VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

1. Sacobia River (1/3)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	CONCEPCION						
2	Sto. Cristo 2316039	0	0 0	0 0	0 0	0 0	14 14
	San Jose (Poblacion) 2316027	418	0 418	0 418	0 418	0 418	0 418
	Green Village 2316011	700	0 700	1 701	8 709	0 709	4 713
	San Nicolas (Poblacion) 2316030	153	0 153	0 153	20 173	83 256	133 389
	Alfonso 2316001	0	0 0	0 0	0 0	0 0	93 93
	Minane 2316016	1,058	26 1,084	2 1,086	32 1,118	15 1,133	8 1,141
	Sta. Rita 2316037	229	0 229	21 250	11 261	41 302	98 400
	San Francisco 2316025	4	0 4	13 17	29 46	139 185	156 341
	Total	2,562	26 2,588	37 2,625	100 2,725	278 3,003	506 3,509
	CONCEPCION						
3	Malupa 2316015	5	0 5	4 9	0 9	5 14	33 47
	Sto. Cristo 2316039	10	0 10	0 10	0 10	5 15	30 45
	Magao 2316014	0	0 0	0 0	0 0	0 0	147 147
	Balutu 2316002	0	0 0	0 0	0 0	9 9	16 25
	Total	15	0 15	4 19	0 19	19 38	226 264
	CONCEPCION						
4	Magao 2316014	0	0 0	0 0	6 6	27 33	138 171
	Total	0	0 0	0 0	6 6	27 33	138 171

VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

1. Sacobia River (2/3)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	BAMBAN						
6	San Nicolas (Poblacion) 2317010	0	0 / 0	0 / 0	0 / 0	0 / 0	27 / 27
	Total	0	0 / 0	0 / 0	0 / 0	0 / 0	27 / 27
	CONCEPCION						
7	Malonzo (Bamban) 2317008	0	0 / 0	0 / 0	13 / 13	24 / 37	22 / 59
	Bangcu 2317003	0	0 / 0	0 / 0	0 / 0	2 / 2	30 / 32
	Telabangca 2316044	17	10 / 27	2 / 29	9 / 38	14 / 52	30 / 82
	Total	17	10 / 27	2 / 29	22 / 51	40 / 91	82 / 173
	CONCEPCION						
8	San Nicolas Balas 2316031	88	6 / 94	27 / 121	72 / 193	34 / 227	173 / 400
	San Vicente 2316032	0	0 / 0	0 / 0	0 / 0	2 / 2	63 / 65
	San Antonio 2316023	38	0 / 38	0 / 38	1 / 39	2 / 41	273 / 314
	San Bartolome 2316024	0	0 / 0	0 / 0	0 / 0	0 / 0	47 / 47
	Dungan (Macangcong) 2316009	0	0 / 0	0 / 0	0 / 0	0 / 0	7 / 7
	Telabangca 2316044	196	4 / 200	12 / 212	13 / 225	57 / 282	3 / 285
	San Francisco 2316025	5	6 / 11	8 / 19	23 / 42	22 / 64	169 / 233
	Sub-Total	327	16 / 343	47 / 390	109 / 499	117 / 616	735 / 1,351

VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

1. Sacobia River (3/3)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	MAGALANG						
8	San Roque 2011020	0	0 0	0 0	0 0	5 5	306 311
	San Navaling 2011007	0	0 0	0 0	0 0	0 0	187 187
	Sub-Total	0	0 0	0 0	0 0	5 5	493 498
	Total	327	16 343	47 390	109 499	122 621	1,228 1,849
	Grand Total	2,921	52 2,973	90 3,063	237 3,300	486 3,786	2,207 5,993

VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

2. Abacan River (1/4)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	ANGELES CITY						
20	Pulong Maragul 2009020	112	4 116	19 135	163 298	157 455	131 586
	Sapang Libutad 2009026	0	3 3	0 3	6 9	12 21	11 32
	Pandan 2009018	0	0 0	0 0	12 12	5 17	215 232
	Tabun 2009032	4	0 4	0 4	0 4	29 33	85 118
	Capaya 2009005	0	0	0 0	0 0	0 0	113 113
	Total	116	7 123	19 142	181 323	203 526	555 1,081
	MEXICO						
21	Culubasa 2021008	0	0 0	0 0	3 3	13 16	8 24
	Cawayan 2021006	40	10 50	0 50	49 99	29 128	26 154
	Sapang Libutad A.C. 2009026	8	0 8	0 8	0 8	0 8	0 8
	Total	48	10 58	0 58	52 110	42 152	34 186
	MEXICO						
22	San Agustin, Sta. Ana 2022001	0	0 0	0 0	1 1	14 15	19 34
	San Antonio, Arayat 2012020	0	0 0	0 0	0 0	2 2	303 305
	Anao 2021002	0	0 0	0 0	28 28	0 28	30 58
	Cawayan 2021006	0	0 0	0 0	0 0	0 0	9 9
	Pangatlan, Sn Jose, Mal. 2021026	4	0 4	0 4	0 4	0 4	0 4
	Total	4	0 4	0 4	29 33	16 49	361 410

VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

2. Abacan River (2/4)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	MEXICO						
28	Pangatlan Sn Jose, Mal. 2021026	4	0 / 4	1 / 5	2 / 7	1 / 8	170 / 178
	Culubasa 2021008	0	0 / 0	0 / 0	0 / 0	0 / 0	105 / 105
	Total	4	0 / 4	1 / 5	2 / 7	1 / 8	275 / 283
	MEXICO						
29	Sto. Rosario 2021041	9	0 / 9	0 / 9	19 / 28	1 / 29	0 / 29
	San Vicente 2021036	0	0 / 0	0 / 0	0 / 0	4 / 4	62 / 66
	Balas 2021003	0	0 / 0	0 / 0	0 / 0	36 / 36	107 / 143
	Sta. Cruz 2021038	0	0 / 0	0 / 0	0 / 0	0 / 0	83 / 83
	Pangatlan 2021020	0	0 / 0	0 / 0	0 / 0	0 / 0	28 / 28
	Anao 2021002	404	2 / 406	4 / 410	0 / 410	3 / 413	5 / 418
	Sub-Total	413	2 / 415	4 / 419	19 / 438	44 / 482	285 / 767
	STA. ANA						
	San Pablo 2022008	96	25 / 121	1 / 122	51 / 173	73 / 246	36 / 282
	San Roque 2022010	379	0 / 379	8 / 387	16 / 403	58 / 461	24 / 485
	San Agustin 2022001	0	0 / 0	0 / 0	5 / 5	2 / 7	60 / 67
	Sub-Total	475	25 / 500	9 / 509	72 / 581	133 / 714	120 / 834
	Total	888	27 / 915	13 / 928	91 / 1,019	177 / 1,196	405 / 1,601

VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

2. Abacan River (3/4)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	STA. ANA						
30	San Agustin 2022001	28	0 28	0 28	0 28	0 28	0 28
	Sto. Rosario 2022013	11	1 12	0 12	0 12	0 12	0 12
	Total	39	1 40	0 40	0 40	0 40	0 40
	MEXICO						
31	Sabanilla 2021023	0	0 0	0 0	6 6	0 6	76 82
	Masamat 2021016	0	0 0	0 0	0 0	0 0	5 5
	Lagundi 2021013	231	0 231	0 231	0 231	0 231	0 231
	Masangsang 2021017	949	0 949	7 956	0 956	9 965	0 965
	Divisoria 2021009	0	0 0	0 0	0 0	0 0	15 15
	San Jose Matulid 2021027	337	0 337	23 360	82 442	181 623	367 990
	San Antonio 2021024	18	1 19	0 19	1 20	6 26	10 36
	Sto. Rosario 2021041	155	11 166	0 166	0 166	0 166	0 166
	Total	1,690	12 1,702	30 1,732	89 1,821	196 2,017	473 2,490

VII.3 Number of Buildings Located in Probable Flood Areas in Sacobia/Bamban and Abacan River Basins

2. Abacan River (4/4)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
	MEXICO						
32	San Juan, Sta. Ana 2022006	0	0 / 0	0 / 0	0 / 0	2 / 2	8 / 10
	San Roque 2021035	5	0 / 5	0 / 5	0 / 5	2 / 7	0 / 7
	Sta. Maria 2021039	20	0 / 20	0 / 20	0 / 20	0 / 20	0 / 20
	Sto. Domingo 2021040	46	5 / 51	3 / 54	27 / 81	65 / 146	97 / 243
	Dolores (Piring) 2021010	0	0 / 0	0 / 0	0 / 0	0 / 0	78 / 78
	Total	71	5 / 76	3 / 79	27 / 106	69 / 175	183 / 358
	Graud Total	2,860	62 / 2,922	66 / 2,988	471 / 3,459	704 / 4,163	2,286 / 6,449

VII.4 Summary of Traffic Counting on Magalang-Tarlac Road

Station No. 1 Mabalacat

DATE	ROUTE	CAR, TAXI, VAN PICK-UP	JEEPNEY	SMALL BUS	BIG BUS	RIGID TRUCK	ARTICULATED TRUCK	TOTAL
7/16/95	Dau-Tarlac	616	530	4	513	137	35	1,835
	Tarlac-Dau	710	553	2	557	156	11	1,989
7/17/95	Dau-Tarlac	537	443	9	471	288	65	1,813
	Tarlac-Dau	566	494	4	479	364	16	1,923
7/18/95	Dau-Tarlac	558	447	17	439	333	15	1,809
	Tarlac-Dau	625	470	5	499	399	26	2,024
7/19/95	Dau-Tarlac	541	440	9	491	514	13	2,008
	Tarlac-Dau	550	465	8	506	402	16	1,947
7/20/95	Dau-Tarlac	520	407	8	486	414	25	1,860
	Tarlac-Dau	568	455	9	515	444	11	2,002
7/21/95	Dau-Tarlac	445	421	6	516	403	11	1,802
	Tarlac-Dau	530	483	4	499	406	17	1,939
7/22/95	Dau-Tarlac	585	428	1	535	410	17	1,976
	Tarlac-Dau	684	537	2	621	486	22	2,352
7/23/95	Dau-Tarlac	628	557	21	624	177	6	2,013
	Tarlac-Dau	709	617	37	987	793	42	3,185
Total Dau-Tarlac		4,430 (6,645)	3,673 (5,510)	75 (113)	4,075 (6,113)	2,676 (4,014)	187 (281)	15,116 (22,674)
Total Tarlac-Dau		4,942 (7,413)	4,074 (6,111)	71 (107)	4,663 (6,995)	3,450 (5,175)	161 (242)	17,361 (26,042)
Daily Ave. Dau-Tarlac		554 (831)	459 (689)	9 (14)	509 (764)	335 (502)	23 (35)	1,890 (2,834)
Daily Ave. Tarlac-Dau		618 (927)	509 (764)	9 (13)	583 (874)	431 (647)	20 (30)	2,170 (3,255)
Daily Average Total		**1,172 (1,757)**	**968 (1,453)**	**18 (27)**	**1,092 (1,638)**	**766 (1,149)**	**44 (65)**	**4,060 (6,089)**

Note : (i) Traffic volume of 12 hours for the period from July 16 to July 23, 1995.
(ii) Figures in parentheses show the traffic volume converted to 24 hours.
(iii) Points of survey station are shown in Figure ___.

Source : JICA Study Team Survey

VII.4 Summary of Traffic Counting on Magalang-Tarlac Road

Station No. 2 Magalang

DATE	ROUTE	CAR, TAXI, VAN PICK-UP	JEEPNEY	SMALL BUS	BIG BUS	RIGID TRUCK	ARTICULATED TRUCK	TOTAL
7/16/95	Dau-Tarlac	1,790	598	1	560	213	16	3,178
	Tarlac-Dau	2,864	856	21	612	342	20	4,715
7/17/95	Dau-Tarlac	1,426	450	5	455	479	52	2,867
	Tarlac-Dau	1,580	601	7	502	477	44	3,211
7/18/95	Dau-Tarlac	1,606	468	10	444	503	38	3,069
	Tarlac-Dau	1,531	545	12	488	534	53	3,163
7/19/95	Dau-Tarlac	1,746	509	11	511	495	39	3,311
	Tarlac-Dau	1,748	618	11	500	502	51	3,430
7/20/95	Dau-Tarlac	1,632	432	6	466	485	44	3,065
	Tarlac-Dau	1,617	532	5	490	529	53	3,226
7/21/95	Dau-Tarlac	1,888	529	11	543	517	37	3,525
	Tarlac-Dau	1,645	568	6	472	491	46	3,228
7/22/95	Dau-Tarlac	2,355	795	10	593	523	46	4,322
	Tarlac-Dau	2,017	690	7	586	591	44	3,935
7/23/95	Dau-Tarlac	1,932	823	25	636	201	11	3,628
	Tarlac-Dau	2,607	812	22	646	319	15	4,421
Total Dau-Tarlac		14,375 (21,563)	4,604 (6,906)	79 (119)	4,208 (6,312)	3,416 (5,124)	283 (425)	26,965 (40,448)
Total Tarlac-Dau		15,609 (23,414)	5,222 (7,833)	91 (137)	4,296 (6,444)	3,785 (5,678)	326 (489)	29,329 (43,994)
Daily Ave. Dau-Tarlac		1,797 (2,695)	576 (863)	10 (15)	526 (789)	427 (641)	35 (53)	3,371 (5,056)
Daily Ave. Tarlac-Dau		1,951 (2,927)	653 (979)	11 (17)	537 (806)	473 (710)	41 (61)	3,666 (5,499)
Daily Average Total		**3,748 (5,622)**	**1,228 (1,842)**	**21 (32)**	**1,063 (1,595)**	**900 (1,350)**	**76 (114)**	**7,037 (10,555)**

Note : (i) Traffic volume of 12 hours for the period from July 16 to July 23, 1995.
(ii) Figures in parentheses show the traffic volume converted to 24 hours.
(iii) Points of survey station are shown in Figure ___.

Source : JICA Study Team Survey

VII.4 Summary of Traffic Counting on Magalang-Tarlac Road

Station No. 3 Capas

DATE	ROUTE	CAR, TAXI, VAN PICK-UP		JEEPNEY		SMALL BUS		BIG BUS		RIGID TRUCK		ARTICULATED TRUCK		TOTAL	
7/16/95	Dau-Tarlac	1,306		657		45		622		258		18		2,906	
	Tarlac-Dau	4,085		651		44		689		359		20		5,848	
7/17/95	Dau-Tarlac	1,168		702		51		599		553		53		3,126	
	Tarlac-Dau	2,257		608		37		549		559		52		4,062	
7/18/95	Dau-Tarlac	1,578		686		42		565		469		50		3,390	
	Tarlac-Dau	1,859		543		31		481		627		59		3,600	
7/19/95	Dau-Tarlac	1,578		632		46		540		497		55		3,348	
	Tarlac-Dau	1,435		629		24		495		565		51		3,199	
7/20/95	Dau-Tarlac	1,236		744		48		552		486		38		3,104	
	Tarlac-Dau	1,450		522		39		474		582		42		3,109	
7/21/95	Dau-Tarlac	1,142		846		46		577		499		39		3,149	
	Tarlac-Dau	1,542		505		36		496		548		44		3,171	
7/22/95	Dau-Tarlac	1,662		947		54		585		491		49		3,788	
	Tarlac-Dau	1,843		638		43		596		662		46		3,828	
7/23/95	Dau-Tarlac	1,613		846		47		635		199		13		3,353	
	Tarlac-Dau	2,916		734		47		669		333		19		4,718	
Total Dau-Tarlac		11,283	(16,925)	6,060	(9,090)	379	(569)	4,675	(7,013)	3,452	(5,178)	315	(473)	26,164	(39,246)
Total Tarlac-Dau		17,387	(26,081)	4,830	(7,245)	301	(452)	4,449	(6,674)	4,235	(6,353)	333	(500)	31,535	(47,303)
Daily Ave. Dau-Tarlac		1,410	(2,116)	758	(1,136)	47	(71)	584	(877)	432	(647)	39	(59)	3,271	(4,906)
Daily Ave. Tarlac-Dau		2,173	(3,260)	604	(906)	38	(56)	556	(834)	529	(794)	42	(62)	3,942	(5,913)
Daily Average Total		**3,584**	**(5,376)**	**1,361**	**(2,042)**	**85**	**(128)**	**1,141**	**(1,711)**	**961**	**(1,441)**	**81**	**(122)**	**7,212**	**(10,819)**

Note : (i) Traffic volume of 12 hours for the period from July 16 to July 23, 1995.
(ii) Figures in parentheses show the traffic volume converted to 24 hours.
(iii) Points of survey station are shown in Figure ___.

Source : JICA Study Team Survey

VII.5 Traffic Counting Survey at Three Stations at Magalang-Tarlac Road on July 19,1995

Unit : Number of vehicles

Station No.1(Matadecat)	Dau-Tarlac			Tarlac-Dau			Total		
	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total
1) Car,Taxi,Van,Jeep	541	219	760	550	162	712	1091	381	1472
2) Jeepney	440	193	633	465	189	654	905	382	1287
3) Small Bus	9	2	11	8	11	19	17	13	30
4) Big Bus	491	241	732	506	242	748	997	483	1480
5) Rigid Truck	514	240	754	402	265	667	916	505	1421
6) Articulated Truck	13	27	40	16	20	36	29	47	76
7) Total	2008	922	2930	1947	889	2636	3955 100	1811 45.8%	5766 145.8%

Station No.2(Magalang)	Dau-Tarlac			Tarlac-Dau			Total		
	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total
1) Car,Taxi,Van,Jeep	1746	679	2425	1748	652	2400	3494	1331	4825
2) Jeepney	509	424	933	618	337	955	1127	761	1888
3) Small Bus	11	8	19	11	12	23	22	20	42
4) Big Bus	511	293	804	500	274	774	1011	567	1578
5) Rigid Truck	495	539	1034	502	463	965	997	1002	1999
6) Articulated Truck	39	83	122	51	53	104	90	136	226
7) Total	3311	2026	5337	3430	1791	5221	6741 100	3817 56.6%	10558 156.6%

Station No.3(Capas)	Dau-Tarlac			Tarlac-Dau			Total		
	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total
1) Car,Taxi,Van,Jeep	1578	602	2180	1435	527	1962	3013	1129	4142
2) Jeepney	632	284	916	629	262	891	1261	546	1807
3) Small Bus	46	11	57	24	18	42	70	29	99
4) Big Bus	540	294	834	495	263	758	1035	557	1592
5) Rigid Truck	497	437	934	565	400	965	1062	837	1899
6) Articulated Truck	55	91	146	51	52	103	106	143	249
7) Total	3348	1719	5067	3199	1522	4721	6547 100	3241 49.5%	9788 149.5%

Source : JICA Study Team Survey

Notes : 1) Time of survey: 7:0019:00 and 19:00-7:00 on July 19 ,1995.
2) Site of survey : Three Stations shown in Figure —.

VII.6 Summary of Traffic Data on North Luzon Expressway on July 16-23, 1995

(1) NORTH BOUND TRAFFIC

ENTRY \ EXIT	STA. INES	DAU	ANGELES	SAN FERNANDO	SAN SIMON	PULILAN	STA. RITA	TABANG	BOCAUE	MEYCAUAYAN	VALENZUELA	BALINTAWAK	TOTAL
STA. INES													
DAU	(492) 3,935												(492) 3,935 0.8
ANGELES	(80) 639	(259) 2,069											(339) 2,708 0.5
SAN FERNANDO	(383) 3,061	(607) 4,854	(465) 3,716										(1454) 11,631 2.3
SAN SIMON	(102) 815	(102) 814	(130) 1,036	(1625) 13,003									(1959) 15,668 3.1
PULILAN	(102) 814	(58) 463	(53) 422	(526) 4,204	(114) 915								(852) 6,818 1.4
STA. RITA	(100) 797	(42) 335	(47) 376	(362) 2,899	(74) 590	(94) 751							(719) 5,748 1.1
BOCAUE	(144) 1,153	(61) 486	(60) 480	(475) 3,800	(94) 749	(124) 988	(624) 4,988	(1087) 8,692					(2667) 21,336 4.2
MEYCAUAYAN	(90) 718	(44) 353	(41) 325	(260) 2,081	(76) 610	(70) 561	(380) 3,041	(633) 5,067	(1473) 11,785				(3068) 24,541 4.9
VALENZUELA	(160) 1,276	(60) 477	(46) 367	(356) 2,851	(98) 781	(62) 498	(374) 2,988	(435) 3,479	(819) 6,549	(1807) 14,454			(4215) 33,720 6.7
BALINTAWAK	(2289) 18,311	(1737) 13,895	(797) 6,378	(5426) 43,408	(1375) 11,000	(711) 5,690	(4367) 34,937	(5239) 41,912	(6450) 51,602	(7224) 57,794	(11542) 92,339		(47158) 377,266 74.9
TOTAL	(3940) 31,519 6.3	(2968) 23,746 4.7	(1638) 13,100 2.6	(9031) 72,246 14.4	(1831) 14,645 2.9	(1061) 8,488 1.7	(5744) 45,954 9.1	(7394) 59,150 11.8	(8742) 69,956 13.9	(9031) 72,248 14.4	(11542) 92,339 18.3		(62921) 503,371 100

Note : (i) Total number of Cars/Private Jeepneys, Tourist Buses, Trucks, Public Buses and Articulated Trucks.
(ii) Traffic volume of 24 hours for the period from July 16 to 23, 1995.
(iii) Figures in parentheses show daily average values.
(iv) Figures at the bottom of "Total" show pecentages to the total.
Source : PNCC-NLTD Controllership.

