

THE REPUBLIC OF TURKEY

FEASIBILITY REPORT
ON
CORUH RIVER HYDROELECTRIC
POWER DEVELOPMENT PROJECT
APPENDIX

DECEMBER 1986

JAPAN INTERNATIONAL COOPERATION AGENCY

THE REPUBLIC OF TURKEY

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ON
CORUH RIVER HYDROELECTRIC
POWER DEVELOPMENT PROJECT
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DECEMBER 1986

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団		
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Year Sub-Total Total	Thermal						Hydraulic						Thermal & Hydraulic				
	Name of Station	Type of Fuel	(MW)	(GWh)	(Hour)	(%)	Name of Station	(MW)	Average			Firm			(MW)	Average (GWh)	Firm (GWh)
			(1)	(2)	(3)	(GWh) (4)		(Hour)	%	(GWh) (5)	(Hour)	%	(1)+(3)	(2) + (4)	(2) + (5)		
1984	Existing		4,584	23,420	14.0	58		3,875	14,200	10.0	42	10,460	7.4	31	8,459	37,620	33,880
1985	Elbistan A2	Lignite	340	1,950													
Sub-Total			340	1,950	15.7	65		-	-			-			340	1,950	1,950
Total			4,924	25,370	14.1	59		3,875	14,200	10.0	42	10,460	7.4	31	8,799	39,570	35,830
1986	Elbistan A3 - 4 Soma B3 - 4	Lignite Lignite	680 330	3,900 1,980			Karacaoren	30	142			84					
Sub-Total			1,010	5,880	16.0	67		30	142	13.0	54	84	7.7	32	1,040	6,022	5,964
Total			5,934	31,250	14.4	60		3,905	14,342	10.1	42	10,544	7.4	31	9,839	45,592	41,794
1987	Cayirhan 1 - 2	Lignite	300	1,800			Altinkaya 1 - 2 Karakaya 1 - 2	350 600	816 4,200			617 4,000					
Sub-Total			300	1,800	16.4	68		950	5,016	14.5	60	4,617	13.3	55	1,250	6,816	6,417
Total			6,234	33,050	14.5	60		4,855	19,358	10.9	45	15,161	8.6	36	11,089	52,408	48,211
1988	Y. Catalagzi B	Stone -coal	150	900			Adiguzel 1 - 2 Kokluce Altinkaya 3 - 4 Karakaya 3 - 4 Kapulukaya	60 90 350 600 51	280 588 816 2,900 190			150 576 617 2,060 150					
Sub-Total			150	900	16.4	68		1,151	4,774	11.4	48	3,553	8.5	35	1,301	5,674	4,453
Total			6,384	33,950	14.6	61		6,006	24,132	11.0	46	18,714	8.5	35	12,390	58,082	52,664
1989	Orhaneli Seyitomer 4	Lignite Lignite	200 150	1,200 900			Menzelet 1 - 4 Kilickaya 1 - 2 Gezende 1 - 3	120 120 150	334 332 528			192 236 130					
Sub-Total			350	2,100	16.4	68		390	1,194	8.4	35	558	3.9	16	740	3,294	2,658
Total			6,734	35,050	13.9	58		6,396	25,326	10.8	45	19,272	8.3	35	13,130	61,376	55,322
1990	Yenikoy 1 - 2 Kangal 1 - 2	Lignite Lignite	420 300	2,520 1,800			Derbent Karakaya 5 - 6	56 600	257 254			201 0					
Sub-Total			720	4,320	16.4	68		656	511	2.1	9	201	0.8	3	1,376	4,831	4,521
Total			7,454	40,370	14.8	62		7,052	25,837	10.0	42	19,473	7.6	32	14,506	66,207	59,843

Table AP.1-1 Construction Schedule of Power Plants in Turkey (2/5)

Year	Thermal						Hydraulic						Thermal & Hydraulic				
	Sub-Total Total	Name of Station	Type of Fuel	(MW) (1)	(GWh) (2)	(Hour) (3)	(%) (4)	Name of Station	(MW) (5)	Average		Firm		(MW) (1)+(3)	Average (GWh) (2) + (4)	Firm (GWh) (2) + (5)	
									(GWh) (4)	(Hour) %	(GWh) (5)	(Hour) %					
1991	Keles	Lignite	200	1,200			Catalan	155	509		271						
							Tohma	14.5	67		34						
							Yenice	36.9	122		92						
							Camligoze	16	88		77						
							Tercan	15	30		18						
							Kralkizi	90	146		111						
Sub-Total			200	1,200	16.4	68		327	962	8.1	34	603	5.1	21	527	2,162	1,803
Total			7,654	41,570	14.9	62		7,379	26,799	10.0	42	20,076	7.5	31	15,033	68,369	61,646
1992	Cankiri-Orti Bingol-Karli Elbistan B1	Lignite Lignite Lignite	100 100 300	600 600 1,950			Kayraktepe	420	1,000		650						
							Batman	130	459		251						
							Manavgat	40	195		40						
							Imamoglu	40	148		35						
							Ozkoy	150	182		124						
							Torul	100	322		131						
							Others	142	578		328						
Sub-Total			500	3,150	17.3	72		1,022	2,884	7.7	32	1,559	4.2	18	1,522	6,034	4,709
Total			8,154	44,720	15.0	63		8,401	29,683	9.7	40	21,635	7.1	30	16,555	74,403	66,355
1993	Elbistan B2 - 3	Lignite	600	3,900			Beskonak	200	409		209						
							Ataturk 1 - 2	600	4,400		4,000						
							Yunusyaylasi	160	567		492						
							Eeykoy	15	87		87						
Sub-Total			600	3,900	17.8	74		975	5,463	15.4	64	4,788	13.5	56	1,575	9,363	8,688
Total			8,754	48,620	15.2	63		9,376	35,146	10.3	43	26,423	7.7	32	18,130	83,766	75,043
1994	Saray 1 - 2 Beysehir 1 - 2	Lignite Lignite	300 300	1,800 1,800			Ataturk 3 - 4	600	2,900		2,500						
							Boyabat	510	1,468		925						
Sub-Total			600	3,600	16.4	68		1,110	4,368	10.8	45	3,425	8.5	35	1,710	7,968	7,025
Total			9,354	52,220	15.3	64		10,486	39,514	10.3	43	29,848	7.8	33	19,840	91,734	82,068
1995	Elbistan B4 - 5	Lignite	600	3,900			Sir	261	725		418						
							Ataturk	600	1,400		1,000						
							B.M. Aydogan	70	280		196						
Sub-Total			600	3,900	17.8	74		931	2,405	7.1	30	1,614	4.7	20	1,531	6,305	5,514
Total			9,954	56,120	15.4	64		11,417	41,919	10.1	42	31,462	7.5	31	21,371	98,039	87,582

Table AP.1-1 Construction Schedule of Power Plants in Turkey (3/5)

Year Sub-Total Total	Thermal						Hydraulic						Thermal & Hydraulic				
	Name of Station	Type of Fuel	(MW)	(GWh)	(Hour)	(%)	Name of Station	(MW)	Average			Firm			(MW)	Average (GWh)	Firm (GWh)
			(1)	(2)	(3)	(GWh) (4)		(Hour)	%	(GWh) (5)	(Hour)	%	(1)+(3)	(2) + (4)	(2) + (5)		
1996	Nukleer	Nuclear	1,000	6,000			Ataturk 7 - 8	600	200			0					
							Duzkesme	150	916			678					
							Others	40	116			77					
Sub-Total			1,000	6,000	16.4	68		790	1,232	4.3	18	755	2.6	11	1,790	7,232	6,755
Total			10,954	62,120	15.5	65		12,207	43,151	9.7	40	32,217	7.2	30	23,161	105,271	94,337
1997	Kemerkey	Lignite	420	2,520			Kavsak	120	564			296					
	Cayirhan 3 - 4	Lignite	300	1,800			Susurluk	30	88			50					
	Elbistan B6	Lignite	300	1,950			Akkoy 1	60	260			145					
	Elbistan C1	Lignite	300	1,950			Manyas	20	72			40					
							Bayramhacili	70	170			161					
							Yamula	200	443			345					
							Kurtun	80	198			95					
							Ozluce	160	413			290					
Sub-Total			1,320	8,220	17.1	71		740	2,208	8.2	34	1,422	5.3	22	2,060	10,428	9,642
Total			12,274	70,340	15.7	65		12,947	45,359	9.6	40	33,639	7.1	30	25,221	115,699	103,979
1998	Elbistan C2	Lignite	300	1,950			Kargi-Kizilirmak	76	390			293					
	" D1, 2	Lignite	600	3,900			Goktas	244	1,108			429					
							Palu	78	413			290					
							Lamas 1 - 3	42	254			101					
							Korkun	36	250			195					
							Feke	56	250			162					
							Cevizlik	150	503			326					
							Dikkaya	90	357			200					
							Sami Soydam	175	413			270					
							Others	114	658			441					
Sub-Total			900	5,850	17.8	74		947	4,596	13.3	55	2,707	7.8	33	1,847	10,446	8,557
Total			13,174	76,190	15.8	66		13,894	49,955	9.9	41	36,346	7.2	30	27,068	126,145	112,536
1999	Elbistan D3 - 4	Lignite	600	3,900			Ilisu	1,200	3,678			2,365					
	" D5	Lignite	300	1,950			Dicle	110	300			228					
							Mut	90	288			219					
							Findikli-Birecik	600	1,800			1,200					
Sub-Total			900	5,850	17.8	74		2,000	6,066	8.3	35	4,012	5.5	23	2,900	11,916	9,862
Total			14,074	82,040	16.0	67		15,894	56,021	9.7	40	40,358	7.0	29	29,968	138,061	122,398

Table AP.1-1 Construction Schedule of Power Plants in Turkey (4/5)

Year Sub-Total Total	Thermal						Hydraulic						Thermal & Hydraulic				
	Name of Station	Type of Fuel	(MW) (1)	(GWh) (2)	(Hour)	%	Name of Station	(MW) (3)	Average			Firm			(MW) (1)+(3)	Average (GWh) (2) + (4)	Firm (GWh) (2) + (5)
									(GWh) (4)	(Hour)	%	(GWh) (5)	(Hour)	%			
2000	Elbistan D 6 Beypazari B Golpazari B Elbistan E 1	Lignite Lignite Lignite Lignite	300 250 50 300	1,950 1,500 300 1,950			Akkoy 2 Obruk Karkamis Derekoy Cizre Baraji Dereli Karatas Yusufeli Artvin (Inanli)	180 180 400 150 300 60 40 540 320	604 460 1,200 347 1,270 230 175 1,700 990			400 300 800 250 1,000 103 122 1,150 700					
Sub-Total			900	5,700	17.4	73		2,170	6,976	8.8	37	4,825	6.1	25	3,070	12,676	10,525
Total			14,974	87,740	16.1	67		18,064	62,997	9.6	40	45,183	6.9	29	33,038	150,737	132,923
2001	Elbistan E 2 Nukleer 2	Lignite Nuclear	300 1,000	1,950 6,000			Aslancik Uzuncayir Konaktepe Ikizdere 2 Buyukduz Kandil 1 Muratli Akimli Yedigöze Kandil 2	90 71 65 90 60 55 100 110 315 103	349 310 250 270 174 178 500 483 951 362			178 217 177 190 91 115 350 338 414 235					
Sub-Total			1,300	7,950	16.8	70		1,059	3,827	9.9	41	2,305	6.0	25	2,359	11,777	10,255
Total			16,274	95,690	16.1	67		19,123	66,824	9.6	40	47,488	6.8	28	35,397	162,514	143,178
2002	Nukleer 3	Nuclear	1,000	6,000			Cambasi Bedii, Y Kandil 3 Bagist Garzal Sevimli Kura Menge Kopru Borcka Gullubag Others	65 80 103 186 90 200 89 189 350 120 523	158 300 371 1,042 315 619 247 481 870 300 2,345			84 200 240 730 180 324 118 249 610 230 1,527					
Sub-Total			1,000	6,000	16.4	68		1,995	7,048	9.7	40	4,492	6.2	26	2,995	13,048	10,492
Total			17,274	101,690	16.1	67		21,118	73,872	9.6	40	51,980	6.7	28	38,392	175,562	153,670

Table AP.1-1 Construction Schedule of Power Plants in Turkey (5/5)

Year Sub-Total Total	Name of Station	Thermal				Hydraulic							Thermal & Hydraulic			
		Type of Fuel	(MW) (1)	(GWh) (2)	(Hour)	Name of Station	(MW) (3)	Average			Firm			(MW) (1)+(3)	Average (GWh) (2) + (4)	Firm (GWh) (2) + (5)
								(GWh) (4)	(Hour)	%	(GWh) (5)	(Hour)	%			
2003	Nukleer 4	Nuclear	1,100	6,600		Emet-Adranos	500	1,000				440				
						Gecimli	210	867				477				
						Gormel H	40	255				165				
						Gokyar	120	150				98				
						Bolasan	72	315				160				
						Deriner	600	2,050				1,450				
						Tozkoy	160	285				210				
						Bidar 1	46	198				130				
						Urfa Tuneli	48	124				0				
						Hakkari	47	180				91				
						Andiraz	27	129				90				
						Bidar 2	36	160				100				
						Gormel	25	128				83				
						Karabuk	27	129				90				
						Narli-Dalaman	130	160				100				
						Akkopru-Dalaman	150	266				170				
						Tirebolu	60	114				59				
						Kemah	36	203				142				
						Yenice	26	126				88				
						Gokceseyh	34	118				83				
						Kazan	28	97				68				
						Uzumlu	300	750				525				
						Adliye-Kaletepe	40	80				50				
Sub-Total			1,100	6,600	16.4	68	2,762	7,854	7.8	33	4,869	4.8	20	3,862	14,454	11,469
Total			18,374	108,290	16.1	67	23,880	81,726	9.4	39	56,849	6.5	27	42,254	190,016	165,139

**A-2 METEOROLOGICAL AND
HYDROLOGICAL DATA**

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Table AP.2-1 Monthly Flow at Peterk Gauging Station

Catchment Area : 7,272 km

UNIT : 10**6 M3

G.S : 2205

YEAR	CCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
42	112.00	230.00	113.00	59.00	114.00	192.00	531.00	1035.00	412.00	199.00	102.00	81.00	2593.00
43	52.80	110.00	107.00	80.40	66.30	88.80	304.00	457.00	277.00	144.00	86.00	65.00	1879.30
44	70.70	75.90	75.10	64.90	65.70	174.00	295.00	1083.00	507.00	291.00	97.70	73.20	2867.20
45	56.50	75.10	53.50	47.20	41.00	58.50	221.00	428.00	325.00	138.00	64.00	47.40	1565.20
46	102.00	51.00	49.60	43.40	45.50	80.40	272.00	466.00	378.00	180.00	107.00	63.70	1786.50
47	23.40	74.00	58.60	57.30	58.80	186.00	273.00	217.00	166.00	79.40	49.20	42.30	1362.60
48	59.10	91.60	59.40	55.90	52.00	52.50	252.00	460.00	355.00	119.00	65.90	61.00	1765.10
49	51.80	44.10	44.10	42.30	37.20	72.20	177.00	430.00	229.00	74.10	52.10	45.10	1314.00
50	48.60	43.40	43.70	38.20	34.80	98.30	362.00	460.00	236.00	126.00	60.00	41.00	1593.00
51	77.30	63.00	54.00	49.80	45.10	76.00	282.00	359.00	255.00	120.00	66.00	66.50	1553.70
52	124.00	52.10	67.30	61.20	65.70	91.70	385.00	431.00	301.00	170.00	74.00	52.90	1818.90
53	47.70	44.50	41.40	37.70	40.00	53.90	263.00	447.00	318.00	146.00	76.90	70.10	1586.20
54	59.10	58.30	46.30	47.00	52.50	108.00	380.00	620.00	441.00	226.00	92.10	66.20	2156.50
55	55.50	52.80	49.10	39.40	40.00	65.80	154.00	259.00	145.00	50.60	33.40	30.80	978.40
56	32.10	22.10	36.30	23.10	27.70	67.70	277.00	359.00	308.00	136.00	58.50	46.00	1436.00
57	42.00	38.20	34.50	28.20	41.30	134.00	288.00	436.00	353.00	141.00	61.00	47.50	1845.70
58	41.50	49.00	47.00	40.90	41.10	96.80	255.00	448.00	319.00	122.00	55.50	53.50	1615.70
59	51.50	45.30	50.70	50.60	37.40	108.00	304.00	542.00	403.00	168.00	85.20	63.60	1913.40
60	88.00	79.00	61.50	112.00	188.00	285.00	705.00	819.00	467.00	232.00	102.00	58.10	3199.60
61	55.60	48.50	45.40	30.70	32.80	69.00	288.00	345.00	221.00	58.30	28.50	27.30	1251.90
62	21.80	40.30	64.70	47.30	51.60	221.00	390.00	533.00	316.00	125.00	54.00	51.50	1810.20
63	53.10	53.60	55.40	58.90	60.90	52.10	355.00	899.00	614.00	422.00	156.00	70.30	3290.30
64	69.40	60.30	57.10	53.60	50.90	123.00	415.00	631.00	445.00	133.00	65.70	56.70	2159.70
65	53.70	58.20	63.10	53.60	42.70	165.00	447.00	605.00	405.00	161.00	69.50	53.80	2187.60
66	82.50	73.70	70.50	85.30	82.30	161.00	376.00	589.00	376.00	163.00	69.50	62.00	2189.20
67	55.10	54.50	60.70	51.30	45.00	91.00	344.00	664.00	355.00	297.00	112.00	86.90	2229.90
68	75.20	65.40	92.60	74.80	74.80	193.00	511.00	811.00	423.00	210.00	124.00	117.00	3175.80
69	138.00	142.00	103.00	85.80	73.40	221.00	472.00	714.00	342.00	149.00	87.00	78.80	2602.00
70	59.50	68.20	64.80	56.90	60.90	153.00	435.00	607.00	215.00	98.40	66.20	53.50	1724.50
71	69.20	60.60	64.60	48.70	27.20	155.00	299.00	357.00	422.00	168.00	105.00	52.00	2088.40
72	56.40	54.30	73.50	48.60	45.00	109.00	430.00	447.00	425.00	175.00	80.80	78.20	2032.80
73	80.20	72.20	50.70	44.20	54.10	73.50	288.00	388.00	225.00	151.00	57.10	42.90	1851.70
74	60.40	70.30	57.10	42.80	42.80	159.00	267.00	510.00	264.00	84.40	51.10	72.30	1685.50
75	49.00	48.80	49.40	44.10	35.10	112.00	482.00	450.00	237.00	121.00	48.40	66.20	1747.00
76	57.60	47.70	42.00	54.70	51.00	125.00	471.00	641.00	465.00	218.00	86.60	46.20	2237.90
77	81.00	71.20	66.80	51.50	64.10	124.00	288.00	532.00	372.00	154.00	75.90	54.00	1935.30
78	75.40	63.40	56.50	55.00	76.50	174.00	447.00	658.00	387.00	200.00	78.00	54.40	2320.20
79	58.70	56.40	54.30	57.70	70.80	119.00	294.00	468.00	395.00	186.00	68.40	46.40	1874.70
80	74.90	122.00	100.00	79.20	70.90	195.00	675.00	635.00	328.00	138.00	74.50	52.00	2558.50
81	64.30	60.50	67.40	58.60	42.70	106.00	239.00	443.00	528.00	212.00	72.50	44.90	1926.90
82	58.00	66.60	65.90	50.90	40.70	73.00	438.00	575.00	247.00	142.00	64.50	48.50	1968.50
83	52.30	46.20	36.80	23.40	32.70	75.20	186.00	318.00	223.00	84.30	32.70	38.40	1159.00
84	56.40	145.00	102.00	64.00	36.30	115.00	255.00	508.00	422.00	205.00	80.80	55.50	2101.00
AVE	67.13	70.51	61.71	54.91	56.19	123.25	272.63	535.63	355.72	160.73	74.49	57.76	1994.66
MAX	134.00	230.00	113.00	112.00	188.00	285.00	531.00	1083.00	814.00	422.00	156.00	117.00	3593.00
MIN	31.80	32.10	34.50	28.20	32.70	53.90	154.00	217.00	145.00	50.60	28.50	27.30	978.40

Table AP.2-2 Monthly Flow at Karsikoy Gauging Station

Catchment Area : 19,654 km

UNIT : 10**6 M3

YEAR	CCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
65	343.00	256.00	329.00	226.00	206.00	687.00	1282.00	1490.00	1064.00	490.00	183.00	137.00	6703.00
66	364.00	384.00	271.00	286.00	310.00	410.00	1062.00	1684.00	904.00	404.00	185.00	183.00	6452.00
67	161.00	136.00	159.00	140.00	154.00	304.00	858.00	1746.00	526.00	780.00	374.00	288.00	6026.00
68	259.00	255.00	597.00	375.00	351.00	654.00	2669.00	2999.00	1525.00	741.00	392.00	317.00	11174.00
69	308.00	286.00	283.00	191.00	194.00	443.00	1166.00	1839.00	486.00	271.00	176.00	152.00	6035.00
70	412.00	258.00	247.00	228.00	270.00	457.00	1099.00	999.00	480.00	278.00	219.00	231.00	5189.00
71	430.00	302.00	278.00	235.00	270.00	558.00	796.00	1536.00	1036.00	394.00	325.00	166.00	6330.00
72	268.00	258.00	362.00	153.00	210.00	405.00	1417.00	1259.00	1061.00	461.00	204.00	231.00	6329.00
73	214.00	292.00	239.00	204.00	358.00	410.00	881.00	1366.00	1012.00	471.00	188.00	149.00	5884.00
74	190.00	318.00	259.00	145.00	155.00	444.00	612.00	1351.00	656.00	234.00	181.00	298.00	4843.00
75	141.00	157.00	187.00	186.00	182.00	519.00	1220.00	1056.00	766.00	338.00	145.00	143.00	5130.00
76	296.00	219.00	180.00	203.00	173.00	466.00	1287.00	1725.00	1193.00	567.00	243.00	226.00	6718.00
77	474.00	218.00	193.00	165.00	155.00	333.00	755.00	1285.00	624.00	432.00	276.00	257.00	5421.00
78	394.00	318.00	208.00	198.00	168.00	463.00	1177.00	1592.00	1182.00	570.00	277.00	179.00	6967.00
79	202.00	328.00	355.00	215.00	371.00	415.00	531.00	1442.00	1103.00	572.00	233.00	167.00	6439.00
80	305.00	442.00	406.00	260.00	244.00	545.00	1449.00	1555.00	703.00	273.00	177.00	169.00	6528.00
81	203.00	412.00	272.00	230.00	215.00	452.00	707.00	1244.00	1463.00	544.00	210.00	215.00	6131.00
82	234.00	395.00	283.00	268.00	203.00	318.00	1244.00	1433.00	1767.00	377.00	205.00	152.00	5872.00
83	219.00	246.00	228.00	165.00	164.00	446.00	774.00	1017.00	698.00	291.00	142.00	150.00	4562.00
84	237.00	421.00	314.00	295.00	254.00	421.00	770.00	1301.00	888.00	511.00	273.00	154.00	5849.00
AVE	282.60	256.85	282.50	226.60	244.30	457.70	1112.65	1500.95	943.35	448.45	230.60	202.20	6229.15
MAX	474.00	442.00	597.00	375.00	398.00	687.00	2665.00	2999.00	1525.00	780.00	392.00	317.00	11174.00
MIN	141.00	136.00	159.00	140.00	154.00	304.00	612.00	999.00	480.00	234.00	142.00	137.00	4562.00

Table AP.2-3 Monthly Flow at Isprkopru Gauging Station

Catchment Area : 5.505 km

G.S : 2214 UNIT : 10**6 M³

YEAR	ECT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
65	38.50	40.50	45.20	57.80	36.60	105.90	336.00	614.00	153.00	64.50	40.80	36.40	1288.30
66	50.80	49.50	50.20	52.40	57.20	56.70	264.00	373.90	177.00	63.30	45.20	42.20	1322.50
67	35.10	30.90	31.60	32.00	28.60	48.30	180.00	374.00	144.00	101.00	46.80	45.30	1094.60
68	45.30	40.40	47.70	28.90	25.50	83.10	577.00	480.00	158.00	95.70	61.80	54.20	1747.60
69	55.80	57.40	54.10	45.70	37.30	121.00	217.00	586.00	164.00	58.70	40.10	37.70	1560.80
70	48.50	35.50	35.30	31.50	34.00	97.10	254.00	177.00	77.00	35.50	31.80	26.00	885.60
71	33.80	34.40	38.20	30.40	25.60	93.80	211.00	390.00	234.00	58.70	50.60	27.40	1228.90
72	33.80	33.70	38.00	31.40	25.90	63.80	264.00	260.00	216.00	67.10	38.90	33.30	1109.90
73	40.10	36.20	27.40	25.70	31.10	41.20	138.00	216.00	147.00	54.60	24.60	20.60	802.50
74	30.50	43.60	33.10	38.80	31.40	124.00	188.00	303.00	138.00	35.20	30.80	38.10	1024.90
75	26.70	27.20	28.40	28.30	22.50	65.70	272.00	275.00	126.00	43.20	26.30	27.40	982.80
76	38.20	28.00	26.90	27.40	22.00	61.70	350.00	434.00	269.00	93.80	41.50	35.40	1439.70
77	44.70	41.40	43.40	31.30	35.40	71.80	191.00	354.00	181.00	66.50	36.30	28.70	1125.50
78	37.60	35.60	35.70	32.50	42.10	118.00	325.00	409.00	220.00	84.50	33.80	25.40	1400.40
79	30.50	27.90	28.40	29.70	39.30	73.10	214.00	298.00	221.00	87.20	34.00	22.40	1105.90
80	43.40	28.00	61.00	50.60	40.90	118.00	461.00	466.00	207.00	61.50	35.30	32.40	1656.10
81	41.00	36.60	33.30	33.20	25.90	68.20	142.00	303.00	272.00	89.60	38.50	28.60	1110.90
82	26.70	37.80	37.40	31.80	25.00	44.30	256.00	343.00	191.00	54.30	30.50	26.50	1123.70
83	32.20	21.20	28.50	26.70	22.50	51.50	101.90	179.40	114.40	35.00	20.10	24.10	667.50
84	38.00	50.40	51.60	36.20	24.30	65.10	180.00	366.00	201.00	69.20	32.50	28.70	1183.40
AVE	39.18	41.84	38.78	33.60	31.58	80.62	261.20	350.02	184.87	66.26	37.04	32.10	1158.09
MAX	59.80	93.40	61.00	52.40	57.20	124.00	577.00	566.00	273.00	101.00	61.80	54.20	1747.60
MIN	26.70	27.20	26.90	25.70	22.00	41.20	101.90	177.00	77.00	35.00	20.10	20.60	667.50

Table AP.2-4 Monthly Flow at Duttere Gauging Station

Catchment Area : 586 km

UNIT : 10**6 M³

G.S : 2321

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
72	13.40	9.50	15.70	10.10	8.50	17.60	70.40	73.10	107.00	58.30	25.80	19.60	429.40
73	18.70	17.20	10.70	8.66	10.60	16.20	36.60	99.40	105.00	53.80	20.00	12.50	409.36
74	9.46	12.40	12.00	7.21	7.17	15.70	22.50	94.00	75.30	27.90	16.20	20.20	334.04
75	11.10	5.03	7.12	6.81	6.89	22.10	82.50	85.30	95.10	37.50	16.80	18.90	357.15
76	17.00	11.40	8.70	5.10	8.20	28.00	55.60	97.70	111.00	64.00	24.70	14.20	447.60
77	25.90	14.30	10.00	7.13	5.13	22.10	45.10	91.80	86.10	50.20	21.40	14.00	401.36
78	14.00	12.60	9.83	7.47	11.10	23.40	48.00	98.50	54.00	67.80	22.40	14.40	423.90
79	12.80	14.20	16.40	13.70	15.30	26.50	52.80	118.00	118.00	73.10	28.00	15.70	504.50
80	19.50	16.30	14.80	12.00	8.73	20.10	61.70	95.50	71.60	32.50	16.00	17.20	385.93
81	17.80	15.60	14.60	8.73	5.56	21.60	38.60	83.80	130.00	76.90	30.20	15.70	467.19
82	10.60	13.60	10.50	8.60	6.90	14.00	55.50	52.60	81.80	48.90	21.20	11.30	379.60
83	8.86	10.50	8.02	6.68	7.40	23.20	51.00	88.00	80.50	44.40	14.40	6.96	353.32
84	13.30	15.50	8.56	8.90	6.93	18.00	45.80	71.00	50.50	53.10	15.80	11.00	363.19
AVE	14.80	13.61	11.33	8.85	8.95	20.81	51.85	91.47	95.87	52.95	21.33	15.59	407.41
MAY	25.90	19.60	16.40	13.70	15.30	26.50	82.50	118.00	130.00	76.90	30.20	30.20	504.50
MIN	8.86	5.03	7.12	6.68	6.89	14.00	22.50	71.00	71.60	27.90	14.40	9.96	334.04

