

Fig. 5-14 Rating curve at Tsialong

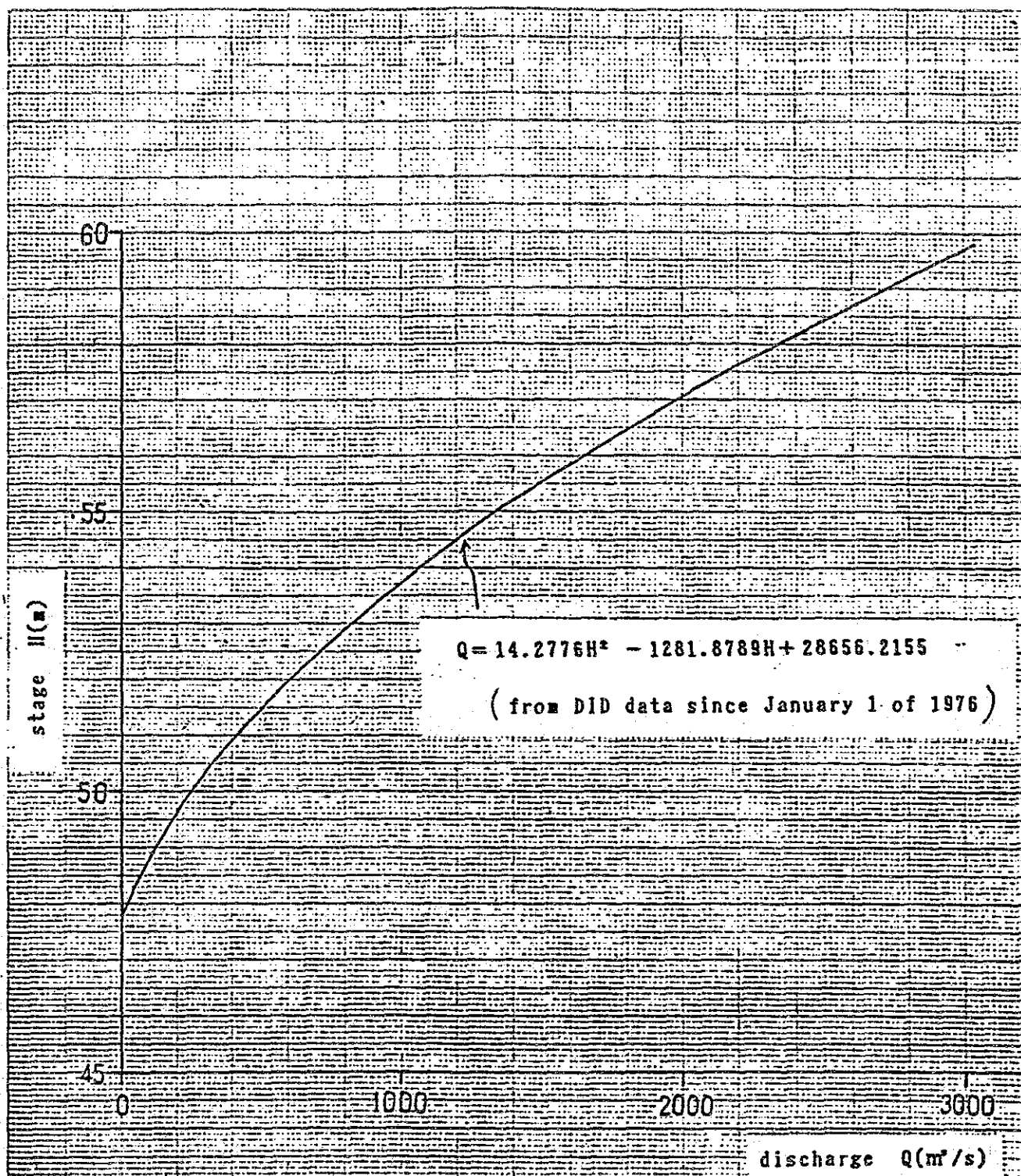


Fig.5-15 Rating curve at Bertan

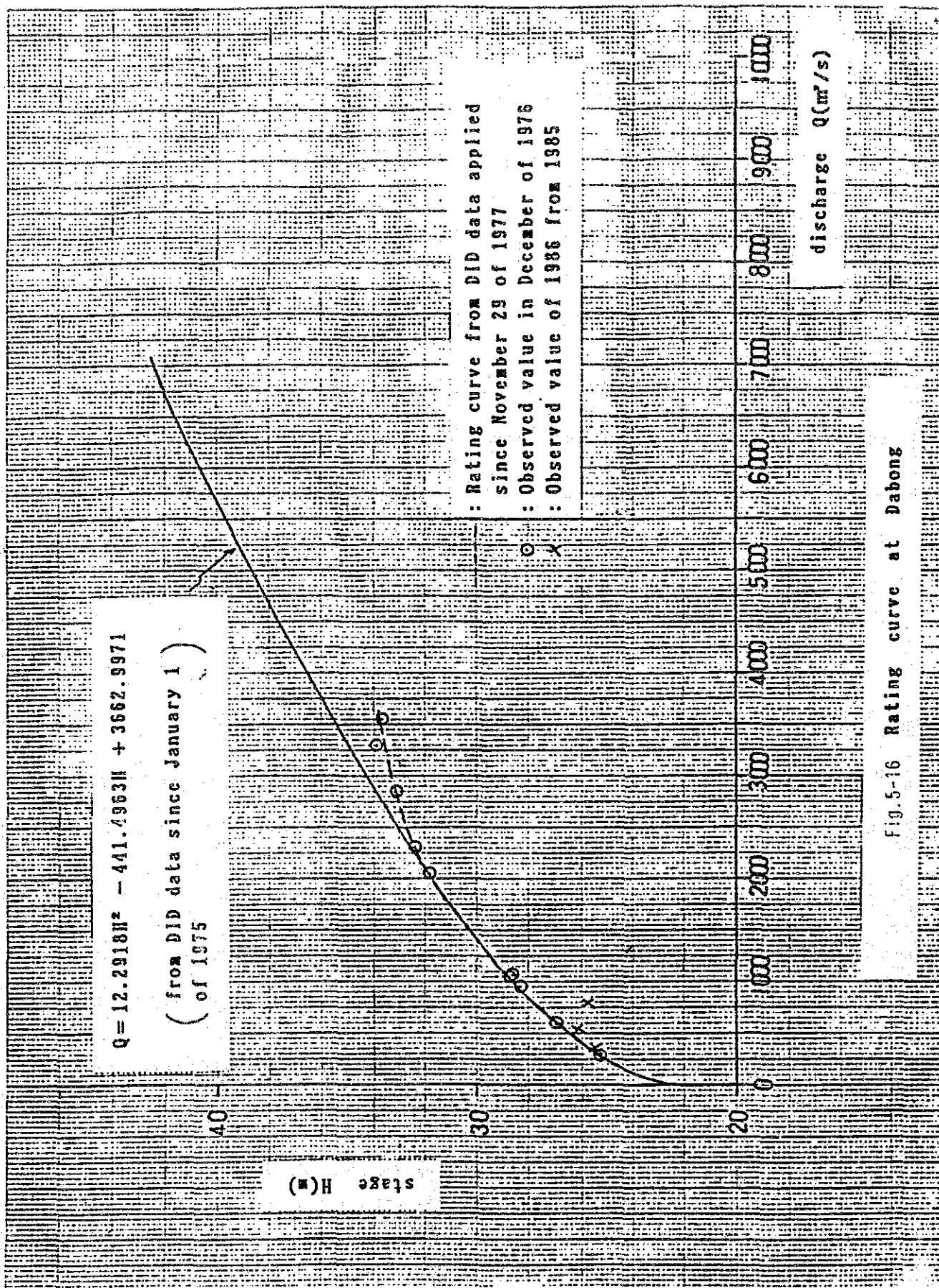


Fig.5-16 Rating curve at Dabong

-----: Rating curve from DID data applied since January 1 of 1970
 -----: Rating curve from DID data applied since January 1 of 1980
 ○ : Observed value in 1965 and 1985

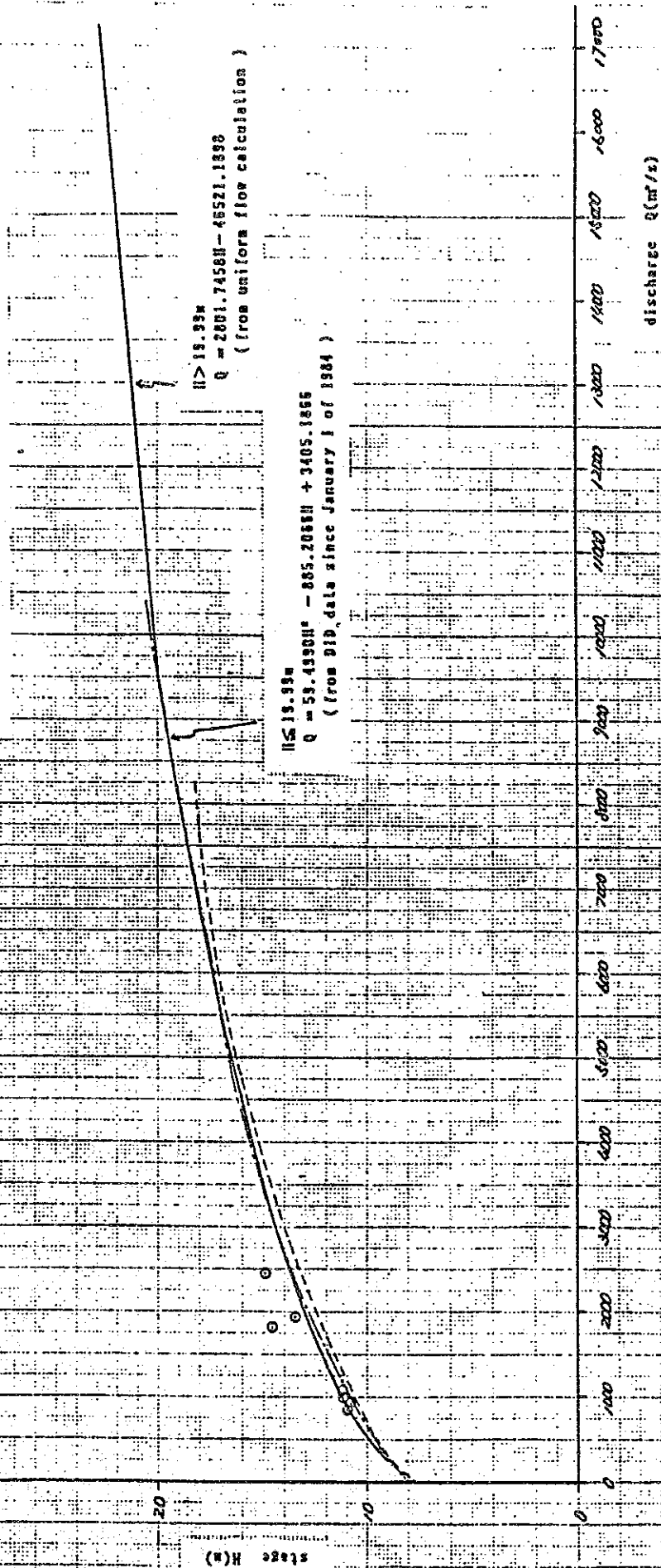


Fig. 5-17 RATING CURVE AT GUILLEMARD BRIDGE

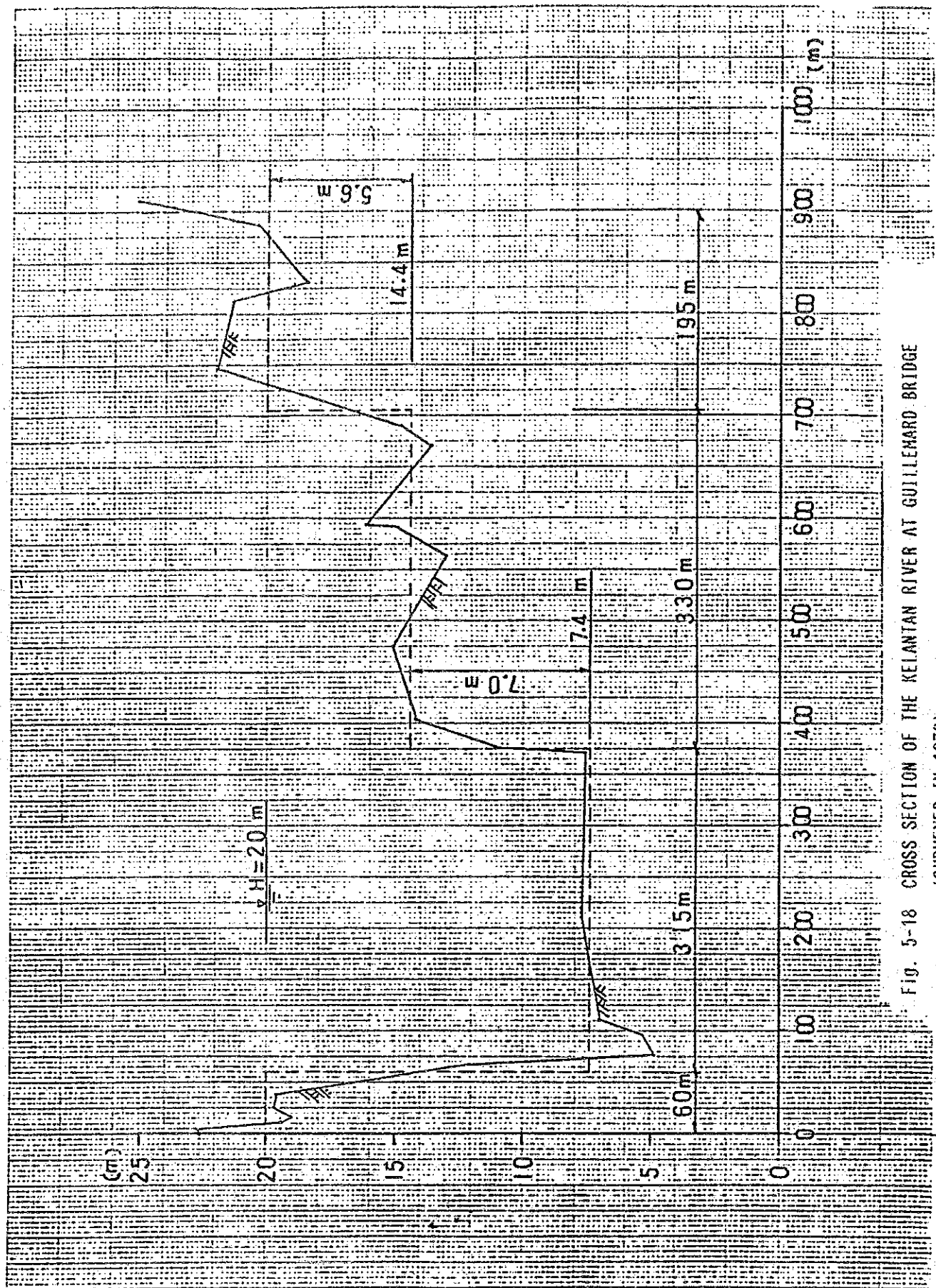


Fig. 5-18 CROSS SECTION OF THE KELANTAN RIVER AT GUILLEMAR BRIDGE
(SURVEYED IN 1976)

