資料編　添付編表及び添付図目次

表F2-1　作物別耕地面積

(単位：100万ha)

	1980	1983	1984	1985	1986	1987
統計収穫面積	12.764	12.649	12.602	13.004	13.248	12.804
穀物合計	6.670	6.186	6.389	6.817	7.059	6.939
米	3.471	3.054	3.162	3.307	3.464	3.256
トウモロコシ	3.199	3.132	3.227	3.511	3.595	3.683
その他の食糧作物	5.554	5.878	5.759	5.685	5.724	5.416
ココナッツ	3.010	3.205	3.272	3.245	3.335	3.058
さとうきび	0.460	0.480	0.486	0.407	0.298	0.256
果実	0.655	0.720	0.715	0.719	0.741	0.739
野菜	1.323	1.319	1.130	1.153	1.186	1.197
非食糧作物	0.539	0.585	0.453	0.502	0.466	0.449
繊維作物	0.285	0.229	0.207	0.213	0.206	0.198
その他	0.254	0.356	0.247	0.289	0.260	0.251

出所：表2-1に同じ。

表F2-2 作物別収量

(単位：トン/ha)

	1980	1983	1984	1985	1986	1987
作物総計	3.69	3.28	3.17	3.31	3.31	3.35
穀物合計	1.60	1.69	1.73	1.86	1.89	1.85
米	2.20	2.39	2.48	2.66	2.67	2.62
トウモロコシ	0.95	1.00	1.01	1.10	1.14	1.16
その他の食糧作物	6.42	5.20	4.92	4.14	5.23	5.46
ココナッツ	5.18	3.40	3.35	3.44	3.58	3.86
さとうきび	4.95	4.91	5.19	6.75	4.94	4.96
果実	11.36	10.53	10.23	10.74	10.67	10.72
野菜	7.74	7.29	6.54	6.98	7.15	7.05

出所：表2-1に同じ。

表F2-3 耕種生産性

(単位:100万トン)

	1980	1983	1984	1985	1986	1987
作物総計	47.90	41.55	39.96	43.10	43.86	42.93
穀物合計	10.70	10.43	11.08	12.67	13.34	12.82
米	7.65	7.29	7.83	8.81	9.25	8.54
トウモロコシ	3.05	3.13	3.25	3.86	4.09	4.28
その他の食糧作物	35.68	30.57	28.32	23.55	29.93	29.57
ココナッツ	15.59	10.89	10.97	11.15	11.93	11.80
さとうきび	2.27	2.36	2.52	2.75	1.47	1.27
果実	7.44	7.58	7.31	7.72	7.91	7.92
野菜	10.24	9.61	7.39	8.05	8.48	8.44
非食糧作物	0.71	0.55	0.56	0.62	0.59	0.55
繊維作物	0.51	0.33	0.27	0.29	0.28	0.26
その他	0.20	0.22	0.28	0.33	0.31	0.29

出所:表2-1に同じ。

表F5-1 岡本公式による地震力分析表

SEISMIC ANALYSIS BY DR. OKAMOTO'S FORMULA

PROJECT NAME ; BOHOL IRRIGATION PROJECT II F/S

LOCATION ; BAYONGAN, SAN-MIGUEL, BOHOL

DAMSITE'S LATITUDE ; 9.96(DEGREES)

DITTO LONGITUDE ; 124.35(DEGREES)

NUMBER OF DATA ; 83 RECORDS ; 1907 TO 1982 = 76 YRS

NO.	DATE (M-D-Y)	LAT. (DEG)	LON. (DEG)	MG.	DIST. (KM)	ACC. (GAL)	NO./Y
1	03.07.50	10.00	124.00	6.8	38.52	191.1	0.0132
2	09.02.48	10.00	125.00	7.0	71.20	134.4	0.0263
3	10.30.26	9.50	124.50	6.3	53.63	101.9	0.0395
4	07.19.41	10.00	124.00	5.8	38.52	89.6	0.0526
5	02.04.41	9.00	124.00	6.9	113.24	67.4	0.0658
6	09.21.29	10.00	125.00	6.0	71.20	51.1	0.0789
7	07.12.11	9.00	126.00	7.8	209.73	46.3	0.0921
8	01.26.56	10.00	124.00	5.0	38.52	37.3	0.1053
9	03.10.75	9.60	124.10	5.2	48.42	34.2	0.1184
10	03.19.52	9.50	126.50	7.8	240.69	33.4	0.1316
11	01.24.48	10.50	122.00	8.2	263.61	31.7	0.1447
12	05.05.25	9.50	123.00	6.8	156.27	31.2	0.1579
13	01.24.48	11.00	122.00	8.2	281.28	26.6	0.1711
14	03.31.55	8.00	124.00	7.3	220.92	25.5	0.1842
15	05.24.31	10.00	125.50	6.3	125.80	24.7	0.1974
16	07.25.42	11.50	124.50	6.8	171.72	24.6	0.2105
17	06.07.47	11.50	125.00	6.9	185.06	23.5	0.2237
18	05.06.65	9.60	124.10	4.9	48.42	22.6	0.2368
19	02.10.57	10.25	126.00	6.8	183.16	20.6	0.2500
20	02.10.57	10.00	126.00	6.7	180.43	18.2	0.2632
21	12.14.77	10.00	125.30	5.8	103.95	17.4	0.2763
22	01.14.82	9.99	124.23	3.4	13.54	17.1	0.2895
23	10.20.42	8.50	122.50	7.3	259.51	15.8	0.3026
24	02.10.57	10.00	126.00	6.6	180.43	15.3	0.3158
25	03.12.15	12.00	124.00	7.0	229.63	14.5	0.3289
26	01.01.19	8.00	126.00	7.4	282.95	13.7	0.3421
27	02.11.57	10.00	126.00	6.5	180.43	12.7	0.3553
28	05.03.82	10.03	124.44	3.1	12.54	12.5	0.3684
29	02.10.57	10.25	126.00	6.5	183.16	12.1	0.3816
30	09.23.73	10.35	125.30	5.7	112.46	11.7	0.3947
31	09.22.40	8.00	124.00	6.8	220.92	11.5	0.4079
32	08.30.24	8.50	126.50	7.3	285.92	11.4	0.4211
33	05.03.43	12.50	125.50	7.4	308.49	10.1	0.4342
34	03.07.50	11.00	122.50	6.8	232.59	9.6	0.4474
35	04.27.19	11.00	123.00	6.4	187.19	9.2	0.4605
36	03.07.50	10.50	122.25	6.8	237.10	9.0	0.4737
37	01.24.31	10.00	126.00	6.3	180.43	8.5	0.4868
38	02.11.57	10.00	126.00	6.3	180.43	8.5	0.5000

CONTINUED

CONTINUED

NO.	DATE (M-D-Y)	LAT. (DEG)	LON. (DEG)	MG.	DIST. (KM)	ACC. (GAL)	NO./Y
39	02.10.57	10.50	126.50	6.8	242.38	8.3	0.5132
40	08.13.36	9.00	126.50	6.8	258.39	6.5	0.5263
41	03.15.80	9.79	124.45	3.1	21.81	6.2	0.5395
42	08.18.57	12.00	124.50	6.5	227.03	5.5	0.5526
43	04.10.55	8.00	125.00	6.5	228.93	5.4	0.5658
44	07.08.51	9.90	122.20	6.5	235.17	4.8	0.5789
45	09.16.82	10.09	124.79	4.0	50.21	4.7	0.5921
46	05.27.79	9.92	124.91	4.3	61.39	4.7	0.6053
47	11.14.81	10.07	125.29	5.1	103.47	4.4	0.6184
48	03.31.55	8.10	123.20	6.5	241.91	4.3	0.6316
49	03.31.55	8.10	123.20	6.5	241.91	4.3	0.6447
50	09.23.82	9.60	124.34	3.6	39.97	4.1	0.6579
51	11.15.57	8.00	124.50	6.3	218.18	4.0	0.6711
52	11.05.41	12.50	123.00	6.9	317.95	3.3	0.6842
53	02.17.70	9.80	125.90	5.8	170.42	3.3	0.6974
54	07.04.81	10.35	124.84	4.3	68.85	3.3	0.7105
55	02.05.81	9.84	124.09	3.1	31.40	3.0	0.7237
56	01.16.78	9.68	124.81	4.0	59.14	2.9	0.7368
57	05.01.79	9.36	125.46	5.4	138.52	2.9	0.7500
58	07.13.62	10.00	123.00	5.5	147.65	2.8	0.7632
59	09.10.52	10.50	123.50	5.0	110.52	2.8	0.7763
60	12.12.68	9.67	125.78	5.6	159.68	2.6	0.7895
61	07.13.62	10.00	122.50	6.0	202.29	2.6	0.8026
62	07.12.31	12.00	123.00	6.5	270.03	2.6	0.8158
63	07.12.70	10.84	125.41	5.5	151.44	2.5	0.8289
64	11.25.81	9.39	124.35	4.0	63.27	2.3	0.8421
65	11.25.62	11.20	124.80	5.4	146.14	2.3	0.8553
66	07.08.51	11.00	122.00	6.5	281.28	2.1	0.8684
67	03.20.81	9.67	124.56	3.2	39.54	2.0	0.8816
68	11.10.75	10.57	124.10	4.1	73.01	1.7	0.8947
69	09.16.82	10.14	124.72	3.3	45.11	1.7	0.9079
70	10.10.80	10.59	124.78	4.3	84.24	1.6	0.9211
71	06.15.28	11.50	121.50	6.8	354.72	1.5	0.9342
72	12.07.69	9.67	125.63	5.2	143.65	1.5	0.9474
73	12.28.79	9.85	125.18	4.4	91.57	1.4	0.9605
74	04.01.65	9.93	125.85	5.4	164.03	1.3	0.9737
75	01.21.64	10.50	125.50	5.1	139.19	1.3	0.9868
76	03.17.62	9.50	123.00	5.3	156.27	1.3	1.0000
77	09.13.73	9.20	126.10	5.8	209.30	1.2	1.0132
78	05.03.81	9.44	124.48	3.6	59.45	1.2	1.0263
79	06.12.64	11.25	124.75	5.2	149.69	1.2	1.0395
80	03.06.82	10.01	125.06	4.0	77.81	1.0	1.0526
81	09.22.77	10.39	124.17	3.3	51.62	1.0	1.0658
82	11.16.82	10.23	124.74	3.3	52.10	1.0	1.0789
83	04.08.77	9.04	121.82	4.4	295.20	0.0	1.0921

表F5-2 設計洪水量比較検討表

COMPARATIVE ESTIMATION OF DESIGN FLOOD (CAPAYAS)

Step	Method	Description	Max. Discharge	Equivalent Creager's C	Remarks
The Prime	B.P.W's Formula (Rare)	$Q_{max} = \frac{150 \cdot A}{\sqrt{A + 13}}$	417 cu.m/sec or 28.6 cu.m/sec/sq.km	77	A; Catchment Area 14.6 sq.km
Verif. 1	Creager's Formula (C = 75) 1/	$Q_{max} = 46CA^{(0.894A^{-0.048})}$	405 cu.m/ sec or 27.7 cu.m/sec/sq.km	75	Q; in cu.ft/sec A; in sq. mile
Verif. 2	Rational Method (R.P = 1,000 yrs)	$Q_{max} = \frac{1}{3.6} \cdot f \cdot r_t \cdot A$ With the Rainfall data at Dagohoy 1957 - 84	369 cu.m/sec or 25.3 cu.m/sec/sq.km	68	$f = 0.9$ $r_t = \frac{R24}{24}\left(\frac{24}{T}\right)^{0.6} = \frac{403.5}{24}\left(\frac{24}{1.2}\right)^{0.6} \fallingdotseq 101$ mm/hr $T \fallingdotseq 200A^{0.22}r_t^{-0.35} = 1.2$ hr 2/
Verif. 3	From Traces of Historic Floods in Bohol	Typhoon "DELILAH: at Nov. 22, 1964	2,219 3/ cu.m/sec or 3.80 cum./sec/sq.km	40.7	
		Typhoon "NITANG" at Sept. 2, 1984	1,410 3/ cu.m/sec 2.41 cu.m/sec/sq.km	25.9	
Verif. 4	From the Probably Maximum Precipitation	-	-	-	Meteorological P M P may be only about 200 mm/day 403.5 ≫ 200

Note: 1. C = 75 is particularly applied because of small scale of Capayas dam.
2. Fukushima & Kadoya's Formula
3. These data were obtained by the survey of Flood Traces at Loboc Hydropower Station (Mar. 1985)

表F5-3 ペンマン法による蒸発散量の計算

ESTIMATION OF POTENTIAL EVAPOTRANSPIRATION BY PENMAN METHOD

Station : Tagbilaran (Latitude : 10°00', Altitude : 30m MSL)

Month	Rediation Term						Aerodynamic Term					Adjust-ment Factor	Reference Crop Evapotranspiration ETo	
	Weighting Factor	Net Radiation (mm/day)					Weighting Factor	Wind Function	Vapour Pressure (mbar)					
	W.	Ra	Rs	Rns	Rn1	Rn	1-W	f(u)	ea	ed	ea-ed	C	mm/day	mm/month
Jan.	0.75	13.2	5.9	4.44	0.78	3.66	0.25	0.59	33.80	28.02	5.78	1.00	3.60	111.6
Feb.	0.75	14.2	6.4	4.78	0.80	3.99	0.25	0.60	34.00	27.64	6.36	1.00	3.94	110.3
Mar.	0.76	15.3	7.7	5.74	0.95	4.79	0.24	0.58	35.30	27.96	7.34	1.00	4.66	144.5
Apr.	0.77	15.7	7.9	5.91	0.94	4.97	0.23	0.56	37.00	28.64	8.36	1.01	4.96	148.8
May.	0.77	15.5	7.0	5.21	0.73	4.49	0.23	0.52	38.70	30.50	8.20	1.01	4.48	138.9
Jun.	0.77	15.3	5.9	4.40	0.53	3.88	0.23	0.50	38.30	31.21	7.09	1.01	3.84	115.2
Jul.	0.77	15.3	6.1	4.60	0.59	4.01	0.23	0.54	37.80	30.62	7.18	1.00	3.98	123.4
Aug.	0.77	15.5	6.2	4.64	0.59	4.05	0.23	0.57	38.50	30.42	8.09	1.00	4.18	129.6
Sep.	0.77	15.3	6.1	4.58	0.58	4.00	0.23	0.55	38.00	30.70	7.30	1.00	4.00	120.0
Oct.	0.77	14.7	5.9	4.39	0.57	3.82	0.23	0.51	37.00	30.71	6.29	1.01	3.72	115.3
Nov.	0.76	13.6	6.1	4.57	0.71	3.86	0.24	0.53	36.30	30.67	5.63	1.01	3.69	110.7
Dec.	0.76	12.9	5.2	3.89	0.61	3.28	0.24	0.55	35.10	29.45	5.65	1.00	3.24	100.4
Average	0.76	14.7	6.3	4.76	0.69	4.07	0.24	0.55	36.70	29.76	6.94	1.00	4.01	122.4