Table AP.2-5 Monthly Flow at Altinsu Gauging Station

Catchment Area : 16,326 km²

G.S : 2322

UNIT : 10**6 M3

YEAR	CCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
72	181.00	169.00	215.00	155.00	193.00	295.00	1168.00	1097.00	984.00	437.00	190.00	212.00	5246.00
73	172.00	192.00	149.00	137.00	197.00	257.00	661.00	1226.00	548.00	424.00	155.00	114.00	4632.00
74	145.00	180.00	158.00	123.00	110.00	328.00	451.00	1248.00	532.00	186.00	122.00	217.00	2802.00
75	128.00	126.00	124.00	123.00	132.00	309.00	1405.00	1025.00	747.00	290.00	115.00	121.00	4295.00
76	178.00	137.00	120.00	122.00	130.00	312.00	1004.00	1650.00	1073.00	510.00	192.00	159.00	5597.00
77	255.00	182.00	159.00	130.00	134.00	251.00	658.00	1193.00	778.00	345.00	178.00	145.00	4408.00
78	188.00	170.00	136.00	128.00	151.00	368.00	545.00	1579.00	1003.00	485.00	221.00	141.00	5555.00
79	156.00	143.00	168.00	182.00	212.00	312.00	751.00	1280.00	1011.00	570.00	197.00	116.00	5048.00
80	170.00	302.00	243.00	172.00	171.00	401.00	1215.00	1897.00	583.00	244.00	159.00	131.00	5186.00
81	172.00	148.00	173.00	144.00	140.00	270.00	562.00	1047.00	1219.00	459.00	195.00	170.00	4729.00
82	172.00	185.00	169.00	147.00	119.00	176.00	1023.00	1354.00	732.00	330.00	161.00	135.00	4704.00
83	144.00	134.00	119.00	106.00	55.00	239.00	544.00	882.00	625.00	228.00	97.00	105.00	3336.00
84	143.00	304.00	206.00	155.00	134.00	254.00	706.00	1166.00	572.00	440.00	202.00	151.00	4775.00
AVE	165.62	186.31	164.54	141.08	146.46	292.00	834.85	1241.85	856.77	372.15	168.08	147.46	4721.17
MAX	255.00	304.00	243.00	182.00	212.00	401.00	1215.00	1650.00	1219.00	510.00	221.00	217.00	5597.00
MIN	128.00	126.00	119.00	106.00	55.00	176.00	491.00	882.00	583.00	186.00	97.00	105.00	3336.00

Table AP.2-6 Monthly Flow at Ishan Kopru Gauging Station

Catchment Area ; 6,854 km

UNIT : 10⁶ m³

G.S : 2323

YEAR	CCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	TOTAL
62	27.80	32.00	36.50	22.30	30.80	52.70	116.00	225.00	124.00	64.50	34.60	29.80	809.30
63	30.20	32.50	31.60	34.10	31.20	36.80	223.00	527.00	377.00	210.00	145.00	57.70	1743.10
64													
65	44.20	42.50	43.40	36.20	32.30	73.10	178.00	238.00	154.00	90.60	52.00	40.30	1025.60
66	66.70	50.60	48.80	49.50	46.40	57.10	181.00	324.00	104.00	46.10	32.80	37.30	1049.90
67	44.70	41.60	37.50	25.90	20.20	38.40	79.70	373.00	158.00	163.00	80.50	50.70	1123.20
68	54.50	53.60	52.70	47.70	43.10	76.10	536.00	601.00	325.00	115.00	65.50	55.30	2033.90
69	58.50	64.00	50.50	41.20	36.20	67.00	240.00	454.00	113.00	44.10	42.50	40.30	1252.10
70	60.80	67.10	48.00	41.70	37.20	52.40	152.00	160.00	61.70	51.30	32.20	36.00	820.40
71	40.50	37.20	32.70	31.80	26.50	44.50	67.20	290.00	152.00	36.80	72.10	30.10	881.20
72	39.20	41.00	40.90	38.30	37.10	45.40	185.00	250.00	192.00	76.90	41.00	52.80	1035.60
73	57.10	53.60	46.10	44.50	46.80	53.10	132.00	262.00	191.00	75.60	30.70	35.40	1027.50
74	52.80	50.10	38.70	33.10	31.20	48.80	75.50	268.00	60.80	35.00	33.30	52.90	814.30
75	33.20	34.10	38.20	37.50	30.50	42.70	128.00	151.00	57.50	44.10	26.50	32.70	695.00
76	43.60	41.30	29.10	30.20	31.20	61.40	182.00	425.00	220.00	102.00	51.00	49.60	1269.40
77	56.80	47.00	42.60	35.50	32.30	57.10	151.00	331.00	151.00	64.90	46.10	41.40	1054.70
78	44.50	40.20	35.10	35.30	40.70	56.40	154.00	204.00	105.00	70.80	41.90	31.30	1146.60
79	43.80	41.10	43.80	38.60	38.20	44.40	131.00	224.00	216.00	123.00	39.40	22.50	1015.80
80	57.20	100.00	55.50	45.70	41.20	63.80	253.00	302.00	92.60	47.00	32.80	24.10	1115.90
81	42.00	37.40	37.20	40.10	32.40	37.40	101.00	210.00	210.00	71.20	41.00	46.10	908.80
82	47.50	45.10	48.60	45.60	34.60	35.00	182.00	108.00	133.00	40.10	25.60	37.90	981.40
83	39.63	36.80	38.10	31.80	28.70	34.60	64.20	151.00	133.00	42.30	30.70	42.80	678.60
84	42.20	51.10	43.50	44.30	26.90	57.60	175.00	534.00	236.00	101.00	55.60	43.00	1418.20
AVE	46.78	46.46	41.89	38.76	35.49	51.58	171.16	318.86	168.03	78.20	47.85	40.95	1086.07
MAX	66.70	100.00	55.50	49.60	46.80	76.10	536.00	601.00	377.00	210.00	145.00	57.70	2033.90
MIN	27.80	32.00	29.10	30.20	26.50	34.60	64.20	151.00	61.70	35.00	25.60	24.10	678.60

Table AP.2-7 Monthly Total Precipitation at Aydintepe Meteorological Station

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1968	43.7	36.7	22.6	40.7	71.9	16.6	8.0	11.6	46.0	74.5	64.3	28.5	465.1
1970	17.1	20.2	58.9	15.9	64.1	24.0	6.8	38.2	14.2	50.2	35.6	45.7	390.9
1971	5.1	10.8	44.1	53.9	49.4	40.8	3.5	29.0	5.5	22.8	35.4	59.2	359.5
1972	13.9	5.8	28.1	62.3	54.3	74.0	3.0	9.9	35.6	45.4	23.1	3.4	358.8
1973	20.5	5.7	18.4	80.0	51.2	35.6	6.6	0.0	0.0	62.9	59.7	31.3	371.9
1974	35.5	22.8	12.8	79.3	21.3	6.0	3.2	35.6	26.0	19.5	24.4	41.7	328.1
1975	6.7	38.4	31.4	41.3	76.5	28.5	12.8	0.0	35.2	19.9	34.5	51.1	376.3
1976	82.5	39.9	53.9	51.4	69.1	67.1	12.4	1.6	15.5	52.0	22.1	32.9	500.4
1977	13.3	15.7	63.2	71.7	95.7	61.6	3.0	17.2	10.1	39.0	21.9	55.7	468.1
1978	68.0	43.9	61.7	107.1	21.1	31.4	0.0	0.0	13.5	25.8	1.4	37.0	410.9
1979	39.1	59.0	44.0	69.9	63.1	72.9	19.5	0.0	9.3	73.3	52.9	85.8	588.8
1980	46.3	17.8	62.0	47.5	66.1	20.9	6.7	9.6	11.9	13.0	24.8	64.0	390.6
1981	19.0	20.3	58.8	46.2	84.3	22.2	6.3	4.1	16.2	33.4	40.8	24.4	376.0
1982	30.6	22.8	29.8	108.9	51.8	32.9	43.9	1.9	13.0	14.2	13.1	20.4	383.3
1983	15.8	18.5	36.4	26.8	82.9	78.3	1.2	5.4	33.7	60.5	89.8	16.1	465.4

Table AP.2-8 Monthly Total Precipitation at Bayburt Meteorological Station (1)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1931	26.8	5.7	20.9	63.7	67.2	76.5	23.8	8.2	10.6	28.0	43.8	59.5	434.7
1932	11.1	48.7	24.4	62.1	38.9	16.6	6.5	9.7	1.6	2.5	32.5	0.7	255.3
1933	26.8	37.8	27.1	79.4	100.8	104.6	14.5	0.0	40.3	36.8	29.7	40.6	538.4
1934	2.4	13.3	19.6	54.7	67.7	84.1	41.6	12.2	19.0	67.4	56.7	21.2	459.9
1935	32.4	52.6	56.3	80.1	13.7	11.1	19.9	1.3	34.6	42.7	40.0	34.0	418.7
1936	18.6	47.4	34.0	90.8	130.7	53.8	19.4	60.1	50.9	60.8	20.0	22.6	609.1
1937	39.8	13.1	39.5	74.4	84.5	73.5	10.2	35.7	3.6	30.2	32.2	18.6	455.3
1938	23.5	33.5	27.6	79.8	48.9	25.2	23.9	15.8	40.0	5.1	36.5	36.6	396.4
1939	16.5	15.4	82.5	82.5	78.3	32.3	50.4	49.1	30.5	26.7	35.3	32.3	531.8
1940	72.7	42.7	57.2	63.1	81.4	79.0	10.8	0.7	11.4	62.2	11.1	32.5	524.8
1941	50.6	46.9	62.0	97.5	36.7	33.1	53.2	11.1	31.5	72.5	103.0	47.6	645.7
1942	47.3	18.7	58.6	37.3	81.3	8.9	5.2	14.9	31.3	55.3	74.3	28.2	461.3
1943	23.3	33.3	21.5	45.6	82.4	33.0	17.0	31.2	1.7	50.6	19.2	39.3	398.1
1944	13.9	29.7	53.1	48.8	119.8	37.9	24.2	2.8	10.9	46.2	40.5	7.9	435.7
1945	19.2	37.5	43.9	66.9	27.5	80.6	32.9	14.2	7.1	52.2	28.9	20.9	431.8

Table AP.2-8 Monthly Total Precipitation at Bayburt Meteorological Station (2)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1946	16.5	27.2	39.4	31.6	124.2	54.6	47.3	37.9	1.0	142.6	21.8	0.0	544.1
1947	29.2	17.2	63.0	19.4	17.5	69.2	78.6	13.5	17.5	55.0	57.1	0.0	437.2
1948	26.2	32.6	42.6	32.8	94.3	24.5	0.0	48.4	28.8	19.5	25.9	15.9	391.5
1949	30.9	35.6	32.7	86.5	24.2	43.2	19.0	0.2	16.0	15.0	3.7	44.3	351.3
1950	31.1	24.1	21.0	30.9	73.8	11.5	34.6	8.4	19.1	106.7	49.2	17.2	427.6
1951	28.8	14.6	51.1	41.1	81.7	58.2	37.1	7.0	29.7	85.8	25.1	21.1	481.3
1952	21.0	34.0	12.1	19.2	66.1	63.8	6.0	8.6	42.2	12.4	22.0	14.8	322.2
1953	16.1	59.4	54.1	40.6	65.7	55.7	33.6	2.3	36.6	15.7	72.3	5.4	457.5
1955	14.0	28.8	25.1	39.9	44.4	1.4	16.7	8.6	14.0	6.8	28.8	37.7	266.2
1956	8.8	68.4	16.5	18.5	49.9	25.1	17.6	15.1	9.2	20.1	21.0	35.7	305.9
1957	10.2	25.5	31.0	55.7	80.5	82.9	2.1	4.0	11.9	0.1	33.2	22.6	359.7
1958	15.4	12.3	61.7	59.8	59.5	48.8	23.5	0.0	32.9	7.9	33.3	31.2	386.3
1959	29.4	25.6	24.8	36.5	154.4	71.7	28.6	14.4	36.0	40.4	22.4	13.9	498.1
1960	29.3	58.4	27.5	88.2	60.5	109.2	27.2	13.4	1.4	25.8	26.0	11.3	478.2
1961	40.4	5.9	33.8	38.1	25.1	55.1	1.7	14.3	16.3	9.1	38.8	39.7	318.3

Table AP.2-8 Monthly Total Precipitation at Bayburt Meteorological Station (3)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1962	28.5	33.0	50.8	48.6	75.9	13.5	16.0	18.3	0.0	15.8	24.6	34.1	359.1
1963	38.8	34.7	59.5	108.4	98.2	111.5	64.0	3.5	36.9	51.4	28.6	32.1	667.6
1964	9.5	24.5	55.2	55.0	145.8	65.7	5.4	2.9	12.4	3.7	63.3	23.9	467.3
1965	15.0	21.7	31.6	87.1	36.1	44.5	7.4	0.0	27.7	55.2	33.2	16.0	375.5
1966	24.6	3.2	36.3	51.8	57.2	14.7	10.8	13.8	25.1	6.1	13.3	18.4	275.3
1967	30.5	24.3	15.6	48.8	47.7	65.7	35.0	8.6	21.1	36.9	37.6	67.7	439.5
1968	29.0	26.3	24.8	47.0	79.1	38.5	8.9	22.3	61.5	57.4	44.1	34.3	473.2
1969	11.9	24.9	39.9	47.7	51.1	58.3	1.4	0.1	27.1	70.6	8.3	37.5	378.8
1970	9.2	13.6	37.0	16.3	49.6	32.3	67.2	54.3	16.8	61.2	34.8	24.1	416.4
1971	6.9	16.5	59.1	21.4	81.1	70.8	10.7	47.5	0.0	31.4	26.1	49.9	421.4
1972	14.3	11.6	44.9	56.6	56.9	113.3	6.1	21.3	18.3	28.0	41.2	8.9	421.4

Table AP.2-8 Monthly Total Precipitation at Bayburt Meteorological Station (4)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1973	22.9	16.2	28.7	67.0	29.8	63.6	5.8	0.0	0.0	42.5	58.5	15.2	350.2
1974	25.6	9.9	10.5	114.8	18.2	24.6	2.0	28.1	11.1	11.8	17.7	35.7	310.0
1975	8.7	37.7	20.3	35.6	76.5	22.0	10.1	0.3	41.9	16.4	23.3	14.6	307.4
1976	48.2	36.7	37.6	46.1	43.4	54.0	10.3	2.0	15.2	48.7	12.9	18.0	373.1
1977	10.8	8.9	46.7	45.2	105.3	98.9	5.9	6.2	5.1	56.4	20.8	44.0	454.2
1978	45.4	25.3	47.6	79.8	26.4	37.2	3.4	0.0	16.4	22.0	9.6	26.8	339.9
1979	38.9	65.5	40.5	46.2	40.9	110.3	57.5	4.0	8.4	102.2	62.0	55.6	632.0
1980	28.2	11.6	55.0	77.3	56.9	10.4	1.4	17.9	11.0	20.6	43.7	48.1	382.1
1981	7.2	12.5	53.0	61.8	107.1	69.0	3.3	4.1	22.3	25.3	40.9	13.0	419.5
1982	22.2	13.6	28.5	104.6	66.9	11.1	20.4	3.2	9.0	11.7	19.0	7.4	317.6
1983	19.4	14.1	25.7	19.0	83.5	69.4	2.1	6.0	55.2	55.6	72.2	2.4	424.6

Table AP.2-9 Monthly Total Precipitation at Kirik Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1970	39.5	49.3	53.7	15.7	43.2	25.0	36.8	19.6	33.5	28.1	41.4	56.1	441.9
1971	12.2	52.3	59.5	42.5	115.3	51.0	17.1	80.3	11.4	27.3	43.3	100.3	612.5
1972	21.8	4.6	29.2	94.7	94.2	92.0	46.0	25.5	28.4	52.8	41.7	12.2	543.1
1973	26.3	32.4	35.7	51.6	38.3	72.6	20.2	0.0	0.9	51.9	63.4	39.0	432.3
1974	40.1	15.7	21.9	69.8	77.6	27.2	8.5	24.8	40.5	10.4	33.0	32.1	401.6
1975	14.0	68.3	112.1	80.4	90.2	61.8	41.4	0.0	53.9	12.9	34.8	54.1	623.9
1976	115.1	62.4	37.4	73.3	48.3	124.2	30.9	1.4	18.1	54.4	28.6	42.8	636.9
1977	11.8	23.1	56.4	60.8	103.7	94.9	34.7	6.8	8.6	38.1	20.7	44.8	504.4
1978	62.5	39.4	50.1	109.8	45.1	48.9	1.3	6.2	15.4	34.1	11.0	45.6	469.4
1979	40.1	66.0	29.1	65.9	66.6	68.7	23.9	8.9	1.2	95.5	104.6	72.6	643.1
1980	88.1	17.7	49.9	78.1	83.9	15.3	11.0	14.6	1.2	36.2	43.4	35.7	475.1
1981	28.2	28.4	59.0	35.6	110.8	61.4	21.6	51.9	18.6	21.1	56.1	40.9	533.6
1982	35.9	19.0	43.8	95.1	105.0	24.4	23.8	3.9	9.7	25.5	11.2	16.9	414.2
1983	27.0	20.5	33.9	31.1	63.5	75.3	17.7	21.0	31.1	75.0	104.1	9.2	509.4

Table AP.2-10 Monthly Total Precipitation at Pazaryolu Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1977	9.9	26.8	58.6	48.5	68.7	62.8	11.1	1.7	9.9	24.5	12.3	49.5	384.3
1978	62.6	39.0	37.1	125.2	23.4	24.6	0.0	1.4	10.8	20.4	1.7	41.5	387.7
1979	37.7	62.7	34.2	52.6	60.9	59.4	19.0	1.7	1.1	85.5	89.2	92.5	596.5
1980	53.9	15.9	58.9	69.8	58.6	7.3	3.0	49.4	4.6	28.8	54.0	33.4	437.6
1981	17.0	17.2	48.9	40.3	108.3	81.4	7.2	12.3	36.9	24.7	43.4	37.6	475.2
1982	27.4	17.4	37.5	106.3	89.8	16.7	54.8	0.0	6.1	24.1	7.9	18.0	406.0
1983	37.0	14.0	43.1	24.4	64.2	69.8	10.5	8.8	42.5	59.0	116.7	8.2	498.2

Table AP.2-11 Monthly Total Precipitation at Ispir Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1966	39.5	5.7	32.8	41.6	85.7	19.7	28.4	22.2	52.6	8.3	14.9	41.0	392.4
1967	56.4	24.6	39.5	53.3	31.9	81.5	51.8	23.3	33.6	26.4	44.3	129.9	596.5
1968	40.3	69.6	45.6	68.8	78.6	45.7	5.1	53.6	55.1	38.5	23.1	50.9	574.9
1969	31.1	43.5	48.5	49.7	34.0	37.7	14.1	10.9	19.0	88.7	11.7	33.3	422.2
1970	10.2	48.7	56.6	29.3	41.7	15.8	38.4	38.5	24.5	39.8	33.1	49.1	425.7
1971	2.5	23.8	87.4	30.5	96.0	43.3	0.5	43.7	13.8	33.1	35.9	53.8	464.3
1972	21.3	1.5	32.5	52.7	85.9	84.0	35.7	3.0	51.5	34.3	36.9	7.9	447.2
1974	36.5	11.8	15.9	84.6	29.4	19.0	17.3	23.2	31.7	8.6	19.3	31.3	328.6
1975	13.1	79.1	45.3	53.6	69.4	47.3	23.4	0.4	25.6	16.1	27.9	85.9	487.1
1976	96.2	45.0	26.5	43.7	29.3	78.8	39.6	7.7	25.2	39.1	31.8	49.5	512.4
1977	6.2	22.7	50.3	59.8	73.4	53.9	25.5	10.6	20.9	47.1	13.5	28.3	412.2
1979	26.6	65.6	18.0	67.1	38.6	62.0	28.1	3.6	2.7	80.1	84.8	104.3	581.5
1980	31.2	17.3	41.5	54.2	84.9	3.8	7.0	19.0	5.7	19.1	32.1	27.6	343.4
1981	19.8	33.5	45.2	39.3	87.8	64.3	6.1	35.2	21.3	22.9	55.3	33.0	463.7
1982	26.4	19.0	35.0	81.4	85.9	13.3	39.7	18.8	5.7	20.6	9.8	10.2	365.8
1983	19.8	15.1	32.1	55.5	69.5	75.7	24.1	18.0	49.2	67.5	116.7	11.6	554.8

Table AP.2-12 Monthly Total Precipitation at Camikaya Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1977	8.8	25.3	61.9	65.2	106.5	57.1	29.3	8.9	17.9	52.3	6.2	39.0	478.4
1978	58.7	55.3	75.6	118.1	26.3	54.5	3.3	12.5	23.7	22.7	7.4	64.7	522.8
1980	38.1	9.0	40.5	47.3	60.2	5.4	15.0	26.7	2.9	15.9	49.2	45.2	355.4
1981	17.3	33.7	31.4	30.1	91.8	79.3	17.9	22.6	27.8	22.2	76.0	54.9	505.0
1982	46.9	20.1	33.0	80.7	89.4	10.6	52.6	23.4	26.6	9.8	7.2	5.1	405.4
1983	19.2	18.6	51.9	34.8	73.8	72.0	20.4	12.5	47.9	62.8	139.8	13.4	567.1

Table AP.2.-13 Monthly Total Precipitation at Kilickaya Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1977	14.9	17.4	64.1	49.5	54.5	92.1	26.6	9.7	14.5	43.8	15.7	24.4	427.2
1978	56.1	19.9	34.1	80.5	13.4	54.2	12.6	13.2	23.2	22.7	12.0	49.6	391.5
1979	23.4	38.0	21.3	33.7	33.0	61.7	33.1	8.4	8.7	80.3	48.4	45.1	435.1
1980	22.1	0.0	30.0	29.1	43.9	4.6	19.8	14.2	3.6	16.7	65.6	27.5	277.1
1981	8.4	10.2	19.7	17.4	83.2	61.3	5.8	15.6	28.8	15.2	50.8	3.1	319.5
1982	12.0	19.2	24.4	48.8	80.0	14.7	35.4	10.1	13.2	12.2	11.6	1.5	283.1
1983	19.0	16.6	35.5	23.8	31.2	44.1	32.2	16.2	51.8	57.7	62.6	4.2	394.9

Table AP.2-14 Monthly Total Precipitation at Yusufeli Meteorological Station (1)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1955	0.0	12.3	21.6	16.8	9.3	13.8	15.0	0.0	8.3	2.7	39.0	37.5	176.3
1956	15.5	59.8	10.0	2.3	15.6	0.0	0.0	0.0	0.0	0.0	15.0	21.8	140.0
1957	1.0	17.8	7.8	2.3	18.3	0.0	1.0	0.0	20.6	0.0	14.5	4.5	87.8
1958	22.6	9.3	22.3	13.6	6.4	73.2	2.1	1.1	63.6	25.2	13.9	0.0	253.3
1959	20.6	11.0	38.8	27.0	115.4	92.6	42.9	24.1	33.7	50.7	15.8	7.2	479.8
1960	46.6	36.6	4.4	51.0	24.7	43.4	51.9	13.7	2.2	0.0	16.1	19.5	310.1
1961	24.3	0.0	36.3	15.1	31.1	46.9	4.7	8.6	1.4	8.9	55.3	30.5	263.1
1962	4.6	33.6	15.6	63.7	38.3	37.8	30.8	13.2	16.7	3.4	25.4	27.1	310.2
1963	30.1	33.5	34.8	58.5	48.5	54.9	93.0	14.8	39.0	36.4	8.7	27.1	479.3
1964	0.5	17.6	36.3	15.5	67.4	33.8	6.9	8.4	14.3	0.0	105.1	19.6	325.4
1965	2.8	23.5	34.4	60.6	17.5	64.2	23.5	9.0	23.7	47.0	28.3	19.6	354.1
1966	39.4	0.3	18.4	26.9	48.9	15.7	5.6	13.5	41.0	6.0	6.7	15.2	237.6
1968	29.5	11.9	30.5	54.7	67.9	44.6	11.9	43.9	30.3	44.7	6.2	27.7	403.8
1969	13.5	6.0	18.7	26.9	23.7	25.7	7.2	10.3	2.7	47.4	2.3	24.5	208.9
1970	5.7	28.4	34.8	12.8	46.1	6.6	38.3	47.5	4.0	42.7	17.9	24.1	308.9

Table AP.2-14 Monthly Total Precipitation at Yusufeli Meteorological Station (2)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1971	2.1	14.6	48.6	22.9	73.1	57.4	7.5	28.4	1.5	23.7	47.1	73.5	400.4
1972	4.3	2.0	11.9	22.5	28.7	60.3	15.8	12.0	39.7	15.8	17.3	9.0	239.3
1973	3.5	20.8	24.4	32.5	30.5	67.6	17.2	0.0	0.0	13.2	46.2	13.2	269.1
1974	11.7	0.0	14.6	65.9	27.0	24.4	5.3	19.0	29.8	3.2	17.3	20.5	238.7
1975	8.4	45.4	22.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.6	131.8
1976	69.8	26.8	18.3	24.8	28.9	74.8	27.8	13.2	0.3	31.2	22.8	24.1	362.8
1977	6.1	15.6	47.4	56.3	41.6	63.2	24.1	2.3	20.6	23.4	11.3	20.3	332.2
1978	38.7	41.9	42.6	53.4	15.5	34.1	8.7	14.9	10.9	10.0	0.0	35.1	305.8
1979	9.8	16.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.7
1983	6.4	8.3	24.0	7.2	35.5	35.3	33.0	10.2	33.7	35.8	50.8	3.1	283.3

Table AP.2-15 Monthly Total Precipitation at Tortum Meteorological Station (1)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1953	0.0	0.0	0.0	2.3	90.0	42.0	88.5	40.3	22.6	28.8	40.8	15.7	371.0
1955	0.8	5.5	25.1	20.9	47.1	35.4	12.0	1.0	21.5	5.8	36.1	17.9	229.1
1956	5.9	48.7	34.2	20.7	26.8	48.0	12.2	27.6	2.8	41.4	9.2	31.0	308.5
1957	15.7	23.7	20.2	28.1	83.3	52.4	24.5	12.9	12.0	5.7	29.5	1.7	309.7
1958	19.4	13.4	39.9	37.5	52.2	72.3	24.0	2.6	29.9	25.5	6.2	13.8	336.7
1959	55.0	15.4	19.3	36.9	175.6	48.6	35.5	33.2	29.6	61.7	26.4	4.3	541.5
1960	46.9	26.9	17.7	44.3	36.1	102.9	97.2	34.9	0.0	13.0	6.6	7.6	434.1
1961	30.8	11.8	47.7	53.7	20.2	58.1	9.0	28.7	3.4	23.1	55.4	17.9	359.8
1962	14.9	38.1	18.4	90.3	36.5	61.9	63.8	16.2	5.9	15.8	18.6	34.3	414.7
1963	0.0	53.6	59.8	122.9	60.7	59.8	106.2	41.4	41.6	55.7	12.9	30.4	645.0
1964	2.6	21.2	75.4	62.9	77.2	82.1	16.7	5.5	33.1	4.0	87.1	4.7	472.5
1965	10.2	28.4	33.9	115.9	22.4	61.2	29.8	39.7	18.9	103.2	47.6	29.6	540.8
1966	60.1	12.0	45.9	46.8	121.0	44.7	40.0	30.3	35.8	14.4	14.7	25.5	491.2
1967	42.4	11.3	62.9	72.0	101.2	128.5	79.0	30.9	32.2	43.5	63.7	53.4	721.0
1968	55.9	10.6	59.6	37.6	107.7	76.9	13.6	68.8	32.2	37.7	47.9	35.0	583.5

Table AP.2--15 Monthly Total Precipitation at Tortum Meteorological Station (2)

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1969	47.1	26.9	63.1	55.0	28.4	17.9	16.2	10.6	6.5	51.7	18.2	63.6	405.2
1970	16.6	41.2	33.0	8.8	48.3	34.7	32.2	38.9	12.2	40.4	8.5	35.4	350.2
1971	0.3	35.2	71.2	43.7	81.9	70.3	10.5	113.7	16.5	46.3	25.2	61.0	575.8
1972	21.2	23.5	25.1	53.4	168.3	64.7	81.8	22.8	43.7	58.6	54.2	10.9	628.2
1973	26.7	51.1	55.0	73.0	42.3	97.5	32.3	0.0	0.2	68.4	77.8	28.4	552.7
1974	39.4	7.5	20.5	39.7	45.0	42.5	6.3	16.9	29.7	16.9	27.0	20.2	311.6
1975	8.2	77.8	12.6	26.4	55.5	54.4	28.9	1.6	44.1	44.8	22.9	35.7	412.9
1976	70.7	56.6	12.5	89.9	30.2	61.9	54.4	13.9	7.1	31.3	22.7	30.6	481.8
1977	25.8	23.8	66.4	51.4	102.7	72.3	39.1	10.9	20.7	47.9	17.0	21.1	499.1
1978	35.2	56.9	53.2	60.4	56.8	60.9	14.0	6.6	17.3	25.9	3.2	23.1	413.5
1979	45.4	48.5	37.4	80.2	69.7	103.9	54.1	12.9	3.0	88.0	76.4	33.4	652.9
1980	25.2	11.6	31.2	57.8	56.1	16.9	18.5	27.0	7.3	30.5	44.2	33.8	360.1
1981	23.7	16.8	26.4	41.7	78.5	102.2	7.7	14.5	27.1	44.0	54.2	21.7	458.5
1982	10.2	14.6	18.6	64.0	51.9	9.4	21.1	13.2	8.0	11.2	28.6	0.9	251.7
1983	9.4	14.1	36.7	52.0	52.2	73.2	15.2	29.7	33.8	54.3	58.9	4.4	433.9