VII.6 Summary of Traffic Data on North Luzon Expressway on July 16-23, 1995

(2) SOUTH BOUND TRAFFIC

ENTRY \ EXIT	STA. INES	DAU	ANGELES	SAN FERNANDO	SAN SIMON	PULILAN	STA. RITA	BOCAUE	MEYCAUAYAN	VALENZUELA	BALINTAWAK	TOTAL
STA. INES		(497) 3,974	(100) 798	(373) 2,982	(91) 727	(113) 906	(88) 701	(114) 914	(81) 650	(145) 1,161	(2447) 19,572	(4046) 32,385 6.6
DAU			(260) 2,079	(610) 4,882	(95) 762	(63) 505	(52) 412	(48) 383	(42) 337	(49) 388	(1885) 15,080	(3104) 24,828 5.0
ANGELES				(457) 3,653	(106) 849	(52) 418	(41) 328	(49) 393	(30) 238	(39) 313	(805) 6,436	(1579) 12,628 2.6
SAN FERNANDO					(1383) 11,067	(551) 4,409	(397) 3,172	(393) 3,140	(230) 1,838	(324) 2,594	(5885) 47,079	(9162) 73,299 14.9
SAN SIMON						(109) 869	(88) 706	(88) 704	(68) 542	(91) 727	(1104) 8,834	(1548) 12,382 2.5
PULILAN							(115) 917	(128) 1,026	(45) 358	(56) 449	(685) 5,477	(1028) 8,227 1.7
STA. RITA								(489) 3,910	(268) 2,141	(348) 2,787	(4260) 34,083	(5365) 42,921 8.7
TABANG								(1130) 9,040	(642) 5,134	(467) 3,735	(6203) 49,625	(8442) 67,534 13.7
BOCAUE									(1091) 8,724	(869) 6,950	(6408) 51,267	(8368) 66,941 13.6
MEYCAUAYAN										(959) 7,511	(7606) 60,847	(8545) 68,358 13.9
VALENZUELA											(10329) 82,628	(10329) 82,628 16.8
TOTAL		(497) 3,974 0.8	(360) 2,877 0.6	(1440) 11,517 2.3	(1676) 13,405 2.7	(888) 7,107 1.4	(780) 6,236 1.3	(2439) 19,510 4.0	(2495) 19,962 4.1	(3327) 26,615 5.4	(47616) 380,928 77.4	(61516) 492,131 100

Note: (i) Total number of Cars/Private Jeepneys, Tourist Buses, Trucks, Public Buses and Articulated Trucks.
(ii) Traffic volume of 24 hours for the period from July 16 to 23, 1995.
(iii) Figures in parentheses show daily average values.
(iv) Figures at the bottom of "Total" show percentages to the total.

Source: PNCC-NLTD Controllership

VII.7 Traffic Data in the Study Area

	Road Section	Data Source	A Node	B Node	Car	Jeepney	Bus	Truck	Total	PCU	Others	
1)	CLDP Data											
	Mabalacat-Bamban(MNR)	LISR	3401	3535	6554	1874	1807	1629	11864	16237	0	1992
	San Fernando-Angeles(MNR)	NTCP87	3428	3429	6793	8577	3900	1973	21243	31405	0	1987
	Bamban-Capas	NTCP87	3532	3535	3855	1291	1755	1269	8170	11840	105	1987
	Angeles-San Fernando	ALT93	3437	3439	8197	0	2090	3094	13381	18565	0	1993
2)	LISR Data											
	SanFernando-Mabalacat(NLE)				11340	5873	2280	3096	22589			1992
	Mabalacat-Capas				5066	1467	1104	2010	9647			1992
3)	DPWH Data											
	Mabalacat-Bamban	DPWH Angeles			1231	728	117	922	2998		225	Nov.19,94
	Mabalacat-Concepcion	ditto			2401	4223	889	684	8197 *			Nov.7-13,94
									(10929)			Daily average
4)	Angeles-San Fernando(MNR)	Kampsax Int'l			12909	638	163	1379	15089		213	Nov.14,92
	ditto				13225	685	190	1562	15662		249	Nov.13,92
5)	San Francisco Bridge(#329)	JICA			3603	1805	1196	1080	7684 *			Aug.21-28,94
									(10245)			Daily average

Note :

* :	12 hrs survey data which was adjusted to 24 hrs data and is shown in the parenthses of the down column.
LISR:	Luzon Island Strategic Road Development Study, JICA, July 1993
NTCP:	National Traffic Count Program ,DPWH
ALT93:	Feasibility Study of the Proposed Alternate Arterial Roads in Central Luzon, 1994

VII.8 DPWH Traffic Counting Survey in November 1994

Unit : Number of vehicles

	Mon. Nov.7	Tue. Nov.8	Wed. Nov. 9	Thu. Nov.10*	Fri. Nov. 11	Sat. Nov. 12	Sun. Nov. 13	Total	Daily Aver.
1) Car,Taxi,Van,Jeep	2623	2151	2292	2450	2373	2416	2504	16809	2401
	(34.8)	(27.5)	(27.6)	(28.3)	(27.7)	(28.5)	(31.3)	(29.3)	
2) Jeepney	3542	4248	4419	4487	4457	4436	3974	29563	4223
	(47.0)	(54.2)	(53.3)	(51.8)	(52.0)	(52.3)	(49.7)	(51.5)	
3) Small Bus	115	72	61	84	83	79	91	585	84
	(1.5)	(0.9)	(0.7)	(1.0)	(1.0)	(0.9)	(1.1)	(1.0)	
4) Big Bus	711	764	848	868	864	833	745	5633	805
	(9.4)	(9.8)	(10.2)	(10.0)	(10.1)	(9.8)	(9.3)	(9.8)	
5) Rigid Truck	442	536	607	692	708	635	598	4218	603
	(5.9)	(6.8)	(7.3)	(8.0)	(8.3)	(7.5)	(7.5)	(7.4)	
6) Articulated Truck	107	63	69	74	87	77	92	569	81
	(1.4)	(0.8)	(0.8)	(0.9)	(1.0)	(0.9)	(1.1)	(1.0)	
7) Total	7540	7834	8296	8655	8572	8476	8004	57377	8197
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

Source : DPWH-PDESO Angeles.

Notes : 1) Time of survey: 7:00 a.m. -19:00 p.m. from November 7 to November 13, 1994.
2) Site of survey : Station No. 021 in Mabalacat Municipality in Pampanga.
3) :* : Original data covering 24 hrs. was adjusted to 12hrs. survey in this table.

VII.9 Analysis of Economic Benefit in Sacobia/Bamban River Basin

Probable Flood Damage for each Flood Return Period for Sacobia / Bamban Rivers

Unit : Pesos 10^3

	Buildings	Crops & Livestock	Infrastructure	Evacuation & Cleanup Cost	Loss of GRDP	Total
Return Period						
2 years	55,215	21,356	19,334	9,700	8,180	113,785
5	60,264	21,776	19,759	9,890	8,300	119,990
10	63,541	22,680	19,284	10,160	8,530	124,196
20	72,255	23,615	19,893	10,890	9,140	135,793
50	75,912	26,678	21,047	12,290	10,310	146,237
100	119,069	35,913	21,803	19,590	16,450	212,826

	Buildings	Crops & Livestock	Infrastructure	Evacuation & Cleanup Cost	Loss of GRDP	Total
2 years	48.53%	18.77%	16.99%	8.52%	7.19%	100
5	50.22%	18.15%	16.47%	8.24%	6.92%	100
10	51.16%	18.26%	15.53%	8.18%	6.87%	100
20	53.21%	17.39%	14.65%	8.02%	6.73%	100
50	51.91%	18.24%	14.39%	8.40%	7.05%	100
100	55.95%	16.87%	10.24%	9.20%	7.73%	100

	No.of Affected Buildings	Affected Agricultural Land(sq.m)	Total Affected Area(sq.km)	Affected Household	Affected Urban Population
2 years	2,921			3,436	9,604
5	2,973			3,498	9,775
10	3,063			3,604	10,071
20	3,300	28.07	58.16	3,882	10,850
50	3,786			4,454	12,448
100	5,993		134.06	7,051	19,705

Note: (1) "Affected Household" is computed at "No. of Affected Buildings" divided by 0.85.
(2) "Affected Urban Population" = "Affected Household" * Urbanization Ratio * Family Size

Average Annual Damage for 20-Year Return Period (Pesos million)

Building	Crops & Livestock	Infrastructure	Evacuation & Cleanup Cost	Loss of GRDP	Detour Cost	Total
51.09	19.00	17.06	8.62	7.25	76.77	179.79
28%	11%	9%	5%	4%	43%	100%

VII.9 Analysis of Economic Benefit in Sacobia/Bamban River Basin

Average Annual Damage of each Asset in Sacobia / Bamban River Basin

(1) Buildings

(A) Return Period	(B) Average Annual Probability of Exceedance for Return Period	(C) Events within Intervals	(D) Flood Damage up to Indicated Return Period (Pesos 10^6)	(E) Average Flood Damage (Pesos 10^6)	(F) Flood Damage within Intervals (Pesos 10^6)	(G) Average Annual Flood Damage up to Indicated Return Period (Pesos 10^6)
2	0.5		55.22			0.00
		0.3		85.35	25.60	
5	0.2		115.48			25.60
		0.1		147.25	14.72	
10	0.1		179.02			40.33
		0.05		215.15	10.76	
20	0.05		251.28			51.09
		0.03		289.23	8.66	
50	0.02		327.19			59.76
		0.01		386.72	3.87	
100	0.01		446.26			63.63

(2) Crops and Livestock

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		21.35			0.00
		0.3		32.24	9.67	
5	0.2		43.13			9.67
		0.1		54.47	5.45	
10	0.1		65.81			15.12
		0.05		77.62	3.88	
20	0.05		89.43			19.01
		0.03		102.77	3.08	
50	0.02		116.11			22.08
		0.01		134.06	1.34	
100	0.01		152.02			23.42

(3) Infrastructures

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		19.33			0.00
		0.3		29.21	8.76	
5	0.2		39.09			8.76
		0.1		48.74	4.87	
10	0.1		58.38			13.64
		0.05		68.32	3.42	
20	0.05		78.27			17.06
		0.03		88.79	2.66	
50	0.02		99.32			19.72
		0.01		110.22	1.10	
100	0.01		121.12			20.82

(4) Evacuation and Clean-up Costs

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		9.70			0.00
		0.3		14.65	4.39	
5	0.2		19.59			4.39
		0.1		24.67	2.47	
10	0.1		29.75			6.86
		0.05		35.20	1.76	
20	0.05		40.64			8.62
		0.03		46.79	1.40	
50	0.02		52.93			10.02
		0.01		62.73	0.63	
100	0.01		72.52			10.65

(5) Loss of GRDP

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		8.18			0.00
		0.3		12.33	3.70	
5	0.2		16.48			3.70
		0.1		20.75	2.07	
10	0.1		25.01			5.77
		0.05		29.58	1.48	
20	0.05		34.15			7.25
		0.03		39.31	1.18	
50	0.02		44.46			8.43
		0.01		52.69	0.53	
100	0.01		60.91			8.96

(6) Total

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		113.79			0.00
		0.3		173.78	52.13	
5	0.2		233.78			52.13
		0.1		295.87	29.59	
10	0.1		357.97			81.72
		0.05		425.87	21.29	
20	0.05		493.76			103.01
		0.03		566.88	17.01	
50	0.02		640.00			120.02
		0.01		746.41	7.46	
100	0.01		852.83			127.49

VII.10 Analysis of Economic Benefit in Abacan River Basin

Probable Flood Damage for each Flood Return Period in Abacan River Basin

	Buildings	Crops & Livestock	Infrastructure	Evacuation & Cleanup Cost	Loss of GRDP	Total
Return Period						
2 years	60,587	25,729	17,759	10,300	8,649	123,016
5	67,125	28,505	18,763	10,520	8,830	133,743
10	83,414	27,815	21,382	10,720	9,030	152,361
20	108,345	30,071	25,195	12,450	10,450	186,511
50	168,873	33,695	33,675	14,990	12,580	263,812
100	233,827	38,165	32,726	23,220	19,490	347,428

	Buildings	Crops & Livestock	Infrastructure	Evacuation & Cleanup Cost	Loss of GRDP	Total
Return Period						
2 years	49.25%	20.92%	14.44%	8.37%	7.02%	100
5	50.19%	21.31%	14.03%	7.87%	6.60%	100
10	54.75%	18.26%	14.03%	7.04%	5.93%	100
20	58.09%	16.12%	13.51%	6.68%	5.60%	100
50	64.01%	12.77%	12.76%	5.68%	4.77%	100
100	67.30%	10.99%	9.42%	6.68%	5.61%	100

	No.of Affected Buildings	Affected Agricultural Land(sq.m)	Total Affected Area(sq.km)	Affected Household	Affected Urban Population
2 years	2,650			3,365	9,404
5	2,922			3,438	9,608
10	2,988			3,515	9,825
20	3,459	15.40	29.21	4,069	11,373
50	4,163			4,898	13,688
100	6,449		61.15	7,587	21,204

Note: (1) "Affected Household" is computed at "No. of Affected Buildings" divided by 0.85.
(2) "Affected Urban Population" = "Affected Household" * Urbanization Ratio * Family Size

Average Annual Damage for 20-Year Return Period (Pesos million)

Building	Crops & Livestock	Infrastructure	Evacuation & Cleanup Cost	Loss of GRDP	Total
58.45	23.66	16.39	9.17	7.70	115.37
51%	21%	14%	8%	7%	100%

Table Estimated Average Annual Damage of each Asset in Abacan River Basin

(1) Buildings

(A) Return Period	(B) Average Annual Probability of Exceedance for Return Period	(C) Events within Intervals	(D) Flood Damage up to Indicated Return Period (Pesos 10^6)	(E) Average Flood Damage (Pesos 10^6)	(F) Flood Damage within Intervals (Pesos 10^6)	(G) Average Annual Flood Damage up to Indicated Return Period (Pesos 10^6)
2	0.5		60.59			0.00
		0.3		94.15	28.24	
5	0.2		127.71			28.24
		0.1		169.42	16.94	
10	0.1		211.13			45.19
		0.05		265.30	13.26	
20	0.05		319.47			58.45
		0.03		403.91	12.12	
50	0.02		488.34			70.57
		0.01		605.26	6.05	
100	0.01		722.17			76.62

(2) Agricultural Crops & Livestock

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		25.73			0.00
		0.3		39.98	11.99	
5	0.2		54.23			11.99
		0.1		68.14	6.81	
10	0.1		82.05			18.81
		0.05		97.08	4.85	
20	0.05		112.12			23.68
		0.03		128.97	3.87	
50	0.02		145.82			27.53
		0.01		164.90	1.65	
100	0.01		183.98			29.18

(3) Infrastructures

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		17.76			0.00
		0.3		27.14	8.14	
5	0.2		36.52			8.14
		0.1		47.21	4.72	
10	0.1		57.90			12.86
		0.05		70.50	3.53	
20	0.05		83.10			16.39
		0.03		99.94	3.00	
50	0.02		116.77			19.39
		0.01		133.14	1.33	
100	0.01		149.50			20.72

(4) Evacuation and Clean-up Costs

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		10.30			0.00
		0.3		15.56	4.67	
5	0.2		20.82			4.67
		0.1		26.18	2.62	
10	0.1		31.54			7.29
		0.05		37.77	1.89	
20	0.05		43.99			9.17
		0.03		51.49	1.54	
50	0.02		58.98			10.72
		0.01		70.59	0.71	
100	0.01		82.20			11.42

(5) Loss of GRDP

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		8.64			0.00
		0.3		13.06	3.92	
5	0.2		17.47			3.92
		0.1		21.99	2.20	
10	0.1		26.50			6.12
		0.05		31.73	1.59	
20	0.05		36.95			7.70
		0.03		43.24	1.30	
50	0.02		49.53			9.00
		0.01		59.28	0.59	
100	0.01		69.02			9.59

(6) Total

(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		123.02			0.00
		0.3		189.89	56.97	
5	0.2		256.76			56.97
		0.1		332.94	33.29	
10	0.1		409.12			90.25
		0.05		502.38	25.12	
20	0.05		595.63			115.36
		0.03		727.54	21.83	
50	0.02		859.44			137.21
		0.01		1033.16	10.33	
100	0.01		1206.87			147.54

VII.11 Data on Shadow Pricing of Land Acquisition Cost

1) Land Compensation Cost

-20 ha, within the total area of 35 ha land, of irrigated paddy was assumed.
The remaining land was assumed to be not utilized for production.

