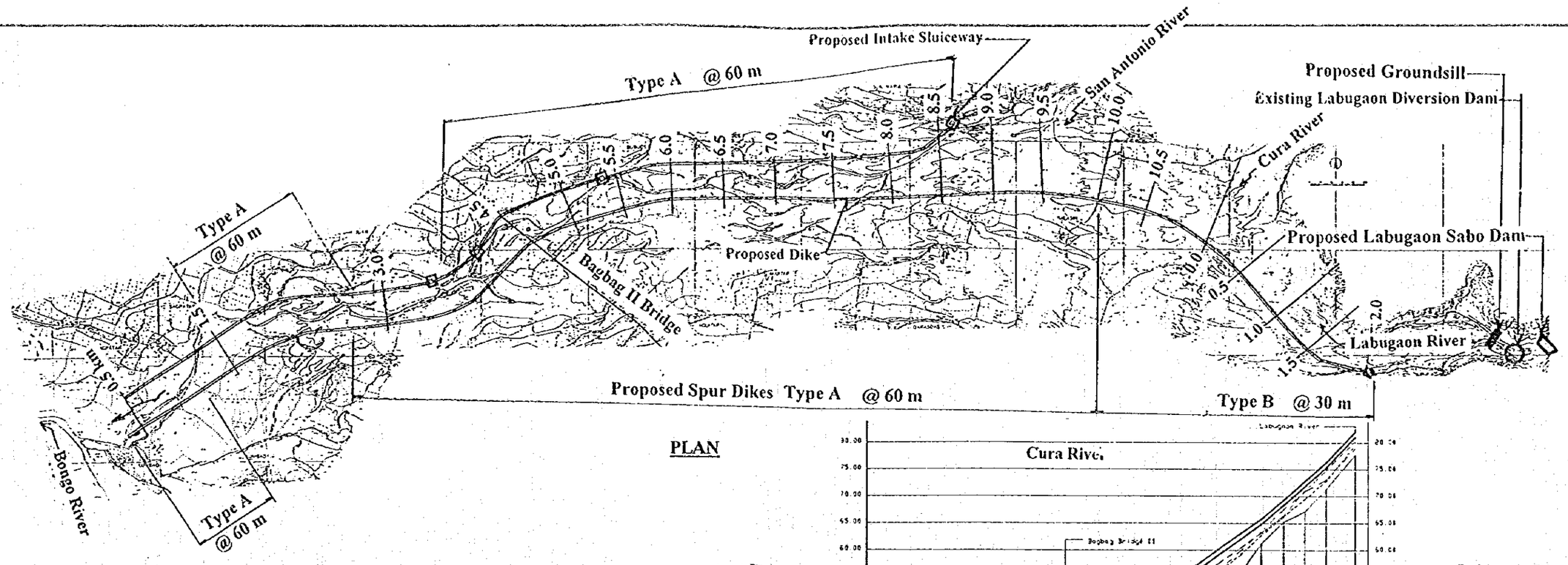
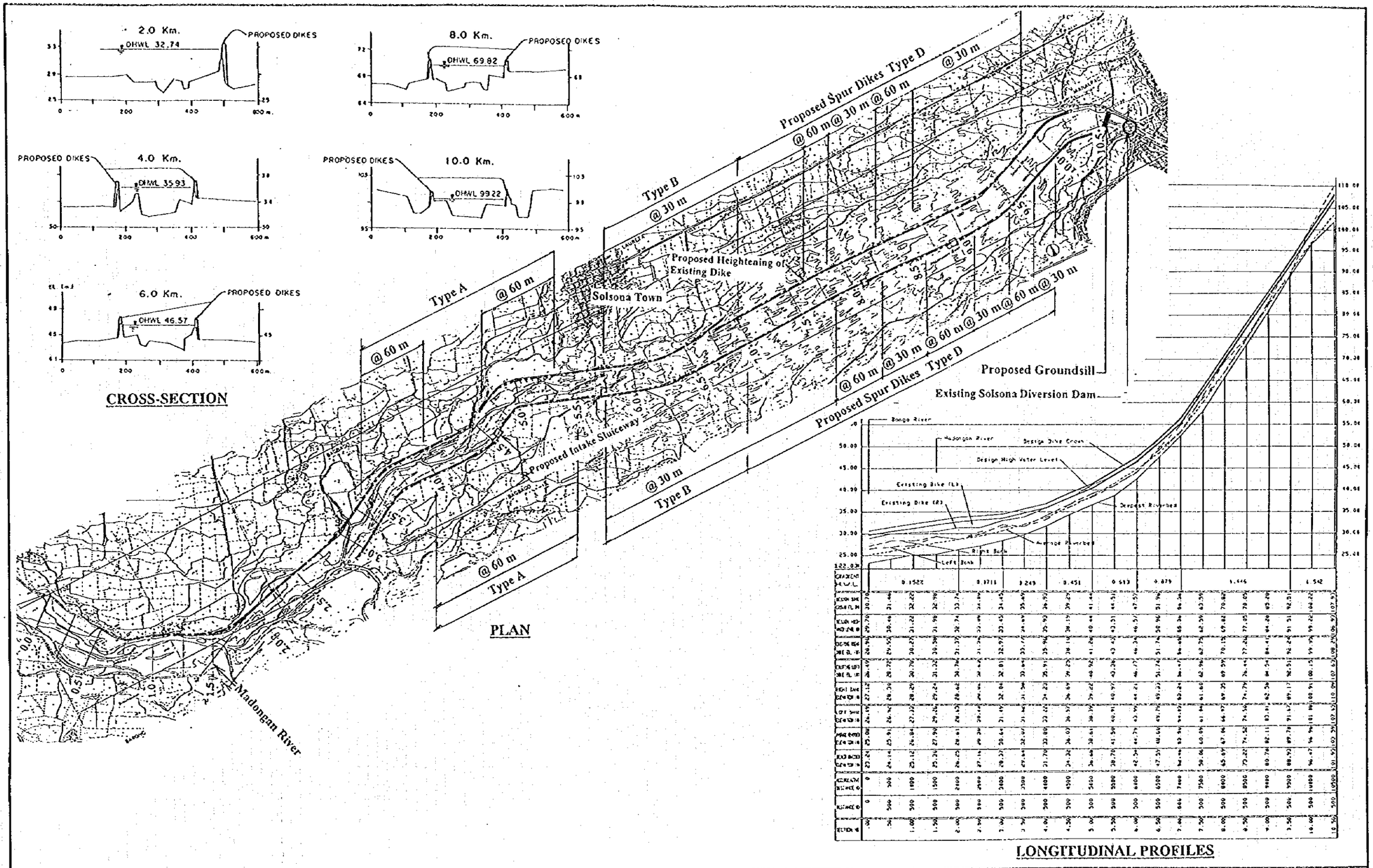
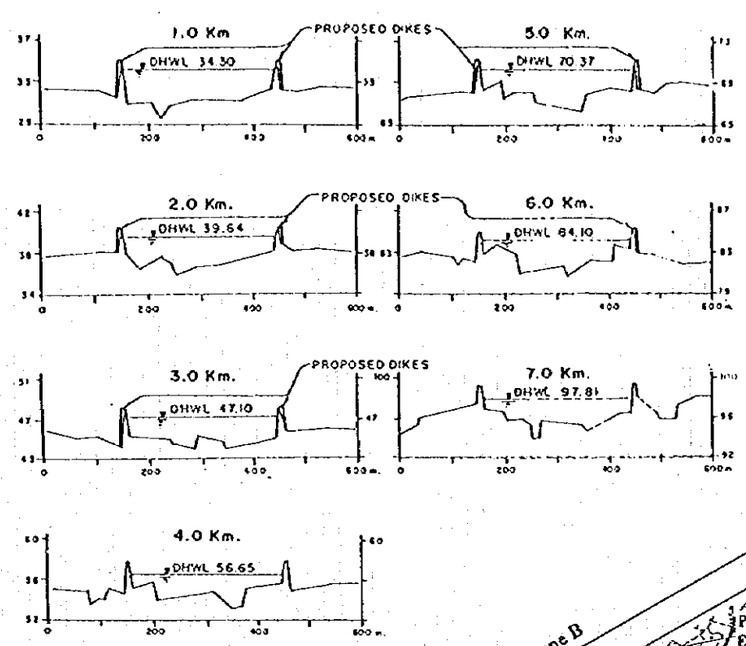


THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN JAPAN INTERNATIONAL COOPERATION AGENCY	図4. 14 クラ・ラブガオン川改修計画

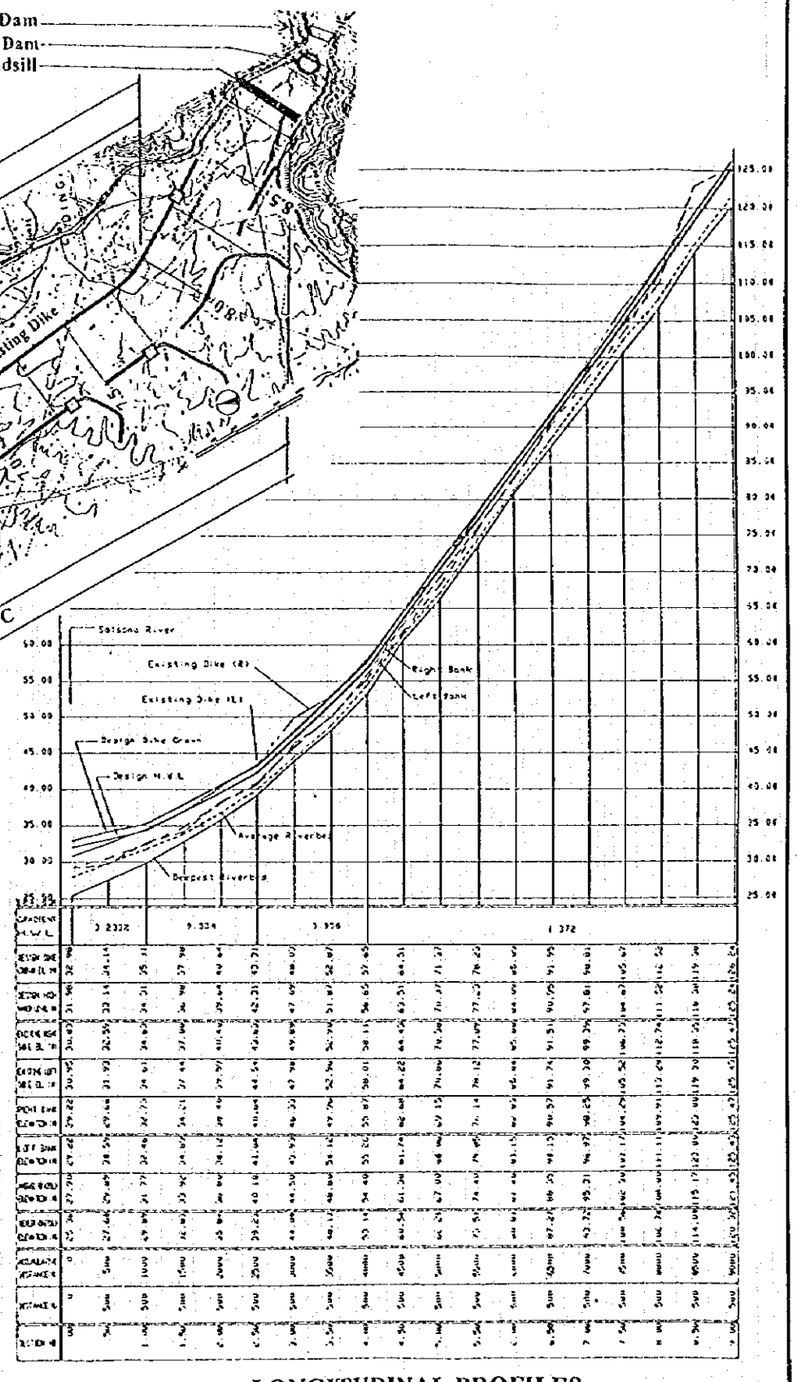


THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図4. 15 ソルソナ川改修計画
JAPAN INTERNATIONAL COOPERATION AGENCY	