Table AP.2-16 Monthly Total Precipitation at Narman Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1977	27.8	13.3	67.3	38.1	76.1	68.1	18.9	6.1	15.5	44.7	13.1	23.7	412.7
1978	34.6	43.2	40.5	41.9	68.1	52.9	9.6	12.8	10.7	19.6	8.4	15.0	357.3
1979	8.3	40.6	20.8	65.6	58.9	106.7	43.2	14.8	1.3	76.4	78.1	22.0	536.7
1980	34.5	8.1	26.1	43.0	39.3	21.1	0	59.1	15.2	27.5	46.3	53.9	374.1
1981	18.4	10.7	35.2	45.9	65.0	84.7	18.1	33.4	15.0	25.9	52.6	7.3	412.2
1982	10.8	24.6	20.7	73.0	61.3	54.1	23.0	4.5	9.3	9.5	14.9	4.5	310.2

Table AP.2-17 Monthly Total Precipitation at Otu Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1977	8.9	16.5	31.6	43.1	79.8	76.1	9.6	8.2	16.4	0.0	0.2	10.8	301.2
1978	33.8	45.2	39.4	31.5	46.3	29.6	18.4	4.9	6.9	13.9	4.7	16.9	291.5
1979	4.9	38.8	16.8	52.1	69.4	75.1	55.9	7.3	1.3	74.4	59.9	13.3	469.2
1980	25.2	0.0	0.0	17.8	49.1	32.8	17.0	0.0	0.0	0.0	22.3	17.0	181.2
1981	15.2	4.6	8.5	22.5	56.0	75.8	29.7	15.5	12.9	21.7	27.2	3.4	293.0
1982	3.5	15.6	20.2	64.7	67.0	27.4	16.9	0.0	15.1	8.7	11.1	1.5	251.7
1983	4.7	8.3	19.9	28.8	59.5	78.6	22.6	23.0	38.0	52.3	33.2	1.7	370.6

Table AP.2-18 Monthly Total Precipitation at Olur Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1977	7.1	18.0	34.9	72.0	100.6	50.2	0.0	1.9	15.8	25.0	9.1	24.3	358.9
1978	31.2	40.1	51.6	72.6	15.3	37.3	8.5	15.6	3.9	25.1	5.3	55.4	361.9
1979	22.0	29.7	6.9	57.3	88.3	98.3	67.1	4.5	15.3	80.7	69.7	29.7	569.5
1980	14.5	4.7	31.3	26.3	51.4	24.7	5.6	40.1	0.0	25.7	27.0	16.7	268.0
1981	19.5	29.7	21.6	33.1	99.6	51.8	18.2	27.5	26.4	13.7	62.0	5.7	408.8
1982	21.9	15.9	19.8	58.2	53.7	9.8	44.3	10.0	11.5	10.8	6.7	2.8	265.4
1983	6.8	9.5	39.8	22.2	115.3	66.7	35.7	13.6	45.2	42.6	56.3	7.9	461.6

Table AP.2-19 Monthly Total Precipitation at Senkaya Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1963	7.2	17.7	25.1	61.8	80.7	96.7	126.7	68.0	28.3	60.7	18.7	16.2	607.8
1964	11.1	17.8	49.4	54.6	63.8	82.1	21.1	14.8	14.5	14.4	37.0	16.1	396.7
1965	4.3	13.3	36.2	88.3	55.5	97.9	46.1	9.6	2.9	70.3	19.1	20.1	463.6
1966	17.5	3.8	19.9	57.9	125.3	35.1	41.5	42.7	50.3	6.5	3.0	10.3	413.8
1968	39.8	9.0	27.2	51.7	104.6	55.9	20.8	36.7	37.5	37.2	35.6	15.0	471.0
1969	21.1	15.9	30.4	69.9	36.5	47.2	19.7	8.6	9.2	103.1	8.7	46.8	417.1
1970	7.2	26.4	26.7	7.1	71.3	26.2	29.1	56.8	13.3	43.7	11.8	18.2	337.8
1971	4.7	15.5	40.9	37.8	84.3	45.4	11.1	138.9	3.0	32.9	20.0	20.9	455.4
1972	13.0	5.9	18.6	38.5	116.2	113.8	74.4	33.1	72.4	29.7	36.2	3.6	555.4
1973	25.8	21.4	36.4	41.4	46.1	92.5	45.9	10.0	0.3	32.7	41.7	22.0	416.2
1974	8.8	2.7	17.7	60.9	63.8	26.6	14.9	31.0	49.9	0.0	22.2	18.1	316.6
1975	8.0	44.3	15.3	30.3	136.8	36.1	45.4	6.7	47.8	34.1	14.1	18.2	437.1
1976	22.7	30.2	6.2	57.7	93.4	157.5	69.6	5.7	45.3	24.9	6.6	15.6	535.4
1977	5.4	10.3	25.5	38.8	94.6	86.4	28.8	56.1	37.2	30.8	8.6	14.8	437.3
1978	27.1	23.2	30.5	54.7	74.7	67.9	13.2	10.6	1.4	43.9	3.3	22.6	373.1
1979	15.1	23.1	24.5	52.1	79.5	99.1	67.5	16.1	4.5	65.3	61.2	4.0	512.0
1980	16.1	5.2	15.3	30.3	45.5	26.6	6.5	22.2	7.1	24.5	8.9	13.8	222.0
1981	13.7	7.6	13.7	29.1	98.8	62.2	0.0	21.6	17.5	27.2	47.3	7.1	345.8
1982	7.4	3.5	14.6	55.1	71.3	29.7	47.4	4.4	4.2	15.3	20.0	-	272.9
1983	8.4	3.6	28.2	17.9	74.8	43.1	19.8	32.0	24.4	77.8	38.7	5.3	374.0

Table AP.2-20 Monthly Total Precipitation at Sarimese Meteorological Station

Unit: mm

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1970	45.0	41.1	54.2	30.9	52.5	26.4	18.3	49.4	14.5	35.3	33.7	49.7	451.0
1971	2.5	28.1	63.7	64.8	69.9	70.7	2.2	44.8	6.4	24.7	35.0	62.2	475.0
1972	17.0	6.5	16.8	73.5	55.9	67.1	1.3	20.8	30.6	57.3	23.3	9.6	379.7
1973	16.2	9.6	20.7	85.4	37.5	35.8	6.7	0.0	0.7	57.0	55.0	24.3	348.9
1974	23.6	10.6	21.2	83.3	27.8	5.8	2.0	15.6	11.6	20.2	22.0	42.4	286.1
1975	4.3	27.0	44.4	68.7	83.6	27.7	9.2	0.0	49.5	25.0	48.6	49.7	437.7
1976	48.5	19.9	57.1	60.0	68.4	87.3	12.8	0.0	16.6	60.0	18.5	29.6	478.7
1977	0.0	15.6	41.8	95.6	93.1	34.5	2.4	11.2	13.5	36.8	28.9	41.5	414.9
1978	46.7	37.9	63.7	130.8	26.5	40.3	4.4	1.0	11.2	34.2	5.4	38.9	441.0
1979	40.8	63.1	44.3	86.3	84.6	87.7	19.0	2.7	9.3	80.2	60.5	97.3	675.8
1980	53.8	12.8	66.2	55.3	83.2	14.5	11.9	16.3	15.4	21.4	31.1	35.6	417.5
1981	6.7	11.9	69.5	35.0	72.4	35.1	4.6	14.5	13.7	35.3	31.8	30.7	361.2
1982	35.7	18.8	12.8	130.4	62.5	17.6	20.3	4.2	12.3	13.7	7.8	22.2	358.3
1983	8.4	11.5	16.4	26.2	77.2	64.4	20.4	4.9	33.9	64.3	44.5	16.4	388.5

Table AP.2-21 Monthly Maximum Temperature at Bayburt Meteorological Station (1)

Unit: °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Max.
1960	-	-	-	-	-	20.4	26.4	23.4	19.3	12.1	11.9	4.8	26.4
1961	3.2	3.7	7.3	14.9	20.7	22.1	25.3	24.8	16.5	14.4	9.0	5.4	25.3
1962	1.3	4.8	11.9	13.5	19.8	21.5	26.9	23.1	20.0	17.2	10.2	5.8	26.9
1963	7.1	6.4	6.3	12.3	15.7	20.1	23.4	22.7	18.7	15.2	7.3	4.5	23.4
1964	-5.8	2.0	5.6	12.6	19.2	20.1	24.4	23.1	17.3	11.9	9.5	2.9	24.4
1965	1.0	3.5	7.1	14.6	15.8	20.0	23.0	24.2	21.0	13.1	5.8	6.7	24.2
1966	6.0	5.5	7.4	15.3	16.6	21.6	25.0	23.8	21.8	14.7	12.5	7.7	25.0
1967	5.1	0.4	3.2	10.5	19.3	18.9	20.2	20.8	18.1	12.6	10.0	3.6	20.8
1968	2.3	3.2	5.1	13.1	16.1	20.1	25.3	21.0	21.9	15.3	8.1	3.5	25.3
1969	2.2	2.3	7.7	12.2	17.3	22.5	24.8	24.5	20.6	18.7	8.2	5.0	24.8
1970	2.2	4.2	12.6	18.0	19.3	19.4	24.5	20.0	19.8	14.8	11.0	5.5	24.5
1971	2.1	4.1	7.5	13.9	17.9	18.3	25.0	24.8	20.9	14.4	8.1	3.2	25.0
1972	-2.3	1.1	5.3	14.0	16.5	18.5	25.0	24.8	18.9	16.0	8.0	-0.6	25.0
1973	0.5	6.5	5.5	11.9	18.3	21.0	23.5	26.5	18.8	17.1	6.6	4.4	26.5
1974	-0.3	0.8	7.7	9.5	17.3	24.3	26.2	23.5	17.6	16.6	12.4	3.0	26.2

Table AP.2-21 Monthly Maximum Temperature at Bayburt Meteorological Station (2)

Unit: °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Max.
1975	1.0	0.1	8.4	13.2	16.5	20.3	26.7	22.8	24.0	14.4	7.9	2.2	26.7
1976	2.3	-1.2	2.5	13.7	14.6	18.0	22.6	24.7	22.7	13.6	7.5	5.9	24.7
1977	-3.0	7.5	6.1	12.8	15.7	18.9	23.0	24.9	20.5	15.3	10.9	5.2	24.9
1978	3.4	4.2	6.2	10.6	16.7	20.4	27.9	22.2	21.2	15.1	5.3	5.5	27.9
1979	5.0	6.6	8.2	15.9	15.5	19.8	20.8	25.0	21.9	14.8	12.5	1.2	25.0
1980	2.4	0.6	7.3	13.2	18.6	22.8	26.7	22.4	21.8	12.2	10.5	7.4	26.7
1981	3.1	3.9	8.3	14.3	15.5	20.6	26.0	21.5	23.4	17.9	7.0	6.9	26.0
1982	1.7	3.6	4.8	14.6	16.6	20.4	23.1	21.6	19.6	15.2	9.3	1.1	23.1
1983	0.3	-2.0	9.7	12.7	16.0	20.6	24.3	23.5	18.6	13.8	8.5	8.5	24.3
1984	2.9	5.4	8.2	11.3	16.7	21.3	25.1	20.4	19.1	16.5	8.1	-1.2	25.1
Max.	6.0	7.5	12.6	18.0	20.7	24.3	27.9	26.5	24.0	18.7	12.4	8.5	27.9

Table AP.2-22 Monthly Minimum Temperature at Bayburt Meteorological Station (1)

Unit: °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.
1960	-	-	-	-	-	8.4	13.6	11.7	10.9	5.5	-3.4	-2.8	-3.4
1961	-18.8	-17.6	-11.0	-1.3	6.9	9.3	14.6	12.2	7.7	4.3	-9.7	-15.9	-18.8
1962	-19.9	-11.1	-6.2	0.6	6.6	7.9	15.2	14.7	9.4	2.9	2.4	-6.8	-19.9
1963	-9.3	-8.0	-13.3	1.4	5.4	10.7	13.4	13.8	9.3	2.6	0.7	-10.3	-13.3
1964	-20.7	-18.9	-10.2	0.3	5.1	13.6	11.9	12.5	9.5	2.9	-12.5	-16.4	-20.7
1965	-21.4	-16.6	-8.6	-10.2	1.1	9.3	14.8	14.9	9.3	-2.8	-8.2	-8.6	-21.4
1966	-5.8	-6.6	-4.1	3.5	2.8	7.7	11.6	13.7	9.4	6.7	3.1	-9.8	-9.8
1967	-16.8	-19.0	-11.9	-1.8	6.8	3.2	13.6	14.8	6.2	5.6	-16.4	-16.3	-19.0
1968	-17.4	-17.8	-14.9	0.5	8.8	7.3	13.3	10.1	8.8	4.9	2.1	-19.4	-19.4
1969	-13.7	-15.6	-6.7	-3.9	5.4	10.3	11.4	14.3	4.5	-1.6	-3.4	-6.1	-15.6
1970	-9.7	-8.6	-2.5	1.7	6.3	8.9	14.7	11.7	1.3	1.7	1.3	-11.4	-11.4
1971	-9.3	-14.5	-10.2	1.9	6.8	9.4	14.6	10.3	8.8	-0.3	-3.3	-20.0	-20.0
1972	-26.0	-22.2	-10.6	-4.7	5.0	11.9	14.5	14.9	11.5	1.3	-8.6	-13.9	-26.0
1973	-18.3	-11.9	-9.1	0.9	5.2	8.9	12.3	13.2	10.4	-0.9	-12.4	-14.0	-18.3
1974	-18.7	-17.0	-4.4	-2.6	7.5	11.5	9.9	11.9	7.1	8.5	-8.4	-8.1	-18.7

Table AP.2-22 Monthly Minimum Temperature at Bayburt Meteorological Station (2)

Unit: °C

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.
1975	-16.4	-18.1	-9.4	5.3	6.2	9.5	16.2	10.9	8.4	2.2	-7.7	-15.3	-18.1
1976	-19.2	-19.0	-15.4	1.9	6.9	7.9	10.6	14.2	7.8	3.0	-3.4	-8.9	-19.2
1977	-16.9	-6.9	-7.9	1.0	8.1	7.3	13.0	11.3	8.6	-3.9	-1.6	-19.5	-19.5
1978	-14.6	-9.1	-3.4	0.9	3.3	5.3	11.3	14.3	10.0	4.1	-4.3	-5.5	-14.6
1979	-17.0	-11.2	-6.2	3.0	8.4	9.7	10.6	16.1	11.0	-0.8	-3.8	-14.0	-14.0
1980	-22.7	-19.5	-11.8	-5.1	5.1	12.2	16.5	13.9	1.2	1.9	-4.2	-19.1	-22.7
1981	-9.9	-5.0	-6.4	-4.8	1.8	6.2	15.0	15.4	8.9	5.4	-6.7	-4.2	-9.9
1982	-15.7	-15.9	-12.8	4.8	5.2	9.2	11.1	13.2	9.1	-0.2	-8.4	-11.8	-15.9
1983	-22.3	-16.6	-13.7	1.4	5.8	9.0	13.0	11.7	5.4	2.8	-6.0	-7.4	-22.3
1984	-5.9	-6.1	-1.5	-0.2	4.0	6.7	13.0	12.2	12.6	-0.9	-6.4	-17.3	-17.3
Min.	-26.0	-22.2	-15.4	-10.2	1.1	3.2	10.6	10.1	1.3	-3.9	-12.5	-20.0	-26.0

Table AP.2-23 Suspended Sediment and Runoff at Ispir - Erzurum (1)

Location; Ispir - Erzurum Karayolunun
6 km Sindeki Köprüdedir
Catchment Area; 5,514 km

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
Sep. 26, 1969	19.2	243	Oct. 13, 1971	12.8	67
Oct. 9, 1969	18.8	403	Nov. 13, 1971	10.7	19
Oct. 9, 1969	18.8	449	Dec. 21, 1971	11.2	16
Nov. 8, 1969	15.5	162	Jan. 14, 1972	11.3	17
Mar. 21, 1970	48.8	1,130	Feb. 15, 1972	12.9	148
Apr. 11, 1970	92.8	838	Mar. 14, 1972	23.2	403
Apr. 14, 1970	139.0	2,560	Apr. 14, 1972	121.0	2,470
May 19, 1970	63.6	145	May 14, 1972	91.3	546
May 9, 1970	77.9	258	Jun. 24, 1972	71.5	747
Jun. 18, 1970	23.1	100	Jul. 26, 1972	13.3	861
Aug. 9, 1970	14.4	452	Aug. 8, 1972	10.5	48
Sep. 10, 1970	10.3	95	Sep. 16, 1972	12.6	155
Oct. 14, 1970	14.8	94	Oct. 14, 1972	11.6	121
Nov. 9, 1970	13.1	184	Nov. 26, 1972	13.3	976
Dec. 9, 1970	19.0	103	Dec. 20, 1972	11.1	167
Feb. 18, 1971	9.6	115	Feb. 18, 1973	12.1	139
Mar. 19, 1971	327.0	1,010	Mar. 24, 1973	13.8	135
Apr. 13, 1971	78.9	1,480	Apr. 14, 1973	55.1	2,010
May 10, 1971	160.0	1,720	May 9, 1973	109.0	789
Jun. 23, 1971	59.0	348	Jun. 9, 1973	42.6	241
Jul. 15, 1971	21.3	36	Jul. 10, 1973	20.4	117
Aug. 18, 1971	28.4	1,340	Aug. 7, 1973	9.8	72
Sep. 15, 1971	10.2	57	Sep. 11, 1973	7.6	85

Table AP.2-23 Suspended Sediment and Runoff at Ispir - Erzurum (2)

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
Oct. 21, 1973	11.4	84	Nov. 13, 1975	11.3	31
Nov. 11, 1973	11.9	263	Dec. 10, 1975	10.5	158
Dec. 6, 1973	15.4	115	Feb. 3, 1976	8.3	90
Jan. 9, 1974	14.3	106	Mar. 12, 1976	8.8	61
Mar. 9, 1974	20.4	303	Apr. 9, 1976	131.0	2,050
Apr. 13, 1974	66.4	1,370	May 9, 1976	164.0	1,660
May 16, 1974	67.5	502	Jun. 12, 1976	92.5	311
Jun. 9, 1974	67.2	544	Jul. 12, 1976	37.4	1,240
Jul. 11, 1974	13.6	31	Aug. 13, 1976	15.3	48
Aug. 6, 1974	9.3	26	Sep. 14, 1976	14.0	112
Sep. 11, 1974	14.9	405	Oct. 11, 1976	13.9	68
Oct. 25, 1974	7.8	107	Nov. 8, 1976	15.0	27
Nov. 13, 1974	11.4	67	Dec. 14, 1976	17.6	221
Dec. 11, 1974	11.6	88	Jan. 11, 1977	10.6	128
Jan. 8, 1975	9.8	59	Feb. 8, 1977	14.1	48
Mar. 17, 1975	17.9	523	Mar. 22, 1977	34.5	636
Apr. 13, 1975	153.0	2,900	Apr. 12, 1977	82.5	948
May 11, 1975	84.2	742	Apr. 30, 1977	95.7	520
Jun. 8, 1975	56.1	1,370	May 10, 1977	123.0	1,245
Jul. 24, 1975	13.4	124	Jun. 11, 1977	65.3	328
Aug. 5, 1975	11.7	77	Jul. 24, 1977	18.1	212
Sep. 13, 1975	9.1	35	Aug. 12, 1977	14.7	126
Oct. 24, 1975	11.1	38	Sep. 27, 1977	10.9	48

Table AP.2-23 Suspended Sediment and Runoff at Ispir -- Erzurum (3)

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
Oct. 14, 1977	8.9	18	Sep. 4, 1979	7.5	22
Nov. 17, 1977	9.7	13	Oct. 9, 1979	12.5	248
Dec. 6, 1977	15.5	101	Nov. 15, 1979	56.3	1,670
Jan. 10, 1978	13.4	130	Dec. 28, 1979	64.6	119
Feb. 5, 1978	13.3	88	Jan. 21, 1980	18.3	245
Mar. 23, 1978	46.4	729	Feb. 13, 1980	15.4	22
Apr. 7, 1978	91.0	1,180	Mar. 31, 1980	25.7	110
Apr. 18, 1978	185.0	1,930	Apr. 2, 1980	152.8	254
May 4, 1978	175.0	3,000	Apr. 18, 1980	148.4	1,057
Jun. 8, 1978	80.8	136	May 21, 1980	199.4	851
Jul. 4, 1978	42.8	37	Jun. 12, 1980	69.2	149
Aug. 17, 1978	10.4	22	Aug. 25, 1980	11.0	71
Sep. 11, 1978	10.4	15	Sep. 19, 1980	13.6	55
Oct. 3, 1978	12.4	17	Nov. 13, 1980	14.5	56
Nov. 23, 1978	9.8	15	Dec. 16, 1980	11.4	257
Jan. 16, 1979	11.2	25	Jan. 19, 1981	13.4	156
Feb. 5, 1979	12.1	23	Feb. 3, 1981	9.0	75
Mar. 14, 1979	16.4	25	Mar. 19, 1981	26.7	80
Apr. 13, 1979	72.4	154	Apr. 24, 1981	111.2	609
May 10, 1979	108.0	214	May 6, 1981	69.7	164
Jun. 20, 1979	57.4	58	May 25, 1981	154.5	146
Jul. 11, 1979	37.8	347	Jul. 8, 1981	44.3	481
Aug. 13, 1979	14.0	181	Aug. 19, 1981	13.8	1,084

Table AP.2--23 Suspended Sediment and Runoff at Ispir -- Erzurum (4)

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
Sep. 17, 1981	11.6	196	Mar. 28, 1984	25.3	131
Oct. 15, 1981	25.1	1,280	Apr. 9, 1984	79.3	856
Dec. 18, 1981	14.1	35	Apr. 21, 1984	103.6	528
Jan. 20, 1982	9.4	319	Jun. 13, 1984	76.4	96
Feb. 23, 1982	11.3	107	Sep. 28, 1984	10.5	38
Mar. 24, 1982	22.1	142	Oct. 25, 1984	14.5	39
May 26, 1982	113.9	259			
Jul. 27, 1982	16.9	31			
Aug. 24, 1982	10.7	835			
Sep. 11, 1982	9.7	65			
Oct. 25, 1982	12.4	31			
Nov. 24, 1982	12.9	111			
Mar. 24, 1983	22.7	103			
May 10, 1983	49.3	119			
Jun. 14, 1983	46.9	262			
Jul. 21, 1983	9.3	42			
Aug. 23, 1983	9.8	25			
Sep. 27, 1983	8.8	113			
Oct. 19, 1983	9.8	386			
Nov. 18, 1983	43.4	632			
Dec. 14, 1983	17.3	75			
Jan. 25, 1984	12.3	31			
Feb. 13, 1984	11.1	20			

Table AP.2-24 Suspended Sediment and Runoff at Borcka - Muratli (1)

Location; Borcka - Muratli Karayolunun
6 km Sindeki Koprudedir
Catchment Area; 18,172 km

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
Jun. 20, 1967	240.0	2,330	Jun. 28, 1971	283.0	1,300
Jul. 27, 1967	283.0	1,440	Jul. 17, 1971	131.0	187
May 10, 1969	739.0	6,110	Aug. 21, 1971	116.0	692
Jun. 26, 1969	231.0	1,340	Sep. 17, 1971	54.9	153
Jul. 22, 1969	88.1	1,280	Oct. 16, 1971	78.6	267
Aug. 9, 1969	72.3	319	Dec. 23, 1971	95.0	50
Nov. 12, 1969	119.0	206	Jan. 17, 1972	72.7	26
Mar. 20, 1970	250.0	1,980	Feb. 17, 1972	130.0	875
Apr. 4, 1970	431.0	2,360	Mar. 17, 1972	213.0	662
Apr. 4, 1970	603.0	2,540	May 13, 1972	420.0	1,970
May 16, 1970	444.0	1,130	Jun. 25, 1972	347.0	1,860
May 12, 1970	301.0	912	Jul. 28, 1972	111.0	1,160
Jun. 20, 1970	159.0	154	Aug. 10, 1972	70.2	423
Jul. 19, 1970	138.0	2,570	Sep. 28, 1972	71.5	404
Aug. 12, 1970	64.4	1,073	Oct. 17, 1972	74.7	134
Sep. 12, 1970	868.0	309	Nov. 23, 1972	93.1	408
Oct. 16, 1970	230.0	577	Dec. 23, 1972	82.8	120
Nov. 11, 1970	132.0	257	Jan. 28, 1973	75.6	326
Dec. 24, 1970	74.4	103	Feb. 15, 1973	224.0	110
Feb. 17, 1971	78.0	99	Mar. 23, 1973	124.0	224
Mar. 22, 1971	91.9	1,170	Apr. 11, 1973	230.0	1,060
Apr. 11, 1971	238.0	977	May 12, 1973	775.0	1,760
May 12, 1971	567.0	2,140	Jun. 27, 1973	356.0	357

Table AP.2-24 Suspended Sediment and Runoff at Borcka -- Muratli (2)

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
Jul. 12, 1973	173.0	1,580	Jun. 11, 1975	297.0	5,080
Aug. 9, 1973	81.6	104	Jul. 26, 1975	84.0	1,570
Sep. 16, 1973	60.6	50	Aug. 7, 1975	56.3	309
Oct. 21, 1973	60.8	71	Sep. 11, 1975	105.0	223
Nov. 13, 1973	128.0	102	Oct. 27, 1975	75.9	594
Dec. 4, 1973	118.0	977	Nov. 11, 1975	60.3	159
Jan. 12, 1974	65.4	188	Dec. 8, 1975	55.2	318
Feb. 17, 1974	69.6	799	Jan. 16, 1976	71.5	122
Mar. 11, 1974	113.0	352	Feb. 6, 1976	83.8	332
Apr. 8, 1974	155.0	1,120	Mar. 11, 1976	117.0	333
May 18, 1974	508.0	1,420	Apr. 11, 1976	471.0	3,010
Jun. 11, 1974	313.0	1,140	May 12, 1976	500.0	4,190
Jul. 13, 1974	96.8	534	Jun. 16, 1976	320.0	796
Aug. 10, 1974	61.9	1,690	Jul. 14, 1976	203.0	1,240
Sep. 13, 1974	129.0	4,540	Aug. 15, 1976	82.5	113
Oct. 28, 1974	44.5	170	Sep. 16, 1976	86.0	87
Nov. 11, 1974	101.0	490	Oct. 14, 1976	91.0	666
Dec. 15, 1974	57.6	960	Nov. 10, 1976	86.8	179
Jan. 15, 1975	48.6	104	Dec. 6, 1976	83.0	396
Feb. 10, 1975	59.7	69	Jan. 13, 1977	62.9	1,490
Mar. 14, 1975	288.0	1,290	Feb. 10, 1977	69.5	238
Apr. 11, 1975	598.0	945	Mar. 25, 1977	230.0	1,570
May 14, 1975	457.0	4,350	Apr. 14, 1977	334.0	2,690

Table AP.2-24 Suspended Sediment and Runoff at Borcka - Muratli (3)

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
May 27, 1977	386.0	946	Feb. 7, 1979	97.9	162
May 13, 1977	512.0	3,870	Mar. 13, 1979	101.0	106
Jun. 8, 1977	382.0	464	Apr. 11, 1979	401.0	749
Jul. 26, 1977	106.0	1,200	May 8, 1979	521.0	450
Aug. 15, 1977	72.7	669	Jun. 21, 1979	328.0	1,270
Sep. 28, 1977	115.0	59	Jul. 11, 1979	238.0	220
Oct. 12, 1977	144.0	145	Aug. 15, 1979	79.6	393
Nov. 16, 1977	106.0	159	Sep. 5, 1979	66.9	425
Dec. 8, 1977	80.6	209	Jan. 26, 1980	75.0	296
Jan. 12, 1978	67.7	223	Feb. 15, 1980	114.3	56
Feb. 3, 1978	130.0	150	Apr. 4, 1980	501.4	2,750
Mar. 22, 1978	158.0	208	Apr. 16, 1980	428.0	1,705
Apr. 26, 1978	489.0	1,710	May 22, 1980	712.3	1,550
Apr. 3, 1978	205.0	1,630	Jun. 10, 1980	275.3	272
May 6, 1978	623.0	5,590	Jul. 12, 1980	144.9	6,170
Jun. 5, 1978	365.0	463	Aug. 28, 1980	52.7	322
Jul. 7, 1978	258.0	408	Sep. 27, 1980	78.5	221
Aug. 24, 1978	89.8	481	Nov. 26, 1980	197.8	468
Sep. 9, 1978	63.9	245	Dec. 25, 1980	81.8	424
Oct. 5, 1978	65.5	259	Jan. 21, 1981	72.3	438
Nov. 22, 1978	85.7	91	Feb. 3, 1981	99.1	164
Dec. 6, 1978	70.2	202	Mar. 18, 1981	165.6	246
Jan. 19, 1979	154.0	243	Apr. 17, 1981	193.6	1,230

Table AP.2-24 Suspended Sediment and Runoff at Borcka – Muratli (4)

