20100.00	100.00	190+200
		45.41	20200.00	100.00	190+300
		45.26	20300.00	100.00	190+400
		45.12	20400.00	100.00	190+500
		44.97	20500.00	100.00	190+600
		44.80	20600.00	100.00	190+700
		44.65	20700.00	100.00	190+800
		44.48	20800.00	100.00	190+900
		44.33	20900.00	100.00	191+000
		44.28	21000.00	100.00	191+100
		44.15	21100.00	100.00	191+200
		42.50	21200.00	100.00	191+300
		41.50	21300.00	100.00	191+400
		42.92	21400.00	100.00	191+500
		43.37	21500.00	100.00	191+600
		43.63	21600.00	100.00	191+700
		43.61	21700.00	100.00	191+800
		43.64	21800.00	100.00	191+900
		43.38	21900.00	100.00	192+000
		42.84	22000.00	100.00	192+100
		42.67	22100.00	100.00	192+200
		42.82	22200.00	100.00	192+300
		42.63	22300.00	100.00	192+400
		43.00	22400.00	100.00	192+500
		43.30	22500.00	100.00	192+600
		43.65	22600.00	100.00	192+700
		43.76	22700.00	100.00	192+800
		43.71	22800.00	100.00	192+900
		43.79	22900.00	100.00	193+000



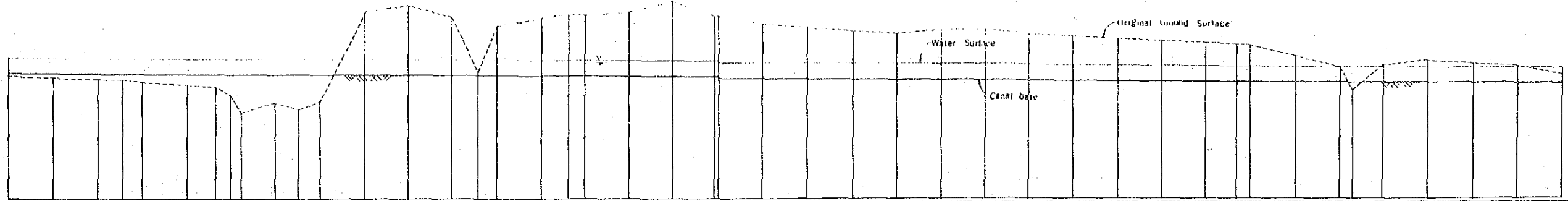
STATION	DISTANCE	TOTAL DISTANCE	GROUND SURFACE ELEVATION	WATER SURFACE ELEVATION	CANAL BASE ELEVATION
NO. 0	0.00	0.00	58.91	59.41	58.06
NO. 1	100.00	100.00	59.01	59.39	58.04
+30.00		130.00	58.09	59.39	58.03
+50.00		150.00	57.77		
+80.00		196.00	58.08	49.01	49.01
+10.00		210.00	54.85	49.01	49.01
+20.00		228.00	53.31	49.01	49.01
+30.00		258.00	56.24	49.01	49.01
+80.00		380.00	54.45	59.08	57.73
NO. 3	72.00	300.00	57.15	59.08	57.73
NO. 4	100.00	400.00	56.42	59.05	57.70
+78.00		478.00	55.99	59.03	57.68
NO. 5	22.00	300.00	58.16	58.03	57.68
+10.00		310.00	58.65	59.02	57.67
NO. 6	100.00	600.00	56.33	59.00	57.65
NO. 7	100.00	700.00	56.65	58.98	57.63
19.1 km	77.75	777.75	58.48	58.96	57.61
NO. 8	22.25	800.00	56.20	58.95	57.60
+93.00		893.00	57.33	58.94	57.59
+80.00		813.00	54.42	58.94	57.59
+71.00		884.00	57.08	58.94	57.59
NO. 9	25.00	900.00	57.90	58.93	57.58
NO. 10	100.00	1000.00	57.75	58.90	57.55
NO. 11	100.00	1100.00	58.00	58.88	57.53
NO. 12	100.00	1200.00	57.44	58.85	57.51
NO. 13	100.00	1300.00	57.33	58.83	57.48
NO. 14	100.00	1400.00	57.2	58.81	57.46