表F5-4　ペンマン法による蒸発散量の計算用データ

Latitude : 10°00'
Altitude : 30 m MSL

$$ETo = C\,[W.Rn + (1-w).f(u).(ea-ed)]$$

Month	Temperature (°C)			Relative Humidity (%)			Dewpoint Temperature	Vapour Presure (mbar)	Wind Speed (km/day)	Height (m)	Weighting Factor		Sunshine hour (hr)		Radiation (mm/day)	Adjustment Factor: Wind Speed (m/sec)			Adjustment Factor: Solar Radiation (mm/day)	
	Tmax	Tmin	Tmean	RHmax	RHmin	RHmean	Tdmean	ea	Uz	He	(1-W)	W	n	N	Ra	Uday	Unight	Ud/Un	Rs	c
Jan.	30.4	21.7	26.1	93.3	72.1	82.9	22.6	33.8	132.0	3.7	0.25	0.75	4.6	11.6	13.2	1.53	1.02	1.5	5.9	1.00
Feb.	30.8	21.6	26.2	90.8	70.3	81.3	22.4	34.0	136.8	3.7	0.25	0.75	4.7	11.8	14.2	1.58	1.05	1.5	6.4	1.00
Mar.	31.7	21.8	26.8	90.5	69.8	79.2	22.5	35.3	129.6	3.7	0.24	0.76	6.0	12.0	15.3	1.50	1.00	1.5	7.7	1.00
Apr.	32.8	22.5	27.6	86.8	68.0	77.4	23.3	37.0	120.0	3.7	0.23	0.77	6.2	12.3	15.7	1.39	0.93	1.5	7.9	1.01
May.	33.1	23.6	28.4	89.1	71.3	78.8	24.3	38.7	105.6	3.7	0.23	0.77	5.0	12.6	15.5	1.22	0.81	1.5	7.0	1.01
Jun.	32.6	23.8	28.2	90.7	72.6	81.5	24.4	38.3	96.0	3.7	0.23	0.77	3.4	12.7	15.3	1.11	0.74	1.5	5.9	1.01
Jul.	32.3	23.7	28.0	91.5	71.4	81.0	24.2	37.8	112.8	3.7	0.23	0.77	3.8	12.6	15.3	1.31	0.87	1.5	6.1	1.00
Aug.	32.6	23.9	28.3	90.5	70.4	79.0	24.1	38.5	127.2	3.7	0.23	0.77	3.7	12.4	15.5	1.47	0.98	1.5	6.2	1.00
Sep.	32.5	23.7	28.1	90.8	72.7	80.8	24.1	38.0	115.2	3.7	0.23	0.77	3.6	12.1	15.3	1.33	0.89	1.5	6.1	1.00
Oct.	32.1	23.3	27.6	92.4	73.5	83.0	24.1	37.0	100.8	3.7	0.23	0.77	3.5	11.8	14.7	1.17	0.78	1.5	5.9	1.01
Nov.	31.8	22.8	27.3	93.5	75.0	84.5	24.0	36.3	108.0	3.7	0.24	0.76	4.6	11.6	13.6	1.25	0.83	1.5	6.1	1.01
Dec.	31.2	22.5	26.7	93.5	74.4	83.9	23.6	35.1	117.6	3.7	0.24	0.76	3.5	11.5	12.9	1.36	0.91	1.5	5.2	1.00
Average	32.0	22.9	27.4	91.1	71.8	81.1	23.6	36.7	116.8	3.7	0.24	0.76	4.4	12.1	14.7	1.35	0.90	1.5	6.3	1.00

表F5-5 稲の消費水量

	蒸発散量			作物消費量	
月	mm/日	mm/月	ET/ETc比	mm/日	mm/月
Jan.	3.60	111.6	1.45	5.3	161.9
Feb.	3.94	110.3	1.37	5.4	151.2
Mar.	4.66	144.5	1.38	6.4	199.4
Apr.	4.94	148.2	1.46	7.2	216.4
May.	4.48	138.9	1.50	6.7	208.4
Jun.	3.84	115.2	1.50	5.8	172.8
Jul.	3.98	123.4	1.49	5.9	183.9
Aug.	4.18	129.6	1.42	5.9	184.1
Sep.	4.00	120.0	1.27	5.1	152.4
Oct.	3.72	115.3	1.28	4.8	147.6
Nov.	3.69	110.7	1.41	5.2	156.1
Dec.	3.24	100.4	1.34	4.3	134.6

表F5-6　畑作物の作物係数

Month		Mungbeans	Peanut	Corn	Vegetable
Dec.	I				
	II				
	III		0.54	0.54	
Jan.	I		0.57	0.57	
	II		0.63	0.65	
	III	0.52	0.75	0.80	0.50
Feb.	I	0.56	0.87	0.95	0.57
	II	0.70	0.95	1.05	0.70
	III	0.87	0.97	1.08	0.88
Mar.	I	0.96	0.95	1.07	0.97
	II	0.97	0.88	1.04	0.96
	III	0.91	0.55	0.95	0.50
Apr.	I	0.85			
	II				
	III				

表F5-7 畑作物の消費水量

Month	ETo	Mungbeans	Peanut	Corn	Vegetable
Dec. Ⅲ	3.24		1.75 (–)	1.75 (–)	
Jan. Ⅰ	3.60		2.05 (1.94)	2.05 (1.94)	
Ⅱ	3.60		2.27 (2.05)	2.34 (2.05)	
Ⅲ	3.60	1.87 (–)	2.70 (2.27)	2.88 (2.34)	1.80 (–)
Feb. Ⅰ	3.94	2.21 (2.05) 1/	3.43 (2.96)	3.74 (3.15)	2.25 (1.97)
Ⅱ	3.94	2.76 (2.21)	3.74 (3.43)	4.14 (3.74)	2.76 (2.25)
Ⅲ	3.94	3.43 (2.76)	3.82 (3.74)	4.26 (4.14)	3.47 (2.76)
Mar. Ⅰ	4.66	4.47 (4.05)	4.43 (4.52)	4.96 (5.03)	4.52 (4.10)
Ⅱ	4.66	4.52 (4.47)	4.10 (4.43)	4.85 (4.99)	4.47 (4.52)
Ⅲ	4.66	4.24 (4.52)	2.56 (4.10)	4.43 (4.85)	4.47 (4.47)
Apr. Ⅰ	4.94	3.96 (4.50)	– (2.72)	– (4.69)	2.47 (4.74)
Ⅱ	4.94	– (4.20)			(2.47)
Ⅲ					

Note: 1/ : Figures in parenthesis show the consumptive use in case of planting lag of crops.

表F5-8 畑作物の10日単位消費水量

(Unit: mm)

	Paddy				Upland Crops			
	Dry Season		Wet Season					
	Paddy (1) 1/	Paddy (2) 2/	Paddy (1)	Paddy (2)	Mungbean	Peanuts	Corn	Vegetable
Oct. I			21.8	36.3				
II			7.3	21.8				
III	30.0	30.0		7.8				
Nov. I	42.5	42.5						
II	49.9	49.9						
III	64.6	64.6						
Dec. I	46.3	46.3						
II	47.3	47.3				9.5	9.5	
III	58.4	58.4						
Jan. I	63.0	63.0				20.0	20.0	
II	63.0	63.0				21.6	22.0	
III	68.3	68.3			10.3	27.3	28.7	10.1
Feb. I	60.0	60.0			21.1	31.6	34.1	21.1
II	52.5	60.0			24.6	35.5	39.0	24.8
III	31.3	43.8			24.5	30.0	33.2	24.6
Mar. I	25.9	43.1			43.0	45.1	50.0	43.5
II	8.6	25.9			45.4	43.0	49.6	45.4
III		9.4			48.6	37.0	57.4	41.6
Apr. I					32.8	13.5	23.3	28.2
II					10.5			12.3
III								
May. I								
II								
III			37.5	37.5				
Jun. I			52.5	52.5				
II			60.9	60.9				
III			77.6	77.6				
Jul. I			55.6	55.6				
II			56.9	56.9				
III			70.5	70.5				
Aug. I			66.0	66.0				
II			66.0	66.0				
III			71.6	71.6				
Sep. I			58.0	58.0				
II			50.8	58.0				
III			36.3	50.8				
Total	711.6	775.5	789.3	847.8	260.8	314.1	361.3	251.6

1/ : Paddy (1) ..... Transplanting Paddy
Paddy (2) ..... Direct Sowing Paddy

表F5-9 雨期稲の平均潅漑蓑水量の算定

No.	Month		Equation for Calculation of WCWR	Weighted 10-day CWR		Irrigation Water Requirement Per Hactare
1	May.	III	$WR = 19P_2/40$	$(19\times66)/40 =$	31.4	0.679
2	Jun.	I	$WR = (20P_2+9P_1+3P)/40$	$(20\times66+9\times29+3\times45)/40 =$	42.9	0.927
3		II	$WR = (20P_2+10P_1+10P+5W_2)/40$	$(20\times66+10\times29+10\times45+5\times67)/40 =$	59.9	1.295
4		III	$WR = (20P_2+10P_1+10P\times20W_2)/40$	$(20\times66+10\times29+10\times45+20\times67)/40 =$	85.0 (max.)	1.837 1/
5	Jul.	I	$WR = (P_2+10P_1+10P+20W_2+10W_3)/40$	$(66+10\times29+10\times45+20\times67+10\times65)/40 =$	69.9	1.511
6		II	$WR = (P_1+7P+20W_2+20W_3)/40$	$(29+7\times45+20\times67+20\times65)/40 =$	74.6	1.612
7		III	$WR = (15W_2+30W_3)/40$	$(15\times67+30\times65)/40 =$	73.9	1.597
8	Aug.	I	$WR = (30W_3+10W_4)/40$	$(30\times65+10\times66)/40 =$	65.3	1.412
9		II	$WR = (20W_3+20W_4)/40$	$(20\times65+20\times66)/40 =$	65.5	1.416
10		III	$WR = (10W_3+30W_4)/40$	$(10\times65+30\times66)/40 =$	65.8	1.422 2/
11	Sep.	I	$WR = (30W_4+10W_5)/40$	$(30\times66+10\times58)/40 =$	64.0	1.383
12		II	$WR = (20W_4+20W_5)/40$	$(20\times66+20\times58)/40 =$	62.0	1.340
13		III	$WR = (10W_4+20W_5)/40$	$(10\times66+20\times58)/40 =$	45.5	0.983
14	Oct.	I	$WR = 20W_5/40$	$(20\times58)/40 =$	29.0	0.627
15		II	$WR = 10W_5/40$	$(10\times58)/40 =$	14.5	0.313

Land soaking and land perparation water;

$P_2 = 132/2 = 66$ mm

$P_1 = 29$ mm

$P = 45$ mm

10-day crop water requirement;

$W_1 = 76.0$ mm $W_4 = 66.0$ mm

$W_2 = 67.0$ mm $W_5 = 58.0$ mm

$W_3 = 65.0$ mm $W_6 = 58.0$ mm

1/: Maximum irrigation water requirement; (land preparation stage)

$$q = \frac{8.5\times10^{-3}\times1.0\text{ha}\times10^4\times10^3}{86{,}400(1-0.3)\times(1-0.15)\times(1-0.10)} = 1.837\ \ell/\text{sec/ha}$$

2/: Maximum irrigation water requirement; (Crop growing stage)

$$q = \frac{6.58\times10^{-3}\times1.0\text{ha}\times10^4\times10^3}{86{,}400\times(1-0.3)\times(1-0.15)\times(1-0.10)} = 1.422\ \ell/\text{sec/ha}$$

表F5-10　乾期稲の平均潅漑用水量の算定

No.	Month		Equation for Calculation of WCWR	Weighted 10-day CWR		Irrigation Water Requirement Per Hectare
1	Oct.	III	$WR = 19P_2/40$	$(19\times57)/40 =$	27.1	0.511
2	Nov.	I	$WR = (20P_2+9P_1+3P)/40$	$(20\times57+9\times27+3\times33)/40 =$	37.1	0.769
3		II	$WR = (20P_2+10P_1+10P+5W_2)/40$	$(20\times57+10\times27+10\times33+5\times59)/40 =$	50.9	1.055
4		III	$WR = (20P_2+10P_1+10P+20W_2)/40$	$(20\times57+10\times27+10\times33+20\times59)/40 =$	73.0	1.513 1/
5	Dec.	I	$WR = (P_2+10P_1+10P+20W_2+10W_3)/40$	$(57+10\times27+10\times33+20\times59+10\times54)/40 =$	59.4	1.231
6		II	$WR = (P_1+7P+20W_2+20W_3)/40$	$(27+7\times33+20\times59+20\times54)/40 =$	63.0	1.306
7		III	$WR = (15W_2+30W_3)/40$	$(15\times59+30\times54)/40 =$	62.6	1.297
8	Jan.	I	$WR = (30W_3+10W_4)/40$	$(30\times54+10\times63)/40 =$	56.3	1.167
9		II	$WR = (20W_3+20W_4)/40$	$(20\times54+20\times63)/40 =$	58.5	1.212
10		III	$WR = (10W_3+30W_4)/40$	$(10\times54+30\times63)/40 =$	60.8	1.260
11	Feb.	I	$WR = (30W_4+10W_5)/40$	$(30\times63+10\times60)/40 =$	62.3	1.291 2/
12		II	$WR = (20W_4+20W_5)/40$	$(20\times63+20\times60)/40 =$	61.5	1.275
13		III	$WR = (10W_4+20W_5)/40$	$(10\times63+20\times60)/40 =$	45.8	0.949
14	Mar.	I	$WR = 20W_5/40$	$(20\times60)/40 =$	30.0	0.622
15		II	$WR = 10W_5/40$	$(10\times60)/40 =$	15.0	0.311

Land soaking and land perparation water;

$P_2 = 114/2 = 57$ mm

$P_1 = 27$ mm

$P = 33$ mm

10-day crop water requirement;

$W_1 = 58.0$ mm　　$W_4 = 63.0$ mm

$W_2 = 59.0$ mm　　$W_5 = 60.0$ mm

$W_3 = 54.0$ mm　　$W_6 = 69.0$ mm

1/: Maximum irrigation water requirement; (land preparation stage)

$$q = \frac{73.0\times10^{-3}\times 1.0\text{ha}\times10^4\times10^3}{86{,}400(1-0.27)\times(1-0.15)\times(1-0.10)} = 1.513\ \ell/\text{sec/ha}$$

2/: Maximum irrigation water requirement; (Crop growing stage)

$$q = \frac{62.3\times10^{-3}\times 1.0\text{ha}\times10^4\times10^3}{86{,}400\times(1-0.27)\times(1-0.15)\times(1-0.10)} = 1.291\ \ell/\text{sec/ha}$$

表F5-11　カパヤスダム築堤材料リスト

築堤材料	採取地	賦存量	地質	ダムからの距離	材料試験
コア材料 (不透水材料)	ダムサイトと池敷	70万m^3	シルト・粘土 粘土 礫混じり粘土	サイト内	室内試験 土質試験 (1985) 〃 (1989)
ロック及び リップラップ材料 (透水材料)	ナガスナスヒル	充　分	玄武岩	10 km	未試験
	ルマンゴグ	〃	安山岩	3.5 km	〃
	カパヤス川河床	〃	〃	1~2 km	〃
	イラヤ(マリンジン) 川河床	〃	〃	8 km	〃
	アビヒラン	〃	玄武岩	22 km	〃
フィルター/ コンクリート材料	ギンスラン川	充　分	河床堆積物(砂利)	40 km	岩石試験(1985)
	カパヤス川	〃	〃	1.5 km	粒度試験(1989、NIA)
	キナノアン川	不充分	〃	29 km	岩石試験(1985)
	ヒンラヤガン川	〃	〃	32 km	〃
	イラヤ(マリンジン)川	〃	〃	8 km	未試験
路床材料	カパヤス土取り場	充　分	風化せん緑岩	サイト内	岩石試験(1985)