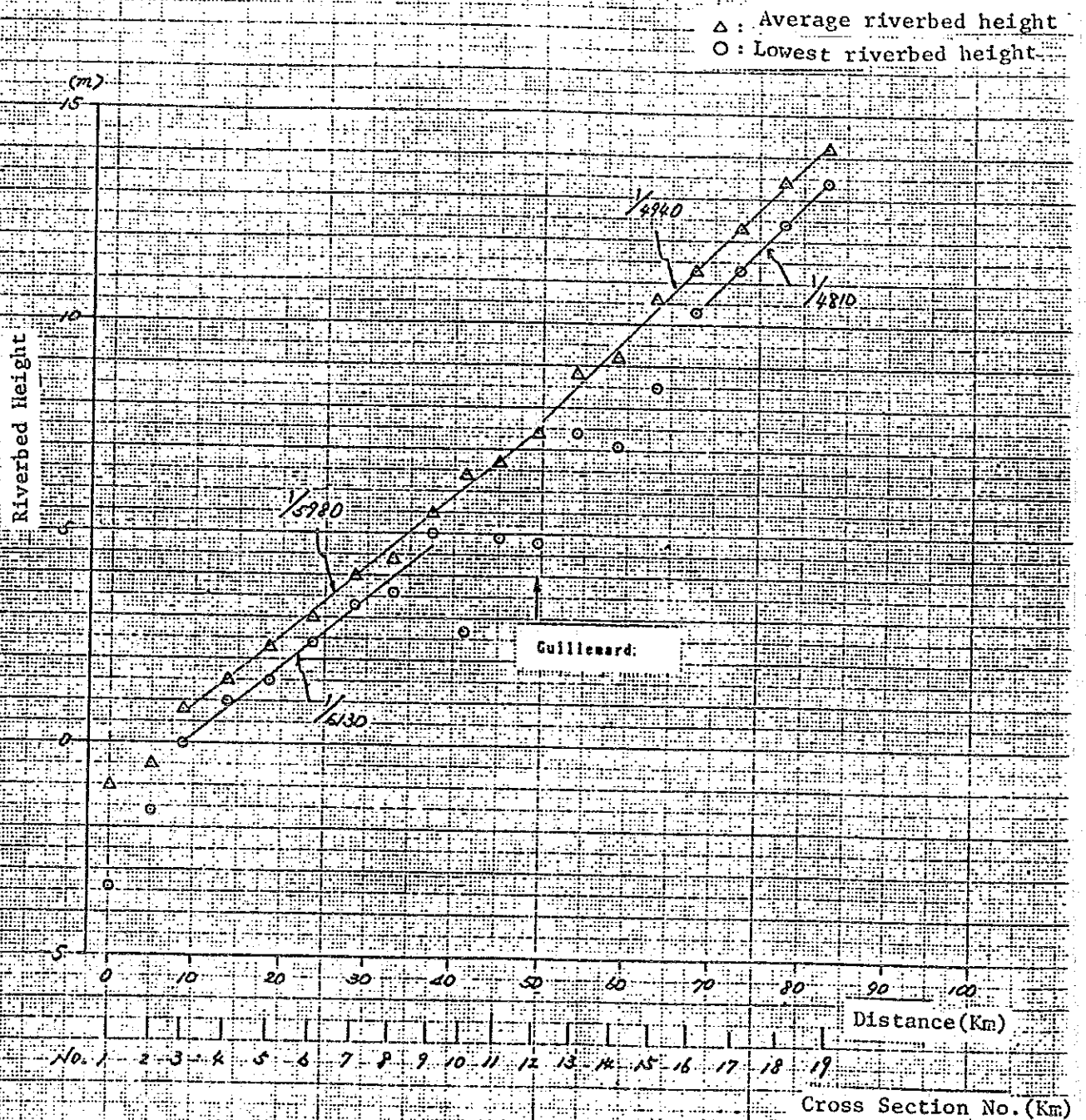
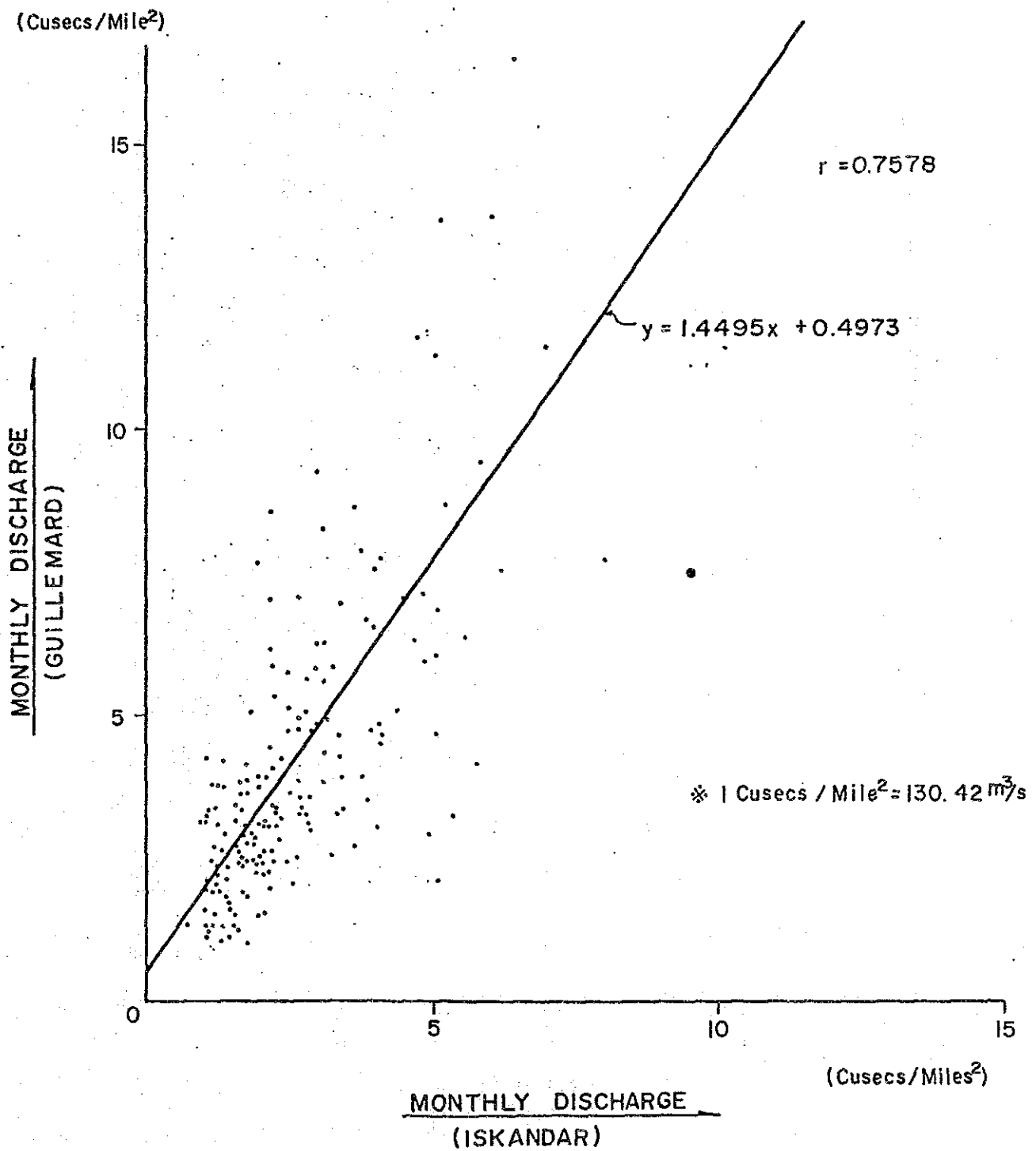


Fig.5-19 Kelantan Riverbed Profile (surveyed in 1976)

○



Fig. 5-21 RELATIONSHIP BETWEEN GUILLEMARD AND ISKANDAR
OF MONTHLY DISCHARGE (JAN ~ DEC)



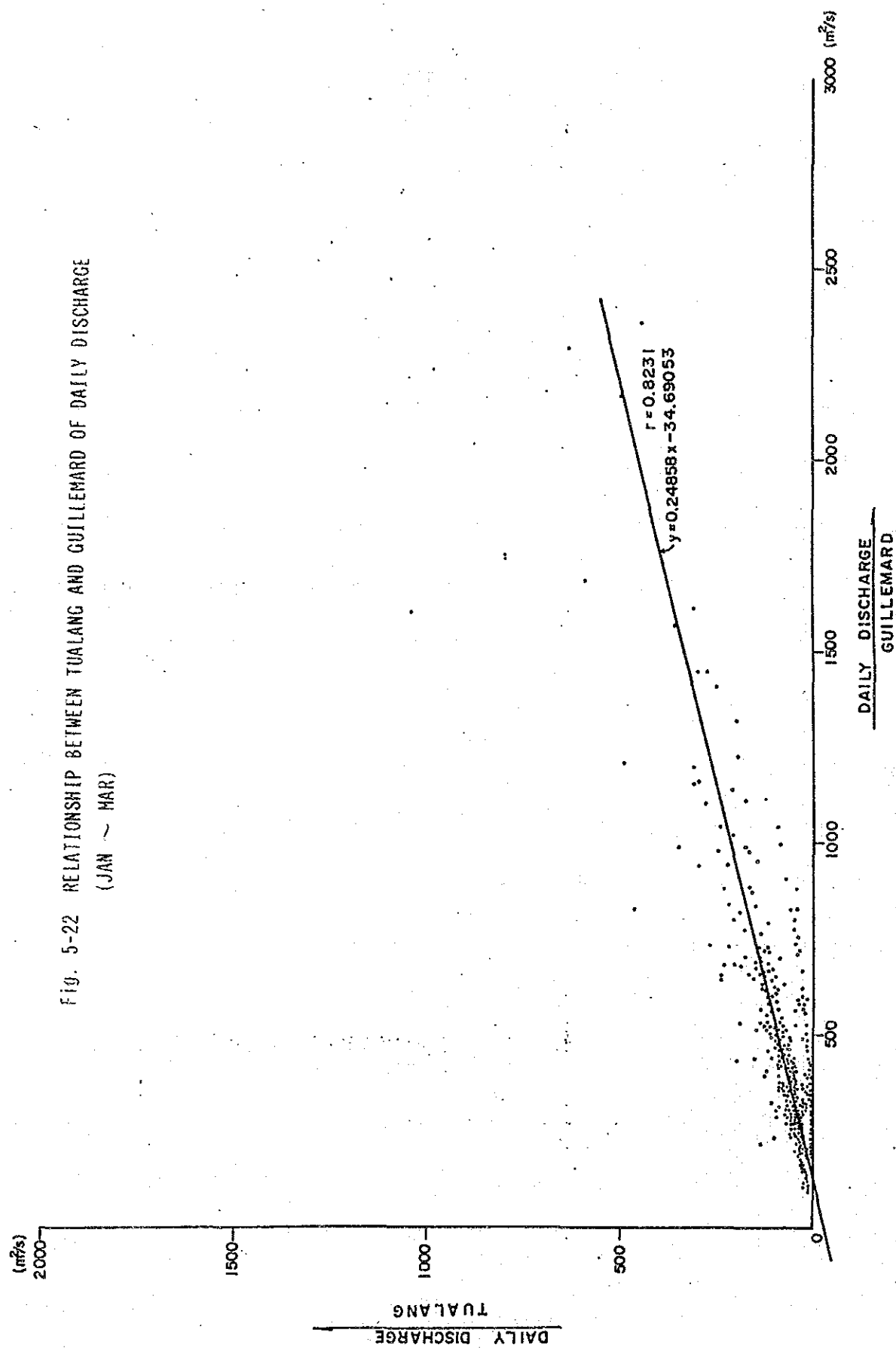


Fig. 5-22 RELATIONSHIP BETWEEN TUALANG AND GUILLEMARD OF DAILY DISCHARGE
(JAN ~ MAR)

FIG. 5-23 RELATIONSHIP BETWEEN TUALANG AND GUILLEMAUD OF DAILY DISCHARGE
(APR ~ SEP)

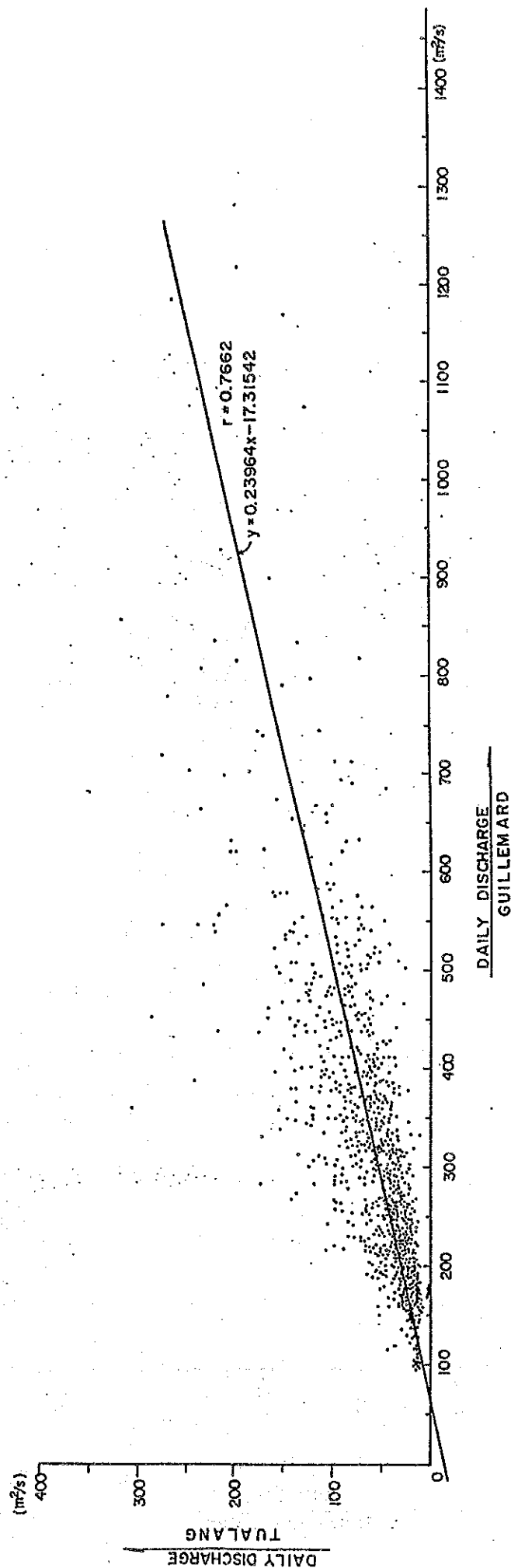


Fig. 5-24 RELATIONSHIP BETWEEN TUALANG AND GUILLEMAND OF DAILY DISCHARGE
(OCT ~ DEC)

