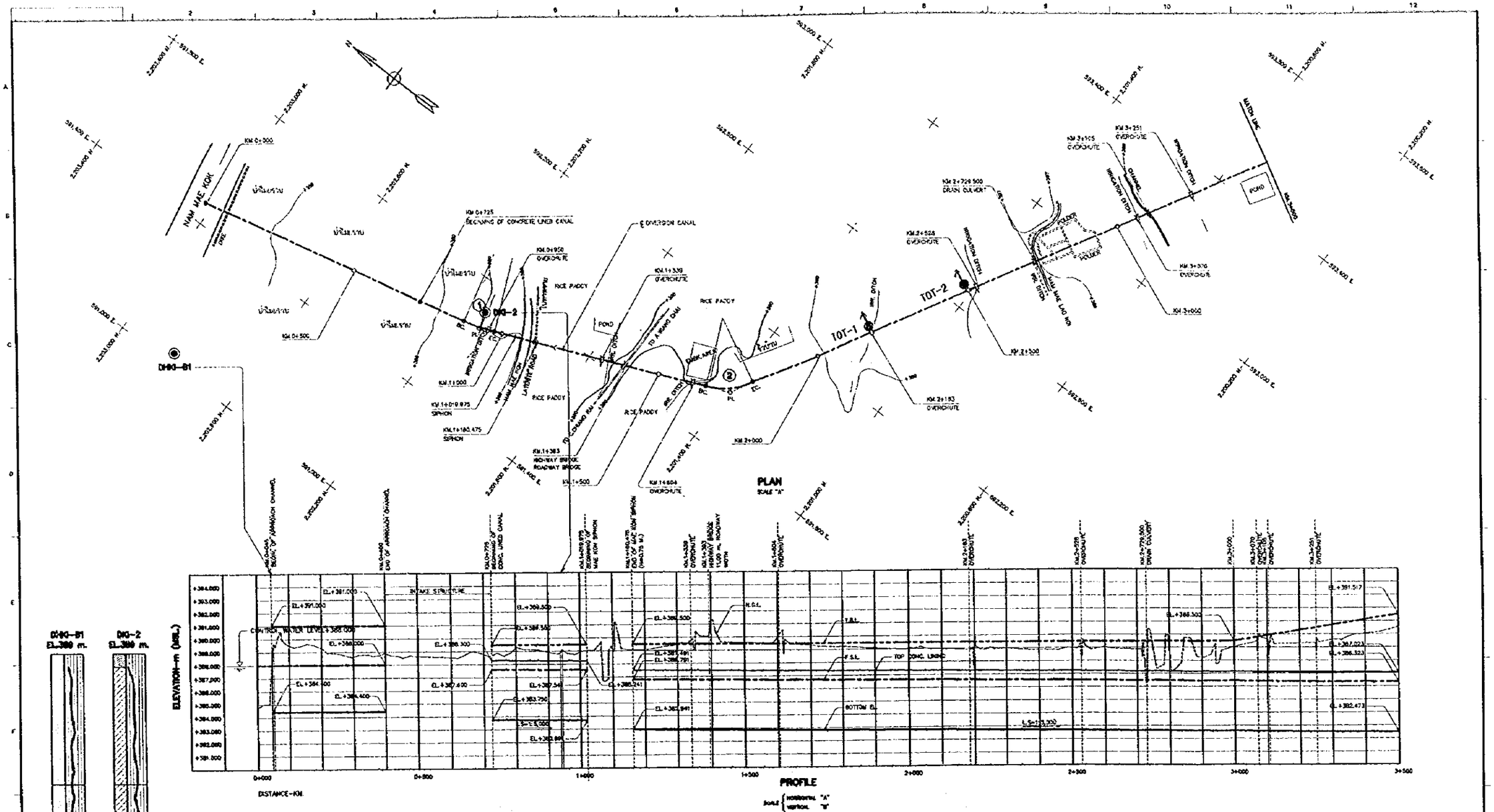


CURVE DATA

NO. OF CURVE	KM. OF PI.	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
B.	0+000.000	922.862	2,203,024.800	581,458.820	-	-	-	-	-	-	-	-	S.12-31-12 E.	Begin. of Reach 1 Canal
1	0+922.862	796.728	2,202,124.345	581,639.810	10	31	06	50.00	543.183	99.719	0+872.862	0+972.581	S.33-22-20 E.	
2	1+719.310		2,201,361.420	581,871.500	37	50	33	75.00	218.752	144.507	1+644.309	1+788.816		

SCALE "A"
0 100 200 300 400 5
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S.S	b (m)	d (m)	t (m)	Hc (m)	Hs (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
0+045.000	0+400.000	140.000	141.846	952.000	3.257	0.148	0.018		1 : 2.0	230.00	6.000	0.20	5.00	10.00	9.00	9.00	10.00	10.00	150.00	150.00	Concrete Lined Canal
0+725.000	3+500.000	140.000	139.412	79.984	2.798	1.743	0.018	1 : 5,000	1 : 1.5	15.50	3.850	VARIES	4.56	VARIES	2.00	2.00	4.00	4.00	50.00	50.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

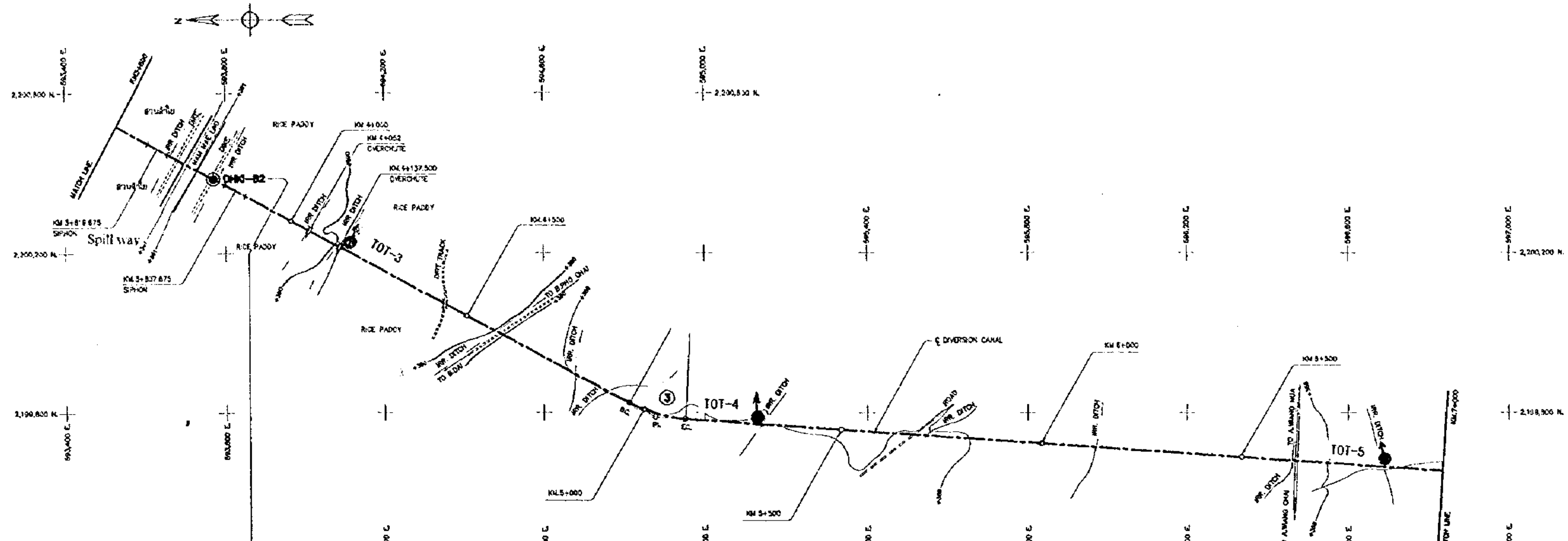
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL
KM.0+000 TO KM.3+500 (1/16)

Map & Draw-ing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

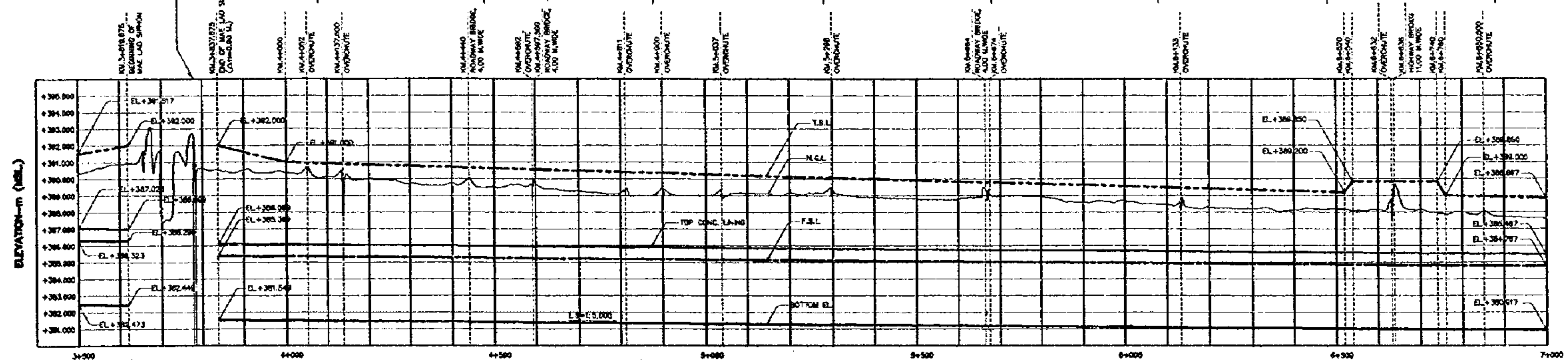
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 11.2.2 (3)-1



PLAN

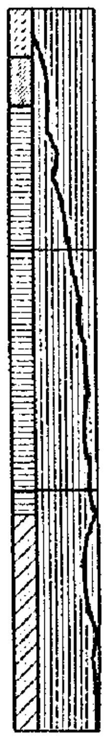
SCALE "A"



PROFILE

SCALE { HORIZONTAL "A" / VERTICAL "B" }

OHG-B2
EL.391 m.



CURVE DATA

NO. OF CURVE	KM. OF PI.	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
2	1+719.310	796.728	2,201,381.420	591,971.500	37	50	33	75.00	218.792	144.507	1+644.309	1+788.816	S.33–02–20 E.	
3	5+32.621	3,318.805	2,199,778.979	594,659.654	25	27	50	75.00	331.636	147.523	4+957.621	5+105.144	S.60–52–53 E.	

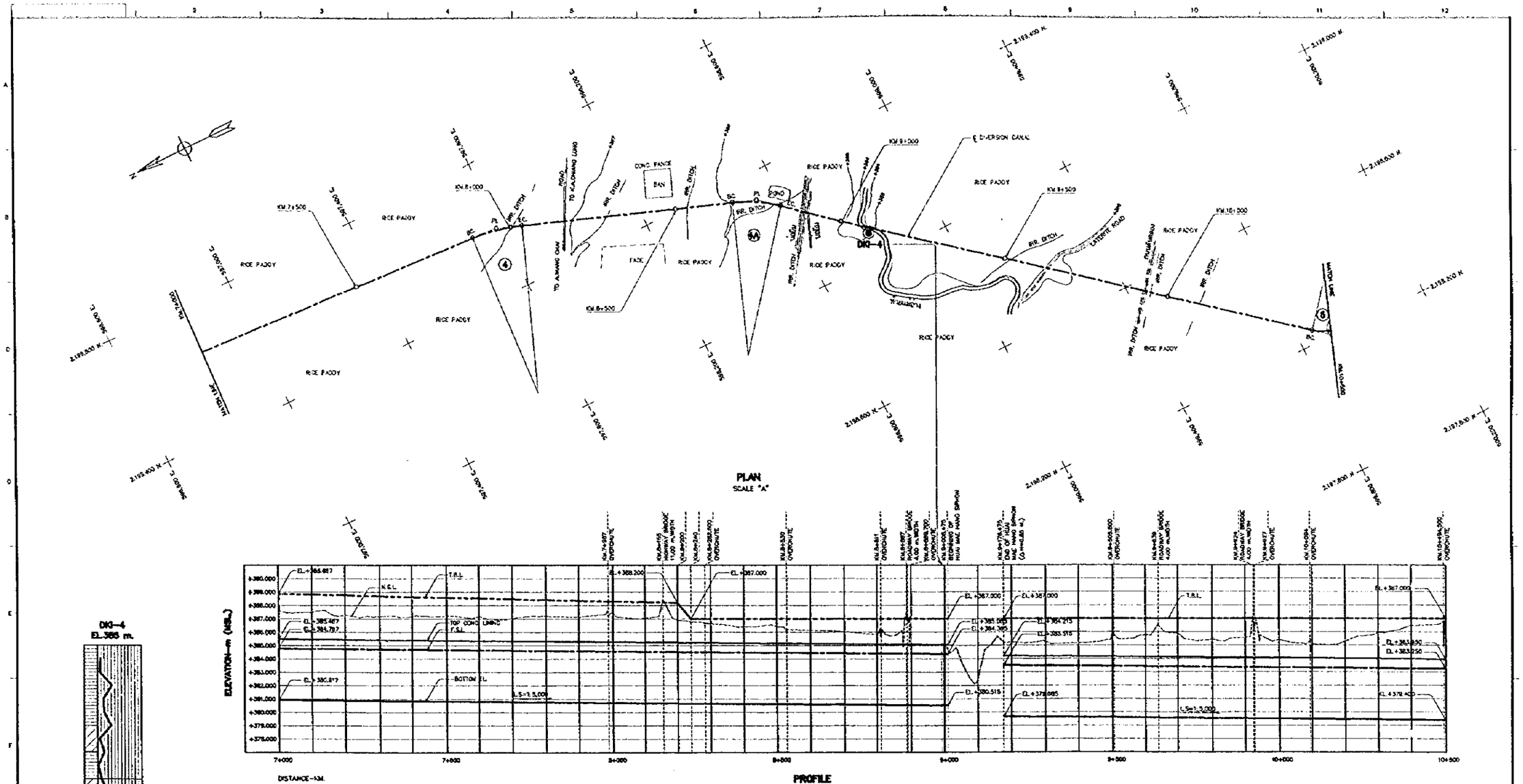
SCALE "A"
0 100 200 300 400 M.
HORIZONTAL 1 : 4,000

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00 M.
VERTICAL 1 : 100

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S:S	b (m)	d (m)	t (m)	H_c (m)	H_B (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
3+500.000	7+000.000	140.000	139.412	79.964	2.769	1.743	0.016	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	5.00	50.00	50.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.3+500 TO KM.7+000 (2/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	11.2.2 (3)-2



CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI TO PI	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
3	5+32.621	3,318.805	2,199,776.979	564,969.854	25	27	30	75.00	331.838	147.523	4+857.621	5+105.144	S.86-52-23 E.	
4	7+955.73	2,625.590	2,199,580.553	567,786.481	16	52	18	75.00	505.710	148.915	7+880.731	8+029.646	S.86-20-43 E.	
4A	8+746.65	762.000	2,199,312.844	568,529.941	18	28	42	75.00	481.087	148.898	8+671.546	8+820.344	S.86-28-25 E.	
5	10+567.18	1,821.815	2,198,166.721	569,943.173	70	47	15	125.00	175.929	217.358	10+442.159	10+659.518	S.50-58-43 E.	

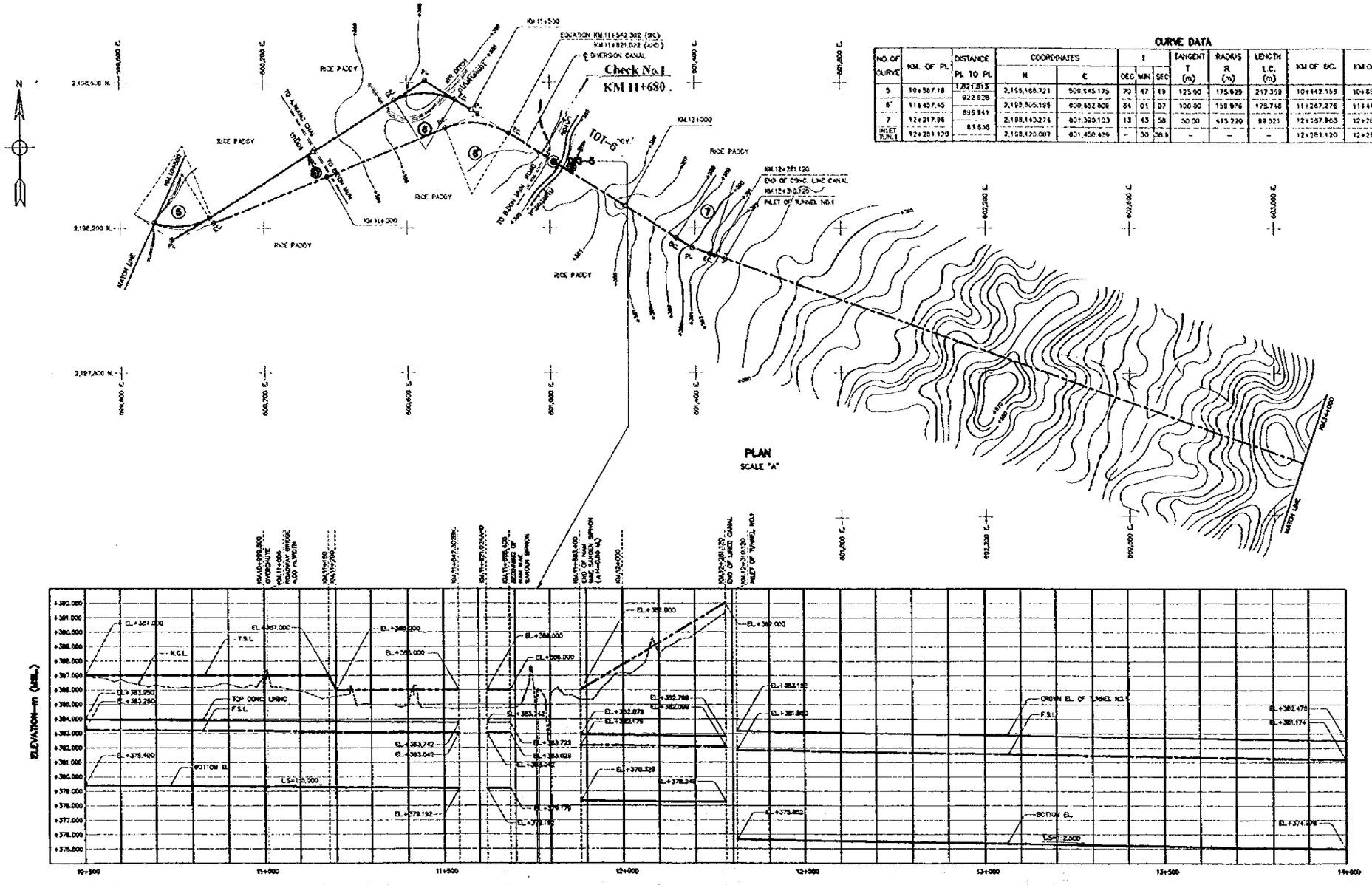
SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 8.00 8.00 10.00
VERTICAL 1 : 100 M.

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S:S	b (m)	d (m)	t (m)	Hc (m)	Hg (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
7+000.000	10+500.000	140.000	138.412	29.964	2.780	1.743	0.016	1 : 5,000	1 : 1.5	15.00	3.650	VARIES	4.55	VARIES	2.00	2.00	4.00	4.00	50.00	50.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.7+000 TO KM.10+500 (3/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-3



CURVE DATA

NO. OF CURVE	KM. OF PI.	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM OF BC.	KM OF EC.	BEARING	REMARK
5	10+587.18	1,821.853	2,165,168.321	599,545.175	70	47	19	125.00	175.929	217.358	10+442.159	10+659.516	S 50 -59 -43 E.	
6'	11+457.45	922.828	2,166,805.195	600,852.808	64	01	07	100.00	158.976	178.748	11+267.376	11+446.023	N 56 -01 -49 E.	Adjusted PI.6
7	12+217.96	895.841	2,168,143.274	601,393.103	13	43	58	50.00	415.220	99.521	12+167.963	12+267.484	S 57 -45 -58 E.	
INLET TUN.1	12+281.120	85.636	2,168,120.087	601,450.429	–	30	36.9	–	–	–	12+281.120	12+281.120	S 71 -29 -53.2 E.	