表F5-12 築堤材料試験結果一覧表

Ds: 表面乾燥飽水状態の比重, Q: 吸水率
Uc: D60/D10 U: $\frac{w_{opt}}{w_n}$×100
(*) 最大値と最小値を記入, 但3~は3×10^-?の時
SCU: 飽和後のCU試験, 直せんCU: 不飽和CU試験

(*) 記号	突固め	透水	圧密	三軸	直せん	最大粒径
○	100	100	60	70	200	4.76 (mm)
◎	200	200	200	200	300	50.8 (mm)
△	300	200	200	300	300	50.8 (mm)

試料名	土質名	採取深度 (m)	比重 4.76mm残留 Ds	比重 4.76mm通過 Gs	自然含水比(FMC) 4.76mm残留 (%)	自然含水比(FMC) 4.76mm通過 (%)	自然含水比(FMC) 全体 (%)	粒度 最大粒径 Dmax (cm)	礫 (%)	砂 4.76 (%)	シルト 0.074 (%)	粘土 0.005 (%)	均等係数 Uc	統一分類	液性限界 w_L	塑性限界 w_P	塑性指数 I_P	突固め モールド内径 (cm)	突固め 仕事量 (kg·cm/cm³)	最大乾燥密度 γ_{dmax} (g/cm³)	最適含水比 w_{opt} (%)
CTP-1 ◆	コア材料	0.6~1.25		2.64			23.1		34	28	38			SC							
CTP-2 ◆	コア材料	0.6~1.65		2.54			33.2		1	19	55	25		CH	76.1	30.4	45.7			1.50	21.7
CTP-3 ◆	コア材料	0.0~1.2		2.59			33.2		2	18	65	15		MH	75.5	43.1	32.4			1.50	22.8
CTP-4 ◆	コア材料	0.3~1.2		2.58			29.0		0	8	60	32		CH	69.1	31.5	37.6				
CTP-5 ◆	コア材料	0.3~1.2		2.76			31.7		8	29	50	13		CH	72.4	31.6	40.8			1.61	20.0
CTP-6 ◆	コア材料	0.3~1.2		2.64			27.1		1	3	96										
CTP-7	コア材料	0.3~1.8		2.52			33.0		2	14	62	22		MH	58	28	30	15.1	425	1.74	18.5
CTP-8	コア材料	0.6~1.7		2.61			20.0		7	30	32	31		ML	40	29	11	15.1	425	1.96	15.8
CTP-9	コア材料	0.4~2.0		2.51			37.0		2	15	54	28		MH	53	29	24	15.1	425	1.76	17.7
CTP-10	コア材料	0.5~2.4		2.70			21.0		15	36	37	12		SC	40	30	10	15.1	425	1.99	14.5
CTP-11-A	コア材料	1.1~2.0		2.72			19.0		22	12	38	28		ML	48	32	16	15.1	425	1.94	16.0
Dagohoy Q. ◆	安山岩	19.0	2.70																		
	ロック材	28.2	2.69												安定度試験(%)						
Ilaya R. ◆	フィルター		2.60 / 2.64						87	12					27.54						
Guinsularan R. ◆	フィルター		2.32 / 2.46						71	28					38.65						
Kinanoan R. ◆	コンクリート骨材		2.70 / 2.73						74	25					9.91						
Minlayagan R. ◆	コンクリート骨材		2.61 / 2.59						77	22					8.21						
Capayas R	コンクリート骨材							10	90	10											
								8	90	10											
Capayas Q. ◆	路床材		2.67 / 2.75						67	26	7				46.21						

試料名	供試体の初期状態 試験番号	供試体直径 (*)	突固め仕事量 (%)	D値 γ_d/γ_{dmax} (%)	乾燥密度 γ_d (g/cm³)	含水比 w (%)	間隙比 e	飽和度 Sr (%)	最適含水比との差 (%)	コーン指数 q_c (kg/cm²)	透水係数 k (cm/sec)	圧密 圧縮指数 Cc	圧密係数 (*) c_v (cm²/sec)	沈下量 (%)	三軸UU 全応力 c_u (kg/cm²)	ϕ_u	有効応力 c'_u	ϕ'_u	三軸SCU 全応力 c_{cu}	ϕ_{cu}	有効応力 c'_{cu}	ϕ'_{cu}	直せんCU c	φ	一軸圧縮強さ	[illegible]
CTP-1 ◆																									(kg/cm²)	
CTP-2 ◆																										
CTP-3 ◆				100	1.50	22.8	0.72	82.0	-10.4		7.1×10^{-6}		8.4×10^{-3} / 3.4×10^{-3}		0.78	7.5					0.39	1.5				
CTP-4 ◆																										
CTP-5 ◆																										
CTP-6 ◆																										
CTP-7		3.55	425	100	1.74	18.5	0.45	104	-14.5		1.3×10^{-6}		4.2×10^{-3} / 2.3×10^{-3}		1.5	16					0.5	16				
CTP-8		3.55	425	100	1.96	15.8	0.33	125	-4.2		1.5×10^{-6}		1.99×10^{-3} / 1.4×10^{-3}		1.7	17					0.8	17				
CTP-9		3.55	425	100	1.76	17.7	0.42	108	-19.8		9.4×10^{-7}		1.59×10^{-3} / 1.49×10^{-3}		1.3	13					0.4	19				
CTP-10		3.55	425	100	1.99	14.5	0.36	109	-6.5		1.1×10^{-6}		5.31×10^{-3} / 8.3×10^{-3}		1.5	18					0.8	17				
CTP-11-A		3.55	425	100	1.94	16.0	0.40	109	-3.0		1.1×10^{-6}		2.49×10^{-3} / 5.4×10^{-3}		1.95	12					0.5	17				
Dagohoy Q. ◆ (安山岩)																									776	1460
(ロック材)																									649	2740
Ilaya R. ◆																										
Guinsularan R. ◆																										
Kinanoan R. ◆																										
Minlayagan R. ◆																										
Capayas R																										
Capayas Q. ◆																										

注） ◆ 印は、1985年実施した試験結果、その他は1989年度試験結果

表F5-13 ダム盛立材料力学定数表

SOIL MECHANICAL DATA OF DAM BODY (CAPAYAS)

Material (Zone)	Specific Gravity G_s	Void Ratio e	Dry Density γ_d (t/cu.m)	Moisture Content w (%)	Wet Density γ_t (t/cu.m)	Saturated Density γ_{sat} (t/cu.m)	Total Stress Base: Cohesion c (t/sq.m)	Total Stress Base: I.F.A ϕ (Degree)	Effective Stress Base: Cohesion c' (t/sq.m)	Effective Stress Base: I.F.A ϕ' (Degree)	Ratio of Pore Pressure u (%)
Homogeneous fill	2.55	0.70	1.50	25	1.88	1.91	-	-	5	10	10
Toe drain	2.60	0.40	1.86	10	2.05	2.14	0	43	-	-	-

Note: G_s; Based on the soil tests and or on the general informations (see Annex C)
e, w, c, ϕ, c', ϕ', and u; ditto
$\gamma_d = G_s (1 + e)$, $\gamma_t = \gamma_d (1 + w/100)$, $\gamma_{sat} = (G_s + e)/(1 + e)$

表F5-14 カパヤスダム安定計算書

SLOPE STABILITY ANALYSIS

(STANDARD METHOD OF SLICES)

カパヤスダム安定計算書

CAPAYAS DAM

UPSTREAM SLOPE : 3:1

DOWNSTREAM SLOPE: 2:1

** MINIMUM FACTOR OF SAFETY **

CASE NO.	CIRCLE NO.	COORDINATES OF CENTER - X - (M)	- Y - (M)	RADIUS (M)	FACTOR OF SAFETY
		** UPSTREAM FACE **			
1	45	35	50	24.75	1.65
2	34	30	55	29.75	2.06
3	45	35	50	24.75	1.56
4	45	35	50	24.75	1.92
		** DOWNSTREAM FACE **			
1	29	65	55	29.75	1.50
2	25	65	50	24.75	1.71

Note: With Earthquake (Seismic Force Coefficient, K = .20)

Number of Slip Circles Analyzed for Each Case:
Upstream Face - 65 Downstream Face - 49

** EXPLANATION **

Case 1 - Reservoir is at Normal Water Level and Seepage is Steady.

Case 2 - End of Construction (there is residual construction pore pressure).

Case 3 - Reservoir is at Intermediate Water Level and Seepage is Steady.

Case 4 - Rapid Drawdown (from normal water level to low water level - there is residual pore pressure).

表F5-14(2/7)

INPUT DATA

COORDINATES OF CENTER OF SLIP CIRCLE (X,Y):

	Upstream	Downstream
Minimum X - Meters	15	60
Maximum X - Meters	40	80
Increment of X - Meters	5	5
Minimum Y - Meters	40	40
Maximum Y - Meters	55	55
Increment of Y - Meters	5	5

INCREMENT OF RADIUS - Meters	2.50
SLICE THICKNESS - Meter/s	1.00
SEISMIC FORCE COEFFICIENT, K	.20

** SOIL MECHANICAL DATA OF EACH ZONE **

ZONE NO.	MOIST DENSITY (T/cu.m.)	SATURATED DENSITY (T/cu.m.)	COHESION (T/sq.m.)	ANGLE OF INT. FRIC. (Degrees)	CONST. PORE PRESSURE (Per cent)
0	1.00	1.00	0.00	0.0	0
1	1.88	1.91	5.00	10.0	10
2	2.05	2.14	0.00	43.0	0
3	0.00	0.00	0.00	0.0	0

表F5-14(3/7)

*** SLOPE STABILITY ANALYSIS ***

Name of Dam: CAPAYAS
Location : BOHOL PROVINCE

Type of Dam: EARTHFILL
Face of Dam: UPSTREAM
Slope : 3:1

*** WITH EARTHQUAKE ***

CIRCLE NO.	COORDINATES OF CENTER - X - (M)	- Y - (M)	RADIUS (M)	FACTOR OF SAFETY CASE 1	CASE 2	CASE 3	CASE 4
1	15	40	14.75	6.97	6.15	6.97	9.77
				6.97*	6.15*	6.97*	9.77*
2	15	45	19.75	6.34	5.60	6.34	8.43
				6.34*	5.60*	6.34*	8.43*
3	15	50	24.75	5.56	4.93	5.56	6.79
				5.56*	4.93*	5.56*	6.79*
4	15	55	29.75	4.97	4.42	4.86	5.67
				4.97*	4.42*	4.86*	5.67*
5	20	40	12.25	14.66	12.61	14.66	18.80
6	20	40	14.75	4.18	3.83	4.18	4.95
				4.18*	3.83*	4.18*	4.95*
7	20	45	17.25	11.19	9.67	11.19	12.37
8	20	45	19.75	3.82	3.49	3.67	4.20
				3.82*	3.49*	3.67*	4.20*
9	20	50	22.25	9.07	7.88	8.87	9.20
10	20	50	24.75	3.43	3.15	3.16	3.59
				3.43*	3.15*	3.16*	3.59*
11	20	55	27.25	7.64	6.66	7.01	7.35
12	20	55	29.75	3.17	2.99	2.89	3.29
				3.17*	2.99*	2.89*	3.29*
13	25	40	12.25	5.53	4.99	5.23	5.32
14	25	40	14.75	3.09	2.94	2.80	3.14
				3.09*	2.94*	2.80*	3.14*
15	25	45	17.25	4.99	4.48	4.40	4.63
16	25	45	19.75	2.69	2.63	2.41	2.73
				2.69*	2.63*	2.41*	2.73*
17	25	50	19.75	25.30	21.53	21.88	21.03
18	25	50	22.25	4.26	3.97	3.71	4.02
19	25	50	24.75	2.41	2.45	2.18	2.50
				2.41*	2.45*	2.18*	2.50*
20	25	55	24.75	16.22	13.88	12.82	13.49
21	25	55	27.25	3.68	3.61	3.25	3.60
22	25	55	29.75	2.21	2.32	2.03	2.35
				2.21*	2.32*	2.03*	2.35*
23	30	40	9.75	8.49	7.49	6.72	7.21

表F5-14(4/7)

UPSTREAM.....

*** WITH EARTHQUAKE ***

CIRCLE NO.	COORDINATES OF CENTER - X - (M)	- Y - (M)	RADIUS (M)	FACTOR OF SAFETY CASE 1	CASE 2	CASE 3	CASE 4
24	30	40	12.25	3.50	3.45	2.98	3.27
25	30	40	14.75	2.34	2.49	2.08	2.39
				2.34*	2.49*	2.08*	2.39*
26	30	45	14.75	6.62	6.15	5.29	5.90
27	30	45	17.25	3.06	3.16	2.68	3.02
28	30	45	19.75	2.03	2.24	1.85	2.15
				2.03*	2.24*	1.85*	2.15*
29	30	50	19.75	5.58	5.60	4.72	5.40
30	30	50	22.25	2.61	2.81	2.35	2.69
31	30	50	24.75	1.87	2.12	1.73	2.04
				1.87*	2.12*	1.73*	2.04*
32	30	55	24.75	4.66	4.93	4.10	4.77
33	30	55	27.25	2.41	2.68	2.21	2.56
34	30	55	29.75	1.78	2.06	1.66	1.98
				1.78*	2.06*	1.66*	1.98*
35	35	40	9.75	4.10	4.47	3.51	4.28
36	35	40	12.25	2.54	2.94	2.28	2.76
37	35	40	14.75	1.90	2.30	1.74	2.12
				1.90*	2.30*	1.74*	2.12*
38	35	45	12.25	11.42	12.61	10.24	12.45
39	35	45	14.75	3.36	3.82	3.04	3.67
40	35	45	17.25	2.17	2.58	2.00	2.41
41	35	45	19.75	1.74	2.15	1.63	1.98
				1.74*	2.15*	1.63*	1.98*
42	35	50	17.25	8.33	9.67	7.86	9.59
43	35	50	19.75	3.01	3.53	2.80	3.40
44	35	50	22.25	2.03	2.46	1.90	2.30
45	35	50	24.75	1.65	2.08	1.56	1.92
				1.65*	2.08*	1.56*	1.92*
46	35	55	22.25	6.39	7.61	6.17	7.57
47	35	55	24.75	2.83	3.40	2.66	3.27
48	35	55	27.25	2.01	2.49	1.90	2.33
49	35	55	29.75	1.66	2.14	1.58	1.98
				1.66*	2.14*	1.58*	1.98*
50	40	40	9.75	2.74	3.56	2.73	3.43
51	40	40	12.25	2.09	2.80	2.02	2.63
52	40	40	14.75	1.75	2.43	1.68	2.22
				1.75*	2.43*	1.68*	2.22*
53	40	45	12.25	3.97	5.05	4.02	5.02
54	40	45	14.75	2.54	3.31	2.51	3.19
55	40	45	17.25	1.93	2.61	1.87	2.44
56	40	45	19.75	1.66	2.35	1.60	2.14

表F5-14(5/7)

*** WITH EARTHQUAKE ***

CIRCLE NO.	COORDINATES OF CENTER - X - (M)	- Y - (M)	RADIUS (M)	FACTOR OF SAFETY CASE 1	CASE 2	CASE 3	CASE 4
				1.66*	2.35*	1.60*	2.14*
57	40	50	17.25	4.00	5.16	4.04	5.14
58	40	50	19.75	2.40	3.19	2.38	3.07
59	40	50	22.25	1.94	2.68	1.88	2.50
60	40	50	24.75	1.68	2.42	1.62	2.18
				1.68*	2.42*	1.62*	2.18*
61	40	55	19.75	18.27	22.96	18.27	23.01
62	40	55	22.25	3.80	4.97	3.83	4.95
63	40	55	24.75	2.45	3.31	2.42	3.18
64	40	55	27.25	1.97	2.79	1.92	2.59
65	40	55	29.75	1.74	2.56	1.68	2.30
				1.74*	2.56*	1.68*	2.30*

Note: * - Minimum factor of safety in every center of slip circle.