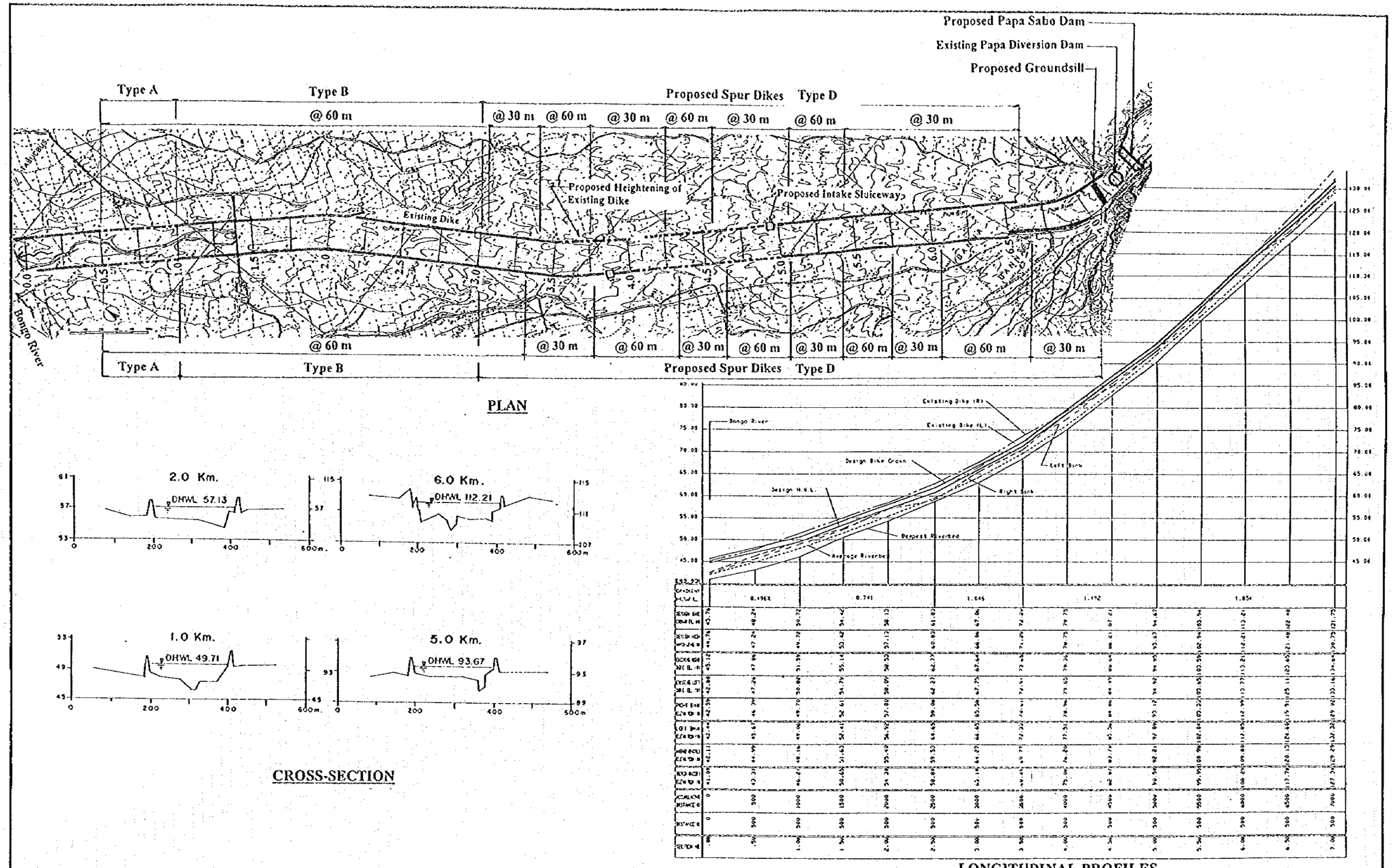
CROSS-SECTION

PLAN



LONGITUDINAL PROFILES

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図4.16 マドンガン川改修計画
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図4. 17 パパ川改修計画
JAPAN INTERNATIONAL COOPERATION AGENCY	

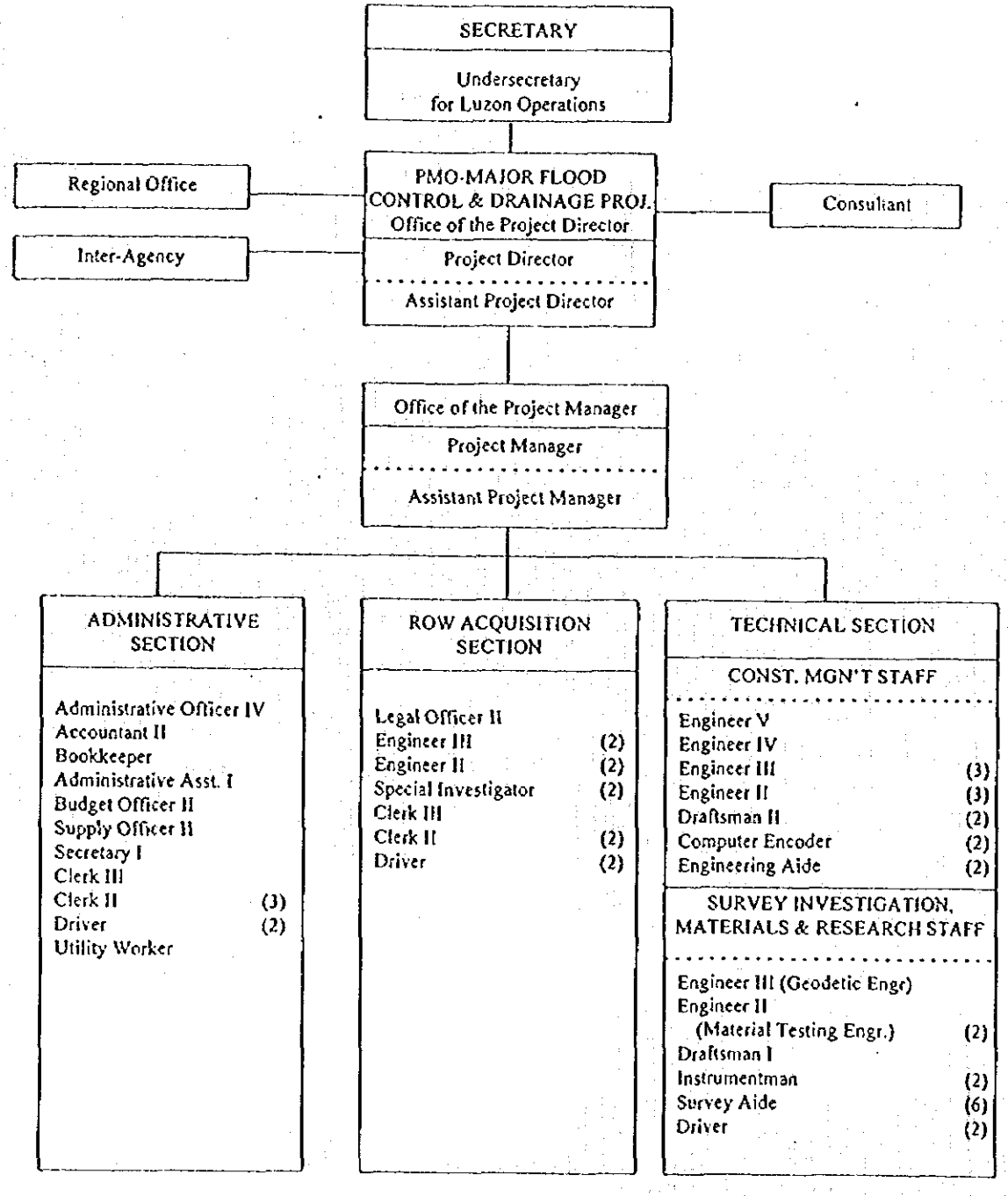
Items	Quantity	1997	1998	1999	2000	2001	2002	2003
1. Feasibility Study								
2. Loan Application & Other Preparations								
3. Detailed Design								
4. Construction								
4.1 Sabo Dams and Alluvial Fan River Improvement								
(1) Cura/Labugaon River								
a) Cura Sabo Dam No.1	15,100 m3							
b) Labugaon Sabo Dam No.1	16,900 m3							
c) River Improvement	12.7 km							
(2) Solsona River								
a) Solsona Sabo Dam No.1	5,200 m3							
b) River Improvement	11.0 km							
(3) Madongan River								
a) Madongan Sabo Dam	20,800 m3							
b) River Improvement	9.0 km							
(4) Papa River								
a) Papa Sabo Dam	16,900 m3							
b) River Improvement	7.0 km							
4.2 Laoag-Bongo River Improvement	13.14 km							
a) Poblacion Laoag River Improvement	3.49 km							
d) Poblacion San Nicolas River Improvement	4.20 km							
c) Poblacion Dingras River Improvement	5.45 km							
5. Land Acquisition	40.5 ha							