-From Interim Report(1) :

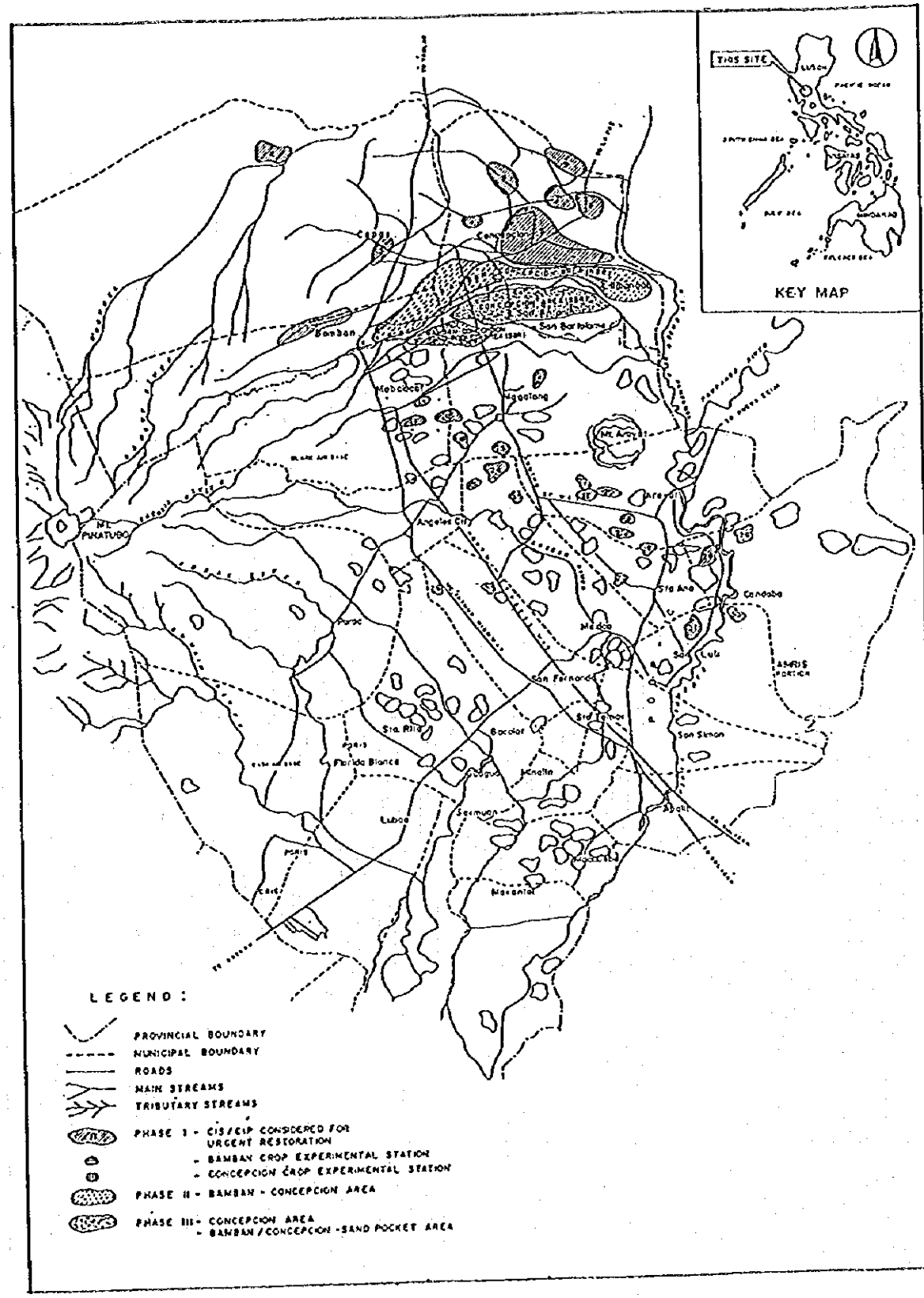
# Yield (ton/ha)	: 4.3
# Economic Price (P/ton)	: 5,300
# Production Cost (P/ha)	: 10,140
# Net Income (P/ha)	: 12,650

-Total Net Income : 35 ha * 12,650 (P/ha) =442,750 Peso / Year

-Capitalization : 442,750 / 0.12 = P3,689,600 (Discount Rate of 12 % was assumed)

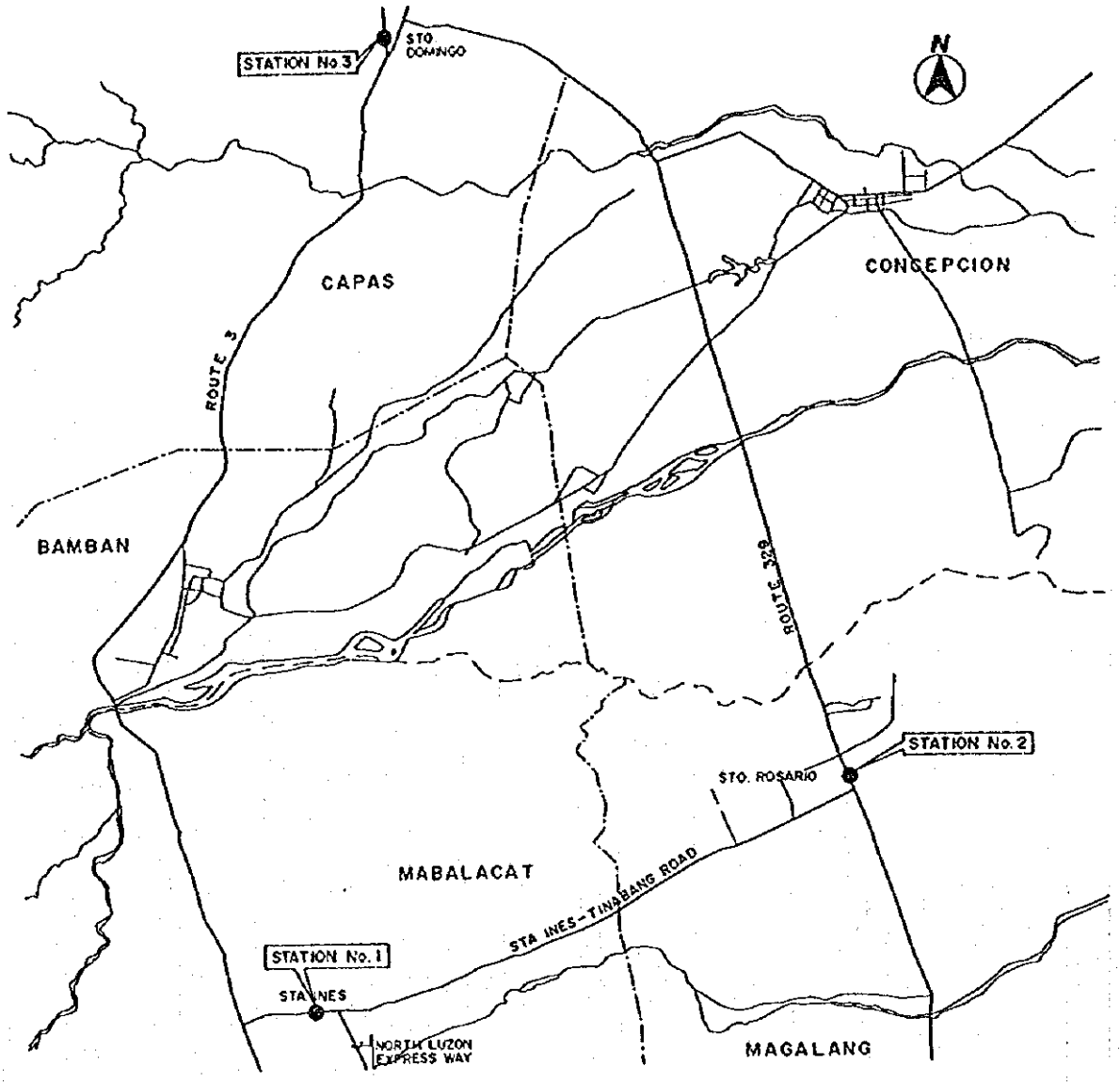
2) Relocation Cost

-20 Houses * @50,000 (P/house) = P1,000,000



VII.12 Location Map of Priority Schemes for Irrigation Development

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



VII.13 Location of Three Stations for Traffic Survey Conducted by JICA Study Team

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

DATABOOK

HYDROLOGICAL DATA

(DB.2)

DATABOOK (DB.2)
HYDROLOGICAL DATA

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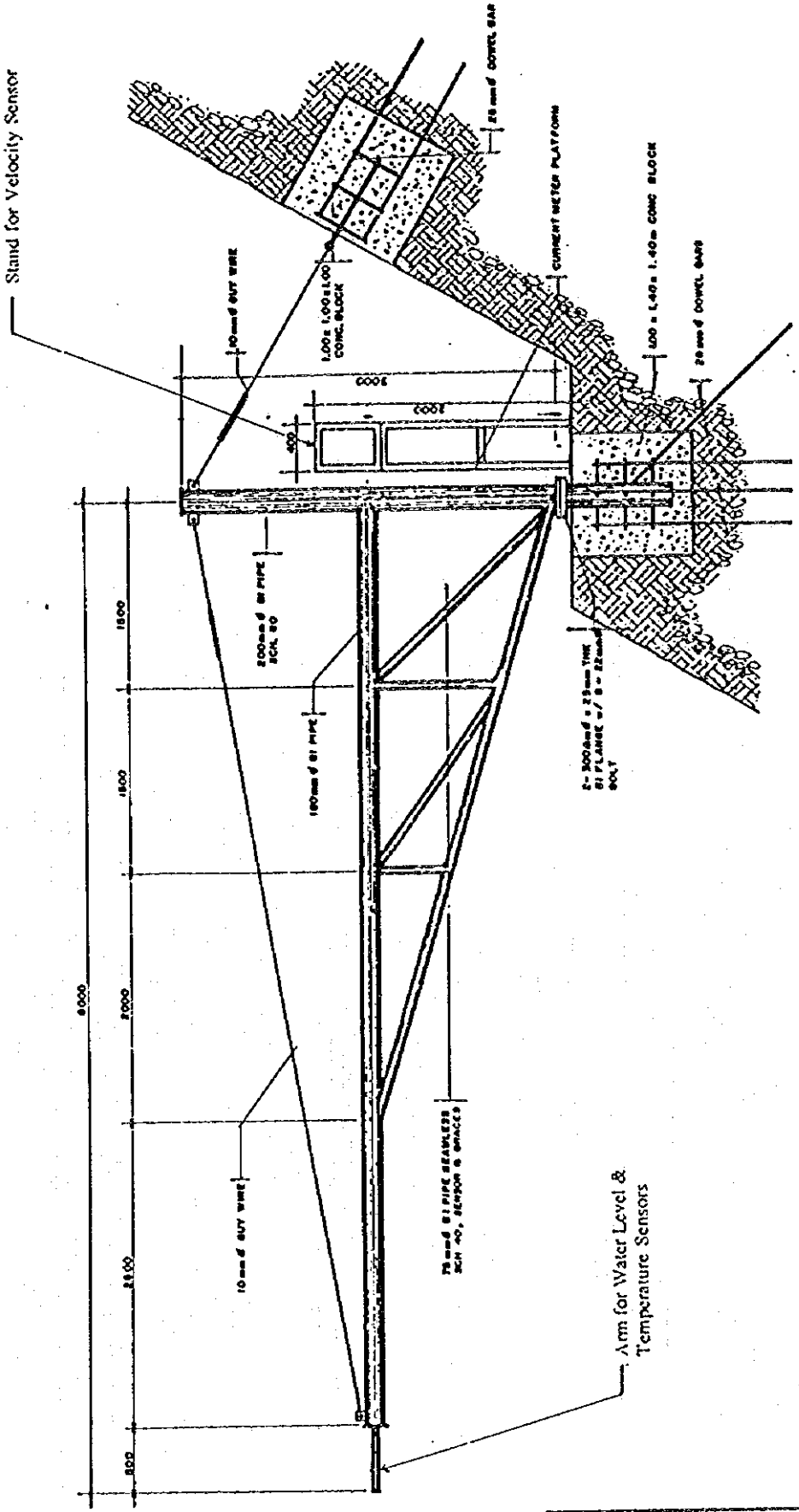
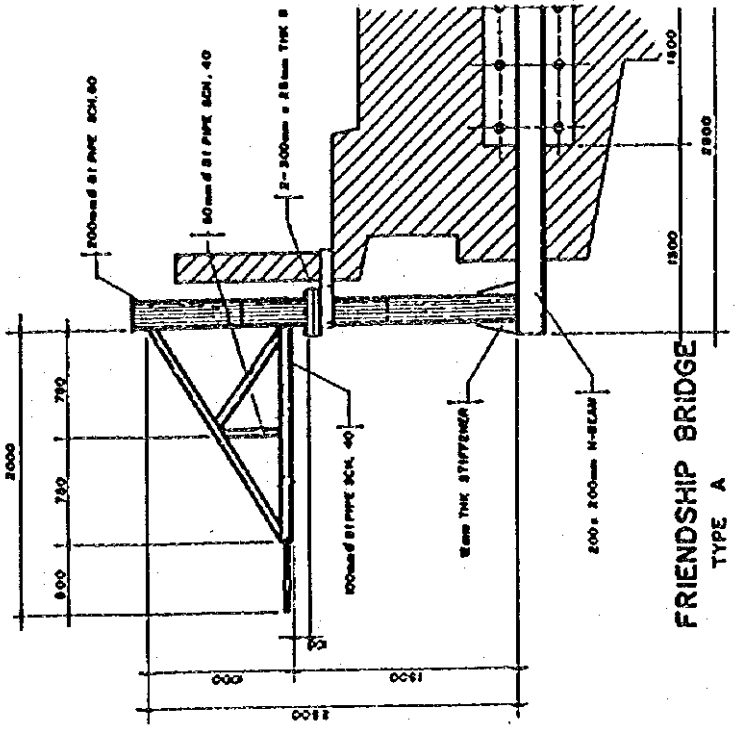
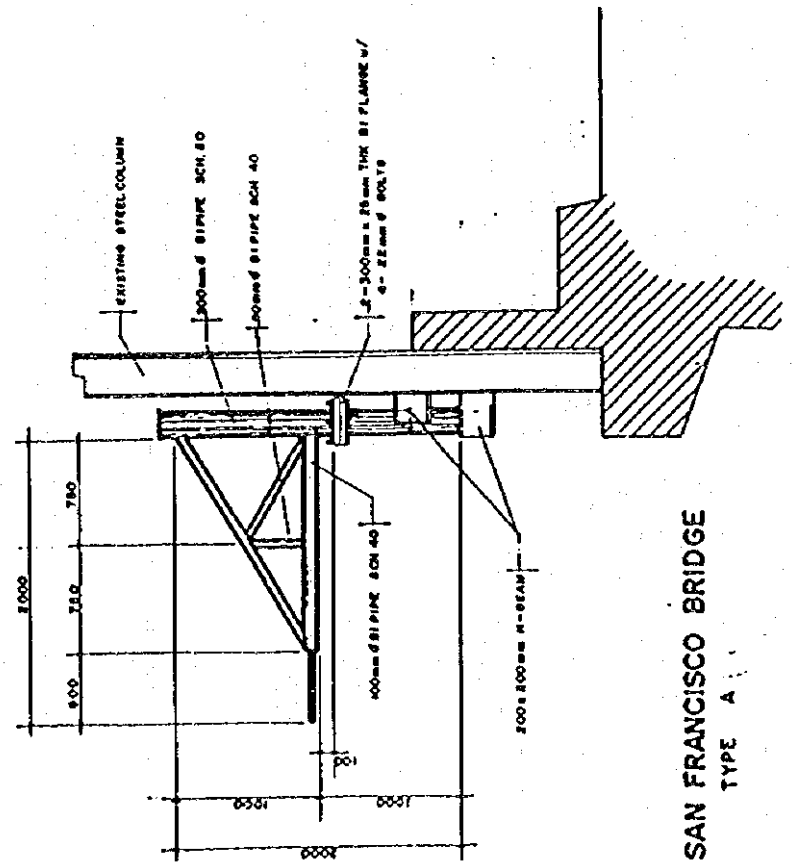
JAPAN INTERNATIONAL COOPERATION AGENCY



Gauging Arm at Sacobia Stream Flow / Mud Flow Gauging Station

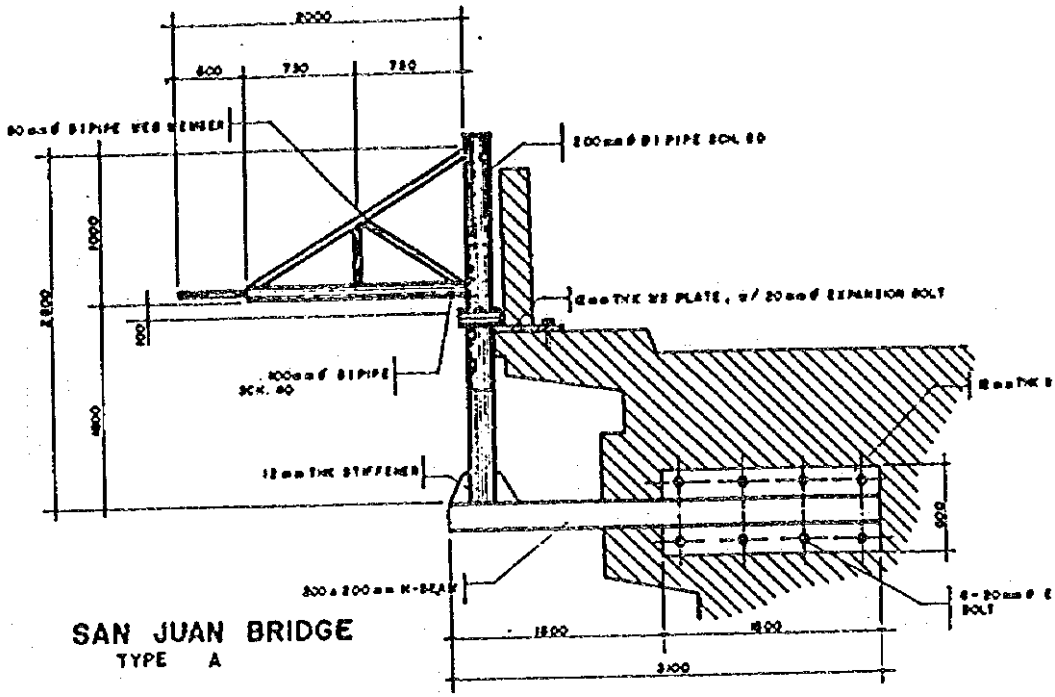
THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



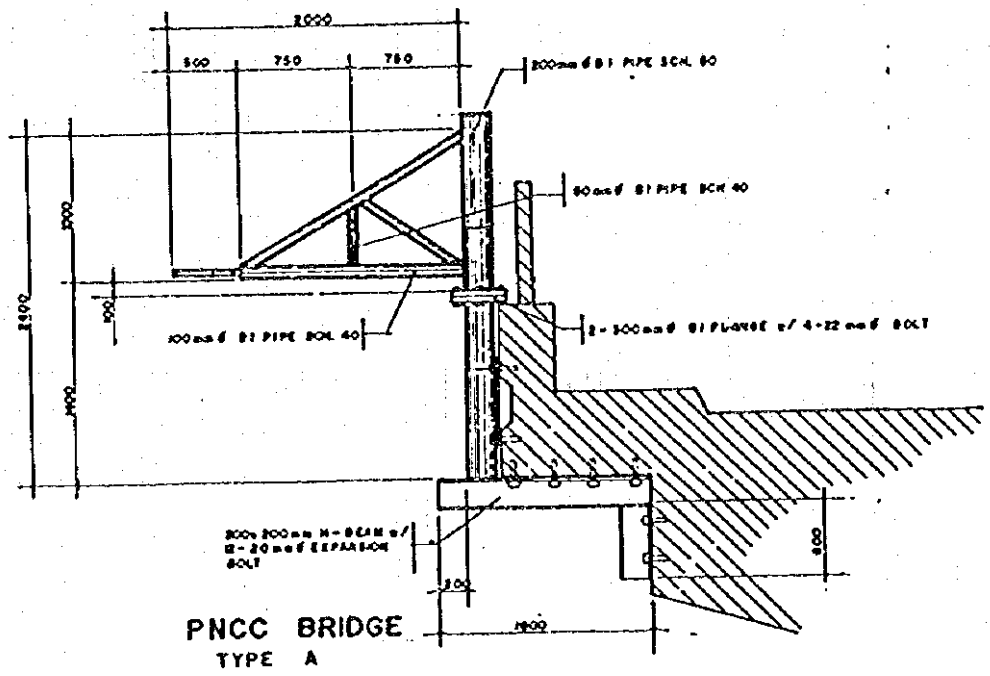


Gauging Arm at San Francisco and Friendship Stream Flow / Mud Flow Gauging Station