表F5 - 14 (6 / 7)

** SLOPE STABILITY ANALYSIS **

Name of Dam: CAPAYAS
Location : BOHOL PROVINCE

Type of Dam: EARTHFILL
Face of Dam: DOWNSTREAM
Slope : 2:1

*** WITH EARTHQUAKE ***

CIRCLE NO.	COORDINATES OF CENTER - X - (M)	- Y - (M)	RADIUS (M)	FACTOR OF SAFETY CASE 1	CASE 2
1	60	40	9.75	2.57	2.97
2	60	40	12.25	1.98	2.25
3	60	40	14.75	1.58	1.82
				1.58*	1.82*
4	60	45	12.25	4.10	4.89
5	60	45	14.75	2.34	2.75
6	60	45	17.25	1.88	2.18
7	60	45	19.75	1.53	1.80
				1.53*	1.80*
8	60	50	17.25	3.82	4.67
9	60	50	19.75	2.36	2.82
10	60	50	22.25	1.85	2.19
11	60	50	24.75	1.55	1.86
				1.55*	1.86*
12	60	55	22.25	3.60	4.49
13	60	55	24.75	2.33	2.84
14	60	55	27.25	1.89	2.28
15	60	55	29.75	1.59	1.95
				1.59*	1.95*
16	65	40	9.75	4.63	5.29
17	65	40	12.25	2.33	2.44
18	65	40	14.75	1.70	1.85
				1.70*	1.85*
19	65	45	14.75	3.50	3.98
20	65	45	17.25	1.95	2.10
21	65	45	19.75	1.57	1.76
				1.57*	1.76*
22	65	50	17.25	23.80	27.75
23	65	50	19.75	2.85	3.27
24	65	50	22.25	1.86	2.05
25	65	50	24.75	1.51	1.71
				1.51*	1.71*
26	65	55	22.25	8.51	10.02
27	65	55	24.75	2.65	3.09
28	65	55	27.25	1.81	2.03
29	65	55	29.75	1.50	1.74
				1.50*	1.74*
30	70	40	12.25	3.30	3.67
31	70	40	14.75	2.15	2.26

表F5-14(7/7)

DOWNSTREAM.....

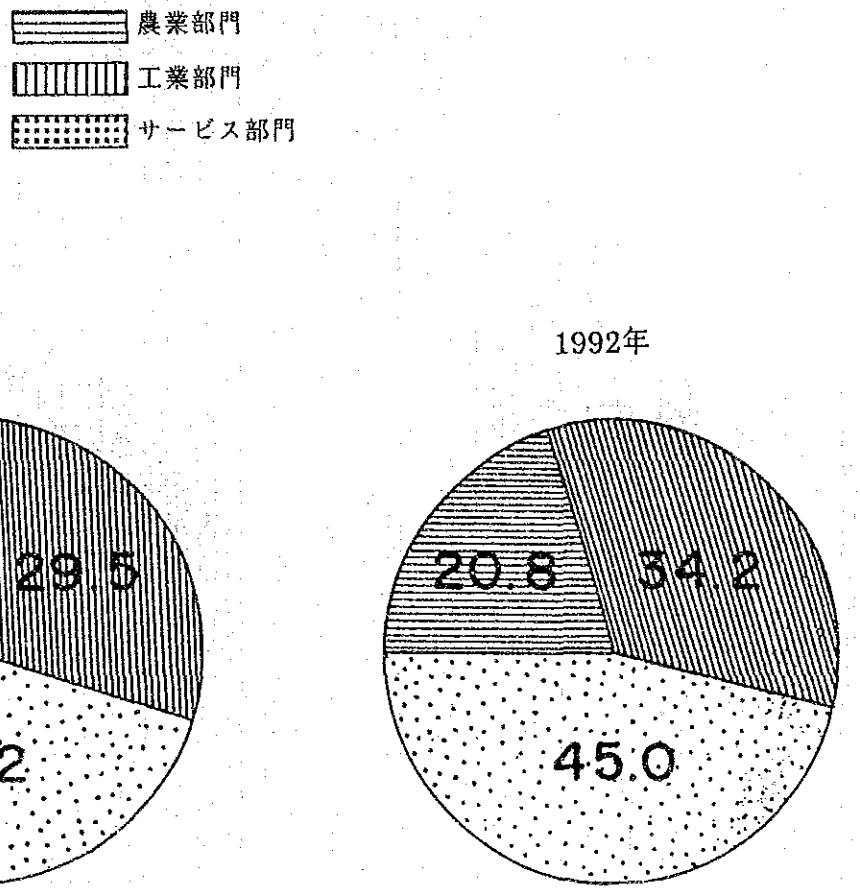
*** WITH EARTHQUAKE ***

CIRCLE NO.	COORDINATES OF CENTER - X - (M)	- Y - (M)	RADIUS (M)	FACTOR OF SAFETY CASE 1	CASE 2
				2.15*	2.26*
32	70	45	17.25	2.89	3.09
33	70	45	19.75	1.84	1.96
				1.84*	1.96*
34	70	50	19.75	12.54	14.63
35	70	50	22.25	2.43	2.62
36	70	50	24.75	1.67	1.81
				1.67*	1.81*
37	70	55	24.75	6.59	7.68
38	70	55	27.25	2.14	2.33
39	70	55	29.75	1.59	1.76
				1.59*	1.76*
40	75	40	14.75	2.41	2.80
				2.41*	2.80*
41	75	45	17.25	19.33	22.56
42	75	45	19.75	2.41	2.62
				2.41*	2.62*
43	75	50	22.25	7.52	8.77
44	75	50	24.75	2.20	2.35
				2.20*	2.35*
45	75	55	27.25	4.70	5.48
46	75	55	29.75	1.93	2.08
				1.93*	2.08*
47	80	45	19.75	2.78	3.32
				2.78*	3.32*
48	80	50	24.75	3.49	4.12
				3.49*	4.12*
49	80	55	29.75	3.05	3.57
				3.05*	3.57*

Note: * - Minimum factor of safety in every center of slip circle.

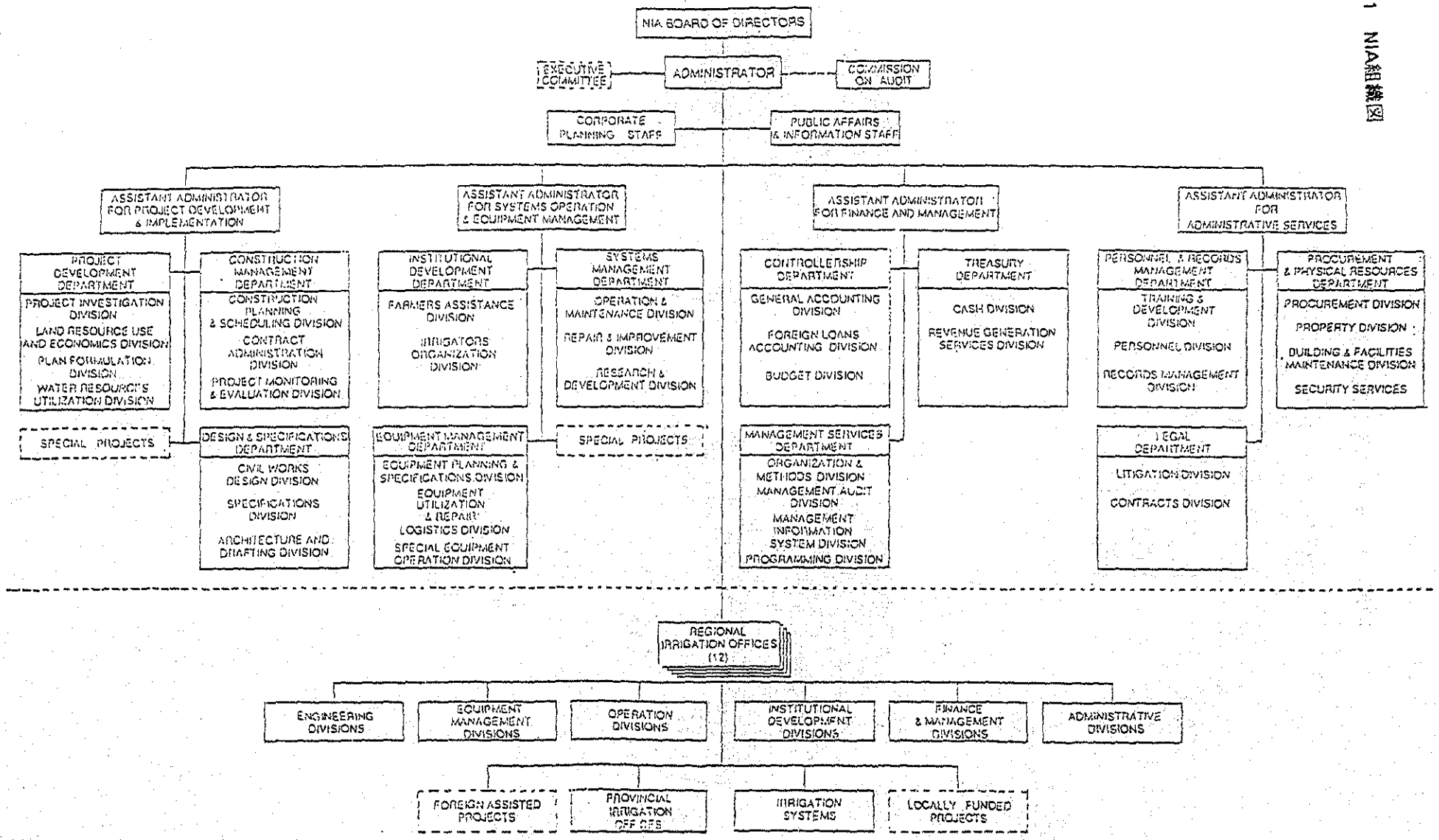
図F2-1　中部ビサヤ地域総生産

(1987年と1992年の部門別比率)