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

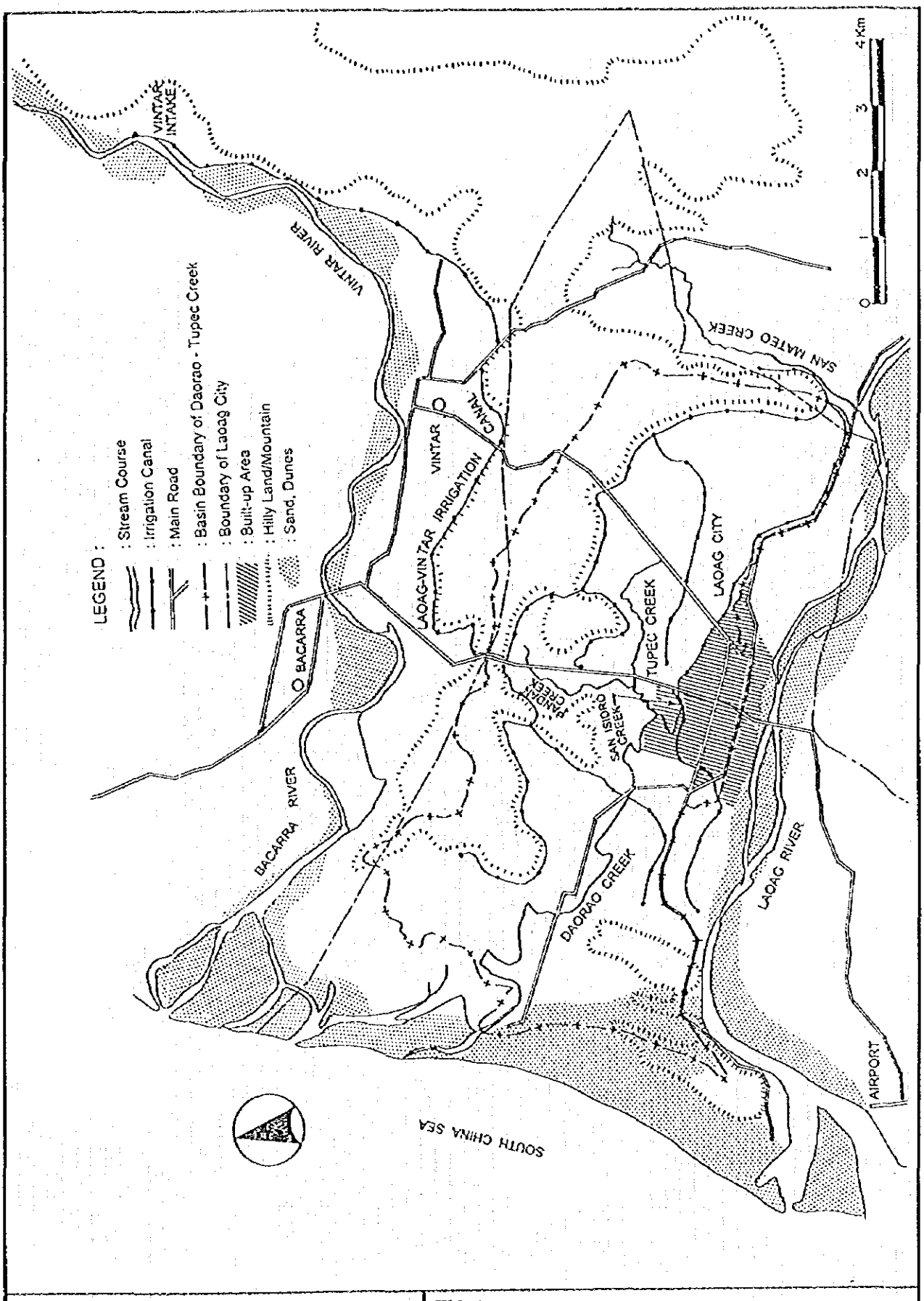
JAPAN INTERNATIONAL COOPERATION AGENCY

図4. 18
緊急計画の実施計画

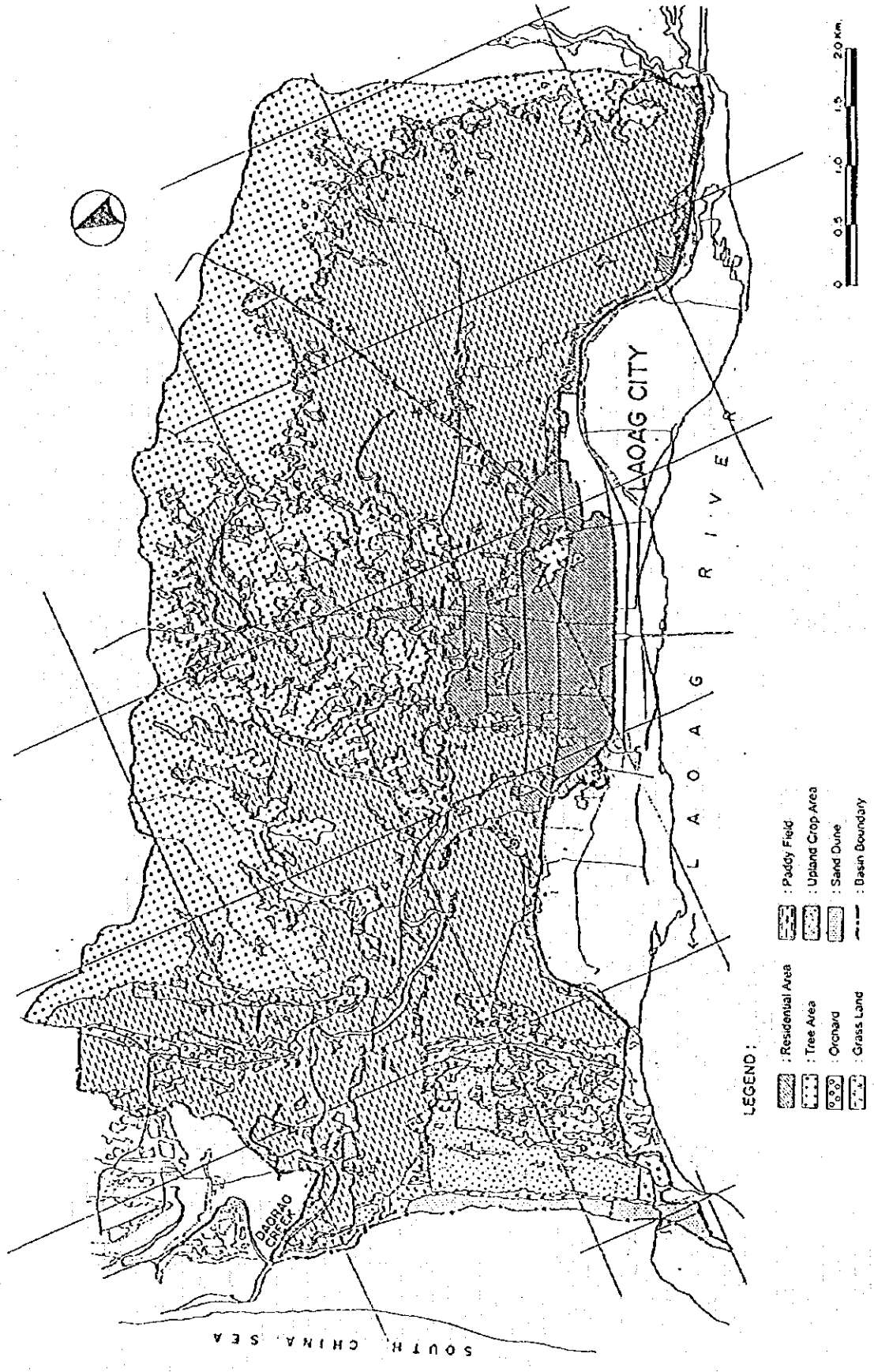
POSITION CHART
PROJECT MANAGMENT OFFICE
LAOAG RIVER SABO AND FLOOD CONTROL PROJECT



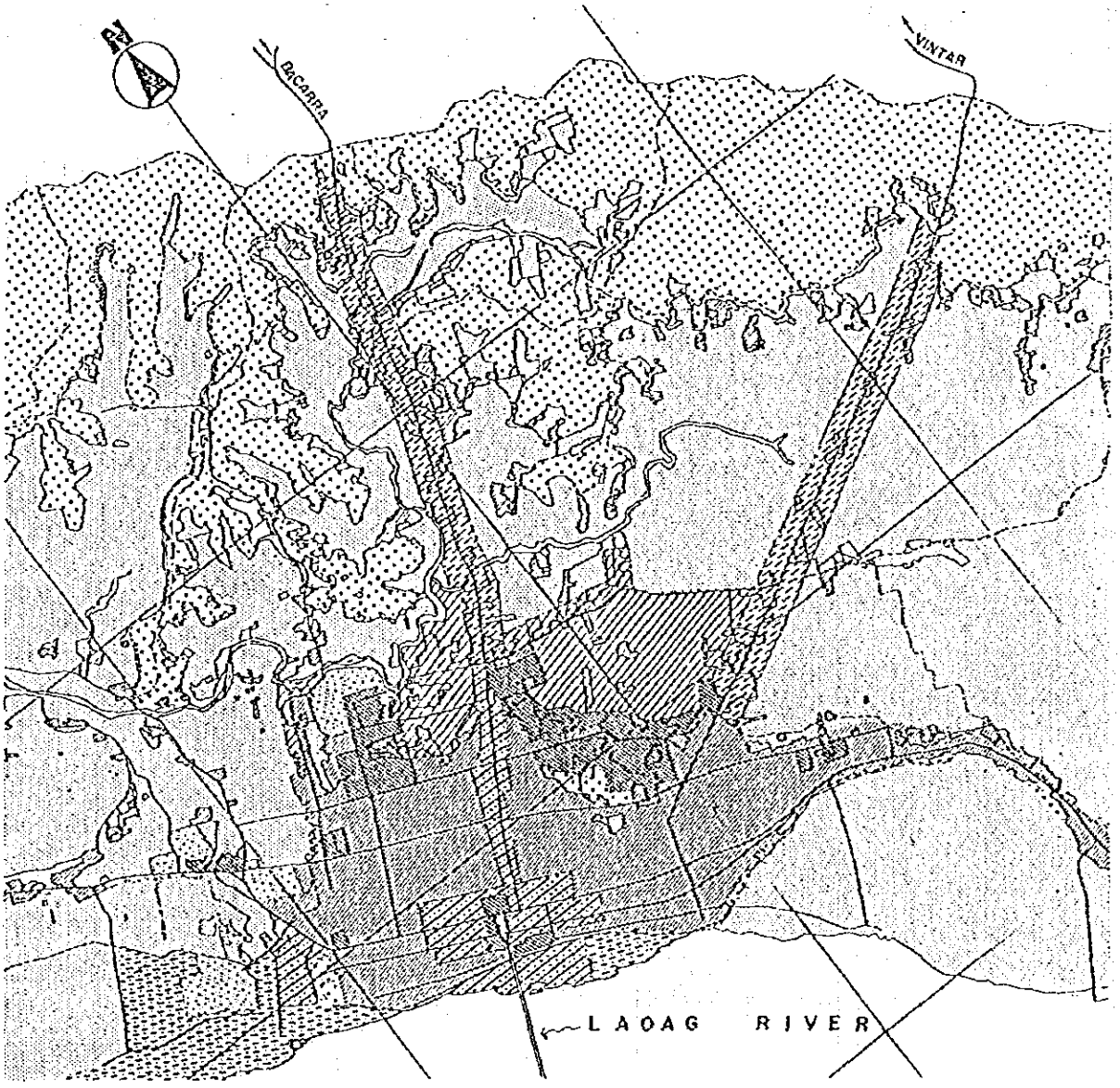
THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図4. 19 プロジェクト実施のための組織構成
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 1 調査対象流域概要図
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 2 現況土地利用図
JAPAN INTERNATIONAL COOPERATION AGENCY	



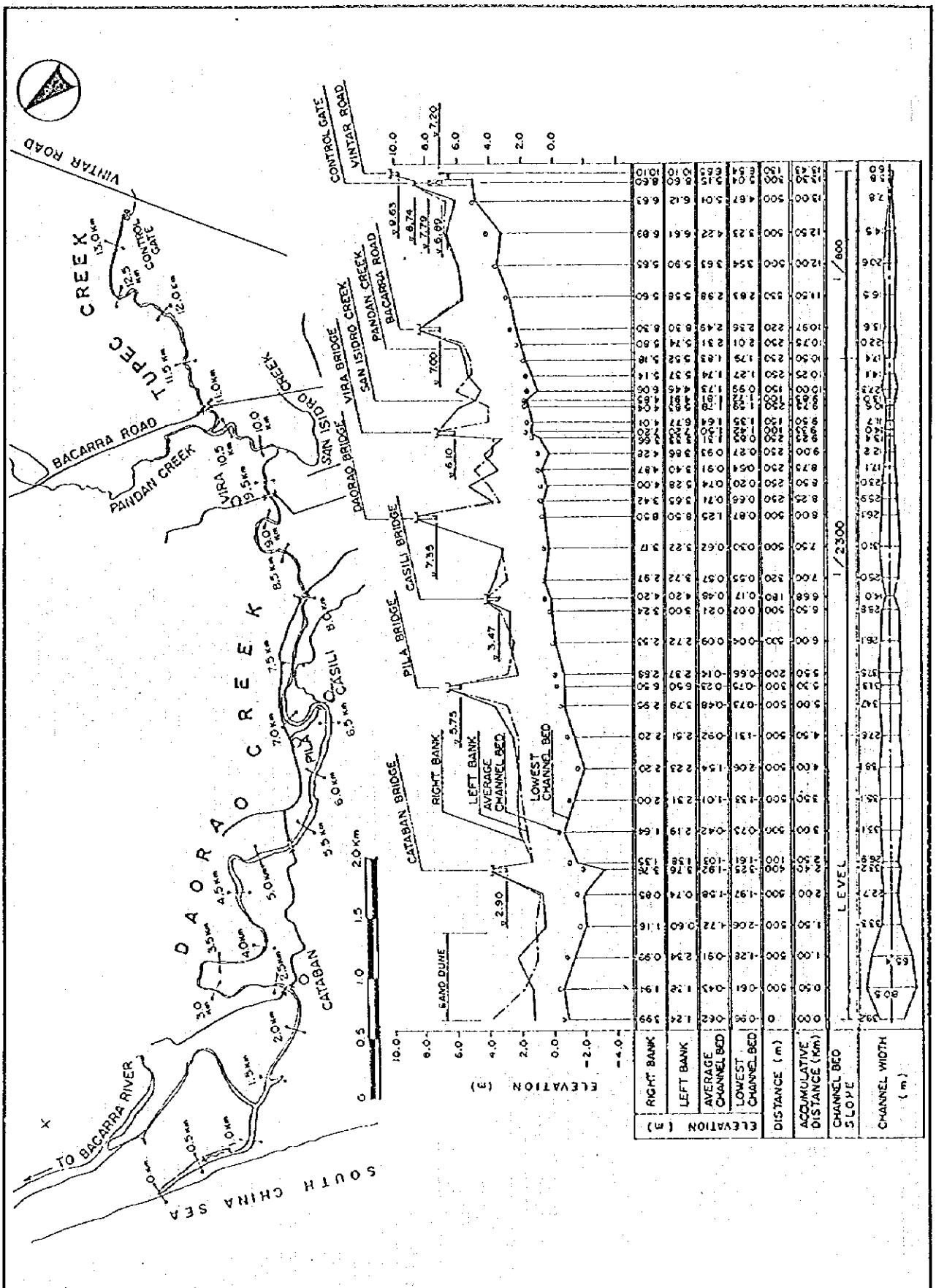
0 0.5 1.0 1.5 2.0 Km.

LEGEND :

- : Residential Area
- : Commercial Area
- : Institutional Area
- : Agricultural Area
- : Hills/Trees
- : Expansion for Residential Area
- : Expansion for Commercial Area
- : Barren/Idel Land
- : Park/Openspace
- : Bodies of Water

Not: The boundary of each Land Use are not authorize.
This may prepared by JICA Study Team to be use for the Drainage Plan only.

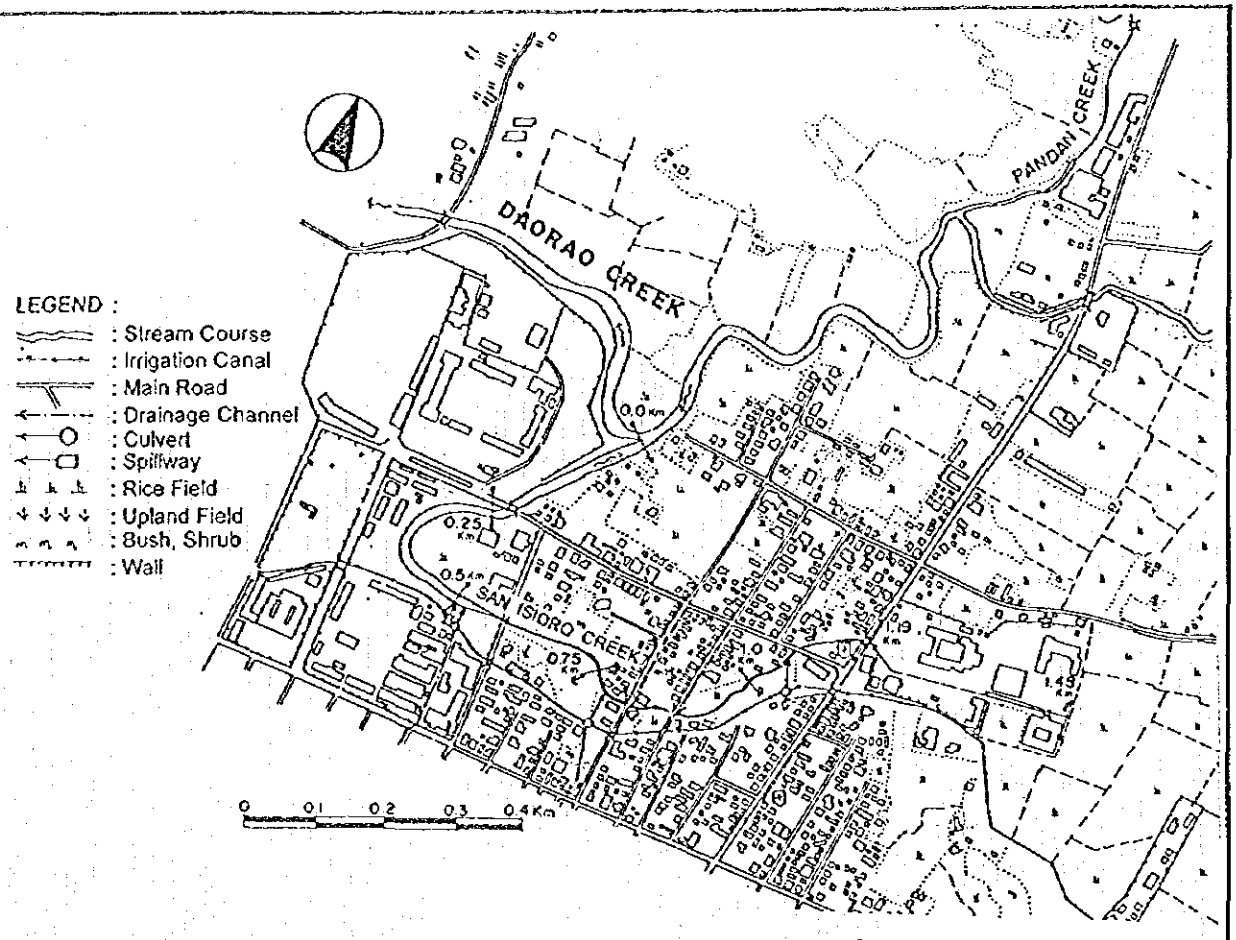
THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 3 将来土地利用図
JAPAN INTERNATIONAL COOPERATION AGENCY	