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S.S	b (m)	d (m)	t (m)	Hc (m)	Hs (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
10+500.000	12+100.000	140.000	138.412	79.864	2.768	1.743	0.015	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	6.00	50.00	50.00	Concrete Lined Canal
12+100.000	12+281.120	140.000	138.412	79.864	2.768	1.743	0.015	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	6.00	50.00	50.00	Concrete Lined Canal
12+313.123	14+000.000	140.000	140.006	56.757	2.583	2.511	0.015	1 : 2,500	–	r=5.50	6.198	–	H=7.50	–	–	–	–	–	–	–	Widen Horseshoe Tunnel

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

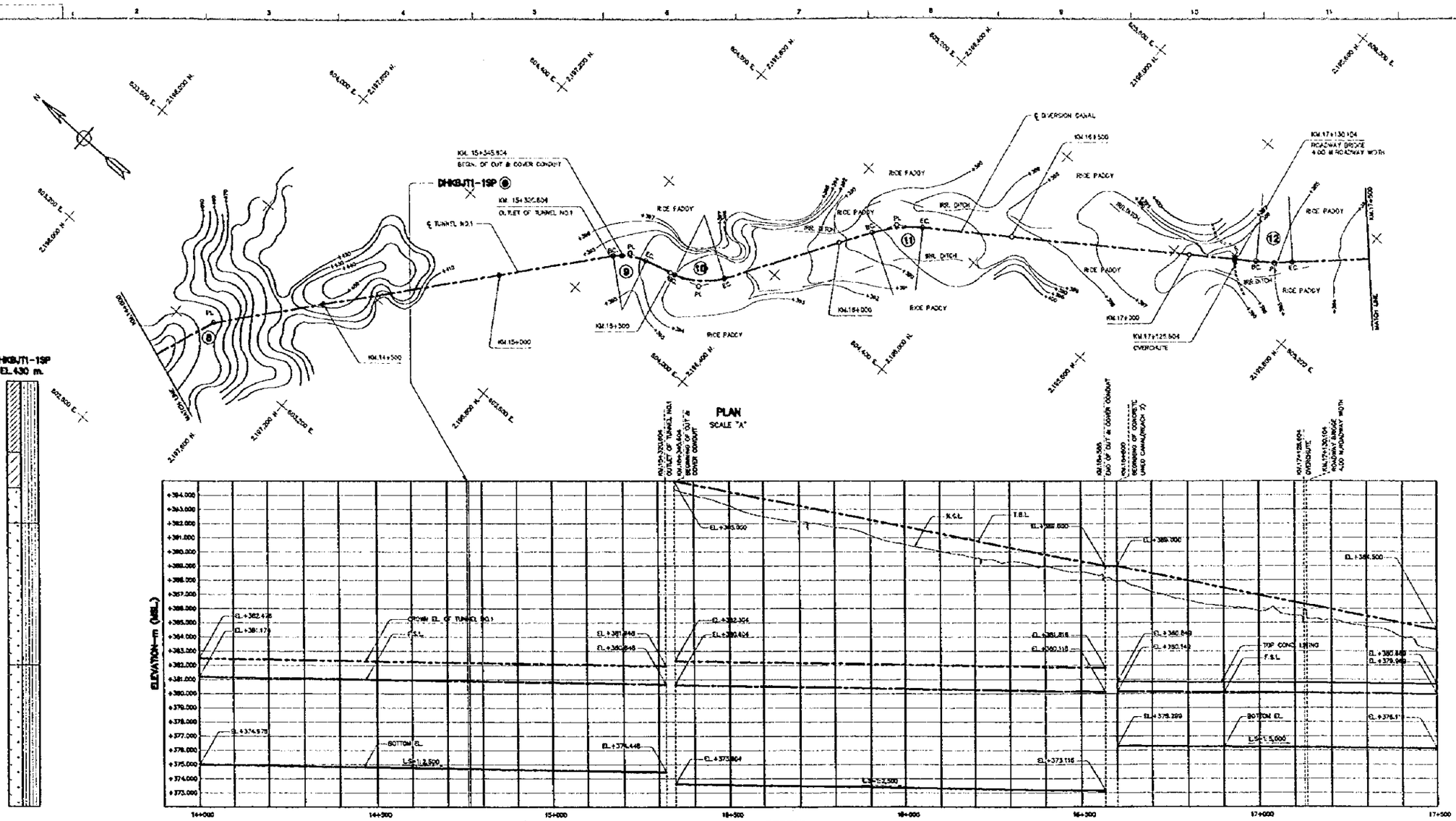
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL
KM.10+500 TO KM.14+000 (4/16)

Map & Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 11.2.2 (3)-4



CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
INLET TUN.1	12+281.120	63.536	2,198,120.067	801,450.428	–	30	36.8	–	–	–	12+281.120	12+281.120	S.71-28-33.2 E.	End of Reach 1 Canal
9	14+185.18	1,904.067	2,197,500.000	803,250.000	20	00	43.8	0.000	0.000	0.000	14+185.187	14+185.187	S.70-00-14.3 E.	From 1:10,000 Topo.Map
OUTLET TUN.1	15+320.604	1,135.617	2,196,785.323	804,131.709	–	09	53.3	0.000	0.000	0.000	15+320.604	15+320.604	S.50-58-30.6 E.	Begin. of Reach 2 Canal
9	15+376.15	55.546	2,196,730.835	804,174.807	33	23	5.5	50.00	156.742	98.801	15+326.150	15+422.951	S.50-48-37.1 E.	PI.1 of Reach 2 Canal
10	15+589.14	216.191	2,196,541.898	804,232.282	43	10	22.1	75.00	189.56	142.835	15+514.142	15+656.977	S.15-25-31.8 E.	PI.2 of Reach 2 Canal
11	16+171.11	508.133	2,196,315.038	804,704.977	22	56	34.7	75.00	369.854	147.953	16+96.110	16+244.153	S.56-30-53.8 E.	PI.3 of Reach 2 Canal
12	17+237.90	1,066.758	2,195,147.056	805,306.041	8	10	30.7	50.00	699.858	99.830	17+187.901	17+287.731	S.35-40-16.2 E.	PI.4 of Reach 2 Canal

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S:S	b (m)	d (m)	f (m)	Hc (m)	Hp (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
14+000.000	15+320.604	140.000	140.006	50.757	2.565	2.511	0.015	1 : 2,500	–	r=5.50	8.198	–	H=7.50	–	–	–	–	–	–	–	Widen Horseshoe Tunnel
15+345.604	16+500.000	140.000	141.023	53.887	2.667	2.617	0.015	1 : 2,500	–	r=4.35	7.000	–	H=8.70	–	–	–	–	6.00	70.00	70.00	Cut & Cover Conduit
16+500.000	17+500.000	140.000	139.412	79.884	2.789	1.743	0.016	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	1.00	2.00	4.00	6.00	60.00	60.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

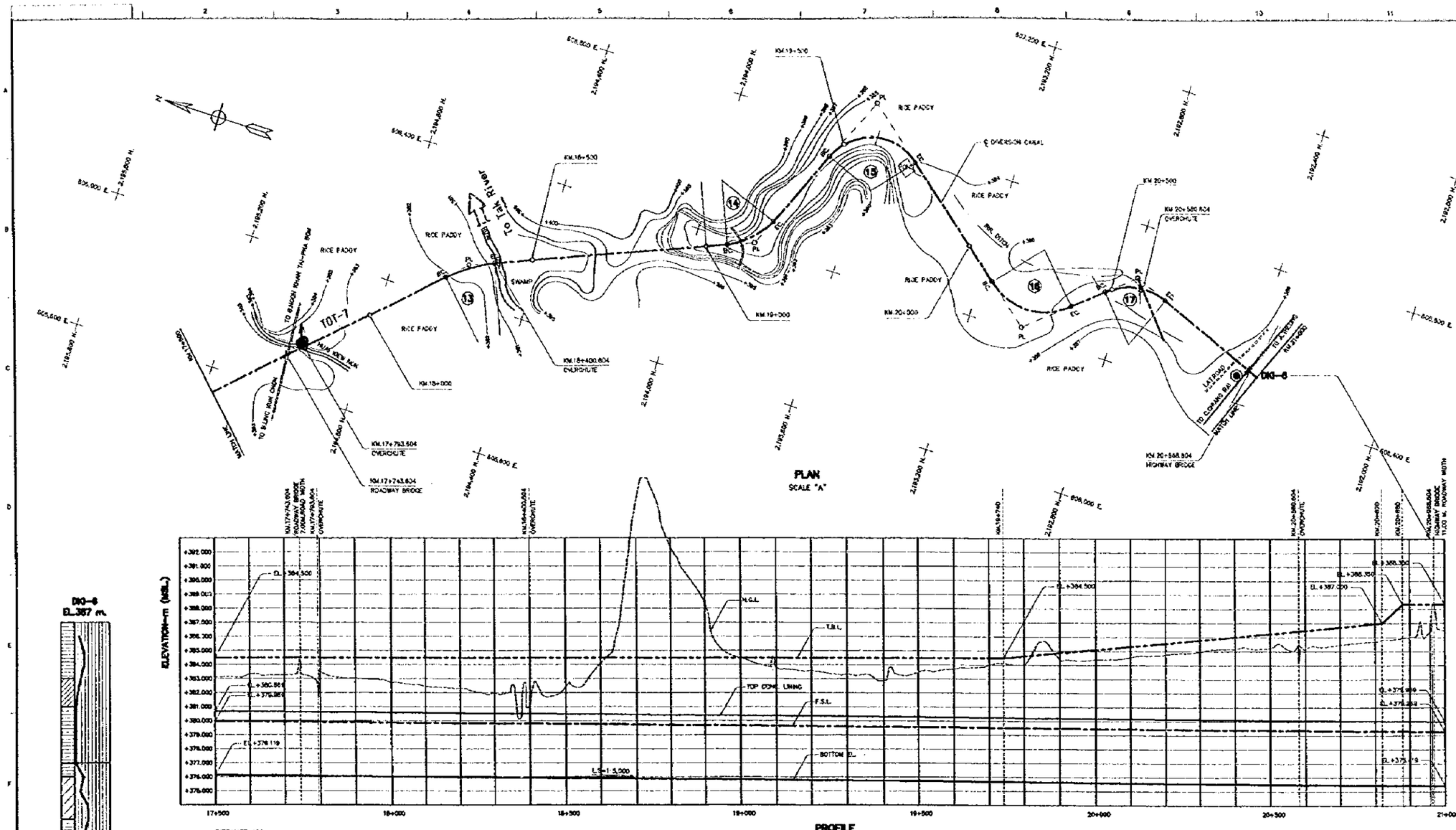
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.14+000 TO KM.17+500 (5/16)

Map & Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 11.2.2 (3)-5



DKI-6
El.387 m.

CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEC	I MIN.	I SEC.	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
12	17+237.90	1,086.798	2,195,267.056	805,358.041	8	10	30.7	50.00	899.658	99.830	17+187.901	17+287.731	S.35-45-19.8 E.	PI. 4 of Reach 2 Canal
13	18+313.218	1,081.487	2,194,567.351	806,108.869	21	45	59.2	75.00	361.621	148.206	18+244.218	18+392.424	S.43-50-48.9 E.	PI. 5 of Reach 2 Canal
14	19+133.060	813.845	2,193,832.218	806,414.600	44	38	18.7	75.00	183.147	142.368	19+58.060	19+200.428	S.22-08-50.8 E.	PI. 6 of Reach 2 Canal
15	19+645.665	523.247	2,193,625.341	806,895.031	108	32	33.0	200.00	149.232	277.500	19+448.665	19+726.165	S.66-42-10.4 E.	PI. 7 of Reach 2 Canal
16	20+275.574	748.188	2,193,050.267	806,415.224	80	48	0.5	150.00	176.187	248.529	20+125.374	20+373.903	S.39-50-22.6 W.	PI. 8 of Reach 2 Canal
17	20+578.848	304.946	2,192,782.378	806,647.905	82	36	42.4	100.00	154.325	178.667	20+478.849	20+658.516	S.40-56-37.9 E.	PI. 9 of Reach 2 Canal

SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 8.00 10.00
VERTICAL 1 : 100 M.

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S.S	b (m)	d (m)	t (m)	H_C (m)	H_B (m)	S_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
17+500.000	20+500.000	140.000	139.412	79.984	2.769	1.743	0.018	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	6.00	60.00	80.00	Concrete Lined Canal
20+500.000	21+000.000	140.000	139.412	79.984	2.768	1.743	0.018	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	6.00	65.00	85.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

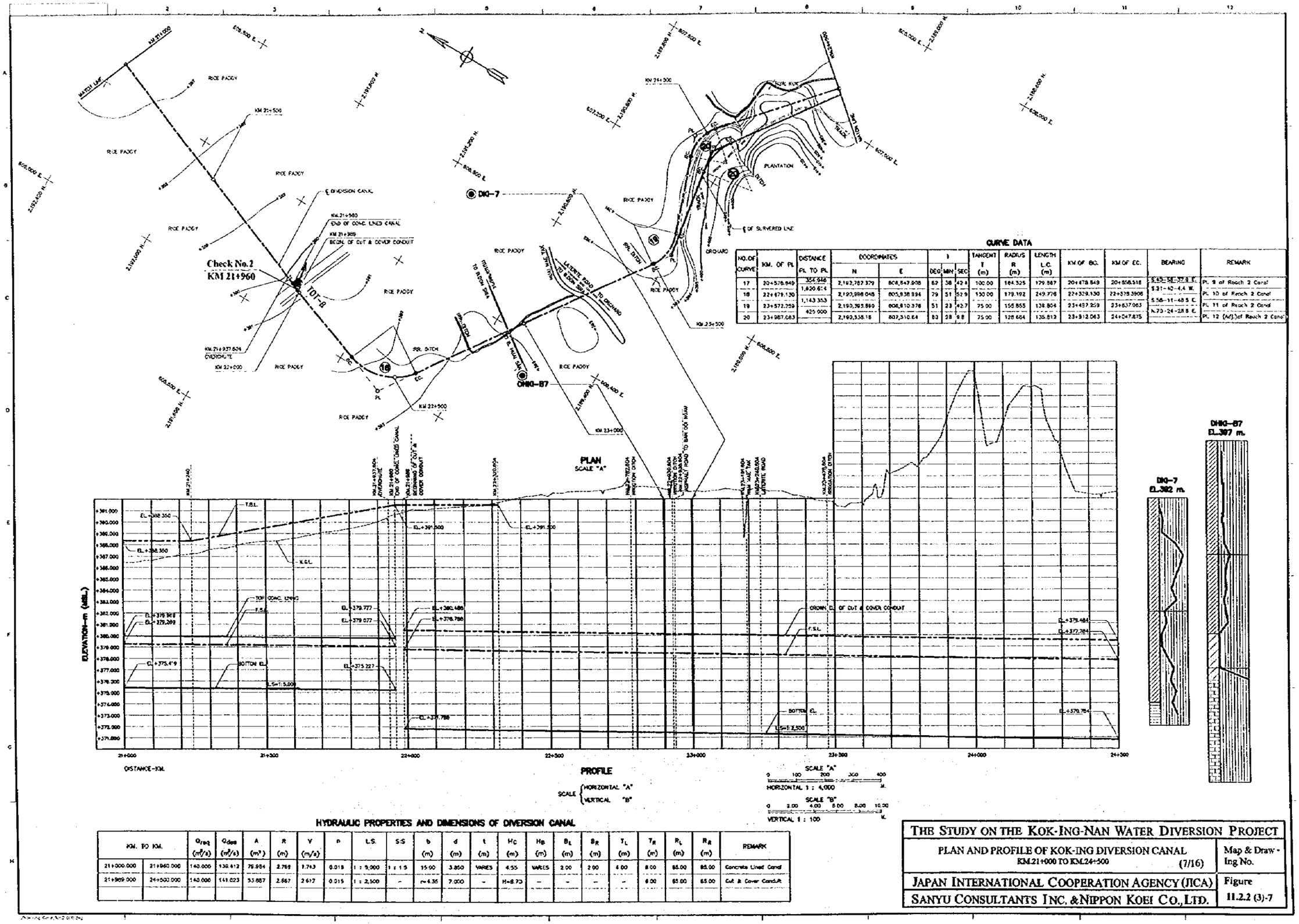
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.17+500 TO KM.21+000 (6/16)

Map & Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 11.2.2 (3)-6



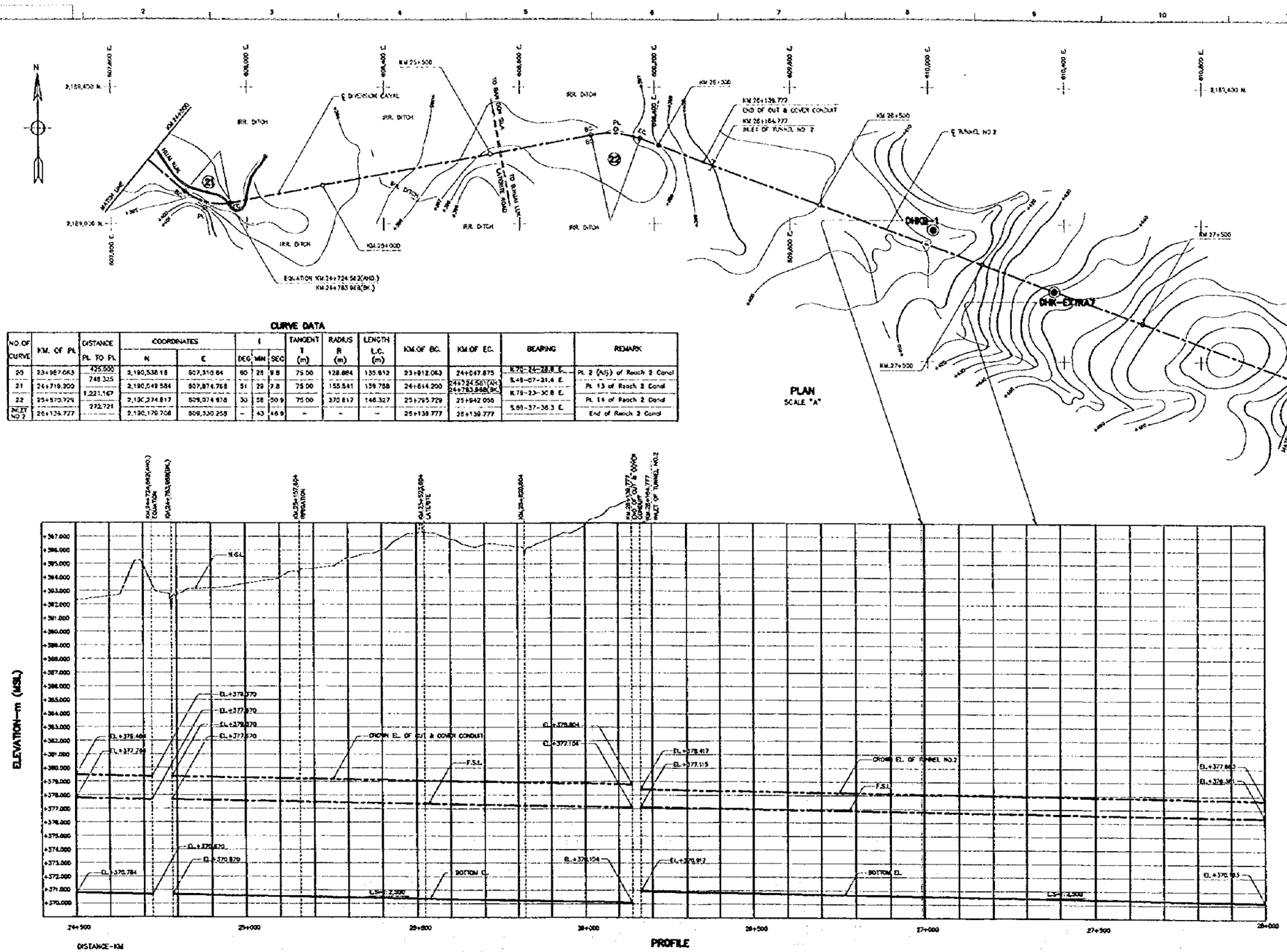
CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI TO PI	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM OF BC.	KM OF EC.	BEARING	REMARK
17	20+576.849	354.546	2,192,782.379	808,647.908	62	38	42.4	100.00	164.325	179.867	20+478.849	20+658.518	S 45-58-57.8 E.	PI. 9 of Reach 2 Canal
18	22+479.130	1,820.614	2,190,998.048	805,838.894	79	51	52.9	130.00	179.192	249.776	22+329.130	22+578.3906	S 31-40-4.4 W.	PI. 10 of Reach 2 Canal
19	23+572.259	1,143.353	2,190,393.860	806,810.378	51	23	42.7	75.00	155.855	138.804	23+497.259	23+637.063	S 56-11-48.5 E.	PI. 11 of Reach 2 Canal
20	23+987.083	425.000	2,190,338.18	807,310.64	80	28	9.8	75.00	128.684	135.812	23+912.063	24+047.875	N 79-24-28.8 E.	PI. 12 (Adj.) of Reach 2 Canal

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S.S	b (m)	d (m)	t (m)	H_C (m)	H_B (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
21+000.000	21+960.000	140.000	139.612	75.984	2.769	1.743	0.018	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	6.00	8.00	65.00	65.00	Concrete Lined Canal
21+989.000	24+500.000	140.000	141.023	53.887	2.667	2.617	0.015	1 : 2,500	-	-	n=4.35	7.000	-	H=8.73	-	-	-	6.00	65.00	65.00	Cut & Cover Conduit

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.21+000 TO KM.24+500 (7/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-7

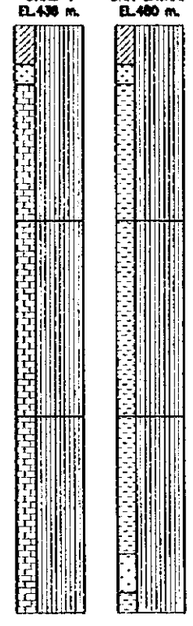


PLAN
SCALE "A"

CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM. OF BC.	KM. OF EC.	BEARING	REMARK
20	23+987.063	425.000	2,190,538.18	607,310.84	60	28	9.8	75.00	128.884	135.812	23+912.063	24+047.875	N.72- 24-28.8 E.	Pt. 2 (Adj.) of Reach 2 Canal
21	24+719.200	748.325	2,190,549.584	607,874.768	51	29	7.8	75.00	155.541	139.788	24+644.200	24+724.561(AH.) 24+783.968(BK.)	S.49-07-21.4 E.	Pt. 13 of Reach 2 Canal
22	25+570.729	1,221.167	2,190,274.817	609,074.978	30	58	50.9	75.00	370.817	146.327	25+795.729	25+942.055	N.79-23-30.8 E.	Pt. 14 of Reach 2 Canal
INLET NO.2	26+139.777	272.721	2,190,179.706	609,330.258	-	43	46.9	-	-	-	25+139.777	25+139.777	S.85-37-38.3 E.	End of Reach 2 Canal

PROFILE
SCALE { HORIZONTAL "A" / VERTICAL "B" }



HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S.S	b (m)	d (m)	t (m)	H_C (m)	H_B (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
24+500.000	26+139.777	140.000	141.023	53.887	2.667	2.617	0.013	1 : 2,500	-	r=4.35	7.000	-	H=8.70	-	-	-	-	6.00	65.00	65.00	Cut & Cover Conduit
25+184.777	28+000.000	140.000	140.006	55.757	2.583	2.511	0.015	1 : 2,500	-	r=5.50	6.195	-	H=7.50	-	-	-	-	-	-	-	Widen Horseshoe Tunnel

SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

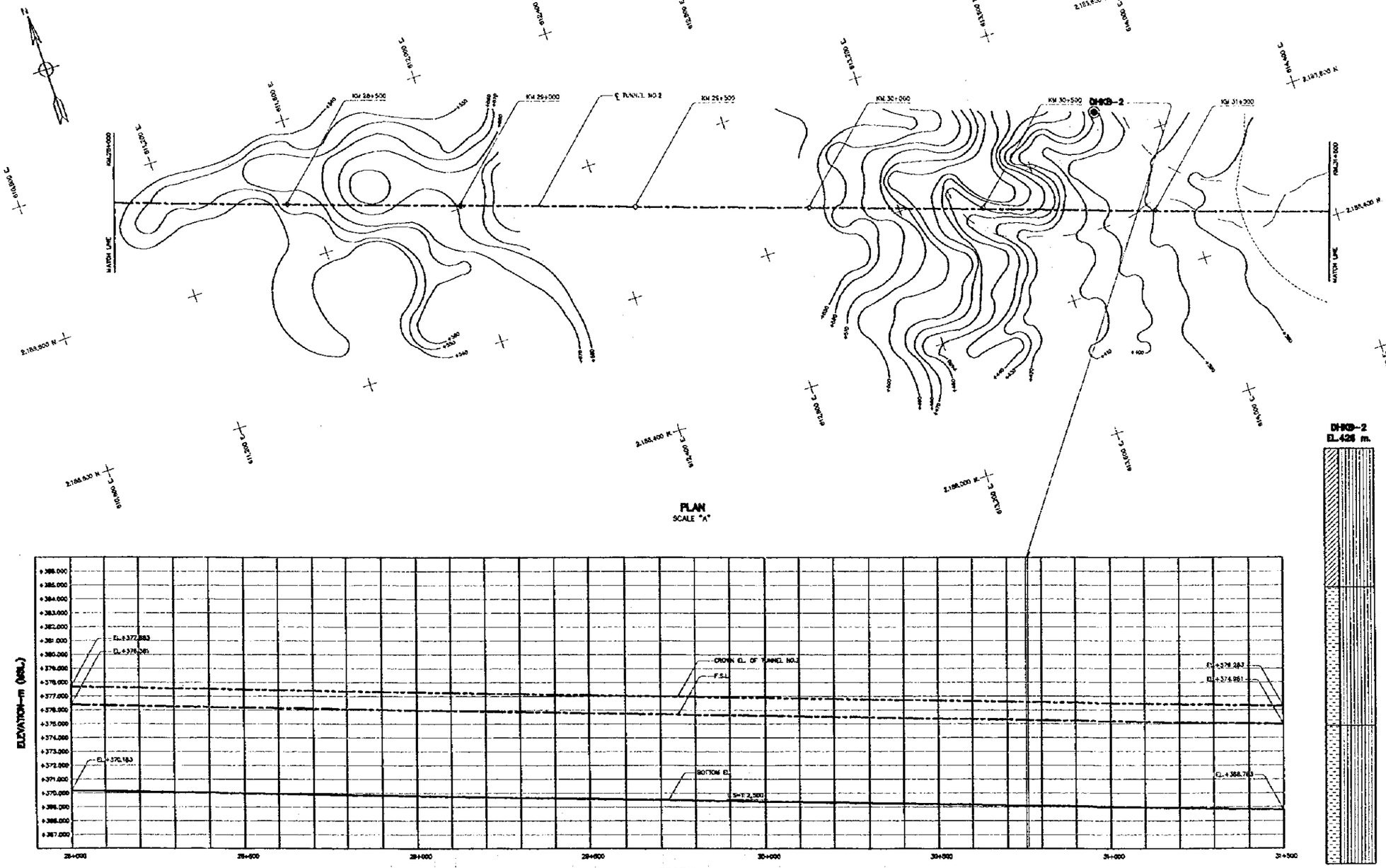
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL
KM.24+500 TO KM.28+000 (8/16)

Map & Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 11.2.2 (3)-8

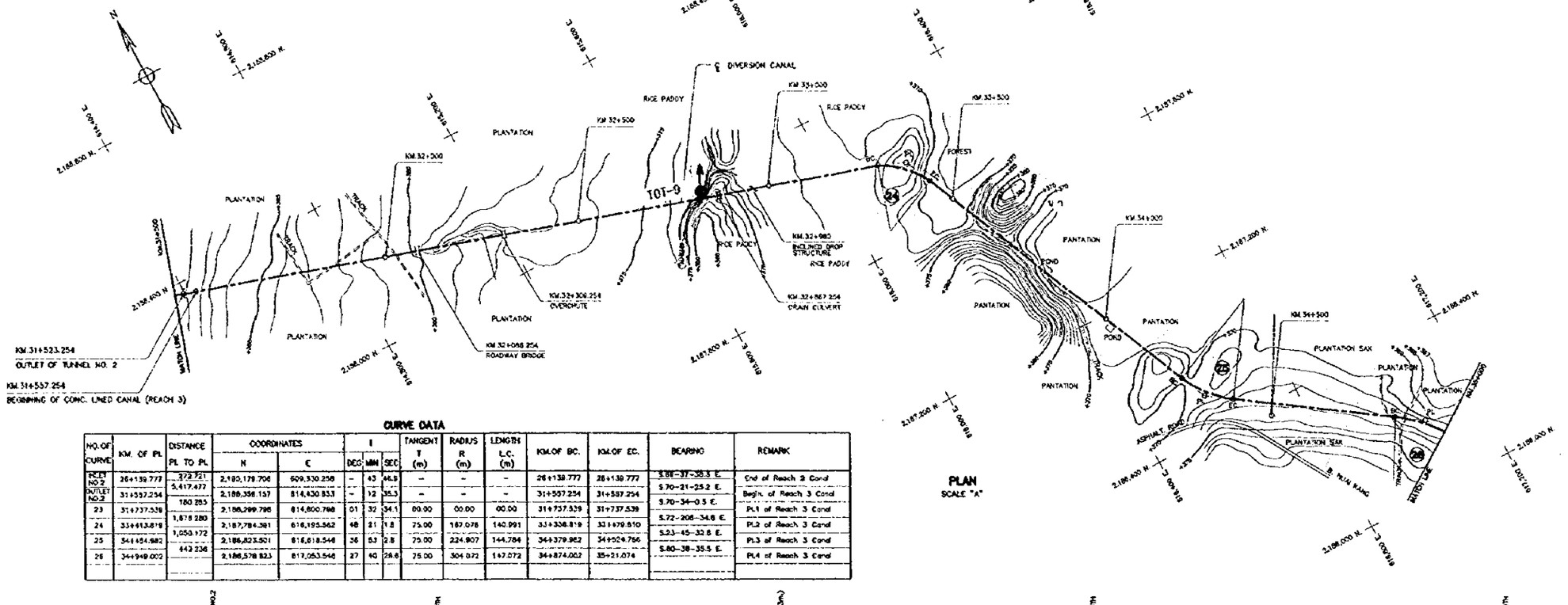


SCALE { HORIZONTAL "A" / VERTICAL "B" }

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

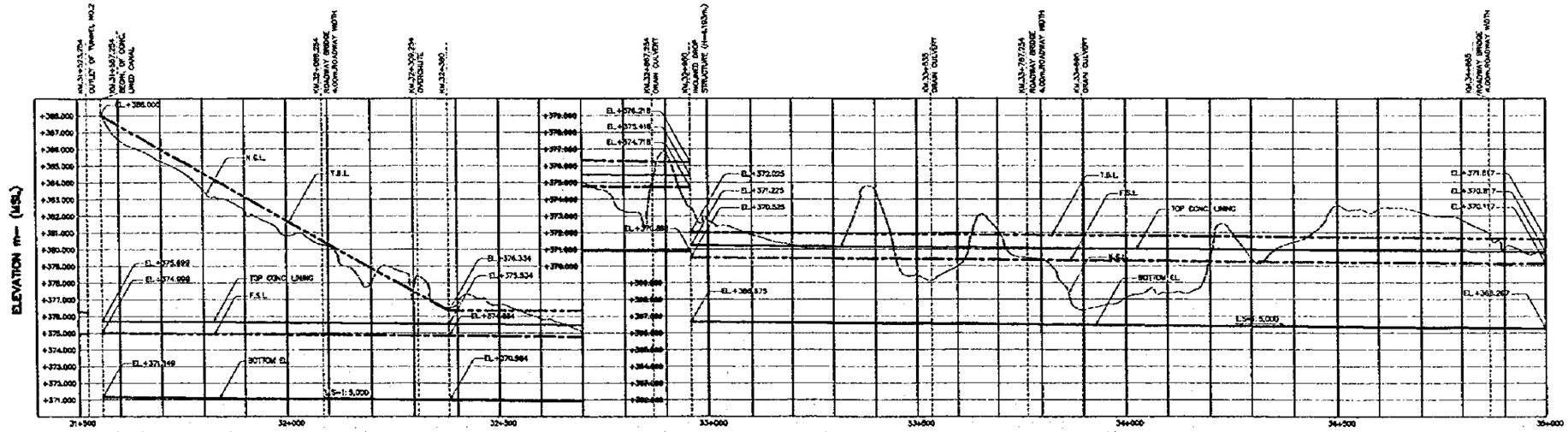
KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S.S	b (m)	d (m)	t (m)	Hc (m)	H_R (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
28+000.000	31+500.000	140.000	140.006	95.757	2.585	3.511	0.015	1 : 2,500	–	r=5.50	8.198	–	H=7.50	–	–	–	–	–	–	–	Widen Horseshoe Tunnel

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.28+000 TO KM.31+500 (9/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-9



CURVE DATA

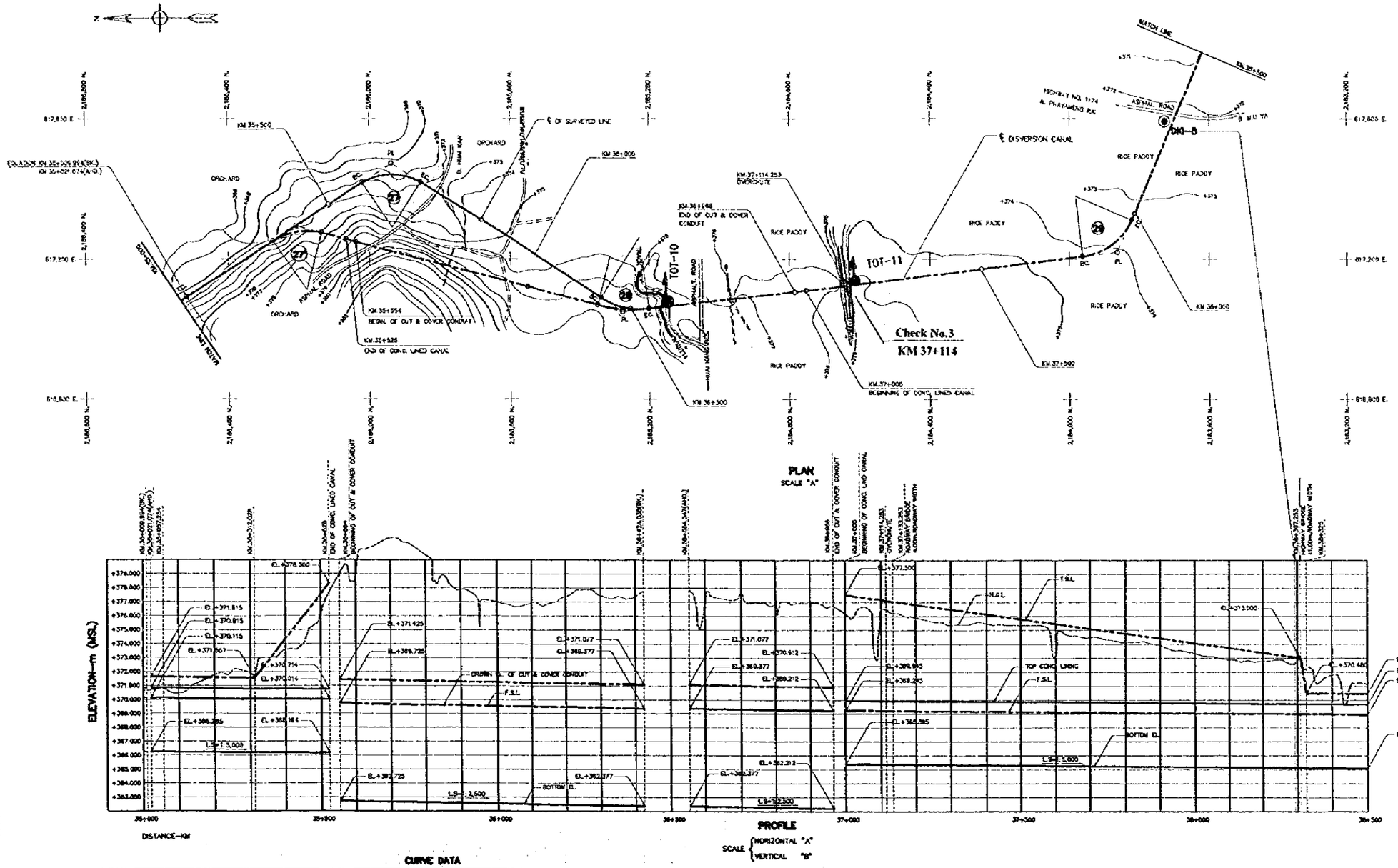
NO. OF CURVE	KM. OF PI	DISTANCE PI TO PI	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
ACES NO.2	26+139.777	272.721	2,190,179.706	609,330.258	–	43	46.8	–	–	–	26+139.777	26+139.777	S.88-37-38.8 E.	End of Reach 2 Canal
OUTLET NO.2	31+537.254	5,417.477	2,186,356.157	614,430.853	–	12	35.3	–	–	–	31+537.254	31+537.254	S.70-21-25.2 E.	Begin. of Reach 3 Canal
23	31+737.539	180.285	2,186,299.798	614,600.798	01	32	34.1	00.00	00.00	00.00	31+737.539	31+737.539	S.70-34-0.5 E.	PI.1 of Reach 3 Canal
24	33+613.819	1,876.280	2,187,784.381	616,195.562	48	21	1.8	75.00	187.078	140.991	33+338.819	33+479.810	S.72-208-34.8 E.	PI.2 of Reach 3 Canal
25	34+854.982	1,050.972	2,186,823.501	616,818.546	36	53	2.8	75.00	224.907	144.784	34+379.982	34+524.766	S.23-45-32.8 E.	PI.3 of Reach 3 Canal
26	34+949.002	443.236	2,186,578.823	617,053.546	27	40	29.8	75.00	304.072	147.072	34+874.002	35+21.074	S.80-38-35.5 E.	PI.4 of Reach 3 Canal



HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S:S	b (m)	d (m)	t (m)	Hc (m)	Hs (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
31+300.000	31+523.254	140.000	140.000	53.757	2.583	2.511	0.015	1 : 2,500	–	r=5.50	8.198	–	H=7.50	–	–	–	–	–	–	–	W.San, Horseshoe Tunnel
31+537.254	32+500.000	140.000	138.412	79.864	2.788	1.743	0.016	1 : 5,000	1 : 1.5	15.50	3.850	VARIES	4.55	VARIES	2.00	2.00	8.00	8.00	75.00	75.00	Concrete Lined Canal
32+500.000	35+000.000	140.000	138.412	79.864	2.788	1.743	0.016	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	8.00	8.00	80.00	80.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.31+500 TO KM.35+000 (10/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-10
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



CURVE DATA

NO. OF CURVE	KM. OF PI.	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
26	34+946.002	446.336	2,186,578.823	817,053.546	27	40	29.8	75.00	304.072	147.072	34+874.002	35+21.074	S.60-38-55.5 E.	Pt. 4 of Reach 3 Canal
27	35+387.025	442.954	2,186,206.982	817,293.433	47	50	19.9	75.00	189.093	141.183	35+312.025	35+453.211	S.30-58-05.8 E.	Pt. 5 (Adj) of Reach 3 Canal
28	36+485.568	972.684	2,185,266.145	817,043.884	22	3	22.7	75.00	384.832	148.143	36+273.893	36+954.347(AHD) 364+424.038(BK)	S.16-32-13.8 W.	Pt. 6 of Reach 3 Canal
29	37+696.257	1,416.910	2,183,863.770	817,221.075	59	52	34.7	100.00	173.638	151.456	37+796.257	37+877.715	S.07-11-09.6 E.	Pt. 7 of Reach 3 Canal

SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S.S	b (m)	d (m)	t (m)	Hc (m)	HB (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
35+300.000	35+523.000	140.000	138.412	79.984	2.769	1.743	0.018	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.56	VARIES	2.00	2.00	6.00	6.00	80.00	80.00	Concrete Lined Canal
35+554.000	36+968.000	140.000	141.023	53.887	2.667	2.617	0.015	1 : 2,500	-	m=4.35	7.000	-	H=8.70	-	-	-	-	6.00	80.00	80.00	Cut & Cover Conduit
37+300.000	38+500.000	140.000	138.412	79.984	2.769	1.743	0.015	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.56	VARIES	2.00	2.00	6.00	6.00	80.00	80.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

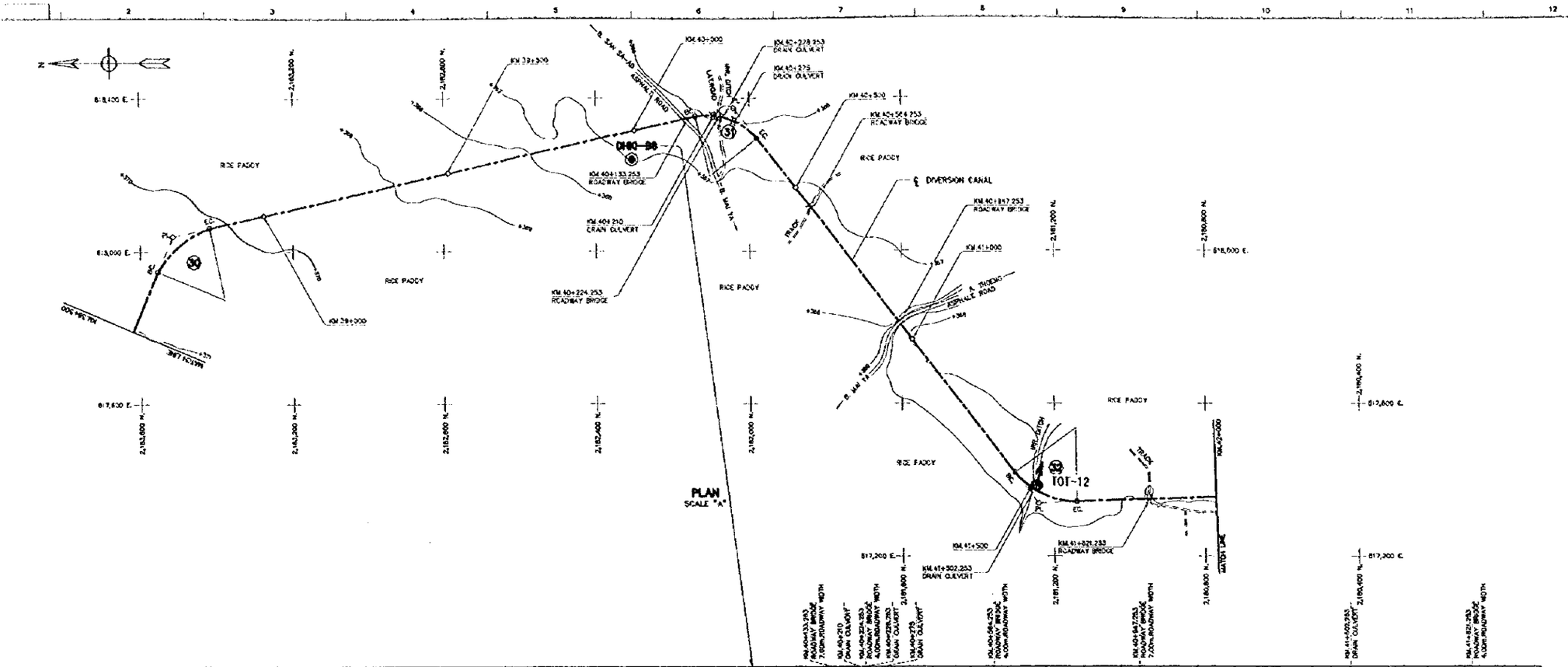
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.35+000 TO KM.38+500 (11/16)

Map & Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.