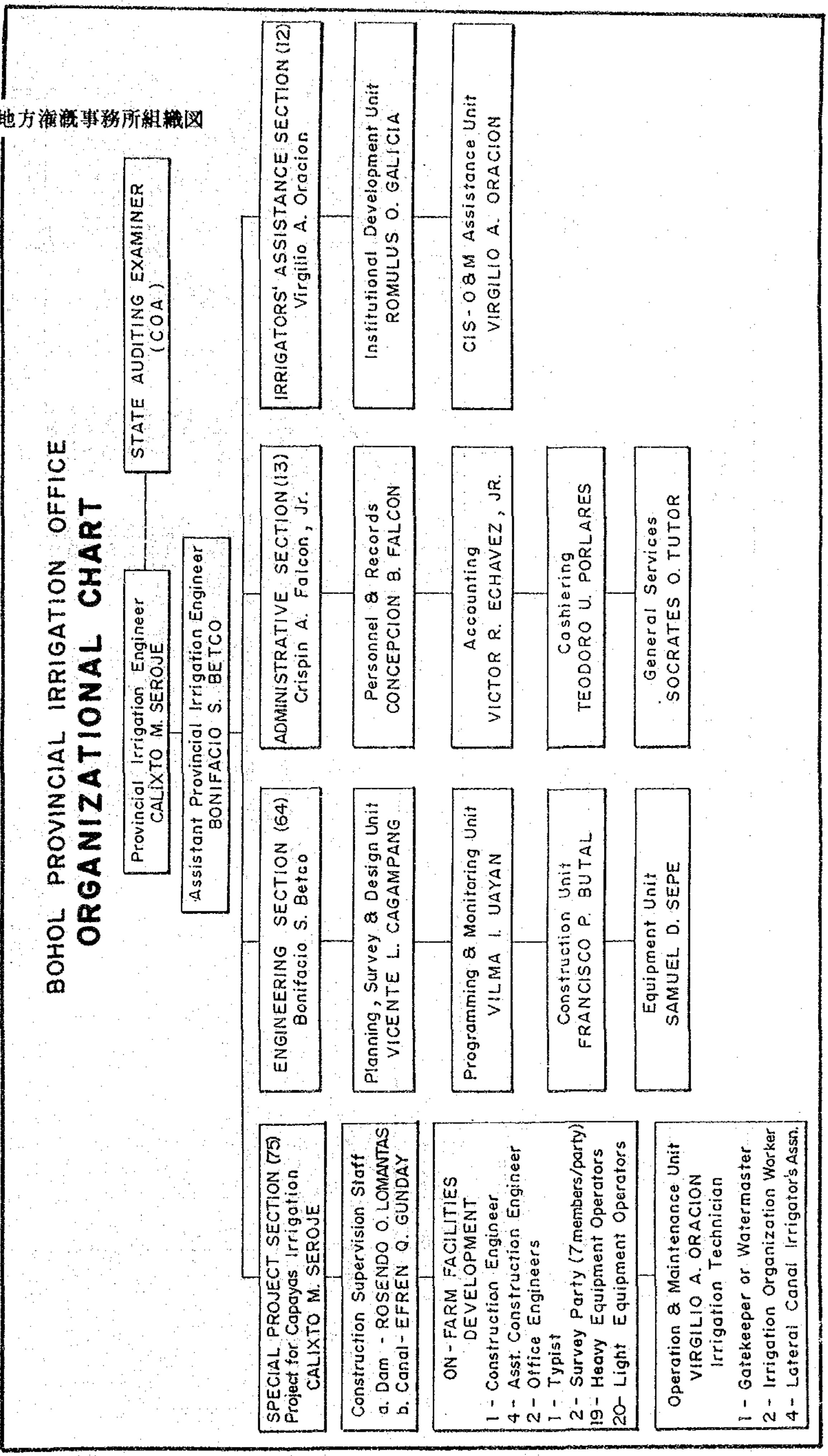
図F4-1 NIA組織図

ORGANIZATIONAL CHART
1988

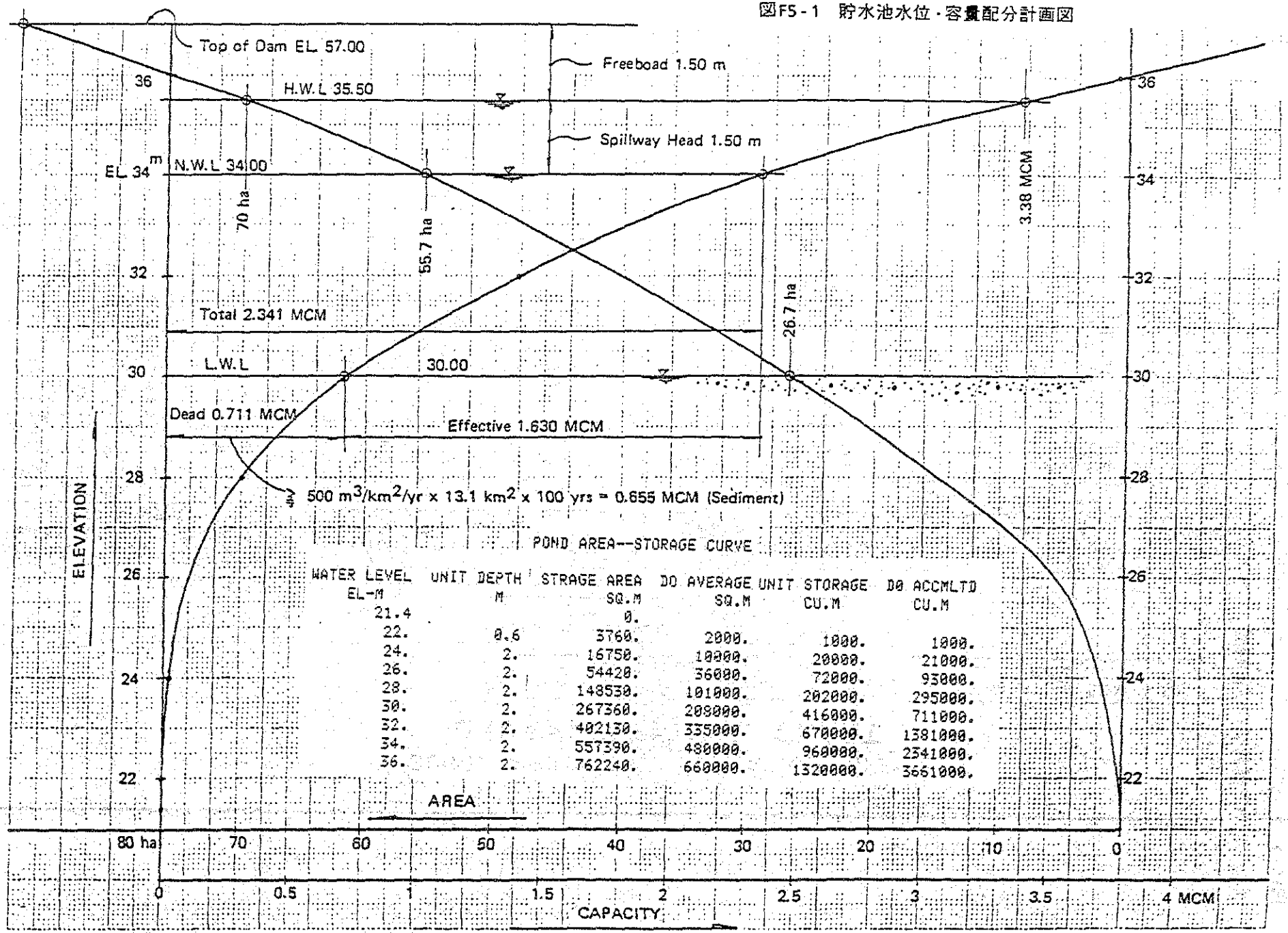


図F4-2

ボホール地方灌漑事務所組織図



図F5-1　貯水池水位・容量配分計画図

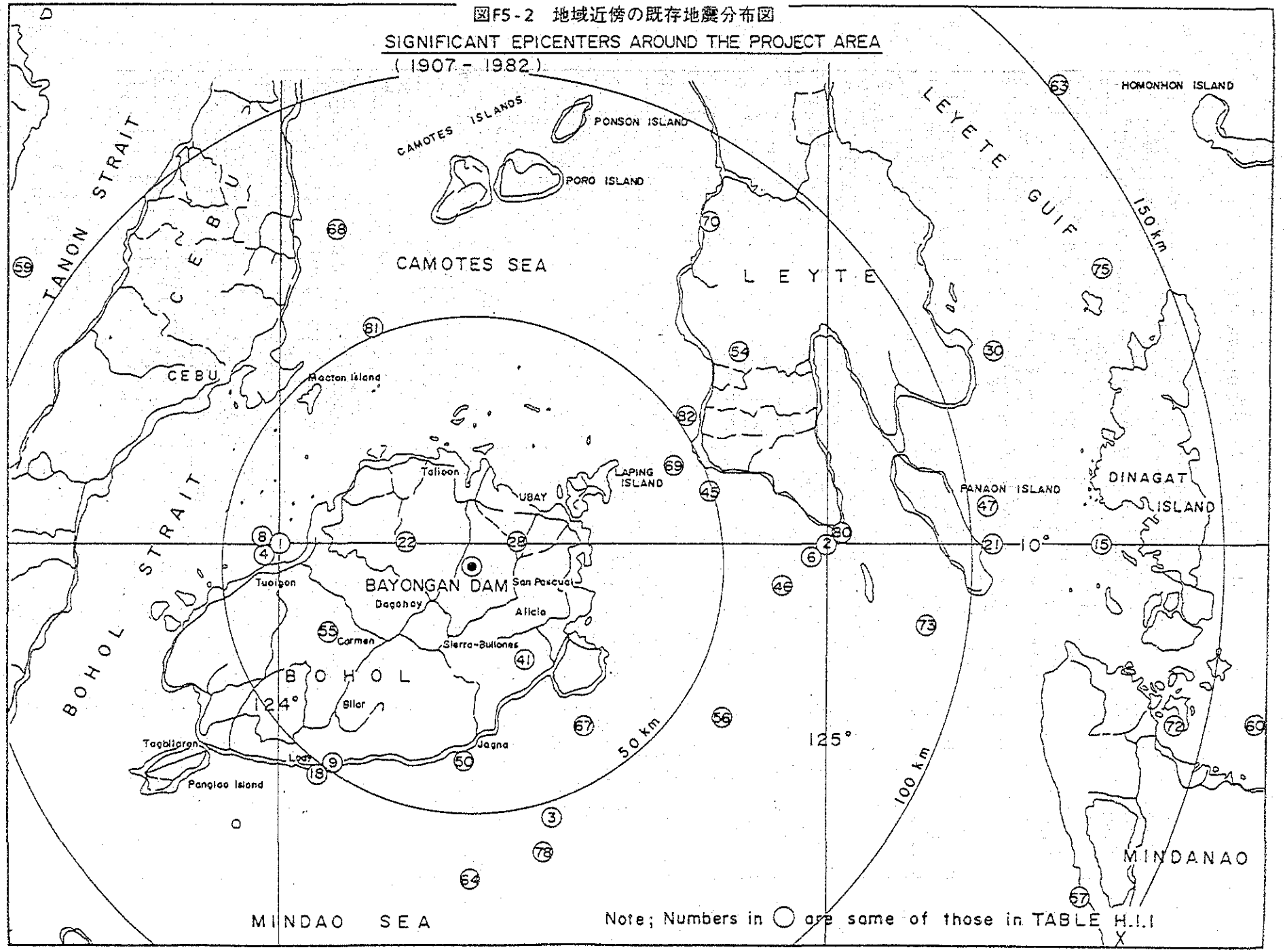


WATER LEVEL EL-M	UNIT DEPTH M	STRAGE AREA SQ.M	DO AVERAGE SQ.M	UNIT STORAGE CU.M	DO ACCMLTD CU.M
21.4		0.			
22.	0.6	3760.	2000.	1000.	1000.
24.	2.	16750.	10000.	20000.	21000.
26.	2.	54420.	36000.	72000.	93000.
28.	2.	148530.	101000.	202000.	295000.
30.	2.	267360.	208000.	416000.	711000.
32.	2.	402130.	335000.	670000.	1381000.
34.	2.	557390.	480000.	960000.	2341000.
36.	2.	762240.	660000.	1320000.	3661000.

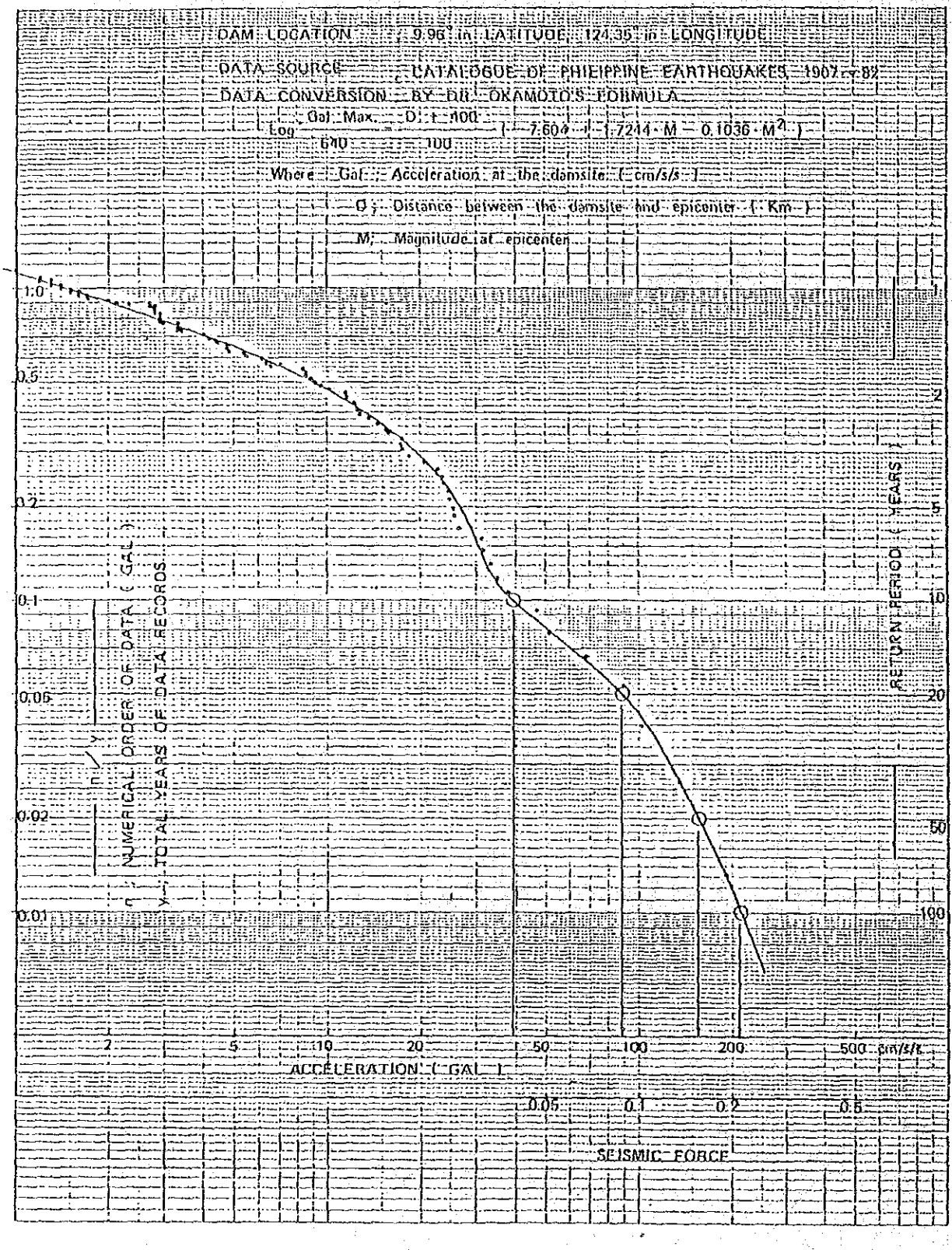
図F5-2 地域近傍の既存地震分布図

SIGNIFICANT EPICENTERS AROUND THE PROJECT AREA

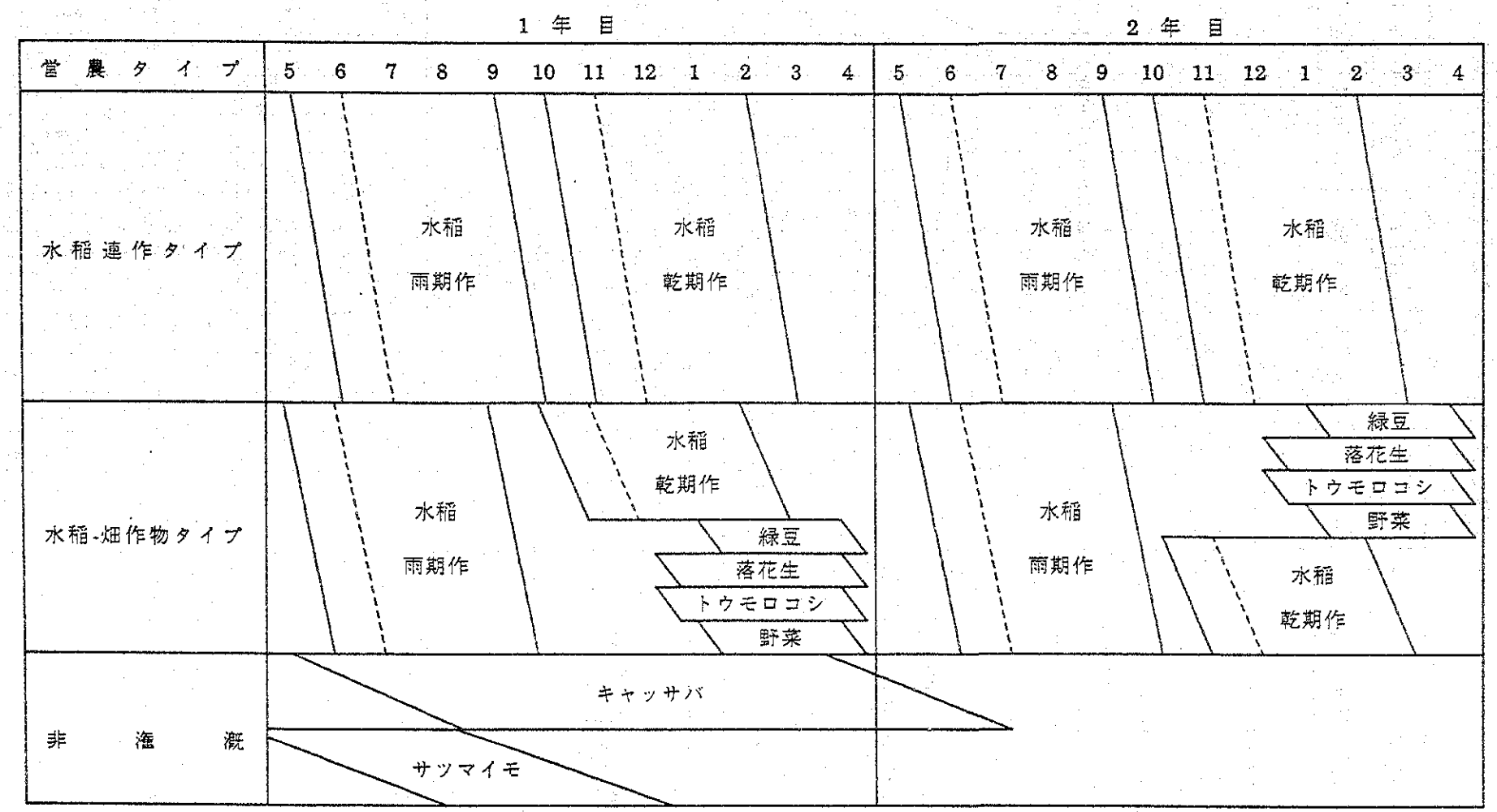
(1907 - 1982)