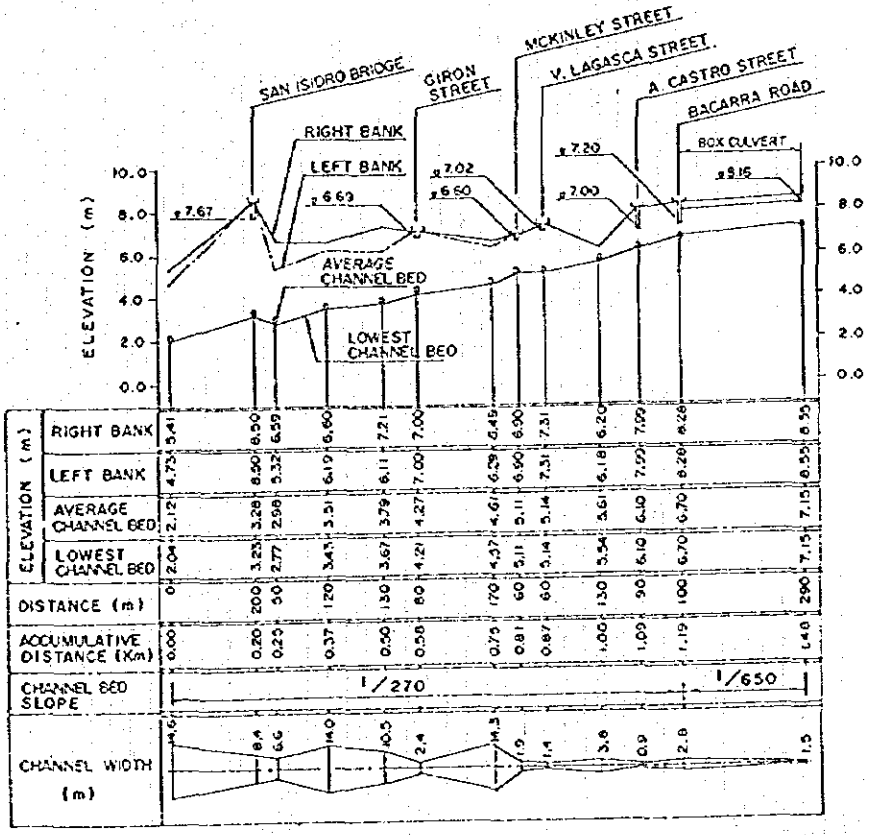


THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

図5.4
ダオラオートゥペッククリーク平面図,
縦断図

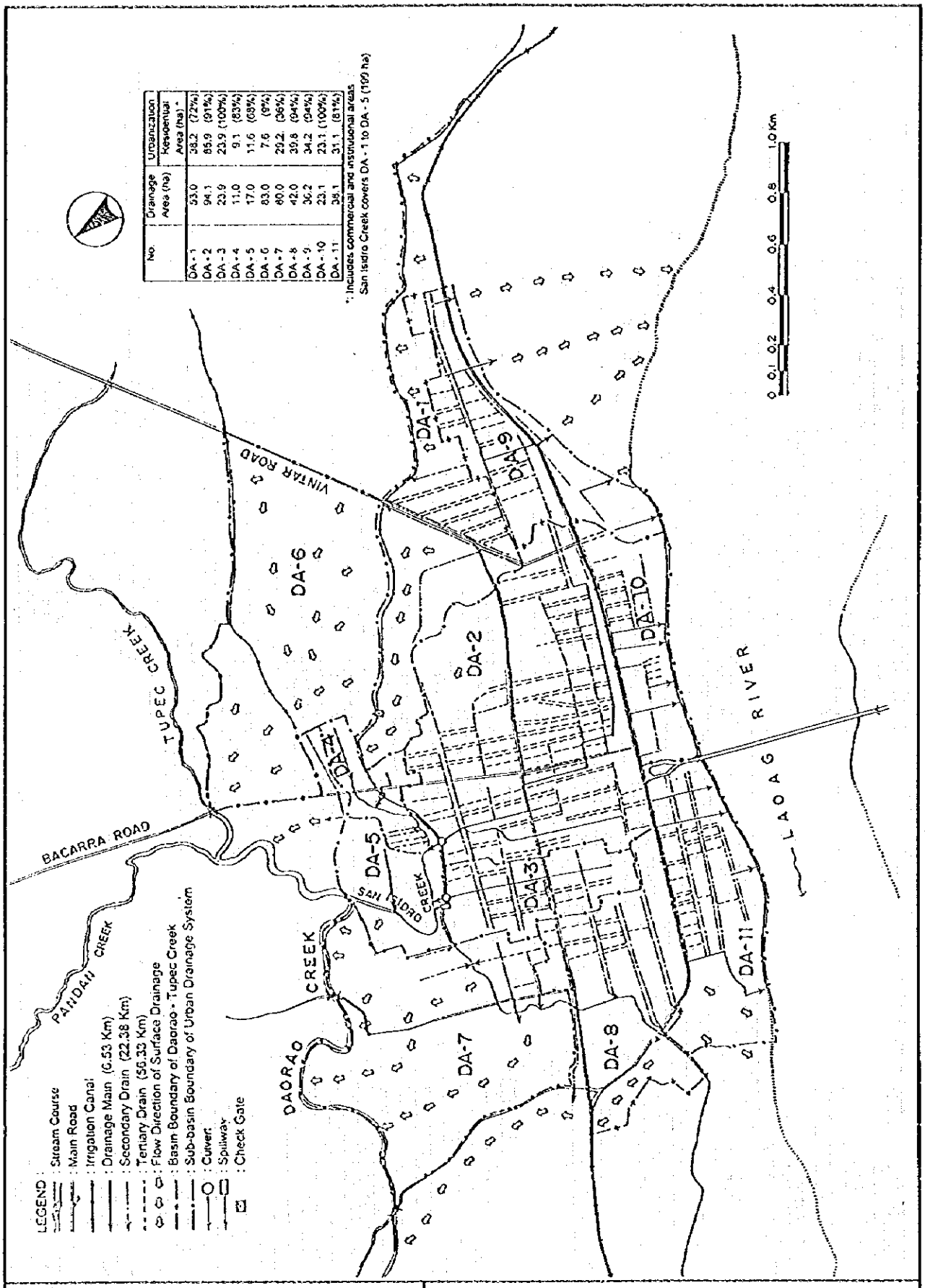




THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

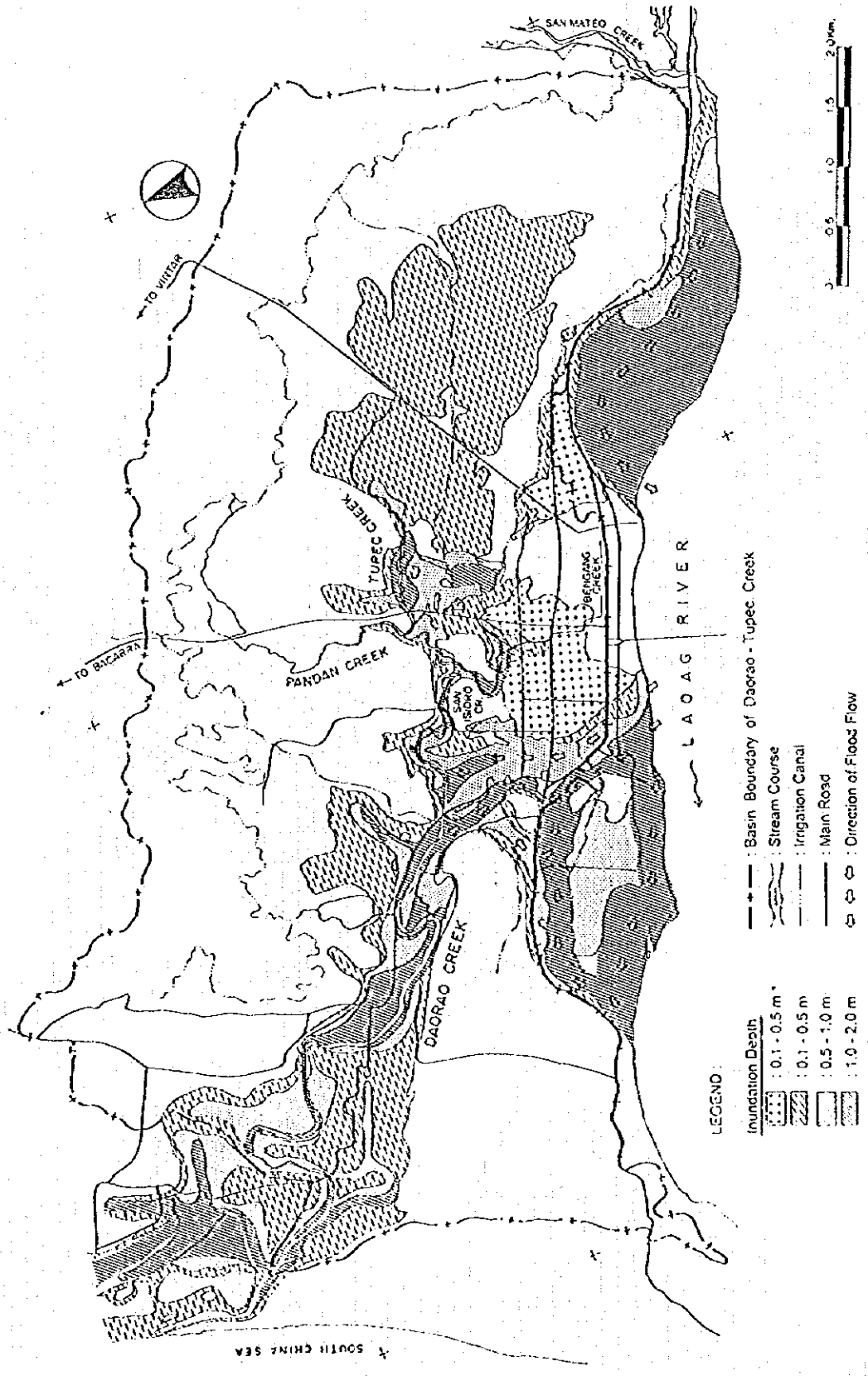
図5. 5
サンイシドゥロクリーク平面図, 縦断図



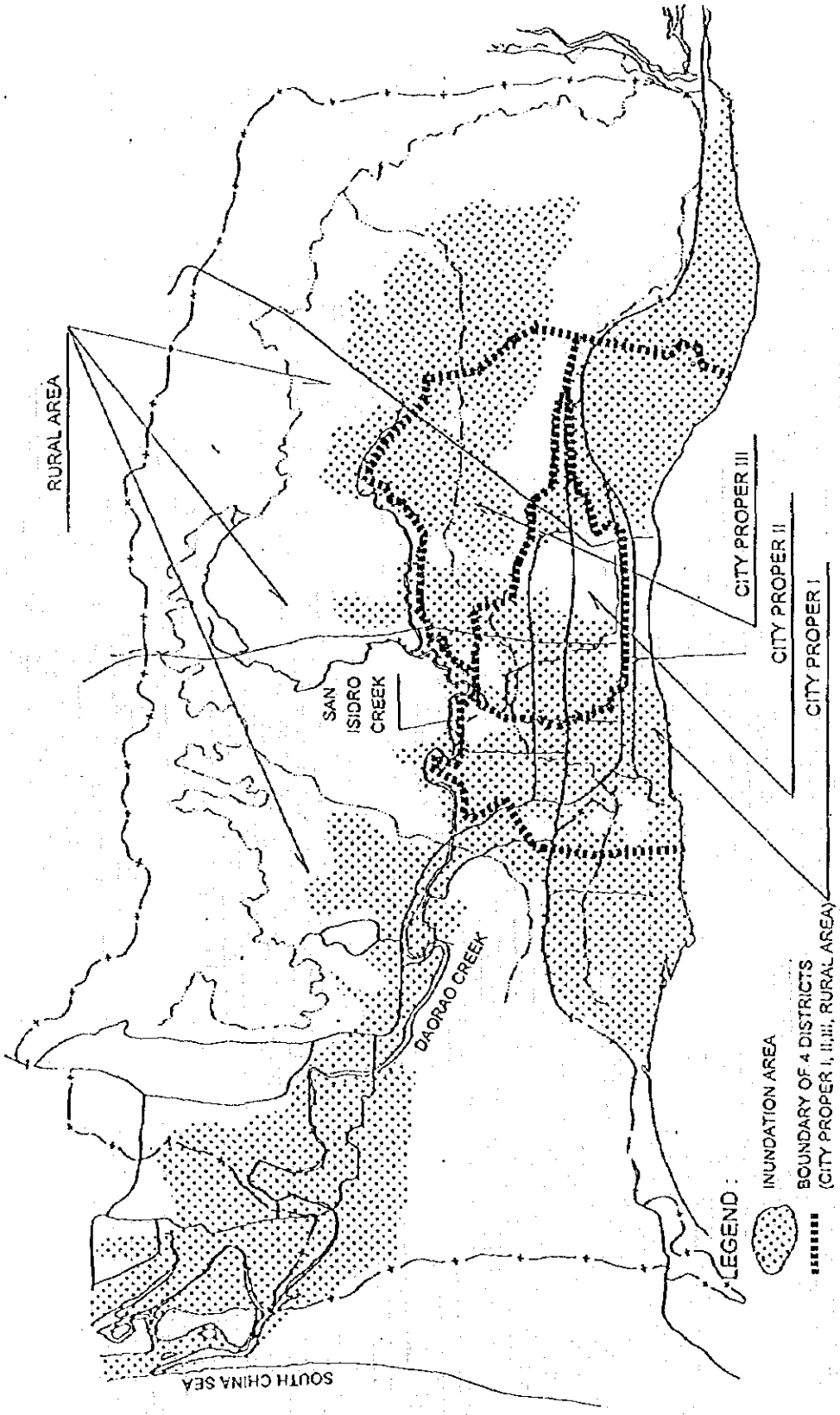
THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