Date	Q(m ³ /sec)	C (ppm)	Date	Q(m ³ /sec)	C (ppm)
May 8, 1981	458.4	553	Jun. 16, 1983	226.7	630
Jun. 21, 1981	490.5	1,140	Jul. 20, 1983	135.0	336
Aug. 28, 1981	78.3	1,170	Aug. 18, 1983	49.2	367
Sep. 18, 1981	99.8	882	Sep. 8, 1983	72.3	330
Nov. 17, 1981	110.0	853	Oct. 11, 1983	300.8	592
Dec. 16, 1981	85.2	314	Dec. 15, 1983	107.4	51
Jan. 19, 1982	93.0	168	Jan. 17, 1984	103.8	143
Mar. 16, 1982	103.9	311	Feb. 14, 1984	118.1	229
Apr. 21, 1982	517.2	2,790	Mar. 22, 1984	93.9	243
May 13, 1982	699.2	929	Apr. 10, 1984	364.2	2,610
Jun. 8, 1982	347.9	608	Apr. 25, 1984	199.6	4,327
Aug. 10, 1982	73.3	379	May 9, 1984	318.7	936
Sep. 16, 1982	53.9	12	Jun. 19, 1984	333.4	287
Oct. 26, 1982	67.1	464	Jul. 24, 1984	135.7	2,612
Nov. 17, 1982	82.5	281	Aug. 9, 1984	113.5	637
Dec. 14, 1982	68.3	140	Sep. 29, 1984	55.3	828
Jan. 12, 1983	70.8	53	Dec. 19, 1984	48.3	49
Feb. 1, 1983	75.6	92			
Apr. 14, 1983	386.0	313			
Apr. 15, 1983	428.9	726			
Apr. 26, 1983	212.6	249			
Apr. 27, 1983	37.6	54			
May 10, 1983	260.7	442			

A-3 GEOLOGY

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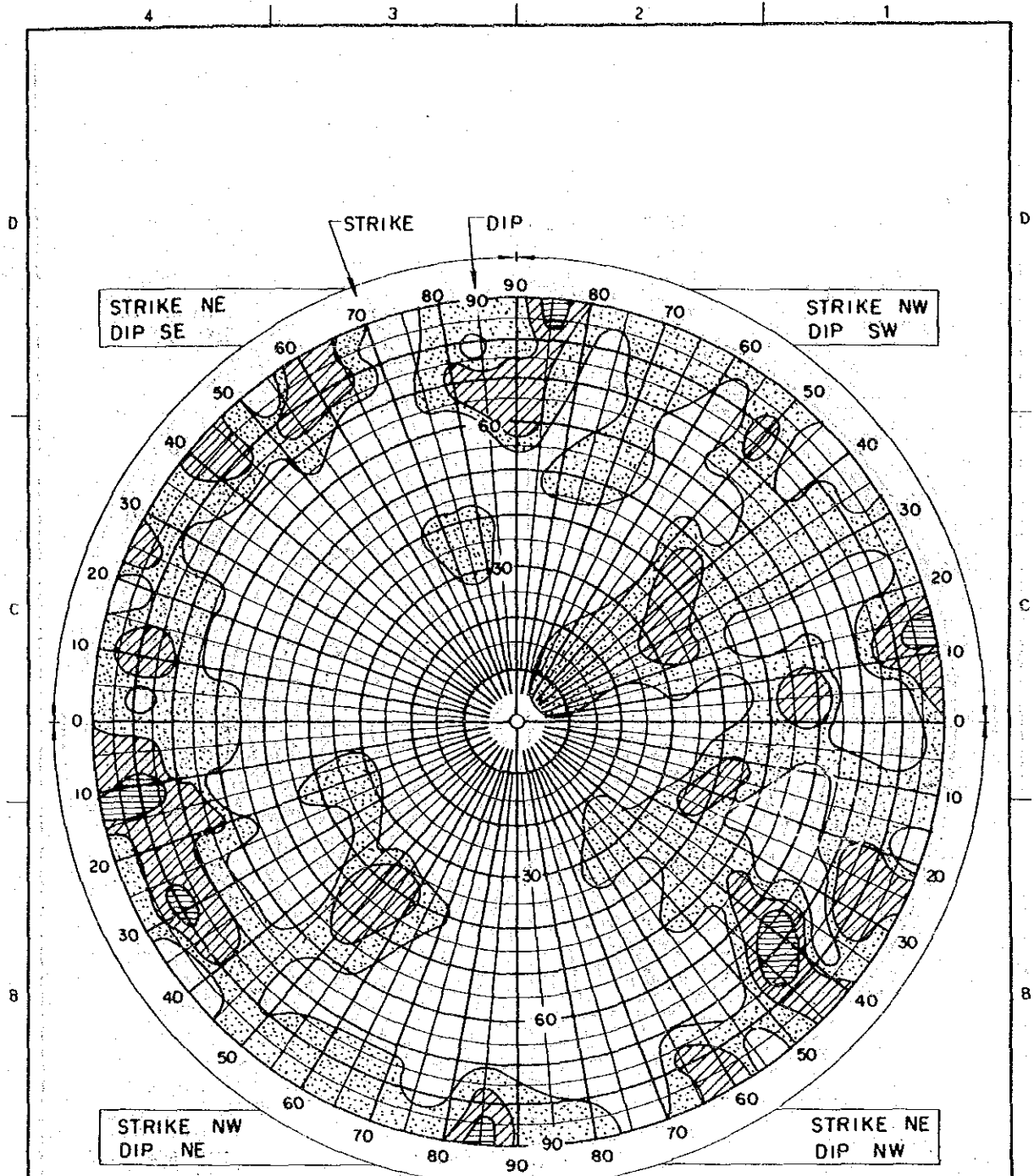
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


List of Drillholes 1 sheet

Log of Drillholes 122 sheets



Concentration Percentages

Number of sample : 64

-  0 ~ 1 %
-  1 ~ 2 %
-  2 ~ 4 %
-  ≥ 4 %

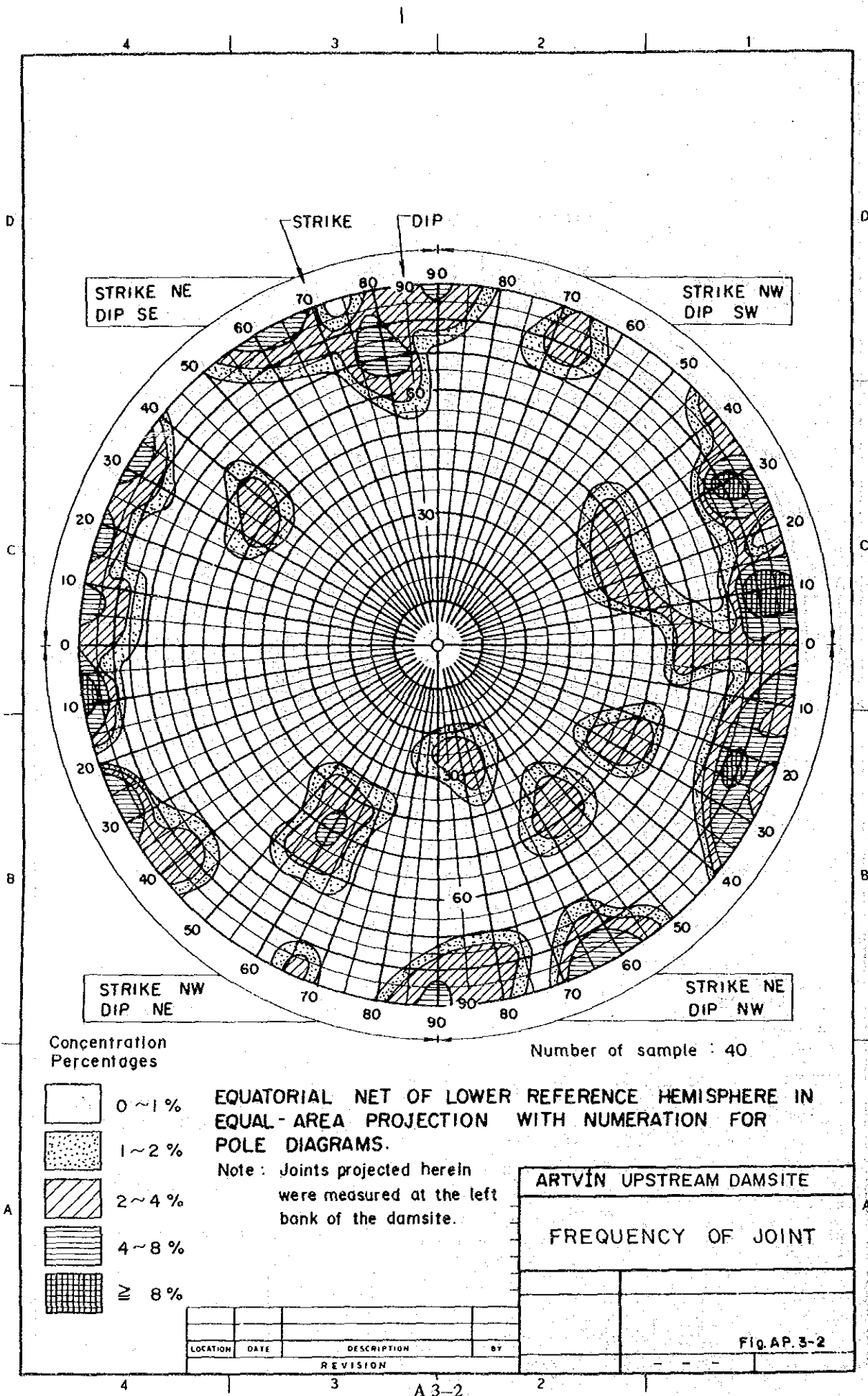
EQUATORIAL NET OF LOWER REFERENCE HEMISPHERE IN EQUAL-AREA PROJECTION WITH NUMERATION FOR POLE DIAGRAMS.

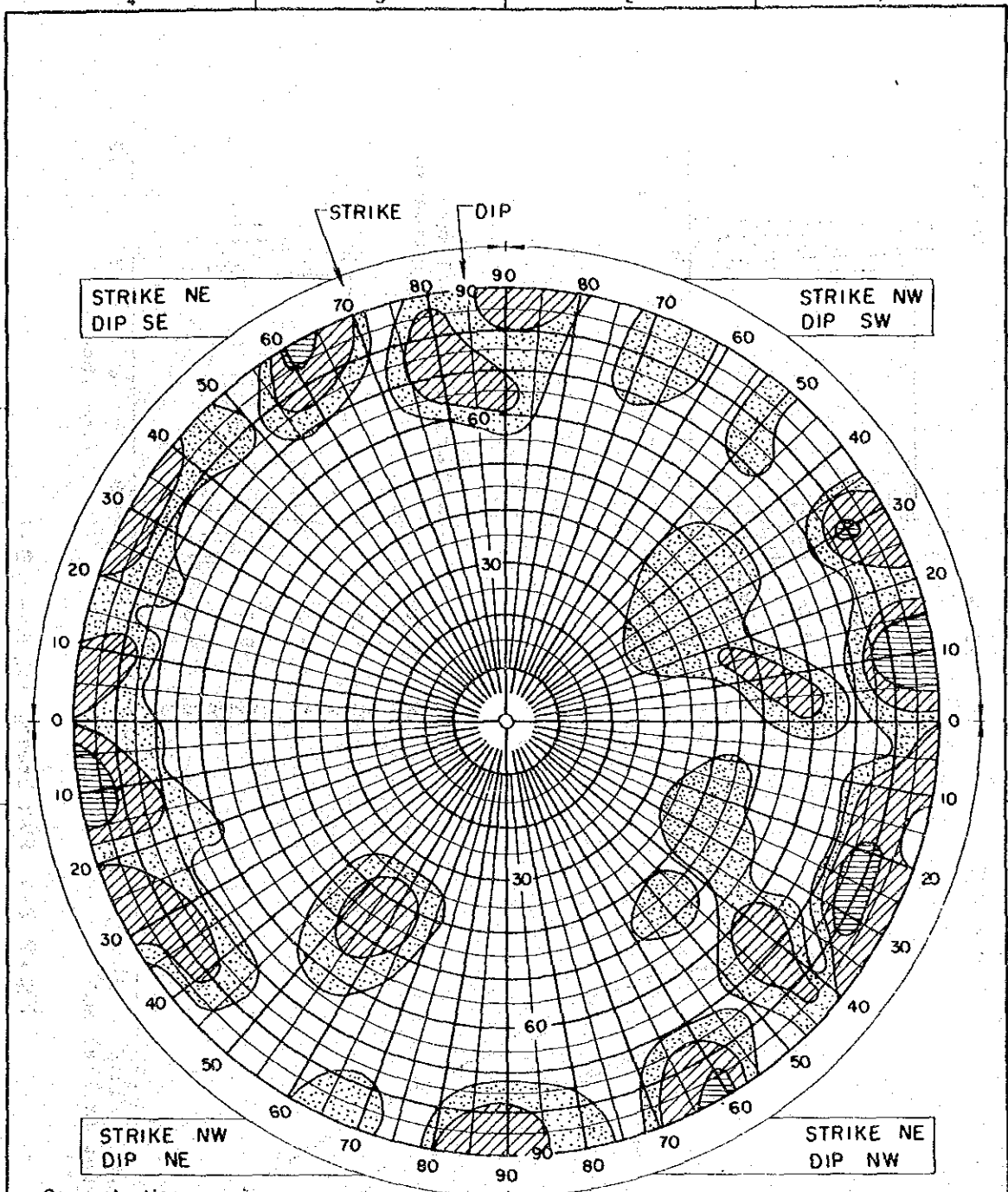
Note: Faults projected herein were measured at the left bank of the damsite, and the thicknesses of these were not less than 1cm.

ARTVIN UPSTREAM DAMSITE	
FREQUENCY OF FAULT	

LOCATION	DATE	DESCRIPTION	BY
REVISION			





Fig. AP. 3-1





Concentration Percentages

Number of sample : 104

-  0~1 %
-  1~2 %
-  2~4 %
-  ≧ 4 %

EQUATORIAL NET OF LOWER REFERENCE HEMISPHERE IN EQUAL-AREA PROJECTION WITH NUMERATION FOR POLE DIAGRAMS.

Note: Faults and joints projected herein were measured at the left bank of the damsite.

ARTVIN UPSTREAM DAMSITE
FREQUENCY OF FAULT AND JOINT

LOCATION	DATE	DESCRIPTION	BY
		REVISION	

Fig. AP 3-3

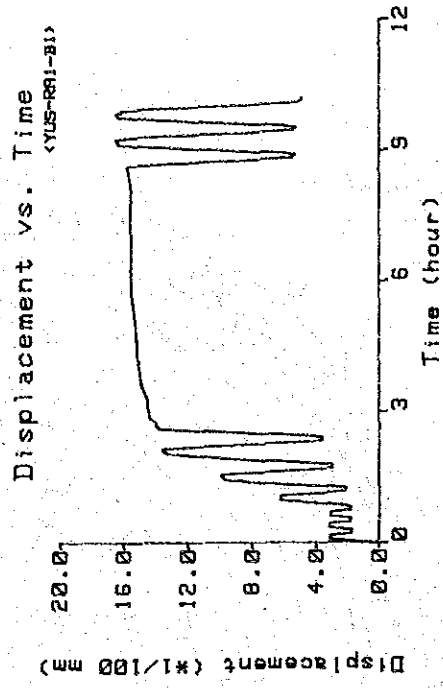
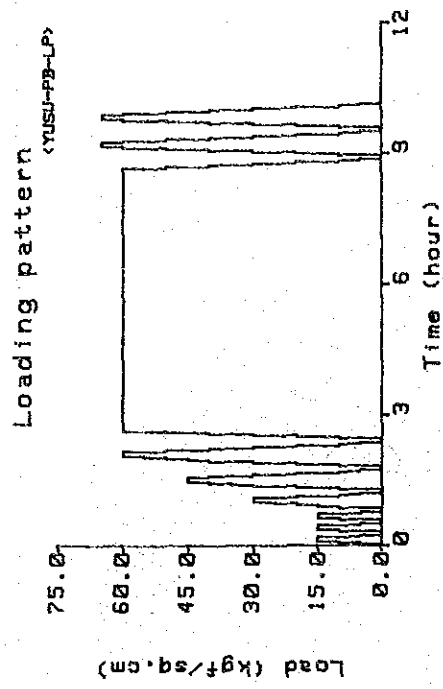
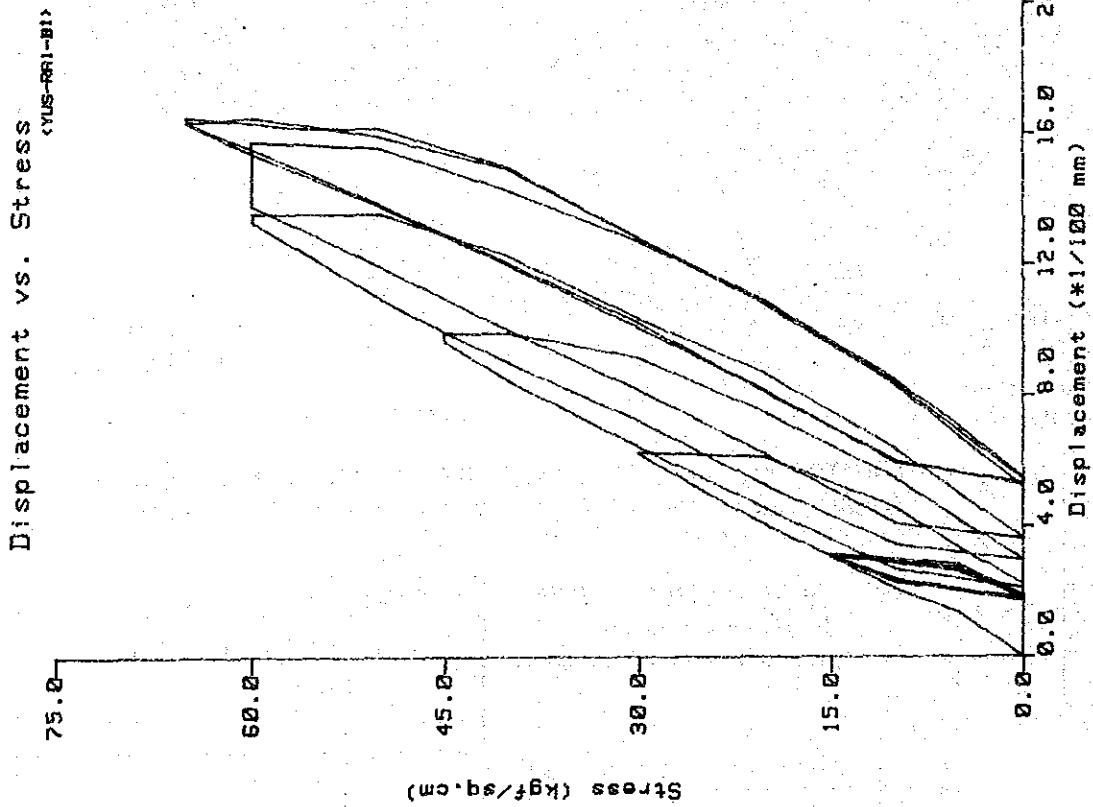


Fig. AP. 3-4 Plate Bearing Test, RA-1, B-1

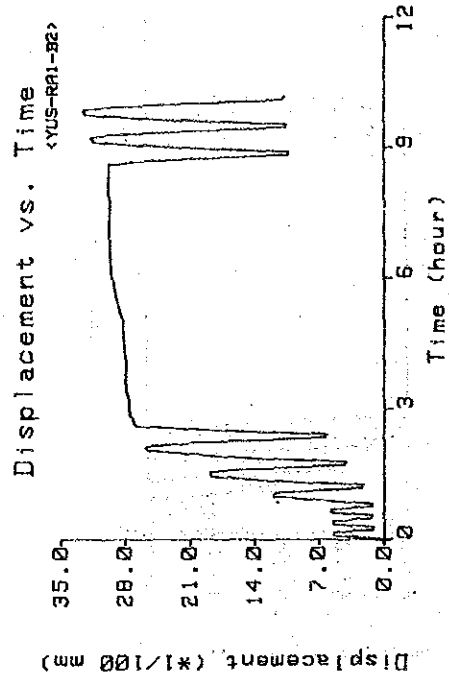
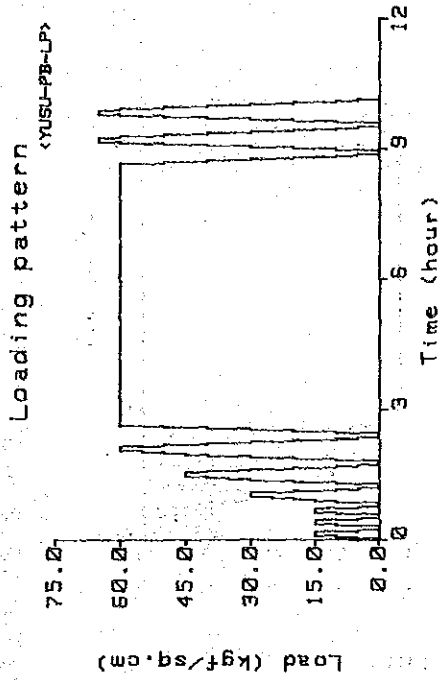
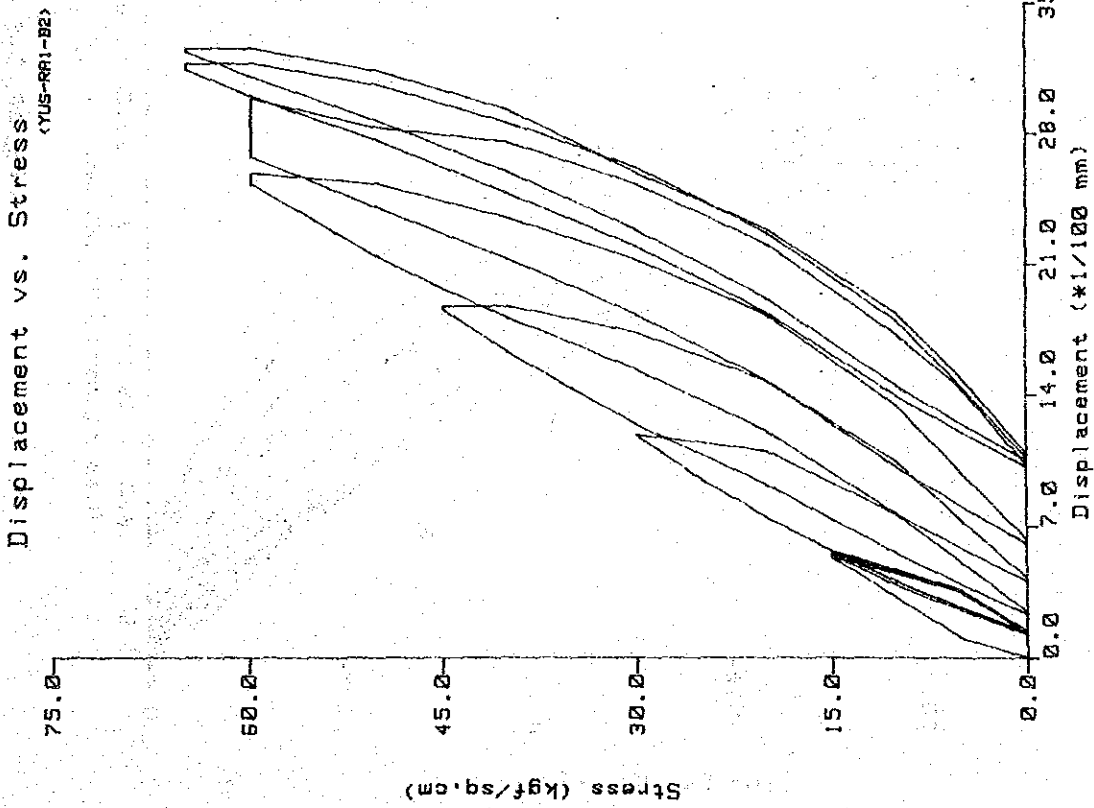


Fig. AP. 3-5 Plate Bearing Test, RA-1, B-2

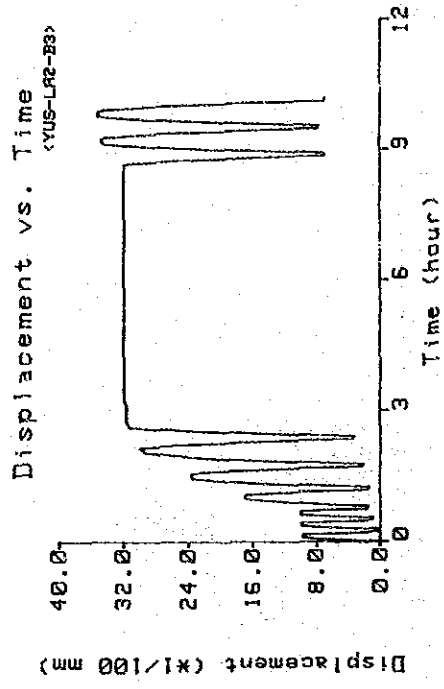
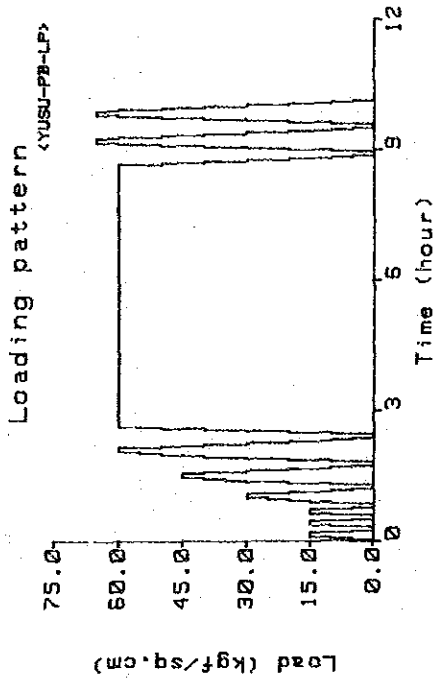
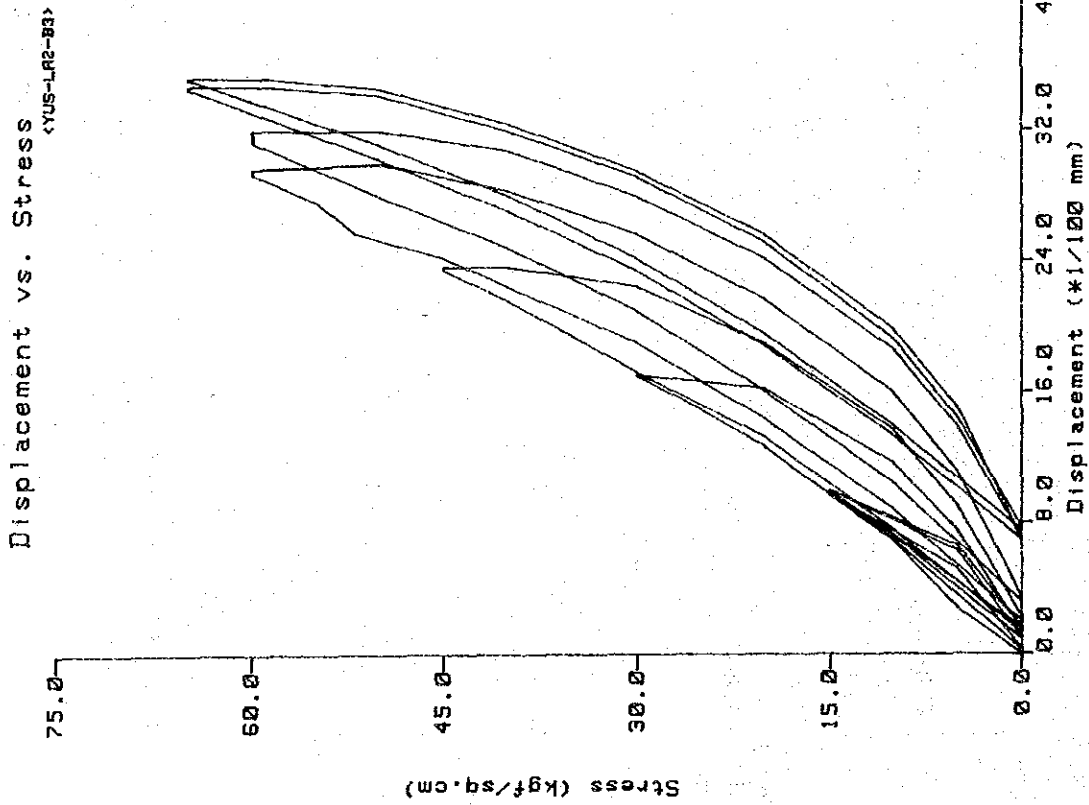