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



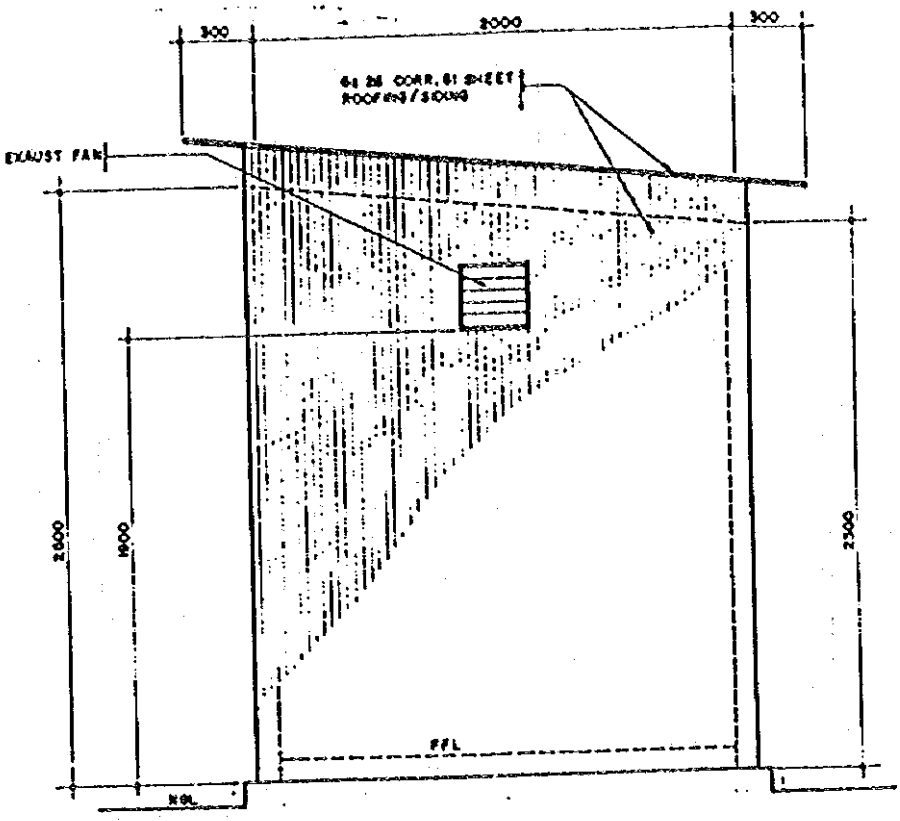
SAN JUAN BRIDGE
TYPE A

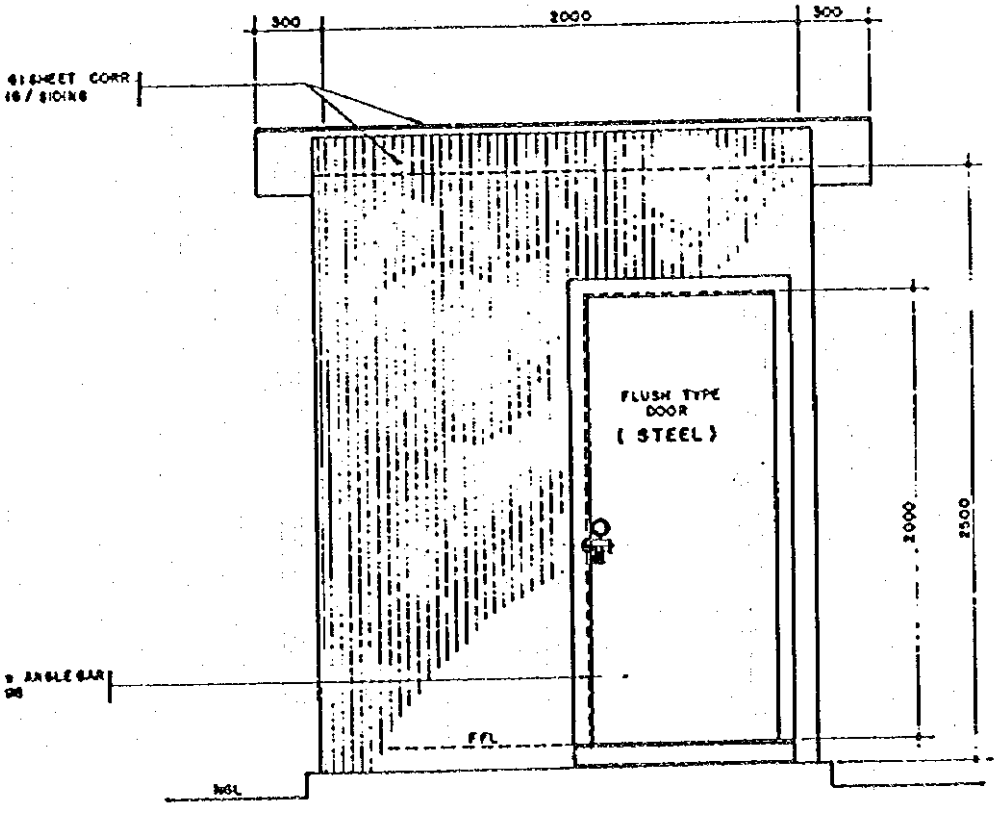


PNCC BRIDGE
TYPE A

Gauging Arm at San Juan and Capaya Stream Flow / Mud Flow Gauging Stations

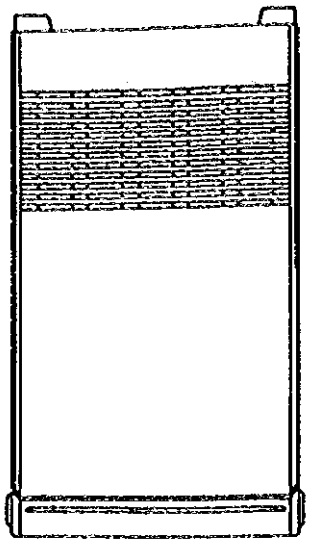
THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY





Electric House for Stream Flow / Mud Flow Gauging Station

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT. PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



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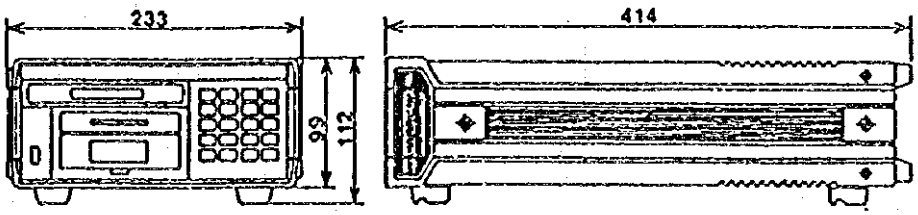
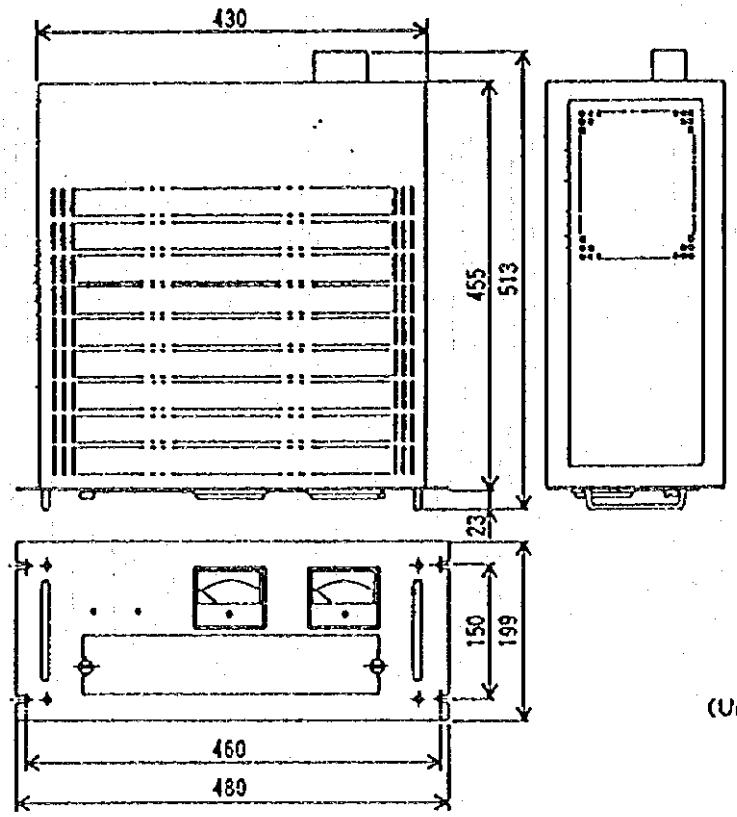


MEMORY CARD LOGGER



(Unit : mm)

POWER SUPPLY UNIT

Memory Card Logger and
Power Supply Unit

THE GOVERNMENT OF THE PHILIPPINES THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT PINATUBO
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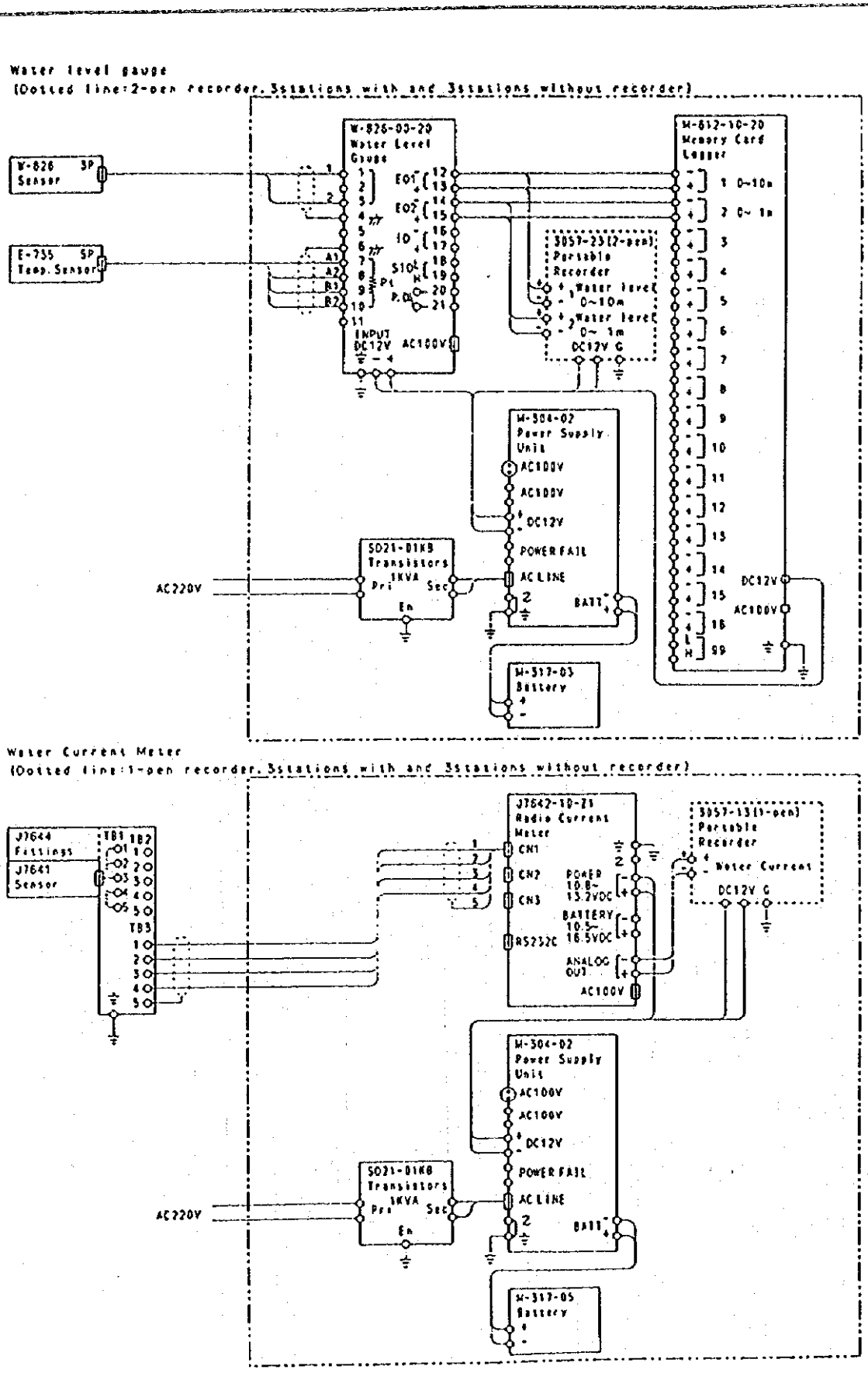
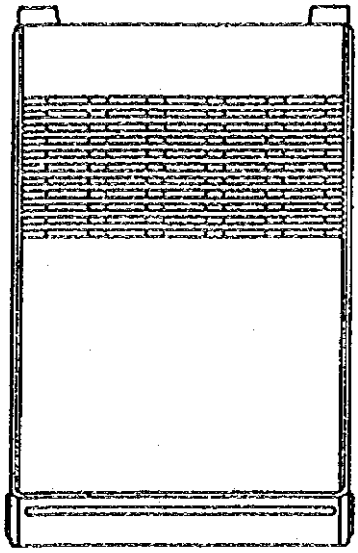
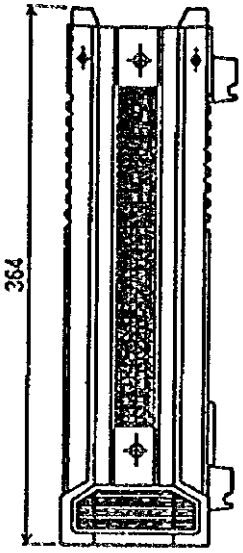
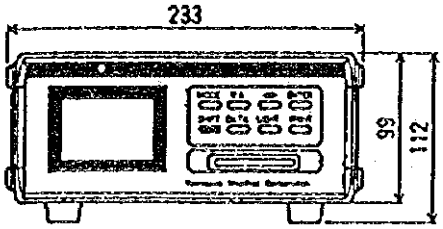


Wiring Diagram for Stream Flow / Mud Flow Gauging Station

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

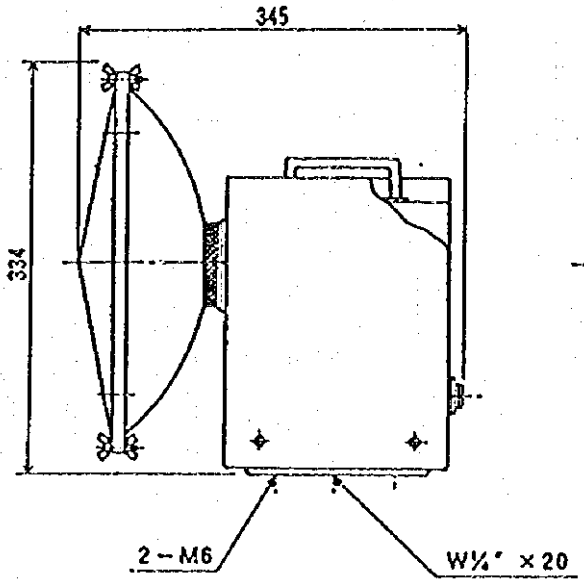


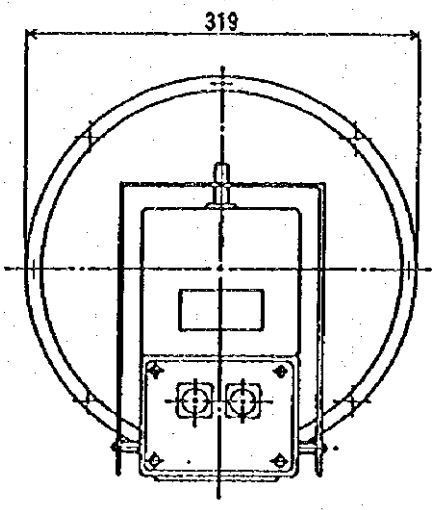




(Unit : mm)

CURRENT METER WITH MEMORY CARD LOGGER



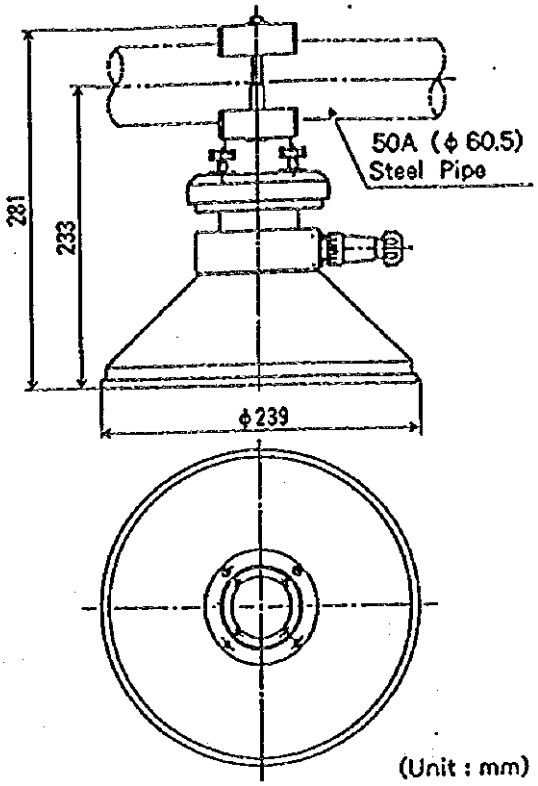


(Unit : mm)

SENSOR

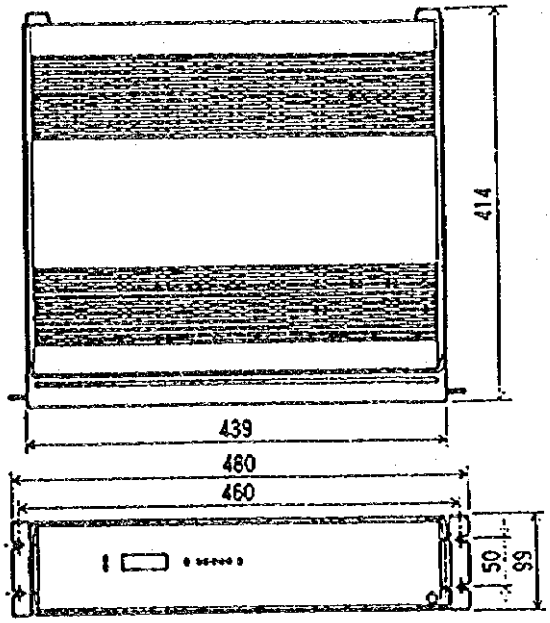
Radio Wave Current Meter

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



(Unit : mm)

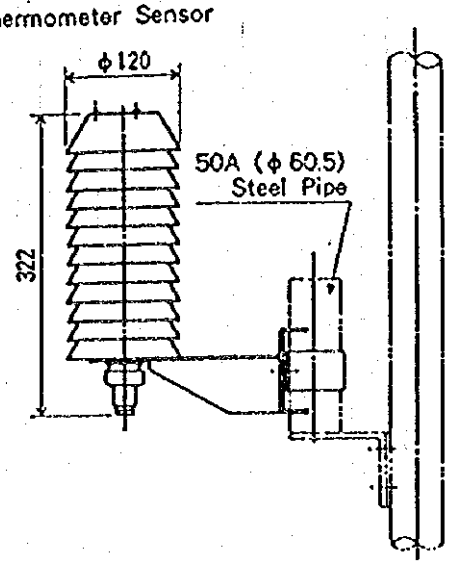
WATER LEVEL SENSOR



(Unit : mm)

WATER LEVEL CONVERTER

Thermometer Sensor

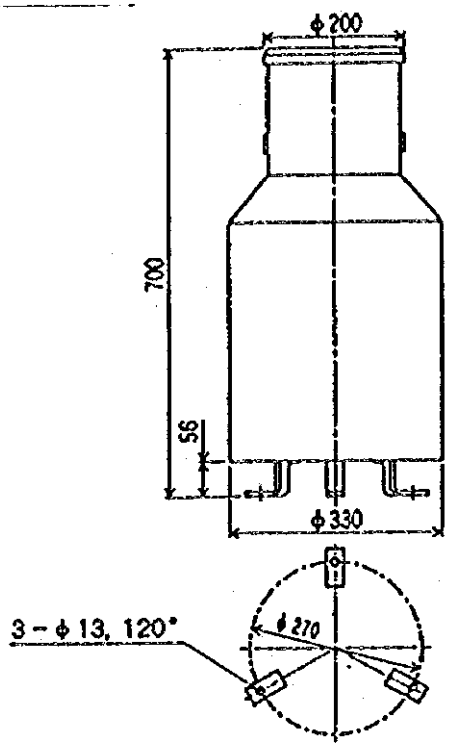


(Unit : mm)

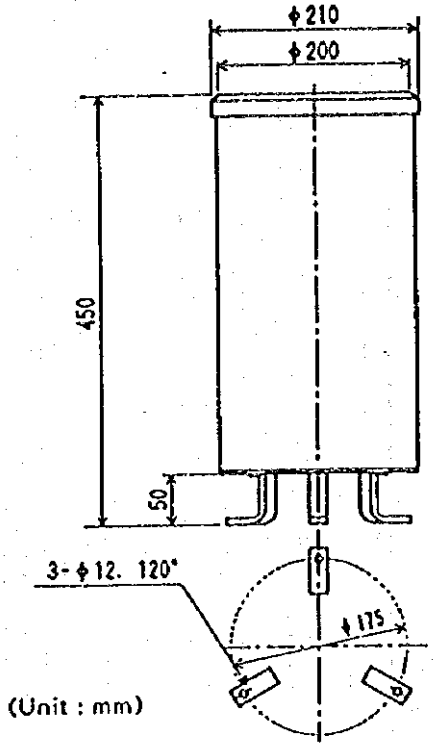
TEMPERATURE SENSOR

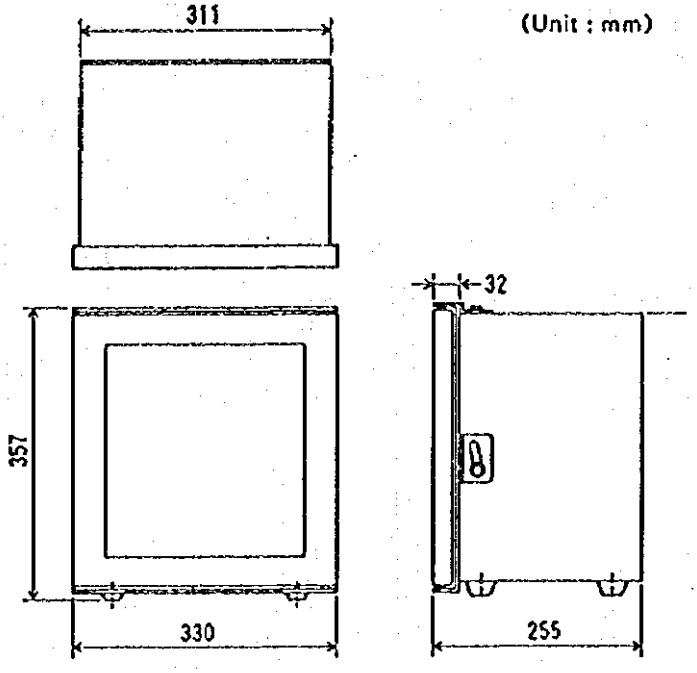
Sensors and Converter
for Water Level Gauge