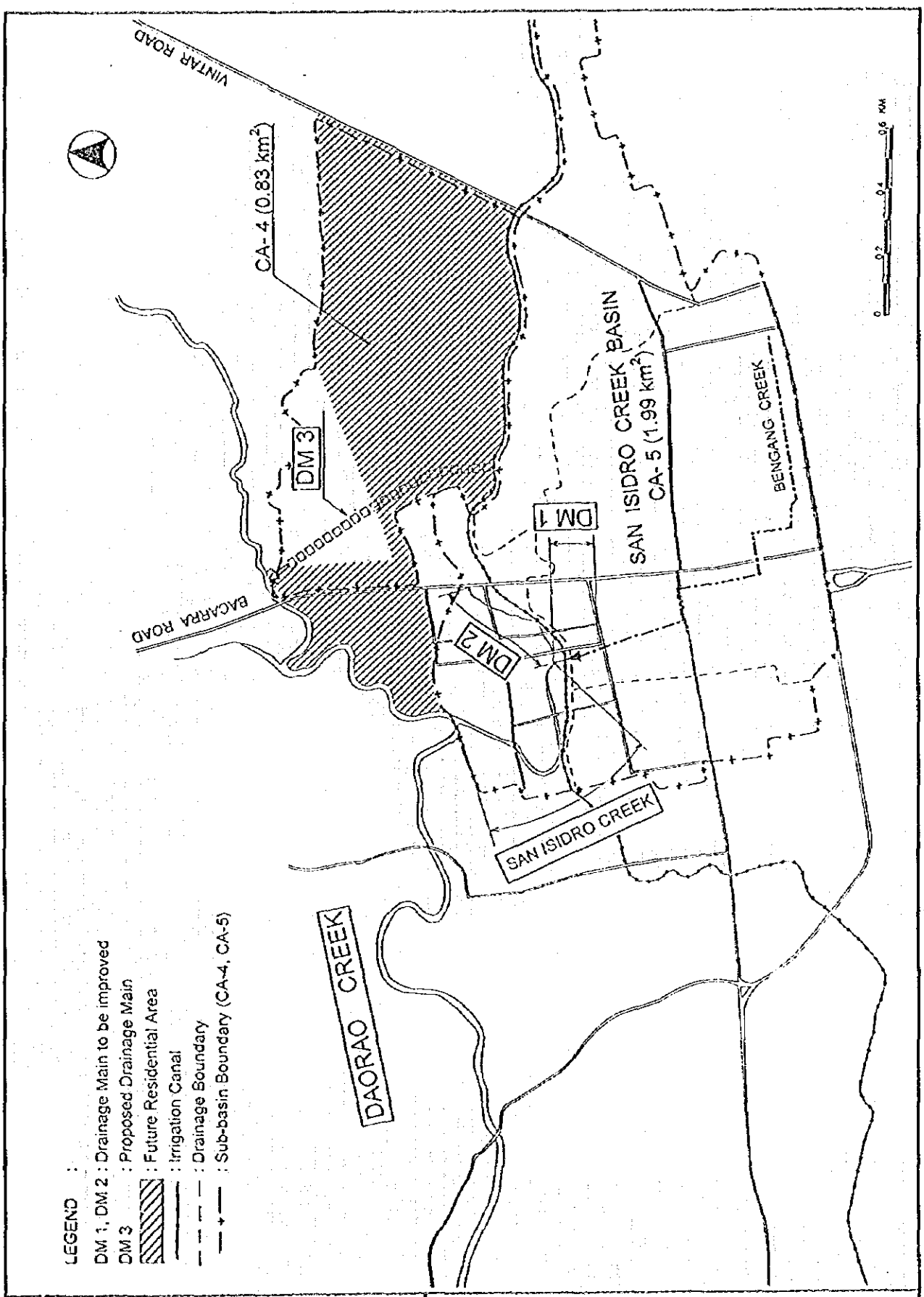
図5. 6
ラオアグ都市排水区分図



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図 5. 7 1996 年台風グローリンによるラオアグ市洪水氾濫図
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 8 洪水氾濫区分図
JAPAN INTERNATIONAL COOPERATION AGENCY	

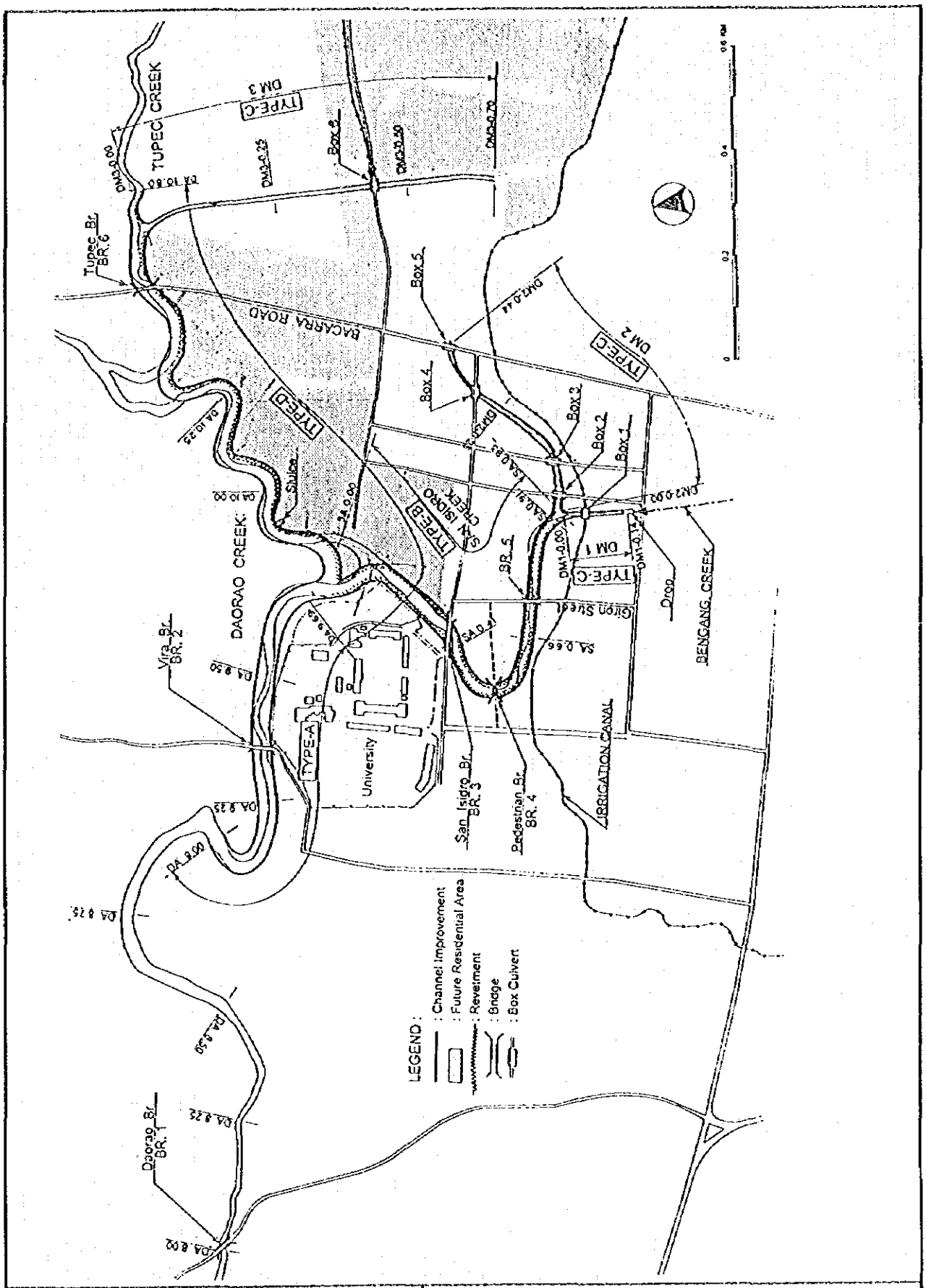


THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 9 排水改良対象地域
JAPAN INTERNATIONAL COOPERATION AGENCY	

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

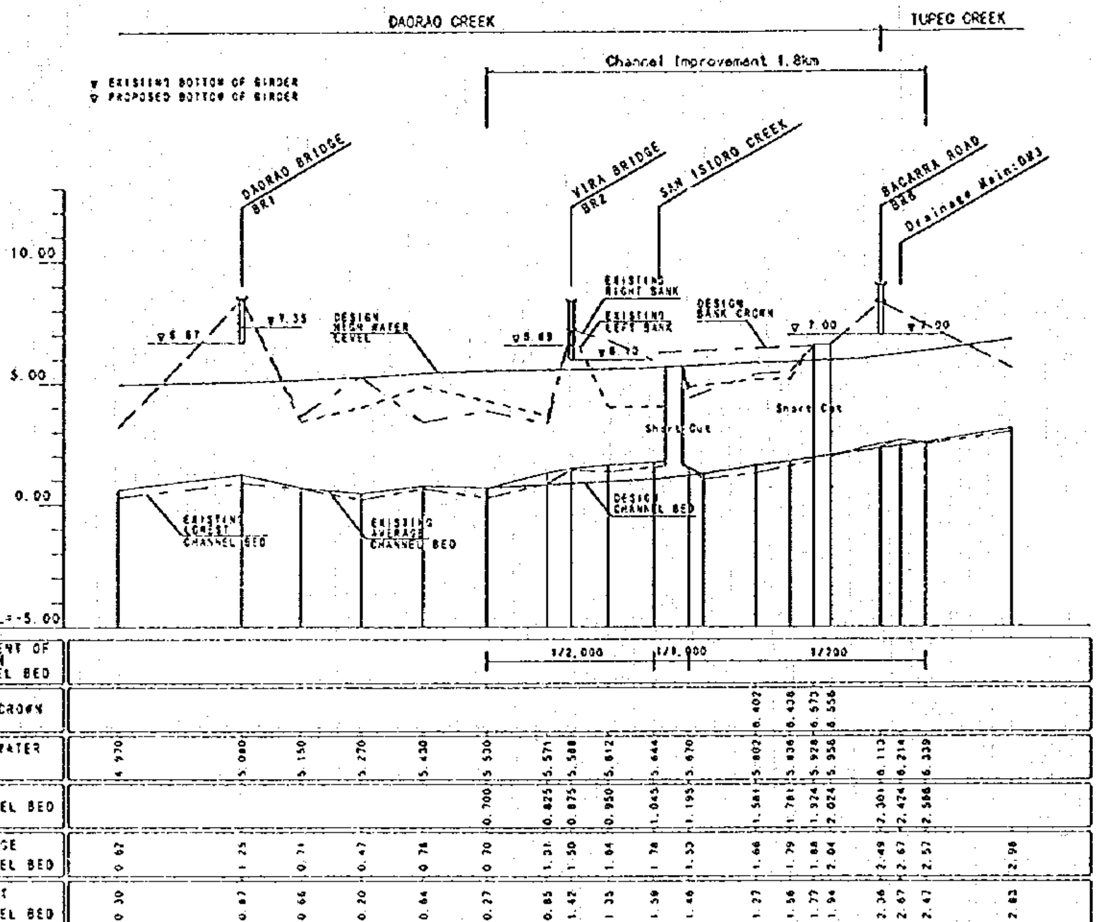
JAPAN INTERNATIONAL COOPERATION AGENCY

図5. 10
流出モデル図



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 11 排水路改修計画平面図（マスタープラン）
JAPAN INTERNATIONAL COOPERATION AGENCY	