Fig. AP. 3-6 Plate Bearing Test, LA-2, B-3

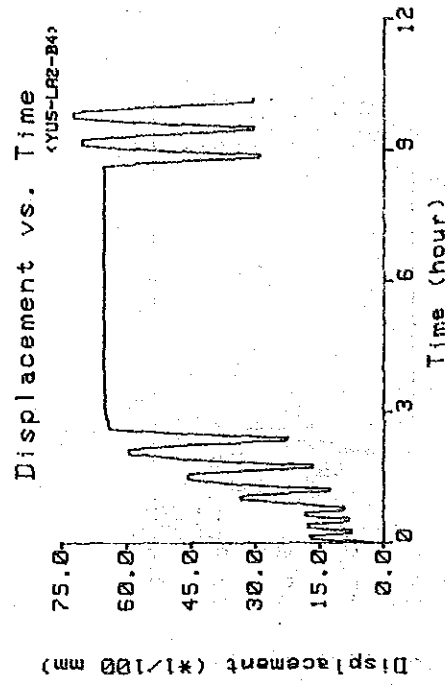
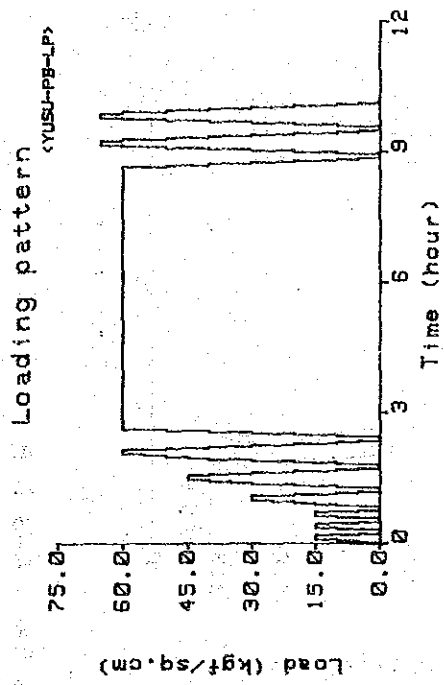
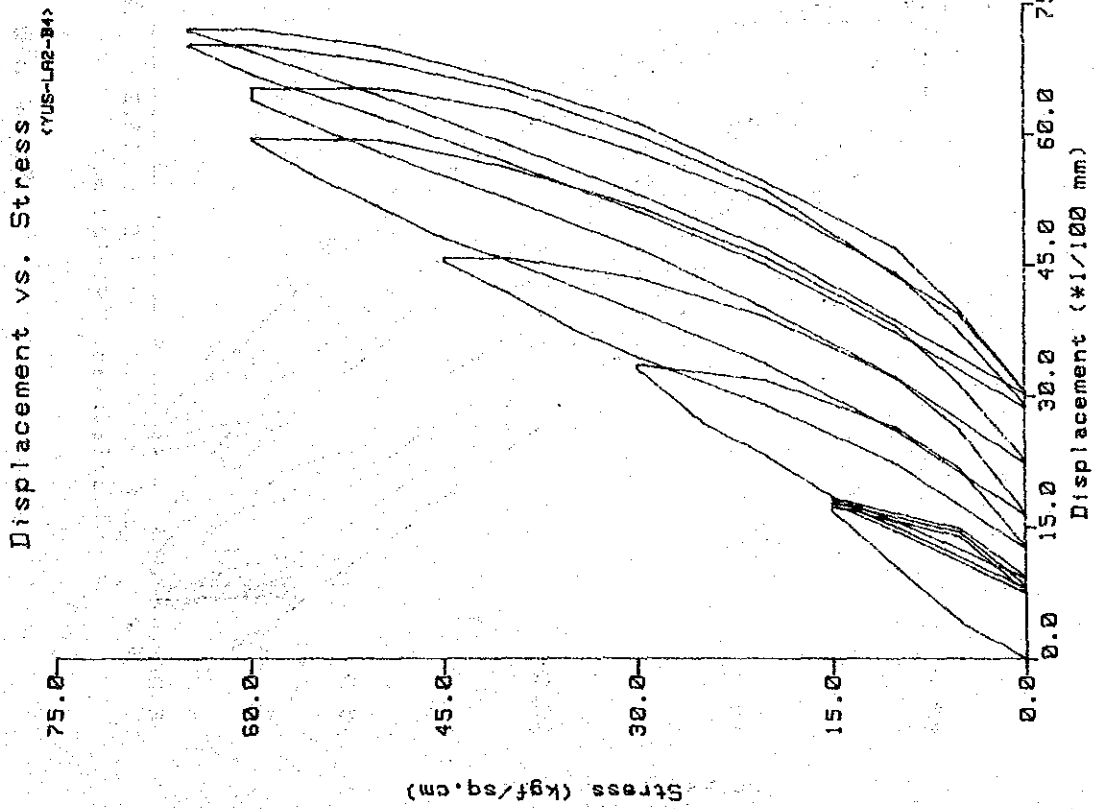


Fig. AP. 3-7 Plate Bearing Test, LA-2, B-4

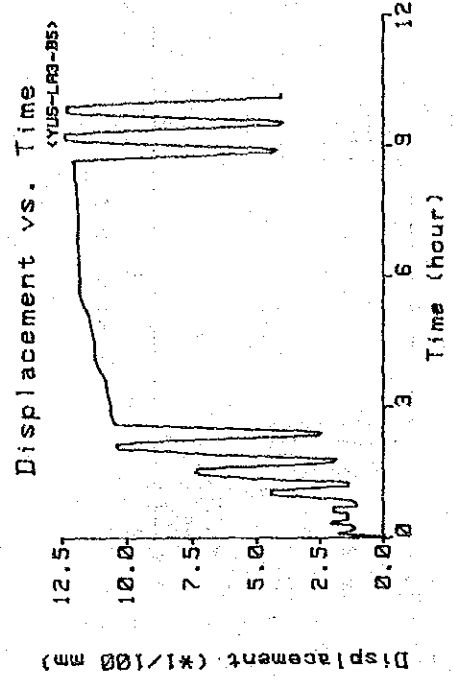
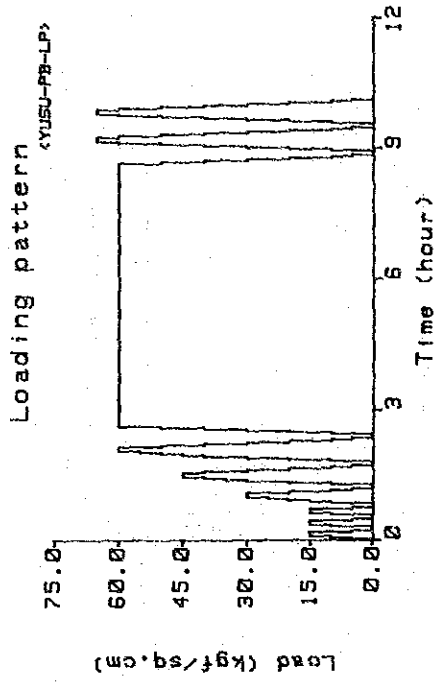
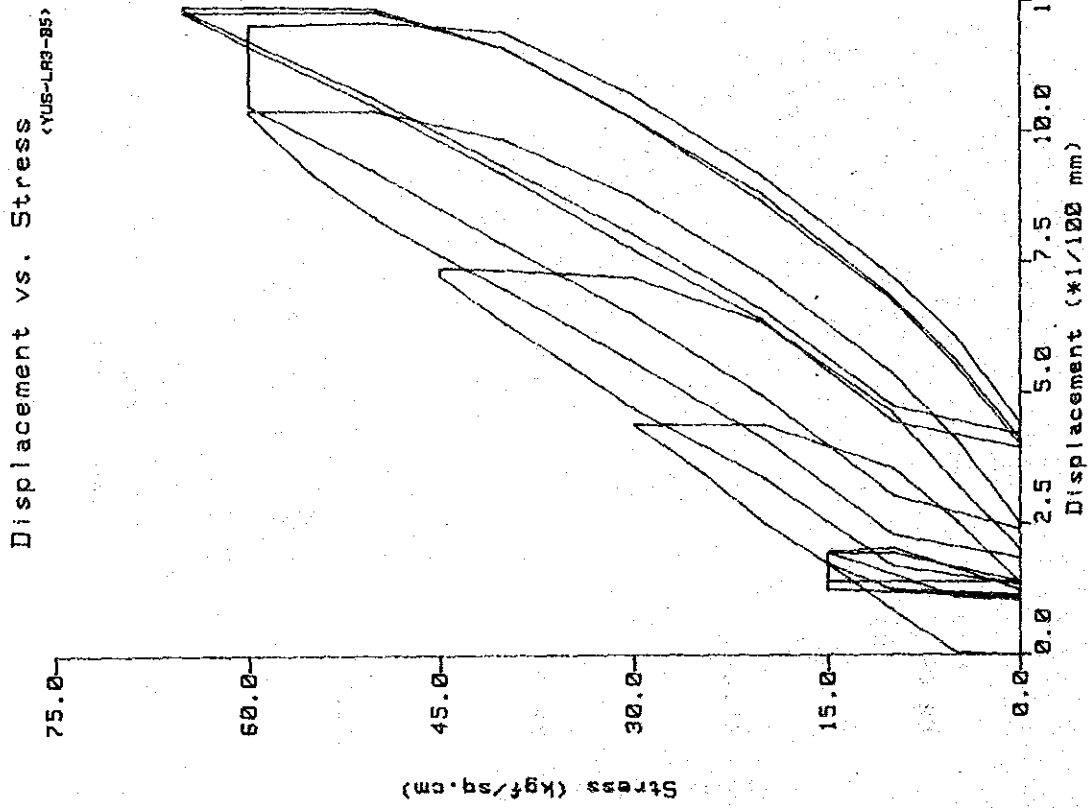


Fig. AP. 3-8 Plate Bearing Test, LA-3, B-5

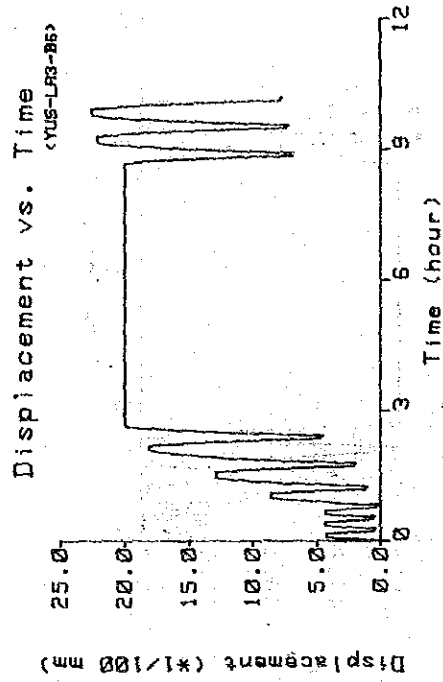
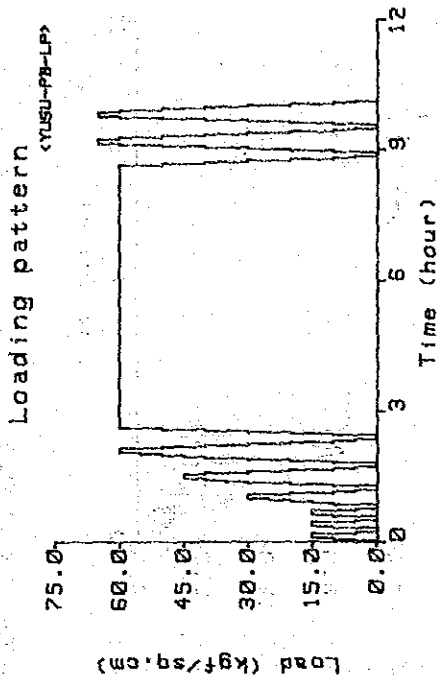
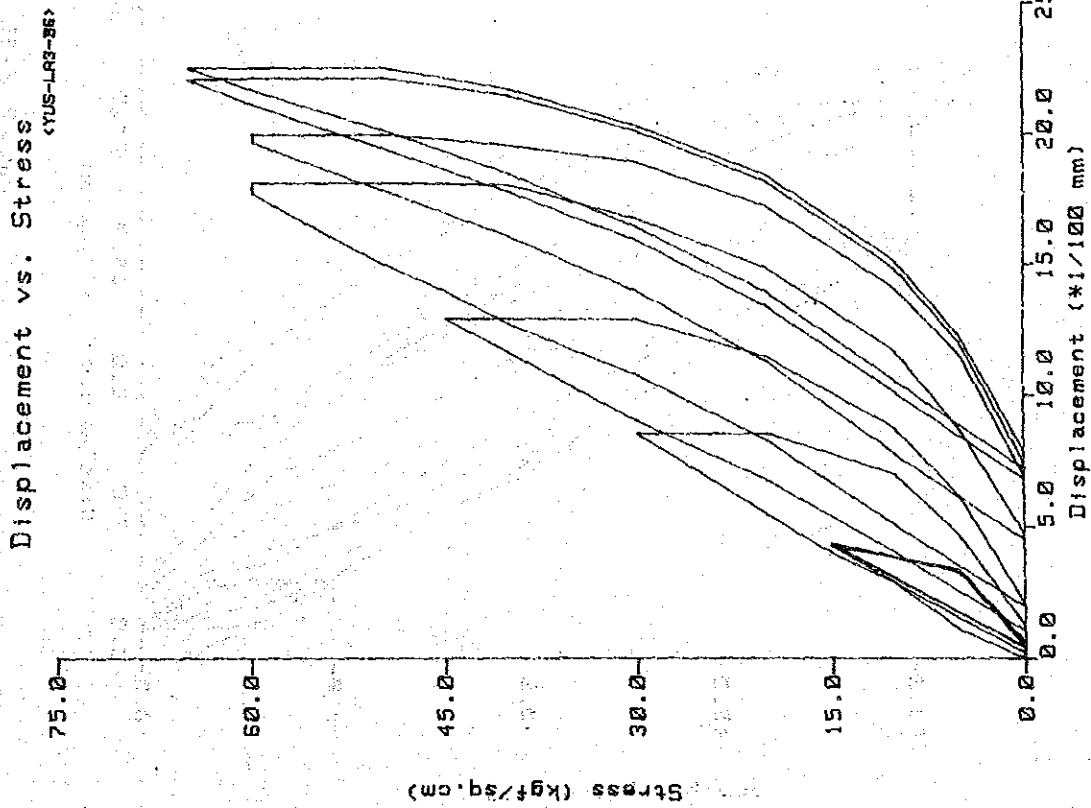


Fig. AP. 3-9 Plate Bearing Test, LA-3, B-6

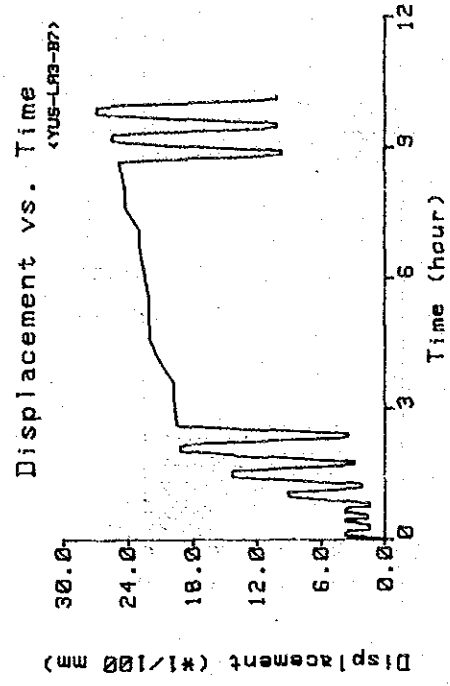
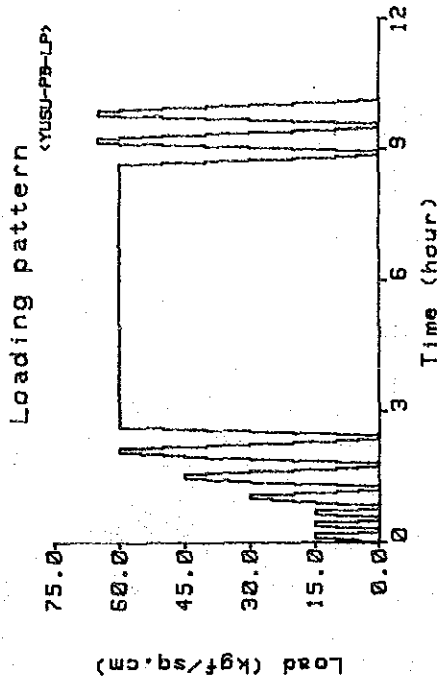
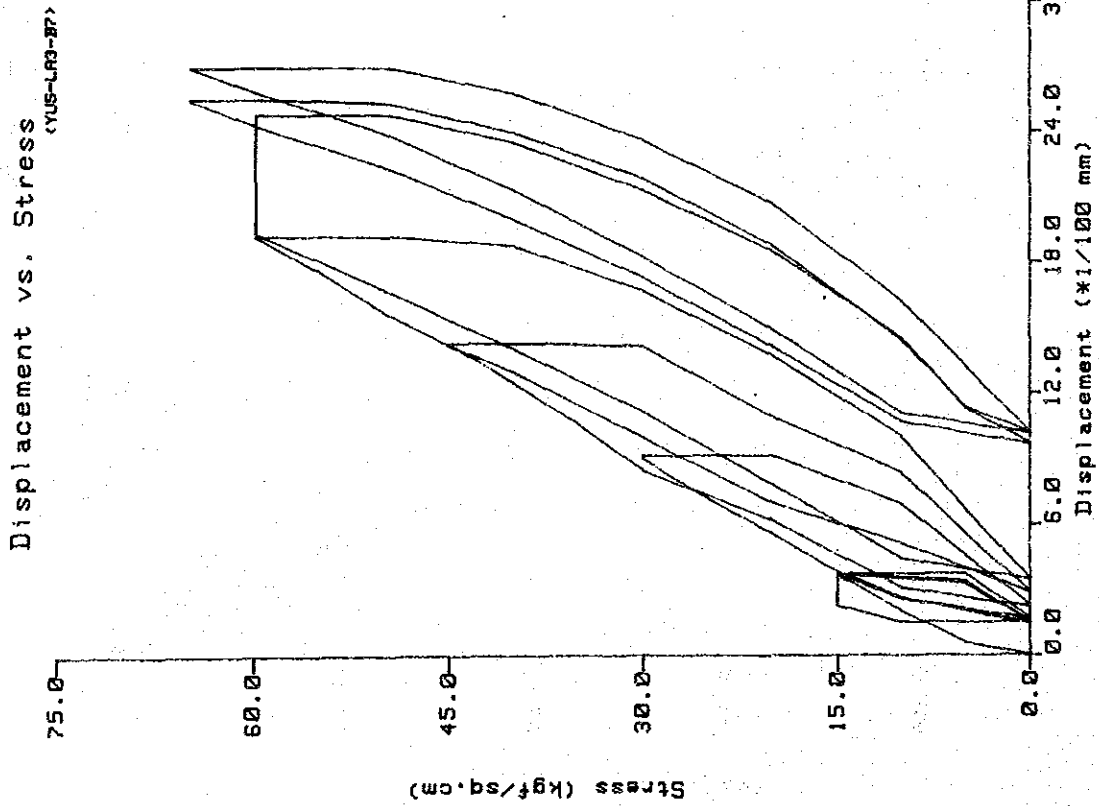


Fig. AP. 3-10 Plate Bearing Test, LA-3, B-7

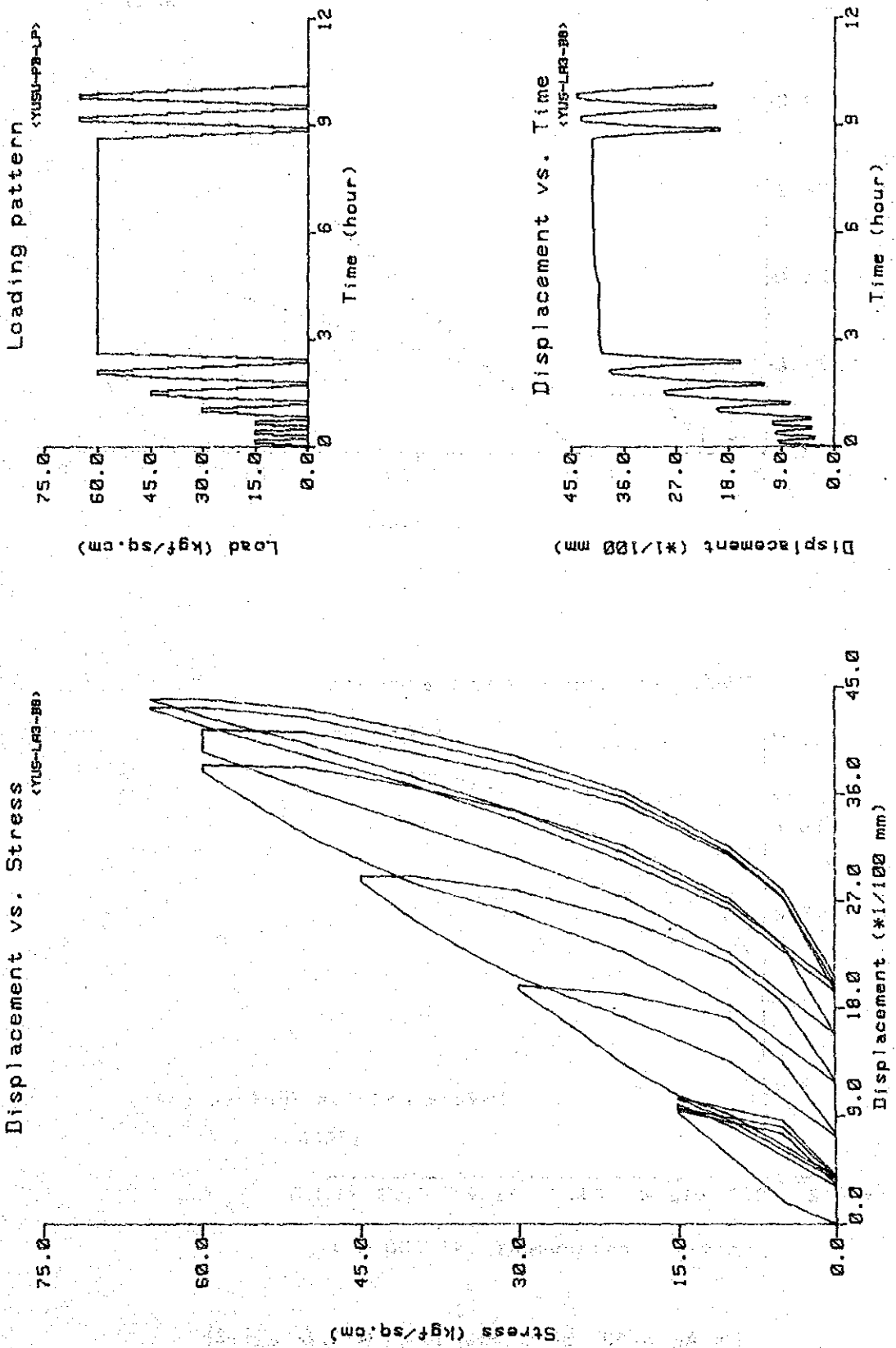
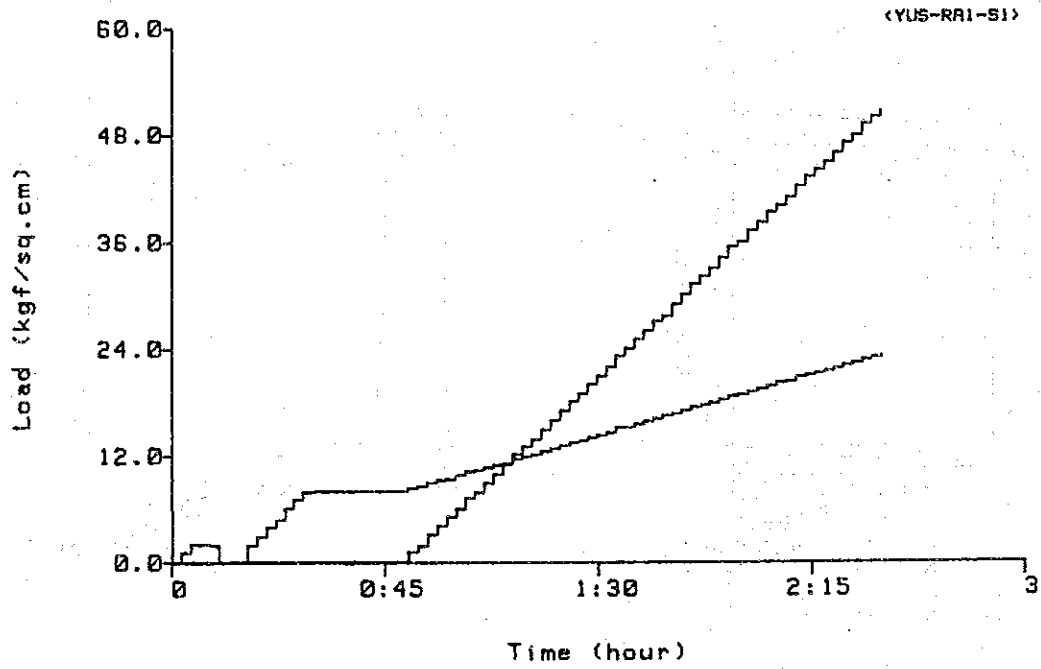


Fig. AP. 3-11 Plate Bearing Test, LA-3, B-8

Loading Pattern



NORMAL stress - displacement

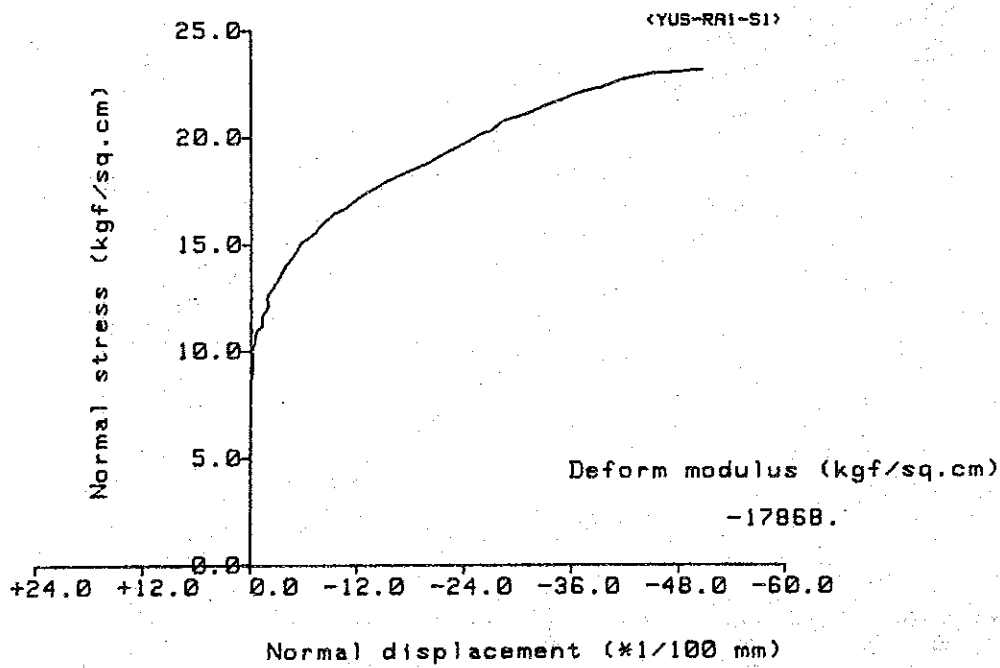
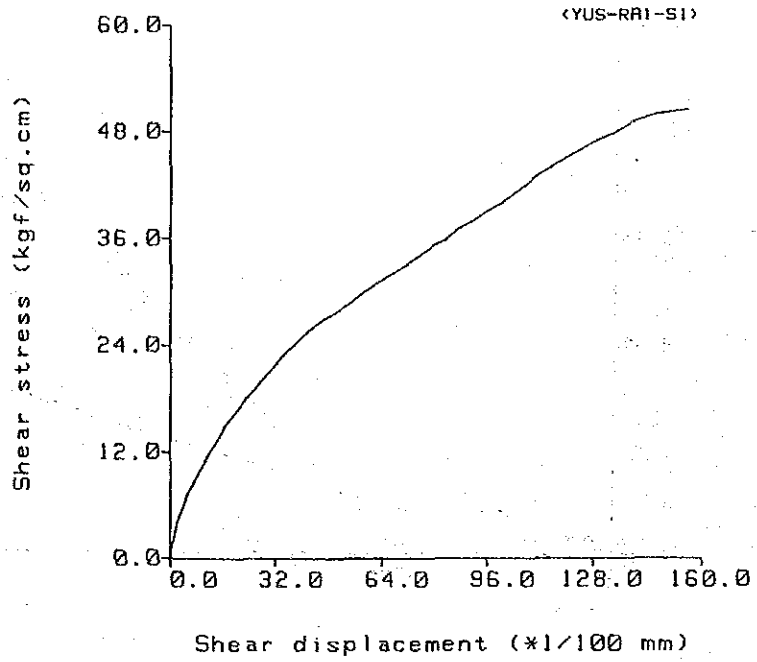


Fig. AP. 3-12 Block Shear Test, RA-1, S-1 (1-2)