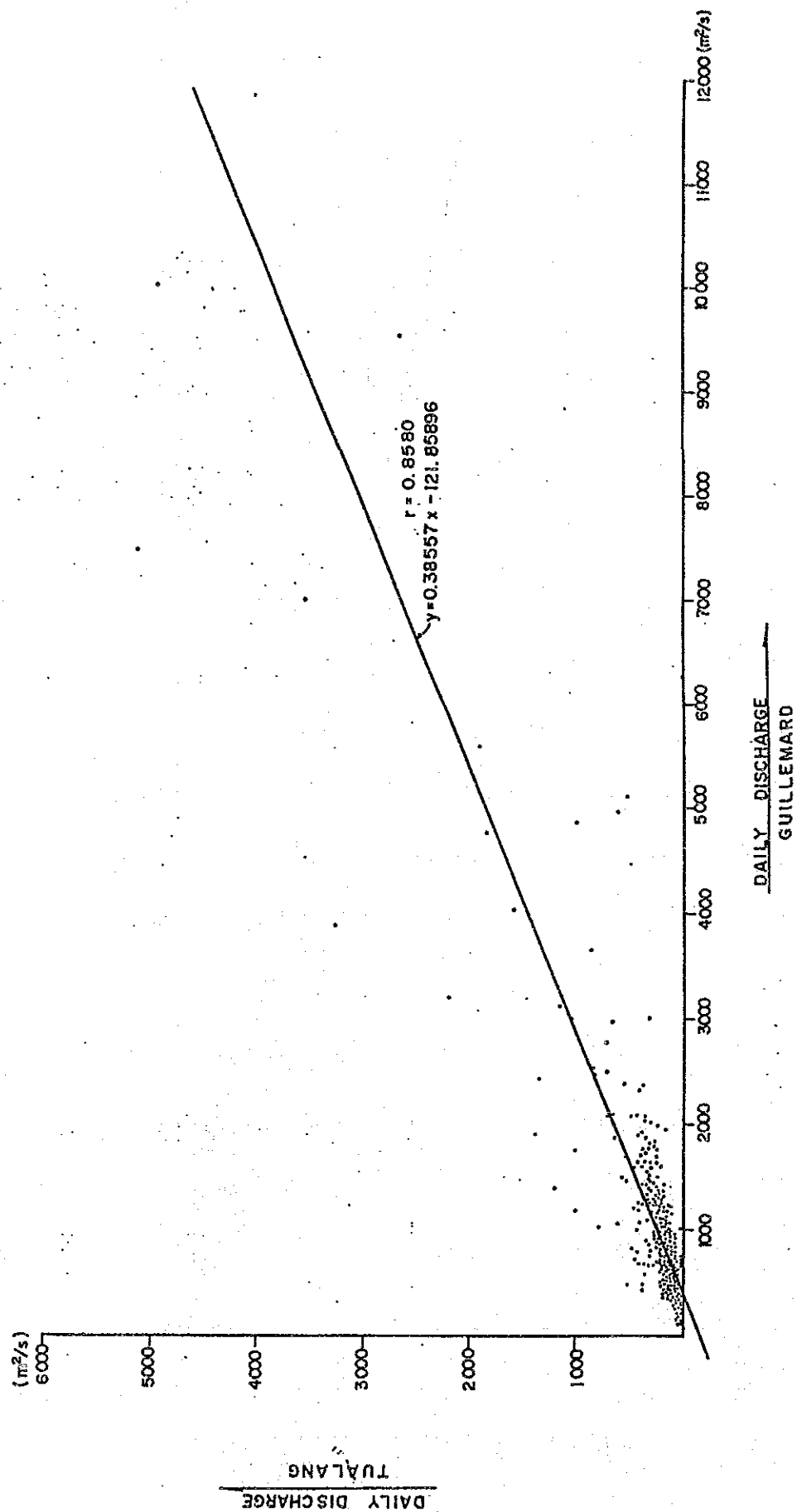


Fig. 5-25 10-DAY DISCHARGE AT GUILLEMARD BRIDGE WITHOUT LESIR DAM

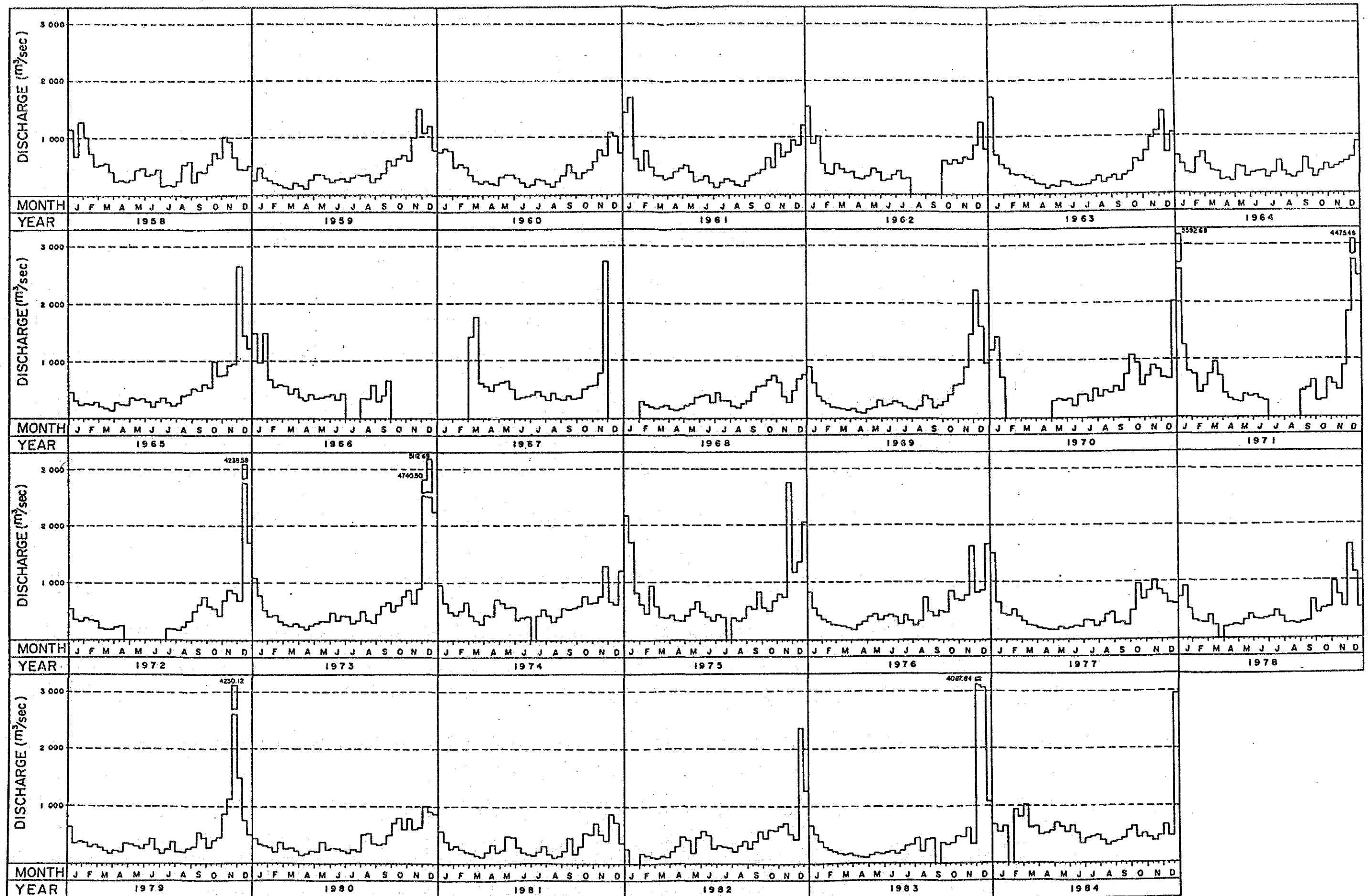


Fig.5-26 10-DAY DISCHARGE AT GUILLEMERD BRIDGE AFTER COMPLETION OF LEBIR DAM WITH DAILY DISCHARGE OF 70 CMS

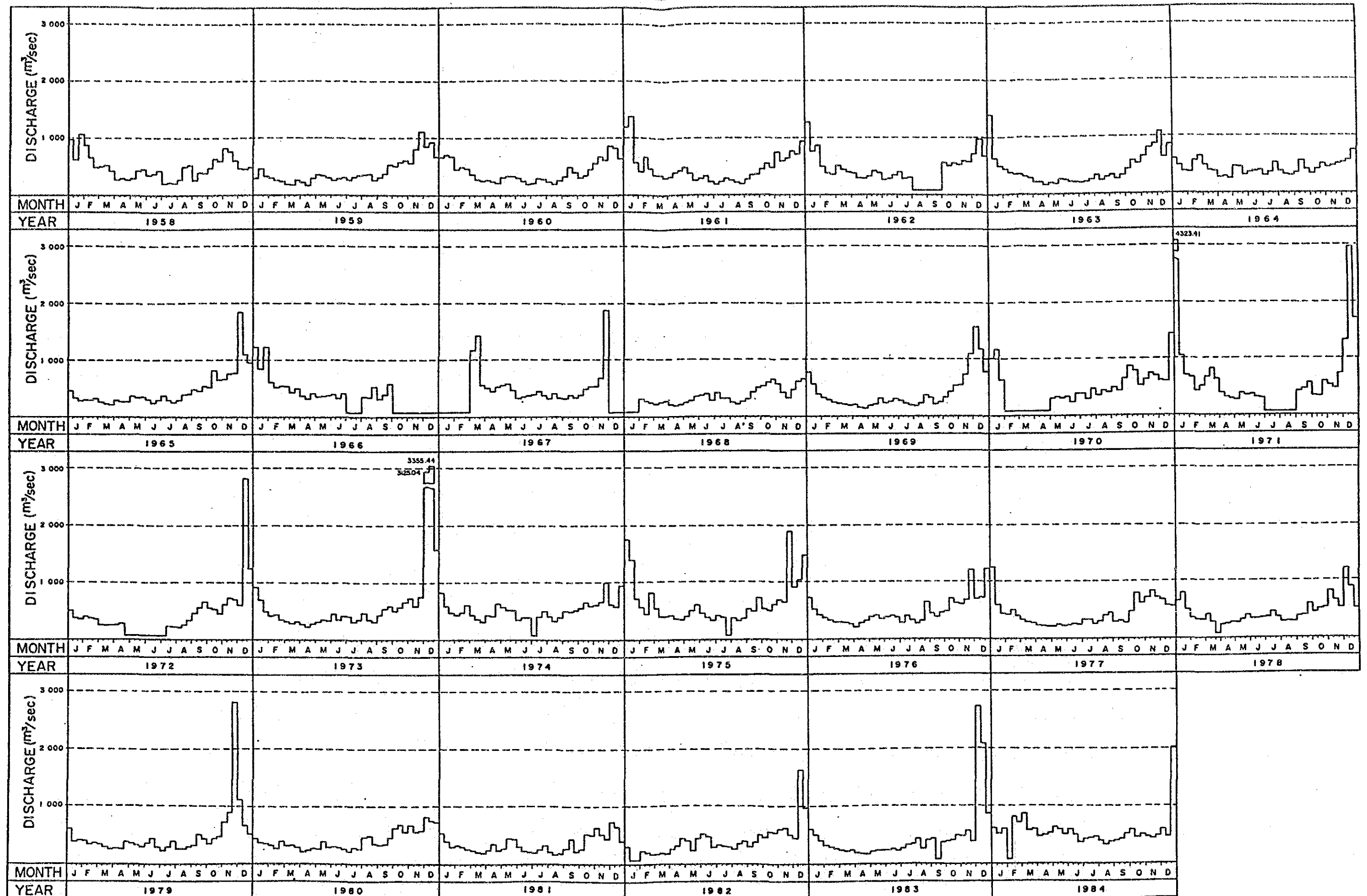


Fig.5-27 10-DAY DISCHARGE AT GUILLEMARD BRIDGE AFTER COMPLETION OF LEBIR DAM WITH DAILY DISCHARGE OF 80 CMS

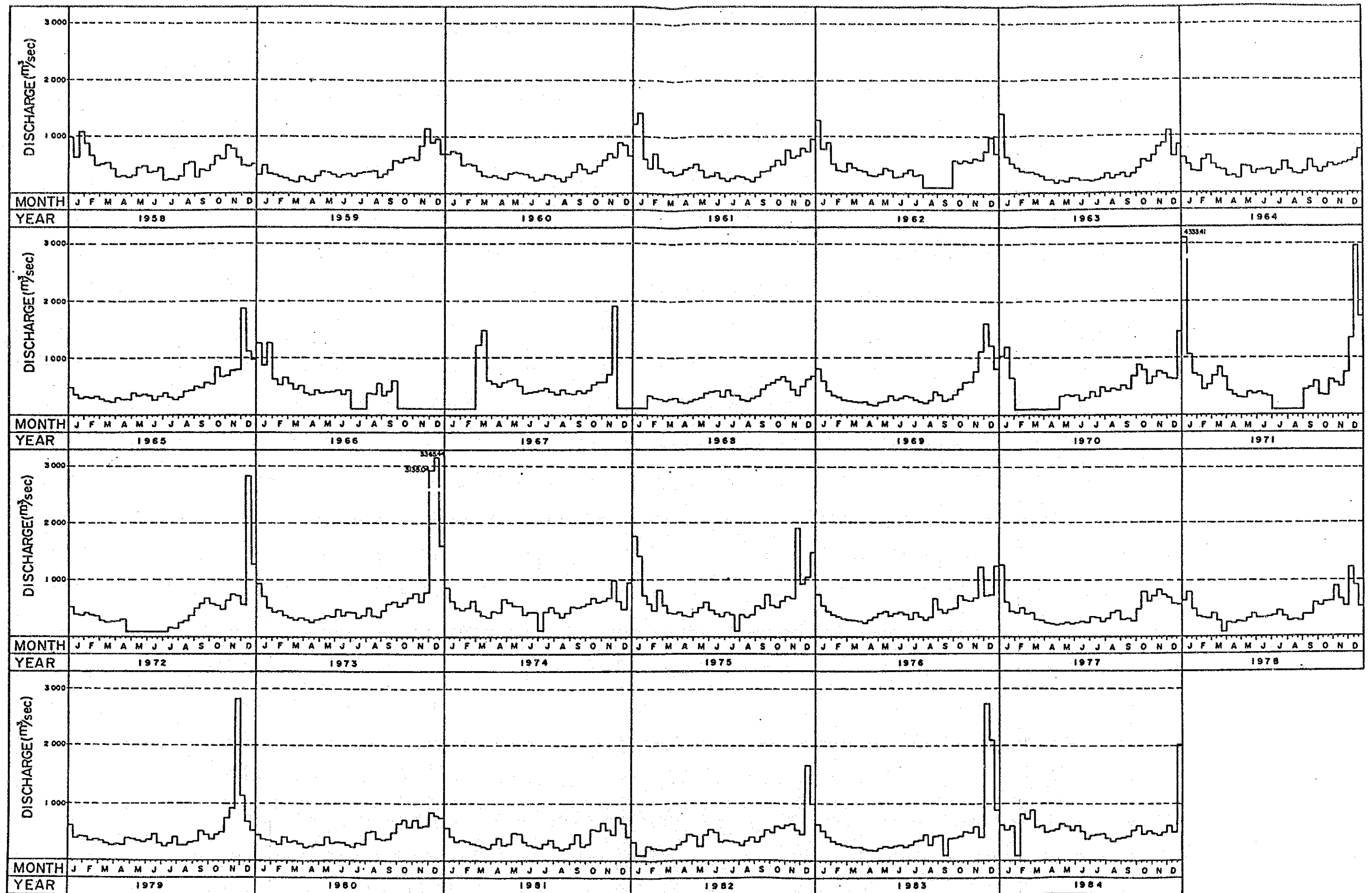
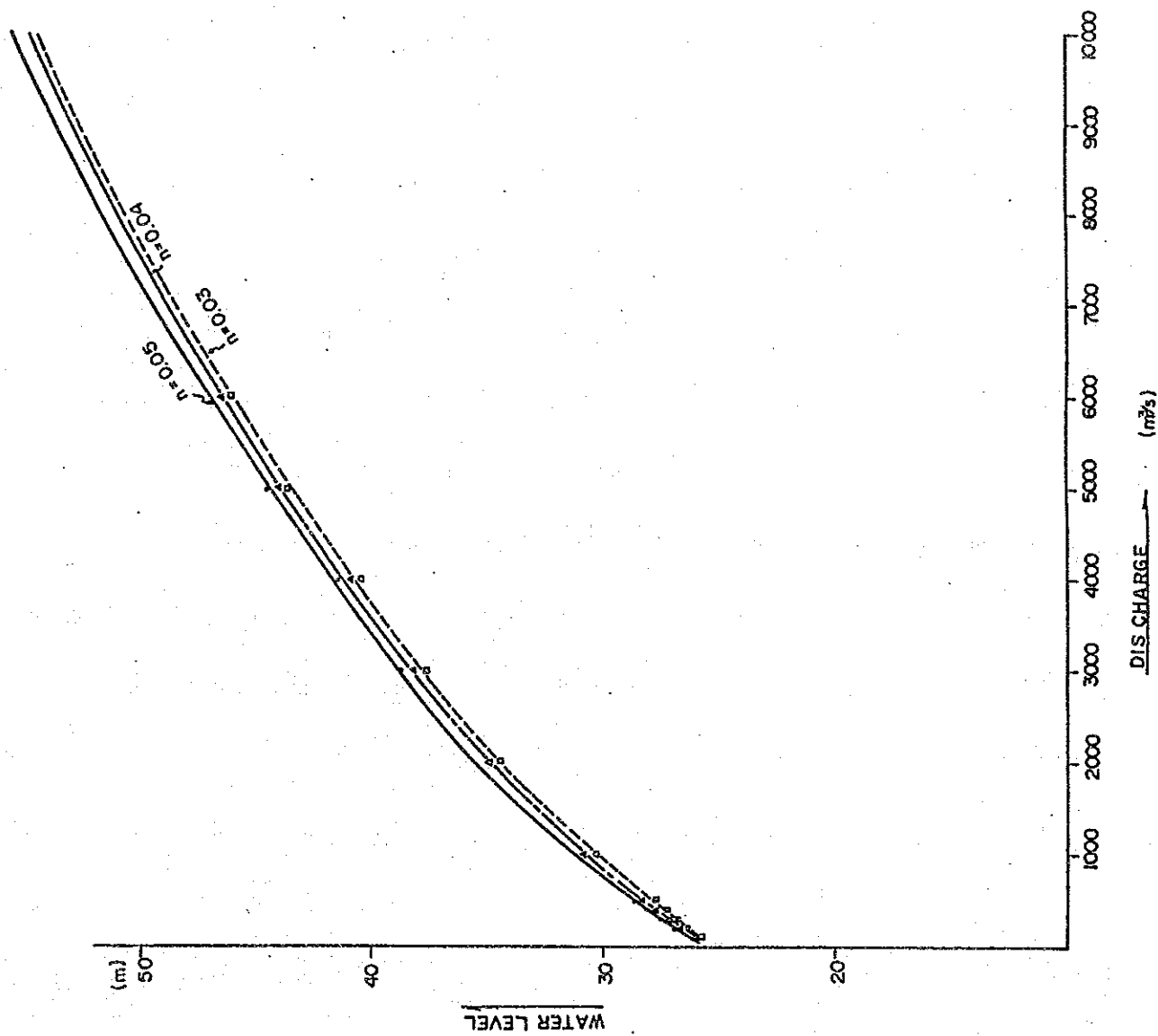