Figure 11.2.2 (3)-11



DHKI-88
EL.367m.

CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
29	37+886.257	1,418.819	2,183,863.770	617,221.976	59	52	34.7	100.00	173.638	151.458	37+798.257	37+977.715	S.07-11-09.6 E.	PI. 7 of Reach 3 Canal
30	38+771.134	893.418	2,182,043.197	616,043.911	54	47	31.8	100.00	193.365	184.576	38+671.134	38+855.712	S.87-03-44.3 E.	PI. 8 of Reach 3 Canal
31	40+253.634	1,507.822	2,182,043.197	616,368.559	64	28	34.8	100.00	195.884	178.458	40+163.634	40+342.092	S.12-22-12.7 E.	PI. 9 of Reach 3 Canal
32	41+544.508	1,302.416	2,181,242.898	617,338.512	53	53	41.3	100.00	196.707	185.031	41+444.508	41+629.539	S.52-04-23.9 W.	PI. 10 of Reach 3 Canal

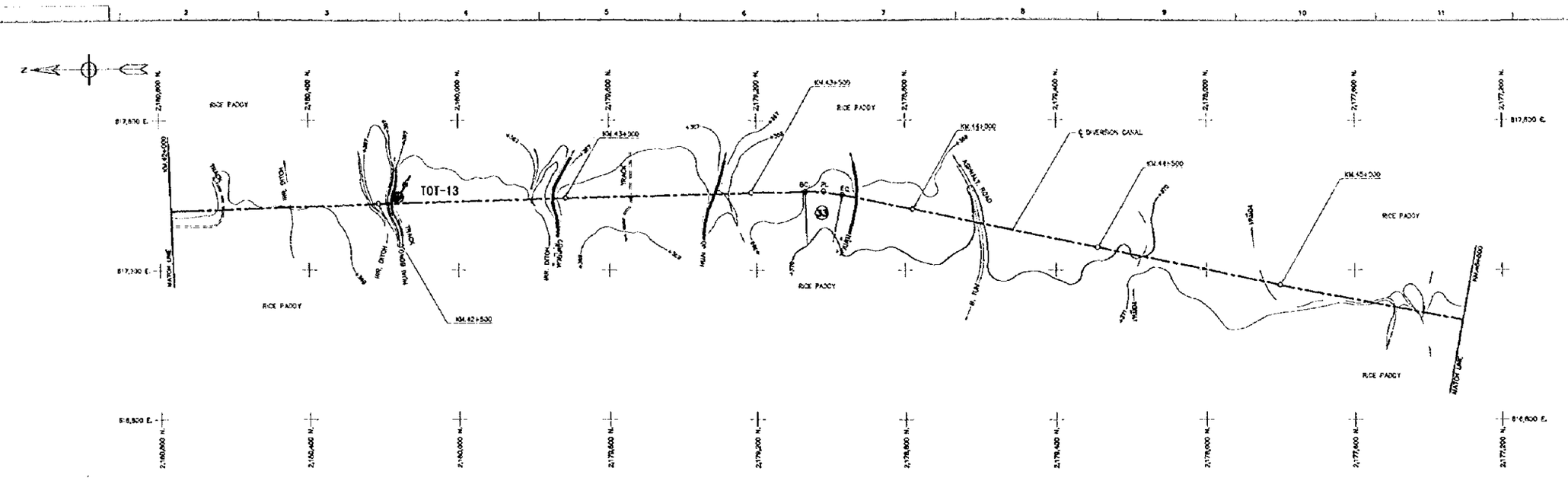
SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

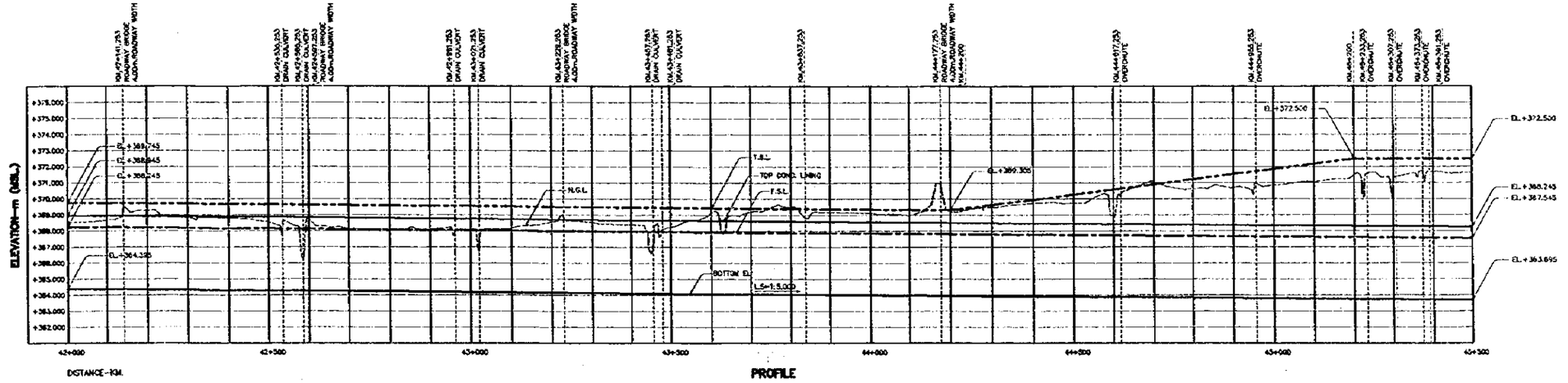
HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S:S	b (m)	d (m)	t (m)	H_C (m)	H_B (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
38+500.000	42+000.000	140.000	139.412	76.984	2.769	1.743	0.016	1 : 5,000	1 : 1.5	13.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	8.50	80.00	80.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.38+500 TO KM.42+000 (12/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-12
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



PLAN
SCALE "A"



PROFILE
SCALE { HORIZONTAL "A" / VERTICAL "B" }

SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 6,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

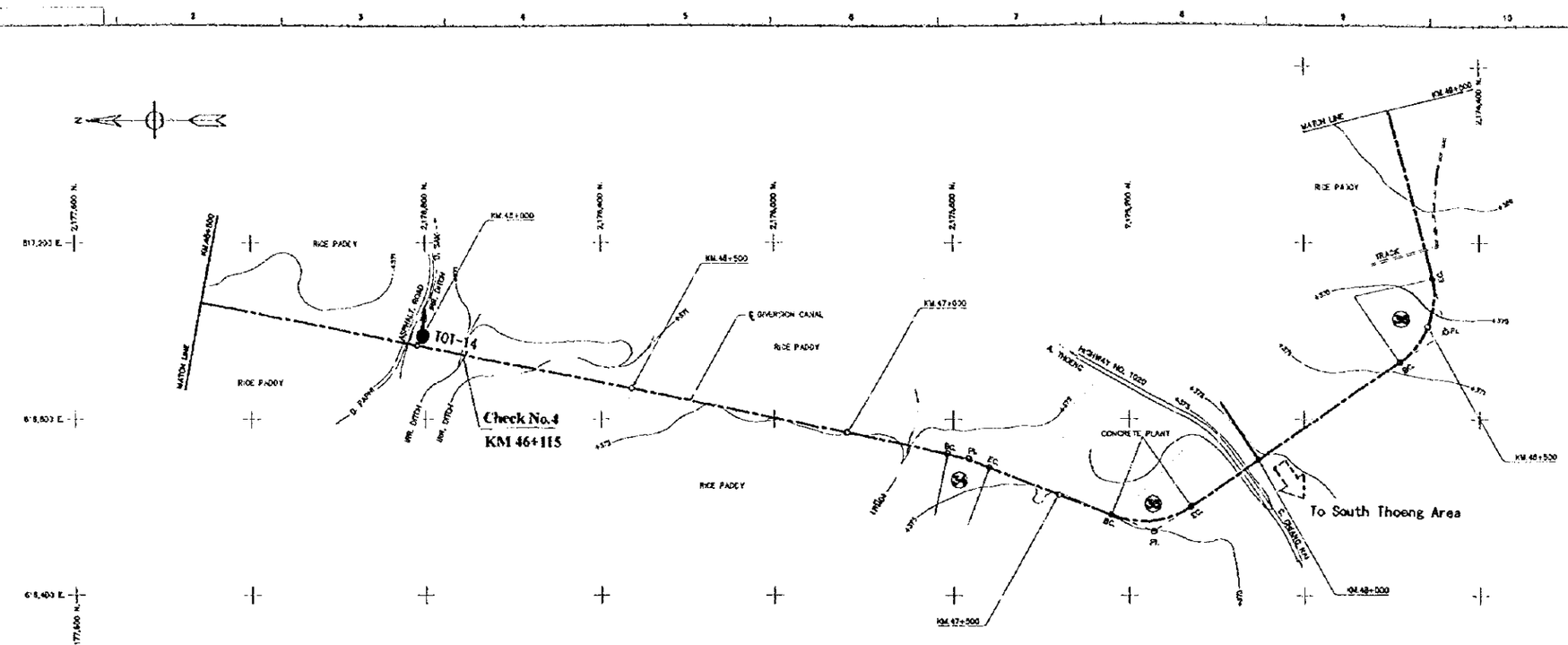
CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LONGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
32	41+544.508	1,302.416	2,181,242.896	817,339.512	53	53	41.3	100.00	198.707	185.031	41+444.508	41+629.539	S.52°-04'-23.9" W.	PI.10 of Reach 3 Canal
33	43+749.750	2,220.211	2,179,024.442	817,613.063	13	10	44.8	50.00	432.829	99.509	43+699.750	43+799.308	S.01°-48'-17.4" E.	PI.11 of Reach 3 Canal

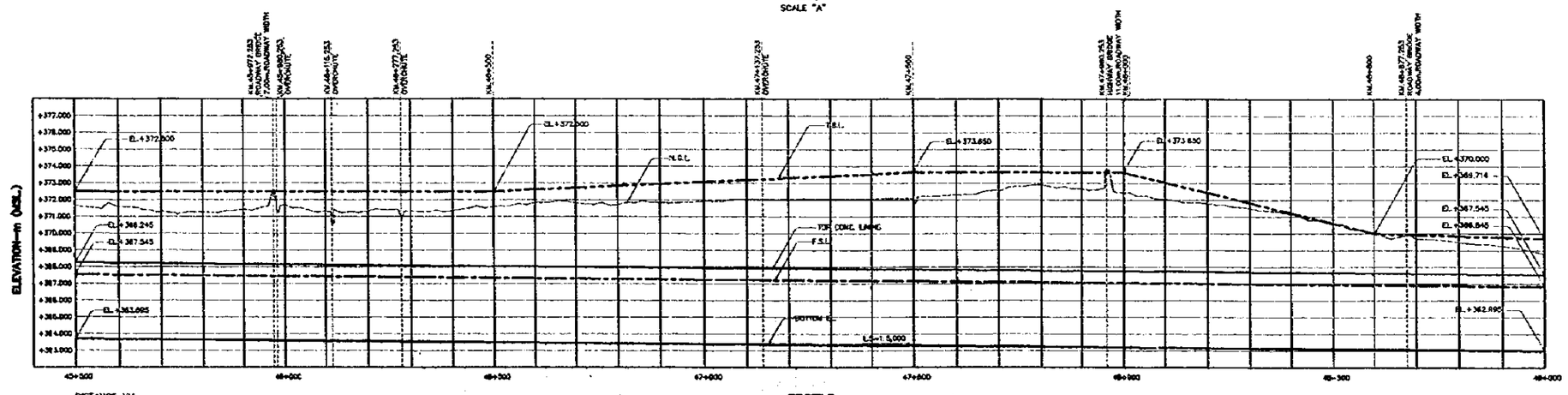
HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S:S	b (m)	d (m)	t (m)	Hc (m)	Hg (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
42+500.000	45+500.000	140.000	139.412	78.994	2.759	1.743	0.016	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	7.00	6.00	6.00			Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.42+000 TO KM.45+500 (13/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-13
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



PLAN
SCALE "A"



PROFILE
SCALE { HORIZONTAL "A" / VERTICAL "B"

SCALE "A"
0 100 200 300 500
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

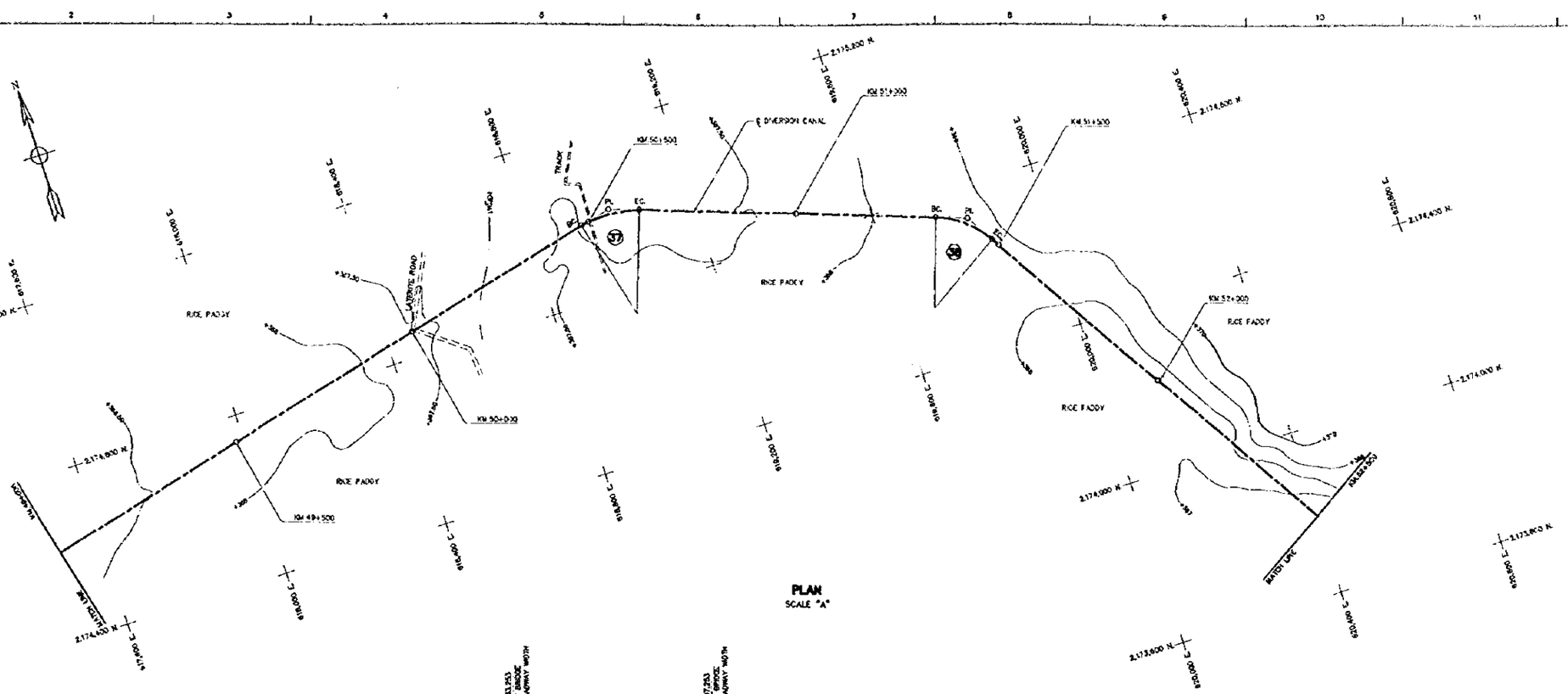
CURVE DATA

NO. OF CURVE	KM. OF PI.	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG	I MIN	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
33	43+740.750	2,226.211	2,179,024.442	817,410.063	13	10	54.8	50.00	432.829	99.559	43+699.750	43+799.309	S.61-46-13.4 E.	PI.11 of Reach 3 Canal
34	47+280.583	3,530.954	2,175,553.822	818,714.901	10	21	13.0	50.00	551.883	99.725	47+230.283	47+329.991	S.11-21-27.6 W.	PI.12 of Reach 3 Canal
35	47+729.421	449.430	2,175,146.192	818,548.891	35	54	36.9	100.00	188.406	183.868	47+629.421	47+813.288	S.21-42-40.3 W.	PI.13 of Reach 3 Canal
36	48+515.674	809.385	2,174,480.297	817,001.318	70	25	40.1	125.00	177.108	217.701	48+393.674	48+611.375	S.34-12-16.6 E.	PI.14 of Reach 3 Canal

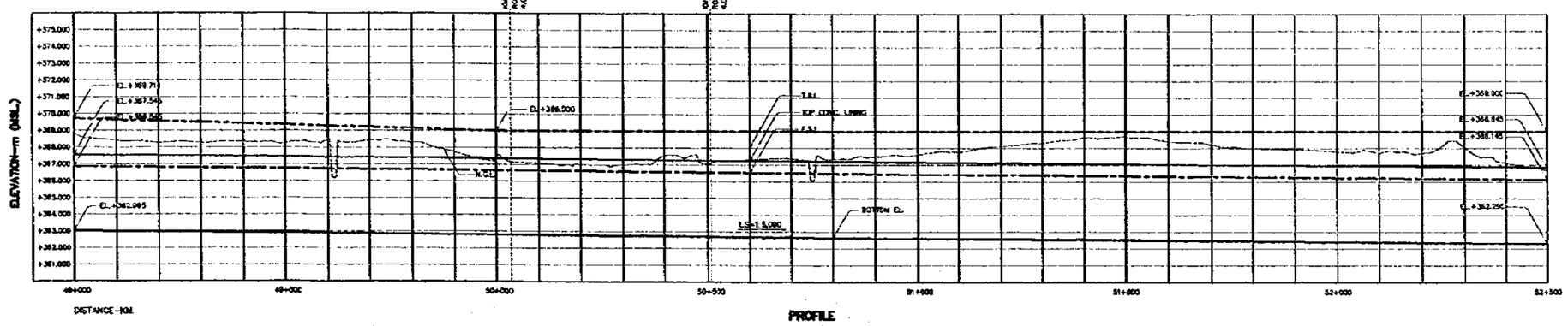
HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	I.S.	S:S	b (m)	d (m)	t (m)	Hc (m)	Hs (m)	S_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
42+500.000	49+000.000	140.000	139.412	79.564	3.769	1.743	0.018	1 : 5,000	1 : 1.5	15.00	3.830	VARIES	4.55	VARIES	2.00	2.50	4.00	8.00	60.00	80.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.45+500 TO KM.49+000 (14/16)	Map & Draw-Ing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-14
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



PLAN
SCALE "A"



PROFILE
SCALE { HORIZONTAL "A" / VERTICAL "B"

SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

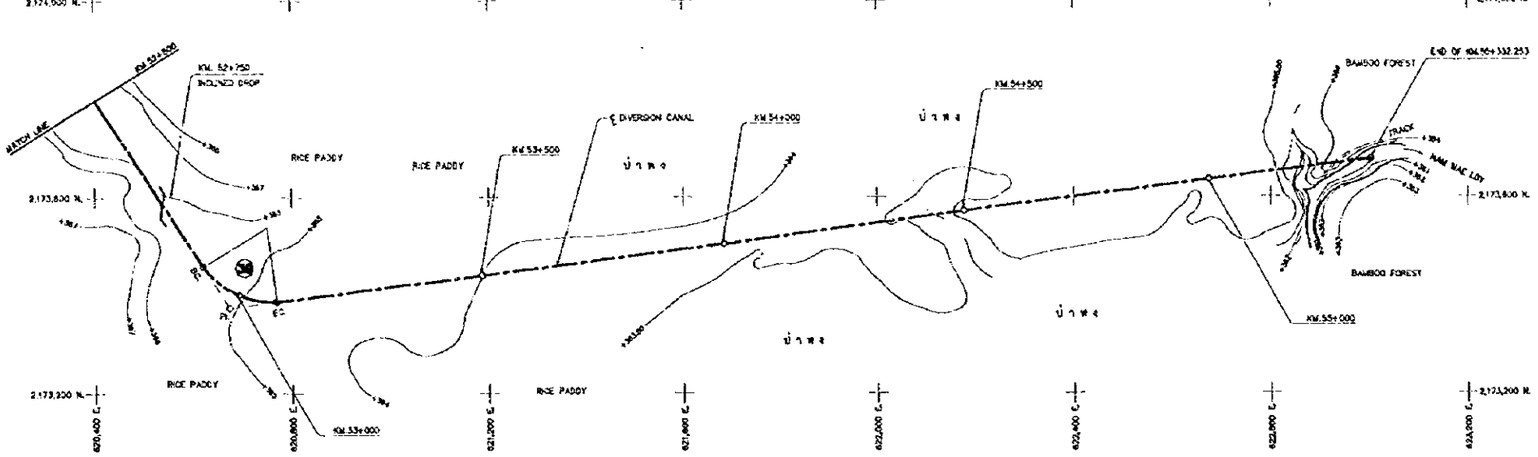
CURVE DATA

NO. OF CURVE	KM. OF PI	DISTANCE PI TO PI	COORDINATES N	COORDINATES E	I DEG	I MIN.	I SEC	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
36	48+518.574	805.385	2,174,480.297	617,001.311	70	25	43.1	125.00	177.108	217.701	48+393.574	48+611.275	S.34-12-18.8 E.	PI.14 of Reach 3 Canal
37	50+358.474	2,670.099	2,175,003.093	619,003.706	33	45	37.1	75.00	247.182	148.835	50+481.474	50+627.108	N.75-22-03.4 E.	PI.15 of Reach 3 Canal
38	51+608.164	857.635	2,174,722.340	619,813.198	38	18	43.7	75.00	215.809	164.389	51+334.164	51+678.513	S.70-32-19.6 W.	PI.16 of Reach 3 Canal