SHEAR stress-displacement



Heaving during shear test

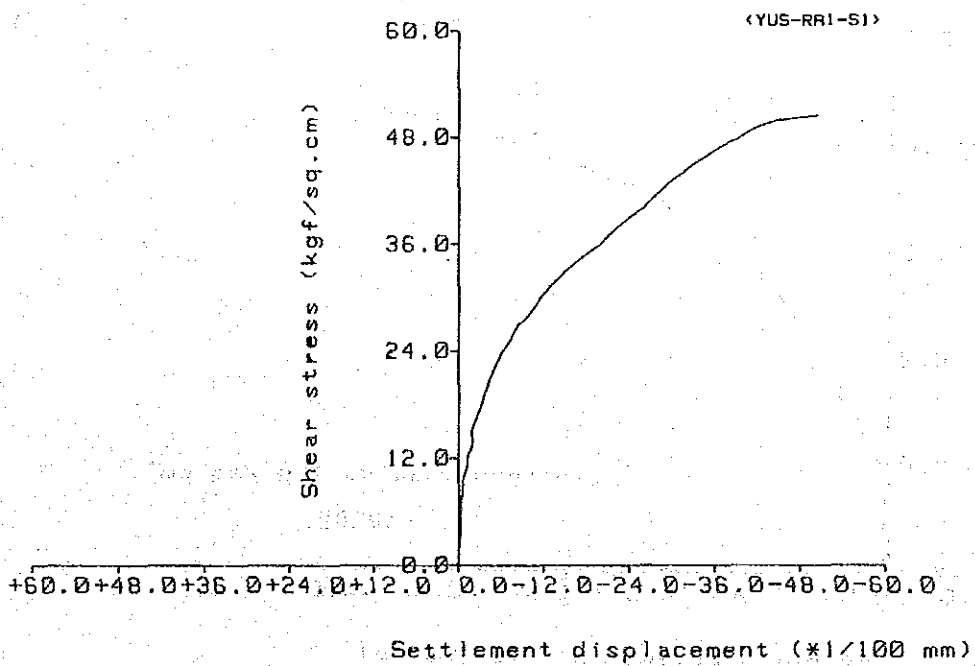
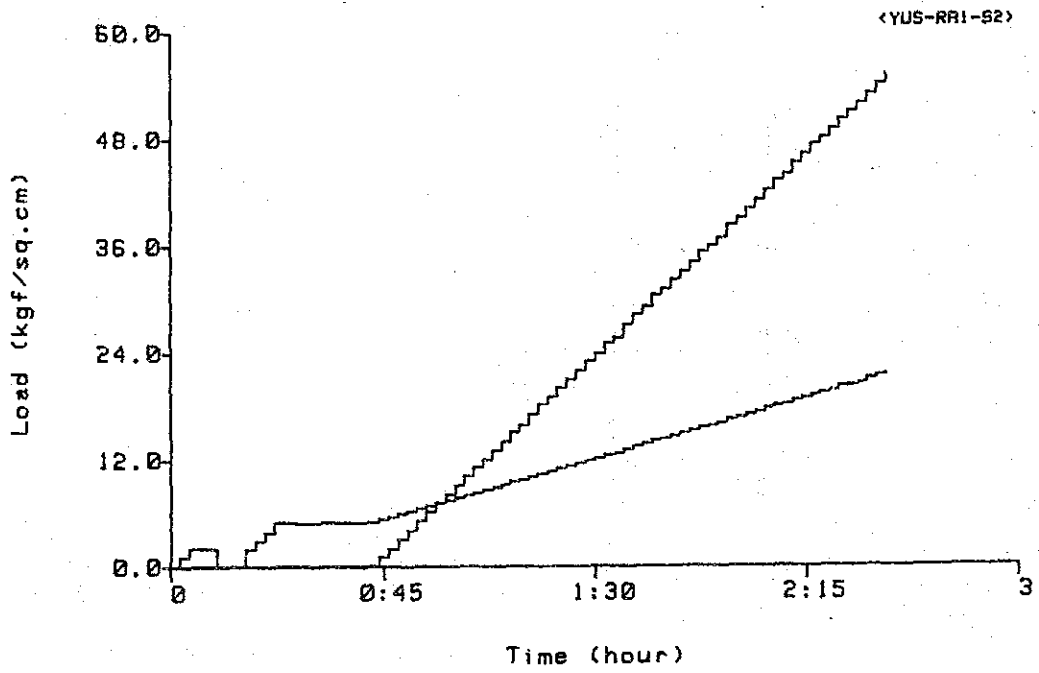


Fig. AP. 3-13 Block Shear Test, RA-1, S-1 (2-2)

Loading Pattern



NORMAL stress - displacement

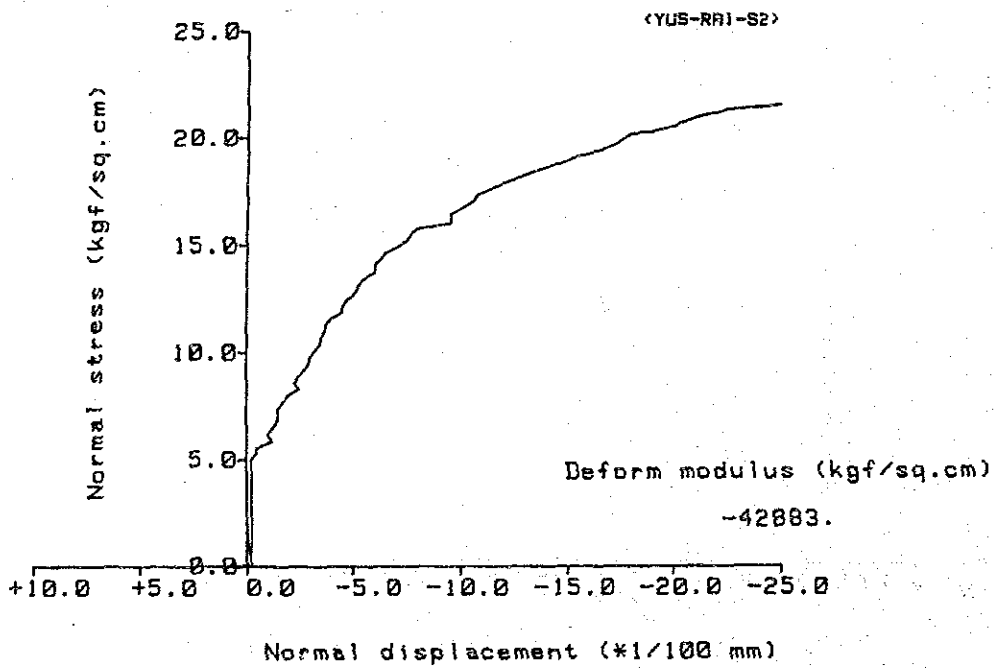
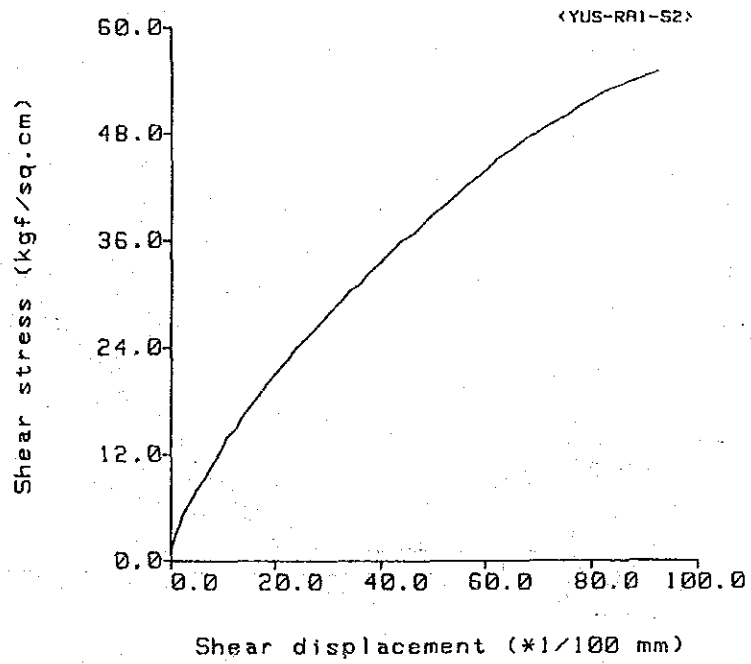


Fig. AP. 3-14 Block Shear Test, RA-1, S-2 (1-2)

SHEAR stress-displacement



Heaving during shear test

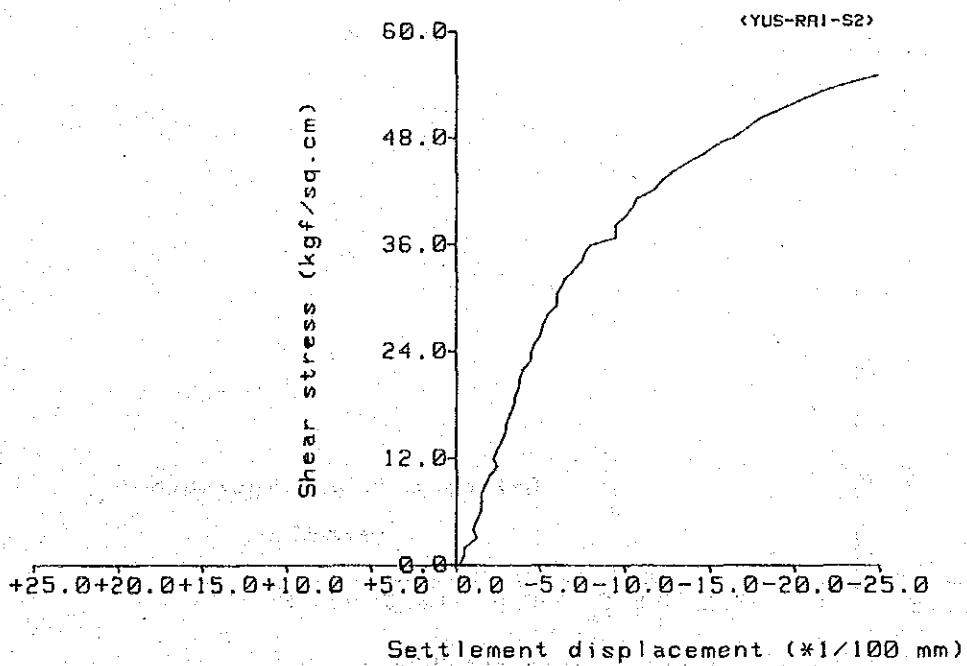
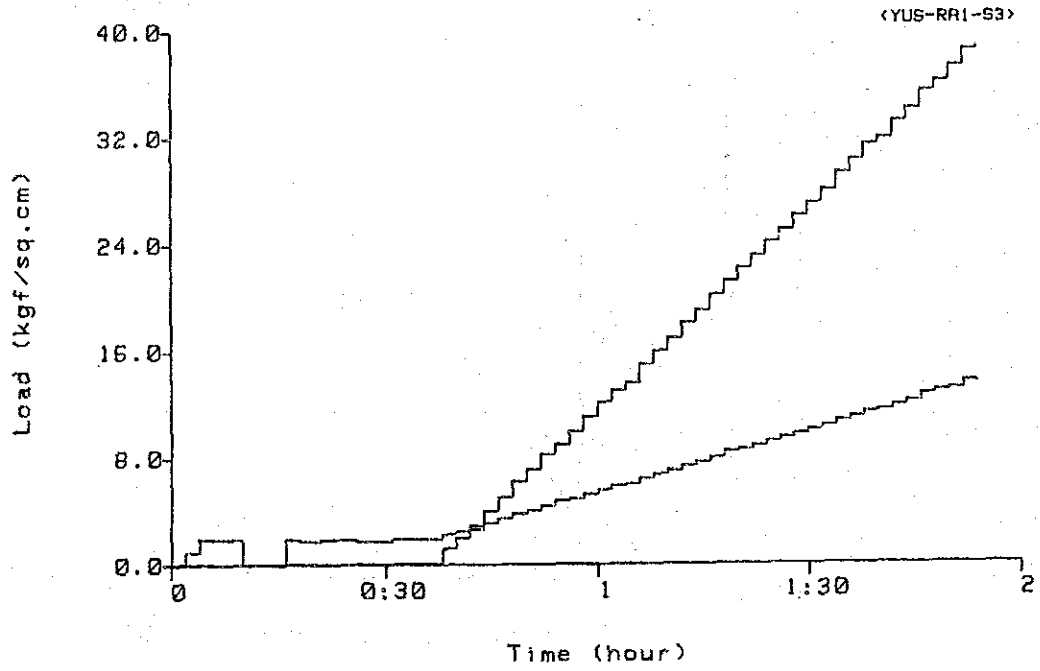


Fig. AP. 3-15 Block Shear Test, RA-1, S-2 (2-2)

Loading Pattern



NORMAL stress - displacement

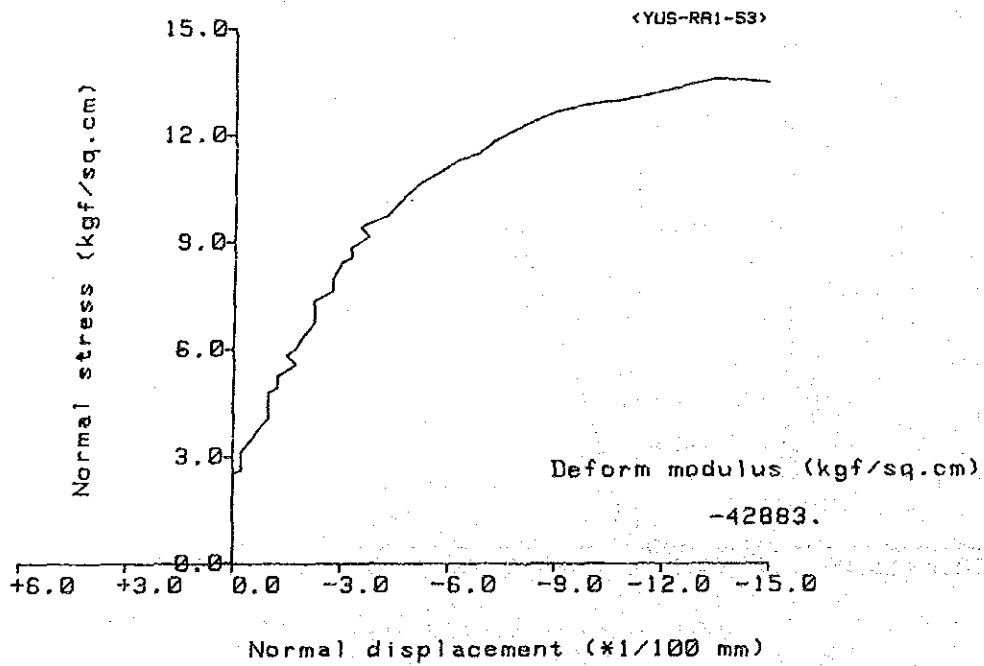
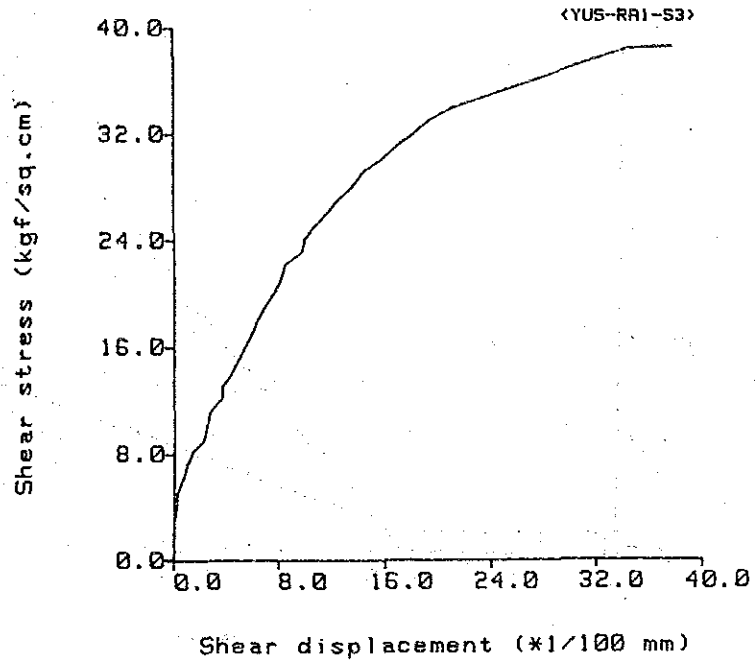


Fig. AP. 3-16 Block Shear Test, RA-1, S-3 (1-2)

SHEAR stress-displacement



Heaving during shear test:

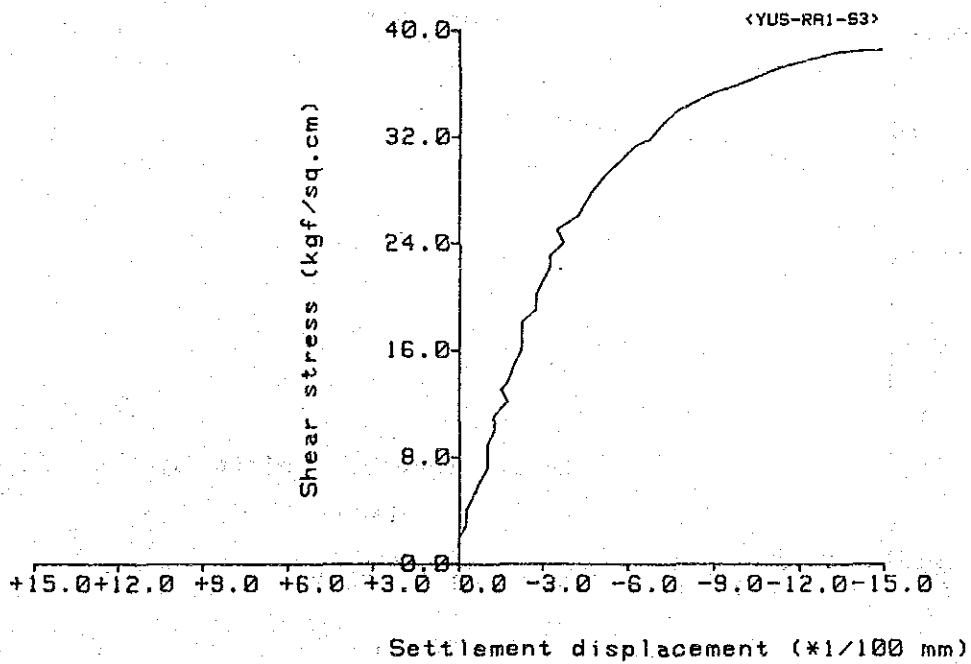
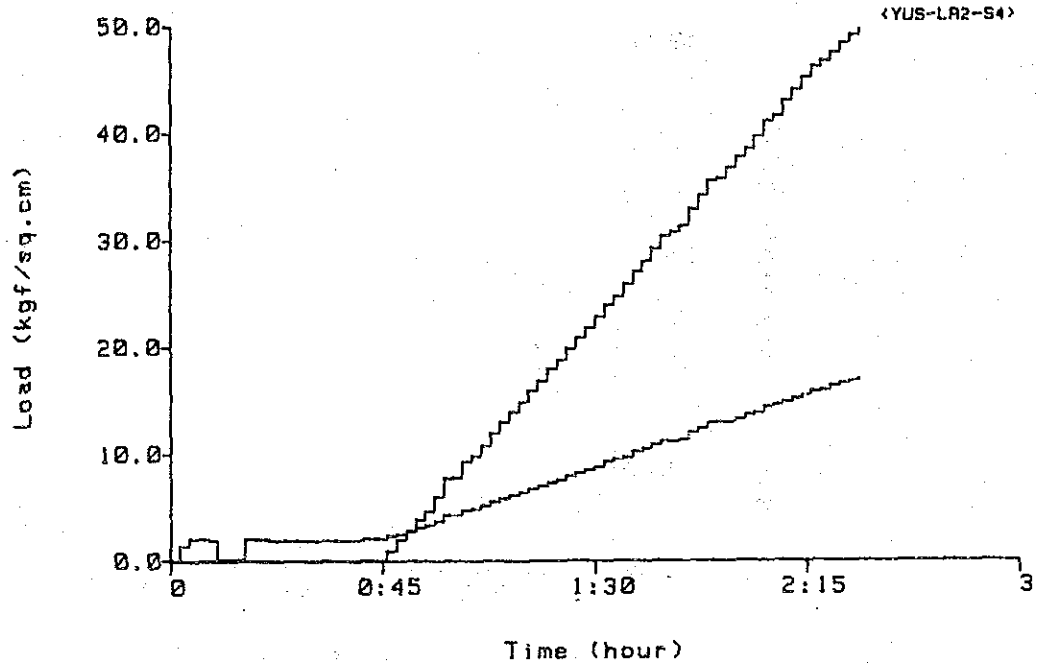


Fig. AP. 3-17. Block Shear Test, RA-1, S-3 (2-2)

Loading Pattern



NORMAL stress - displacement

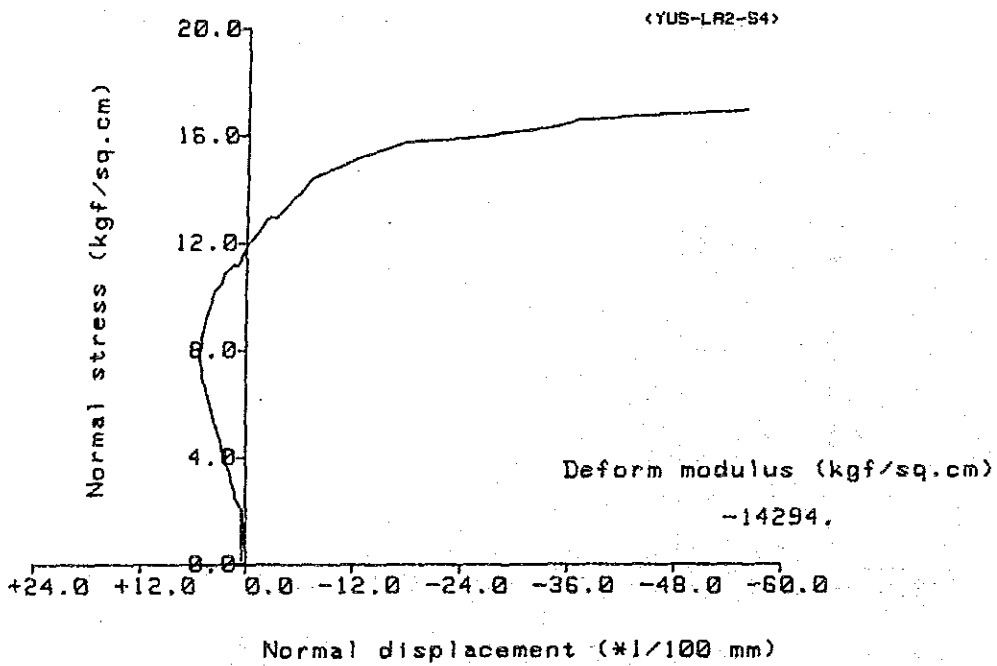
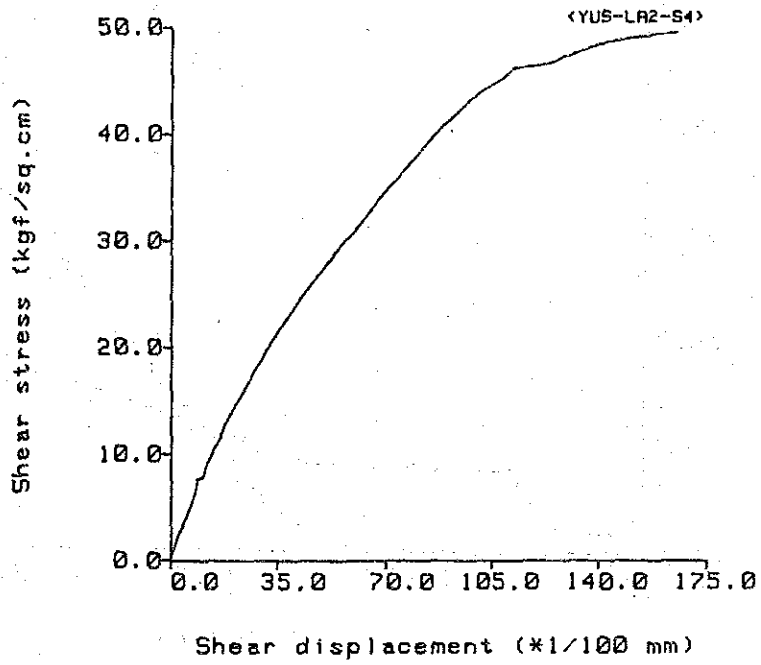


Fig. AP. 3-18 Block Shear Test, LA-2, S-4 (1-2)

SHEAR stress-displacement



Heaving during shear test

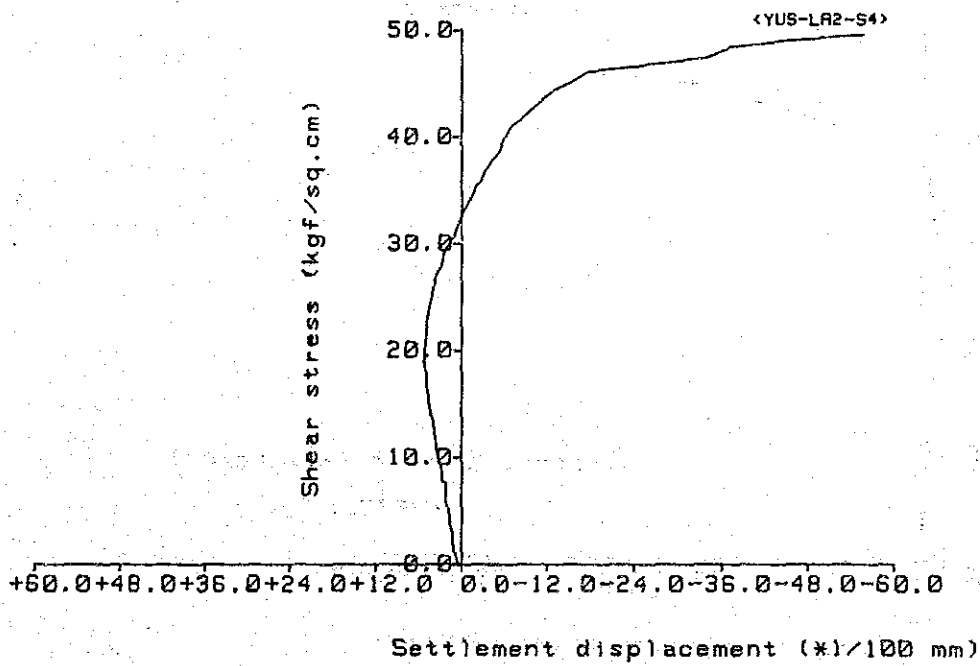
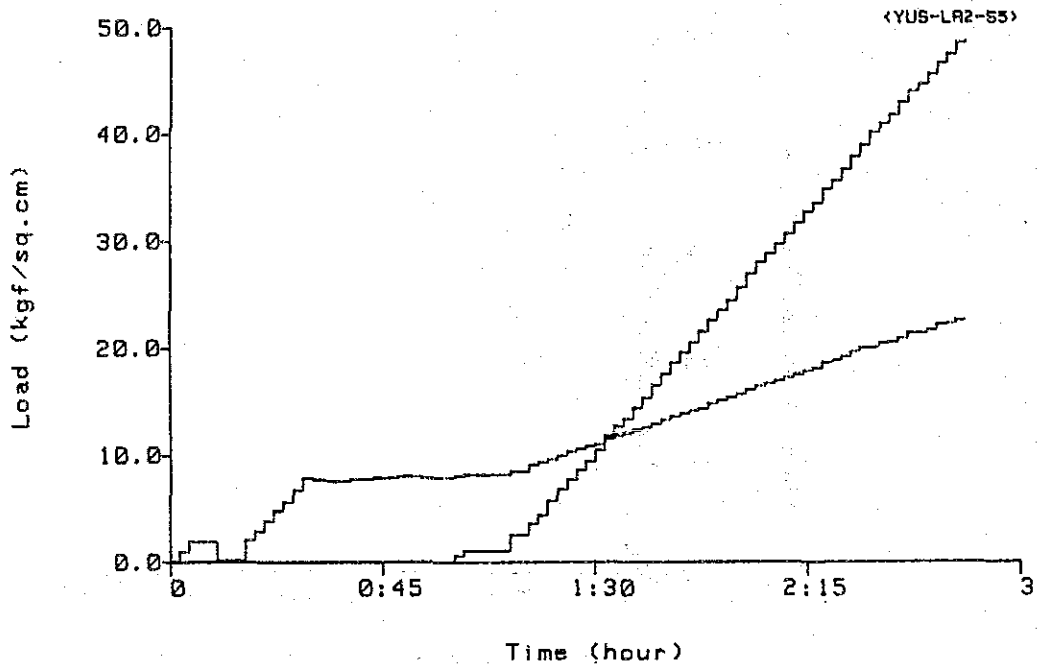


Fig. AP. 3-19. Block Shear Test, LA-2, S-4 (2-2)

Loading Pattern



NORMAL stress - displacement

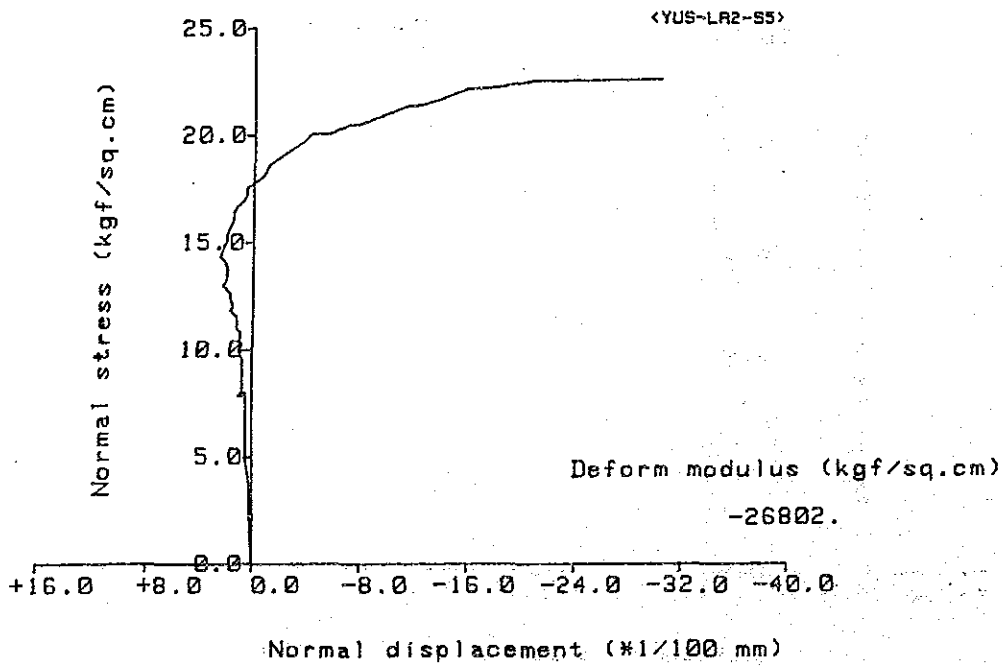


Fig. AP. 3-20 Block Shear Test, LA-2, S-5 (1-2)