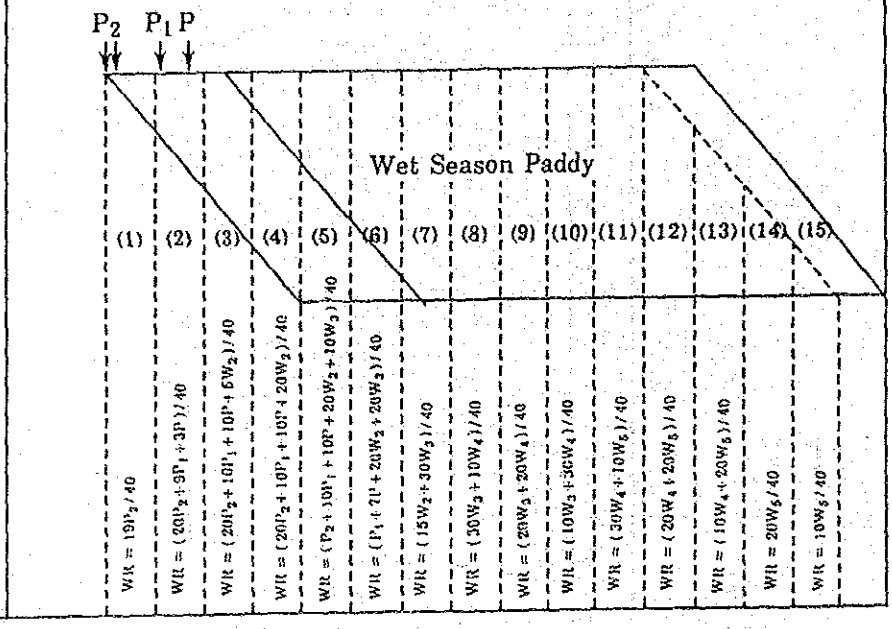
図F5-3　ダム地点地震力の頻度分布図

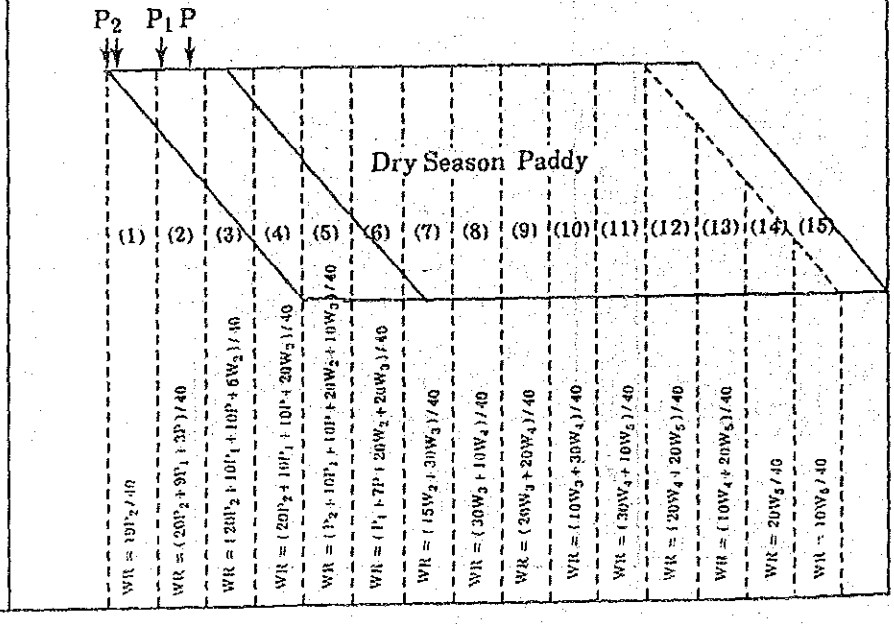


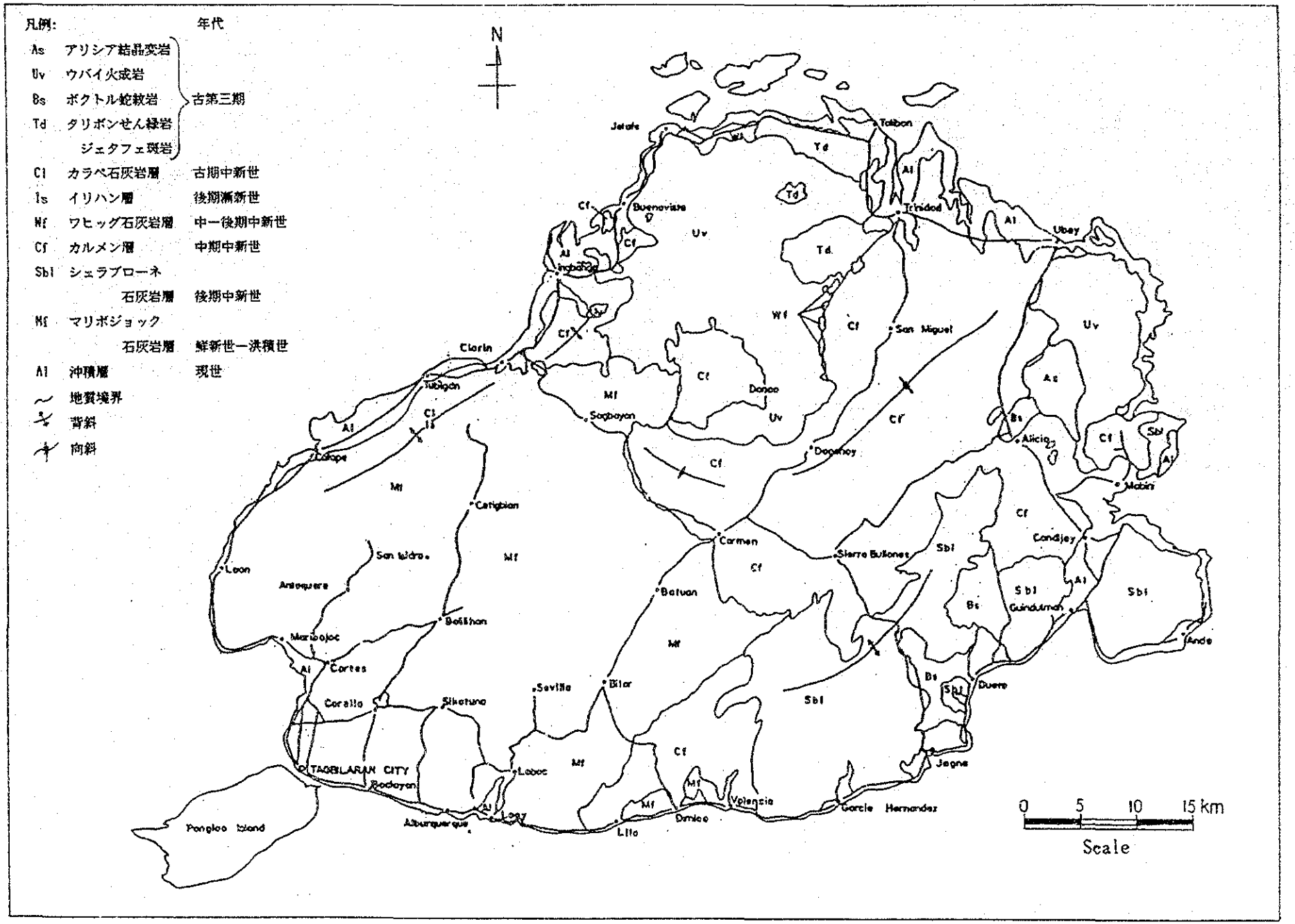
図F5-4　営農タイプ毎の作付けパターン



図F5-5　雨期及び乾期水稲の10日単位用水量の算定

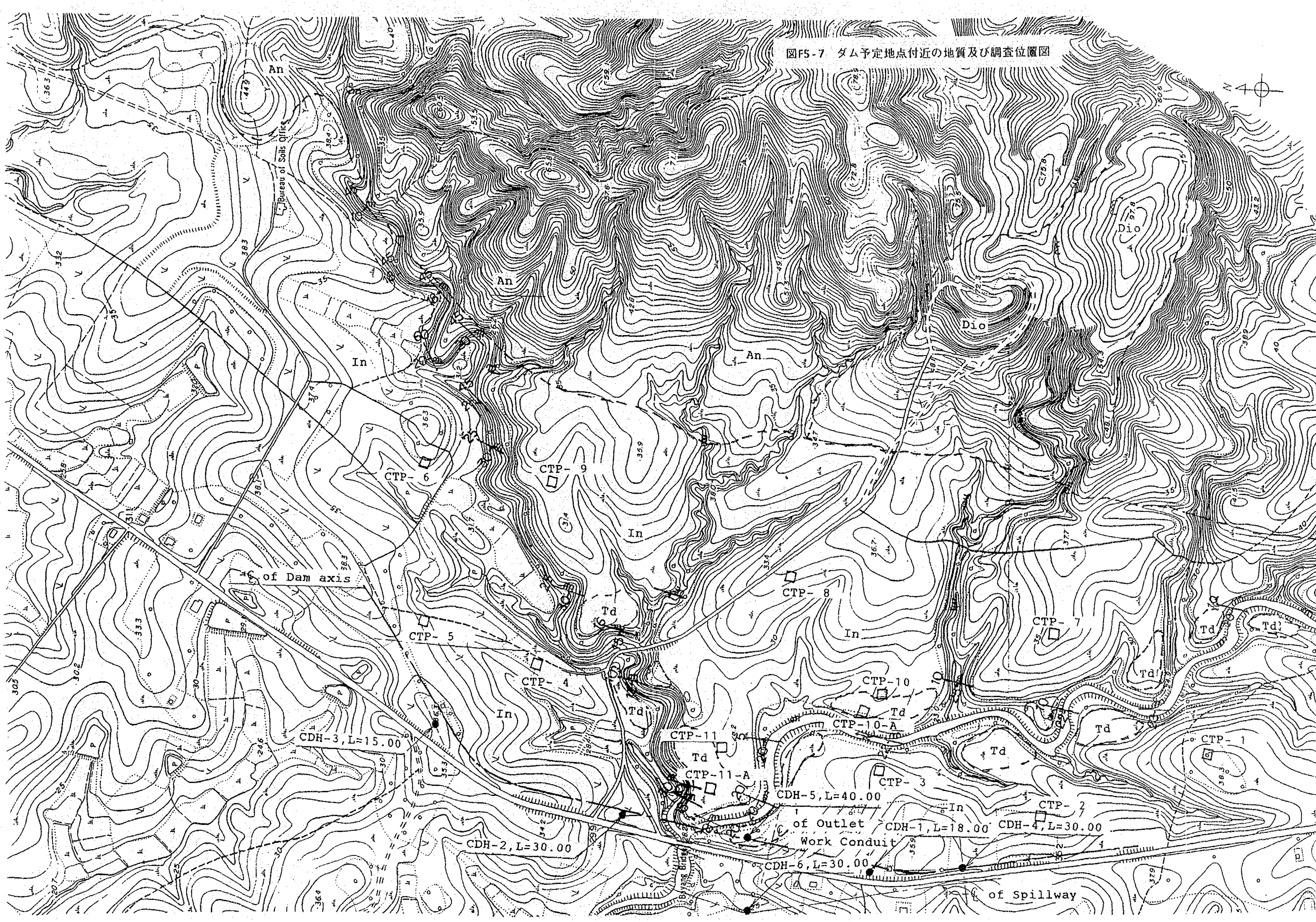
MONTH	MAY	JUNE	JULY	AUG.	SEP.	OCT.
10-DAY CROP WATER REQUIREMENT (mm)	$W_1=76.0$	$W_2=67.0$	$W_3=65.0$	$W_4=66.0$	$W_5=58.0$	$W_6=58.0$
GROWING STAGE OF PADDY IRRIGATION SCHEDULE CALCULATION OF WEIGHTED CROP WATER REQUIREMENT	

MONTH	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
10-DAY CROP WATER REQUIREMENT (mm)	$W_1=58.0$	$W_2=59.0$	$W_3=54.0$	$W_4=63.0$	$W_5=60.0$	$W_6=69.0$
GROWING STAGE OF PADDY IRRIGATION SCHEDULE CALCULATION OF WEIGHTED CROP WATER REQUIREMENT	



図F5-6 地質層序図及び分布図

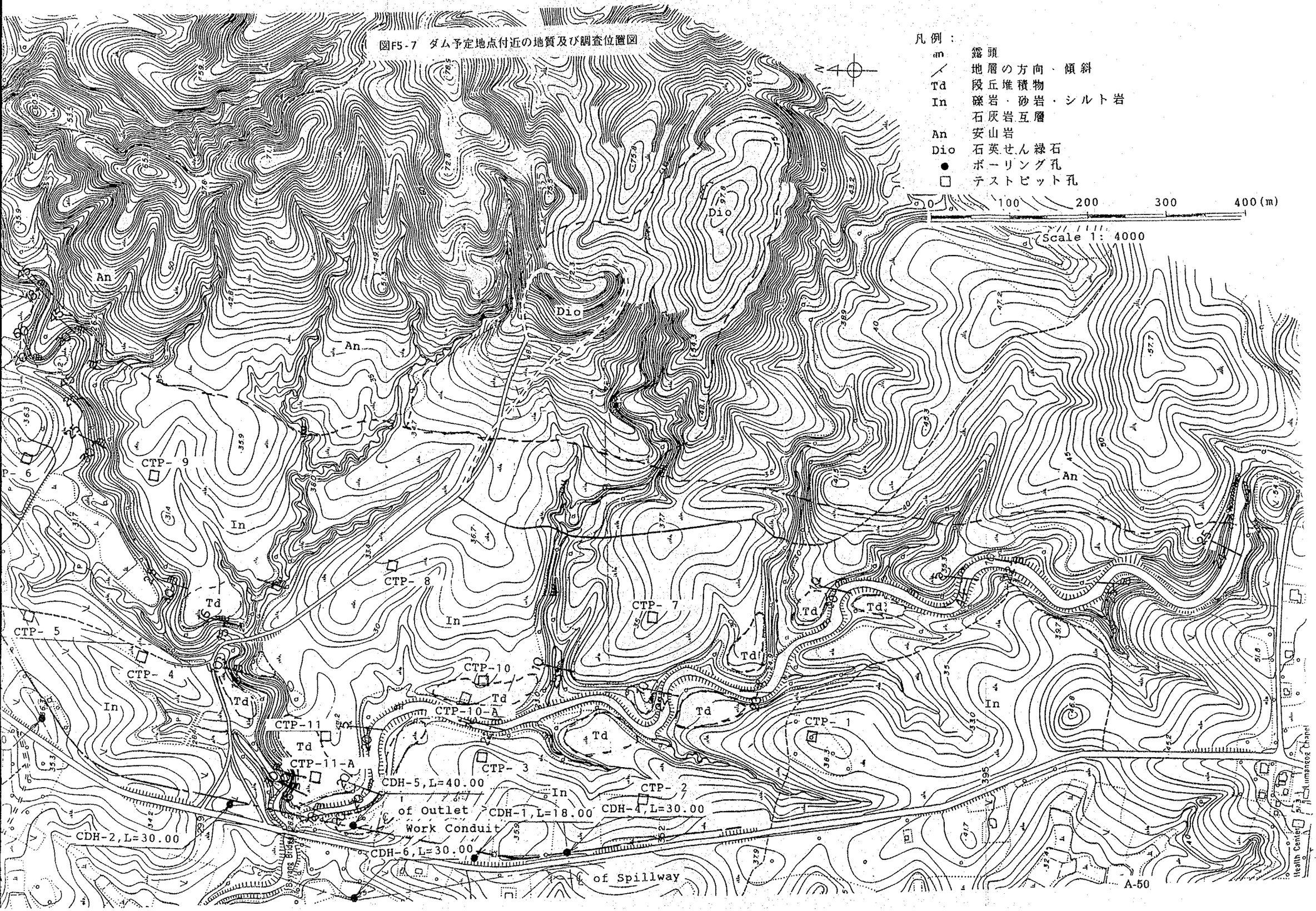
"Biostratigrahic studies in Bohol Island"より引用