Fig. 5-28 WATER LEVEL AT DAM DOWNSTREAM (TAILRACE OUTLET) V.S. RIVER DISCHARGE



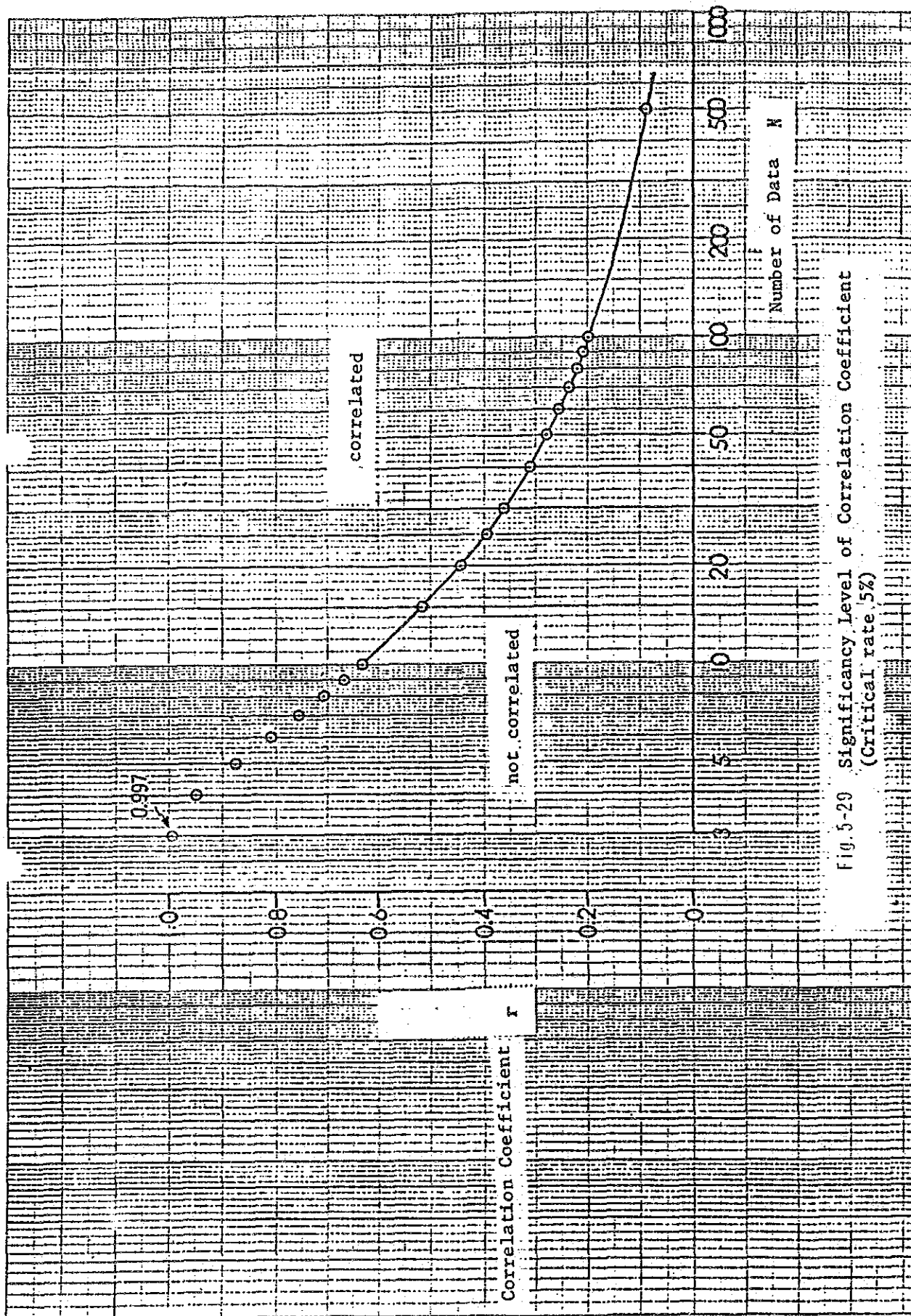


Fig. 5-29 Significance Level of Correlation Coefficient
(Critical rate 5%)

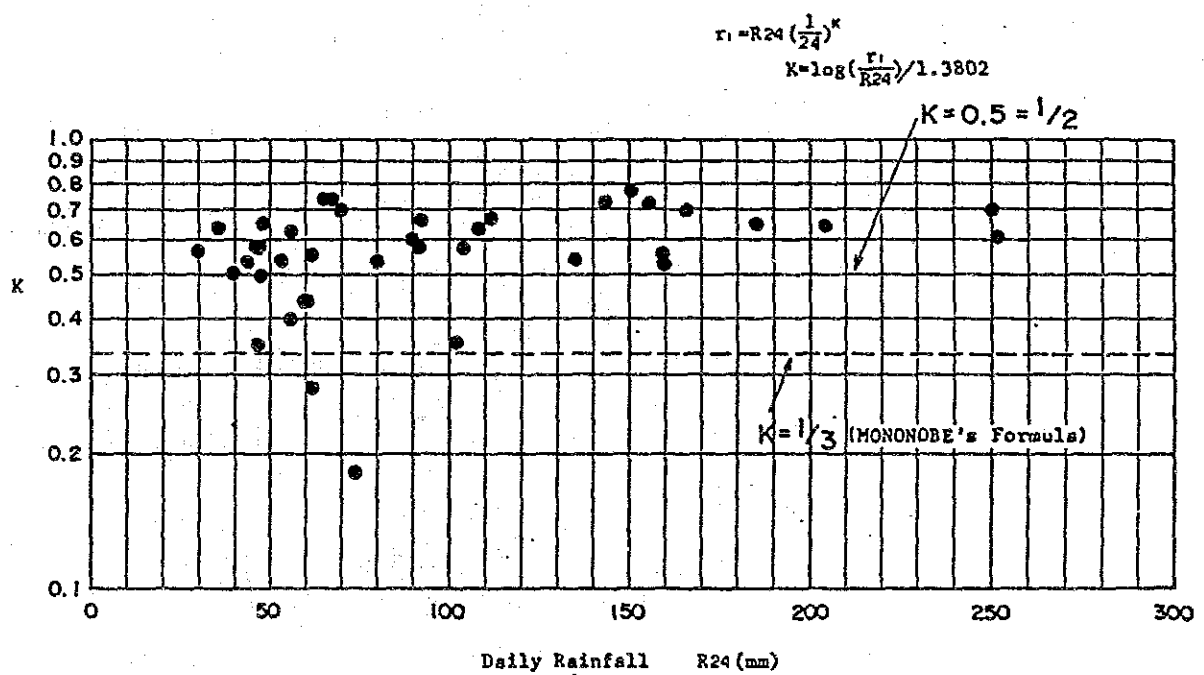


Fig.5-30 RELATIONSHIP BETWEEN DAILY RAINFALL AND PEAK HOURLY RAINFALL

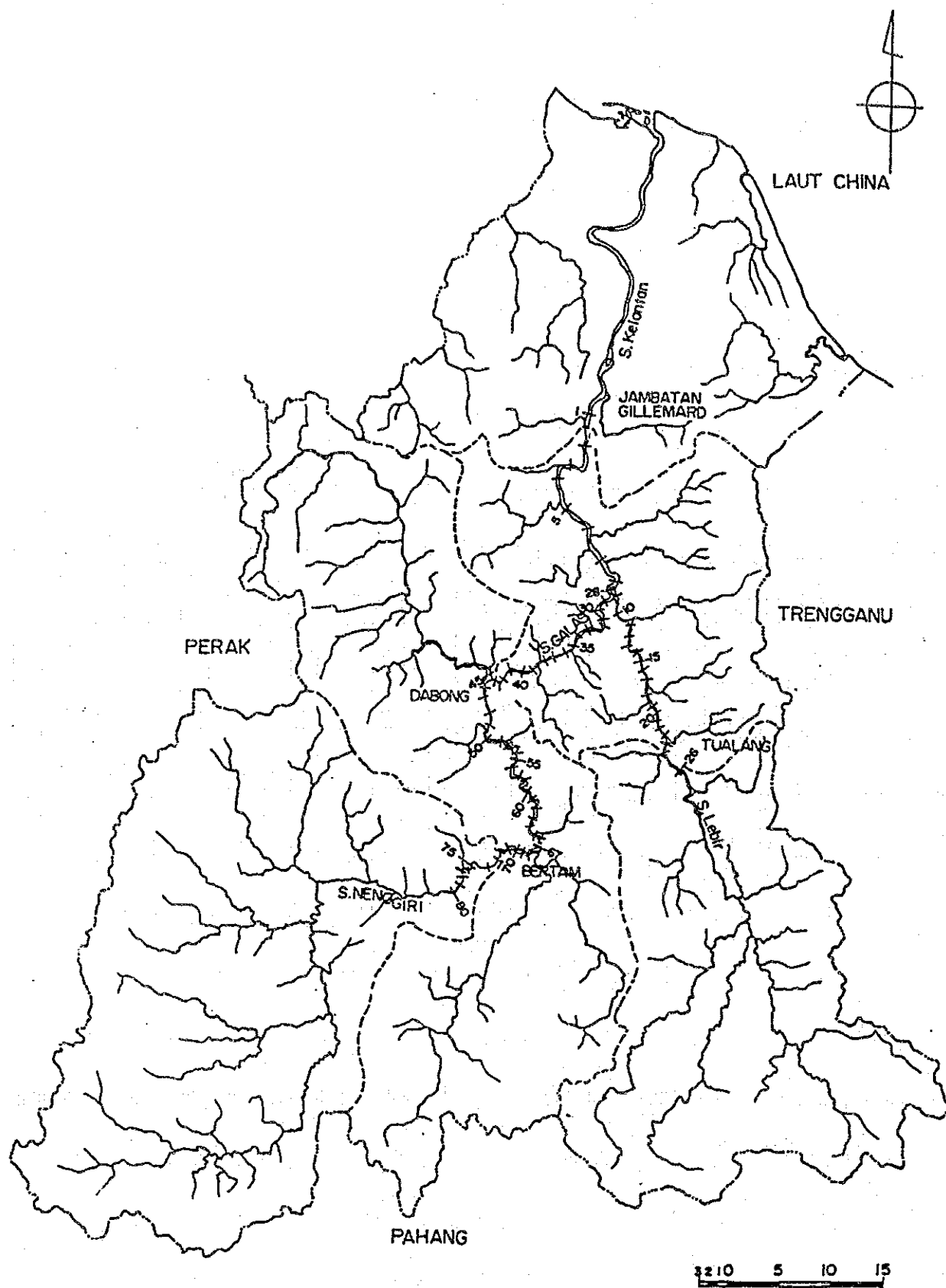


Fig.5-31 LOCATION OF RIVER CROSS SECTION ADOPTED

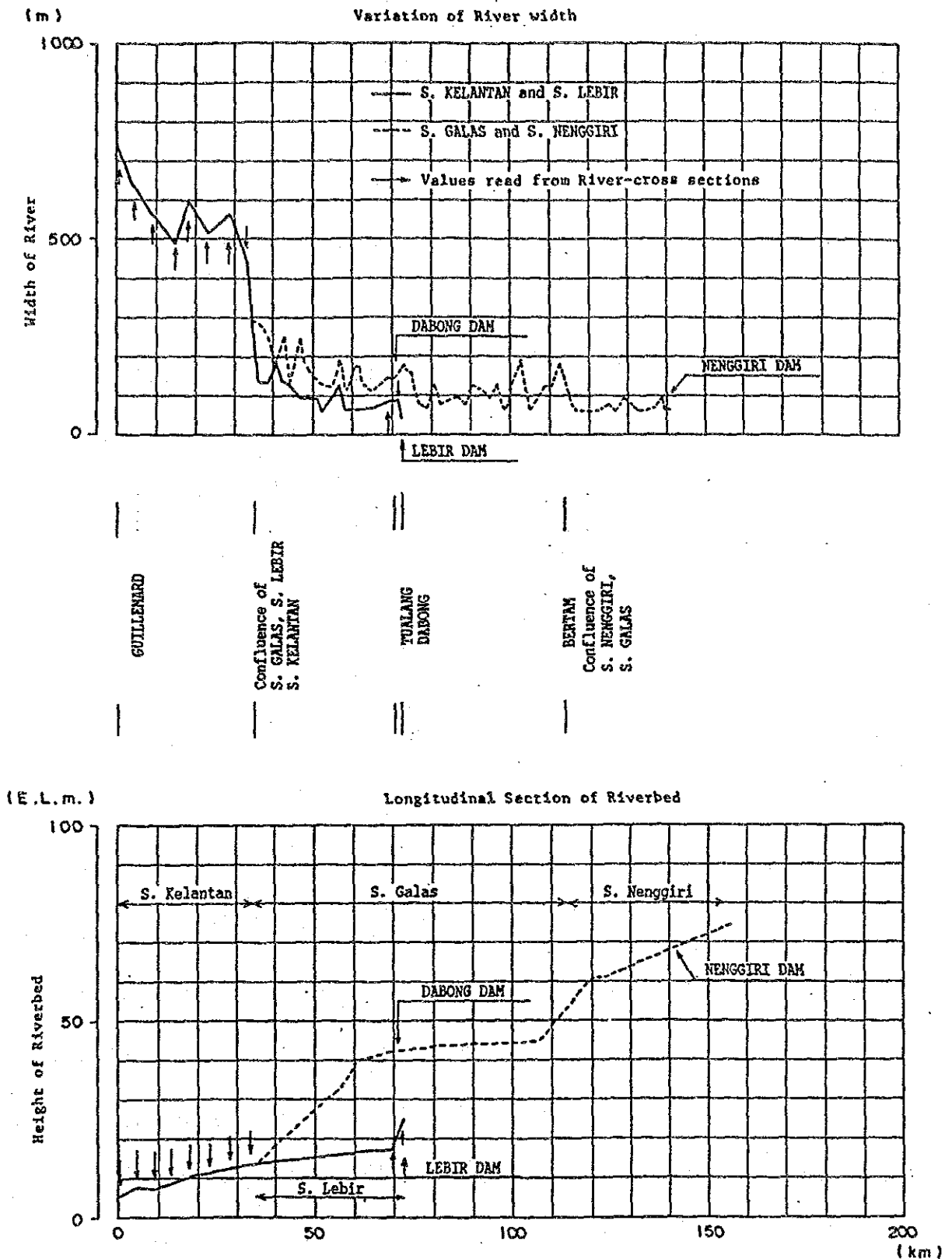


Fig. 5-32 LONGITUDINAL SECTION OF RIVERBED
VARIATION OF RIVER WIDTH

(Kelantan River. Lev Lebri River. Galas River. Nenggiri River)