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 RIGHT BANK MAIN CANAL (1/4)
 JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 21

66.0
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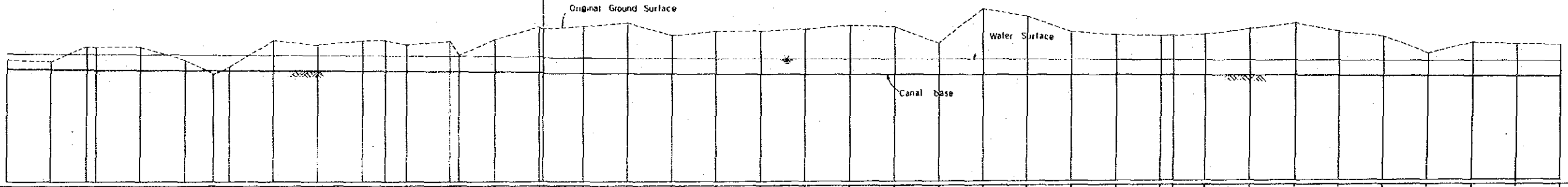
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CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
57.46	58.81	57.21			NO. 14
		57.00			NO. 15
		56.85			NO. 16
		56.81			IP. 21
		56.77			NO. 17
		56.44			NO. 18
		56.27			IP. 31
		55.50			NO. 19
		54.00			+25.00
		54.94			NO. 20
		54.30			+55.50
		54.99			NO. 21
		63.00			NO. 22
		63.43			NO. 23
		62.50			NO. 24
		61.45			+60.00
		62.44			NO. 25
		62.74			+60.00
		62.87			NO. 27
		62.95			NO. 28
		61.83			NO. 29
		61.52			NO. 32
		61.22			NO. 33
		61.00			NO. 34
		61.34			NO. 35
		61.13			NO. 36
		60.95			NO. 37
		60.80			NO. 38
		60.61			NO. 39
		60.42			NO. 40
		60.08			IP. 51
		60.03			NO. 42
		59.20			NO. 43
		58.60			NO. 44
		58.00			+30.00
		58.35			NO. 45
		58.09			NO. 46
		57.34			NO. 48

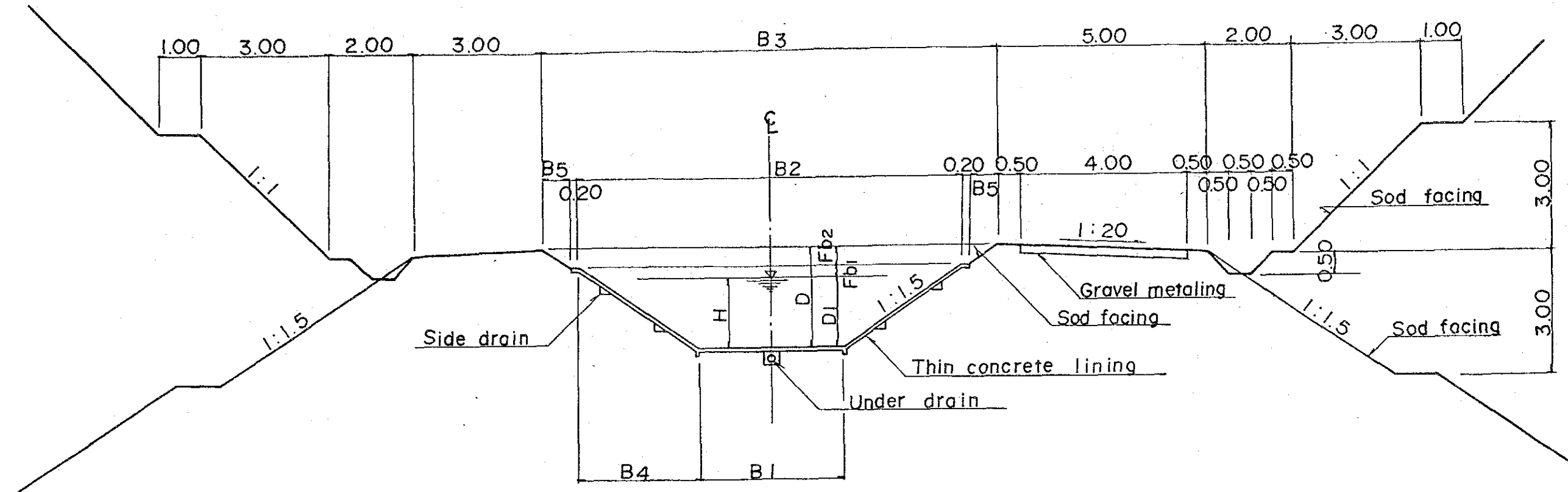
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57.0
56.0
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54.0