図F5-7 ダム予定地点付近の地質及び調査位置図

凡

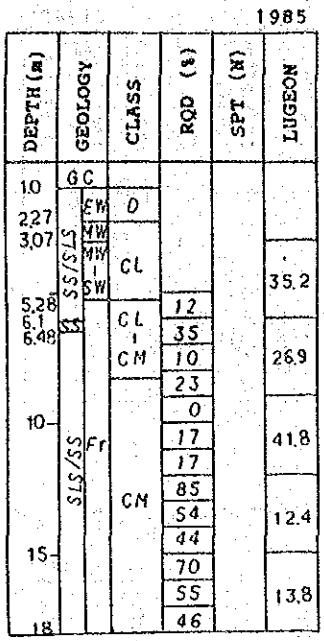
図F5-7　ダム予定地点付近の地質及び調査位置図



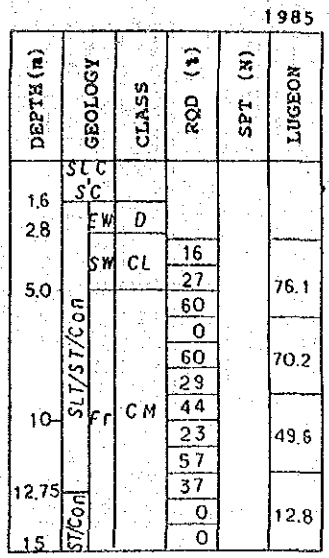
図F5-8　ボーリング柱状図及びテストピット柱状図一覧表

ボーリング柱状図一覧(1)

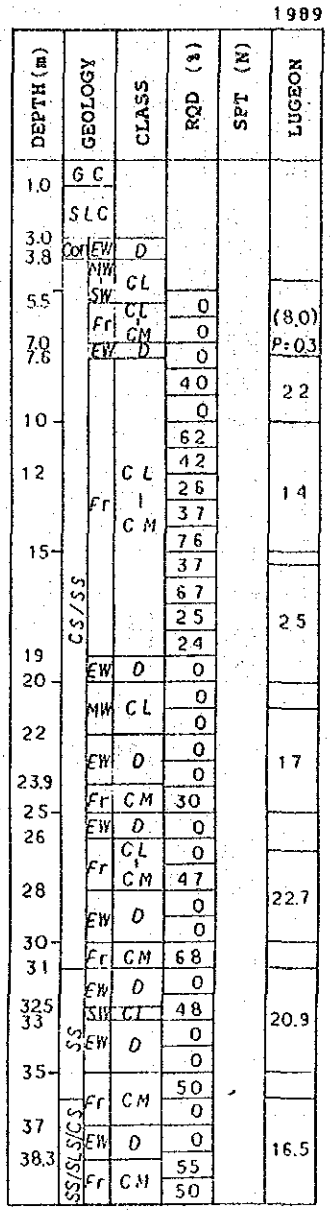
BOREHOLE: CDH-1
EL 33.07



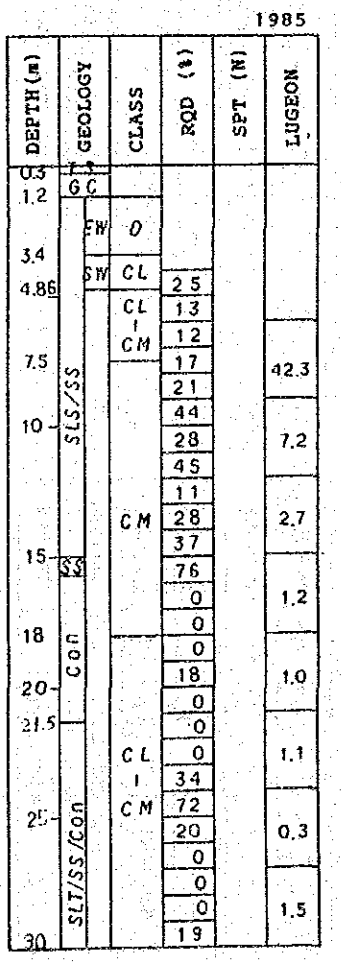
BOREHOLE: CDH-3
EL 34.98



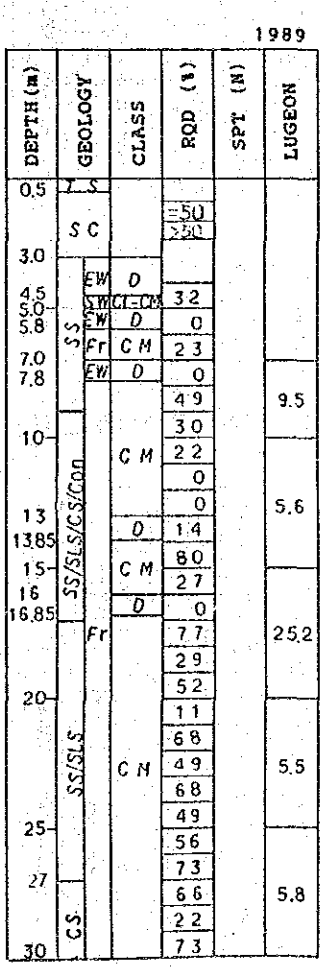
BOREHOLE: CDH-5
EL 25.80



BOREHOLE: CDH-2
EL 28.00



BOREHOLE: CDH-4
EL 33.50



凡例

TS　－ 表土
GC　－ 礫混じり粘土
SC　－ 砂質粘土
SLC　－ シルト質粘土
SS　－ 砂岩
SLS　－ シルト岩
Com　－ 礫岩
EW　－ 強風化
MW　－ 風化
SW　－ 弱風化
Fr　－ 新鮮岩
注）／は互層

ボーリング
柱状図一覧(2)

BOREHOLE: CDH-6
EL 25.00

1989

DEPTH (m)	GEOLOGY	CLASS	RQD (%)	SPT (N)	LUGEON
0.5	T				
	SC			12	
2.0				>50	
3.3	EW	D			
	SW	CL	38		
5.0	Fr	CM	0		
			68		
7.0	EW	D	68		
7.3			27		13.9
	Fr	CM	52		
10			38		
10.3	EW	D	0		
			72		
	Fr	CM	48		7.8
			36		
15			0		
15.7	EW	D	0		
	Fr	CM	0		
18			53		5.8
	EW	D	32		
20	MW	CL	16		
21			0		
			57		
	Fr	CM	66		5.0
			52		
	EW	D	0		
	MW	CL	35		
	Fr	CM	53		4.9
	EW	D	0		
	SW	CL	95		
	Fr	CM	84		

Con ICS/SLS/SS
SS/SLS
CS/SS
Con SS
SS/SLS/CS

テストピット柱状図一覧(1)

TEST PIT NO. CTP- 1

(1985)

DEPTH (m)	GEOLOGY	WEATHERING	CLASSIFICATION	SAMPLING	REMARKS
0.6	SLC		ML	NO SAMPLE	MATERIAL INVESTIGATION 1.78
1	GC		GC		
1.25	SLS	EW	BEDROCK		
1.85					
2	SS	MW			
2.45					

TEST PIT NO. CTP- 2

(1985)

DEPTH (m)	GEOLOGY	WEATHERING	CLASSIFICATION	SAMPLING	REMARKS
0.6	GC		GC	SAMPLE TAKEN 35kg	1.25
1	SLC		ML		
1.65			BEDROCK		
2	SLS /SS	EW			
2.40					

TEST PIT NO. CTP- 3

(1985)

DEPTH (m)	GEOLOGY	WEATHERING	CLASSIFICATION	SAMPLING	REMARKS
0.7	C		CH	SAMPLE TAKEN 35kg	MATERIAL INVESTIGATION
1	SLC		ML		
1.2			BEDROCK		
1.95	SS	EW			

TEST PIT NO. CTP- 4

(1985)

DEPTH (m)	GEOLOGY	WEATHERING	CLASSIFICATION	SAMPLING	REMARKS
0.3	TS				
1	SLC		ML	SAMPLE TAKEN 35kg	MATERIAL INVESTIGATION 2.50
1.2					
2		EW	BEDROCK		
2.5	SLC /SS				
3		SW I Fr			
3.7					

TEST PIT NO. CTP- 5

(1985)

DEPTH (m)	GEOLOGY	WEATHERING	CLASSIFICATION	SAMPLING	REMARKS
0.3	TS				
1	GC		GC	SAMPLE TAKEN 40kg	1.35
1.25		EW I MW			
2	SLS		BEDROCK		
2.4					
2.9	SS	Fr			

TEST PIT NO. CTP- 6

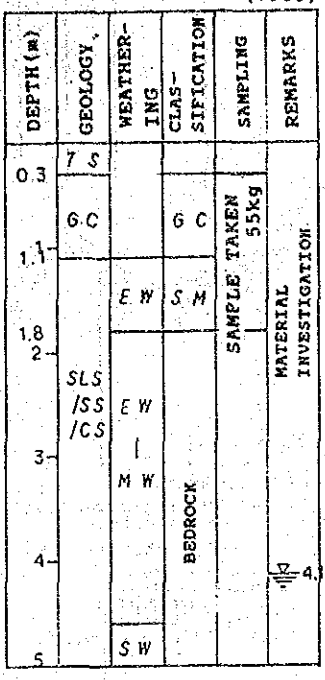
(1985)

DEPTH (m)	GEOLOGY	WEATHERING	CLASSIFICATION	SAMPLING	REMARKS
0.3	TS			NO SAMPLE	MATERIAL INVESTIGATION 2.60
1	C		CL		
1.2	SLC		ML		
1.8					
2	SLS /SS	EW I MW	BEDROCK		
3					
3.30					

テストピット柱状図一覧（2）

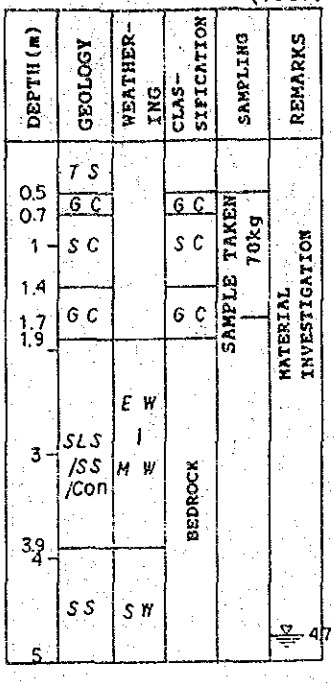
TEST PIT NO. CTP- 7

(1989)



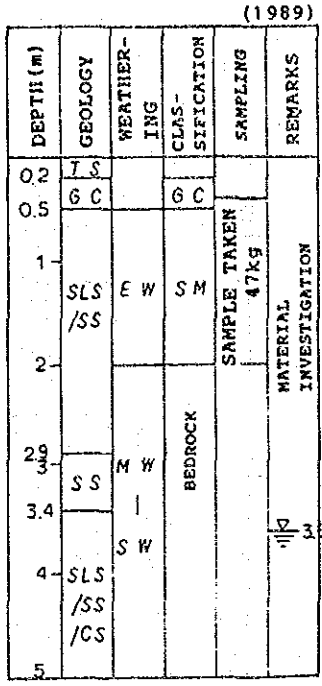
TEST PIT NO. CTP- 8

(1989)



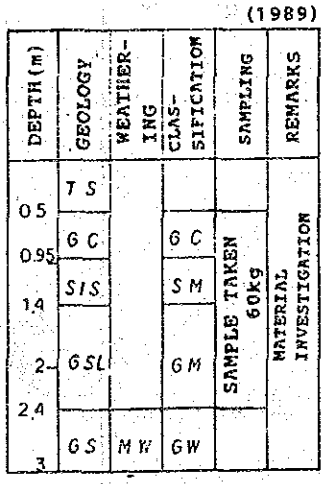
TEST PIT NO. CTP- 9

(1989)



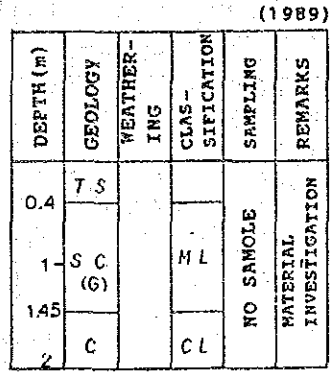
TEST PIT NO. CTP-10

(1989)



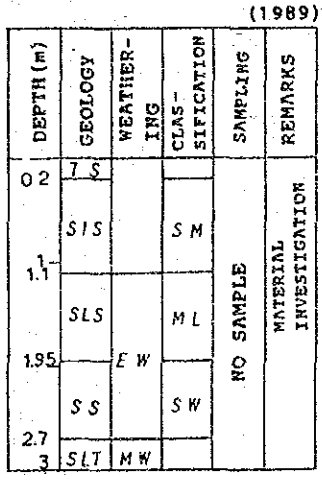
TEST PIT NO. CTP-10-A

(1989)



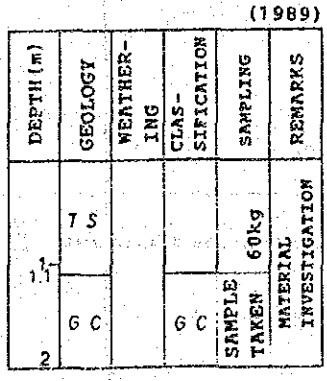
TEST PIT NO. CTP-11

(1989)