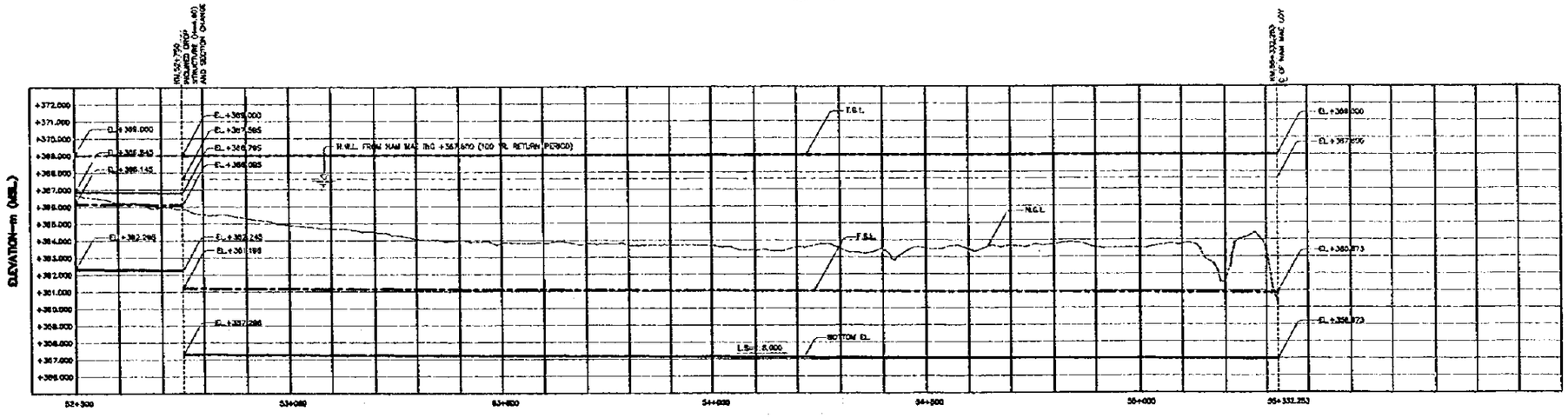
HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S.S	b (m)	d (m)	t (m)	H_C (m)	H_B (m)	B_L (m)	B_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
49+000.000	52+500.000	140.000	139.412	79.584	2.768	1.743	0.015	1 : 5,000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	4.00	6.00	80.30	60.00	Concrete Lined Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.49+000 TO KM.52+500 (15/16)	Map & Draw-Ing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-15
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



PLAN
SCALE "A"



PROFILE
SCALE { HORIZONTAL "A" / VERTICAL "B"

CURVE DATA

NO. OF CURVE	KM. OF PI.	DISTANCE PI. TO PI.	COORDINATES N	COORDINATES E	I DEG.	I MIN.	I SEC.	TANGENT T (m)	RADIUS R (m)	LENGTH L.C. (m)	KM.OF BC.	KM.OF EC.	BEARING	REMARK
36	54+409.144	857.035	2,174,723.340	819,813.186	36	18	40.7	75.00	215.908	144.389	54+334.144	54+478.513	S.70-52-16.8 E.	PI.18 of Reach 3 Canal
36	53+002.252	1,568.749	2,173,575.256	820,873.391	84	55	28.8	100.00	167.196	178.127	52+902.252	53+080.388	S.32-33-38.9 E.	PI.17 of Reach 3 Canal
END	55+332.253	2,351.866	2,173,681.536	823,004.582	–	–	–	–	–	–	–	–	N.82-30-54.4 E.	

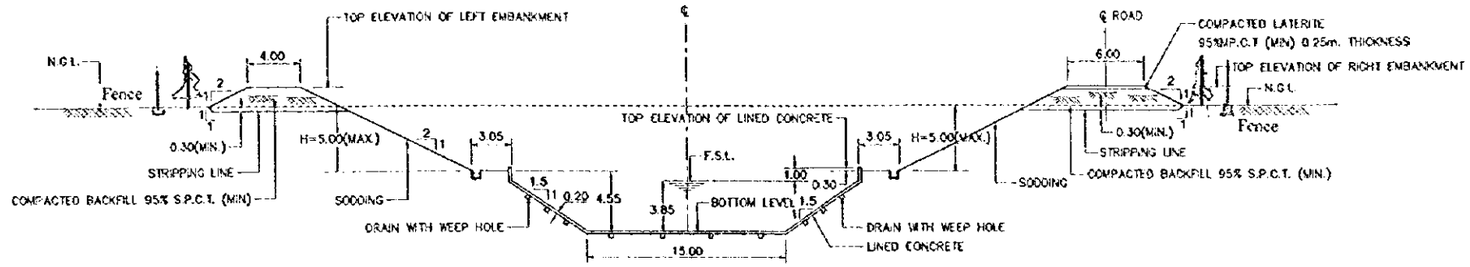
SCALE "A"
0 100 200 300 400
HORIZONTAL 1 : 4,000 M.

SCALE "B"
0 2.00 4.00 6.00 8.00 10.00
VERTICAL 1 : 100 M.

HYDRAULIC PROPERTIES AND DIMENSIONS OF DIVERSION CANAL

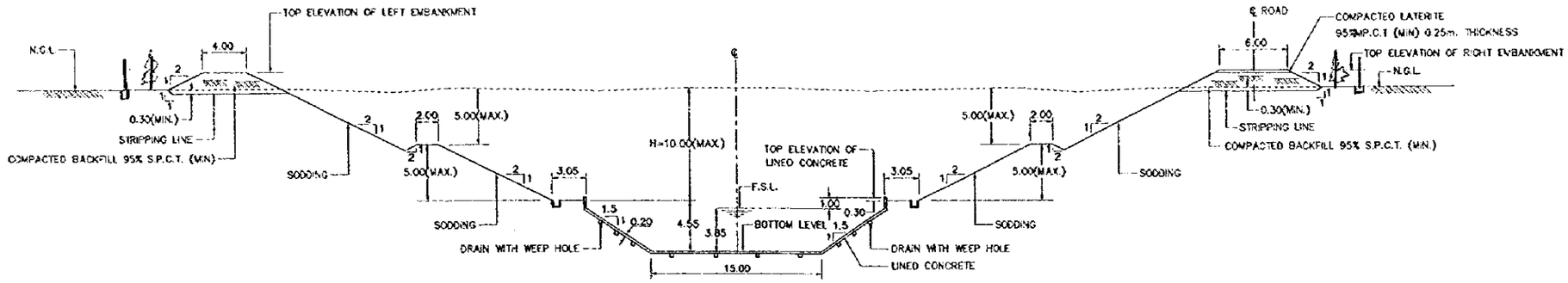
KM. TO KM.		Q_{req} (m^3/s)	Q_{des} (m^3/s)	A (m^2)	R (m)	V (m/s)	n	L.S.	S.S	b (m)	d (m)	i (°)	Hc (m)	Hs (m)	B_L (m)	S_R (m)	T_L (m)	T_R (m)	R_L (m)	R_R (m)	REMARK
52+030.000	52+750.030	140.000	139.412	79.584	2.739	1.743	0.015	1 : 5.000	1 : 1.5	15.00	3.850	VARIES	4.55	VARIES	2.00	2.00	6.00	6.00	80.00	80.00	Concrete Lined Canal
52+750.000	55+332.253	140.000	140.344	147.420	3.107	0.952	0.025	1 : 8.000	1 : 2.0	30.00	3.900	–	–	4.90	6.00	4.00	6.00	6.00	75.00	75.00	Earth Canal

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
PLAN AND PROFILE OF KOK-ING DIVERSION CANAL KM.52+500 TO KM.55+332.253 (16/16)	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-16



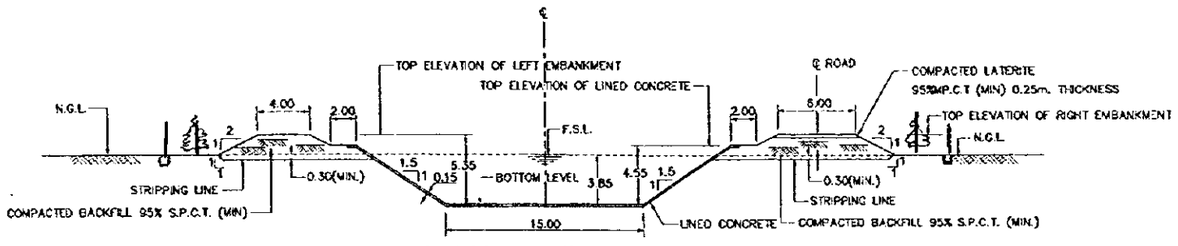
CONCRETE LINED CANAL

CASE H < 5.00 m.

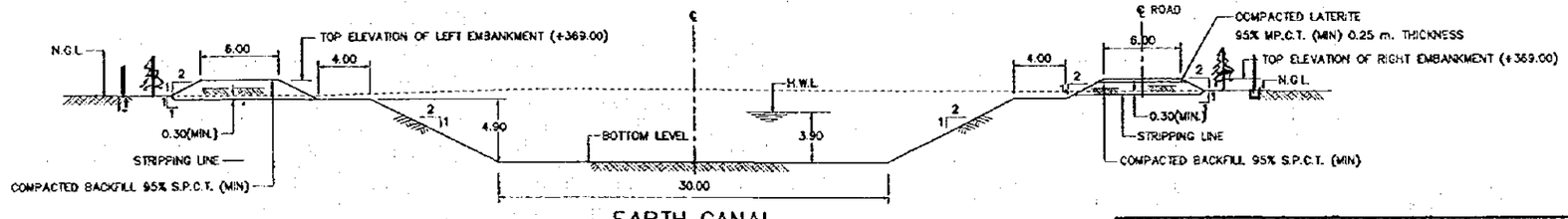


CONCRETE LINED CANAL

CASE 5.00 < H < 10.00 m.



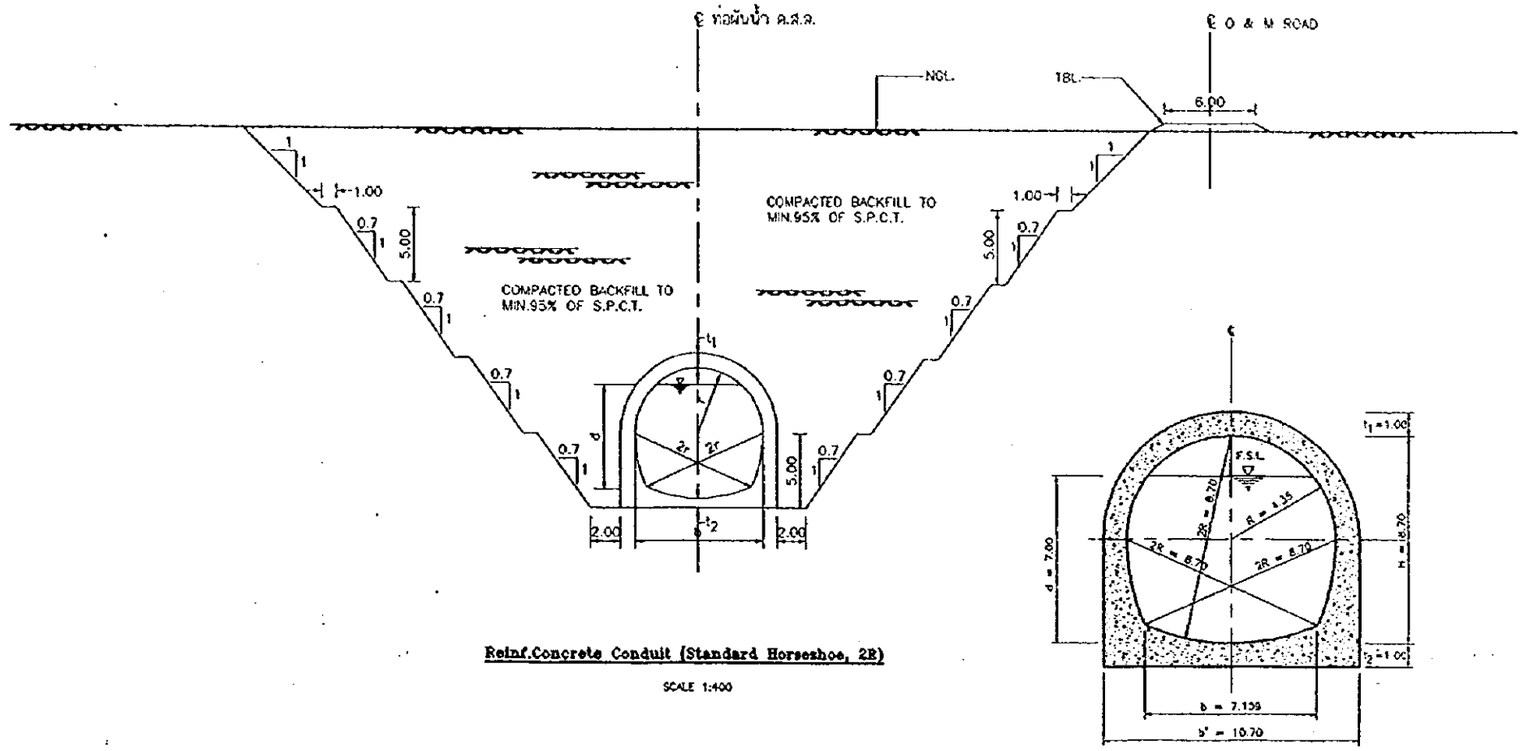
CONCRETE LINED CANAL



EARTH CANAL

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL CROSS SECTION OF OPEN CANAL	Map & Draw-Ing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	11.2.2 (3)-17

CANALSEC.DWG



Reinf.Concrete Conduit (Standard Horseshoe, 2R)

SCALE 1:400

SCALE 1:250

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL CROSS SECTION OF CULVERT	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	11.2.2 (3)-18

1 Open Canal-Concrete Lining Canal

Reach	STA(m) from	STA(m) to	Length (m)	Type	Discharge (m3/s)	Section (m)	Remarks
Reach-1	0 + 725.000	1 + 19.975	294.975	Trapezoid	140.00	W=15.0,H=5.35	
	1 + 160.475	3 + 619.675	2459.200	Trapezoid	140.00	W=15.0,H=5.35	
	3 + 837.675	9 + 8.475	5170.800	Trapezoid	140.00	W=15.0,H=5.35	
	9 + 176.475	11 + 542.302	2365.827	Trapezoid	140.00	W=15.0,H=5.35	
	11 + 542.302	11 + 621.024	0.000	Trapezoid	140.00	W=15.0,H=5.35	Eq = -78.722m
	11 + 621.024	11 + 685.400	64.376	Trapezoid	140.00	W=15.0,H=5.35	
	11 + 883.400	12 + 281.120	397.720	Trapezoid	140.00	W=15.0,H=5.35	
	Sub Total		10752.898				
Reach-2	16 + 600.00	21 + 960.00	5360.000	Trapezoid	140.00	W=15.0,H=5.35	
	Sub Total		5360.000				
Reach-3	31 + 557.254	32 + 960.000	1402.746	Trapezoid	140.00	W=15.0,H=5.35	
	32 + 960.000	35 + 9.994	2049.994	Trapezoid	140.00	W=15.0,H=5.35	
	35 + 9.994	35 + 21.074	0.000				Eq = -11.080m
	35 + 21.074	35 + 525.000	503.926	Trapezoid	140.00	W=15.0,H=5.35	
	37 + 0.000	52 + 750.000	15750.000	Trapezoid	140.00	W=15.0,H=5.35	
	Sub Total		19706.666				
Total			35819.564			W=30.0,d=3.90	

2 Open Canal-Earth Lining Canal

Reach-3	52 + 750.000	55 + 332.253	2582.253	Trapezoid	140.00	W=15.0,H=5.35	

3 Culvert

CLT-1	15 + 320.60	16 + 600.00	1279.396	RC Horse Shoe	140.00	H=8.70m	
CLT-2	21 + 960.00	26 + 139.777	4179.777	RC Horse Shoe	140.00	H=8.70m	
	Sub Total		5459.173				
CLT-3	35 + 525.000	36 + 424.038	899.038	RC Horse Shoe	140.00	H=8.70m	
CLT-4	36 + 424.038	36 + 554.347	0.000	RC Horse Shoe	140.00	H=8.70m	Eq =-130.309
CLT-5	36 + 554.347	37 + 0.000	445.653	RC Horse Shoe	140.00	H=8.70m	
	Sub Total		1344.691				
Total			6803.864				

4 Siphon

S-1	1 + 160.475	1 + 19.975	140.500	R.C Box	140.00	3.60*3.60*4	Nam Mae Kon
S-2	3 + 619.675	3 + 837.675	218.000	R.C Box	140.00	3.60*3.60*4	Nam Mae Lao
S-3	9 + 176.475	9 + 8.475	168.000	R.C Box	140.00	3.60*3.60*4	Huai Mae Hang
S-4	11 + 685.405	11 + 883.405	198.000	R.C Box	140.00	3.60*3.60*4	Nam Mae Sakoen
Total			724.500				

5 Drop

D-1	32 + 960.000			R.C Inclined	140.00	ΔH=2.55m	
D-2	52 + 750.000			R.C Inclined	140.00	ΔH=5.05m	

6. Weir/Check Structure

Name	N0s.	STA(km)	Type		
Check	CH-1	11+680	With radial gate		
	CH-2	21+960	With radial gate		
	CH-3	37+114	With radial gate		
	CH-4	46+115	With radial gate		
Check drop	CD-1	32+960	With stop log gate		
	CD-2	52+750	With stop log gate		

7.Turn Out

Name	Area	STA(km)	Type	Irrigation Area (rai)	Discharge (cum/s)	Size
TOT-1	Kok-1	2+183.006	Pump	920	0.230	
TOT-2	Kok-1	2+528.000	Pump			
TOT-3	Kok-2	4+137.500	Pump	1,880	0.470	
TOT-4	Kok-2	5+298.000	Pump			
TOT-5	Kok-2	6+632.000	Pump			
TOT-6	Kok-3	10+999.500	Pump	740	0.190	
TOT-7	Tak-1	17+793.604	Pump	460	0.120	
TOT-8	Tak-2	21+960.000	Pump	7,000	1.750	
TOT-9	Ing-1	32+860.000	Gravity	7,940	1.990	
TOT-10	Ing-2	36+587.253	Pump	8,600	2.150	
TOT-11	Ing-3	37+000.000	Gravity	3,200	0.800	
TOT-12	Ing-4	41+450.000	Gravity	4,390	1.100	
TOT-13	Ing-5	42+500.000	Gravity	3,140	0.790	
TOT-14	Ing-6	46+115.253	Pump	7,530	1.880	
Total				45,800	11.470	

8.Drain Culvert

Name	STA(km)	Type	Size			
DC-1	2+729.500	RC Box	2.0*2.0*3			Nam Mae Hang
DC-2	32+867.254	RC Pipe	ϕ 1000*1			
DC-3	33+535.000	RC Pipe	ϕ 1000*2			
DC-4	33+895.000	RC Pipe	ϕ 1000*2			
DC-5	40+210.000	RC Pipe	ϕ 1000*3			
DC-6	40+228.253	RC Pipe	ϕ 1000*1			
DC-7	40+275.000	RC Pipe	ϕ 1000*3			
DC-8	41+502.253	RC Pipe	ϕ 1000*1			
DC-9	42+535.253	RC Pipe	ϕ 1000*1			
DC-10	42+961.253	RC Pipe	ϕ 1000*1			
DC-11	43+021.253	RC Pipe	ϕ 1000*2			
DC-12	43+457.253	RC Pipe	ϕ 1000*2			
DC-13	43+481.253	RC Pipe	ϕ 1000*1			