Fig.5-33 Simulation of Flood with 10000-Year Probable Rainfall

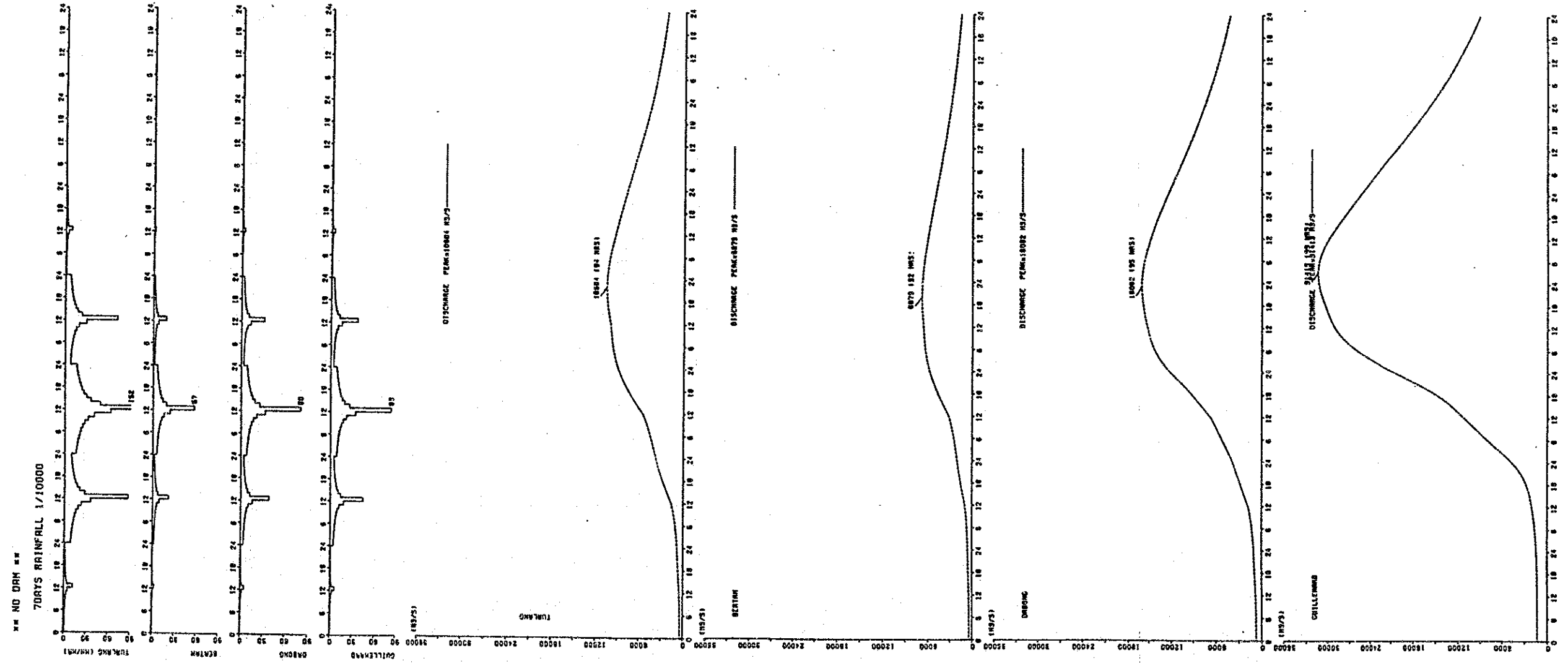


Fig. 5-34 Simulation of Flood with 1000-Year Probable Rainfall

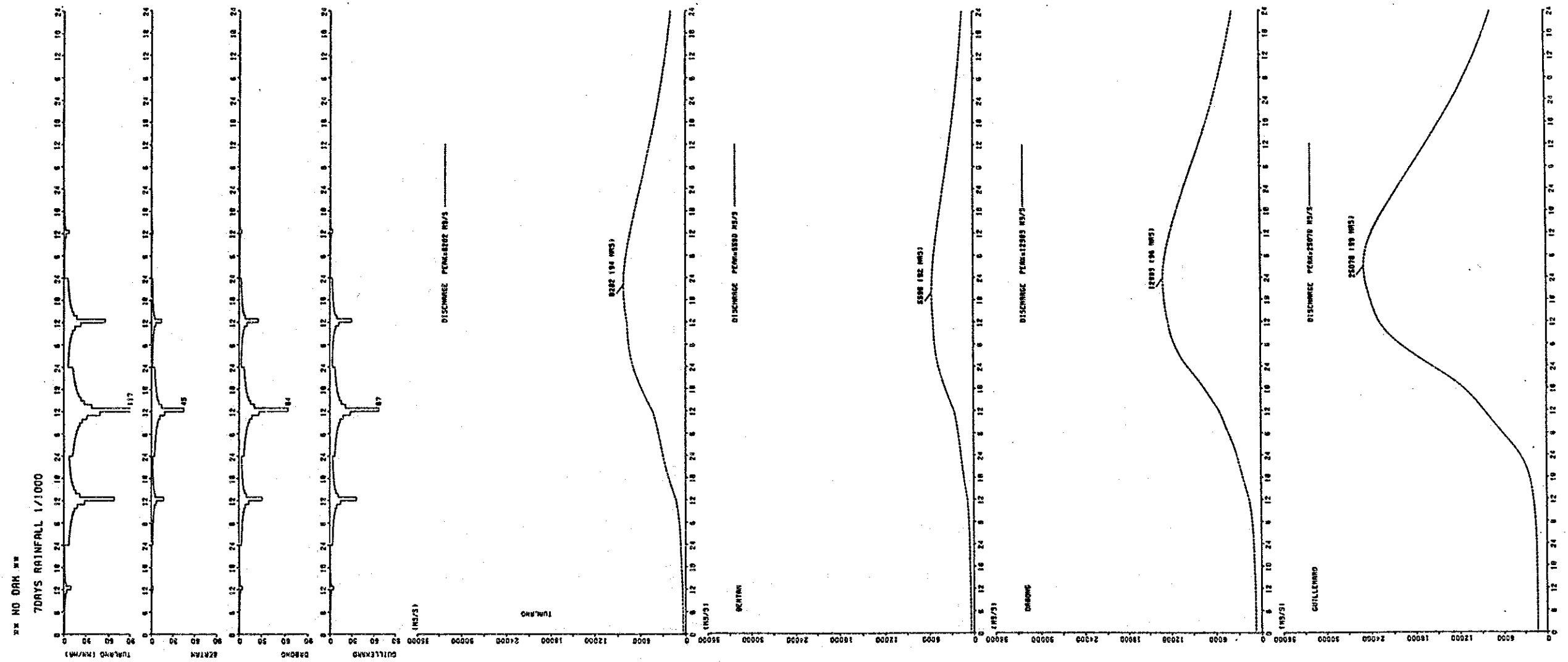


Fig. 5-35 Simulation of Flood with 50-Year Probable Rainfall

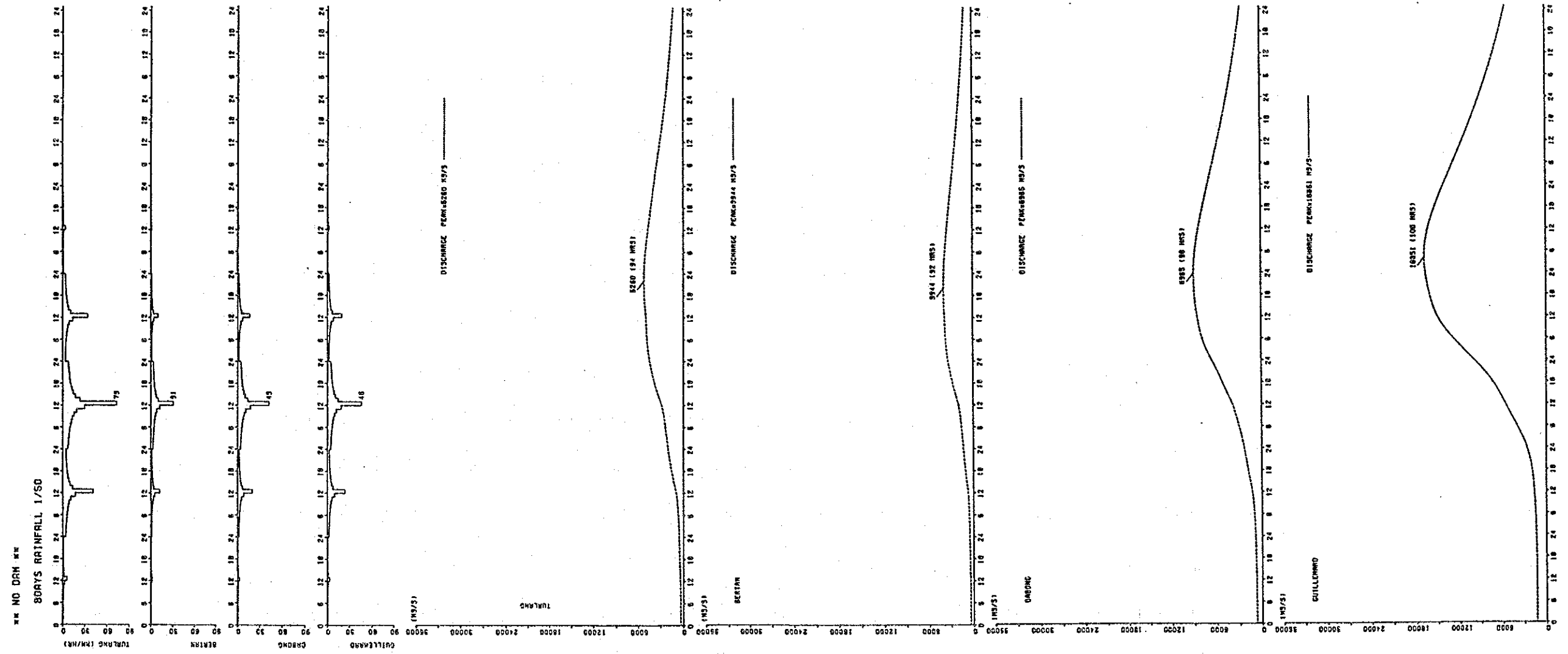
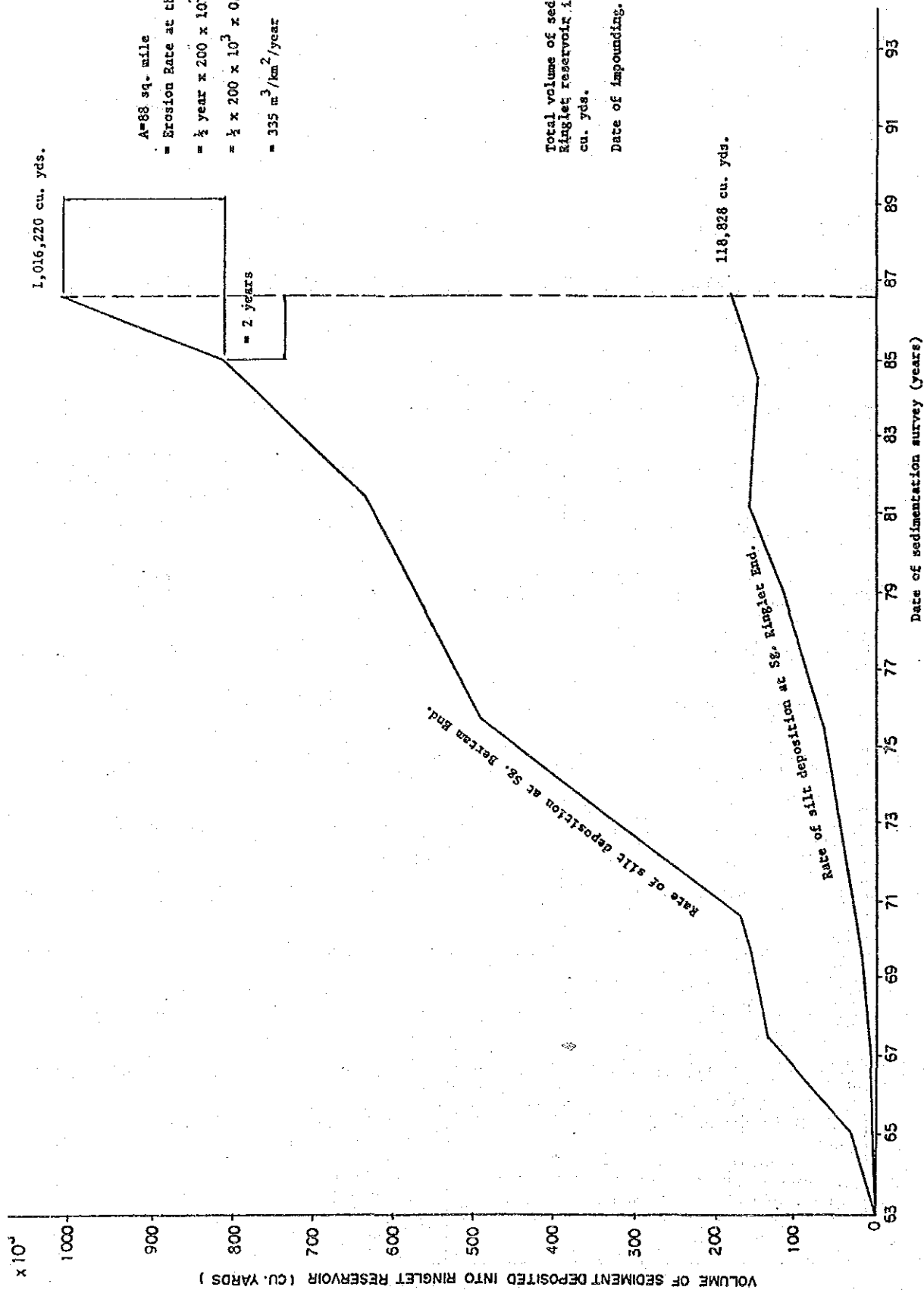




Fig.5-36 Ringleet Falls Reservoir Sedimentation Survey



A=88 sq. mile

= Erosion Rate at the Basin

= $\frac{1}{2}$ year $\times 200 \times 10^3$ cu. yards/88 sq. mile

= $\frac{1}{2} \times 200 \times 10^3 \times 0.764 / (88 \times 2.589) \text{ m}^3 / \text{km}^2 / \text{year}$

= $335 \text{ m}^3 / \text{km}^2 / \text{year}$

Total volume of sediment deposited into Ringlet Reservoir is approx. 1,200,000 cu. yds.

Date of Impounding, 1963

Fig. 5-37 SEDIMENT SURVEY AT RINGLET FALLS RESERVOIR

Table 5 - 1 CORRESPONDING MONTHLY AVERAGE DISCHARGES AT GUILLEMARD BRIDGE AND TUALANG GAUGING STATION

	APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		JAN		FEB		MAR	
	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T	G-B	T
1976	248.0	27.22	396.0	67.36	408.0	84.74	329.0	64.35	441.0	93.07	457.0	101.14	675.0	121.05	1031.0	169.16	1139.0	241.93	851.0	158.04	446.0	53.10	261.0	37.87
1977	177.0	15.96	179.0	17.22	207.0	19.10	286.0	30.72	379.00	72.88	266.0	49.23	715.0	136.94	952.00	131.10	665.0	100.67	746.0	123.91	304.0	37.93	217.00	24.72
1978	206.00	21.00	320.0	49.57	334.0	55.06	402.0	74.27	241.0	45.60	472.17	78.14	484.39	124.51	759.06	166.55	1084.53	231.87	462.98	74.10	339.81	43.26	240.50	29.30
1979	272.19	36.33	305.47	41.48	348.33	44.45	287.37	30.95	229.20	26.96	431.38	74.25	383.19	75.79	2078.72	735.52	912.78	176.19	363.07	61.84	287.85	57.33	292.56	41.58
1980	245.22	36.02	288.48	56.35	280.71	42.27	212.44	32.74	468.57	98.60	583.53	121.42	928.2	204.94	1012.51	228.20	862.24	216.68	410.84	89.58	263.04	54.12	157.41	27.63
1981	254.66	49.96	402.28	84.61	213.58	41.78	226.51	47.69	130.15	20.09	285.75	46.39	446.23	122.45	547.23	80.16	646.51	132.60	268.56	30.62	134.87	17.64	114.26	15.94
r	0.8006		0.9534		0.8606		0.7497		0.9821		0.9442		0.8905		0.9708		0.9176		0.96644		0.677		0.9032	
a	2.3038		2.9252		3.1787		2.7676		3.9355		3.8975		4.3629		2.1291		3.2945		4.8771		4.6473		6.5246	
b	162.2383		151.107		146.342		161.0645		80.5257		110.2972		34.0651		526.6534		281.0556		79.6873		91.9293		21.2589	

$y = ax + b$

$$Y = ax + b \text{ (Y: TUALANG, X: GUILLEMARD)}$$

	r	a	b
JAN ~ MAR	0.9588	4.9521	73.0062
APR ~ SEP	0.9369	0.2492	-24.3265
OCT ~ DEC	0.9308	3.7283	195.0837
JAN ~ DEC	0.9399	0.2829	-41.0378

Table 5-4 ANNUAL MAX. DISCHARGE RECORDED AT GUILLEHARD BRIDGE

No.	Year	Annual max discharge	remark	No.	Year	Annual max discharge	remark
		m ³ /sec				m ³ /sec	
1	1940	2030		24	1964	1610	} a
2	1942	11480		25	1965	6170	
3	1943	4630		26	1966	16000	
4	1944	5230		27		18000	d
5	1945	12850		28	1967	8280	} a
6	1946	3970		29	1968	1700	
7	1947	13580		30	1969	6650	
8	1948	3420		31	1970	8800	
9	1949	7050		32	1971	5550	
10	1950	8090		33	1972	10260	
11	1951	2600	} a	34	1973	11130	} b
12	1952	1970		35	1974	4490	
13	1953	4060		36	1975	5247	
14	1954	4550		37	1976	2610	
15	1955	2310		38	1977	2525	
16	1956	3580		39	1978	3291	} c
17	1957	6050		40	1979	10400	
18	1958	1500		41	1981	2028	
19	1959	3440		42	1982	7172	
20	1960	3610		43	1983	12007	
21	1961	2700		44	1984	7744	b
22	1962	3410		45	1985	1722	} c
23	1963	2790			1986	6901	

a : ENEX REPORT : Inter Report on River Hydro Copy Aug. 1976

b : DID Data

c : JICA RATING CURVE

d : This Study

Table 5-5 PEAK DISCHARGES OF THE FLOOD RECORDED
BOTH AT TUALANG AND GUILLEMARD BRIDGE

year	Guillemard	Tualang	Remark
	m ³ /sec	m ³ /sec	
1926	27,000	7,500	} a
1931	17,500	4,500	
1967	18,000	4,200	
	(16,000)		c
1973	11,180	3,700	} a
1974	3,910	470	
1975(Jan.)	4,490	820	
1975(Nov.)	5,450	2,440	
1975(Dec.)	4,890	850	} b
1976	2,610	951	
1977	2,525	661	
1978	3,291	1,190	
1979	10,400	5,322	
1981	2,028	536	
1982	7,172	3,518*	
1983	12,007	3,900	
1984	7,744	3,430	

* : Daily discharge

a : ENEX REPORT Interim Report River

Hydro Copy Aug. 1976

b : DID Data

c : This Study

Table 5-6 Stage - Discharge Table (Tualang Site) Upper: Water Stage(mm)
(applied since January 1, 1976) Lower: Discharge(ltr./sec)

SITE: 5222452													
RATING APPLIES FROM : 760101													
NUMBER OF DATUM PAIRS: 95													
16000	21660	21715	21765	21816	21866	21913	21962	22003	22042	22087	22128	22174	22214
0	4000	4400	5370	6220	7241	8501	9521	11441	13482	14902	16745	18745	20745
22168	22205	22239	22270	22303	22345	22410	22442	22479	22540	22570	22600	22640	22680
18762	21063	23503	26284	28884	30804	36045	38805	40886	46607	49507	52057	54057	56057
22660	22692	22726	22755	22816	22873	22933	22964	22992	23050	23084	23111	23141	23171
55249	60225	63469	66490	72211	78312	84073	86853	89854	95955	98495	101271	104091	106911
23150	23179	23235	23257	23286	23343	23430	23462	23548	23582	23663	23721	23781	23841
103716	106413	112957	116378	119518	125259	134701	137361	146503	149103	154645	160187	165729	171271
23774	23837	23925	23957	24008	24065	24144	24207	24293	24324	24374	24431	24481	24531
171146	176567	185729	188369	195070	201171	210973	216474	225615	228396	235097	241151	247205	253259
24597	24684	24734	24846	24935	25091	25200	25271	25321	25402	25544	25674	25744	25814
260091	269062	275743	288705	297042	316770	329472	339933	345734	356296	372748	383388	394028	404668
25914	25987	26147	26401	26494	26872	26939	27163	27758	27863	27932	27993	28054	28114
413225	425645	447490	481415	495618	540045	556828	587473	686588	704251	722654	734511	746368	758225
26023	26127	26362	26402	26468	26516	26664	26785	26868	26923	26965	27005	27045	27085
747812	767641	816329	834532	851374	875061	911724	948350	980835	998618	1008059	1017500	1026941	1036382

Table 5-7 Stage-Discharge Table (Bertam Site)
(applied since January 1, 1976)

Upper: Water Stage (mm)
Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)

SITE: 5120401.