Daorao－Tupec Creek

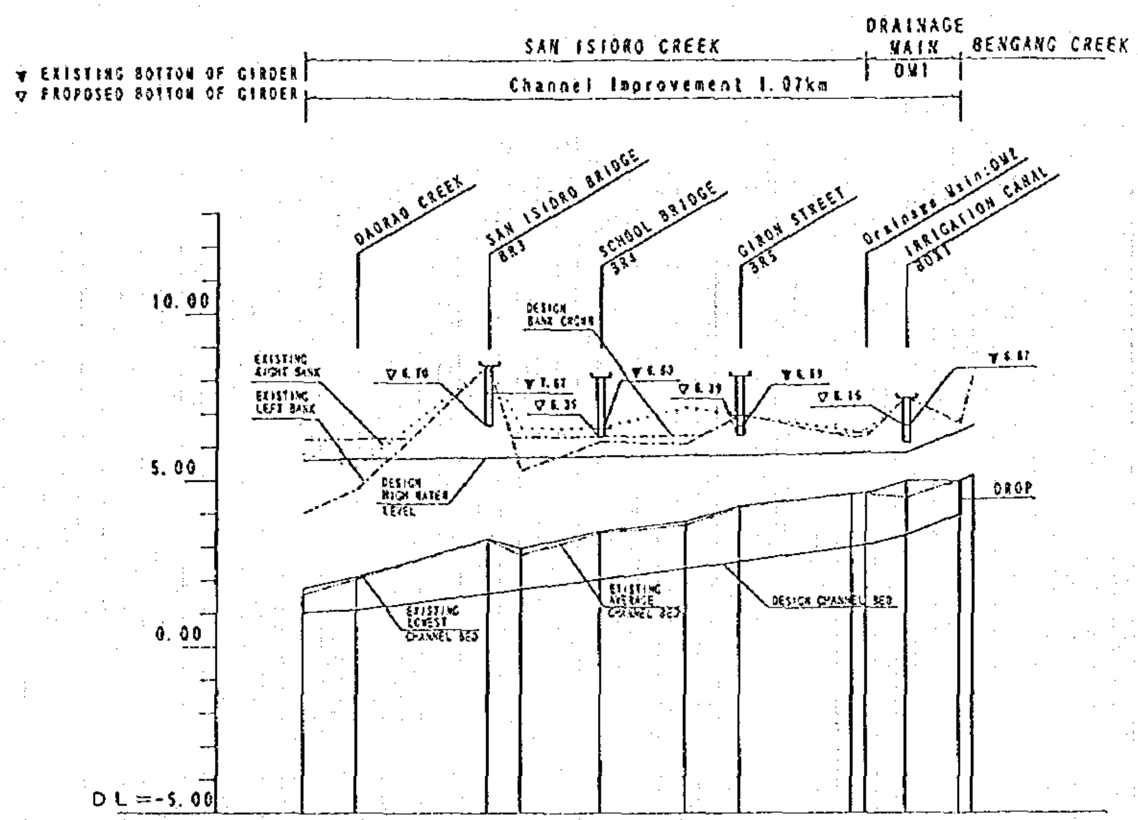


Gradient of design channel bed: 1/2,000 (DA-9 00 – DA-9 68); 1/1,000 (DA-9 68 – DA-9.84); 1/200 (DA-9.84 – DA-10 80)

STATION NO.	DISTANCE(m)	EXISTING LEFT BANK	EXISTING RIGHT BANK	EXISTING LOWEST CHANNEL BED	EXISTING AVERAGE CHANNEL BED	DESIGN CHANNEL BED	DESIGN HIGH WATER LEVEL	DESIGN BANK CROWN
DA-7 50	0	3.22	3.17	0.30	0.67		4.970	
DA-8 00	500	4.50	4.50	0.87	1.25		5.080	
DA-8 25	250	3.65	3.42	0.66	0.71		5.150	
DA-8 50	250	5.24	4.00	0.20	0.47		5.270	
DA-8 75	250	3.40	4.87	0.64	0.78		5.430	
DA-9 00	250	3.88	4.28	0.27	0.70	0.700	5.530	
DA-9 25	250	3.33	3.86	0.85	1.31	0.825	5.571	
DA-9 35	100	7.20	7.20	1.42	1.50	0.875	5.588	
DA-9 50	150	6.77	4.01	1.33	1.64	0.950	5.612	
DA-9 68	190	4.03	5.93	1.59	1.78	1.045	5.644	
DA-9.84	150	4.39	4.84	1.46	1.53	1.195	5.670	
DA-10 11	270	5.37	5.14	1.27	1.66	1.581	5.802	6.402
DA-10 25	140	5.16	5.45	1.56	1.79	1.781	5.836	6.438
DA-10 35	100	5.57	6.57	1.77	1.88	1.924	5.928	6.573
DA-10 42	70	5.57	6.57	1.94	2.04	2.024	5.956	6.556
DA-10 63	200	8.30	8.30	2.36	2.49	2.301	6.113	
DA-10 70	80	7.89	7.89	2.67	2.67	2.474	6.214	
DA-10 80	100	7.38	7.38	2.47	2.57	2.586	6.339	
DA-11 12	350	5.58	5.60	2.83	2.98			

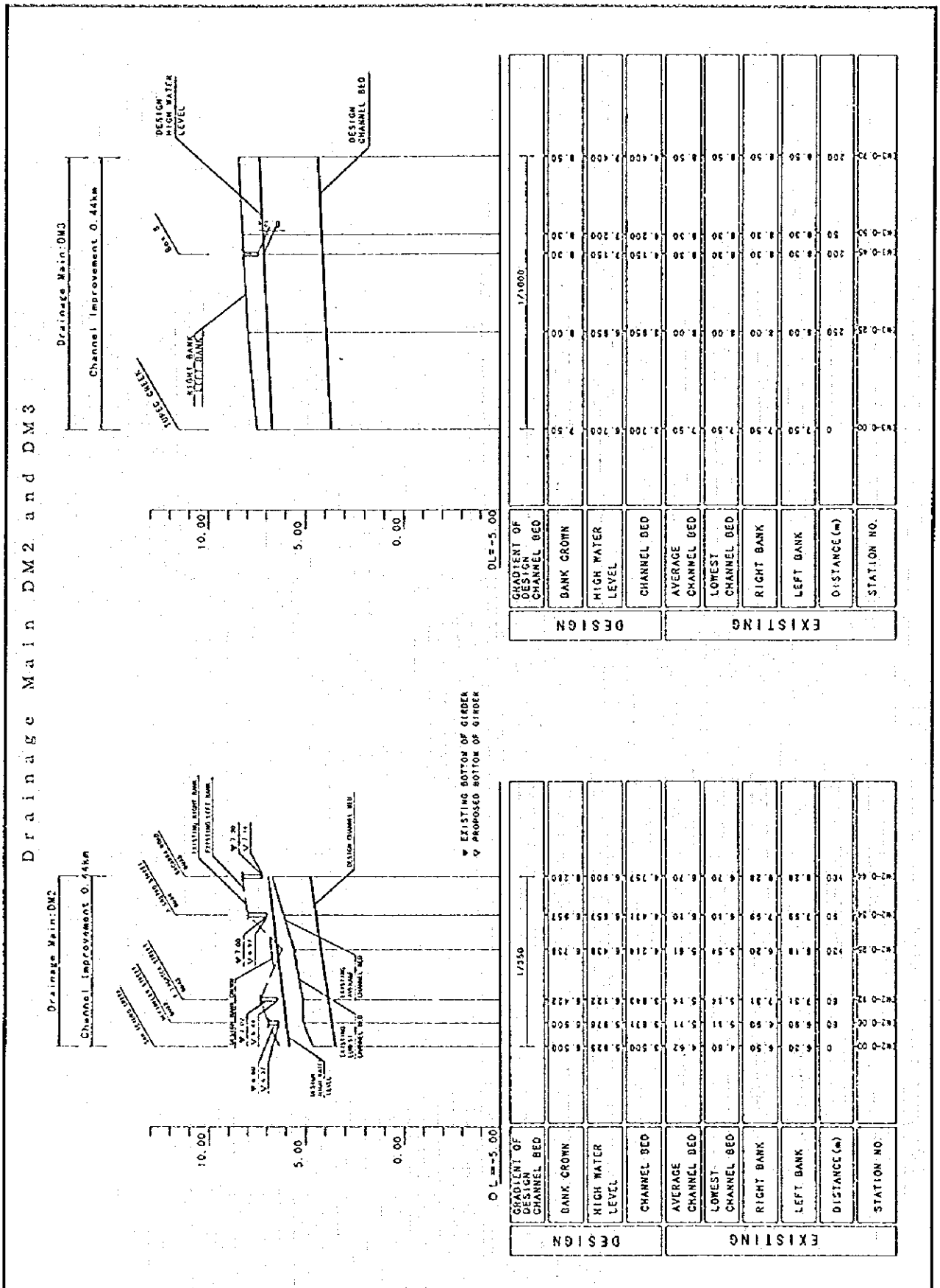
THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 12 (1) 排水路改修計画縦断図 (マスタープラン)
JAPAN INTERNATIONAL COOPERATION AGENCY	

San Isidro Creek, Drainage Main : DM1



		SA-0.00	SA-0.16	SA-0.36	SA-0.41	SA-0.53	SA-0.66	SA-0.74	SA-0.91	SA-0.93 / DM1-0.00	DM1-0.06	DM1-0.14	DM1-0.18
DESIGN	GRADIENT OF DESIGN CHANNEL BED	1/800		1/410					1/220		1/120		
DESIGN	BANK CROWN	6.224	6.265	6.307	6.317	6.342	6.369	6.386	6.421	6.425	6.450	6.817	6.984
DESIGN	HIGH WATER LEVEL	5.644	5.665	5.707	5.717	5.742	5.769	5.786	5.821	5.825	5.850	6.517	6.684
DESIGN	CHANNEL BED	1.045	1.245	1.732	1.855	2.147	2.415	2.660	3.074	3.123	3.396	4.063 5.063	5.185
EXISTING	AVERAGE CHANNEL BED	1.78	2.12	3.28	2.98	3.51	3.79	4.27	4.61	4.62	5.00	5.03	5.19
EXISTING	LOWEST CHANNEL BED	1.59	2.04	3.23	2.77	3.43	3.67	4.21	4.57	4.60	4.48	5.02	5.19
EXISTING	RIGHT BANK	4.04	5.41	6.50	6.59	6.60	7.21	7.00	6.49	6.50	7.50	6.73	8.18
EXISTING	LEFT BANK	5.83	4.73	6.50	5.32	6.19	6.11	7.00	6.29	6.30	7.50	6.73	8.18
EXISTING	DISTANCE (m)	0	160	200	50	120	130	80	170	20	60	50	40
EXISTING	STATION NO.	SA-0.00	SA-0.16	SA-0.36	SA-0.41	SA-0.53	SA-0.66	SA-0.74	SA-0.91	SA-0.93 DM1-0.00	DM1-0.06	DM1-0.14	DM1-0.18

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN JAPAN INTERNATIONAL COOPERATION AGENCY	図5. 12 (2) 排水路改修計画縦断図 (マスタープラン)



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

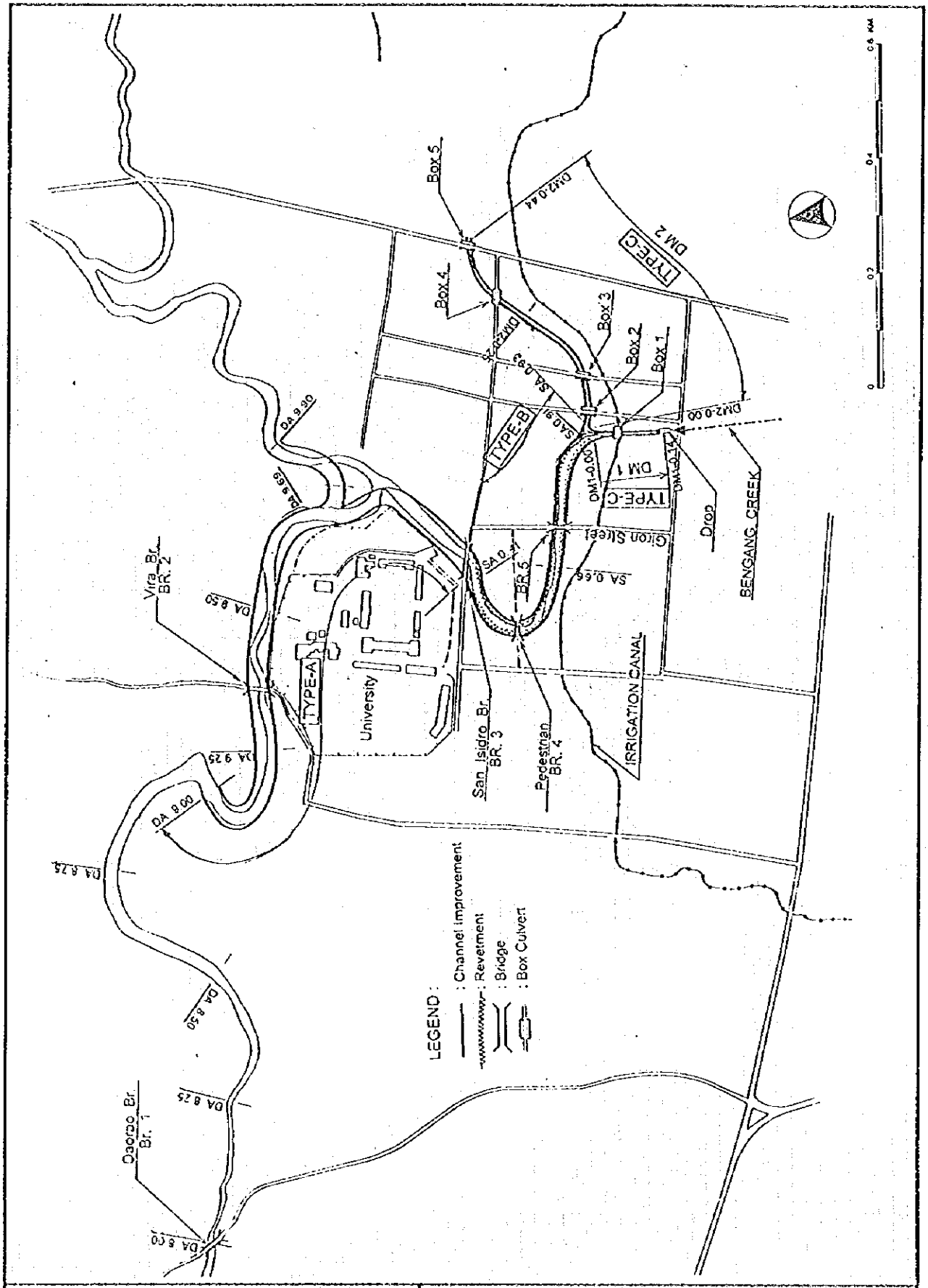
図5. 12 (3)
排水路改修計画縦断図
(マスタープラン)