9.Overchute

Name	STA(km)	Type
OVC-1	0+950.000	
OVC-2	1+339.000	
OVC-3	1+604.000	
OVC-4	2+183.000	
OVC-5	2+528.000	
OVC-6	3+070.000	
OVC-7	3+105.000	
OVC-8	3+251.000	
OVC-9	4+052.000	
OVC-10	4+137.500	
OVC-11	4+592.000	
OVC-12	4+811.000	
OVC-13	4+900.000	
OVC-14	5+037.000	
OVC-15	5+298.000	
OVC-16	5+674.000	
OVC-17	6+133.000	
OVC-18	6+632.000	
OVC-19	6+850.500	
OVC-20	7+987.000	
OVC-21	8+282.500	
OVC-22	8+530.000	
OVC-23	8+811.000	
OVC-24	8+889.700	
OVC-25	9+505.500	

Name	STA(km)
OVC-26	9+927.000
OVC-27	10+094.000
OVC-28	10+494.500
OVC-29	10+999.500
OVC-30	17+124.604
OVC-31	17+793.604
OVC-32	18+400.604
OVC-33	20+580.604
OVC-34	21+937.604
OVC-35	32+309.254
OVC-36	37+114.253
OVC-37	44+617.253
OVC-38	44+955.253
OVC-39	45+235.253
OVC-40	45+307.253
OVC-41	45+373.253
OVC-42	45+391.253
OVC-43	45+980.253
OVC-44	46+115.253
OVC-45	46+277.253
OVC-46	47+137.253

10. Bridge

10-1High Way Bridge W=11.00m

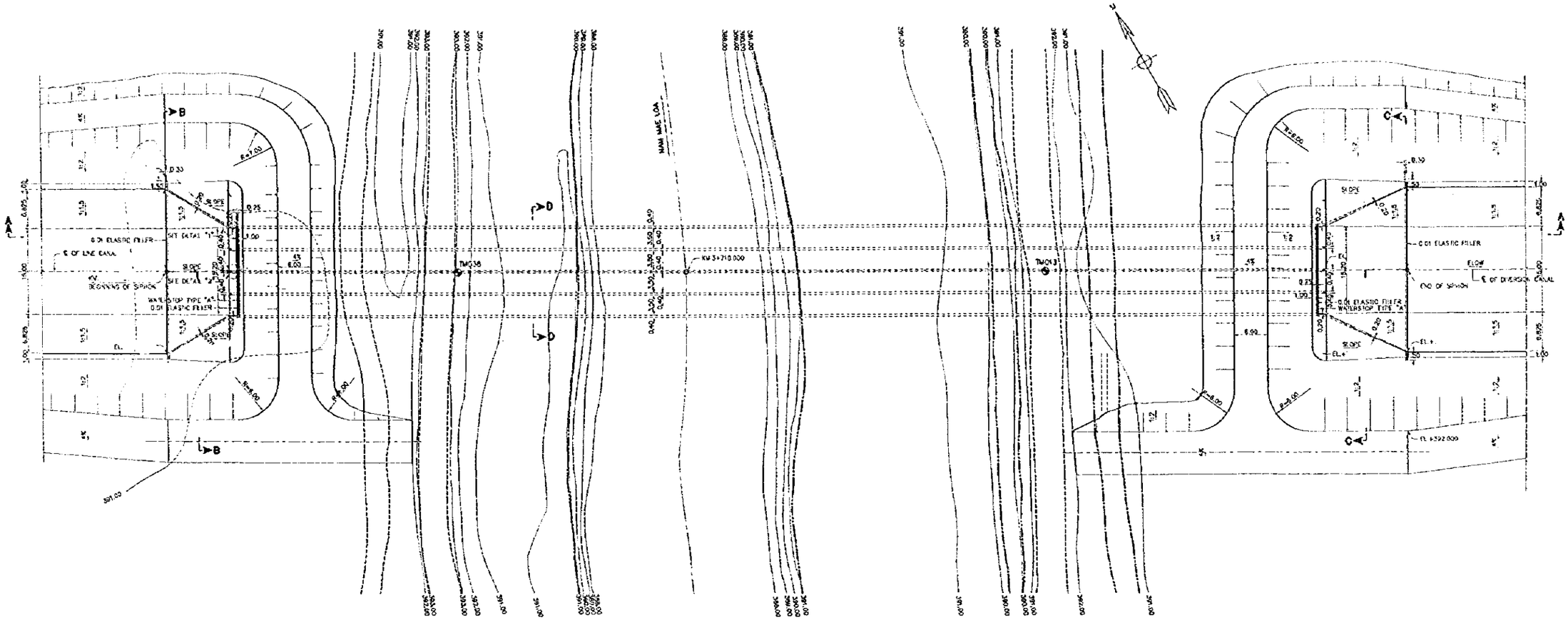
	Name	STA(km)	H.W No.	Length (m)	Type	
HB-1	H/W Bridge	1+393.000	No.1232		R.C Slab	
HB-2	H/W Bridge	6+638.000	No.1232		R.C Slab	
HB-3	H/W Bridge	8+156.000	No.1173		R.C Slab	
HB-4	H/W Bridge	20+968.604	No.1152		R.C Slab	
HB-5	H/W Bridge	38+307.253	No.1174		R.C Slab	
HB-6	H/W Bridge	47+960.853	No.1020		R.C Slab	

10-2.Road Way Bridge W=7.00~4.00m

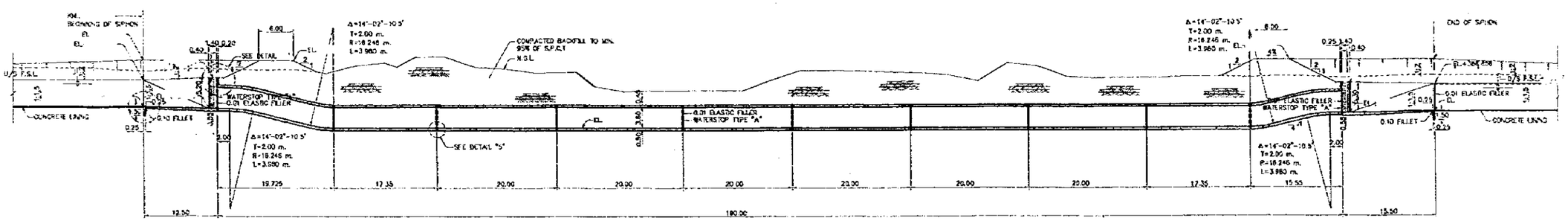
	Name	STA(km)	R/W No.	Length (m)	Type	
RB-1	R/W Bridge	4+440.000			R.C Slab	
RB-2	R/W Bridge	4+597.500			R.C Slab	
RB-3	R/W Bridge	5+664.000			R.C Slab	
RB-4	R/W Bridge	8+887.000			R.C Slab	
RB-5	R/W Bridge	9+639.000			R.C Slab	
RB-6	R/W Bridge	9+924.000			R.C Slab	
RB-7	R/W Bridge	11+008.000			R.C Slab	
RB-8	R/W Bridge	17+130.104			R.C Slab	
RB-9	R/W Bridge	17+743.604			R.C Slab	
RB-10	R/W Bridge	32+086.254			R.C Slab	
RB-11	R/W Bridge	33+767.254			R.C Slab	
RB-12	R/W Bridge	34+865.000			R.C Slab	
RB-13	R/W Bridge	36+704.253			R.C Slab	
RB-14	R/W Bridge	37+133.253			R.C Slab	
RB-15	R/W Bridge	40+224.253			R.C Slab	
RB-16	R/W Bridge	40+224.253			R.C Slab	
RB-17	R/W Bridge	40+564.253			R.C Slab	
RB-18	R/W Bridge	40+947.253			R.C Slab	
RB-19	R/W Bridge	41+821.253			R.C Slab	
RB-20	R/W Bridge	42+141.253			R.C Slab	
RB-21	R/W Bridge	42+597.253			R.C Slab	
RB-22	R/W Bridge	43+229.253			R.C Slab	
RB-23	R/W Bridge	44+177.253			R.C Slab	
RB-24	R/W Bridge	45+972.253			R.C Slab	
RB-25	R/W Bridge	48+677.253			R.C Slab	
RB-26	R/W Bridge	50+033.253			R.C Slab	
RB-27	R/W Bridge	50+507.253			R.C Slab	

10-3. Farm Road Bridge W=4.00m 30 Bridges Location is not fixed.
10-4. O&M Road Bridge W=4.00m 4 Brigdges Siphon sites

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
LIST OF CANAL AND STRUCTURES	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-19
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	



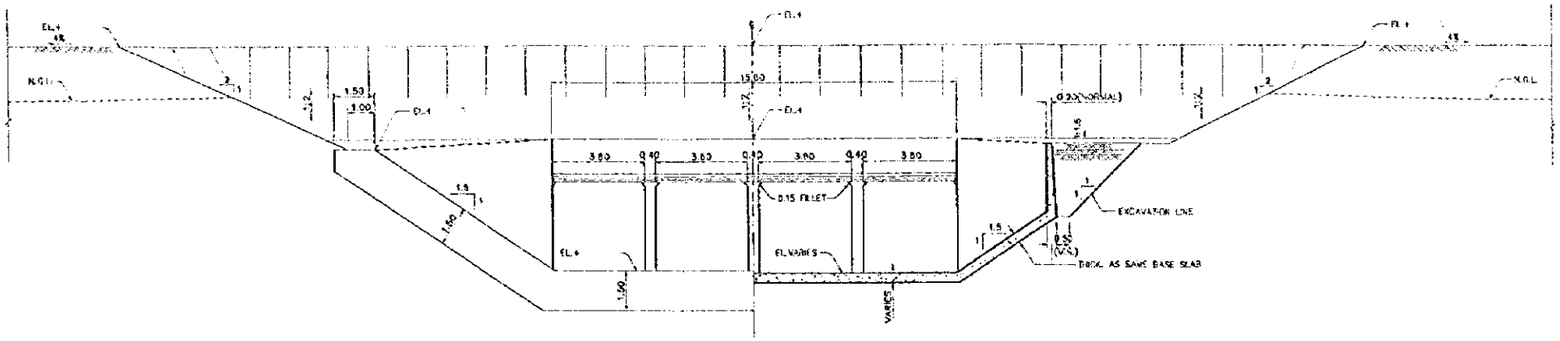
PLAN
SCALE "A"



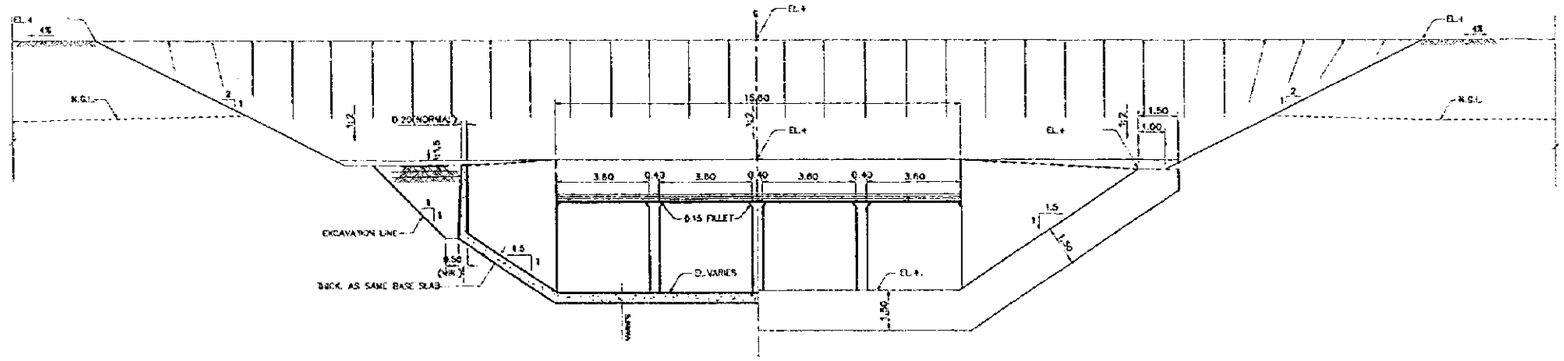
SECTION A–A
SCALE "A"

SCALE "A"
0 5 10 15 20
ORIGINAL SCALE 1:250 M.

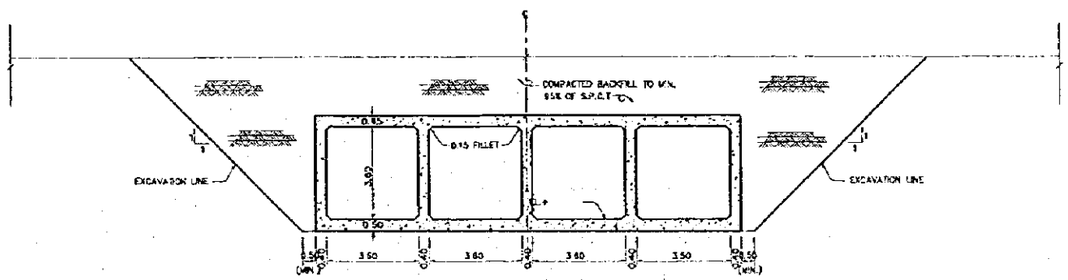
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF SIPHON	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	11.2.2 (3)-20



SECTION B–B
SCALE "A"



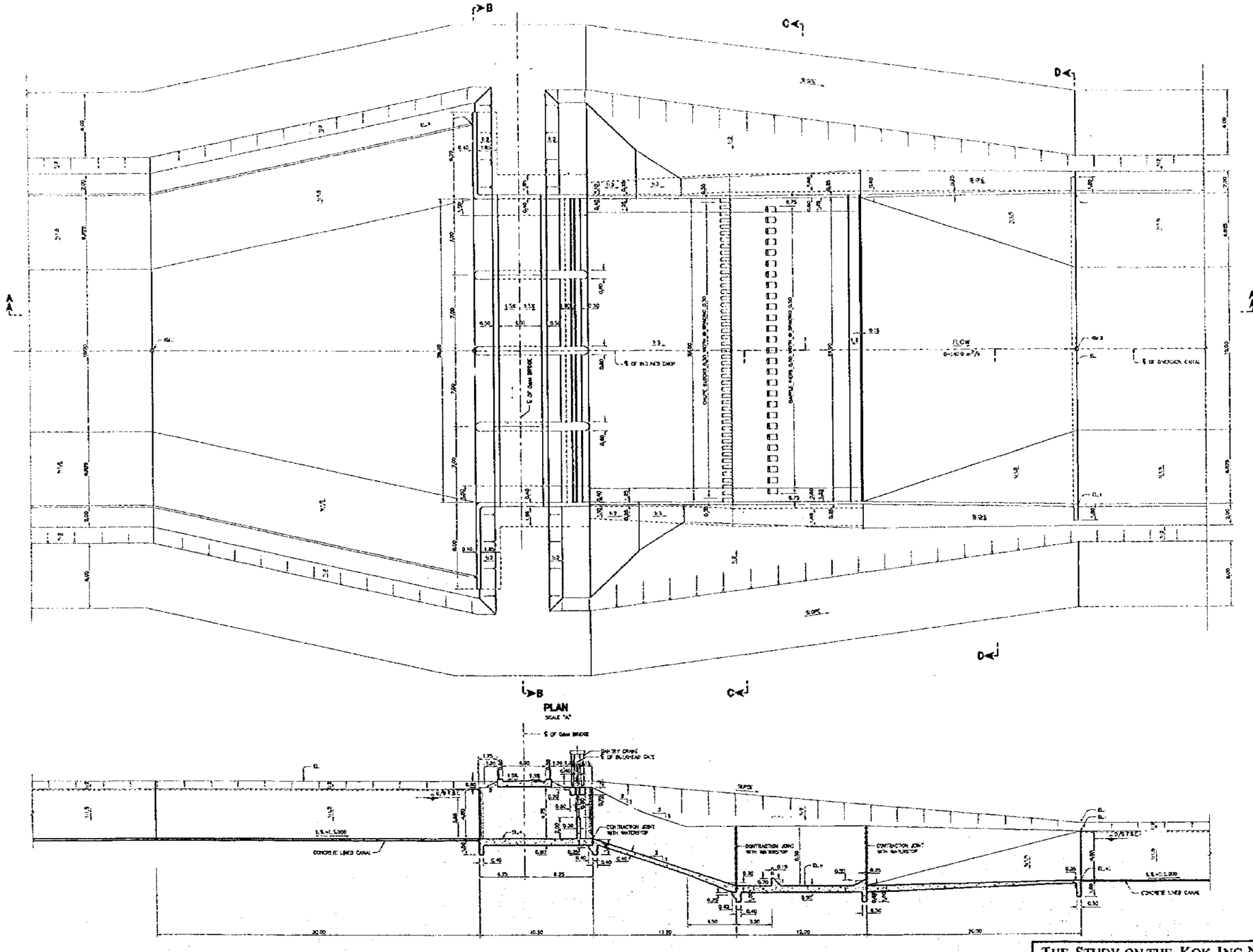
SECTION C–C
SCALE "A"



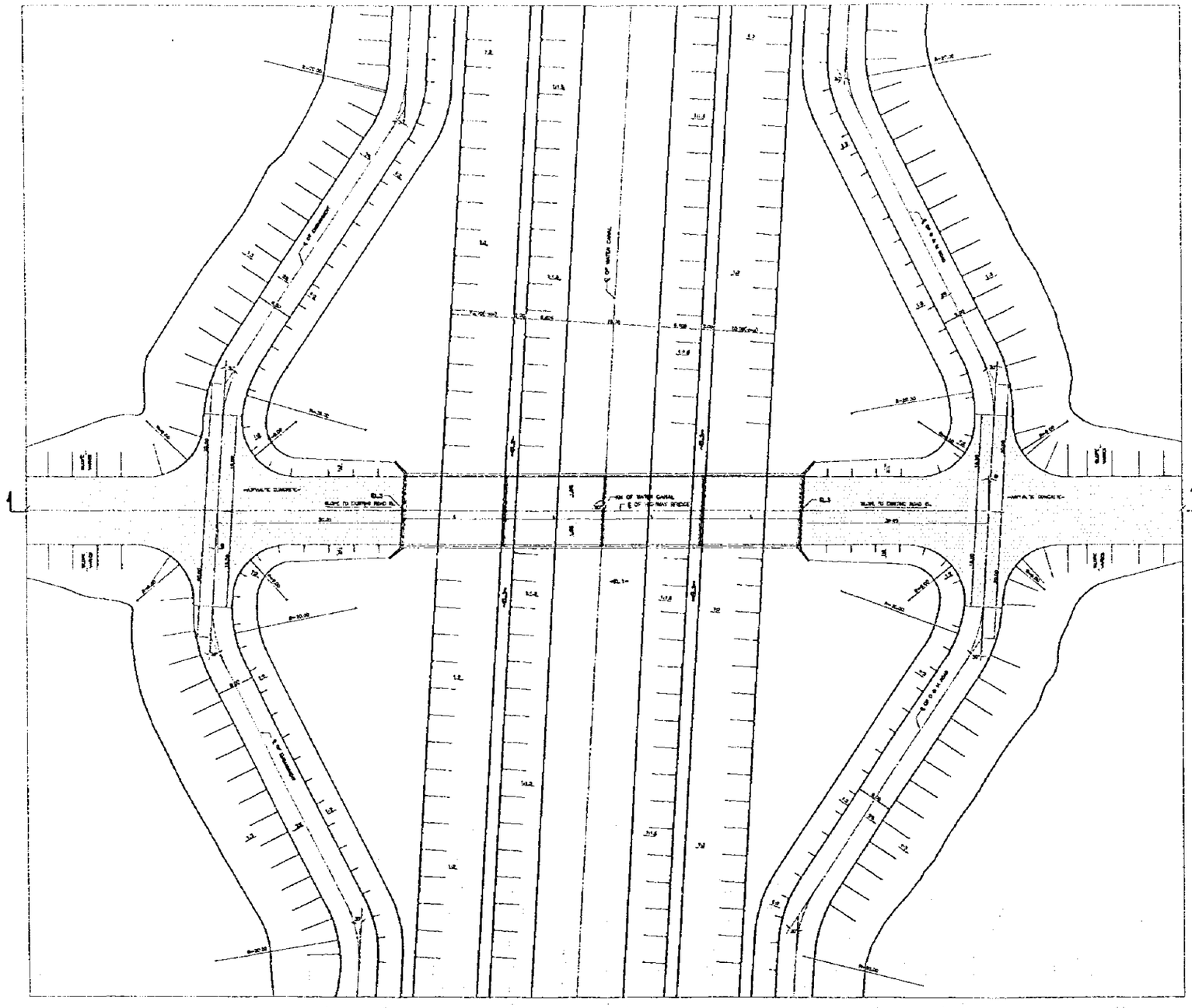
SECTION D–D
SCALE "A"