THE GOVERNMENT OF THE PHILIPPINES THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



ONE UNIT TYPE





(Unit : mm)

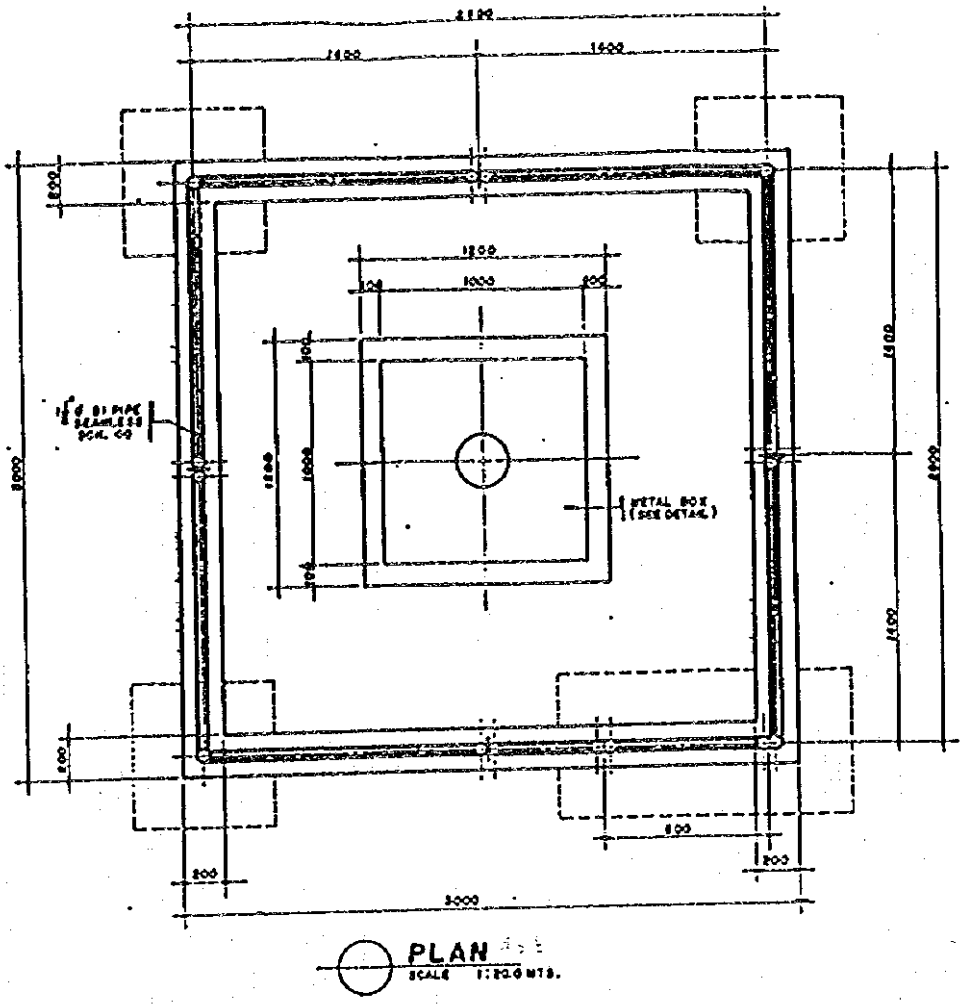
AUTOMATIC RECORDER

RAINFALL GAUGE

SEPARATE TYPE

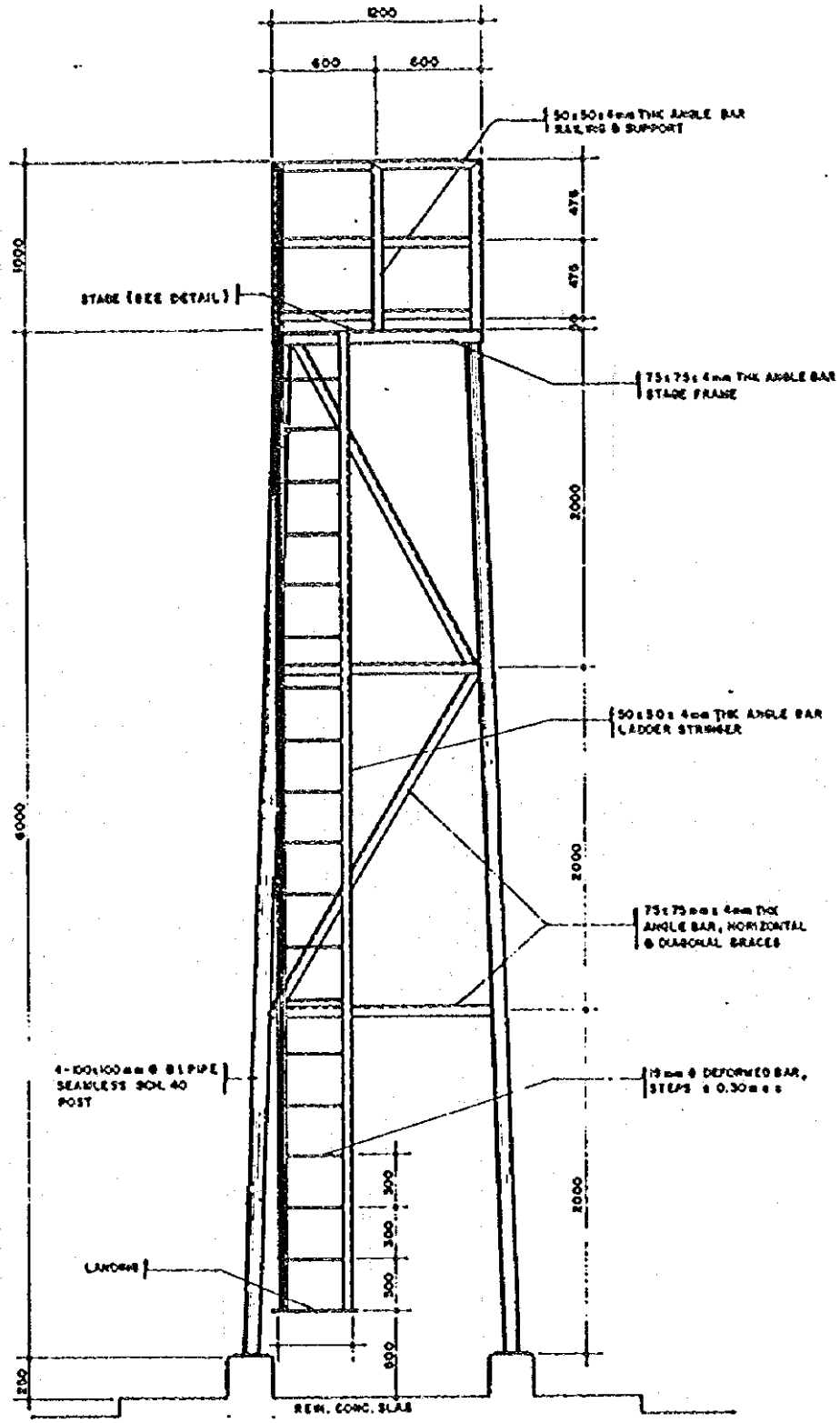
Automatic Rainfall Gauge

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



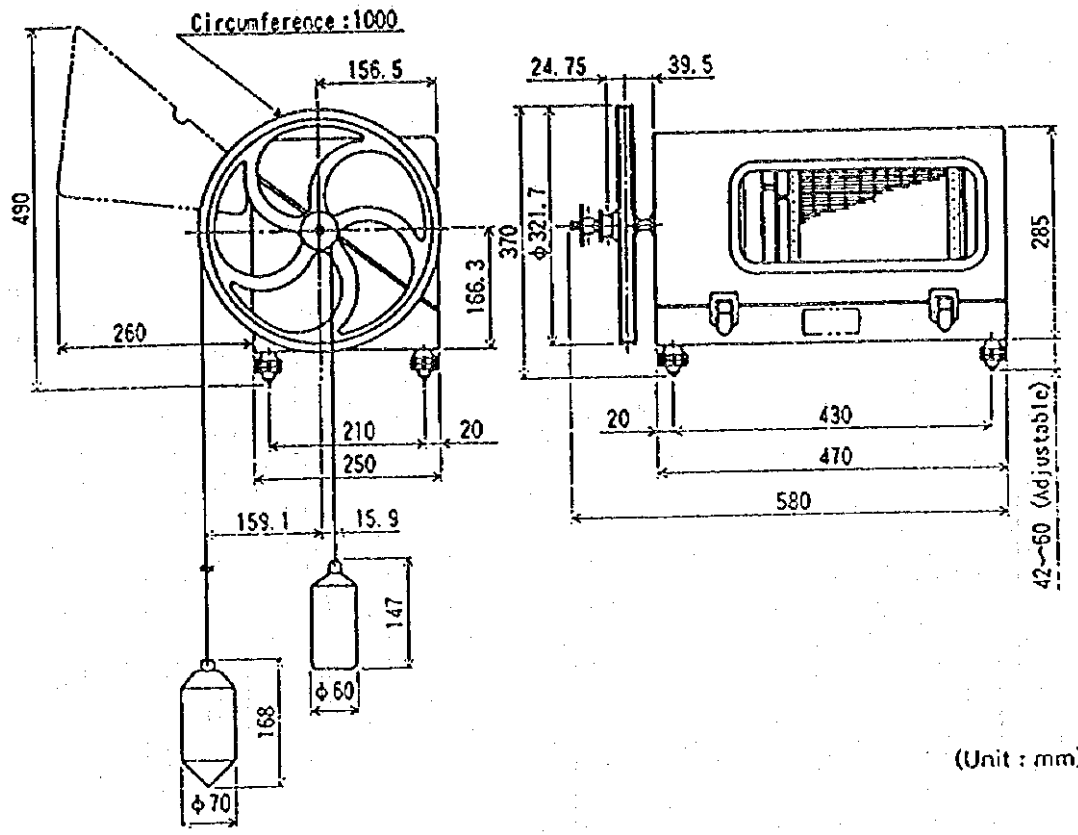
Sacobia Rainfall Gauging Station

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



Tower at Bamban and Angeles
Rainfall Gauging Station

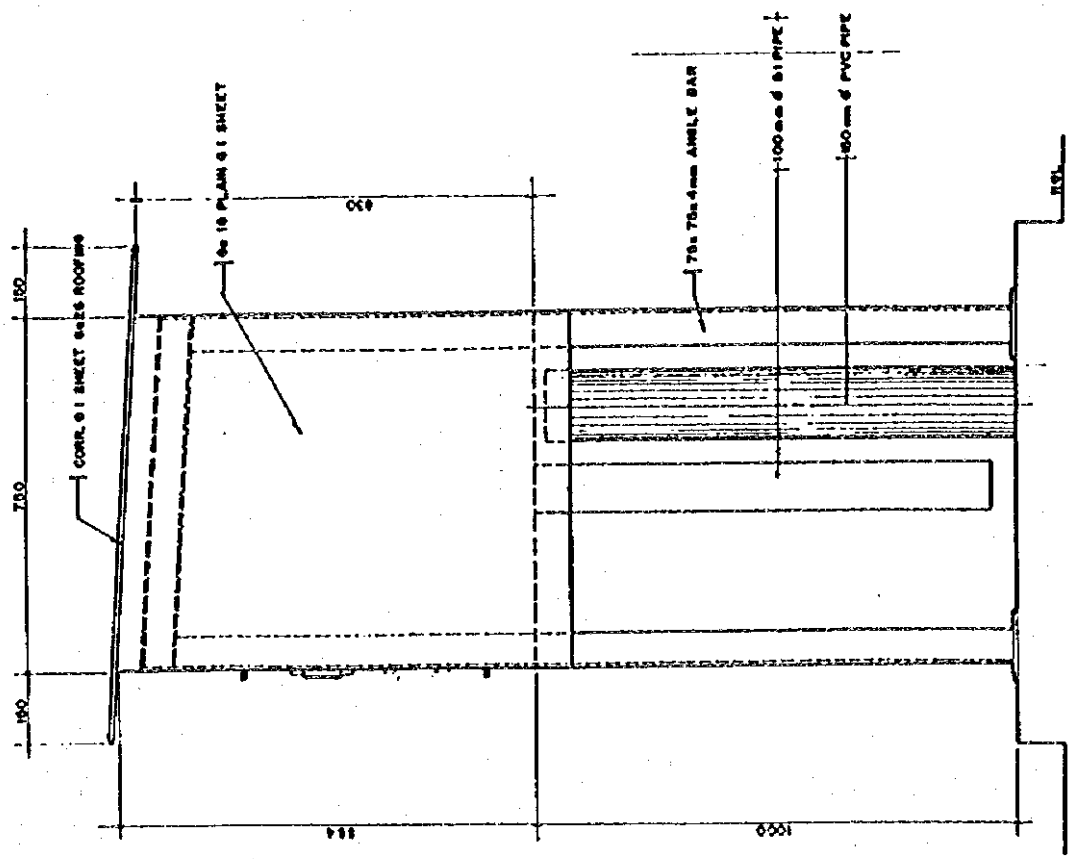
THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT. PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

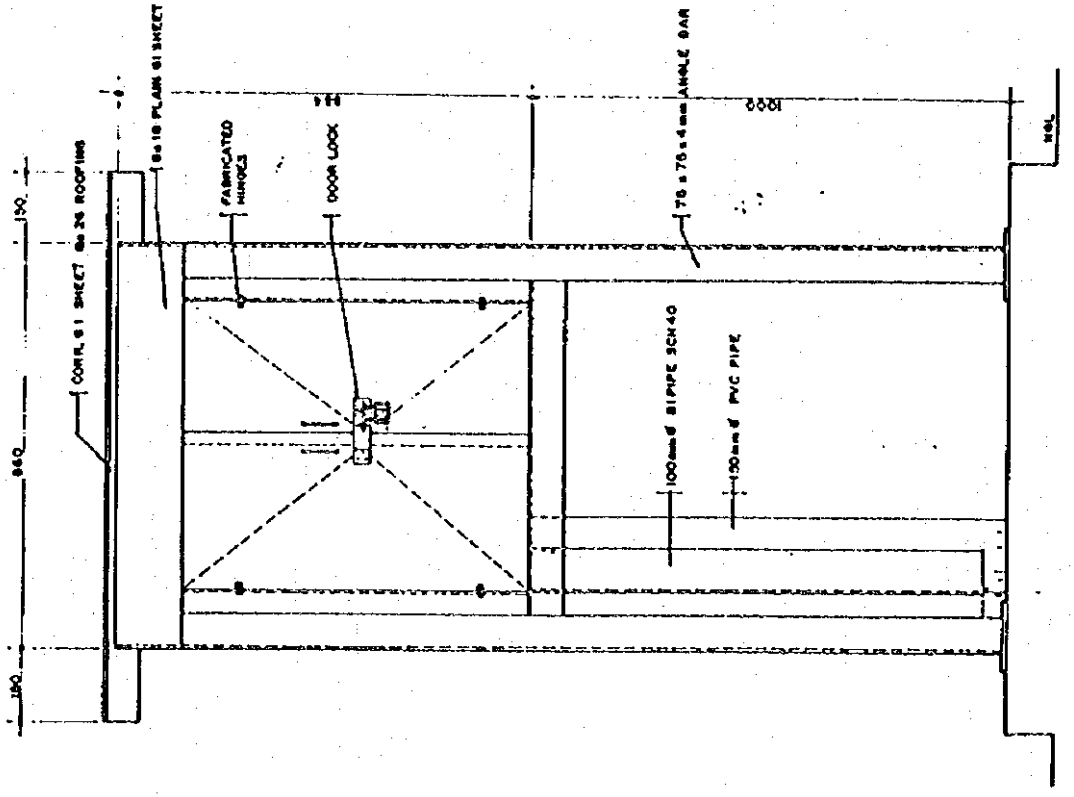


(Unit : mm)