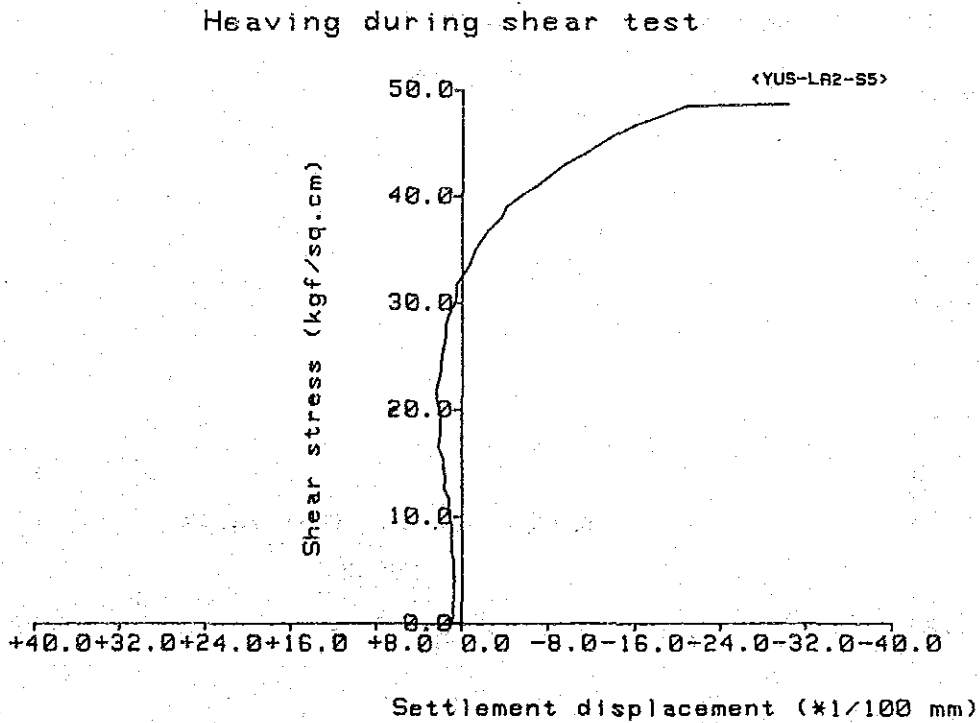
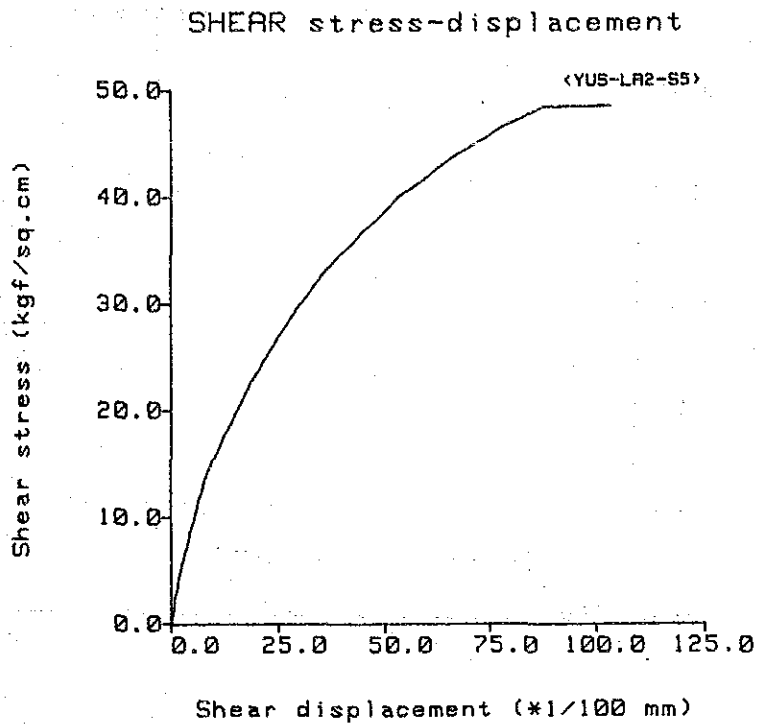
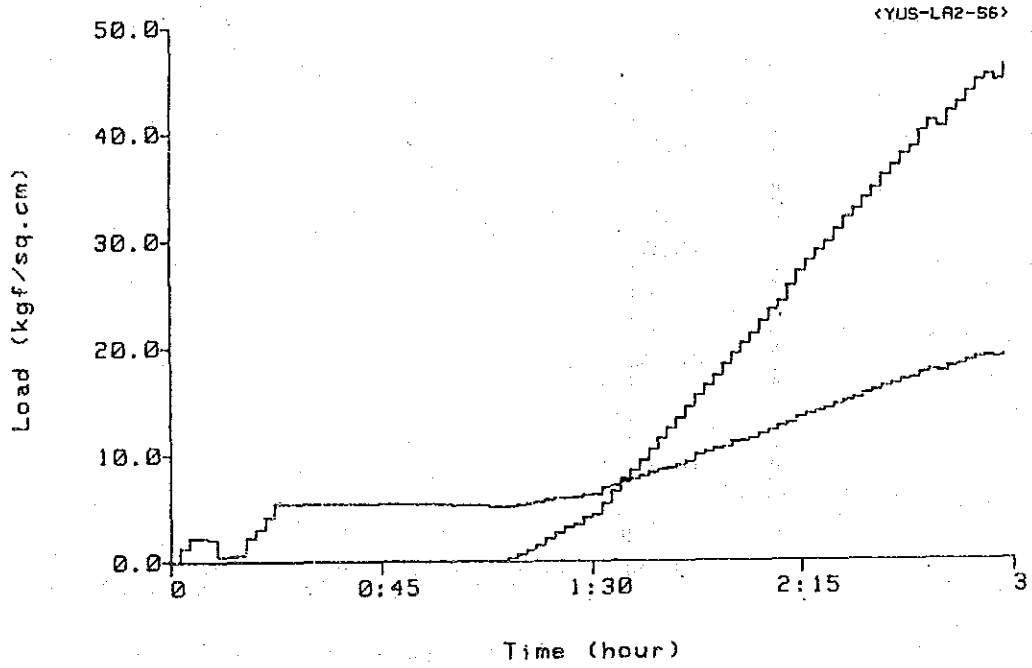


Fig. AP, 3-21 Block Shear Test, LA-3, S-5 (2-2)

Loading Pattern



NORMAL stress - displacement

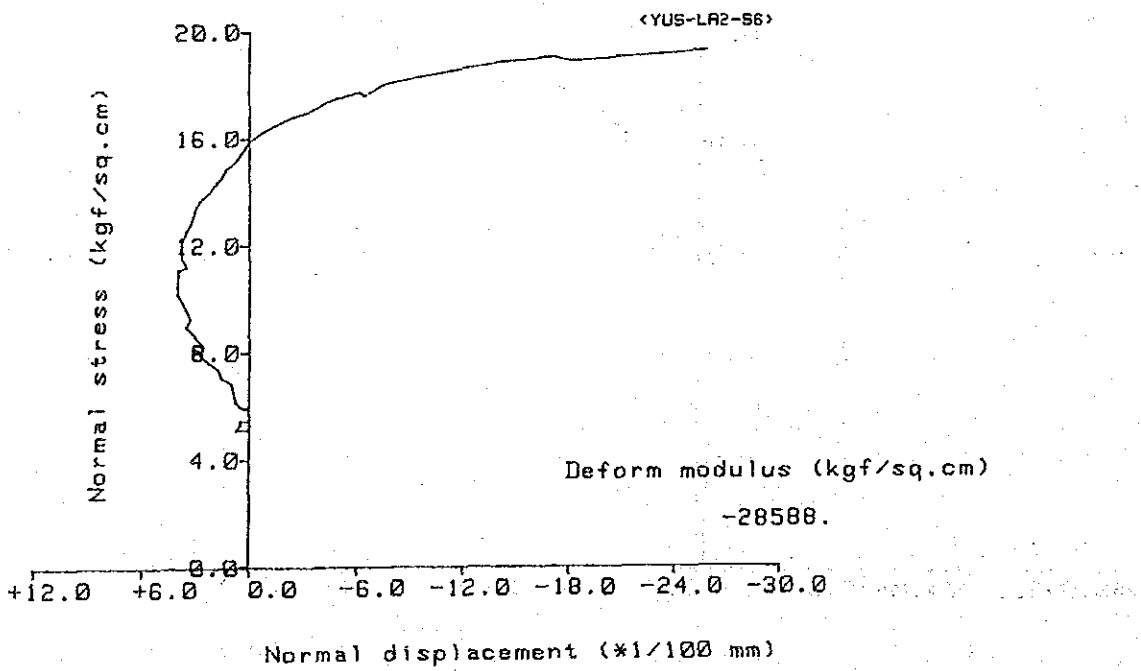


Fig. AP. 3-22 Block Shear Test, LA-2, S-6 (1-2)

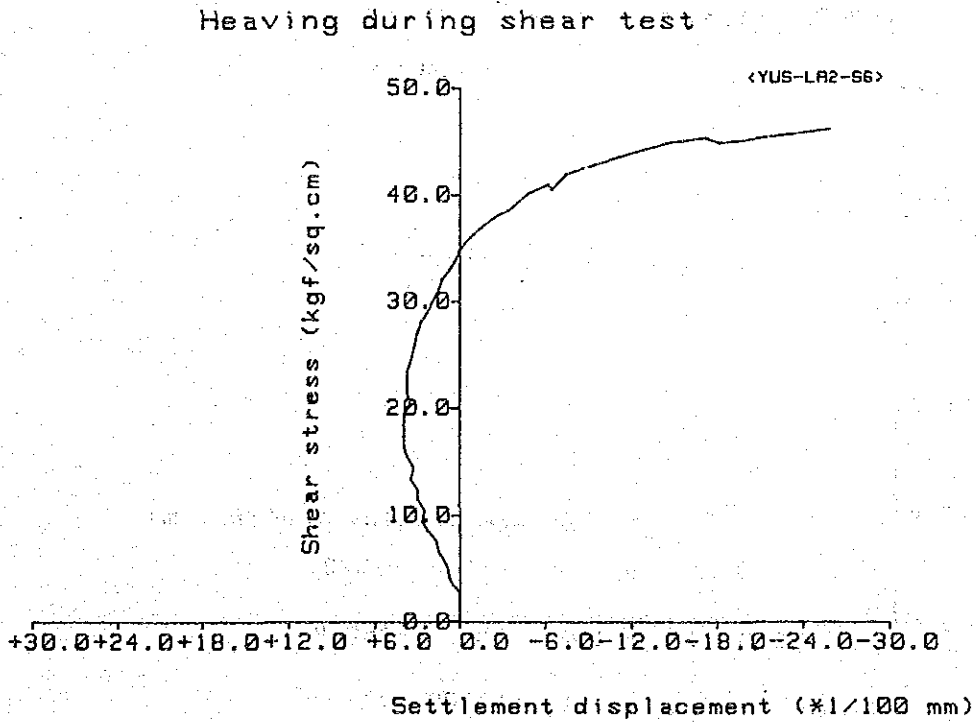
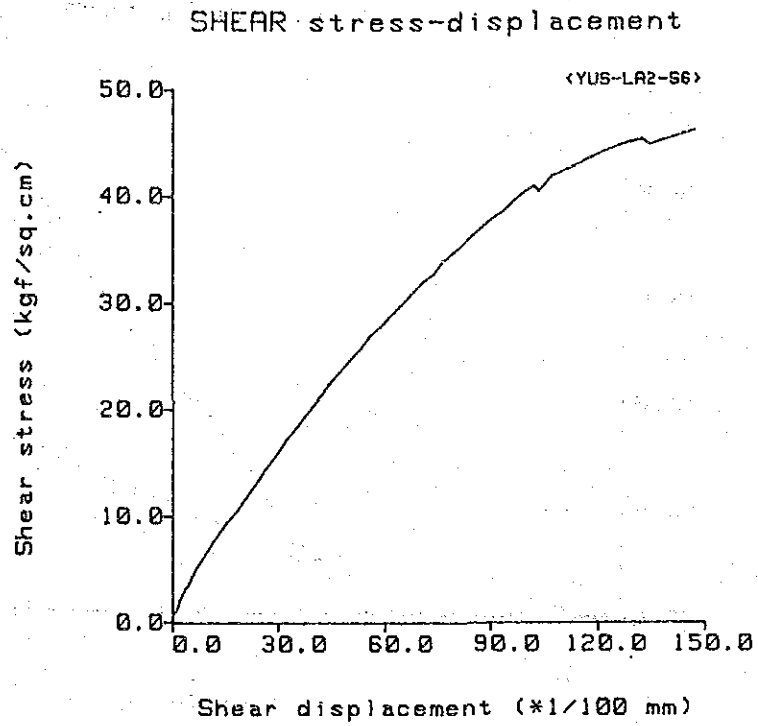
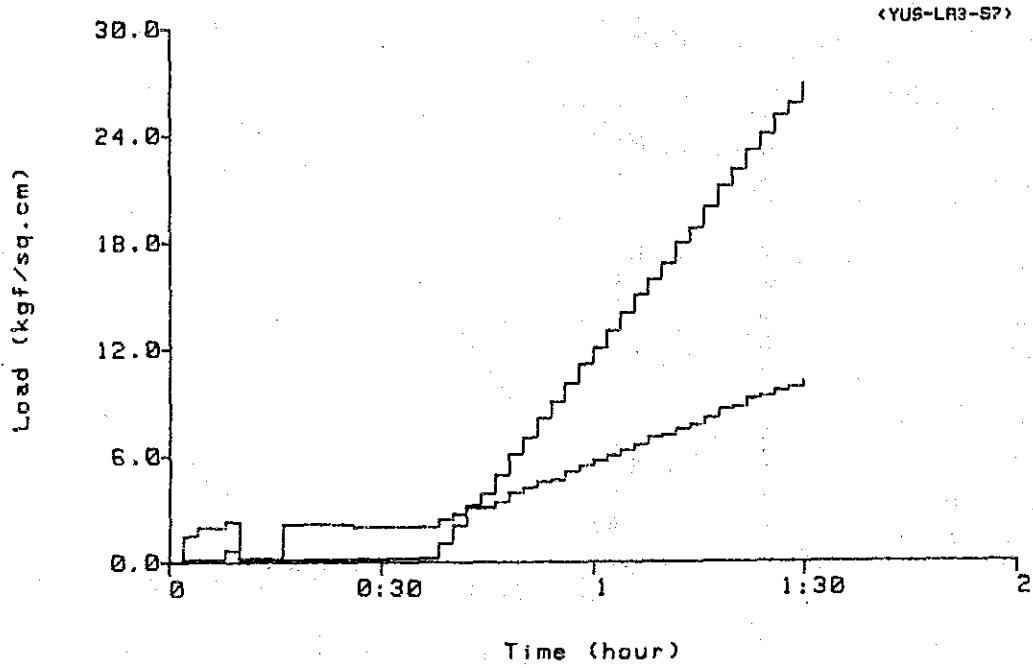


Fig. AP. 3-23 Block Shear Test, LA-2, S-6 (2-2)

Loading Pattern



NORMAL stress - displacement

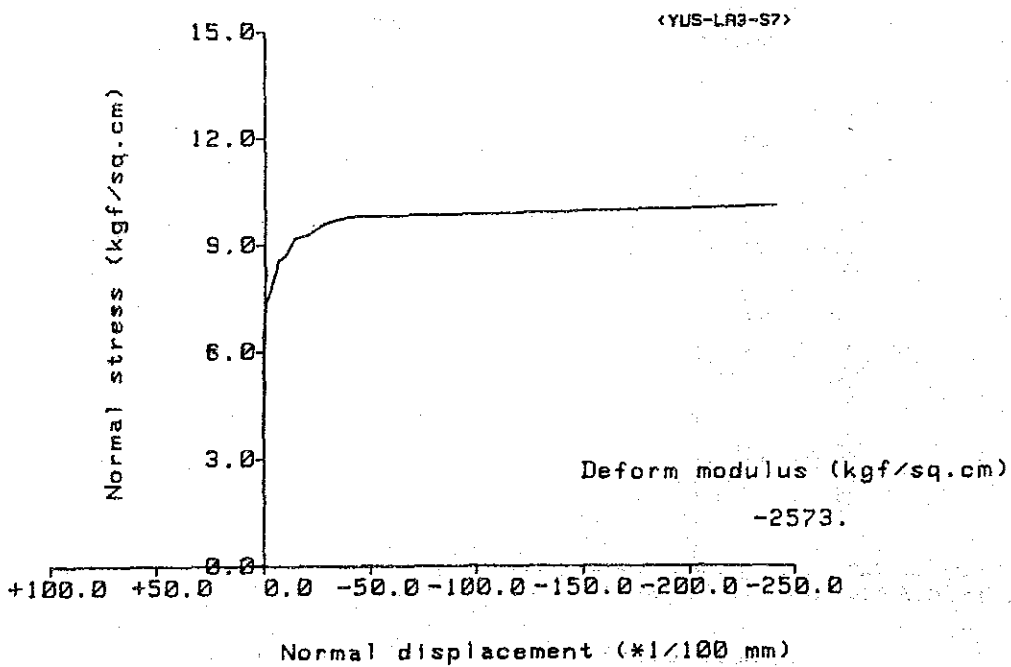


Fig. AP. 3-24 Block Shear Test, LA-3, S-7 (1-2)

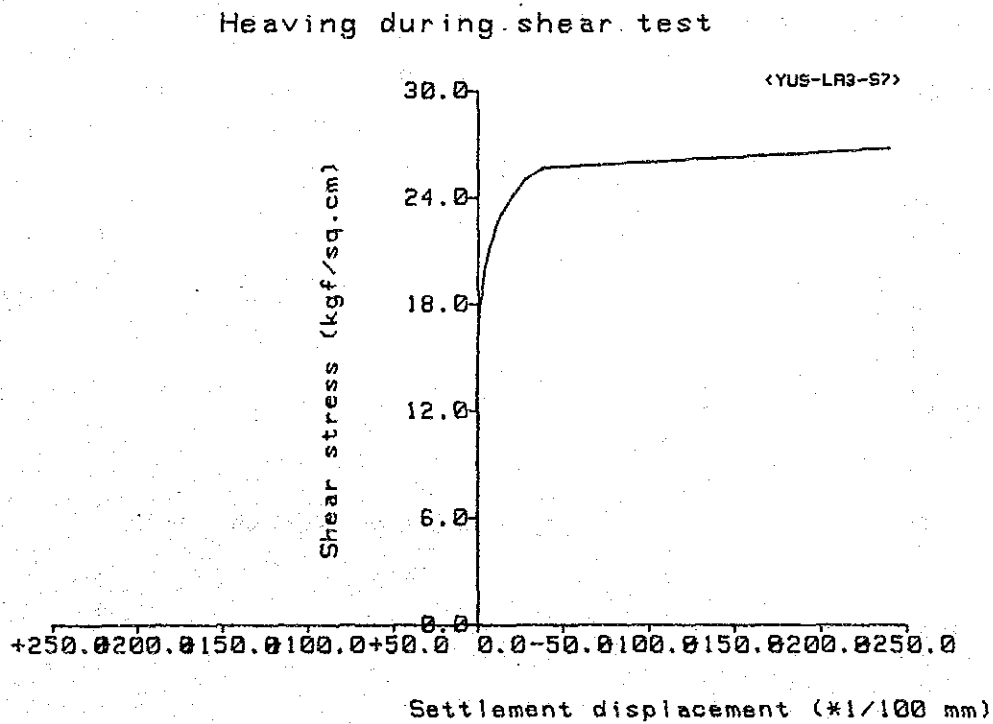
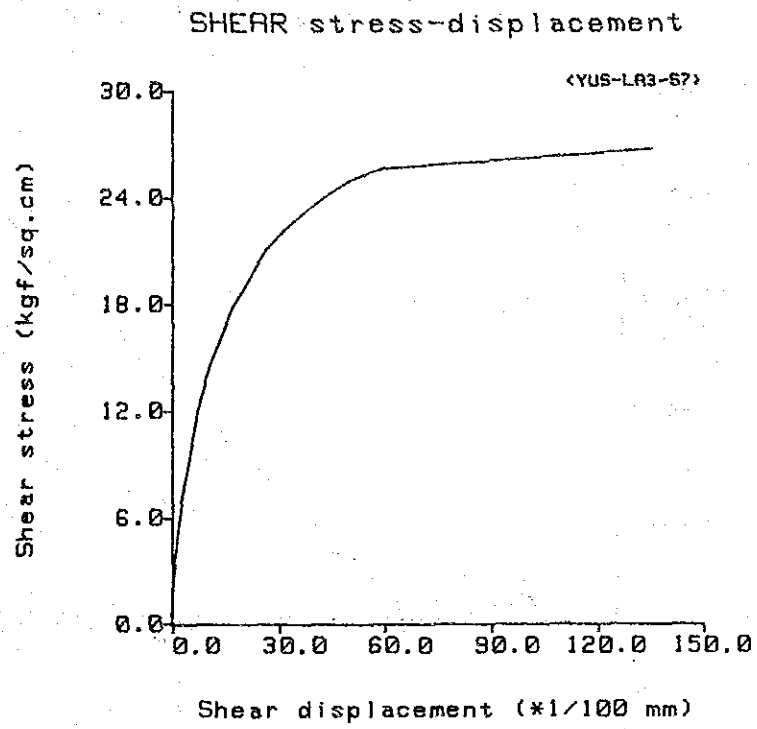
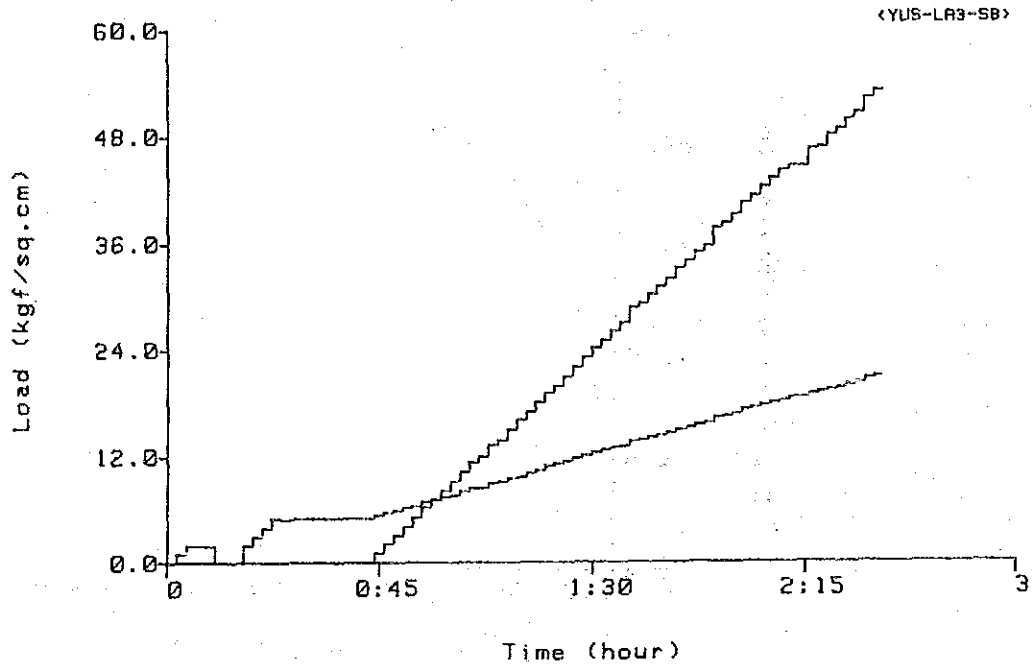


Fig. AP. 3-25 Block Shear Test, LA-3, S-7 (2-2)

Loading Pattern



NORMAL stress - displacement

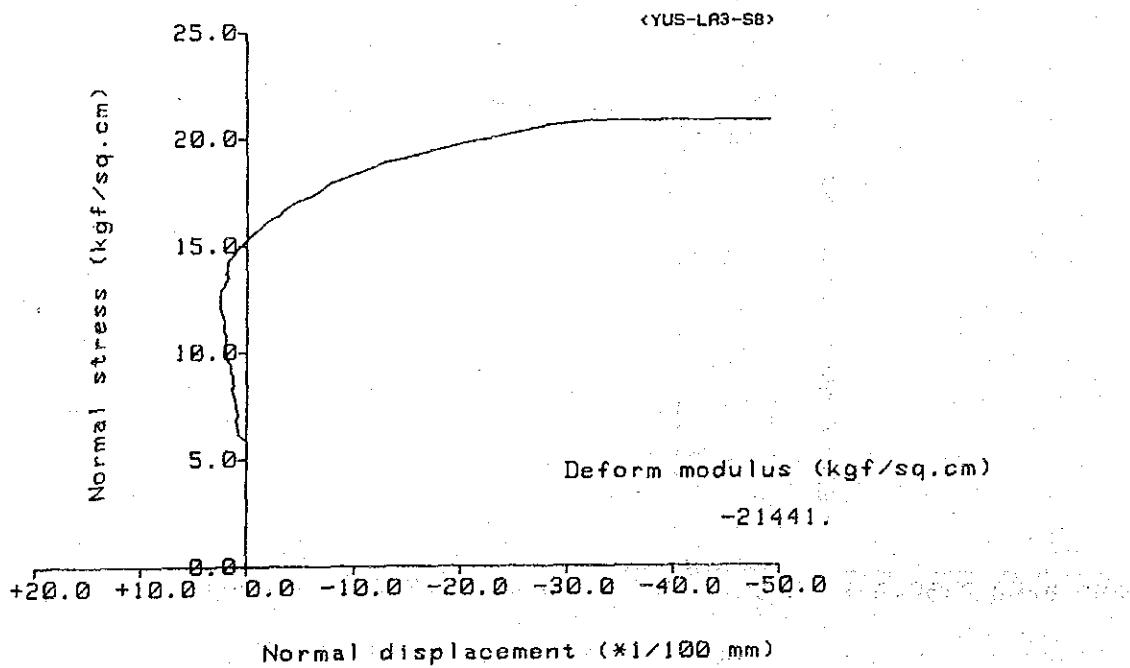
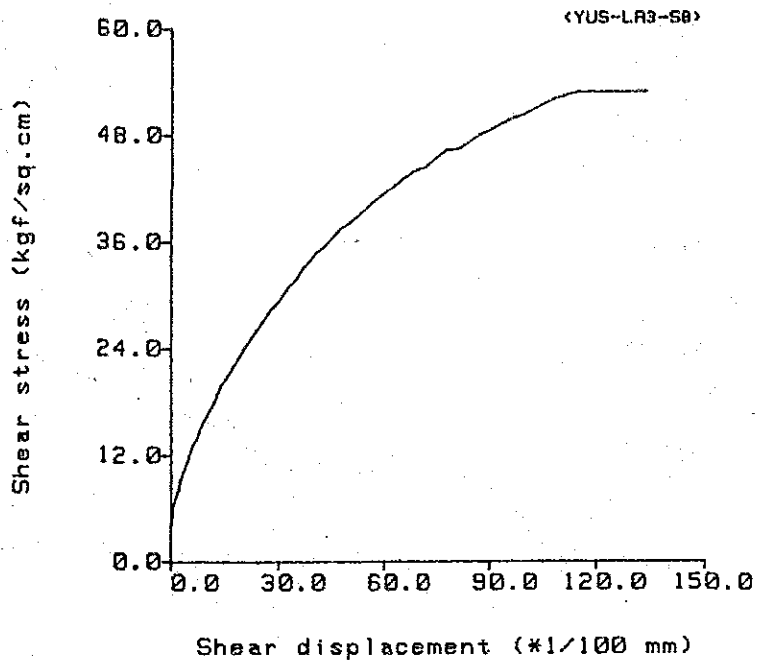


Fig. AP. 3-26 Block Shear Test, LA-3, S-8 (1-2)