SCALE "A"
ORIGINAL SCALE 1:75

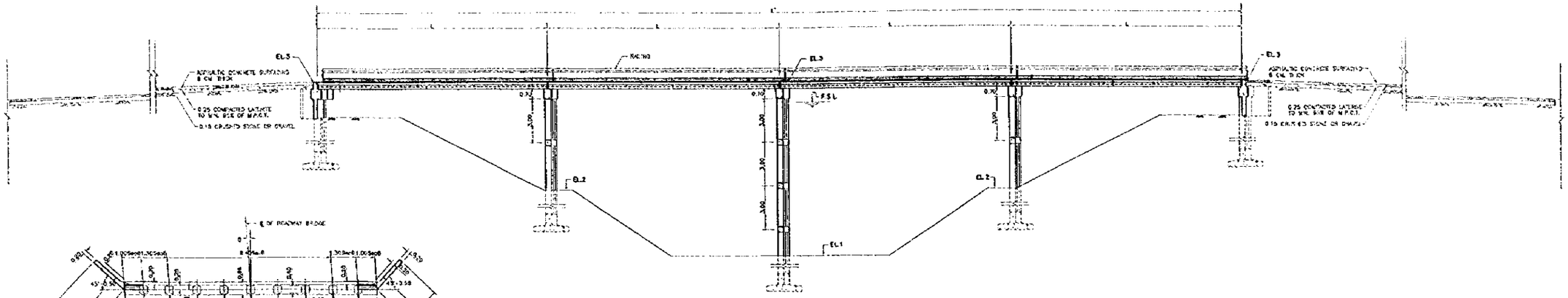
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL CROSS SECTION OF SIPHON I	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-21



THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF INCLINED DROP	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-22
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

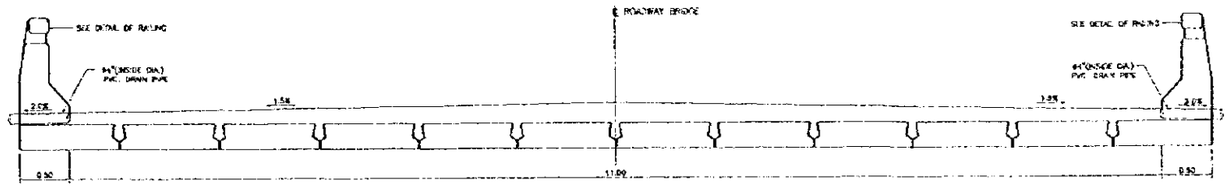


THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN OF HIGHWAY & ROADWAY BRIDGE	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-23

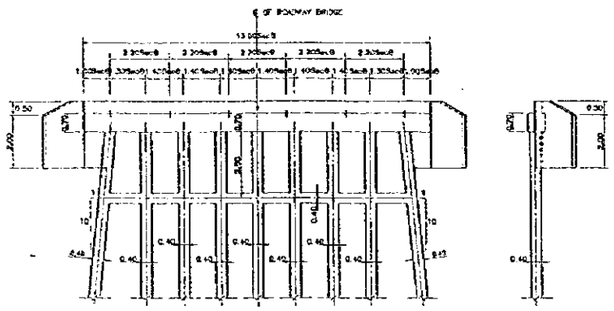


SECTION (A)
SCALE "A"

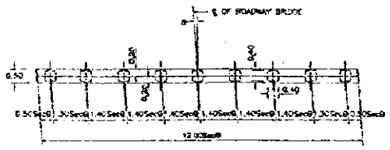
PLAN OF ABUTMENT
NOT TO SCALE



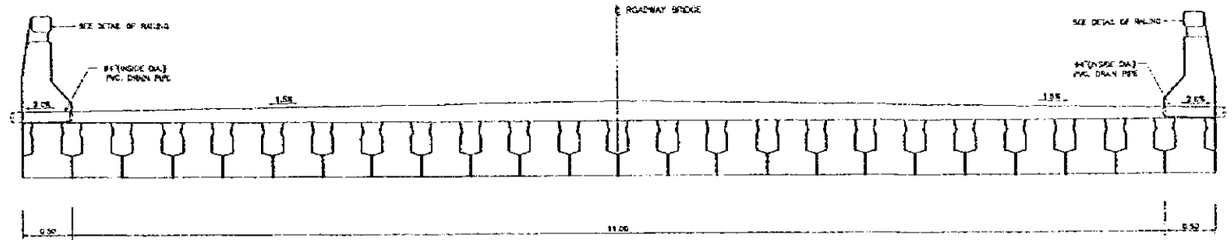
TRANSVERSE SECTION OF 10.00 M. SPAN BRIDGE
REINFORCEMENT NOT SHOWN
SCALE 1:20



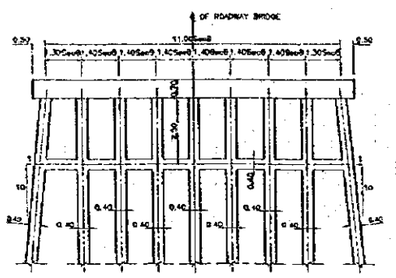
ABUTMENT ELEVATION
NOT TO SCALE



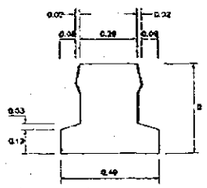
PLAN OF PILE BENT
NOT TO SCALE



TRANSVERSE SECTION OF 12.00 – 16.00 M. SPAN BRIDGE
REINFORCEMENT NOT SHOWN
SCALE 1:20

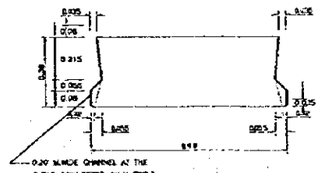


PILE BENT ELEVATION
NOT TO SCALE



12.00 ~16.00 M. SPAN
BEAM CROSS SECTIONS
NOT TO SCALE

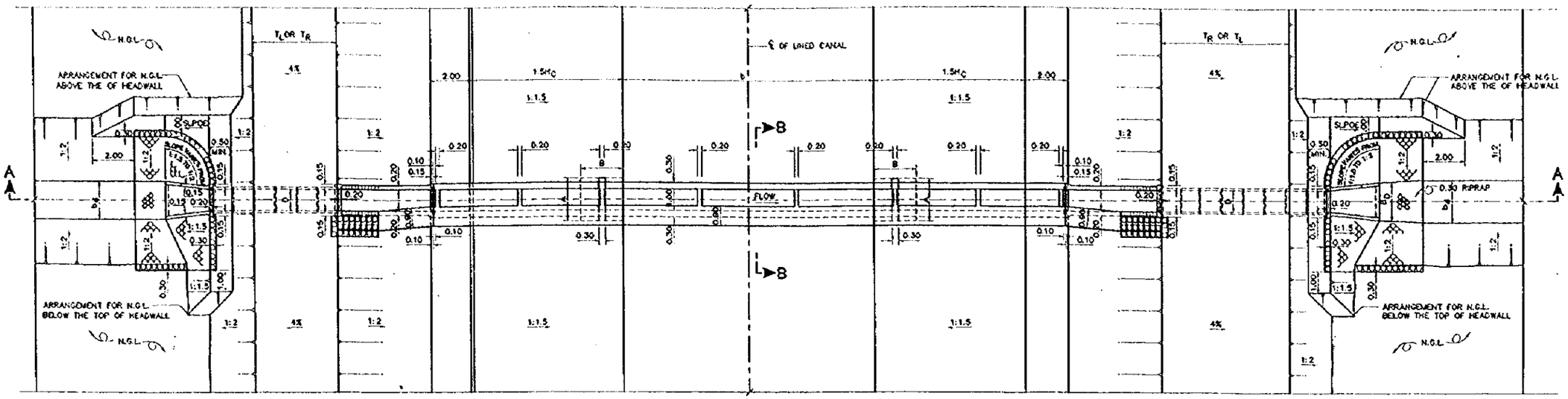
TABLE OF BEAM DETAILS			
SPAN (M.)	12.00	14.00	16.00
D (CM.)	84	49	54



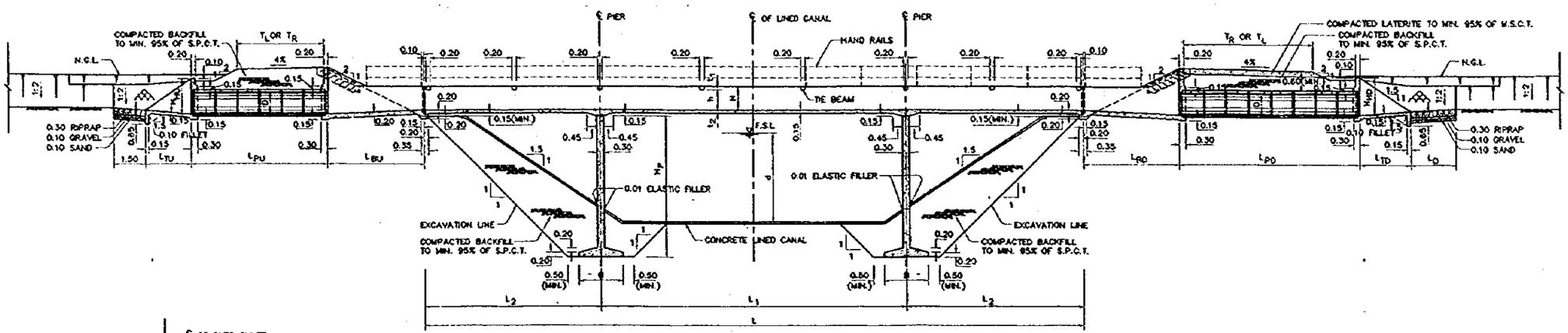
10.00 M. SPAN
GIRDER CROSS SECTIONS
NOT TO SCALE

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL SECTION OF HIGHWAY & ROADWAY BRIDGE	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 112.2 (3)-24
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

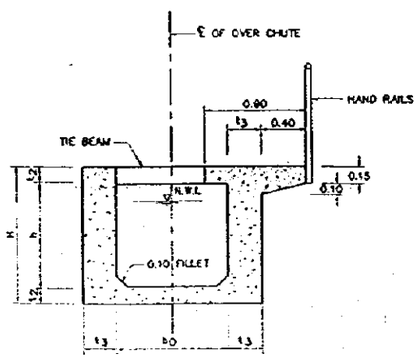
TYPBRG11.DWG



PLAN
NOT TO SCALE



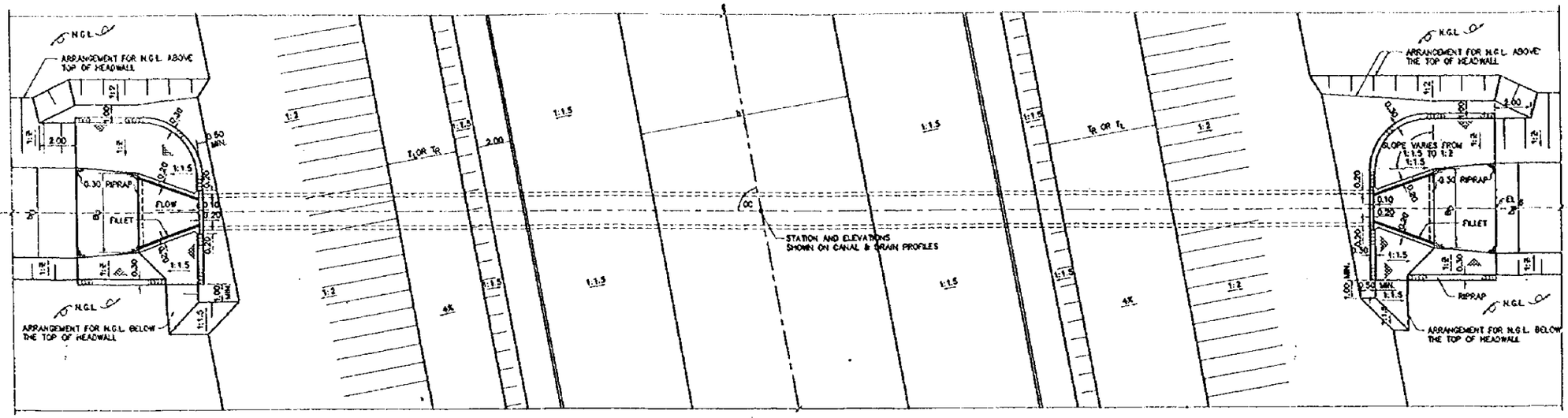
SECTION A–A
NOT TO SCALE



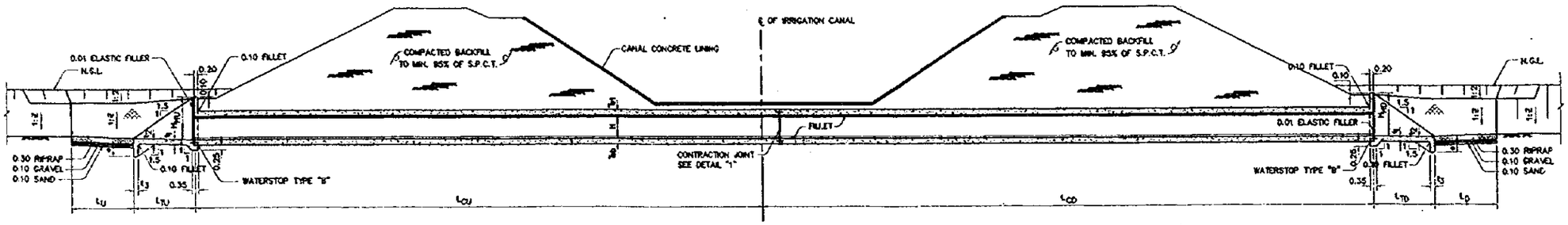
SECTION B–B
NOT TO SCALE

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF OVERCHUTE	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-25
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

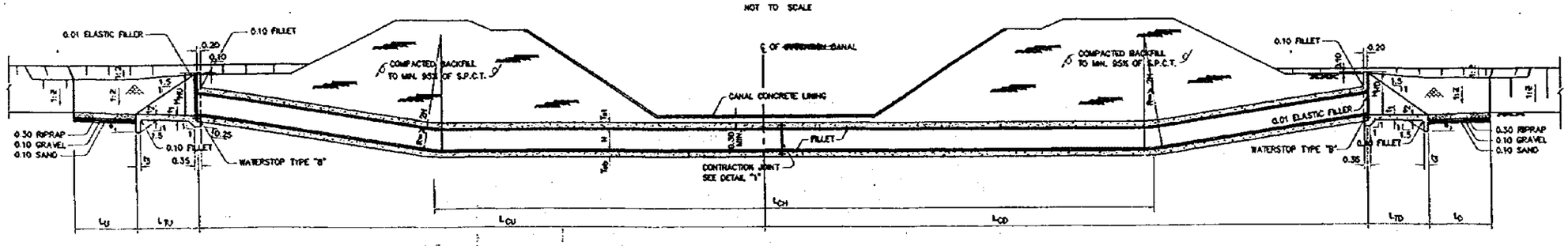
KOK-7F.DWG



PLAN TYPE B-1
SINGLE BOX CULVERT
NOT TO SCALE

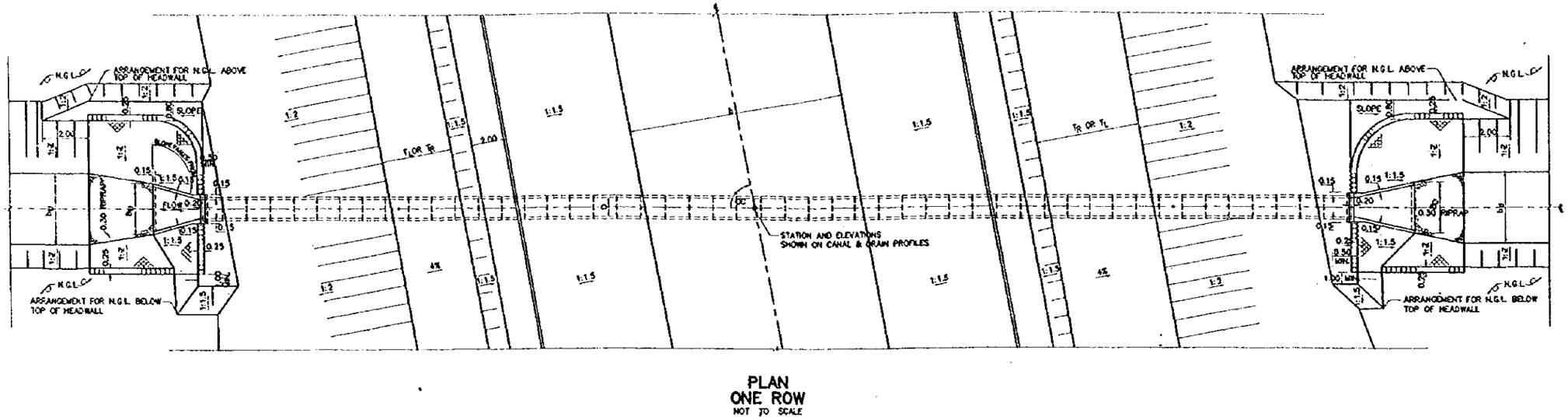


STRUCTURE NO.1
NOT TO SCALE

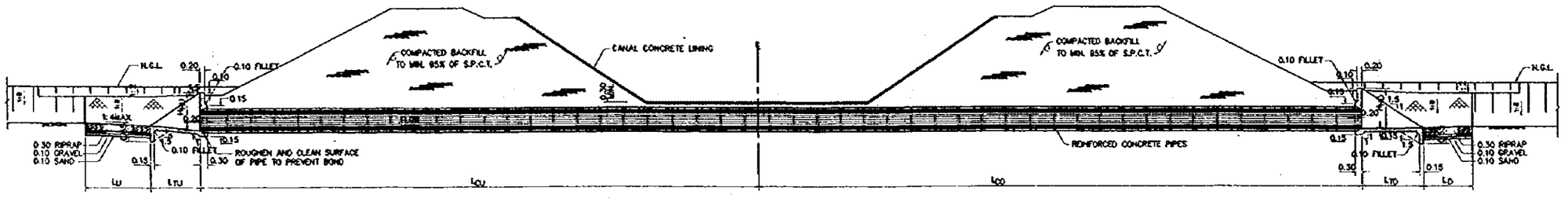


STRUCTURE NO.2
NOT TO SCALE

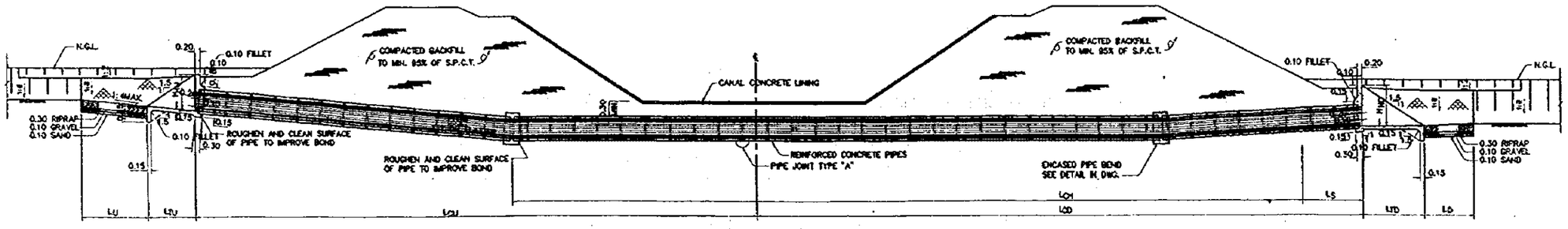
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF DRAIN CULVERT (R.C)	Map & Draw-Ing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-26