Ground Water Level Gauging Equipment

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

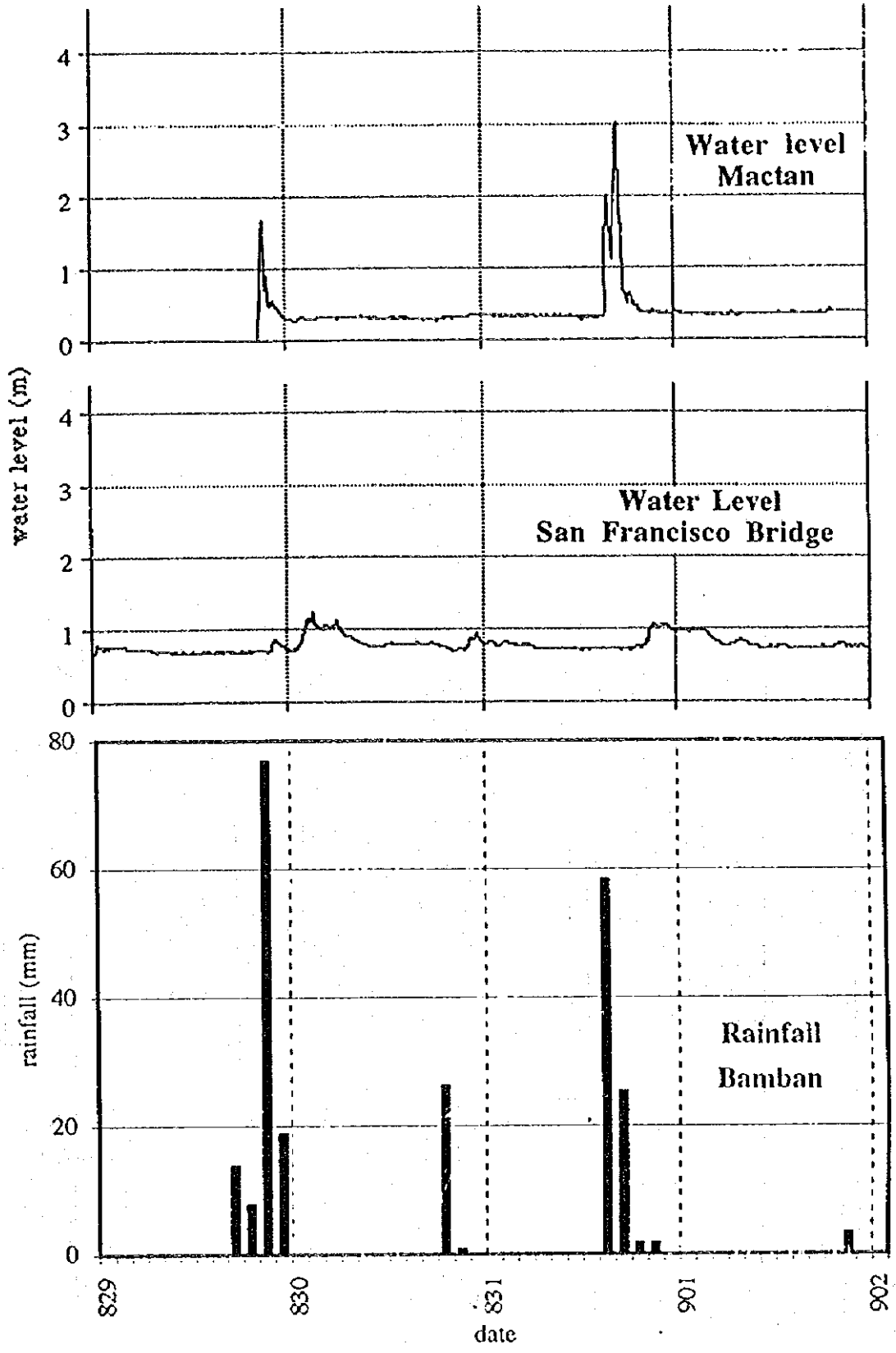




Station House of Ground Water Level Gauging Stations

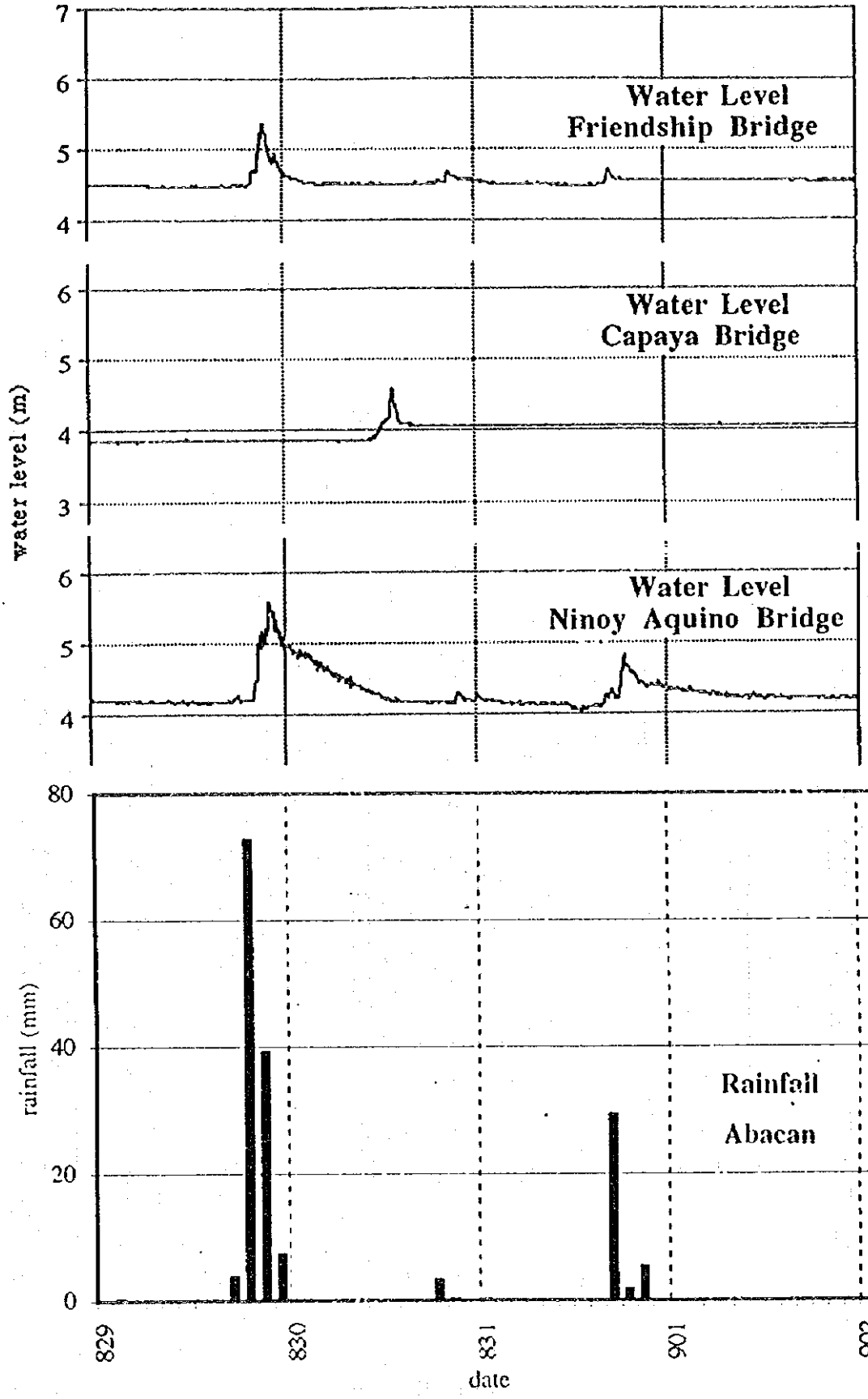
THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT. PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

WATER LEVEL & CURRENT VELOCITY



Relation of Water Level to Rainfall at Sacobia-Bamban River

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



Relation of Water Level to Rainfall at Abacan River

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT. PINATUBO
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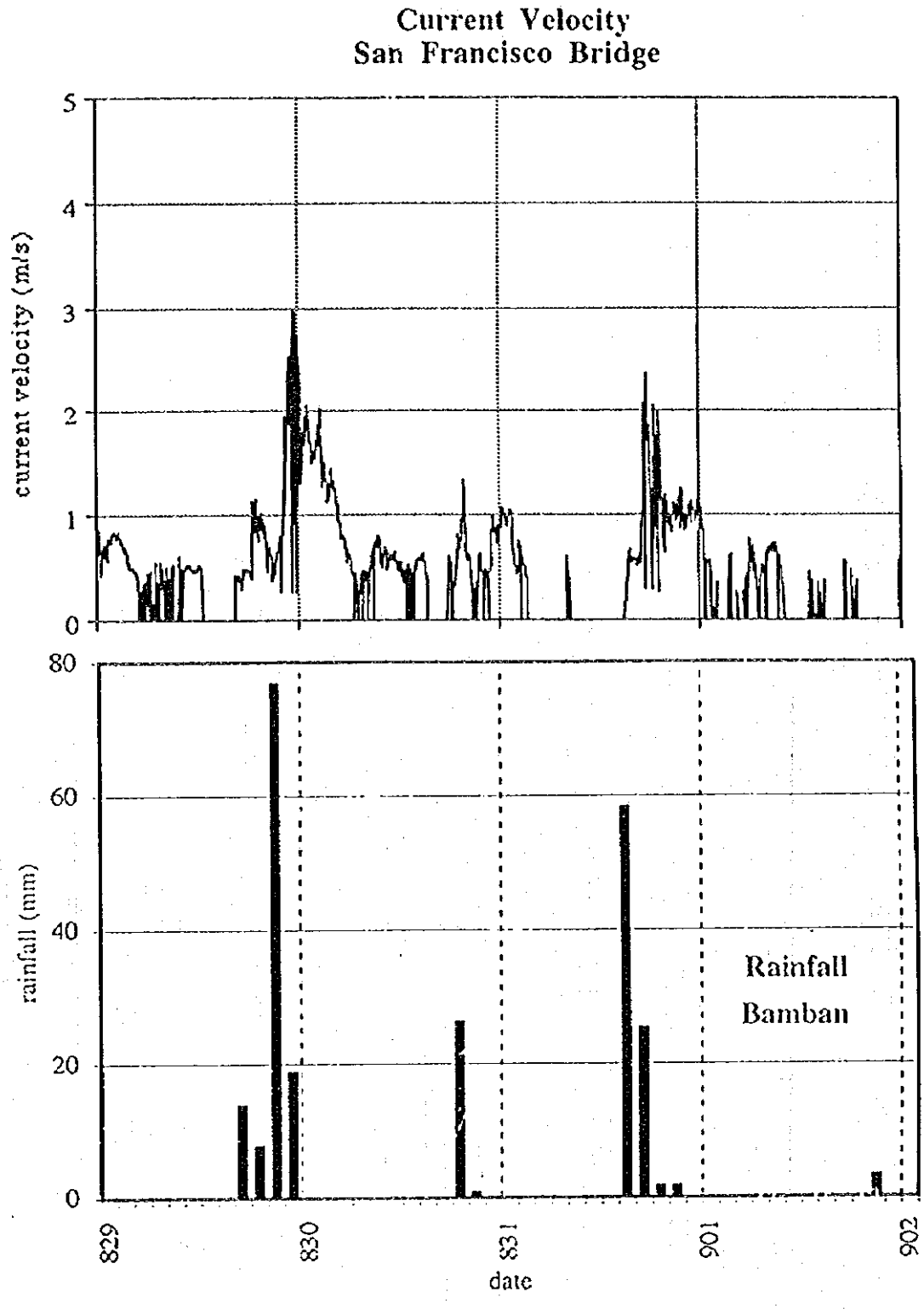
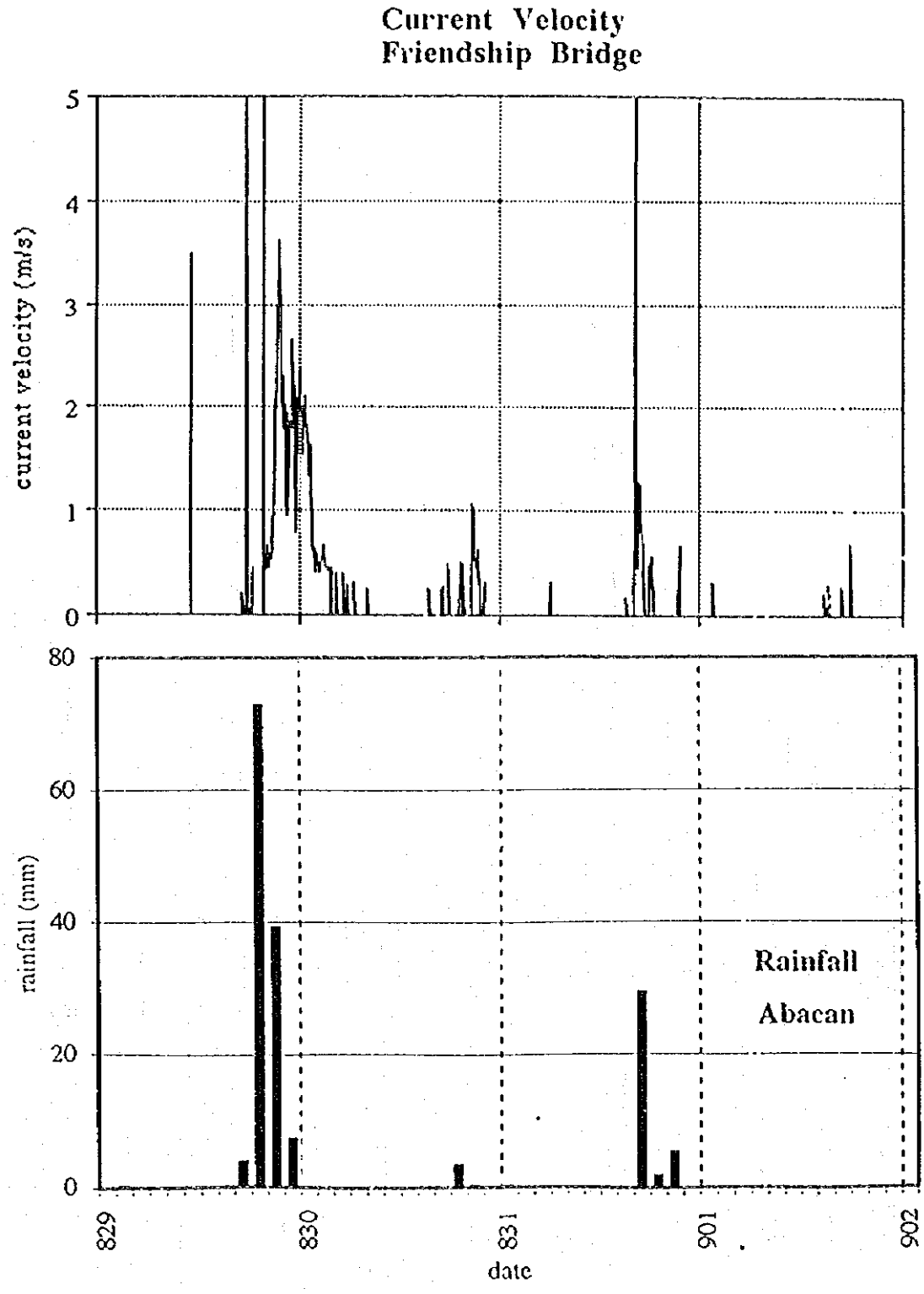


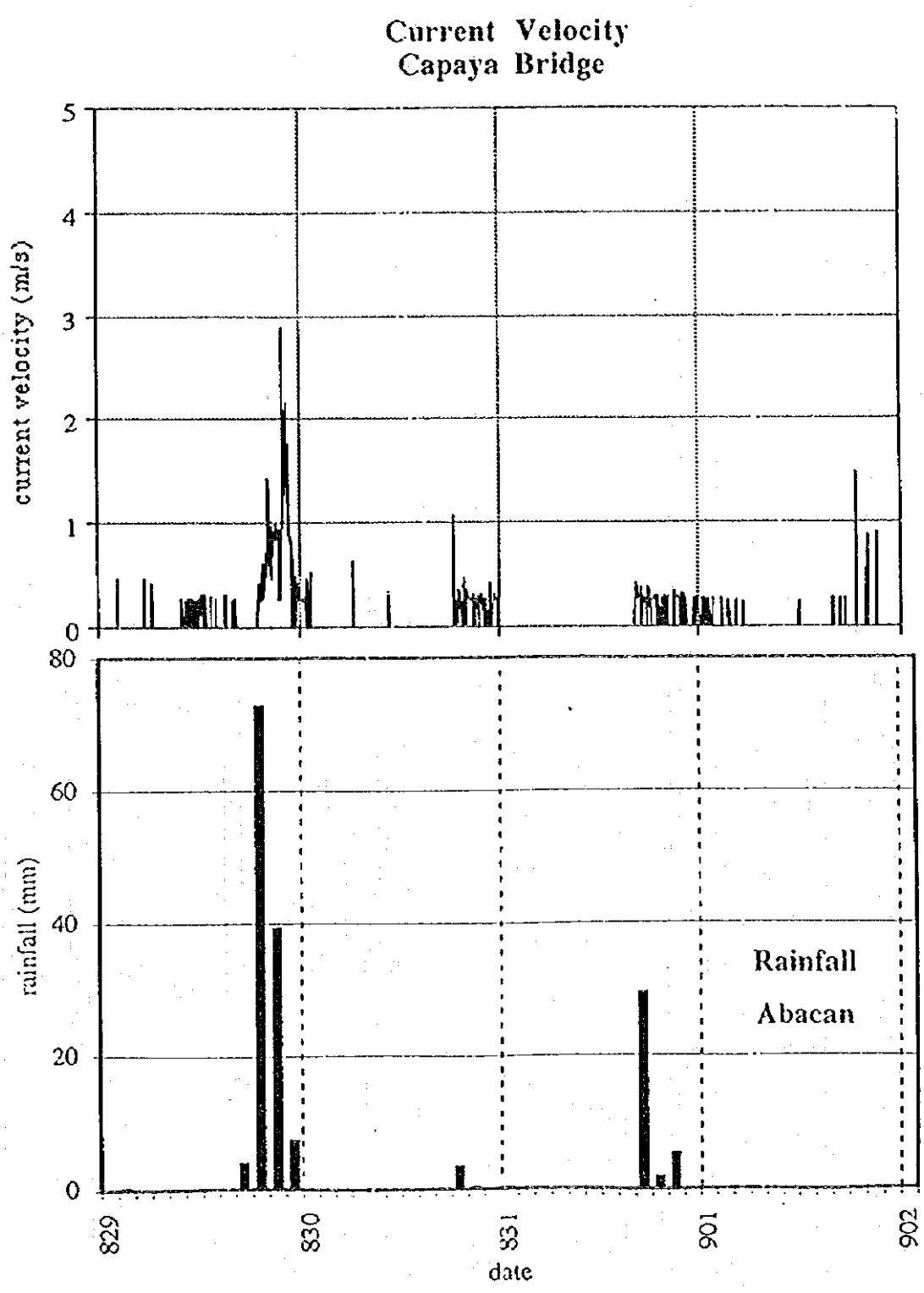
Relation of Current Velocity to Rainfall at San Francisco Bridge

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



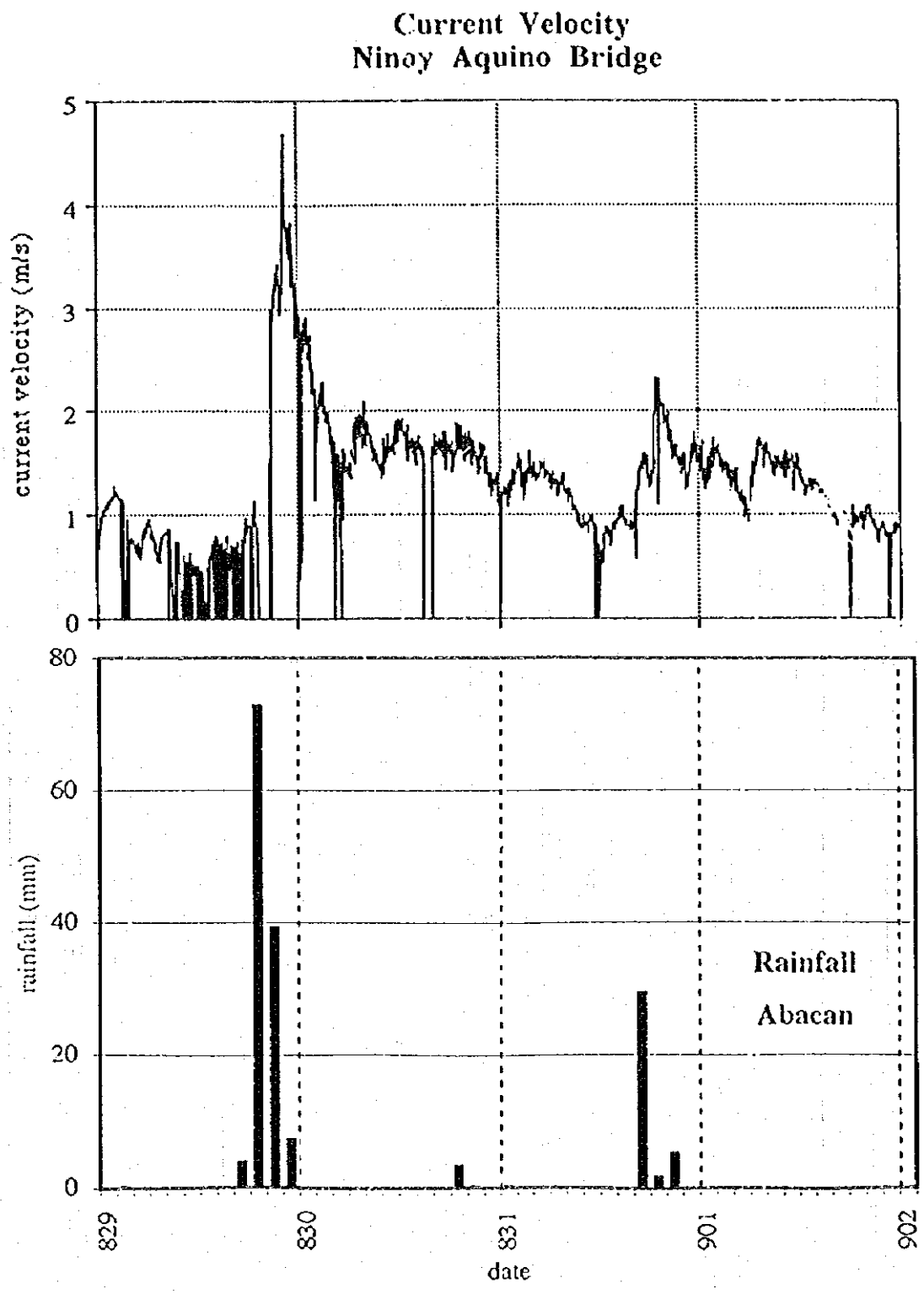
Relation of Current Velocity to Rainfall at Friendship Bridge