CANAL BASE ELEVATION	WATER SURFACE ELEVATION	GROUND SURFACE ELEVATION	TOTAL DISTANCE	DISTANCE	STATION
56.51	57.86	57.34			NO. 49
		57.13			NO. 50
		56.44			IP. 61
		56.45			NO. 51
		56.46			NO. 52
		57.25			NO. 53
		56.00			+65.00
		56.60			NO. 54
		59.00			NO. 55
		58.60			NO. 56
		58.84			NO. 57
		58.00			IP. 71
		58.87			NO. 58
		58.91			NO. 59
		57.70			+20.00
		59.10			NO. 60
		60.32			NO. 61
		60.34			NO. 62
		60.82			NO. 63
		59.47			NO. 64
		59.85			NO. 65
		59.85			NO. 66
		60.16			NO. 67
		60.33			NO. 68
		60.18			NO. 69
		58.80			NO. 70
		61.74			NO. 71
		61.11			NO. 72
		59.92			NO. 73
		59.30			NO. 74
		59.42			NO. 75
		59.42			IP. 81
		59.00			NO. 76
		60.00			NO. 77
		60.45			NO. 78
		59.71			NO. 79
		59.34			NO. 80
		57.80			NO. 81
		58.62			NO. 82
		58.62			NO. 83
		58.49			NO. 84