PLAN
ONE ROW
NOT TO SCALE

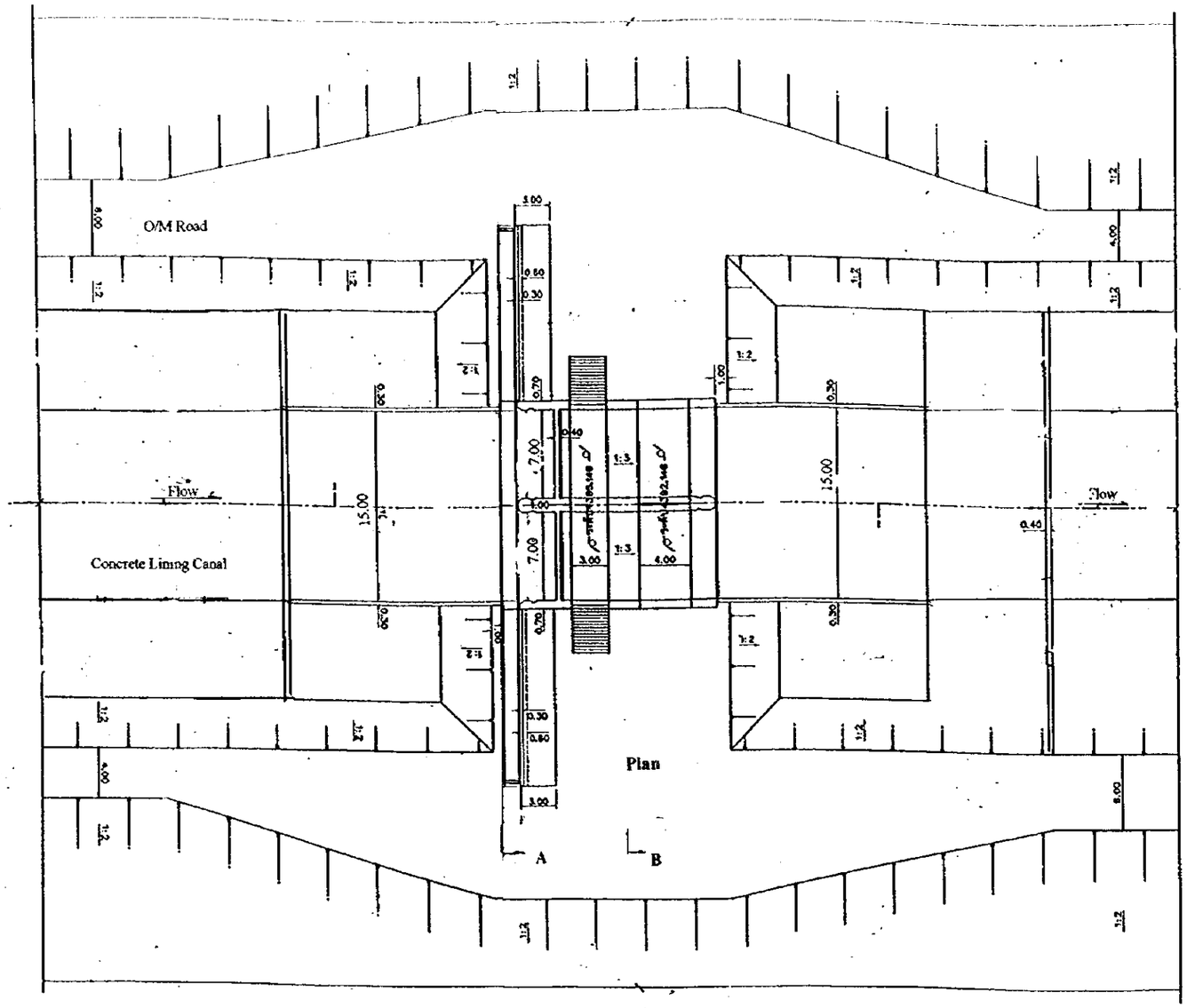


STRUCTURE NO.1
NOT TO SCALE

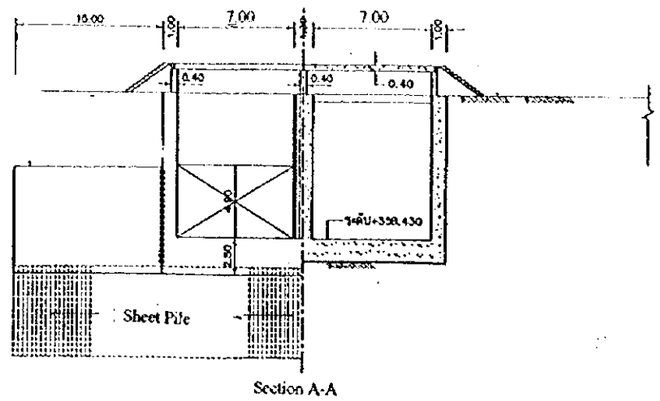


STRUCTURE NO.2
NOT TO SCALE

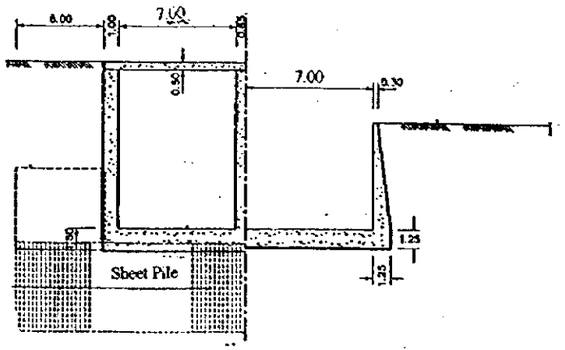
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF DRAIN CULVERT (PIPE)	Map & Draw - Ing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	11.2.2 (3)-27



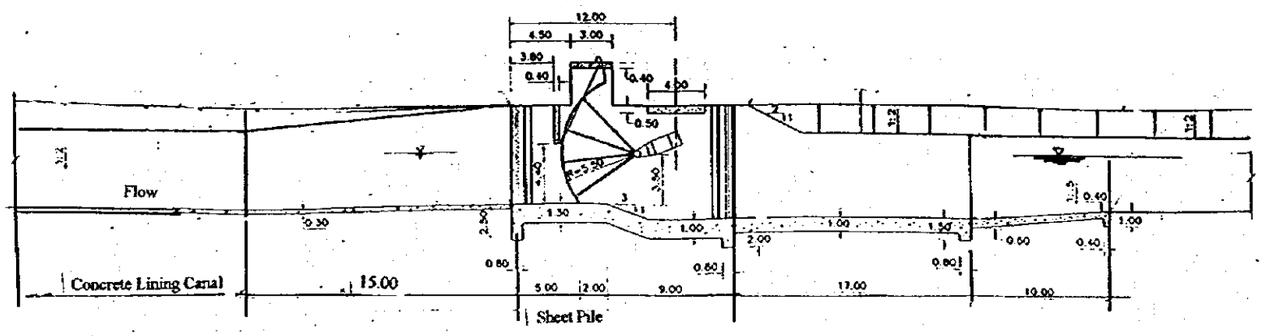
Plan



Section A-A



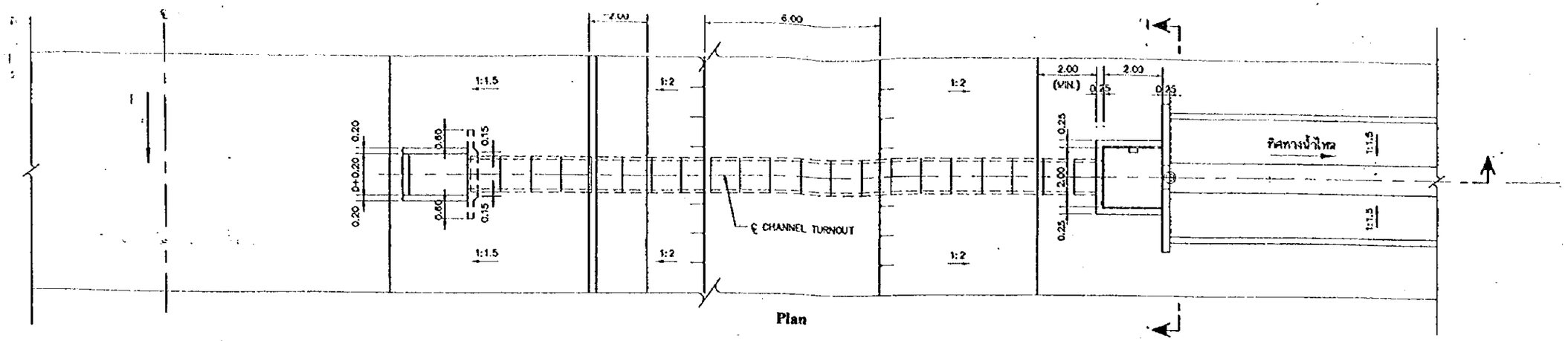
Section B-B



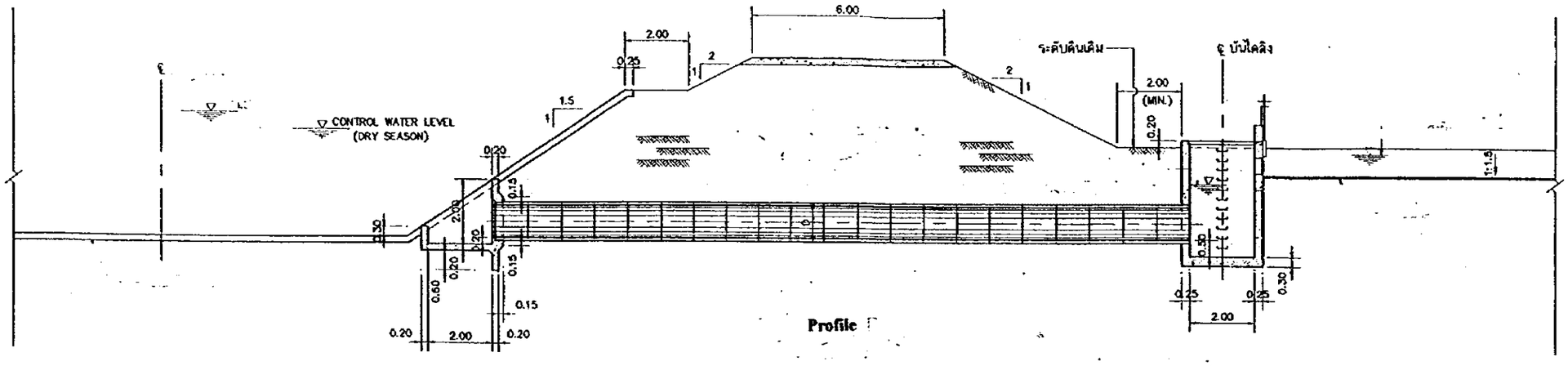
Profile

0 5 10 15 20

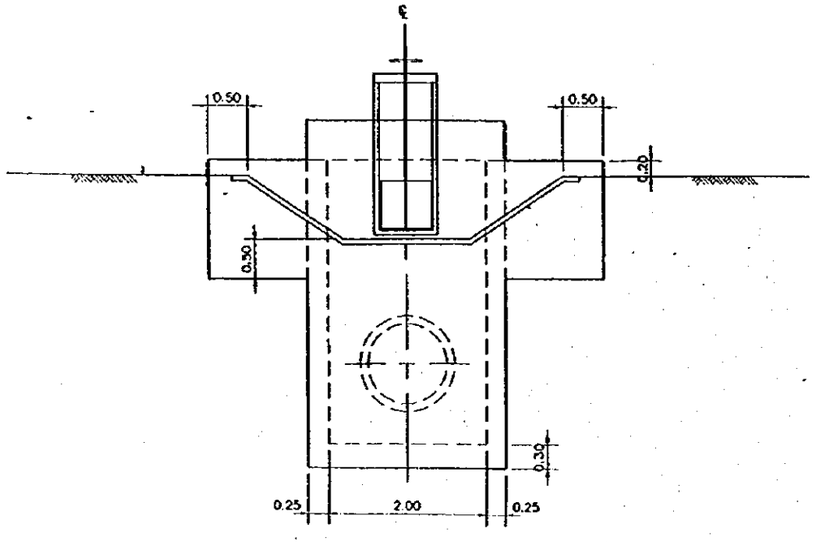
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF CHECK STRUCTURE	Map & Drw - Log No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	II.2.2 (3)-28



Plan



Profile

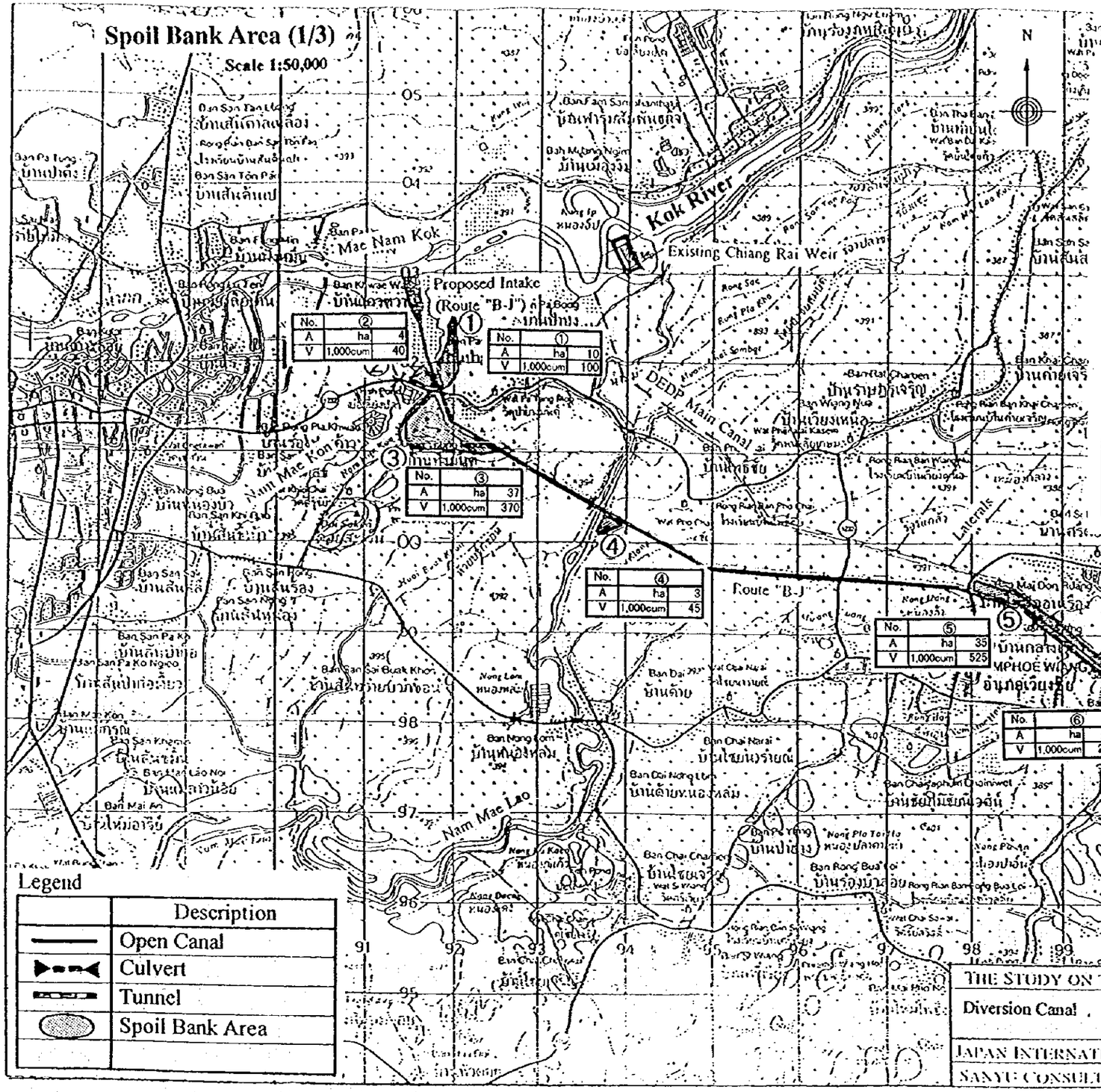


Section

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT	
TYPICAL PLAN AND PROFILE OF TURNOUT	Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Figure 11.2.2 (3)-29
SANYU CONSULTANTS INC. & NIPPON KOEI CO., LTD.	

Spoil Bank Area (1/3)

Scale 1:50,000



Disposal Area and Volume (Kok-Ing)

Basin	Canal Type	Length (m)	D. Volume (1000cu.m)	No.	Area rai	Area (ha)	Volume (1000cu.m)
Kok	Open	2895	347	①	63	10	100
				②	25	4	40
				③	231	37	370
		5380	807	④	19	3	45
				⑤	219	35	525
		3203	674	⑥	94	15	225
				⑦	63	10	150
				⑧	44	7	105
				⑨	113	18	270
Tak	Culvert	1279	143	⑩	206	33	330
	Culvert	2000	500	⑪	131	21	315
	Open	3360	1045	⑫	50	8	240
				⑬	81	13	195
				⑭	100	16	480
	Culvert	4180	521	⑮	188	30	600
Ing	Open	3957	621	⑯	269	43	645
	Culvert	1345	143	⑰	75	12	144
	Open	11000	1507	⑱	938	150	1,500
		7332	951	⑲	500	80	960
	Total	45931	7259		3406	545	7239

Legend

	Description
	Open Canal
	Culvert
	Tunnel
	Spoil Bank Area

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

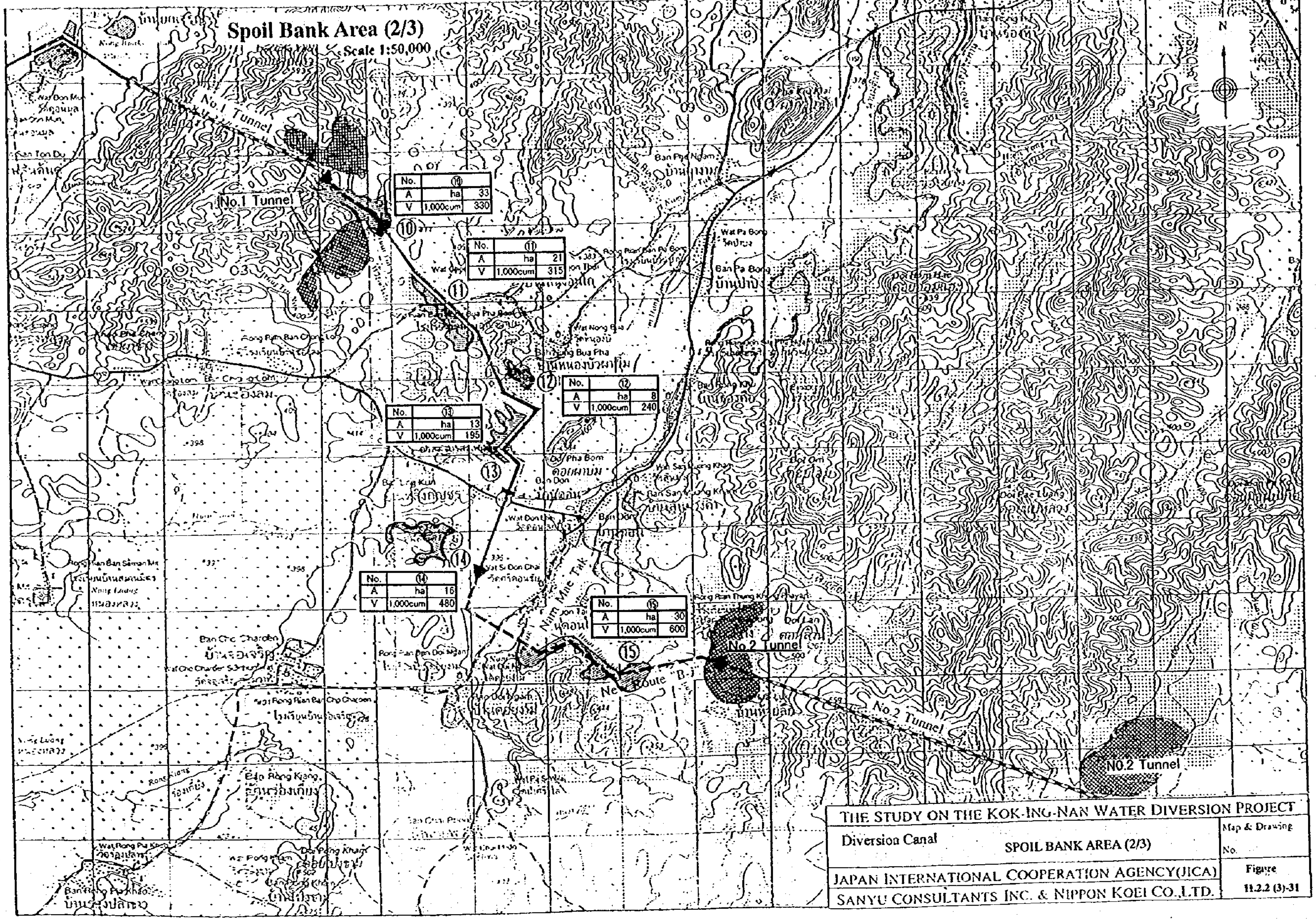
Diversion Canal . SPOIL BANK AREA (1/3)

Map & Drawing No.

JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

SANYU CONSULTANTS INC. & NIPPON KOEI CO.,LTD

Figure 11.2.2 (3)-30


Spoil Bank Area (2/3)
Scale 1:50,000
N
No.1 Tunnel
No.1 Tunnel
No. ⑩ A ha 33 V 1,000cum 330
No. ⑪ A ha 21 V 1,000cum 315
No. ⑫ A ha 8 V 1,000cum 240
No. ⑬ A ha 13 V 1,000cum 195
No. ⑭ A ha 16 V 1,000cum 480
No. ⑮ A ha 30 V 1,000cum 600
⑩
⑪
⑫
⑬
⑭
⑮
Nam Mae Tak
New Route "B"
No.2 Tunnel
No.2 Tunnel
NO.2 Tunnel
Ban Pa Bong
Wat Pa Bong
Ban Cho Charoen
Ban Rong Kiang
Doi Pha Bom
Ban Don
Wat Don Chai
Wat Si Don Chai
Ban Phe Ngam
Wat Nong Bua
Ban Nong Bua Pha
Nong Luang
Wat Rong Pu Khao
Ban Rong Pu Khao
Rong Rian Ban Cho Charoen
THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT
Diversion Canal
SPOIL BANK AREA (2/3)
Map & Drawing No.
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)
SANYU CONSULTANTS INC. & NIPPON KOEI CO.,LTD.
Figure
11.2.2 (3)-31

Spoil Bank Area (3/3)

Scale 1:50,000

No.	⑱	⑲	⑰	⑯
A	ha 150	ha 80	ha 12	ha 43
V	1,000cum 1500	1,000cum 960	1,000cum 144	1,000cum 645

check # 7

THE STUDY ON THE KOK-ING-NAN WATER DIVERSION PROJECT

Diversion Canal SPOIL BANK AREA (3/3)	Map & Drawing No
JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)	Figure 11.2.2 (3)-32
SANYU CONSULTANTS INC. & NIPPON KOEI CO.,LTD.	