Drainage Main	Stretch	B(m)	H(m)
DM1	DM1 0.00 ~ DM1 0.06	5.0	3.5
	DM1 0.06 ~ DM1 0.14	2.0	3.0~3.5
DM2	DM2 0.00 ~ DM1 0.44	2.5	2.5~3.0
DM3	DM1 0.00 ~ DM1 0.70	3.0	3.5

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

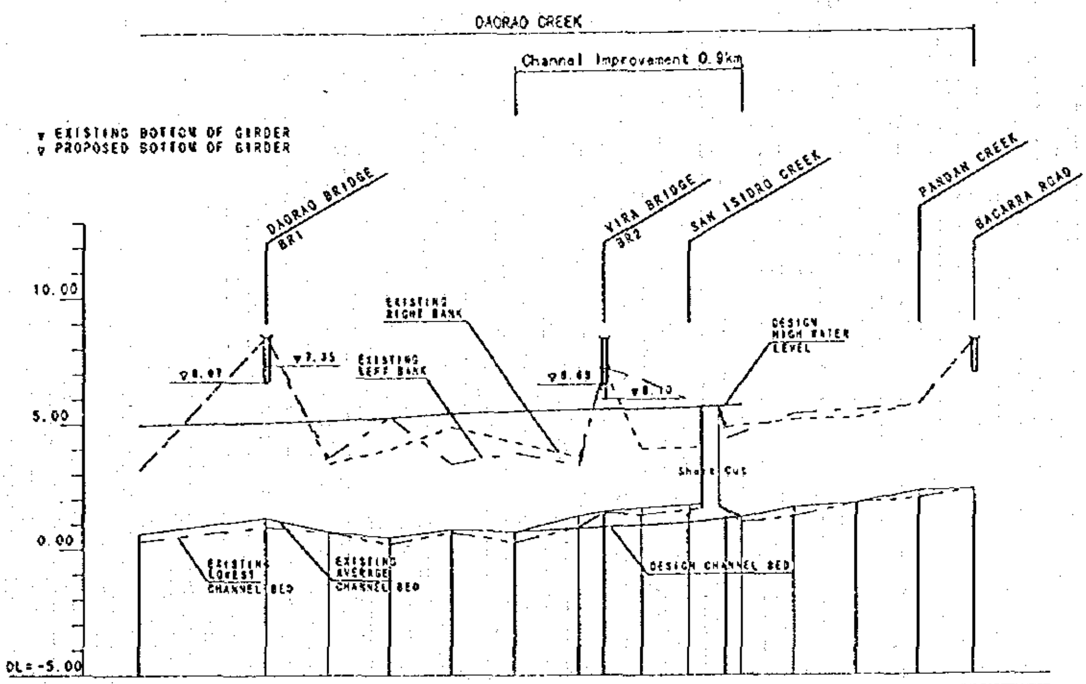
JAPAN INTERNATIONAL COOPERATION AGENCY

図5.13
排水路改修計画横断図（マスタープラン）



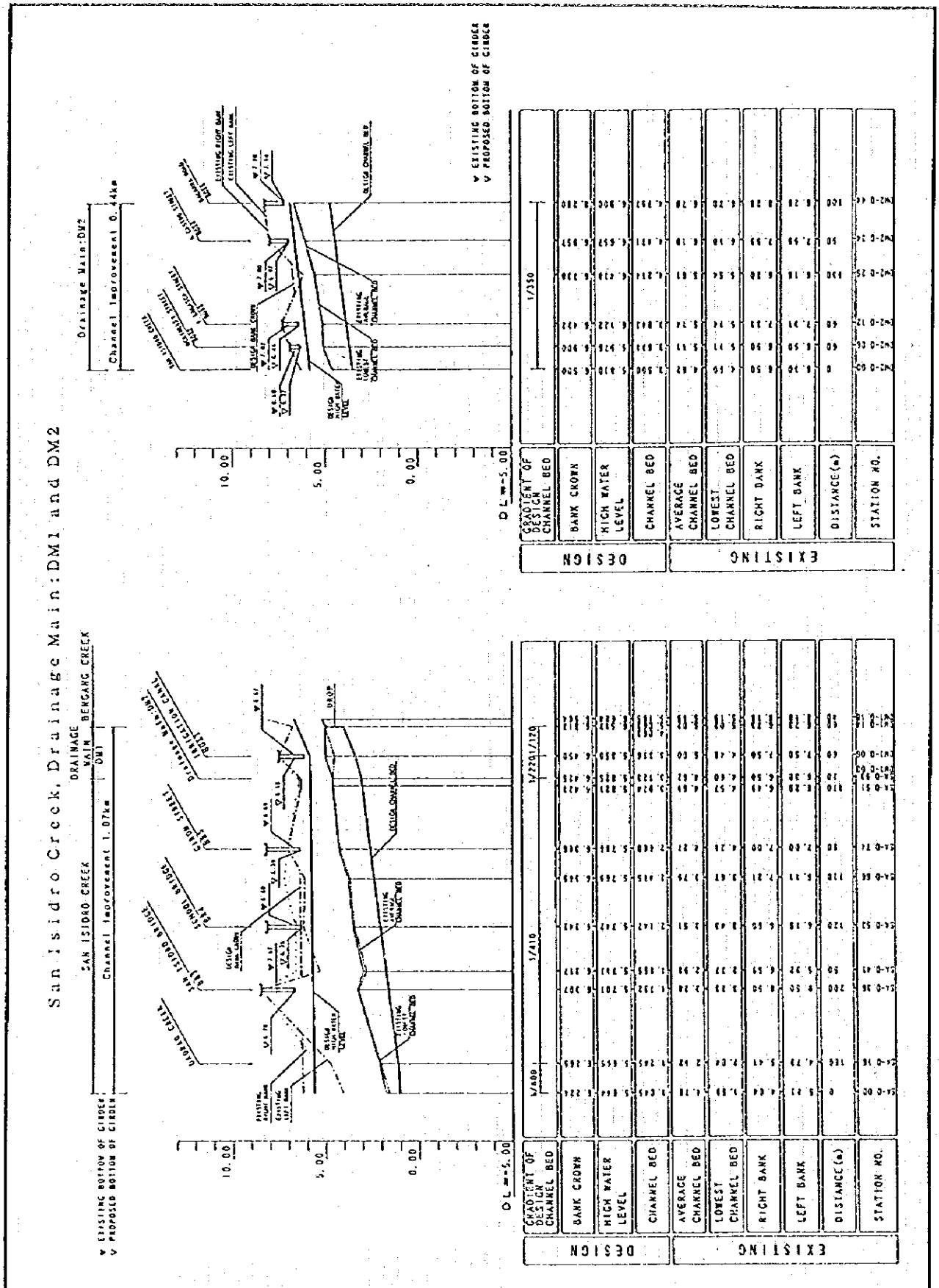
THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN JAPAN INTERNATIONAL COOPERATION AGENCY	図5. 14 排水路改修計画平面図（緊急計画）

Daorao Creek



DESIGN	GRADIENT OF DESIGN CHANNEL BED						1/2,000					1/1,000					
	BANK CROWN																
	HIGH WATER LEVEL	4.970	5.080	5.150	5.270	5.430	5.530	5.571	5.588	5.612	5.644	5.670	5.820				
	CHANNEL BED						0.700	0.825	0.875	0.950	1.045	1.195	1.255				
EXISTING	AVERAGE CHANNEL BED	0.82	1.25	0.71	0.47	0.78	0.70	1.31	1.50	1.84	1.78	1.53	1.26	1.86	1.83	2.31	2.34
	LOWEST CHANNEL BED	0.30	0.87	0.88	0.20	0.94	0.27	0.85	1.42	1.35	1.59	1.48	1.03	1.27	1.79	2.01	2.49
	RIGHT BANK	3.17	8.50	3.47	4.00	4.87	4.28	3.66	7.20	4.01	5.93	4.84	4.91	5.14	5.18	5.80	8.30
	LEFT BANK	3.22	8.50	3.65	5.78	3.40	3.88	3.33	7.20	6.77	4.03	4.39	4.61	5.37	5.57	5.74	8.30
	DISTANCE(m)	0	500	250	250	250	250	250	100	150	190	150	60	210	250	250	220
	STATION NO.	DA+7.50	DA+8.00	DA+8.25	DA+8.50	DA+8.75	DA+9.00	DA+9.25	DA+9.35	DA+9.50	DA+9.69	DA+9.84	DA+9.90	DA+10.11	DA+10.30	DA+10.61	DA+10.83

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5.15(1) 排水路改修計画縦断図（緊急計画）
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