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



Relation of Current Velocity to Rainfall at Capaya Bridge

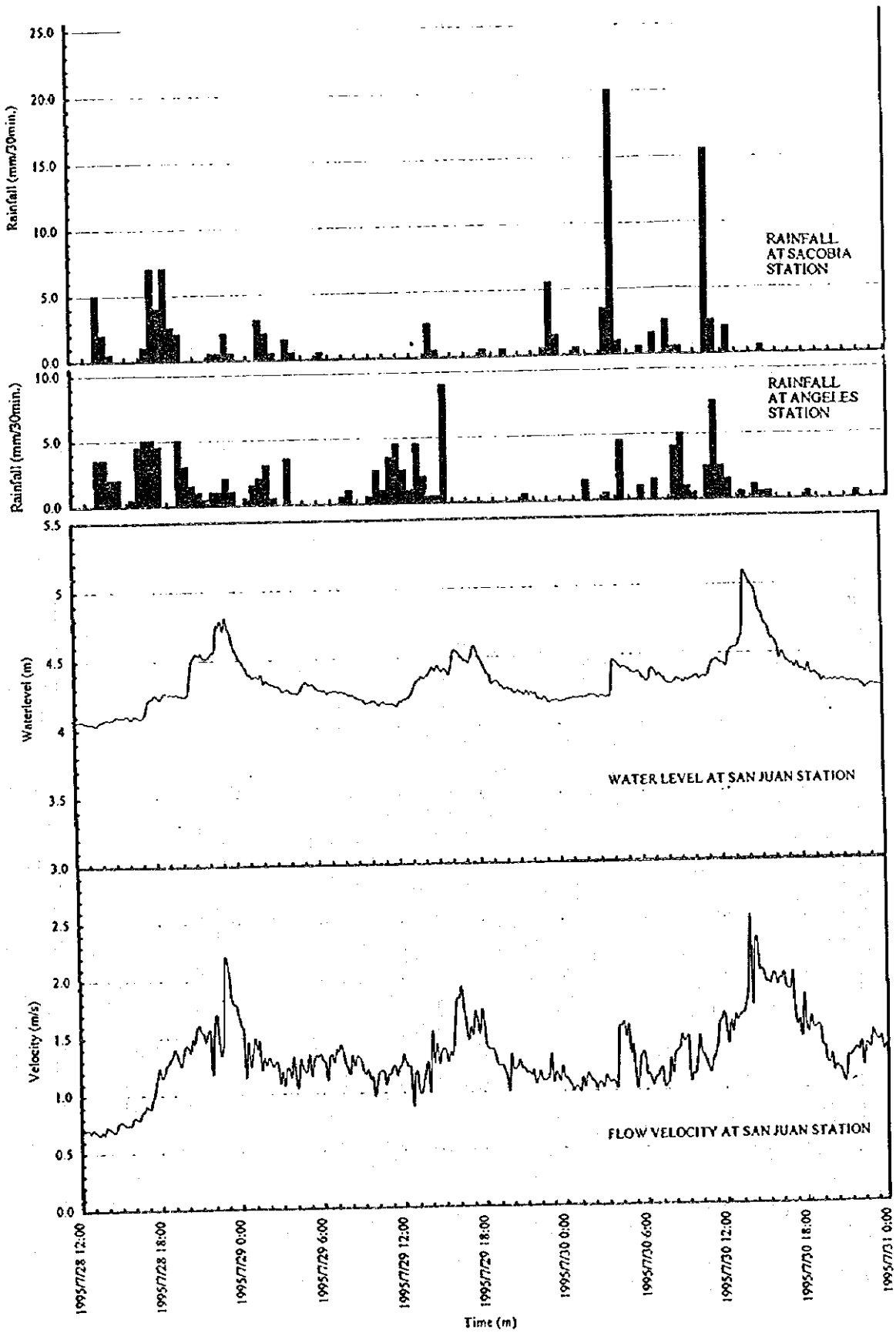
THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY



Relation of Current Velocity to Rainfall at Ninoy Aquino Bridge

THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

DAILY RAINFALL



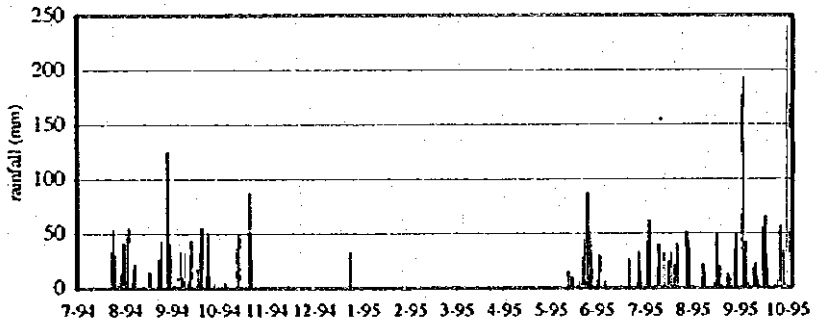
THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

DAILY RAINFALL

Station : Abacan
Year : Jul 1994 - Oct 1995
Agency : JICA

(Unit : mm)

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1		7.0	0.0	0.5	0	0	0	0	0	0	0	7.0	4.0	5.5	0	242.5
2		46.5	3.0	0.0	0	0	0	0	0	0	0	15.0	42.5	0.5	0	0
3		56.0	3.0	0.0	0	0	0	0	0	0	0	30.0	42.0	0	183.0	1
4		1.0	2.0	0.0	0	0	0	0	0	0	0	0	61.5	0	31.0	4.5
5		6.0	10.0	5.5	0	0	0	0	0	0	0	3.0	0.0	0	43.0	
6		18.5	0.0	0.0	0	0	0	0	0	0	0	7.5	0.5	0	2.5	
7		23.0	34.0	0.0	0	0	0	0	0	0	0.5	5.0	17.5	9.0	5.5	
8		0.0	10.5	0.0	0	0.5	0	0	0	0	0	1.0	0	21.5	1.0	
9		0.0	7.5	0.0	0	0	0	0	0	0	0	0	18.0	14.0	0.5	
10		0.0	33.0	0.0	0	0	0	0	0	0	0	0	39.5	0	18.0	
11		0.0	0.0	0.0	0	0	0	0	0	0	0	0	2.5	0	19.0	
12		0.0	8.0	0.0	0	0.5	0	0	0	0	0	0	0.5	0	22.5	
13		0.0	31.0	37.5	0	0	0	0	0	0	15.5	0	32.5	0	10.0	
14		0.0	44.0	49.5	0	0	0	0	0	0	0	0	3.5	0	7.0	
15		0.0	1.0	0.0	2.5	0	0	0	0	0	11	0	0	5.5	1.0	
16		0.0	2.0	0.0	0	0	0	0	0	0	10.5	0	25.0	4.5	56.0	
17		15.0	2.0	2.0	0	0	0	0	0	0	0.5	2.5	0	49.5	45.5	
18		0.0	18.5	0.0	0	0	0	0	0	0	0	0	33.0	10.0	66.0	
19		0.0	6.0	0.0	0	0	0	0	0	0	1.5	0	0	20.5	31.0	
20		0.0	33.5	0.0	0	0	0	0	0	0	7	0	22.0	2.5	17.5	
21		0.0	55.5	87.5	0	0	0	0	0	0	0	0	1.5	2.5	0	
22		0.0	1.0	27.5	0	0	0	0	0	0	5.5	26.5	40.5	1.5	0	
23	33.5	27.5	1.0	0.0	1.5	2	0	0	0	0	28.5	0.5	0	1.0	0	
24	54.5	8.0	11.5	0.0	0	33.5	0	0	0	0	45.0	0.5	0	13.5	3.0	
25	31.5	43.5	51.0	0.0	0	0	0	0	0	0	6.5	0	0	11.0	1.0	
26	3.0	0.5	12.0	0.0	0	0	0	0	0	0	87.0	0	0.5	9.5	7.0	
27	3.5	0.0	0.5	0.0	0	0	0	0	0	0	11.5	5.0	1.5	0.5	0.5	
28	6.0	1.5	0.0	0.0	0	0	0	0	0	0	52.0	33.0	52.0	13.5	56.5	
29	14.0	125.0	5.0	0.0	0	0	0		0	0	17.5	15.0	43.5	34.5	0.5	
30	41.5	4.5	0.0	2.0	0	0	0		0	0	0	5.5	37.0	49.5	29.5	
31	42.0	41.0		0.0		0	0		0		0		0	0		
Total	229.5	424.5	386.5	212.0	4	36.5	0	0	0	0	300	157.0	521.0	280.0	638.0	248.0
															Total =	3,457.0
Daily Max	54.5	125.0	55.5	87.5	2.5	33.5	0	0	0	0	87	33.0	61.5	49.5	183.0	242.5
Rainy Day	9	16	25	8	2	4	0	0	0	0	15	15	22	21	25	3



THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

STATION Abacan
MONTH May 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								
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	60																								
16	30													1.0	1.0										
	60													3.5											

STATION Abacan
MONTH May 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30			0.5																					
	60																								
18	30																								
	60																								
19	30																								
	60														1.5										
20	30															3.5									
	60															2.5			0.5	0.5					
21	30																								
	60																								
22	30													5.0											
	60													0.5											
23	30																		21.5						
	60																	4.5	2.5						
24	30															10.5	1.5	0.5							
	60	0.5														32.0									
25	30																				0.5	1.5	0.5	0.5	
	60																			1.0		1.5	0.5	0.5	
26	30																					30.0	0.5	1.0	
	60								0.5												49.0	3.5	2.0	0.5	
27	30		6.5	3.5																					
	60		1.0	0.5																					
28	30																					15.0	1.0	0.5	
	60																				26.0	7.5	1.5	0.5	0.5
29	30						1.5	1.0	4.5	0.5	0.5	0.5													
	60			0.5	0.5	0.5		3.0	1.5	1.0	1.0														
30	30																								
	60																								
31	30																								
	60																								

STATION Abacan
MONTH June 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																				4.0				
	60																				3.0				
2	30			1.0	1.5								0.5			0.5	2.0	1.0					0.5		
	60		0.5	2.5	0.5								0.5	0.5		3.5	1.0								
3	30				4.0	1.0				0.5	0.5			2.5	1.0	1.5					0.5				
	60	1.5	1.0	5.0	3.0			0.5	0.5	1.0	1.0			2.0	2.5						0.5		0.5		
4	30																								
	60																								
5	30							2.0			0.5														
	60			0.5																					
6	30																3.5	1.0							
	60																2.5	0.5							
7	30	2.5			0.5															0.5					
	60																		1.5						
8	30									0.5	0.5														
	60																								
9	30																								
	60																								
10	30																								
	60																								
11	30																								
	60																								
12	30																								
	60																								
13	30																								
	60																								
14	30																								
	60																								
15	30																								
	60																								
16	30																								
	60																								

STATION Abacan
MONTH June 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																								
	60																		2.5						
18	30																								
	60																								
19	30																								
	60																								
20	30																								
	60																								
21	30																								
	60																								
22	30			15.5																					
	60		11.0																						
23	30										0.5														
	60																								
24	30																								
	60																							0.5	
25	30																								
	60																								
26	30																								
	60																								
27	30																			2.0					
	60																			2.5					
28	30																						4.5	10.0	
	60																	2.0					16.5		
29	30																		4.5	0.5		2.5	0.5		
	60																	0.5	0.5		0.5		0.5		5.0
30	30	2.0	0.5	0.5																					
	60		2.0																						
31	30																								
	60																								

STATION Abacan
MONTH July 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																								
	60																			29.0					
18	30																			4.0					
	60																								
19	30																								
	60															11.5									
20	30														10.0	0.5									
	60														0.5				0.5						
21	30																			0.5					
	60																6.5	13.0	2.0	1.0					
22	30																13.5	1.5	3.0						
	60																								
23	30																								
	60																								
24	30																				0.5				
	60																								0.5
25	30																			0.5		0.5			
	60	0.5	0.5			0.5				0.5						3.5	0.5			5.0	4.5	2.5	1.0	1.0	2.0
26	30	0.5	0.5		0.5		0.5								3.5	2.0			5.5	5.5	7.5	1.5	0.5	1.5	0.5
	60		1.0	2.0						0.5		2.5	3.0	2.5	4.5	0.5	10.0						0.5		
27	30	0.5	2.5	0.5	2.5					0.5	0.5	1.0	4.0	1.0	3.0	0.5									
	60				0.5	3.0				4.5	1.0		8.0	1.5	0.5	1.0	0.5				0.5				0.5	
28	30		1.5		2.5		1.0	1.5		3.5	0.5	2.5	2.0			0.5									
	60																								
29	30																								
	60																								
30	30																								
	60																								
31	30																								
	60																								

STATION Abacan
MONTH July 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30	4.0																							
	60																								
2	30																			22.0					
	60																		17.5	2.5		0.5			
3	30																						21.5		
	60																					17.0			4.5
4	30	11.5										0.5							6.0	15.0	1.5		0.5		
	60																		19.0	5.5	1.0	1.0	0.5		
5	30																								
	60																								
6	30																								
	60																							0.5	
7	30	2.0	0.5				0.5														2.0				
	60	2.0																	3.0		2.5		3.5		
8	30																								
	60																								
9	30																			2.0	3.0	3.0			
	60																			3.5	3.5	2.5	5.0		
10	30																				4.0	3.0	9.5	1.0	
	60																				16.0	5.0	1.5		
11	30	0.5																							0.5
	60																						0.5	0.5	0.5
12	30																								
	60	0.5																							
13	30																							10.5	2.5
	60																						14.0	5.5	
14	30		0.5																						
	60	1.0	1.5							0.5															
15	30																								
	60																								
16	30	21.5	0.5																						
	60	2.5	0.5																						

STATION Abacan
MONTH August 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								
	60																								
2	30		0.5																						
	60																								
3	30																								
	60																								
4	30																								
	60																								
5	30																								
	60																								
6	30																								
	60																								
7	30														5.5						0.5				
	60														3.0										
8	30															8.5	7.0					0.5			
	60															3.0	2.5								
9	30											5.0						0.5							0.5
	60										7.0										0.5	0.5			
10	30																								
	60																								
11	30																								
	60																								
12	30																								
	60																								
13	30																								
	60																								
14	30																								
	60																					1.0	2.0		
15	30																					2.0	0.5		
	60																	2.5							
16	30																	1.0							
	60																								

STATION Abacan
MONTH August 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																			15.0	5.5		0.5		
	60																		18.0	10.5					
18	30																3.0					0.5			
	60																			5.0	1.5				
19	30																			2.0	2.5	1.0	0.5		
	60															7.0		0.5	1.0	2.0	2.5	1.5			
20	30																						0.5		1.0
	60																					0.5			0.5
21	30									0.5										0.5			0.5		
	60																		0.5				0.5		
22	30		0.5																					0.5	
	60																								0.5
23	30				0.5																				0.5
	60																								
24	30	0.5							1.0	5.5	1.5													0.5	0.5
	60									1.5	1.0								0.5					1.0	
25	30								1.5	4.5	0.5														
	60								1.0	3.5															
26	30	1.5	0.5																				0.5		
	60	6.5																				0.5			
27	30																								
	60																							0.5	
28	30		0.5																2.0			1.0	0.5	1.5	
	60		0.5										4.0	0.5					1.5				0.5	0.5	0.5
29	30																	1.0				2.5	2.0	2.0	4.0
	60	0.5								0.5							3.0	0.5			2.5	2.0	6.0	6.5	0.5
30	30	1.0	2.5	3.5	13.5	1.5	2.0	1.5				0.5												1.0	
	60	0.5	3.0	3.0	12.0	2.5	1.0	0.5																	
31	30																								
	60																								

STATION Abacan
MONTH September 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30	1.0	1.5	2.0		0.5			0.5	2.5	2.0	0.5	0.5	0.5											7.5
	60	2.0	1.5	10.5		5.0	1.0	0.5	0.5	0.5	1.0	1.5	0.5							0.5				0.5	0.5
18	30	9.5	1.0	6.0	6.5	3.5	0.5	0.5			3.5	2.0	0.5	0.5								1.5			
	60	1.5	5.5	12.0	0.5	1.5				1.5	3.0	1.0									2.5				2.0
19	30				0.5					0.5							4.5								0.5
	60	0.5							3.5							20.0		0.5						0.5	
20	30					0.5			2.5		0.5			1.0	3.5		0.5	0.5				2.0	0.5		0.5
	60					0.5		1.5	0.5		0.5			2.0								1.5			
21	30																								
	60																								
22	30																								
	60																								
23	30																								
	60																								
24	30																					3.0			
	60																								
25	30								0.5																0.5
	60																								
26	30					1.5	1.0							1.0	0.5	0.5									
	60				1.0	1.0											0.5								
27	30																								
	60												0.5												
28	30		3.0						0.5											39.0		2.0	2.5		
	60																			5.5	1.5	2.0	0.5		
29	30									0.5															
	60																								
30	30											0.5					0.5	0.5		1.5	2.5	2.0	5.0	1.0	2.0
	60											1.0		0.5			1.0		0.5	2.0	2.0		6.0	1.0	
31	30																								
	60																								

STATION Abacan
MONTH September 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								
	60																								
2	30																								
	60																								
3	30																				54.5	35.5	20.0	5.0	1.5
	60																			18.5	36.5	5.0	5.0	0.5	1.0
4	30	1.5	2.0	2.0	2.5	1.0	2.5	1.0	1.0	2.0		0.5											1.0		
	60	1.5	2.0	2.0	1.5	1.5	2.5	1.0	2.0																
5	30		0.5	1.0	2.0	0.5	18.0				0.5			1.0	0.5	0.5	0.5	0.5		0.5					
	60		0.5	0.5	0.5	10.0	0.5	0.5	0.5	1.5	0.5		1.0					0.5			0.5				
6	30			0.5					1.0							0.5									
	60								0.5																
7	30															2.0							1.5		
	60														2.0										
8	30																		0.5						0.5
	60																								
9	30																								
	60						0.5																		
10	30																			8.5					
	60																			9.0		0.5			
11	30																					1.0	3.0	0.5	2.5
	60																	4.5				2.5	0.5	1.0	3.5
12	30	3.5	1.5	1.0	0.5	0.5														4.0	0.5	0.5	0.5	1.0	
	60	3.0	0.5	0.5	1.0															2.5	0.5		0.5	0.5	
13	30			0.5	0.5	1.5		1.0													2.5				0.5
	60		1.0		0.5	0.5	0.5															0.5		0.5	
14	30													2.0		2.0	1.0								
	60												1.5			0.5									
15	30							0.5																	
	60																								0.5
16	30					2.0		0.5	5.5	2.5		0.5				5.0				2.5		5.0	1.0		9.0
	60				1.0	1.0	0.5	2.0	4.5	0.5						0.5				1.0	0.5	1.0		6.5	3.0

STATION Abacan
MONTH OCTOBER 1995

RAINFALL FOR 30 MINUTES PERIODS

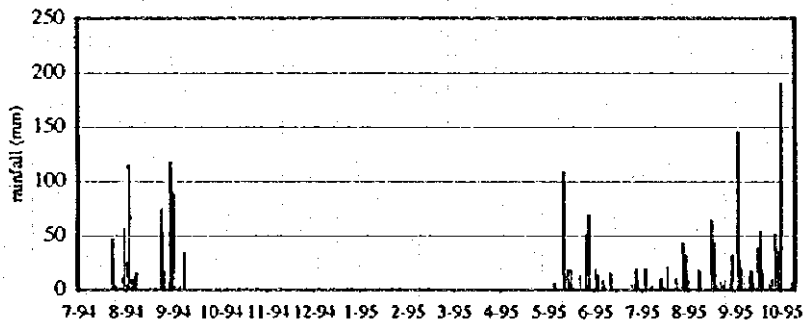
DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30		0.5	12.0	13.5	12.5	4.0	17.5	5.5	8.5	5.5	1.5	1.5	1.5	2.0	5.5	14.0	3.5	2.5	0.5				0.5	
	60		2.5	14.0	10.0	6.5	15.5	22.5	3.5	10.0	3.0	2.0	1.5	0.5	9.0	23.0	2.5	2.5	1.0	0.0			0.5	0.5	
2	30																								
	60																		0.5						0.5
3	30																								
	60																								
4	30	1.5																							
	60	2.5	0.5																						
5	30																								
	60																								
6	30																								
	60																								
7	30																								
	60																								
8	30																								
	60																								
9	30																								
	60																								
10	30																								
	60																								
11	30																								
	60																								
12	30																								
	60																								
13	30																								
	60																								
14	30																								
	60																								
15	30																								
	60																								
16	30																								
	60																								

DAILY RAINFALL

Station : Bamban
Year : Jul 1994 - Oct 1995
Agency : JICA

(Unit mm)