THIN CONCRETE LINING CANAL

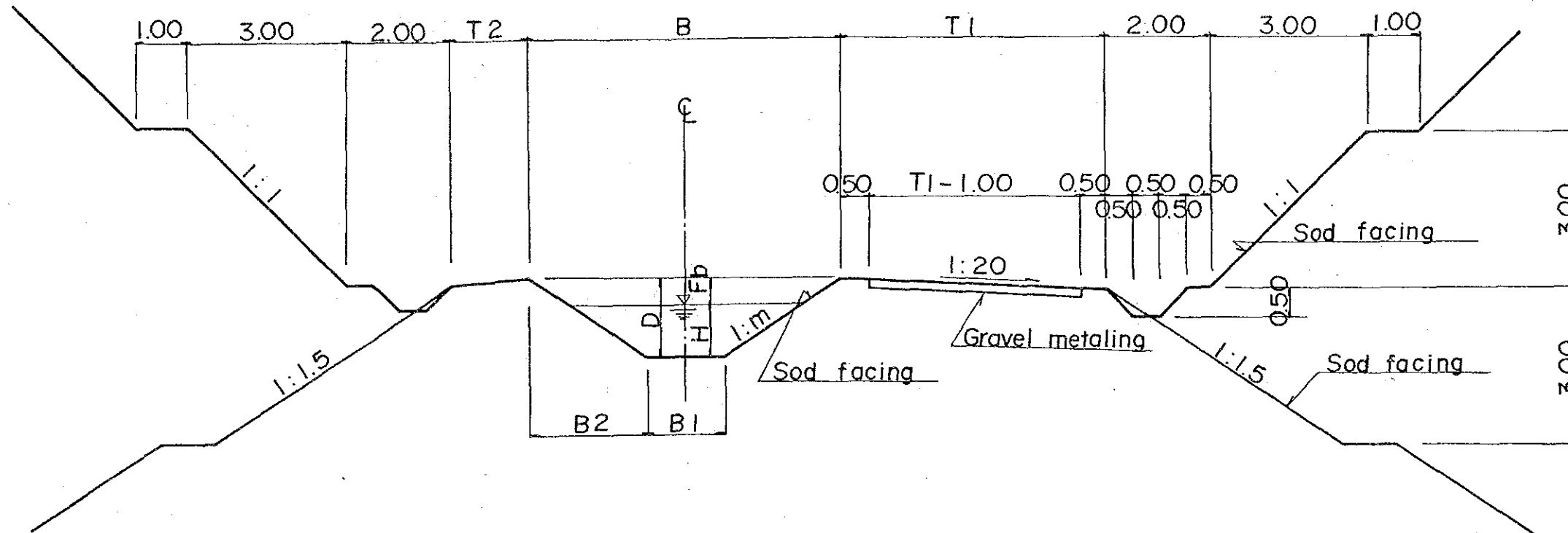


Dimension of Concrete Lining Canal

No.	Q m ³ /s	m	B1 m	B2 m	B3 m	B4 m	B5 m	H m	Fb1 m	Fb2 m	D1 m	D m	I m
C-1	9.34	1.5	3.30	9.15	10.90	2.925	0.675	1.65	0.30	0.45	1.95	2.40	1/5300
C-2	7.38	"	2.80	8.35	10.10	2.775	"	1.54	0.31	"	1.85	2.30	1/5100
C-3	4.80	"	1.80	6.75	8.20	2.475	0.525	1.37	0.28	0.35	1.65	2.00	1/4300
C-4	4.59	"	1.70	6.50	7.95	2.400	"	1.35	0.25	"	1.60	1.95	1/4100
C-5	3.39	"	1.30	5.80	7.25	2.250	"	1.24	0.26	"	1.50	1.85	1/3900
C-6	3.16	"	1.20	5.70	7.15	2.250	"	1.22	0.28	"	1.50	1.85	1/3800
C-7	2.36	"	1.00	5.20	6.65	2.100	"	1.11	0.29	"	1.40	1.75	1/3800
C-8	2.09	"	1.00	4.90	6.35	1.950	"	1.05	0.25	"	1.30	1.65	1/3800

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 THIN CONCRETE LINING CANAL
 JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 25

EARTH CANAL



Dimension of Earth Canal

No.	Q m ³ /s	H m	Fb m	D m	B1 m	m	B2 m	B m	T1 m	T2 m	I
S-1	1.66	1.00	0.60	1.60	2.00	1.5	2.400	6.80	5.00	3.00	1/3800
S-2	1.38	0.95	0.50	1.45	1.80	"	2.175	6.15	"	"	"
S-3	1.06	0.90	0.50	1.40	1.40	"	2.100	5.60	"	2.00	"
S-4	1.01	0.89	0.51	1.40	1.30	"	2.100	5.50	"	"	1/3600
S-5	0.76	0.82	0.53	1.35	1.10	"	2.025	5.15	3.00	"	1/2900
S-6	0.71	0.81	0.54	1.35	1.00	"	2.025	5.05	"	"	1/2700
S-7	0.66	0.79	0.51	1.30	1.00	"	1.950	4.90	"	"	1/2900
S-8	0.53	0.74	0.51	1.25	0.90	"	1.875	4.65	"	"	1/3100
S-9	0.45	0.71	0.44	1.15	0.80	"	1.725	4.25	"	"	1/3100
S-10	0.39	0.68	0.42	1.10	0.70	"	1.650	4.00	"	"	1/3000
S-11	0.24	0.60	0.40	1.00	0.60	1.0	1.500	3.60	"	"	1/2300

REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS
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 BATANG KUMU IRRIGATION PROJECT
 FEASIBILITY STUDY

TYPICAL CROSS SECTION
OF EARTH CANAL

JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO (JICA) DWG. NO. 26

JICA