RATING APPLIES FROM 760101.

NUMBER OF DATUM PAIRS: 125

47701.	47769.	47836.	47909.	47979.	48051.	48121.	48243.	48333.	48408.	48483.	48551
0.	5901.	13803.	20305.	27657.	34358.	41510.	55614.	63065.	69167.	75418.	82820
48622.	48691.	48766.	48830.	48898.	48962.	49031.	49167.	49231.	49299.	49431.	49561
89922.	97274.	103475.	112278.	119879.	128382.	136133.	151487.	160139.	167991.	184445.	201199
49628.	49821.	49895.	49950.	50015.	50077.	50141.	50201.	50267.	50327.	50390.	50450
209301.	233008.	243210.	252112.	260514.	268766.	278418.	288071.	296323.	305875.	314777.	324530
50376.	50637.	50895.	50957.	50814.	50873.	50936.	50998.	51051.	51110.	51171.	51246
342534.	351336.	362039.	371141.	380894.	390296.	400393.	409501.	420703.	430606.	440008.	470616
51603.	51657.	51517.	51572.	51743.	51852.	51909.	51961.	52018.	52126.	52339.	52394
480685.	491821.	501323.	512176.	542283.	565089.	575641.	587094.	597297.	619502.	664863.	675516
52444.	52500.	52601.	52657.	52707.	52760.	52809.	53012.	53204.	53257.	53303.	53358
687369.	698371.	722127.	732780.	744733.	756886.	768539.	816060.	866163.	877365.	903319.	901371
53454.	53604.	53694.	53891.	53934.	53986.	54075.	54123.	54165.	54216.	54302.	54356
926377.	962386.	988093.	1037903.	1051408.	1063061.	1089668.	1102221.	1116324.	1128027.	1154033.	1166486
54397.	54491.	54763.	54859.	54943.	54990.	55029.	55076.	55165.	55214.	55254.	55344
1180690.	1206246.	1285266.	1310522.	1337729.	1350932.	1365685.	1378639.	1405295.	1417493.	1431952.	1458658
55396.	55462.	55567.	55796.	56020.	56115.	56278.	56412.	56708.	56957.	57085.	57124
1472762.	1497765.	1525375.	1590741.	1657307.	1682613.	1739277.	1779727.	1877011.	1961832.	2002492.	2017846
57172.	57332.	57416.	57490.	57893.	58119.	58161.	58192.	58378.	58600.	58675.	58755
2030549.	2088313.	2116070.	2146527.	2290613.	2380635.	2595038.	2611392.	2687261.	2726433.	2808441.	2836998
58905.	59476.	59662.	59743.	59775.							
2697613.	2921418.	2997236.	3025693.	3042197.							

Table 5-8(1) Stage - Discharge Table (Dabong Site) Upper: Water Stage (mm)
(applied since January 1, 1975) Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)									
STAGE: 5320443									
RATING APPLIES FROM : 730101.									
NUMBER OF DATUM PAIRS: 145									
22102.	22238.	22379.	22524.	22668.	22793.	22921.	23055.	23179.	23308.
0.	3003.	4705.	5706.	6807.	11312.	15717.	19020.	23825.	27930.
23672.	23783.	23893.	24100.	24199.	24289.	24384.	24479.	24573.	24656.
44747.	52555.	59963.	77985.	87593.	99105.	109816.	120527.	131339.	144353.
24910.	24975.	25045.	25121.	25204.	25336.	25414.	25590.	25627.	25707.
181982.	190310.	214026.	227240.	258273.	273589.	287504.	301519.	317436.	333052.
25924.	26001.	26148.	26282.	26431.	26491.	26555.	26634.	26720.	26849.
397514.	406430.	435761.	467995.	497026.	514244.	530882.	546376.	557889.	590324.
27124.	27329.	27437.	27606.	27736.	27876.	27944.	28080.	28174.	28334.
652390.	700441.	733276.	762807.	795542.	826374.	842291.	860410.	913767.	974831.
28904.	29025.	29138.	29249.	29360.	29507.	29681.	29749.	29967.	30163.
1091755.	1126392.	1158626.	1195284.	1231803.	1265238.	1318595.	1334312.	1407789.	1480645.
30436.	30807.	30770.	31193.	31309.	31534.	31593.	31788.	31854.	31954.
1549139.	1603096.	1658454.	1808013.	1843931.	1895805.	1951965.	2030047.	2046465.	2083006.
32597.	32714.	32830.	32888.	32937.	33157.	33246.	33347.	33530.	33889.
2337873.	2373010.	2408348.	2429971.	2470914.	2547695.	2588618.	2627079.	2707564.	2841105.
34455.	34613.	34769.	34928.	35055.	35158.	35284.	35600.	35846.	35742.
3078657.	3135116.	3220707.	3276466.	3339032.	3376872.	3439159.	3581088.	3622432.	3640351.
36033.	36268.	36375.	36487.	36600.	36792.	36991.	37157.	37260.	37367.
3787206.	3886914.	3924051.	3989620.	4066501.	4133072.	4211155.	4294743.	4332883.	4390953.
37907.	38055.	38377.	38477.	38550.	38891.	39019.	39182.	39328.	39745.
4042417.	4704677.	4870252.	4908893.	4954641.	5118915.	5180931.	5265370.	5324332.	5534356.
40229.	40351.	40483.	40621.	40764.	40905.	41080.	41301.	41674.	42158.
3758293.	3830389.	3911934.	3901449.	4086136.	6124405.	6231592.	6469243.	6551430.	6834630.
42543.									
7078788.									

Table 5-8(2) Stage - Discharge Table (Dabong Site)
(applied since November 29, 1977)

Upper: Water Stage (mm)
Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)

SITE: 5320443.

RATING APPLIES FROM : 771129.

NUMBER OF DATUM PAIRS: 115

22081.	22187.	22297.	22406.	22507.	22611.	22712.	22811.	22908.	23002.	23096.	23189.
0	1252.	3454.	4556.	6859.	8961.	11164.	13313.	16521.	19825.	22379.	26031.
23279.	23370.	23451.	23531.	23616.	23697.	23770.	23853.	23931.	23999.	24068.	24141.
20738.	33142.	37698.	42456.	46860.	51616.	57223.	61779.	66835.	72943.	79151.	84903.
24208.	24274.	24344.	24414.	24476.	24603.	24664.	24770.	24826.	24731.	24972.	25021.
91367.	92875.	103733.	109843.	116949.	130567.	138626.	153947.	163456.	177227.	182219.	195300.
25664.	25157.	25236.	25317.	25367.	25547.	25642.	25710.	25836.	26003.	26102.	26184.
204962.	222885.	242360.	261786.	270045.	308441.	323964.	346390.	381447.	410225.	427246.	446521.
26245.	26291.	26431.	26544.	26639.	26719.	26822.	26739.	27047.	27135.	27296.	27462.
462443.	477360.	503894.	533632.	551104.	570429.	586950.	616182.	644273.	664599.	703699.	741597.
27321.	27663.	28005.	28242.	28354.	28490.	28728.	29054.	29212.	29341.	29463.	29583.
753719.	769759.	864705.	923177.	953266.	980252.	1038627.	1129443.	1165443.	1210797.	1239533.	1272637.
29675.	30066.	30382.	30534.	30640.	30716.	30816.	30972.	31135.	31567.	31948.	32335.
1366045.	1429776.	1522064.	1526263.	1607053.	1641297.	1672627.	1726706.	1356672.	1990092.	2101925.	2155322.
32316.	32555.	32595.	32613.	32696.	32770.	33002.	33135.	33247.	33323.	33336.	33337.
2274505.	2390754.	2414785.	2441767.	2489650.	2538643.	2604860.	2799075.	2889440.	2940507.	2993223.	3007492.
32338.	33424.	33444.	33451.	33495.	33501.	33516.	33558.	33631.	33441.	33645.	33649.
3659358.	3112776.	312642.	3152677.	3190826.	3204744.	3245396.	3298263.	3361644.	3374261.	3402947.	3435915.
33669.	33671.	33695.	33703.	33718.	33735.	33801.					
3429030.	3443298.	3496016.	3509483.	3523901.	3591638.	3627283.					

Table 5-9(1) Stage - Discharge Table (Guillemard Bridge)
(applied since July 1, 1970)

Upper: Water Stage (mm)

Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)

Site: 5721442.

RATING APPLIES FROM : 700701.

NUMBER OF DATUM PAIRS: 126

7652.	7750.	7845.	7942.	8033.	8130.	8225.	8321.	8421.	8505.	8602.	8685.	8759
U.	13652.	35528.	52003.	75288.	94762.	115241.	136515.	176676.	196150.	219640.	267165.	
8833.	8997.	9082.	9155.	9223.	9376.	9457.	9526.	9584.	9727.	9803.	9862	9862
275233.	325646.	349738.	377645.	406756.	440963.	485437.	515372.	548699.	606713.	633215.	663940	663940
9922.	9993.	10079.	10141.	10200.	10262.	10354.	10409.	10547.	10670.	10730.	10849	10849
695802.	724371.	754687.	786208.	818933.	851637.	879565.	908074.	1002836.	1030342.	1062665.	1127329	
10989.	11163.	11238.	11412.	11482.	11546.	11594.	11653.	11763.	11894.	12029.	12151	12151
5188347.	1285317.	1313625.	1412005.	1442117.	1473638.	1509776.	1542801.	1603555.	1670591.	1736018.	1796074	1796074
12330.	12435.	12493.	12587.	12709.	12867.	12932.	13029.	13148.	13314.	13374.	13471	13471
1895855.	1966322.	1998831.	2074336.	2137979.	2242981.	2273698.	2346176.	2411425.	2516018.	2566944.	2620023	2620023
13530.	13687.	13800.	13958.	13914.	13970.	14013.	14157.	14242.	14339.	14380.	14481	14481
2652748.	2758152.	2826413.	2877408.	2910735.	2944866.	2983215.	3093234.	3170128.	3243207.	3282357.	3333831	3333831
14570.	14627.	14713.	14816.	14876.	14992.	15078.	15134.	15209.	15299.	15360.	15412	15412
3429922.	3463450.	3539340.	3612420.	3687318.	3764401.	3840394.	3876824.	3953131.	4031021.	4096273.	4131606	4131606
15534.	15574.	15602.	15667.	15694.	15762.	15807.	15878.	15974.	16045.	16093.	16164	16164
4249858.	4289908.	4332374.	4370179.	4406859.	4491383.	4530351.	4613249.	4685726.	4767238.	4804581.	4887297	4887297
16211.	16280.	16357.	16385.	16439.	16519.	16880.	16952.	16994.	17174.	17312.	17367	17367
6944038.	5007959.	5087664.	5131029.	5211939.	5298851.	5723596.	5807618.	5845963.	6106353.	6323391.	6410926	6410926
17387.	17417.	17537.	17643.	17681.	17706.	17720.	17811.	17915.	17940.	17970.	17999	17999
6657303.	6500669.	6725529.	6904012.	6997771.	7062341.	7090727.	7272823.	7504309.	7546674.	7643449.	7689417	7689417
18015.	18090.	18133.	18161.	18195.	18199.							
7736798.	7925513.	8069270.	8166261.	8211213.	8260000.							

Table 5-9(2) Stage - Discharge Table (Guillemard Bridge)
(applied since January 1, 1980)

Upper: Water Stage (mm)
Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(H) VERSUS DISCHARGE(LITRES/SEC)

SITE: 5721442

RATING APPLIES FROM 1'800'101

NUMBER OF DATUM PAIRS: 123

6000	6128	6271	6418	6560	6699	6836	6971	7121	7258	7388	7514	7642
0	4505	6006	6807	7808	10110	12713	15916	18719	22323	26928	31432	36432
7862	7955	8047	8144	8240	8337	8490	8546	8614	8690	8762	8812	8812
46748	57959	69071	79281	89992	100103	128331	146450	162366	176381	191696	211216	211216
8871	8934	8997	9042	9088	9125	9171	9224	9277	9338	9394	9437	9437
228834	245752	262369	282690	303010	324633	346753	368573	382091	399109	417127	437949	437949
9483	9564	9625	9728	9765	9840	9894	10004	10044	10141	10248	10430	10430
458169	500813	517831	556270	577792	621337	639856	674293	697815	736955	774894	855477	855477
10581	10719	10910	11038	11234	11318	11502	11663	11801	11943	12059	12194	12194
913236	973798	1052779	1115143	1193123	1235166	1313748	1400435	1460897	1545083	1564524	1674516	1674516
12360	12473	12613	12802	12923	13148	13223	13391	13555	13660	13783	13851	13851
1758402	1823108	1883029	1991841	2055106	2185239	2267423	2311669	236355	2462723	2525985	2570534	2570534
13872	13904	14022	14127	14246	14355	14455	14535	14695	14957	14999	1508	1508
259560	2618483	2711078	2777765	2870341	2938309	3032808	3104181	3353636	3399583	3449434	3519406	3519406
15214	15365	15461	15535	15717	15830	15901	16028	16157	16225	16369	16564	16564
3610700	3755348	3852547	3898192	4044363	4158161	4240365	4352059	4443453	4545659	4602108	4943966	4943966
14668	14691	14730	14821	14873	14924	15088	15170	15211	15346	15411	15626	15626
5039564	5064289	5143370	5241270	5289119	5395328	5652892	5752594	5831675	6008657	6288461	6331287	6331287
17726	17825	18002	18095	18250	18337	18398	18500	18711	18921	18978	19250	19250
6510571	6640704	6837706	6935406	7137913	7236715	7340922	7465750	7772364	8050349	8097597	8450000	8450000
19500	20000	20550										
8800000	9510000	10400000										

Table 5-9(3) Stage - Discharge Table (Guillemard Bridge)
(applied since January 1, 1984)

Upper: Water Stage (mm)
Lower: Discharge (ltr./sec.))

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)											
SITE: 5721442.											
RATING APPLIES FROM : 850101.											
NUMBER OF DATUM PAIRS: 141											
7590.	7600.	7620.	7630.	7660.	7670.	7680.	7700.	7750.	7760.	7770.	7790
0.	191.	1788.	2612.	5175.	4064.	6766.	8820.	13734.	14789.	15815.	17958
7820.	7870.	7880.	7920.	7940.	7960.	8000.	8010.	8030.	8060.	8090.	8130
21273.	27372.	28397.	33432.	36077.	38765.	44335.	45769.	48632.	53172.	57806.	62210
8160.	8200.	8230.	8260.	8300.	8310.	8380.	8420.	8460.	8500.	8550.	8590
67182.	76036.	81385.	86797.	94272.	100085.	110054.	118320.	128842.	135621.	146956.	156313
8630.	8670.	8710.	8750.	8800.	8840.	8890.	8920.	8970.	9010.	9070.	9120
165927.	175777.	185924.	196303.	209648.	220610.	234672.	241103.	258008.	270960.	288920.	306530
9170.	9240.	9290.	9350.	9400.	9440.	9490.	9530.	9580.	9590.	9630.	9660
320839.	344344.	361678.	379291.	401028.	415841.	436717.	450107.	453997.	457590.	479207.	488196
9720.	9760.	9790.	9840.	9920.	9950.	10010.	10070.	10140.	10220.	10290.	10370
505252.	514830.	525620.	540476.	562781.	574066.	592913.	612130.	635017.	661792.	687762.	713772
10430.	10510.	10590.	10620.	10720.	10870.	10970.	11070.	11160.	11250.	11350.	11450
735213.	764375.	794197.	824677.	863705.	903760.	944846.	936959.	1025742.	1055359.	1110355.	1151731
11540.	11630.	11740.	11860.	11940.	12060.	12160.	12270.	12370.	12500.	12610.	12720
1198693.	1241917.	1295671.	1355841.	1396777.	1459417.	1512751.	1572605.	1628097.	1701775.	1745481.	1820429
12820.	12940.	13070.	13190.	13320.	13420.	13550.	13690.	13790.	13920.	14040.	14190
1890551.	1964059.	2045363.	2121959.	2206609.	2272909.	2360635.	2457057.	2527165.	2627043.	2706935.	2817981
14320.	14480.	14640.	14810.	14980.	15130.	15320.	15470.	15490.	15500.	15690.	15850
2915913.	3038951.	3104623.	3301039.	3440427.	3565809.	3728329.	3850839.	3876441.	3885285.	4080387.	4247629
16130.	16330.	16560.	16670.	16700.	16800.	16910.	17120.	17350.	17410.	17810.	18110
4546707.	4787415.	5021931.	5146617.	5180845.	5295617.	5423003.	5669681.	5945673.	6260467.	6513785.	6896281
18330.	18620.	18870.	19090.	19320.	19560.	19850.	19960.	19990.			
7182793.	7568243.	7907629.	8211723.	8525033.	8878427.	9301387.	9464137.	9508739.			