TEST PIT NO. CTP-11-A

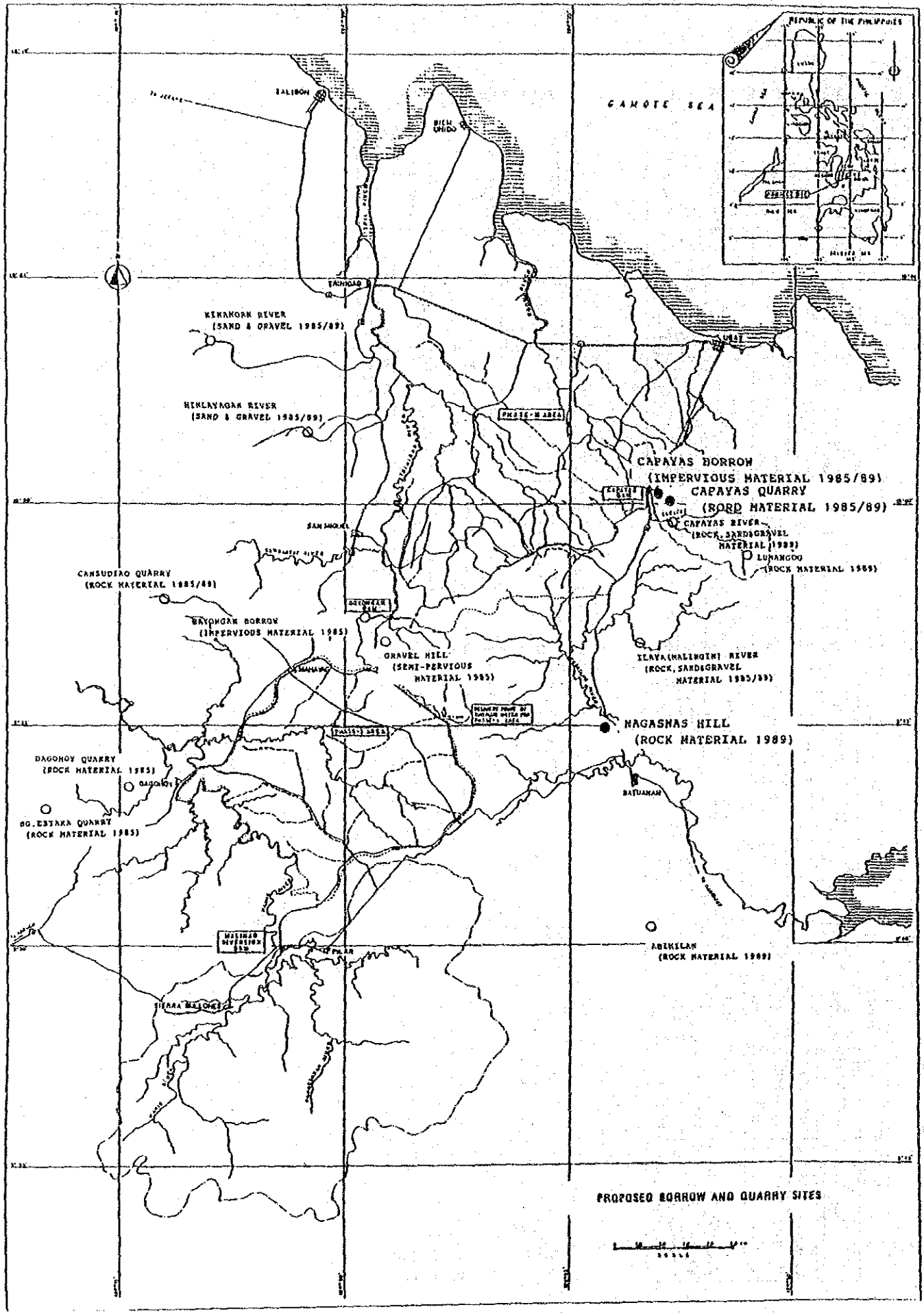
(1989)



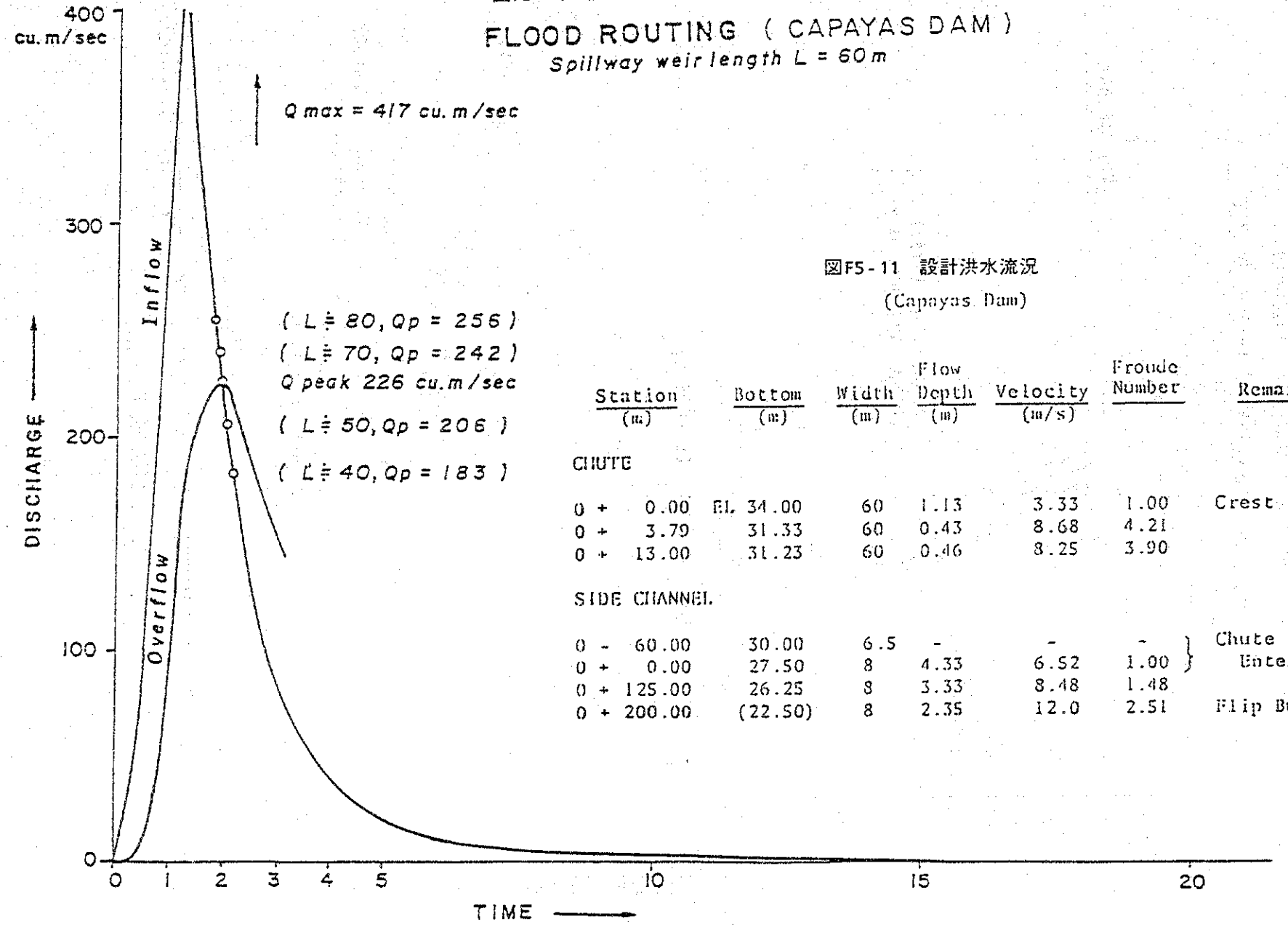
凡例：

TS	- 表土	EW	- 強風化
G	- 礫	MW	- 風化
GS	- 礫混じり砂	SW	- 弱風化
GSL	- 礫混じりシルト	Fr	- 新鮮岩
GC	- 礫混じり粘土	/	: 互層
SIS	- シルト混じり砂		
SC	- 砂混じり粘土		
SLC	- シルト混じり粘土		
Com	- 礫岩		
SS	- 砂岩		
SLS	- シルト岩		
CS	- 粘板岩		

図F5-9　築堤材料採取位置図



図F5-10　設計洪水流入・流下収支図

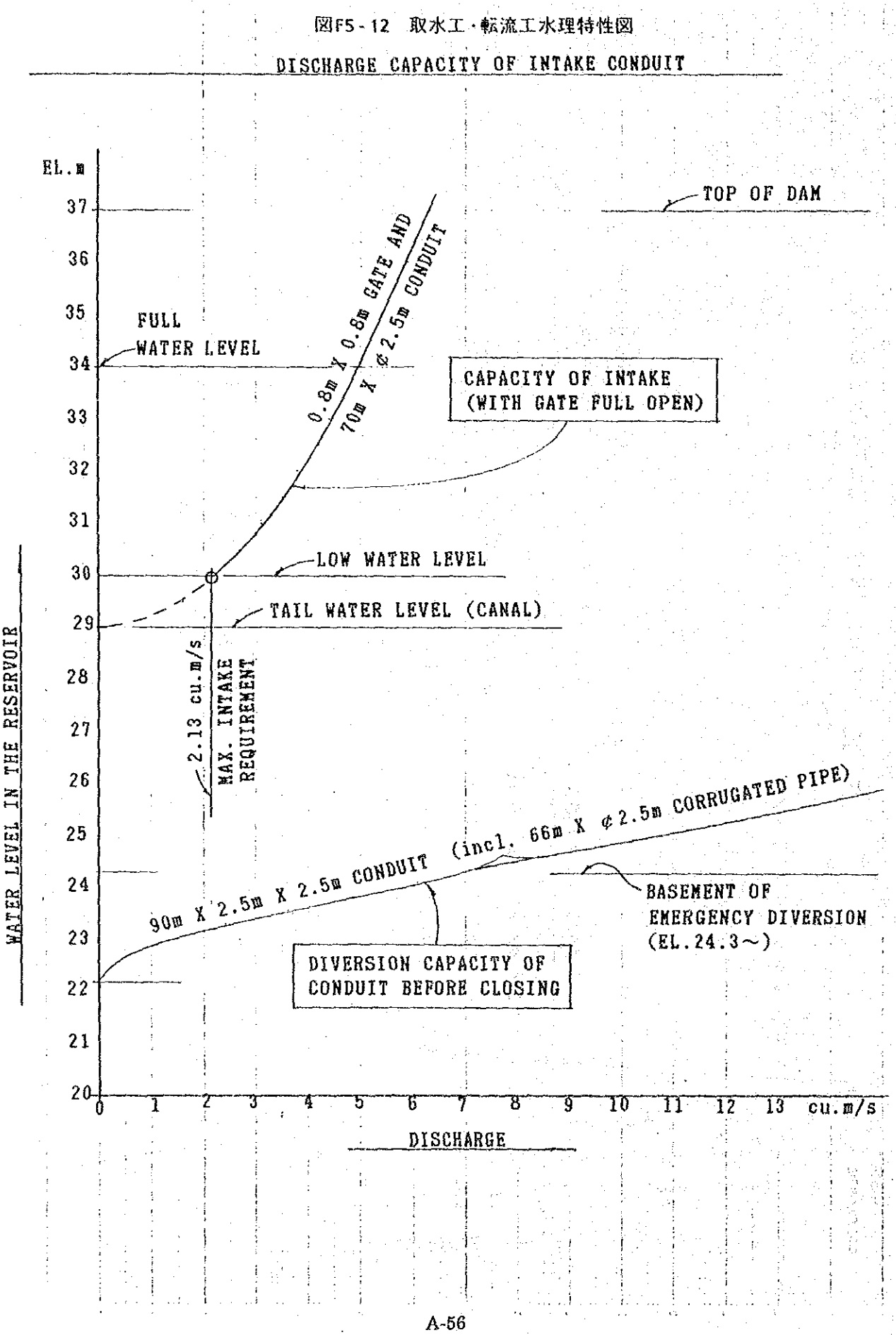


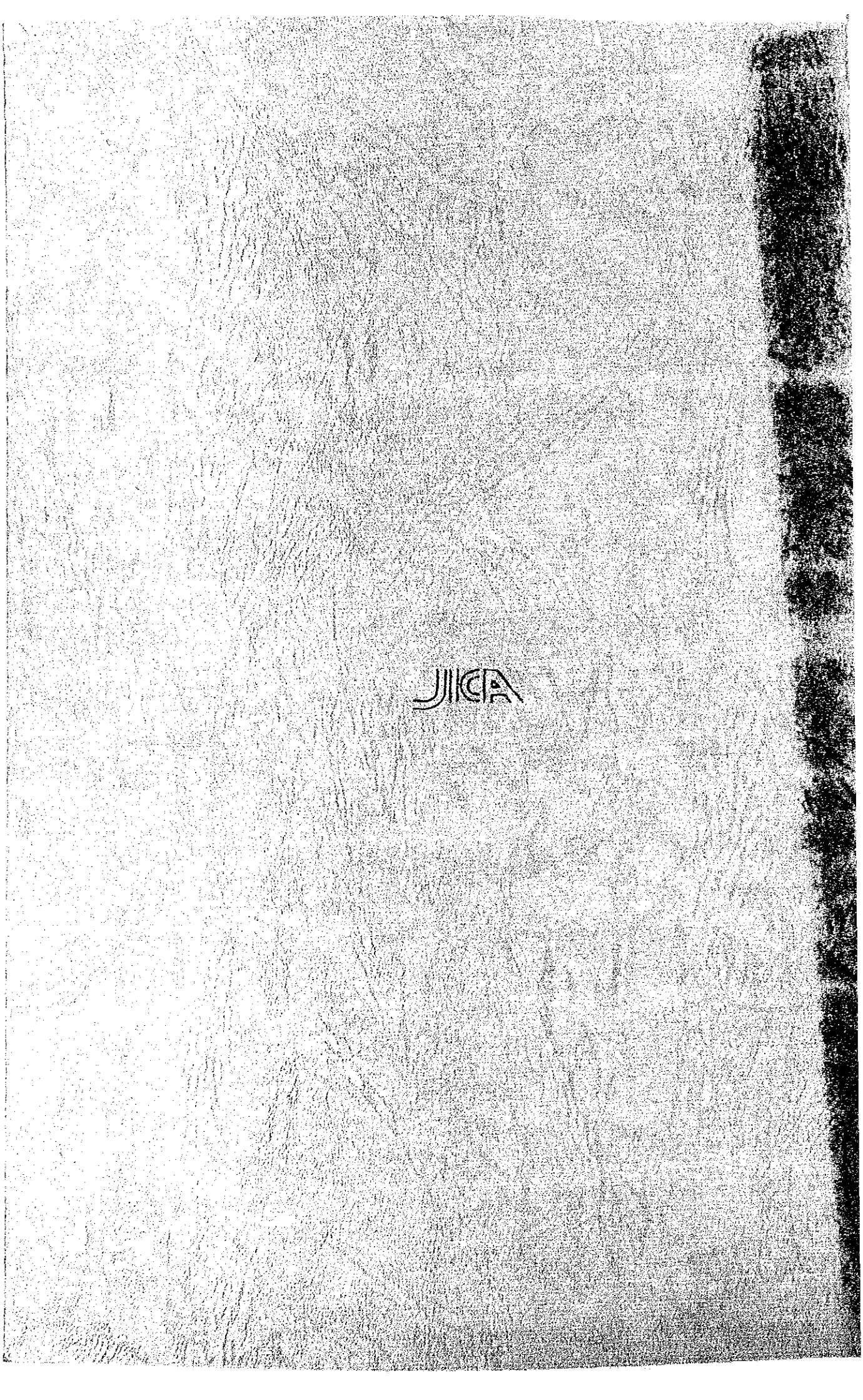
図F5-11　設計洪水流況

(Capayas Dam)

Station (m)	Bottom (m)	Width (m)	Flow Depth (m)	Velocity (m/s)	Froude Number	Remarks
CHUTE						
0 + 0.00	EL. 34.00	60	1.13	3.33	1.00	Crest
0 + 3.79	31.33	60	0.43	8.68	4.21	
0 + 13.00	31.23	60	0.46	8.25	3.90	
SIDE CHANNEL						
0 - 60.00	30.00	6.5	-	-	-	Chute Entered
0 + 0.00	27.50	8	4.33	6.52	1.00	Chute Entered
0 + 125.00	26.25	8	3.33	8.48	1.48	
0 + 200.00	(22.50)	8	2.35	12.0	2.51	Flip Bucket

図F5-12 取水工・転流工水理特性図

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