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	0	5	91	0	0	0	0	0	0	0	0	19.5	0.5	10.0	0.5	19.1
2	0	26	3.5	0	0	0	0	0	0	0	0	14.5	0.5	0.5	0	0
3	0	115.5	0.5	0	0	0	0	0	0	0	0	14.5	20.0	0	146.0	1.5
4	0	10.5	0	0	0	0	0	0	0	0	0	1.5	2.0	0	28.5	1
5	0	11	4.5	0	0	0	0	0	0	0	6	2.5	0	0	20.5	0
6	0	10	1	0	0	0	0	0	0	0	0	9	0	0	0	0
7	0	13	0.5	0	0	0	0	0	0	0	0	4	4.0	0	13.5	0
8	0	16.5	35.5	0	0	0	0	0	0	0	0	2.5	0.5	18.5	0	7.0
9	0	0.5	0	0	0	0	0	0	0	0	0	0	0	9.0	2.0	0.5
10	0	0	0	0	0	0	0	0	0	0	0	0	1.0	0.5	13.0	0.5
11	0	0	0	0	0	0	0	0	0	0	109	16.5	0	0	18.0	
12	0	0	0	0	0	0	0	0	0	0	14	0	0.5	0	18.5	
13	0	0	0	0	0	0	0	0	0	0	0	0	9.0	0	16.5	
14	0	0	0	0	0	0	0	0	0	0	20	0	11.0	0	6.5	
15	0	0	0	0	0	0	0	0	0	0	7	0	3.5	1.5	0	
16	0	0	0	0	0	0	0	1	0	0	20	0	2.5	65.0	39.0	
17	0	0	0	0	0	0	0	0	0	0	5.5	0	0	1.5	18.0	
18	0	0	0	0	0	0	0	0	0	0	0	0	22.0	44.5	54.0	
19	0	0	0	0	0	0	0	0	0	1	0	0	0.5	15.5	19.0	
20	0	2	0	0	0	0	0	0	0	0	0	0	0.5	4.5	15.5	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	0	
22	0	0	0	0	0	0	0	0	0	0	14.5	0	2.0	8.5	0	
23	47.5	0	0	0	0	0	0	0	0	0	0	0	0.5	4.5	0	
24	23.0	75	0	0	0	0	0	0	0	0	2.5	0	11.0	4.0	5.5	
25	3.5	52.5	0	0	0	0	0	0	0	0	13.5	5.5	0	9.5	0.5	
26	4.0	17.5	0	0	0	0	0	0	0	0	51.5	0	3.0	0.5	10.5	
27	0.05	0.5	0	0	0	0	0	0	0	0	4	5.5	3.0	0.5	0.5	
28	3.5	0	0	0	0	0	0	0	0	0	69.5	19.5	43.5	6.0	52.0	
29	2.0	7.5	0	0	0	0	0		0	0	9.5	9.0	35.5	9.0	0	
30	11.4	118	0	0	0	0	0		0	0	0	3.0	32.0	32.5	36.0	
31	57.1	28		0		0	0		1		0		32.0	0		
Total	152.1	509	136.5	0	0	0	0	1	1	1	346.5	127.0	240.5	247.0	534.0	
															Total :	2,295.6
Daily Max	57.1	118	91	0	0	0	0	1	1	1	109	19.5	43.5	65.0	146.0	
Rainy Day	9	17	25	0	0	0	0	1	1	1	14	14	24	21	22	



THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

STATION Bamban
MONTH June 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																								
	60																								
18	30																								
	60																								
19	30																								
	60																								
20	30																								
	60																								
21	30																								
	60																								
22	30																								
	60																								
23	30																								
	60																								
24	30																								
	60																				4.5				
25	30																				1.0				
	60																								
26	30																				1.5				
	60																				4.0				
27	30																		2.0				0.5		
	60																	17.0							0.5
28	30					2.5													0.5	0.5					
	60				4.5	0.5											0.5	0.5		0.5					
29	30	0.5																							
	60								0.5					0.5											
30	30																								
	60																								
31	30																								
	60																								

STATION Bamban
MONTH July 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30	0.5																							
	60																								
2	30																								
	60																						0.5		
3	30																				4.5	2.0	1.5	1.0	
	60																				8.5	1.5	1.0		
4	30																				1.0			0.5	
	60																					0.5			
5	30																								
	60																								
6	30																								
	60																								
7	30																		0.5		1.0				
	60															1.0				1.0			0.5		
8	30																						0.5		
	60																								
9	30																								
	60																								
10	30																			1.0					
	60																								
11	30																								
	60																								
12	30											0.5													
	60																								
13	30																							5.5	1.0
	60																							2.0	0.5
14	30	0.5	1.0	0.5	0.5																				5.0
	60	0.5	1.0	0.5																					1.5
15	30	1.0																							2.5
	60																								
16	30		1.0	0.5																					
	60		0.5		0.5																				

STATION Bamban
MONTH July 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																								
	60																		4.5	1.0	0.5				
18	30																		14.5	1.0	0.5				
	60																					0.5			
19	30																								
	60																								
20	30																								
	60		0.5																						
21	30																								
	60																								
22	30																							2.0	
	60															0.5									
23	30																								
	60																		7.0						
24	30																	4.0							
	60																								
25	30																								
	60																				0.5	1.0			
26	30																	1.0		0.5					
	60																				0.5	0.5	0.5		
27	30																				0.5			0.5	0.5
	60															1.5	1.5	0.5	0.5	5.5	1.5	2.0	1.0		0.5
28	30	0.5	0.5		0.5			0.5	0.5																
	60	0.5		0.5	0.5		0.5				0.5		2.5		8.0	0.5	0.5	1.0	6.5	1.0	3.0	0.5		0.5	
29	30	0.5	0.5	2.5	2.0	2.0					0.5					4.5									9.0
	60		4.0	1.5	6.0	0.5																		0.5	1.5
30	30			1.0	4.0	0.5				3.5			5.0	1.0	0.5		0.5	0.5						0.5	
	60				2.5			0.5	2.0	2.0		6.5	0.5	0.5		0.5									
31	30																					13.0	5.5	1.5	0.5
	60																				0.5	3.0	8.0		

STATION Bamban
MONTH August 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								1.0
	60						0.5																	8.5	
2	30																								
	60	0.5																							
3	30																								
	60																								
4	30																								
	60																								
5	30																								
	60																								
6	30																								
	60																								
7	30																								
	60																								
8	30																4.5					0.5			
	60								0.5							13.0									
9	30																	1.0	1.5	1.0					0.5
	60																1.0	1.5	1.5	0.5	0.5				
10	30																								
	60								0.5																
11	30																								
	60																								
12	30																								
	60																								
13	30																								
	60																								
14	30																								
	60																								
15	30																							0.5	0.5
	60																						0.5		
16	30																	25.0	6.0	1.0	0.5				
	60																	27.5	3.0	1.0					

STATION Bamban
MONTH August 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																			1.0					
	60								0.5											18.0	1.5	0.5			
18	30																		21.0	2.5	1.0				
	60																	1.5		0.5	2.5	2.0			
19	30																	2.0	0.5	2.0	3.0	1.0	0.5		
	60																						2.0	0.5	
20	30																					1.0	1.0		
	60																								
21	30																						1.0		
	60												2.5										2.0	2.0	
22	30												0.5										1.5		
	60																								
23	30	0.5	1.5	0.5				0.5																0.5	0.5
	60		0.5							0.5															
24	30													0.5	0.5				1.0					0.5	0.5
	60	0.5								1.0	1.5	0.5								0.5					
25	30								0.5	5.0	0.5														
	60																								
26	30																								
	60		0.5																					0.5	
27	30																								
	60																		2.0					0.5	
28	30		0.5																			0.5	1.0		0.5
	60		0.5		0.5													2.5				1.0	1.5		
29	30		0.5																			1.5	0.5		1.5
	60																							1.5	
30	30	2.5	3.5	1.0	4.5	2.0		1.0	1.0			0.5											1.5	0.5	
	60	2.0	1.0	0.5	6.0	2.5	0.5		0.5																
31	30																								
	60																								

STATION Bamban
MONTH September 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																						0.5		
	60																								
2	30																								
	60																								
3	30																				37.5	10.0	1.0	1.0	1.0
	60																			67.5	17.5	7.0	2.0	0.5	1.0
4	30	0.5	3.0	2.0	1.5	0.5	3.5	2.5	0.5	0.5													0.5		
	60	1.5	2.5	1.0	1.0	0.5	5.0	1.5	0.5																
5	30			0.5	1.0	0.5	2.0	0.5	0.5	0.5		0.5		1.0		1.0		0.5	0.5	1.5					
	60		0.5	0.5	1.0		5.5				0.5				0.5	0.5	0.5							0.5	
6	30																								
	60																								
7	30																2.0						0.5		
	60															9.5						1.0	0.5		
8	30																								
	60																								
9	30																								
	60					0.5	1.0	0.5																	
10	30																			6.0	0.5				
	60																			1.0	5.5				
11	30																		1.0	0.5	0.5		1.0	0.5	2.0
	60																		1.0	2.0		1.0		1.5	7.0
12	30	4.5	1.5		0.5				0.5											1.5	2.5	0.5		0.5	
	60	3.0	0.5	0.5	0.5														0.5	0.5			0.5		0.5
13	30			0.5																	3.5				
	60			0.5	1.0	0.5			0.5											10.0					
14	30													0.5		2.5			1.0						
	60															1.0		0.5	0.5	0.5					
15	30																								
	60																								
16	30					1.0			2.5	5.0	0.5	0.5		1.0		2.0	0.5		0.5	1.5	0.5	2.0	0.5	1.0	1.0
	60	0.5				0.5	0.5	0.5	4.0	2.0			0.5			4.0	0.5			1.5		1.5		0.5	2.5

STATION Bamban
MONTH September 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30	0.5	0.5	1.5				0.5			0.5		2.0												4.0
	60	1.0	1.0	2.0				1.0					1.0											1.0	1.5
18	30	7.5	1.5	6.5	1.5				0.5	2.0	8.5	2.0													
	60	2.0	2.5	7.5	0.5	0.5		0.5	1.5	3.0	4.5	0.5	0.5	0.5								3.5		1.0	1.0
19	30										6.0													1.5	
	60				1.0				1.5	1.0			0.5				2.0								
20	30						0.5	0.5	1.0				0.5	0.5	2.5		0.5			0.5	4.0	0.5	0.5		
	60					0.5						0.5	0.5	1.0							0.5	0.5		0.5	
21	30																								
	60																								
22	30																								
	60																								
23	30																								
	60																					3.5			
24	30																					2.0			
	60																								0.5
25	30																								
	60					1.5	2.0			1.5															
26	30					2.0	1.0		0.5	0.5				0.5											
	60			0.5	0.5																				
27	30																								
	60				0.5														10.0	2.5	0.5	1.0	2.0		
28	30																		33.0			2.0	1.0		
	60																								
29	30																								
	60																1.0			1.0	3.5	1.0	4.0	2.0	1.0
30	30																1.0		0.5	1.5	6.5	1.0	6.0	4.0	0.5
	60											1.5													
31	30																								
	60																								

STATION Bamban
MONTH October 1995

RAINFALL FOR 30 MINUTES PERIODS

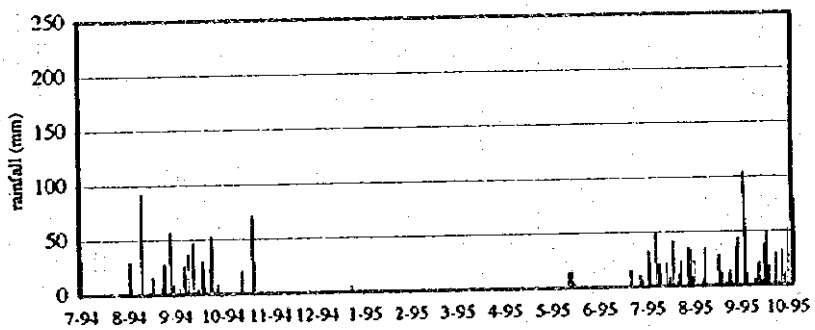
DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30	1.0		5.0	10.0	11.5	2.0	14.5	3.5	5.5	3.0	1.5	1.5	1.5	1.0	15.0	11.5	3.0	1.5	0.5					0.5
	60	0.5	3.0	9.0	11.0	18.5	7.0	11.0	2.5	5.0	2.0	1.0	1.5	0.5	6.0	12.5	1.5	4.0	0.5				0.5		
2	30																								
	60																								
3	30																								1.0
	60																								0.5
4	30									0.5															
	60									0.5															
5	30																								
	60																								
6	30																								
	60																								
7	30																								
	60																								
8	30			0.5	0.5	0.5								0.5	1.0	1.0									0.5
	60			0.5	0.5																			0.5	1.0
9	30	0.5																							
	60																								
10	30																								
	60	0.5																							
11	30																								
	60																								
12	30																								
	60																								
13	30																								
	60																								
14	30																								
	60																								
15	30																								
	60																								
16	30																								
	60																								

DAILY RAINFALL

Station : Sacobia
Year : Jul 1994 - Oct 1995
Agency : JICA

(Unit mm)

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1			0	0	0	0	0	0	0	0	0	0	0	23.5	0	53
2		29.5	1.5	0	0	0	0	0	0	0	0	0	32.5	0.5	0	0
3		6	1.5	0	0	0	0	0	0	0	0	0	22.0	0	104.5	1
4		0	6	0	0	0	0	0	0	0	0	0	2.0	0	10.0	
5		0	0	0	0	0	0	0	0	0	0	1.5	0	0	11.5	
6		0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	
7		0	27	0	0	0	0	0	0	0	0	0	49.0	6.0	0	
8		0	18	0	0	0	0	0	0	0	0	0.5	0.5	34.5	1.0	
9		1	0	0	0	0	0	0	0	0	0	0	21.0	2.5	1.0	
10		93	37	0	0	0	0	0	0	0	0	0	12.5	1.0	6.0	
11		0	0	0	0	0	0	0	0	0	0	0	2.0	0	4.5	
12		0	0.5	0	0	0	0	0	0	0	14.5	0	0	0	20.0	
13		0	47	0.5	0	0	0	0	0	0	0	0	1.5	0	22.0	
14		0	2	21	0	0	0	0	0	0	14.5	0	22.0	0	5.0	
15		0	0	0	0	0	0	0	0	0	6	0	0.5	2.5	5.0	
16		1.5	5	0	0	0	0	0	0	0	4	0	9.0	1.0	38.5	
17		16	4	0	0	0	0	0	0	0	3	0	0	28.5	26.0	
18		0	0	0	0	0	0	0	0	0	1	0	42.0	28.5	49.5	
19		0	30	0	0	0	0	0	0	0	0	0	0	12.5	18.0	
20		0	23	0	0	0	0	0	0	0	0	0	0.5	0	19.5	
21		0	6	72	0	0	0	0	0	0	0	0	3.5	2.5	0.0	
22		0	0	29	0	0	0	0	0	0	0	15.5	11.0	3.5	0.0	
23		6	0	0	0	0	0	0	0	0	0	0	23.5	3.5	3.5	
24		8	24	0	0	6	0	0	0	0	0	0	1.0	11.5	25.0	
25		28	53	0	0	0	0	0	0	0	0	0	0	14.5	0.0	
26		7	4.5	0	0	0	0	0	0	0	0	0	0	4.5	4.0	
27		0	0	0	0	0	0	0	0	0	1	0	0	0.5	1.5	
28		0.5	2	0	0	0	0	0	0	0	0	10.5	35.5	13.5	33.5	
29		57	9	0	0	0	0		0	0	0	6.5	19.5	35.5	0.0	
30		4	0	0	0	0	0		0	0	0.5	6.5	34.0	45.0	12.5	
31		9		0		0	0		0		0		8.0	1.5		
Total		266.5	301	122.5	0	6	0	0	0	0	44.5	41.0	353.0	277.0	422.5	54.0
																Total = 1,888.0
Daily Max		93	53	72	0	6	0	0	0	0	14.5	15.5	49.0	45.0	104.5	53.0
Rainy Day		14	19	4	0	1	0	0	0	0	8	6	22	22	23	2



THE GOVERNMENT OF THE PHILIPPINES
THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
THE STUDY ON FLOOD AND MUDFLOW CONTROL FOR SACOBIA-BAMBAN/ABACAN RIVER DRAINING FROM MT.PINATUBO
JAPAN INTERNATIONAL COOPERATION AGENCY

STATION Sacobia
MONTH June 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																								
	60																								
18	30																								
	60																								
19	30																								
	60																								
20	30																								
	60																								
21	30																								
	60																								
22	30				11																				
	60			3	1.5																				
23	30																								
	60																								
24	30																								
	60																								
25	30																								
	60																								
26	30																								
	60																								
27	30																								
	60																								
28	30																							5.5	
	60																						3.5	2	
29	30																			0.5			0.5	0.5	
	60	0.5																	3	0.5		0.5	0.5		
30	30	0.5		0.5									2												
	60												3.5												
31	30																								
	60																								

STATION Sacobia
MONTH July 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								
	60																								
2	30																		4.0	6.5					
	60																		22.0						
3	30																								
	60																								
4	30																								
	60																								
5	30																								
	60																								
6	30																								
	60																								
7	30	1.0																		25.0	2.0				
	60	1.0																		18.0					2.0
8	30																								
	60																								
9	30																								
	60																								
10	30																								
	60																								
11	30																								
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12	30																								
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	60																								
14	30																								
	60																								
15	30																								
	60																								
16	30																								
	60																								

STATION Sacobia
MONTH July 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																								
	60																								
18	30																			19.0	8.0				
	60																		5.0	6.0	4.0				
19	30																								
	60																								
20	30																								
	60																								
21	30																								
	60																								
22	30																								
	60																								
23	30																								
	60																								
24	30																								
	60																								
25	30																								
	60																								
26	30																								
	60																								
27	30																								
	60																								
28	30															2.0			1.0	4.0	3.0	1.5	0.0	0.5	2.0
	60														5.0	0.5		0.5	7.0	7.0	2.5	0.5	0.0	0.5	0.5
29	30			2.0	0.0	1.0			0.5							2.5				0.5					6.0
	60		3.0	0.5	1.5											0.5					0.5			0.5	1.0
30	30	0.5	0.5		3.5	1.0		0.5		0.5			2.5	2.5											
	60	0.0			2.0		0.5	1.0	2.5	0.5		15.5				0.5									2.0
31	30	0.5																							
	60																			7.5					

STATION Sacobia
MONTH August 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								
	60																								
2	30																								
	60																								
3	30																								
	60																								
4	30																								
	60																								
5	30																								
	60																								
6	30																								
	60																								
7	30																								
	60																								
8	30															27.0	0.5								
	60															7.0									
9	30																								
	60																								
10	30																								
	60																								
11	30																								
	60																								
12	30																								
	60																								
13	30																								
	60																								
14	30																								
	60																								
15	30																								
	60																								
16	30																								
	60																								

STATION Sacobia
MONTH August 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30																			7.0	4.5			0.5	
	60																		15.5	1.0	0.5				
18	30																1.5			0.5	1.0	1.0			
	60															7.0				16.0	1.5				
19	30	0.5																							
	60																								
20	30																								
	60																								
21	30																								
	60																								
22	30																								
	60																								
23	30																								
	60																								
24	30																								
	60																								
25	30																								
	60																								
26	30																								
	60																								
27	30																								
	60																								
28	30															0.5			1.0			1.0	1.0	1.5	0.5
	60	0.5		0.5							0.5		1.5						1.0			1.5	2.0	0.5	
29	30	0.5					0.5			2.0							1.0	2.0				3.5	3.0	6.5	0.5
	60						0.5			0.5							1.0	0.5			2.5	1.5	3.5	5.5	0.5
30	30	1.0	1.0	3.0	12.0	2.0	1.0	0.5	0.5	0.0		0.5												1.5	0.5
	60	2.0	2.0	3.0	8.0	1.0	2.0	0.0	0.5	0.5		0.5											2.0	0.5	
31	30		0.5			0.5																			
	60	0.5																							

STATION Sacobia
MONTH September 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30																								
	60																								
2	30																								
	60																				32.0	20.0	9.0	30.0	
3	30																				16.5	17.0	3.0	5.0	
	60																								
4	30	0.5	1.0	1.0				1.0		1.5															
	60	0.5	0.5	0.5			2.0	0.5	1.0	5.0															
5	30																								
	60																								
6	30																								
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7	30																								
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13	30																								
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14	30																								
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15	30																								
	60																								
16	30					1.5	1.5		2.0	4.5	0.5	0.0	0.0	0.5			0.5			1.0	0.5		1.0	0.5	3.0
	60					1.5	0.5	1.5	6.0	0.5	1.0	0.5	0.5		0.5	6.0	0.5			0.5		2.0			1.5

STATION Sacobia
MONTH September 1995

RAINFALL FOR 30 MINUTES PERIODS

DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
17	30	0.5	1.0	2.5	0.5	0.5			1.0		1.5	0.5	2.0			0.5							0.5		7.0
	60	0.5	2.0	1.0					0.5			1.0	1.0											1.5	0.5
18	30	10.0	0.5	7.5	2.5		0.5			0.5	4.5	1.5	0.5	0.5											
	60	2.5	0.5	5.0	0.5	1.0		1.0	3.0	2.5	3.5	0.5			0.5							0.5			
19	30																								
	60																								
20	30																								
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21	30																								
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22	30																								
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23	30																								
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24	30																						17.0		
	60																					7.5	0.5		
25	30																								
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26	30																								
	60																								
27	30																								
	60																								
28	30													0.5						13.5	2.5		2.0		
	60																			12.5		3.0	0.5		
29	30																								
	60																								
30	30																								
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31	30																								
	60																								

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DATE		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30				3.5			0.5	7.0	6.0	0.5	0.5			4.5	0.5									
	60			0.5	6.0			1.5	12.0	1.0				0.5	4.5	2.0		1.0	1.0						
2	30																								
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