Table 5-10(1) DAILY RAINFALL DATA DURATION & STATION

DAILY RAINFALL DATA

1945

NO.	Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
①	4514031 x LADANG TEH BLUE VALLEY																																				
②	4620045 x MERAPOH																																				
③	4717001 x BLAU																																				
	4819001 GUA MUSANG																																				
④	4819027 x STN TELE GUA MUSANG																																				
⑤	4924001 x STN TELE KG. ARING																																				
⑥	5017001 x GEMALA																																				
⑦	5120025 x BALAI POLIS BERTAN																																				
⑧	5216001 x GOB																																				
	5320001 STN PERTANIAN DABONG																																				
⑨	5320037 x LADANG KUALA BERGAU																																				
	5320038 STN TELE DABONG																																				
⑩	5320039 x LADANG KUALA GRIS																																				
⑪	5322044 x STN TELE KG. LAOK																																				
⑫	5322045 x STN KERETAPI MANEK URAI																																				
	5419036 x LADANG KUALA BALAH																																				
	5422046 x LADANG LAPAN KABU																																				
⑬	5518035 x LUBOK BUNGOR																																				
	5521050 x LADANG KUALA NAL																																				
	5522047 x STN KERETAPI KUALA KRAI																																				
	5621051 x LADANG KENETH																																				
	5621052 x LADANG KERILLA																																				
⑭	5622048 x LADANG KUALA PERTANG																																				
	5718001 KG GEMANG BAHRU																																				
	5718002 AIR LANAS																																				
⑮	5718033 x STN TELE KG. JELI																																				
⑯	5719001 x KG. DURIAN DAUN																																				
	5721001 x MAJLIS TEMPATAN TEMANGAN																																				
	5721002 x LADANG TEBING TINGGI																																				
	5722057 BALAI POLIS KG MACHANG																																				
	5723056 x TELUSAN																																				
	5724002 x KAMPUNG WAKAF RAJA																																				
	5821005 PEJ PERTANIAN BATANG MERBAU																																				
	5821007 STN KERETAPI BT PANAU																																				
	5821059 LADANG SG BAGAN																																				
	5823001 LBU BEKALAN TIGA DAERAH																																				
	5823076 RUMAH PENGAWAS BUKIT ABAL																																				

Note: * shows Rainfall Gauging Station of which Location was confirmed.

○ number in parenthesis shows number of Gauging Station of which data used for the study.

() Number in parenthesis shows months of observation lack

DAILY RAINFALL DATA

[illegible]

Note: * shows Rainfall Gauging Station of which Location was confirmed.
 ○ number in parenthesis shows number of Gauging Station of which data used for the study.
 () Number in parenthesis shows months of observation' lack

MONTHLY RAINFALL DATA

A - 120

Table 5-10(4) DAILY DISCHARGE, SUSPENDED SEDIMENT DISCHARGE, MONTHLY DISCHARGED
AND METEOROLOGICAL DATA DURATION & STATION
DAILY DISCHARGE

Note: Number in parenthesis shows a month of in which some daily observations lack.

Observed year		1950																							
Name		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
5120401	SUNGEI MENGGI DI JAMBATAN BERTAM																								
5222452	SG. LEBIR AT KG. TUALANG																								
5320443	SG. GALAS AT DABONG																								
5721442	SG. KELANTAN AT JAN GULLEMARD																								
6019411	SG. GOLOK AT PANTAU PANJANG																								
6022421	SG. KEMASIN AT PERINGAT																								

DAILY SUSPENDED SEDIMENT DISCHARGE

Note: Number in parenthesis shows a month in which some daily observations lack.

Observed year	1950	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Name	5222552																					
	SUNGAJ LEBIR DI																					
	STN. TELE. KG. TUALANG																					
5320543	SUNGAJ GALAS DI																					
	STN. TELE. DABONG																					
6019511	SUNGAJ GOLOK DI																					
	RANTAU PANJANG																					
6022521	SUNGAJ KEMASIN																					
	DI PERINGAT																					

MONTHLY DISCHARGE

Note: Number in parenthesis shows a month in which some daily observations lack.

Observed year	1945	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
Name	SUNGEI KELANTAN																							
	AT GUILLEMARD BRIDGE																							
5522045	SG. GOLOK AT																							
	RANTAU PANJANG																							
SG. KEMASIN																								
AT PERINGAT																								

METEOROLOGICAL DATA

Note: Number in parenthesis shows a month in which some daily observations lack.

Observed year	1945	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
Name	KG. LALOK																							
T. RATA																								

Table 5-10(5) HOURLY RAINFALL DATA DURATION & STATION

HOURLY RAINFALL DATA

Name	Observed year 1950	5	60	5	70	5	80	5
KAMPONG KUALA BETIS							82.12/16, 83.12/1-6, 84.12/22-28 86.11/26-12/5	
CEGAR ATAS							82.12/13-16, 83.12/1-18, 84.12/22-28 86.11/26-12/5	
KAMPONG LEBIR							81.11/30-2/3, 82.12/13-16, 83.12/1-18 84.12/22-26, 85.11/26-12/5	
JERAM PANJANG							81.11/30-12/3, 82.12/13-16 83.12/1-18, 84.12/22	

DAILY DISCHARGE DATA

Name	Observed year 1950	5	60	5	70	5	80	5
SUNGAI TERANG							81.10/45/52 6, 9, 11/86)	
SUNGAI NENGIRI AT CEGAR ATAS					81.8/72) (8.8/75)			

MONTHLY MEAN, INSTANTANEOUS MAXIMUM AND MINIMUM FLOWS

Name	Observed year 1950	5	60	5	70	5	80	5
SUNGAI TERANG							81.10/45/52 6, 9, 10/86)	
SUNGAI NENGIRI AT CEGAR ATAS								

Table 5-11 Correlation Coefficient of Daily Rainfall among Stations

Station No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1		0.069	-0.034	0.045	0.066	-0.048	0.073	0.172	-	0.112	0.089	-	0.135	0.129	0.106	0.189	0.167	0.270	0.096	0.101
2			0.483	0.336	0.315	0.396	0.361	0.446	-	0.219	0.316	-	0.286	0.205	0.369	0.292	0.280	0.258	0.223	0.193
3				0.532	0.431	0.815	0.451	0.714	-	0.150	0.704	-	0.368	0.417	0.511	0.278	0.670	-	0.283	0.243
4					0.421	0.802	0.404	0.406	0.193	0.220	0.357	0.336	0.291	0.196	0.336	0.294	0.292	-	0.373	0.254
5						0.763	0.443	0.539	-	0.278	0.482	-	0.432	0.440	0.382	0.419	0.322	-	0.208	0.358
6							0.888	0.889	-	0.627	0.847	-	0.772	0.886	0.819	0.593	-0.074	-	0.522	0.847
7								0.617	-	0.397	0.501	0.361	0.448	0.507	0.379	0.455	0.169	-	0.294	0.294
8									-	0.447	0.624	-	0.550	0.571	0.499	0.588	0.180	-	0.406	0.325
9										0.246	0.162	0.263	0.365	0.285	-	-	-	-	0.209	0.240
10											0.452	0.235	0.291	0.275	0.354	0.377	0.336	0.260	0.271	0.338
11												-	0.524	0.462	0.432	0.483	0.094	-	0.380	0.785
12													0.230	0.214	-	-	-	-	-	-
13														0.324	0.586	0.588	0.328	0.316	0.342	0.399
14															0.501	0.509	0.228	0.205	0.223	0.432
15																0.592	0.184	-	0.357	0.438
16																	0.156	-	0.235	0.312
17																		0.309	0.292	0.361
18																			0.330	0.468
19																				0.397
20																				

Table 5-12 CORRELATION OF 5-DAY RAINFALL ALONG STATION

AND NUMBER OF DATA

The case where data in Rainy Season (Oct., Nov., Dec., and Jan. 4 months) were used.
Period where data are existing: from 1947 to 1955, 35 years.

St. No.	x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Y	1	0.409 (20)	—	0.493 (7)	-0.153 (8)	—	0.186 (8)	0.453 (5)	—	0.038 (17)	0.149 (8)	—	0.093 (18)	0.210 (17)	0.004 (8)	0.143 (8)	0.413 (7)	0.722 (4)	0.380 (3)	-0.341 (3)
2			1	0.918 (7)	0.767 (8)	—	—	0.907 (3)	0.851 (5)	—	0.399 (17)	0.656 (8)	—	0.525 (18)	0.473 (17)	0.420 (8)	0.654 (8)	0.917 (7)	0.881 (4)	0.500 (3)	0.829 (3)
3				1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4					1	0.918 (7)	0.744 (7)	0.889 (7)	0.878 (5)	0.438 (12)	0.677 (35)	0.852 (33)	—	0.779 (35)	0.464 (22)	0.444 (22)	0.819 (7)	—	—	0.494 (2)	—
5						1	—	0.906 (8)	0.868 (5)	—	0.908 (8)	0.856 (8)	—	0.949 (8)	0.539 (8)	0.752 (8)	0.823 (8)	—	—	—	—
6							1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7								1	0.886 (5)	—	0.737 (6)	0.876 (6)	—	0.906 (8)	0.927 (8)	0.853 (8)	0.798 (8)	—	—	—	—
8									1	0.959 (5)	0.959 (5)	0.892 (5)	—	0.841 (5)	0.842 (5)	0.820 (5)	0.939 (5)	—	—	—	—
9										1	0.413 (83)	0.649 (14)	0.250 (8)	0.739 (73)	0.592 (85)	—	—	—	—	0.913 (5)	0.864 (5)
10											1	0.413 (41)	0.302 (38)	0.537 (108)	0.328 (104)	0.505 (24)	0.753 (8)	0.490 (5)	0.340 (2)	0.207 (9)	0.331 (14)
11												1	—	0.872 (41)	0.694 (23)	0.873 (23)	0.733 (89)	—	—	0.937 (5)	0.443 (3)
12															0.391 (23)	—	—	—	—	—	—
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					

Note: A 5-day rainfall is calculated by month by month taking up a period in a month where the Monthly Maximum Daily Rainfall occurred at the middle of the period.

Table 5-13 COEFFICIENT OF INTERPOLATION FORMULA FOR MONTHLY MAXIMUM
5-DAY RAINFALL AT EACH STATION

St. No.	x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	y	1	1.5475 -14.7523																		
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					

upper value : a
lower value : b
($R_y = a \cdot R_x + b$)

Note) A 5-day Rainfall is calculated by month taking up a period in a month where the monthly Maximum Daily Rainfall occurred at the middle of the period.

Table 5-14 Coefficient of Correlation Between 5-day Rainfall and Peak Daily Rainfall and Coefficient of Mean Linear Equation

Station No	Number of Data	Correlation Coefficient γ	Coefficient Mean Linear Equation $R_1 = a \cdot R_2 + b$	
			a	b
2	20	0.802	0.3855	6.4969
4	35	0.954	0.5353	3.4306
5	8	0.988	0.5556	-0.1361
7	8	0.992	0.5943	1.4589
8	5	0.957	0.7296	-5.2974
9	102	0.832	0.4138	9.5974
10	129	0.883	0.3908	9.1281
11	41	0.940	0.5096	9.0961
12	38	0.873	0.4237	7.5496
13	111	0.930	0.4642	1.1577
14	128	0.909	0.4299	12.9952
15	24	0.924	0.4685	9.1423
16	8	0.953	0.5615	6.2695
17	7	0.962	0.5057	-7.0978

* R_1 : Peak daily rainfall (mm / day)

R_2 : 5-day rainfall (mm / 5 days)

Table 5-15 Relation Between 5-Day Rainfall and Peak Rainfall

(Curve of 95% Reliability Zone)

Station No	Coefficient of Curve Equation ($R_1 = aR_5 + b + c \sqrt{dR_5^2 + eR_5 + f}$) *					
	a	b	c	d	e	f
2	0.3855	6.4969	2.101	0.4585×10^{-2}	-0.6886	0.5120×10^2
4	0.5353	3.4306	2.035	0.8626×10^{-3}	-0.1029	0.6024×10^1
5	0.5056	-0.1361	2.447	0.1082×10^{-2}	-0.1734	0.1321×10^2
7	0.5943	1.4589	2.447	0.9863×10^{-3}	-0.1310	0.1025×10^2
8	0.7296	-5.2974	3.182	0.1626×10^{-1}	-0.1792×10^1	0.8909×10^2
9	0.4138	9.5974	1.984	0.7599×10^{-3}	-0.1783	0.1534×10^2
10	0.3908	9.1281	1.979	0.3381×10^{-3}	-0.5805×10^{-1}	0.4950×10^1
11	0.5096	9.0961	2.023	0.8825×10^{-3}	-0.1864	0.2007×10^2
12	0.4237	7.5496	2.028	0.1551×10^{-2}	-0.3077	0.2348×10^2
13	0.4642	1.1577	1.982	0.3098×10^{-3}	-0.8962×10^{-1}	0.1198×10^2
14	0.4299	12.9952	1.979	0.3104×10^{-3}	-0.8641×10^{-1}	0.1036×10^2
15	0.4685	9.1423	2.074	0.1699×10^{-2}	-0.4557	0.4611×10^2
16	0.5615	6.2695	2.447	0.5347×10^{-2}	-0.1420×10^1	0.1800×10^2
17	0.5057	-7.0978	2.571	0.4124×10^{-2}	-0.9710	0.8129×10^2

* R_1 : Peak daily (mm/day)
rainfall

R_5 : 5-day (mm/5days)
rainfall

Table 5-16 ORDER OF INTERPOLATION FOR MONTHLY
MAXIMUM 5-DAY RAINFALL

Gauging Station used to supplement observation Data	Order of Considered Gauging Stations' Number which have correlation											
	Order 1	2	3	4	5	6	7	8	9	10	11	12
1												
2	4	17	7	13								
3												
4	2	7	11	16	13	10	15	14				
5	13	14	10	7	11	16	15					
6												
7	14	2	5,13	4	8	11	16	10				
8	10	16	11	7								
9	19	20	13	11	14	10						
10	8	5	11	16	7	4	13	15				
11	19	8	7	13	5	4	10	16	14	15	9	
12	14											
13	5	7	16	11	4	15	9	14	10	2		
14	5	7	16	15	11	13	9	4	12	10		
15	16	14	13	5	11	10	4					
16	8	13	14	15	5	4	7	10	11			
17	2											
18												
19	20	11	9									
20	19	9										

Table 5-17 YEARLY MAXIMUM 5-DAY RAINFALL AT EACH STATION

(mm)