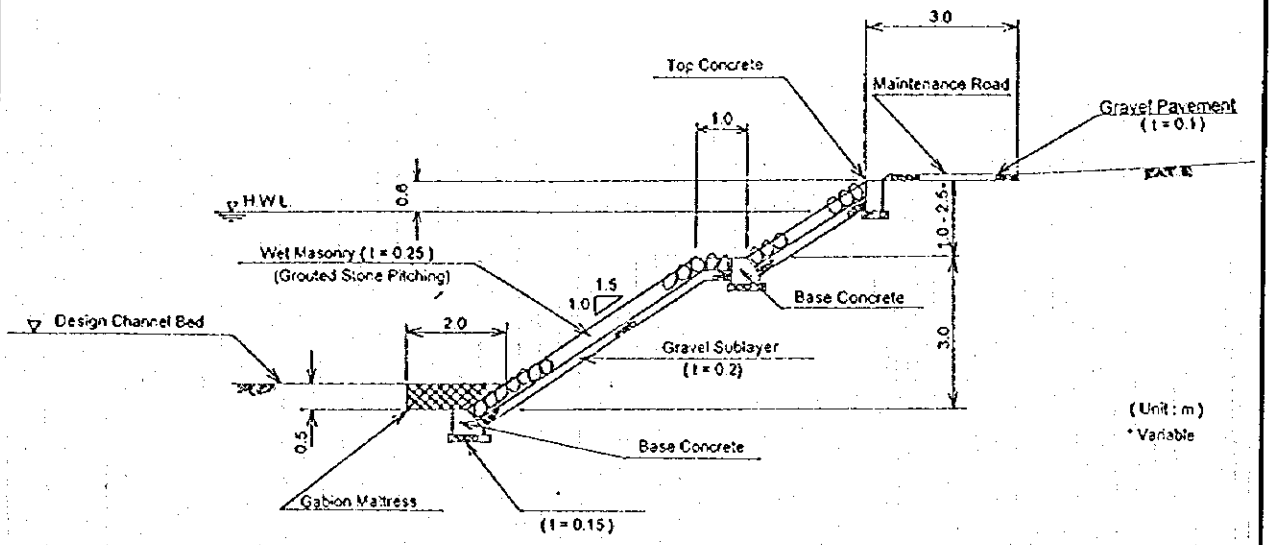
図5. 15 (2)
排水路改修計画縦断図（緊急計画）

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

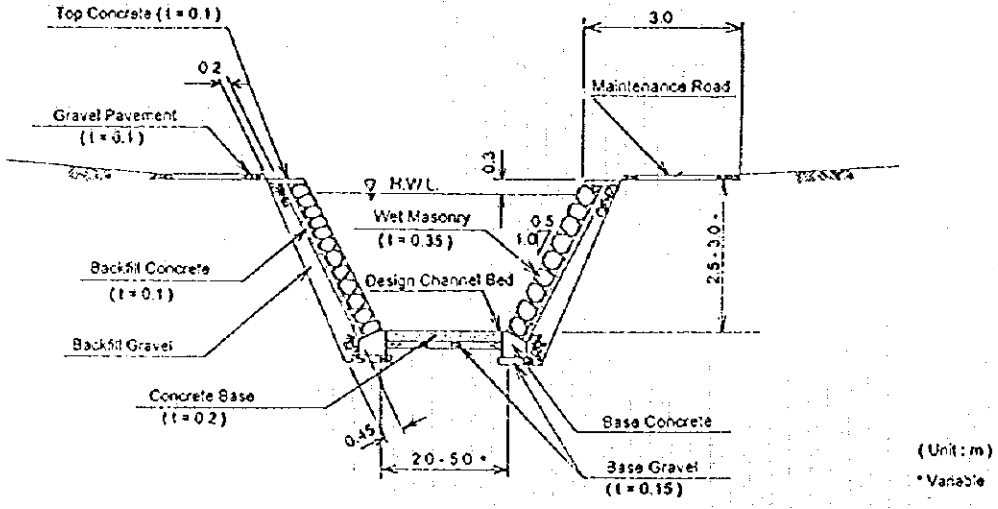
JAPAN INTERNATIONAL COOPERATION AGENCY

図5.16
排水路改修計画横断図（緊急計画）

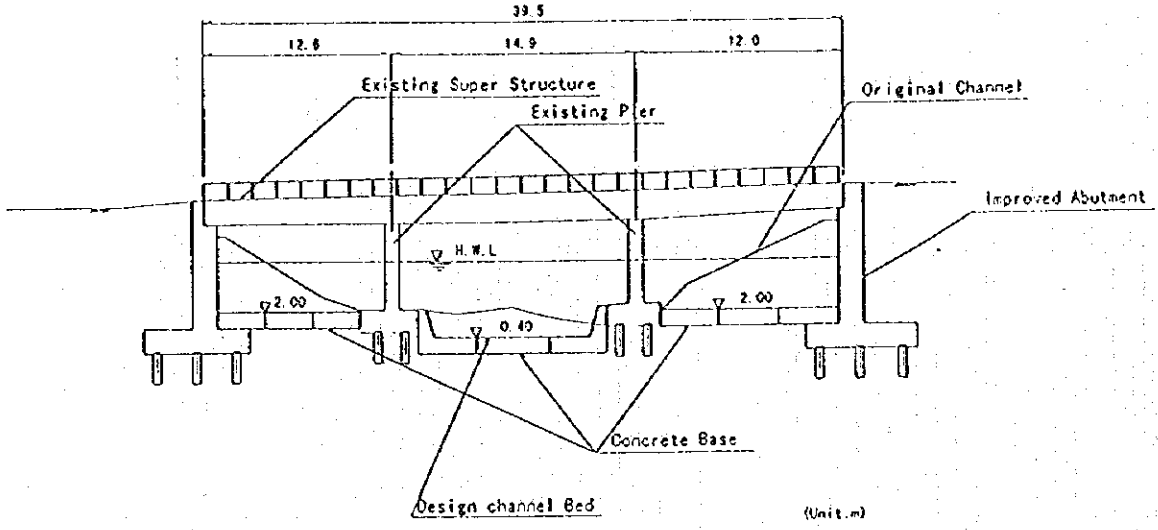
TYPE - RA



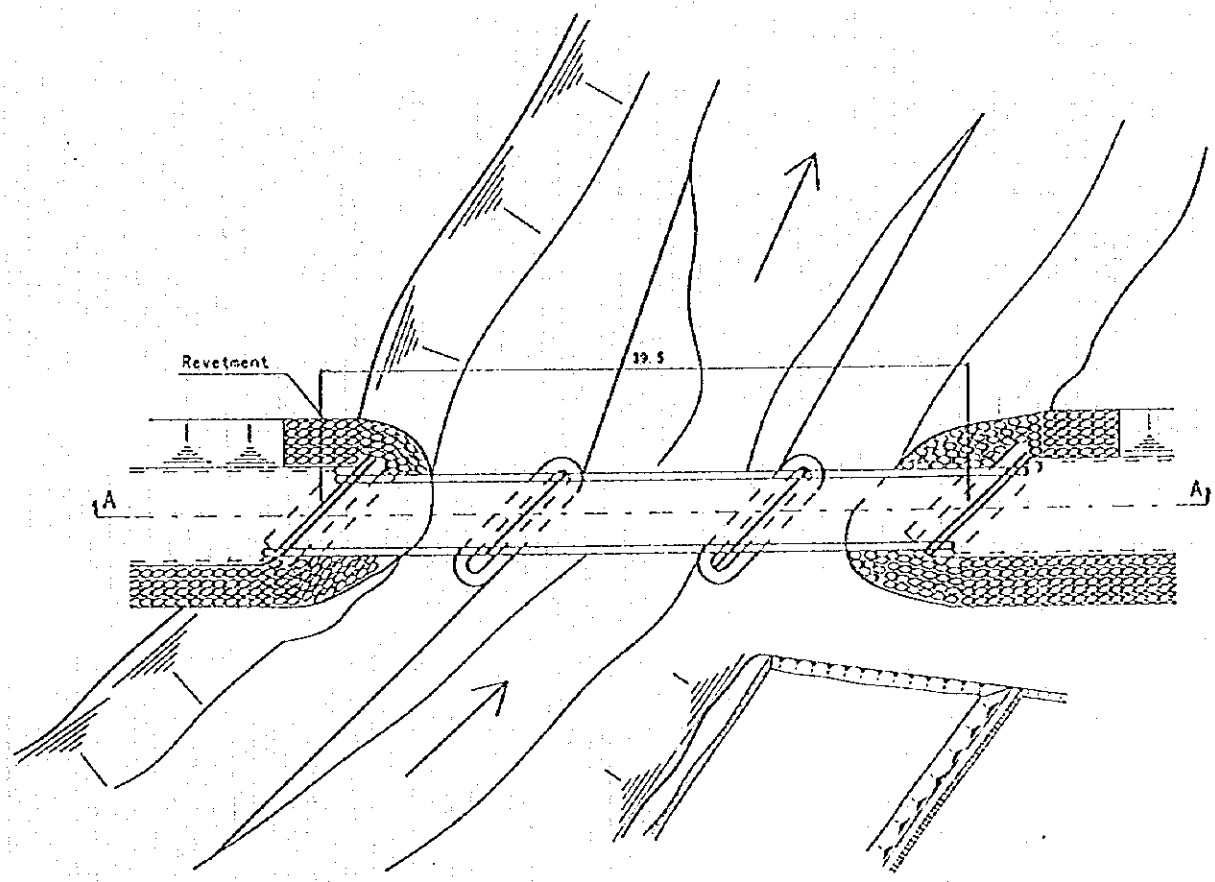
TYPE - RB



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN JAPAN INTERNATIONAL COOPERATION AGENCY	図5. 17 河岸法面防護工計画断面図



SECTION A-A

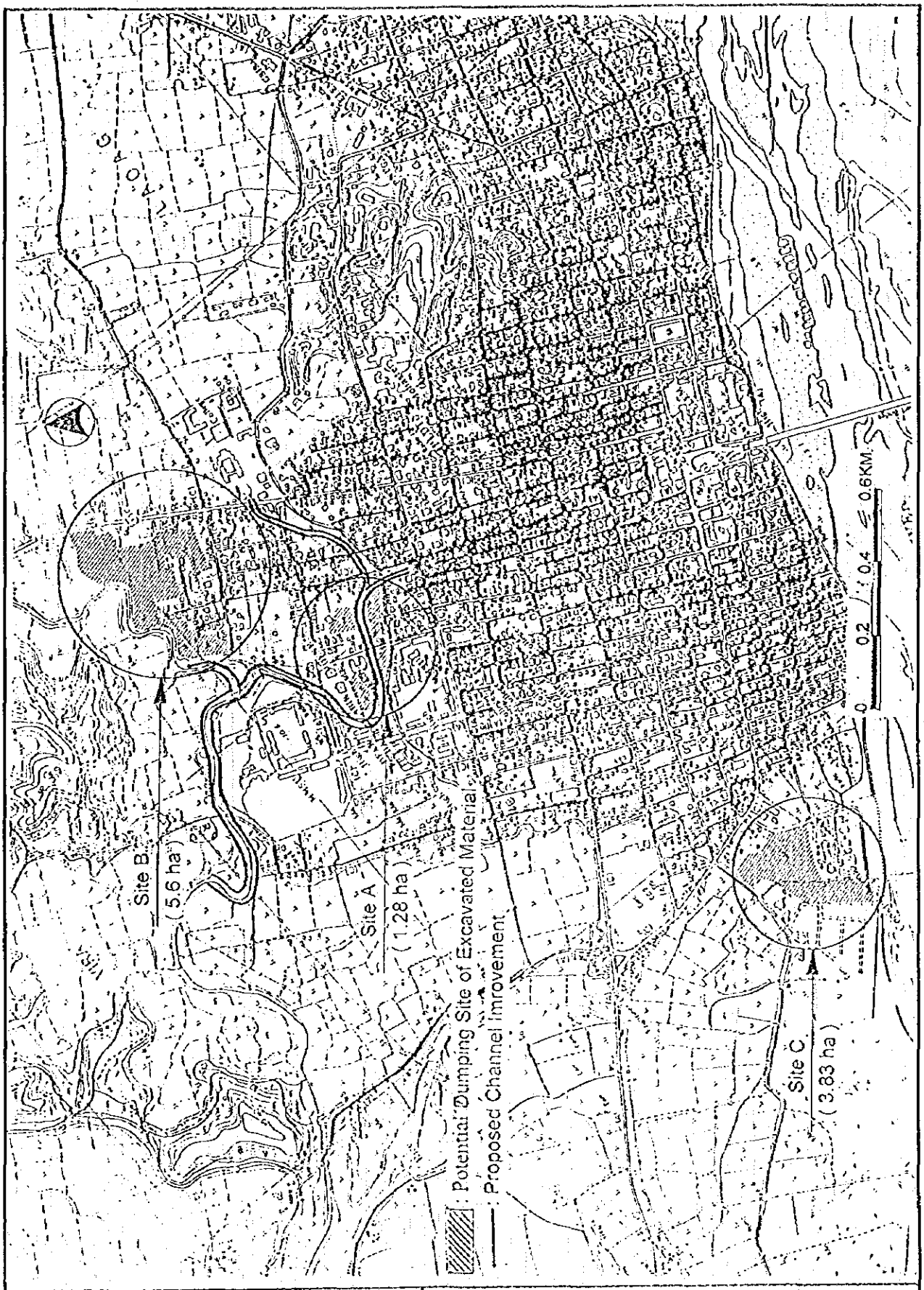


PLAN

DAORAO BRIDGE BR1 (DA-8.00)

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN JAPAN INTERNATIONAL COOPERATION AGENCY	図5.18(1) 橋梁計画一般図

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 18 (2) 橋梁計画一般図
JAPAN INTERNATIONAL COOPERATION AGENCY	



THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN	図5. 19 掘削残土処理計画図
JAPAN INTERNATIONAL COOPERATION AGENCY	

Work Items	Work Volume	First Year / Second Year (1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24)
I Preparatory Works		
II Main Works		
2.1 Channel Improvement		
(1) Earth Work	10,550 m^3	
(2) Revetment Work	2,300 m	
2.2 Bridge and Culvert Work		
(1) Bridge	5 pcs	
(2) Culvert	5 pcs	
2.3 Others		
(1) Drop		
(2) Waste Water Interceptor		
III Miscellaneous Works		

THE STUDY ON SABO AND FLOOD CONTROL IN THE LAOAG RIVER BASIN

JAPAN INTERNATIONAL COOPERATION AGENCY

図5. 20
緊急事業工事実施計画

付属資料

調査関係者名簿

ステアリング・コミッティー

	名前	組織
1.	Teodoro T. Encarnacion	Undersecretary, DPWH (Chairman)
2.	Manuel M. Bonoan	Assistant Secretary for Planning (Vice Chairman)
3.	Bienvenido C. Leuterio	Director, Bureau of Design
4.	Ernesto M. Hernandez	Former Regional Director, DPWH Region I
	Josefino N. Rigor	Incumbent Regional Director, DPWH Region I
5.	Nonito F. Fano	OIC-Project Director, PMO-Major Flood Control Projects

テクニカル・ワーキング・グループ

	名前	組織
1.	Resito V. David	Project Manager I, PMO-Major Flood Control Projects
2.	Rolando H. Tamayo	District Engineer, 1st Ilocos Norte Engineering District
3.	Rizal V. Ruiz	Project Manager II, 2nd Ilocos Norte Engineering District
4.	Sofia T. Santiago	Engineer V, Bureau of Design
5.	Manuel S. Alconis	Engineer V, Planning Service

カウンター・パート

	名前	組織 (DPWH内)
1.	Ernie U. Fano	PMO-Major Flood Control Projects
2.	Carlos P. Zamora	Planning Service
3.	Napoleon S. Famadico	Planning Service
4.	Johnny Montano	Planning Service
5.	Lalain Malassab	Planning Service
6.	Soledad Q. Balisi	Planning Service
7.	Romy Lescano	PMO-Feasibility Study
8.	Glenn V. Reyes	1st Ilocos Norte Engineering District
9.	Wilson Quiamas	2nd Ilocos Norte Engineering District

JICA作業監理委員

名前	担当分野
1. 渡辺　正幸	総括/砂防計画
2. 中村　文彦	治水計画

JICA調査団

名前	担当分野
1. 村田　直人	総括/治水計画
2. 森下　甲子弘	副総括/砂防計画/土砂水理
3. 溝田　祐造	気象/水文/洪水解析/排水計画
4. 鈴木　和人	被害調査
5. 池田　一雄	地形・地質
6. 七十刈　昭夫	施設計画/施工計画
7. 田篠　達郎	社会経済/財務評価
8. 磯村　勝洋	地域計画/環境/土地利用計画
9. 高梨　信行	排水施設計画
10. アントニオ・アルバサン	組織・制度
11. 杉山　英彦/高木　僑	河川測量
12. 中嶋　大吉	航空写真/地形測量
13. 阿久澤　かずみ/松下　剛	業務調整