ST. NO.	2	4	5	7	8	9	10	11	12	13	14	15	16	17	20
Year															
1947	215.8	149.0	272.9	260.0	107.2	258.8	161.1	356.8	219.0	344.6	*505.2	398.0	433.2	205.3	
48	99.8	74.0	120.1	106.5	70.3	*146.6	95.5	132.3	119.5	151.1	*200.0	186.5	195.0	116.2	
49	193.9	134.8	230.8	230.8	100.2	*272.4	148.6	317.8	200.1	255.4	*447.1	387.8	387.8	188.6	
50	123.0	89.0	150.7	137.3	77.7	*113.6	108.7	193.3	139.4	123.8	*261.2	228.9	242.8	134.1	
51	143.7	102.4	177.8	164.5	84.2	*95.4	120.3	229.6	157.1	108.7	*315.4	266.5	285.1	150.0	
52	107.8	79.2	79.1	65.4	96.6	*236.2	*142.3	132.5	*151.9	225.1	*118.2	129.8	131.2	122.4	
53	157.8	111.5	188.2	174.9	138.7	*166.7	*217.0	194.6	*175.4	184.2	*336.0	280.8	301.2	160.9	
54	119.1	86.5	155.9	142.5	106.0	*162.5	*159.1	146.5	*220.0	164.2	*271.6	236.1	250.9	131.1	
55	63.7	50.7	88.6	74.9	59.4	*213.7	*76.3	77.7	*101.8	206.5	*137.2	143.0	146.0	88.5	
56	100.6	89.3	166.1	148.3	148.8	*221.4	*235.0	192.1	*176.4	*252.4	*283.1	244.1	265.4	116.9	
57	76.0	61.9	110.3	205.0	89.4	*172.0	*129.6	106.4	*127.9	*165.2	*395.8	322.2	179.3	97.9	
58	74.5	60.3	106.9	85.0	100.5	*184.4	*149.3	103.7	58.5	*160.0	*157.3	156.9	174.1	96.8	
59	70.7	58.1	98.3	64.2	156.3	*166.9	*248.3	96.6	*122.4	*146.5	*115.8	128.2	160.8	93.9	
60	78.3	64.5	115.5	80.0	88.7	*208.1	*128.3	110.7	*297.0	*173.4	*147.3	150.0	187.4	99.7	
61	71.4	56.8	99.9	130.4	104.1	*171.5	*155.7	97.9	*302.0	*149.0	*247.6	219.5	163.3	94.4	
62	59.7	43.8	73.3	124.8	75.1	*220.7	*104.1	76.2	131.3	*107.5	*286.4	211.7	122.2	85.4	
63	86.7	73.9	134.7	204.8	119.8	*190.1	*183.6	126.4	183.2	*203.3	*395.4	321.9	216.9	106.2	
64	62.8	47.3	80.5	51.0	80.4	*104.3	*113.5	92.0	83.5	*118.7	*89.6	110.0	133.3	87.8	
65	122.3	113.3	215.2	261.0	84.7	*262.4	121.1	192.2	219.7	*328.9	*507.3	399.5	341.0	133.5	
66	97.4	85.7	158.8	142.5	16.4	*236.4	*0.0	146.1	142.8	*240.9	*271.6	236.1	254.1	114.4	*116.2
67	182.6	180.3	352.0	185.6	148.4	*464.4	234.3	394.1	170.8	*442.4	*357.3	295.5	534.2	179.9	*631.2
68	73.2	58.8	103.9	72.4	46.3	*110.6	52.9	101.2	97.3	*155.3	*132.1	139.5	169.5	95.8	*78.0
69	128.7	120.4	229.8	162.6	16.4	*227.0	*0.0	204.2	155.9	*351.7	*311.6	263.8	363.6	138.5	
70	122.8	113.8	216.3	146.3	161.3	*278.0	*257.3	193.2	145.3	*330.7	*279.2	241.4	342.8	133.9	*162.8
71	253.3	*173.2	197.3	180.1	154.1	*335.3	*244.5	*226.0	137.2	*301.1	254.2	216.4	313.6	234.3	*156.7
72	304.5	*206.3	401.3	377.9	184.7	442.7	*298.7	*303.3	212.1	*619.4	483.8	391.8	628.1	273.7	*205.0
73	278.9	229.2	570.0	541.5	253.2	618.4	*420.3	*438.8	274.0	*882.6	673.6	536.8	888.2	254.0	*566.4
74	59.1	48.0	52.3	39.4	131.4	*255.6	*204.2	*141.8	83.9	*74.7	90.9	91.6	89.8	85.2	*130.3
75	68.0	*118.1	210.8	193.1	86.3	*189.9	*124.0	*157.7	142.1	*322.1	289.4	228.0	334.3	188.7	*145.0
76	50.2	*42.0	115.9	132.6	69.4	149.9	*94.0	111.1	136.4	*174.0	*252.0	*216.0	188.0	78.1	*105.3
77	73.5	82.4	92.2	102.0	161.7	125.4	*258.0	*148.0	116.5	*137.0	*191.0	*321.0	151.4	96.0	*119.2
78	102.9	*76.0	247.3	163.8	140.3	285.4	*220.0	*146.0	156.7	*379.0	*314.0	*321.0	390.5	18.6	*145.6
79	418.5	*280.0	390.2	126.9	212.4	432.9	*348.0	*466.0	132.7	*602.0	*240.5	*262.5	610.9	361.4	*427.7
80	92.3	69.2	84.5	70.3	83.5	109.7	*119.0	113.2	96.3	132.1	*129.0	137.3	139.6	110.5	*123.0
81	*162.5	115.2	*118.0	*98.4	101.5	168.4	*151.0	*91.0	207.8	*202.0	*225.0	*277.0	*309.0	164.5	*87.9
82	*196.5	*133.0	*257.0	*255.0	*133.5	291.1	*213.0	*300.0	123.0	*387.5	*456.0	*317.0	*354.5	190.6	
83	*315.0	188.2	241.9	324.7	173.1	280.0	266.0	342.6	237.4	310.7	561.6	254.7	382.3	*286.0	*140.8
84	*104.0	73.2	228.0	328.5	170.2	265.7	*273.0	202.8	263.5	*349.0	*641.5	492.5	360.9	*147.0	*427.8
85	*112.5	77.8	115.3	108.0	89.7	149.2	*130.0	110.6	120.5	*173.0	*203.0	188.6	187.0	126.0	*113.4

Note) * shows actual measured value and others are interpolated values.

Table 5-18 YEARLY MAXIMUM DAILY RAINFALL AT EACH STATION

Year 年	(Estimated based on the mean curve) (mm)																			
	2	4	5	7	8	9	10	11	12	13	14	15	16	17	20					
1947	89.7	83.2	137.8	155.0	72.9	116.7	72.1	190.9	100.3	161.1	241.3	195.6	249.5	96.8						
48	45.0	43.0	60.6	64.8	46.0	34.8	46.4	86.7	58.2	71.3	46.2	96.5	115.8	51.7						
49	81.2	75.6	123.1	138.6	67.8	146.1	67.6	171.0	92.3	119.7	199.4	176.7	224.0	88.3						
50	53.9	51.1	76.1	83.1	51.4	71.7	51.6	107.6	66.6	58.6	115.6	116.4	142.6	60.7						
51	61.9	58.2	89.8	99.2	56.1	81.4	56.1	126.1	74.1	51.6	134.9	134.0	166.4	68.8						
52	48.1	45.8	39.9	40.3	65.2	144.8	50.2	76.6	80.5	105.6	61.5	70.0	79.9	54.8						
53	67.3	63.1	95.0	105.4	95.9	81.6	124.5	108.3	81.4	86.7	146.1	160.7	175.4	74.3						
54	52.4	49.7	78.7	86.1	72.0	129.5	108.5	83.8	107.1	77.4	167.7	118.8	147.1	59.2						
55	31.1	30.6	44.7	46.0	38.0	91.5	45.8	48.7	38.1	97.0	76.9	76.1	88.2	37.7						
56	45.3	51.2	83.8	89.6	103.3	68.3	63.5	86.6	139.7	93.0	105.2	123.5	155.3	52.0						
57	35.8	36.6	53.6	123.3	59.9	106.2	101.6	63.3	77.1	88.9	113.5	160.1	106.9	42.4						
58	35.2	35.7	53.9	52.0	68.0	83.8	57.7	61.9	32.3	79.8	60.5	82.6	104.0	41.9						
59	33.8	33.5	49.6	39.6	108.7	97.3	73.7	58.3	88.1	112.5	80.8	69.2	95.6	40.4						
60	36.7	38.0	58.3	49.0	59.4	80.0	50.8	65.5	114.8	76.9	133.3	79.4	111.5	43.3						
61	34.0	33.8	50.4	79.0	70.7	85.3	77.0	59.0	117.3	40.8	110.7	112.0	98.0	40.6						
62	29.5	26.9	36.9	75.6	49.5	210.8	104.1	47.9	63.2	40.4	215.9	108.3	74.9	36.1						
63	39.9	43.0	68.0	123.2	82.1	88.1	88.9	73.5	85.2	112.3	185.4	160.0	128.1	46.6						
64	30.7	28.8	40.6	31.8	53.4	51.3	42.9	50.9	42.9	57.1	53.8	60.7	81.1	37.3						
65	53.6	64.1	108.7	136.6	56.5	76.2	56.5	107.0	100.6	101.6	181.4	196.3	197.1	60.4						
66	44.0	49.3	80.2	86.1	6.7	91.5	0.0	83.5	68.1	75.2	128.0	119.8	148.9	50.8						
67	76.9	99.9	177.8	111.8	103.0	228.6	100.7	184.1	79.9	235.5	168.6	147.6	306.2	83.9						
68	34.7	34.9	52.4	44.5	28.5	36.8	29.8	60.7	48.8	99.2	81.5	74.5	101.4	41.3						
69	56.1	67.9	116.1	98.1	6.7	106.4	0.0	113.2	73.6	165.6	154.7	132.7	210.4	62.9						
70	53.8	64.3	109.2	88.4	12.4	137.2	97.5	107.6	69.1	129.6	103.4	122.2	198.8	60.6						
71	104.1	71.6	99.6	108.5	107.1	138.9	109.7	104.9	65.7	96.3	122.3	110.5	182.4	111.4						
72	123.9	100.1	202.8	226.0	129.5	192.8	111.3	101.1	97.4	137.9	221.0	192.7	358.9	131.3						
73	114.0	126.1	288.1	323.3	179.4	265.5	151.1	202.9	123.6	427.2	302.6	260.6	505.0	121.4						
74	29.4	29.1	26.3	24.9	90.6	66.5	55.9	70.9	43.1	64.5	52.1	52.1	56.7	36.0						
75	71.3	89.9	106.4	116.2	57.7	88.9	40.4	136.9	67.8	226.1	128.8	116.0	194.0	78.2						
76	25.8	25.0	58.5	80.3	45.3	71.6	50.0	65.7	65.3	85.5	98.0	97.0	111.6	32.4						
77	34.8	47.5	46.5	62.1	112.7	61.5	80.0	95.0	56.9	90.0	96.0	90.0	91.3	41.4						
78	46.2	39.0	124.9	98.8	97.1	127.7	98.0	78.0	73.9	159.0	147.0	125.0	225.5	52.9						
79	167.8	164.0	197.1	76.9	149.7	186.7	185.5	288.0	63.8	384.0	91.5	131.5	349.3	175.7						
80	42.1	40.5	42.6	43.5	55.6	55.0	48.0	66.8	48.4	62.5	61.5	73.5	84.7	43.8						
81	50.0	65.1	52.0	63.6	68.8	79.3	73.0	43.0	61.6	122.0	87.5	196.0	224.0	76.1						
82	159.5	86.0	136.0	151.0	105.3	130.1	102.0	164.0	93.6	206.0	273.0	171.0	161.3	89.3						
83	89.0	104.2	122.2	194.4	121.0	125.5	113.1	163.7	108.1	173.2	254.4	128.5	220.9	133.0						
84	35.0	42.6	115.1	196.7	118.9	119.5	131.0	112.4	119.2	205.5	325.0	239.9	208.9	89.0						
85	73.5	45.1	58.2	65.6	60.1	71.3	45.0	65.5	58.6	104.0	66.5	97.5	111.3	56.6						

Note) * shows actual measured value and others are interpolated values.

Table 5-19 YEARLY MAXIMUM DAILY RAINFALL AT EACH STATION

(ESTIMATES BASED ON THE UPPER LIMIT CURVE OF 95% RELIABILITY ZONE)

(mm)

観測所 年	2	4	5	7	8	9	10	11	12	13	14	15	16	17	20
1947	112.3	89.6	154.5	172.0	102.1	125.6	76.2	207.3	111.5	169.5	*241.3	219.6	307.8	116.0	
48	56.1	46.6	67.5	71.4	67.0	*34.8	49.6	93.8	64.2	76.0	*46.2	105.8	141.0	64.3	
49	101.2	81.3	137.7	152.6	95.0	*146.1	71.1	185.3	102.3	125.8	*199.4	191.5	275.0	105.5	
50	66.5	55.0	84.4	91.1	73.4	*71.7	54.8	115.9	73.3	63.3	*115.6	127.9	172.6	73.6	
51	76.3	62.6	99.7	108.8	79.4	*81.4	59.5	136.0	81.5	56.4	*134.9	148.0	201.8	82.5	
52	58.6	49.5	46.0	46.3	91.4	*144.8	*109.2	83.3	*80.5	111.1	*61.5	78.1	102.6	67.5	
53	83.2	67.8	105.7	115.6	135.3	*81.6	*124.5	116.7	*81.4	91.5	*146.1	155.7	213.1	88.8	
54	64.7	53.6	87.3	94.5	100.8	*129.5	*108.5	90.1	*107.1	82.1	*167.7	131.7	178.1	72.0	
55	41.8	34.1	50.8	52.0	58.2	*91.5	45.8	55.4	*38.1	102.1	*76.9	86.4	111.0	51.2	
56	56.5	55.2	93.1	98.3	146.2	*88.3	*63.5	93.7	*139.7	*93.0	*105.2	136.0	188.1	64.6	
57	46.4	40.1	52.2	135.5	84.3	*106.2	*101.6	59.8	*77.1	*88.9	*143.5	178.1	131.1	55.5	
58	45.8	39.2	60.4	58.1	95.3	*63.8	*57.7	64.8	39.0	*79.8	*60.5	91.1	127.9	54.9	
59	44.3	37.0	55.9	45.6	154.4	*97.3	*73.7	72.0	*114.8	*76.9	*133.3	87.7	136.2	56.3	
60	47.3	41.5	55.0	55.0	83.7	*80.0	*50.8	72.0	*114.8	*76.9	*133.3	87.7	136.2	56.3	
61	44.6	37.3	56.7	86.7	98.9	*85.3	*77.0	65.5	*117.3	*40.8	*110.7	122.9	121.3	53.8	
62	40.3	30.5	43.1	83.1	71.1	*210.8	*104.1	54.6	69.5	*40.4	*215.9	118.0	97.6	49.8	
63	50.6	46.6	75.5	135.4	115.1	*88.1	*88.9	80.1	94.0	*112.3	*185.4	178.0	155.3	59.4	
64	41.4	32.3	46.7	37.8	75.9	*51.3	*42.9	57.5	48.9	*57.1	*53.8	69.1	103.8	50.9	
65	66.2	68.8	121.1	172.7	79.9	*76.2	59.8	115.3	111.9	*101.6	*181.4	220.4	241.3	73.3	
66	55.1	53.1	89.0	94.5	16.4	*91.5	*0.0	90.5	74.8	*75.2	*128.0	131.7	180.3	63.4	
67	95.5	108.0	200.6	122.7	145.8	*228.6	106.9	177.6	88.1	*235.5	*166.6	163.6	381.5	100.2	
68	45.3	38.4	58.8	50.4	46.3	*36.8	33.1	67.1	54.6	*99.2	*61.5	82.7	125.0	54.5	
69	69.2	72.9	129.6	107.6	16.4	*106.4	*0.0	121.9	81.0	*165.6	*134.7	146.5	257.5	76.0	
70	66.4	69.1	121.8	97.0	159.9	*137.2	*97.5	115.9	76.0	*129.6	*103.4	134.5	242.6	73.5	
71	131.6	75.6	110.9	119.1	152.0	*138.9	*109.7	104.9	72.2	*96.3	128.0	121.3	221.9	134.4	
72	158.2	*100.1	229.3	250.7	184.7	211.1	*111.3	101.1	108.1	*197.9	233.7	216.2	430.4	160.0	
73	144.9	136.8	328.0	360.3	253.2	293.2	*151.1	*202.9	138.8	*427.2	371.7	296.0	642.0	147.2	
74	40.2	32.7	32.8	31.2	127.5	*86.5	*55.9	*70.9	49.0	*64.5	56.5	61.0	80.6	49.7	
75	88.2	*89.9	118.6	127.6	81.4	*88.9	*40.4	*136.9	74.5	*226.1	134.9	127.4	238.6	93.4	
76	37.0	*25.0	55.2	88.1	66.2	76.4	*50.0	72.2	71.9	*85.5	*98.0	*97.0	136.5	46.6	
77	45.4	51.3	52.7	68.6	160.4	65.9	*80.0	*95.0	62.9	*90.0	*95.0	*90.0	114.2	54.6	
78	57.5	*39.0	139.7	108.4	137.0	137.9	*98.0	*78.0	81.4	*159.0	*147.0	*125.0	276.9	65.5	
79	217.8	*164.0	222.8	84.4	212.4	206.5	*185.5	*288.0	70.2	*384.0	*91.5	*131.5	437.8	217.8	
80	52.9	44.0	48.7	49.5	78.8	59.4	*48.0	73.3	54.2	67.1	*61.5	81.7	107.3	61.9	
81	*50.0	69.9	*52.0	*63.6	96.3	84.5	*73.0	*43.0	67.9	*122.0	*87.5	*196.0	*224.0	90.9	
82	*159.5	*86.0	*136.0	*151.0	*105.3	140.5	*102.0	*184.0	103.7	*205.0	*273.0	*171.0	*161.8	106.7	
83	*89.0	112.6	136.6	215.2	172.9	135.4	120.3	199.3	120.6	182.4	289.7	141.6	271.0	*133.0	
84	*35.0	46.2	128.5	217.7	169.1	128.8	*131.0	121.2	133.5	*205.5	*325.0	271.6	255.6	*89.0	
85	*73.5	46.7	64.9	72.4	84.6	76.1	*45.0	71.9	64.7	*104.0	*66.5	106.9	135.9	59.3	

Note) *shows actual measured value and others are interpolated values