SHEAR stress-displacement



Heaving during shear test

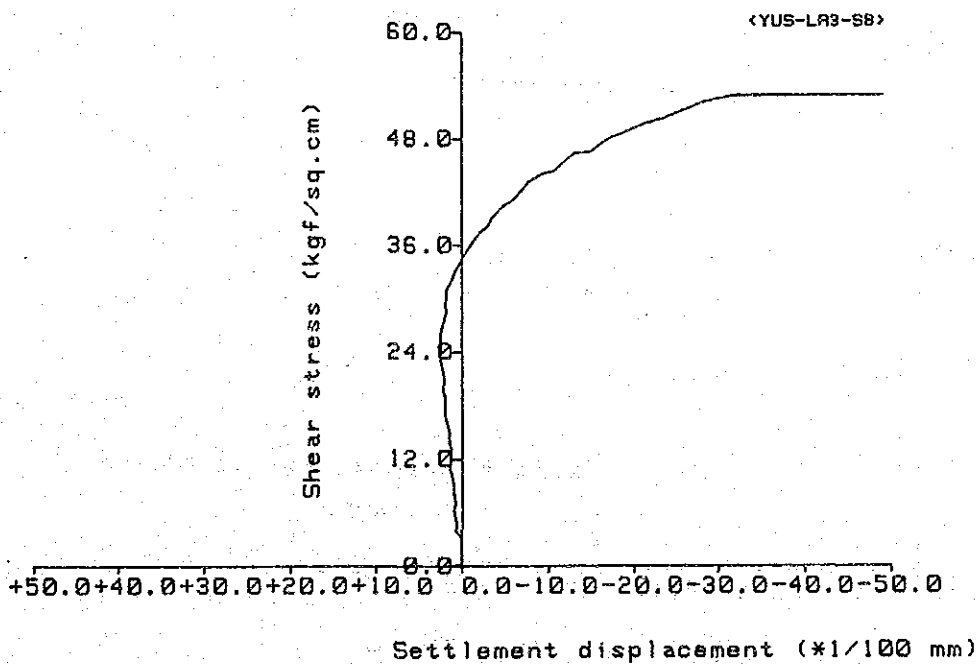
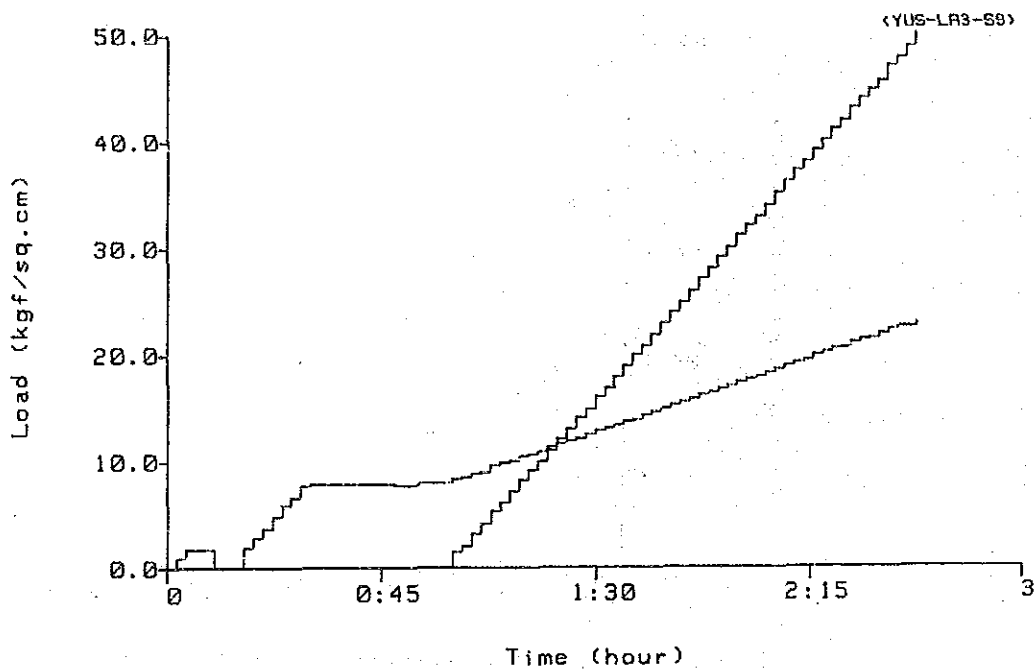


Fig. AP. 3-27 Block Shear Test, LA-3, S-8 (2-2)

Loading Pattern



NORMAL stress - displacement

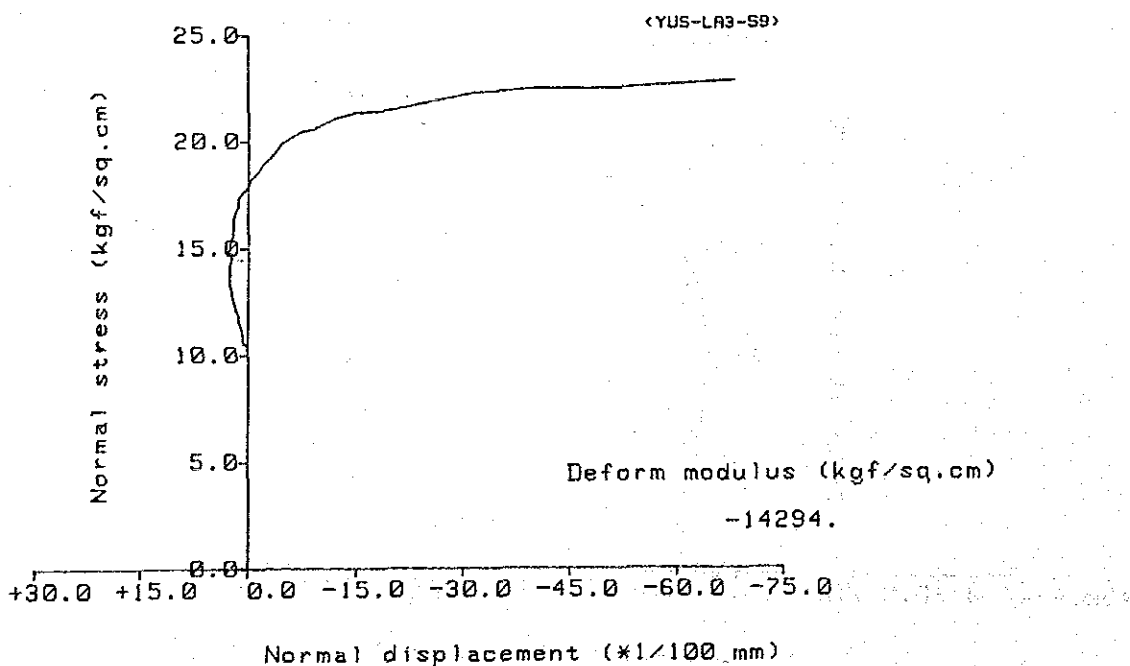
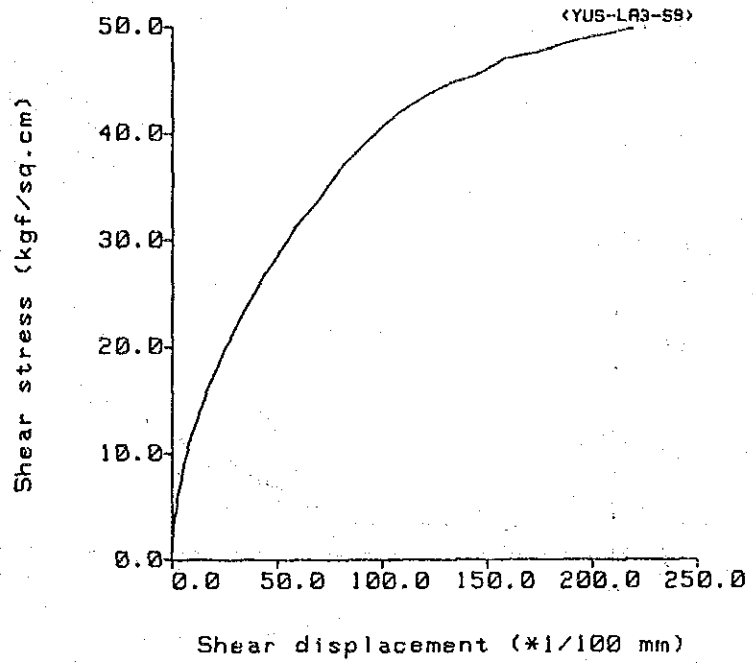


Fig. AP. 3-28 Block Shear Test, LA-3, S-9 (1-2)

SHEAR stress-displacement



Heaving during shear test

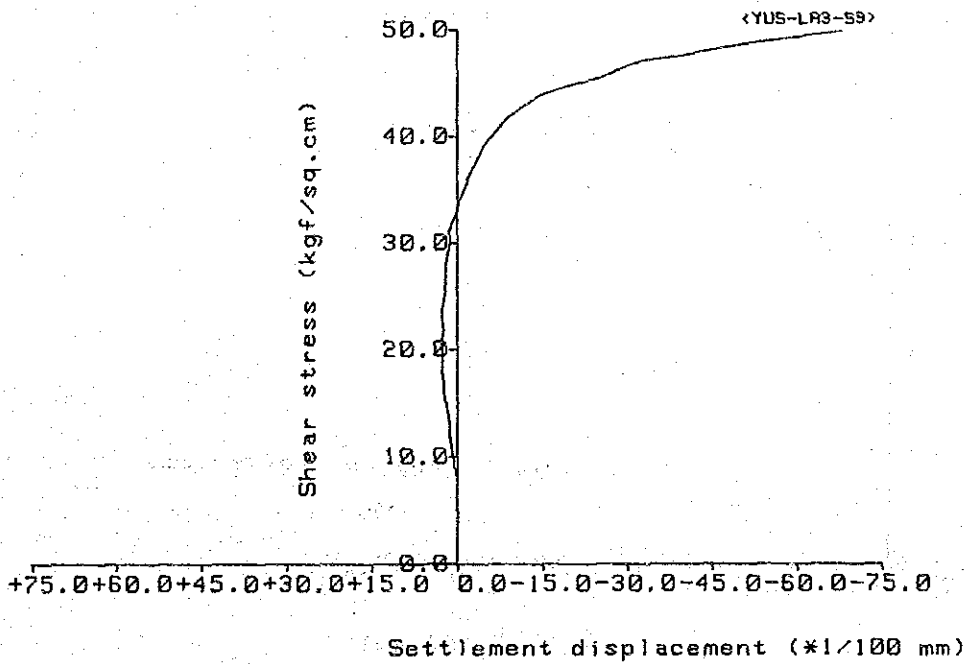
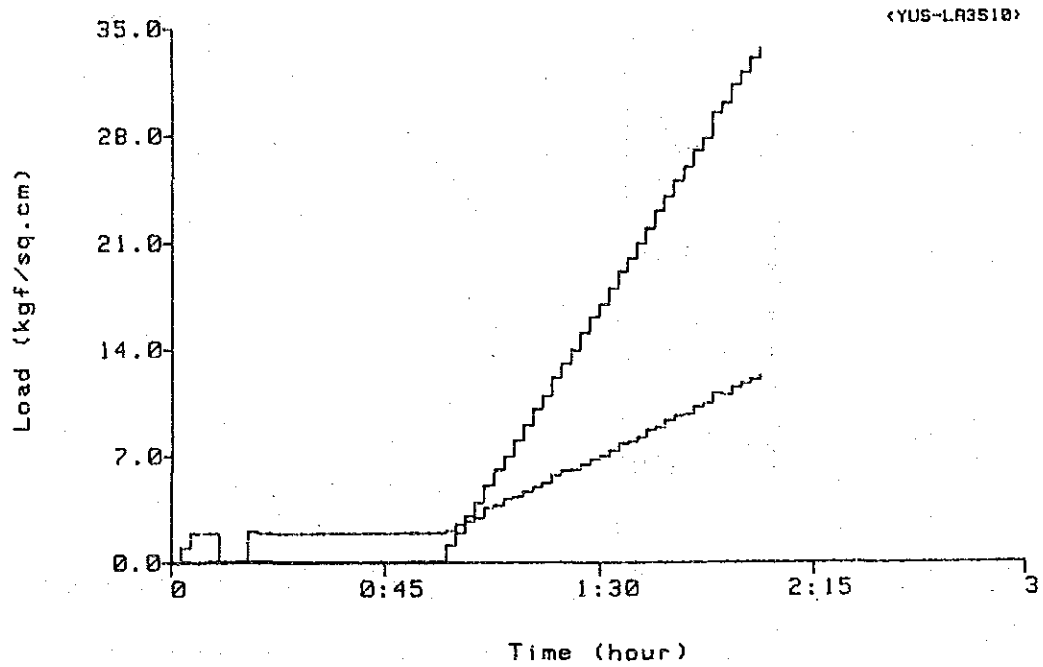


Fig. AP. 3-29 Block Shear Test, LA-3, S-9 (2-2)

Loading Pattern



NORMAL stress - displacement

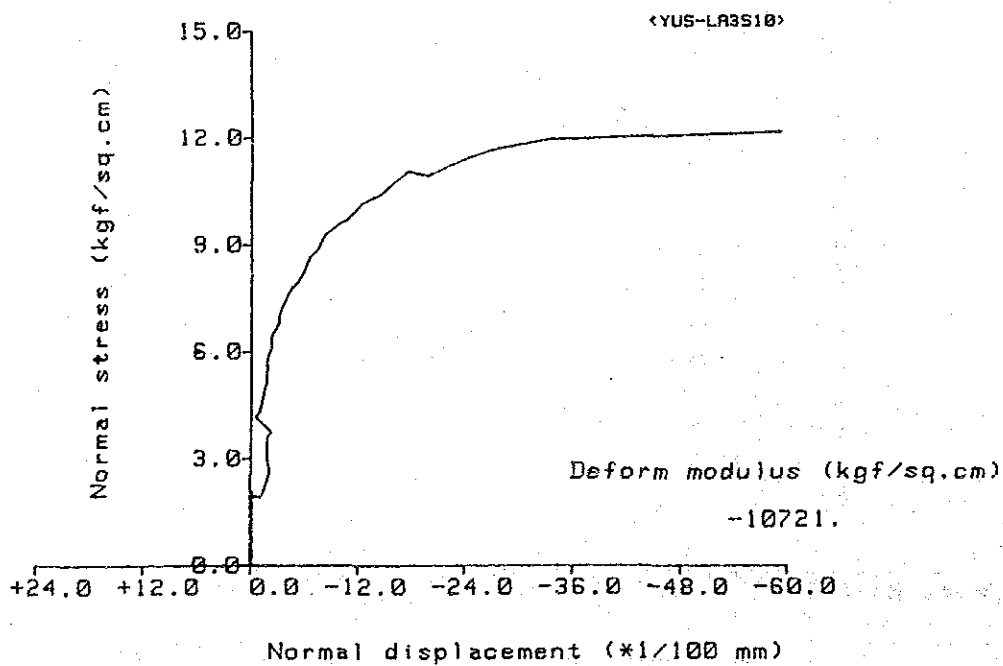
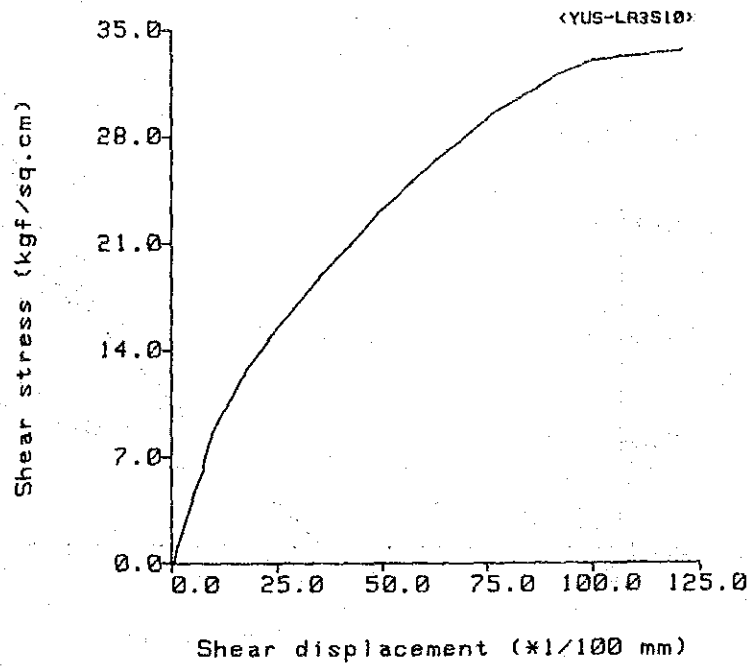


Fig. AP. 3-30 Block Shear Test, LA-3, S-10 (1-2)

SHEAR stress-displacement



Heaving during shear test

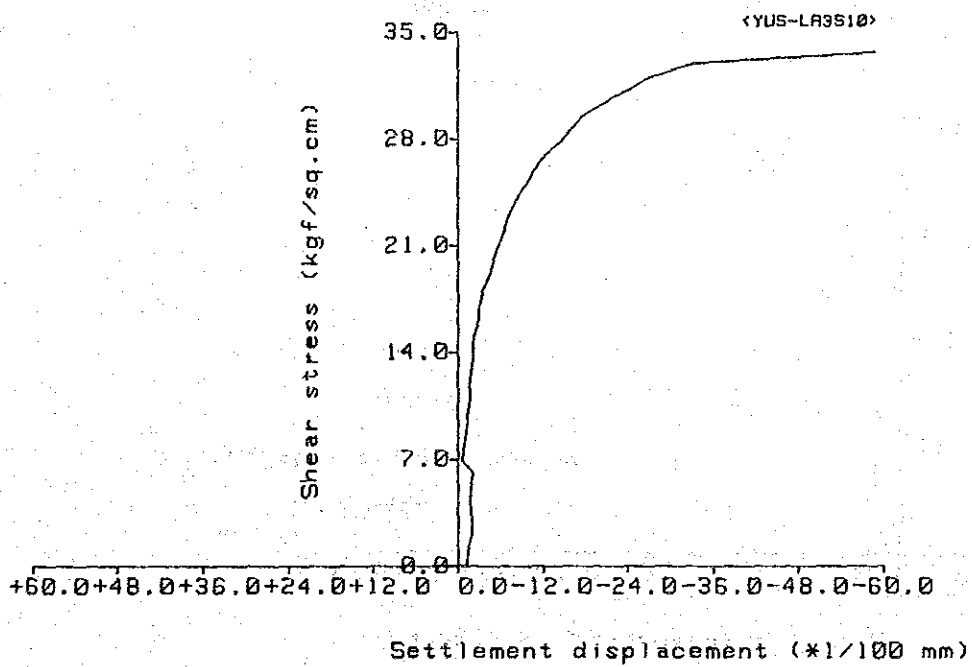
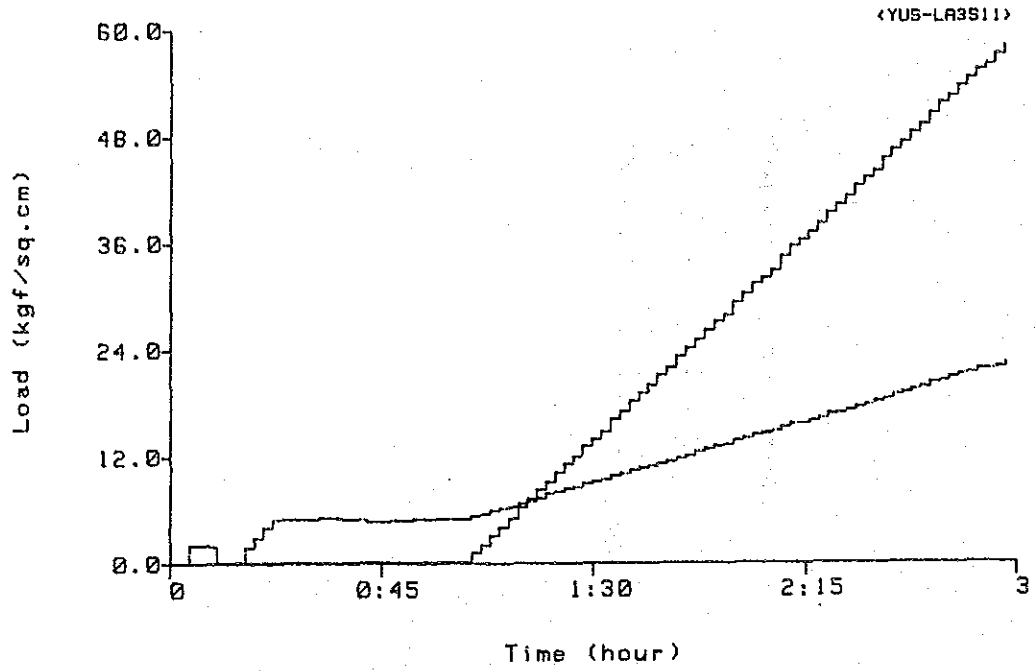


Fig. AP. 3-31 Block Shear Test, LA-3, S-10 (2-2)

Loading Pattern



NORMAL stress - displacement

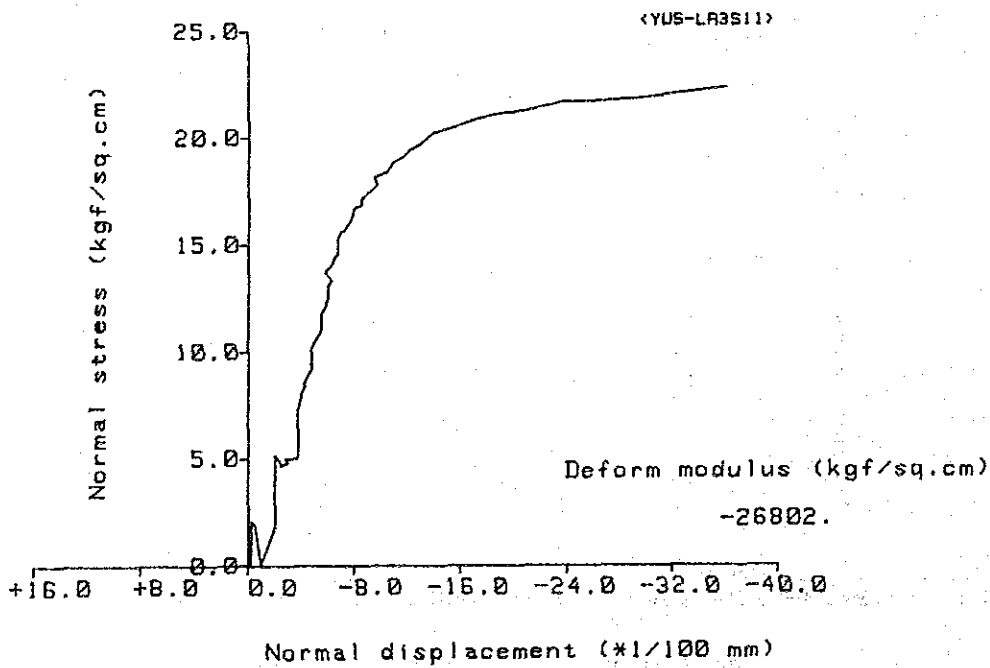
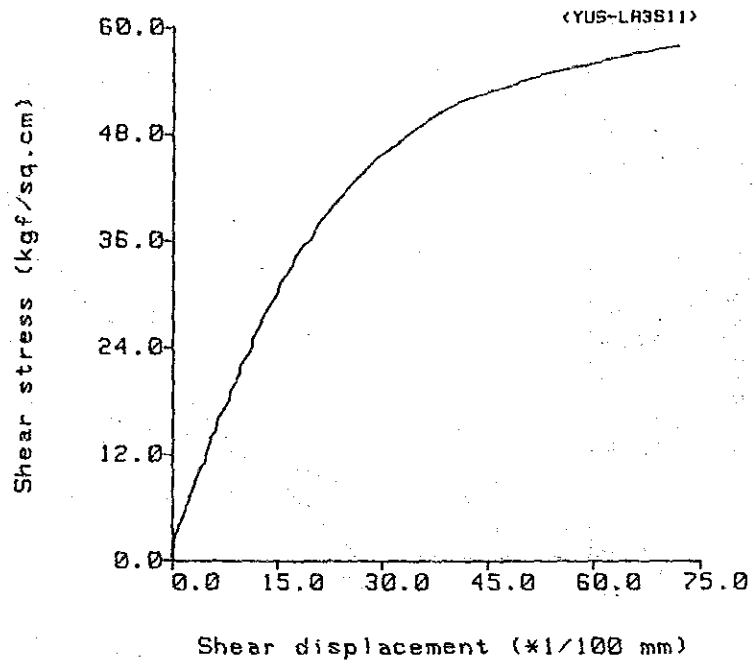


Fig. AP. 3-32 Block Shear Test, LA-3, S-11 (1-2)

SHEAR stress-displacement



Heaving during shear test

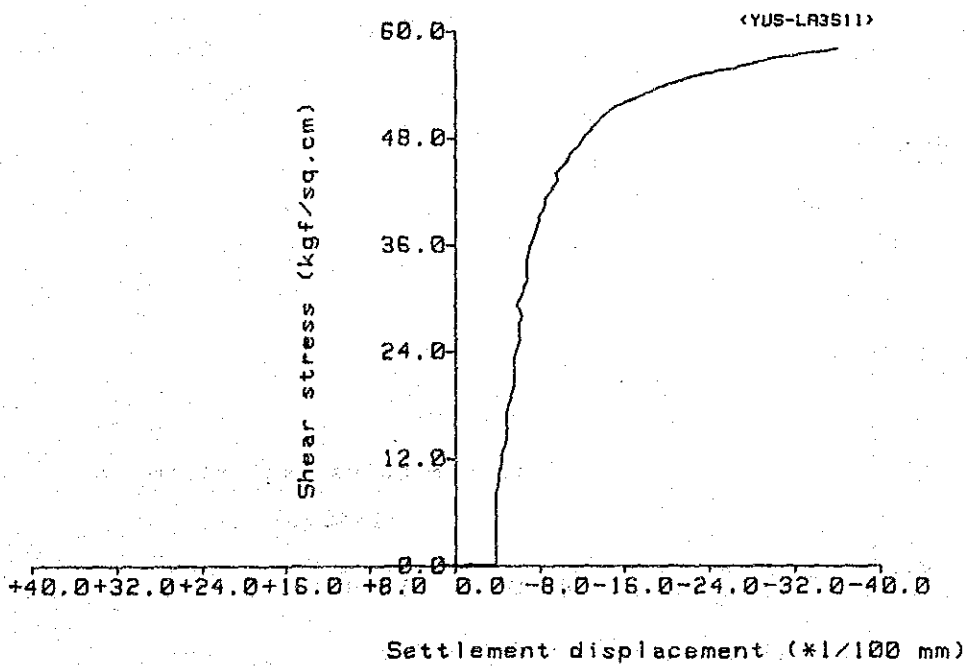
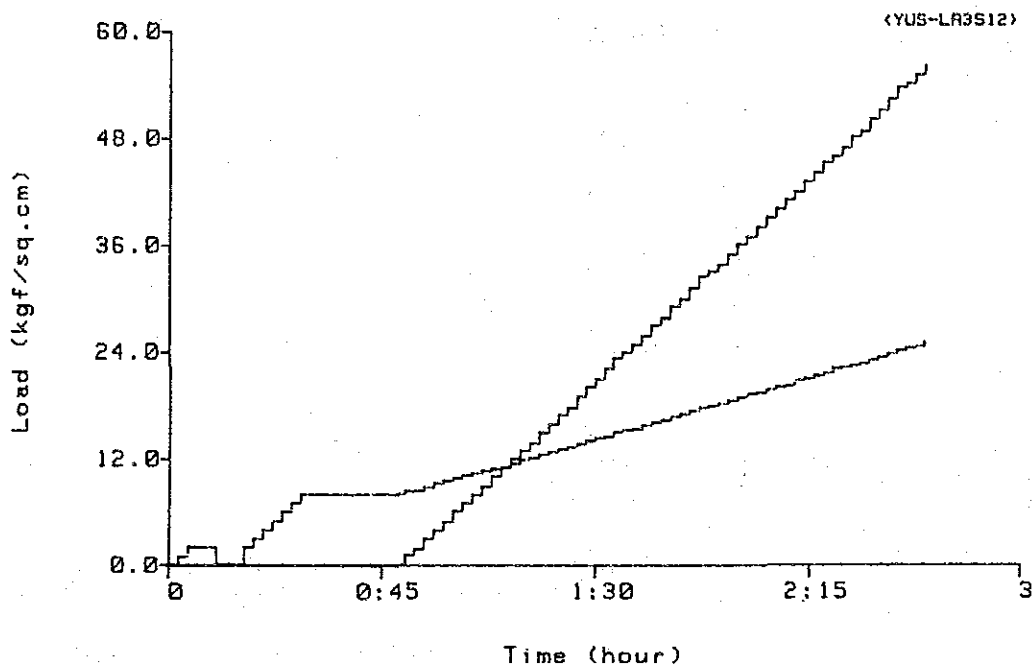


Fig. AP. 3-33 Block Shear Test, LA-3, S-11 (2-2)

Loading Pattern



NORMAL stress - displacement

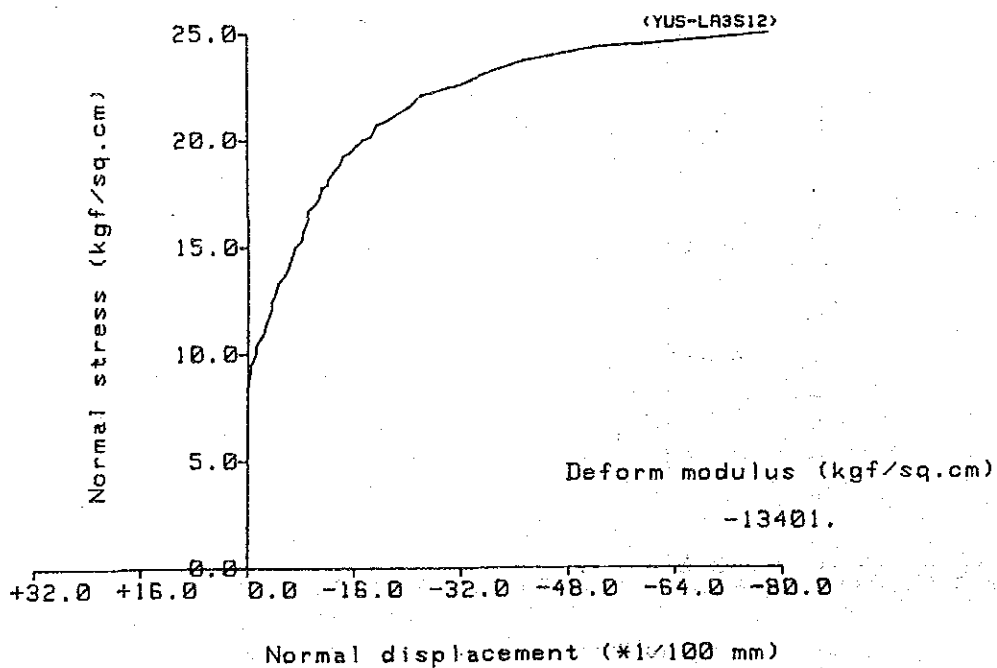
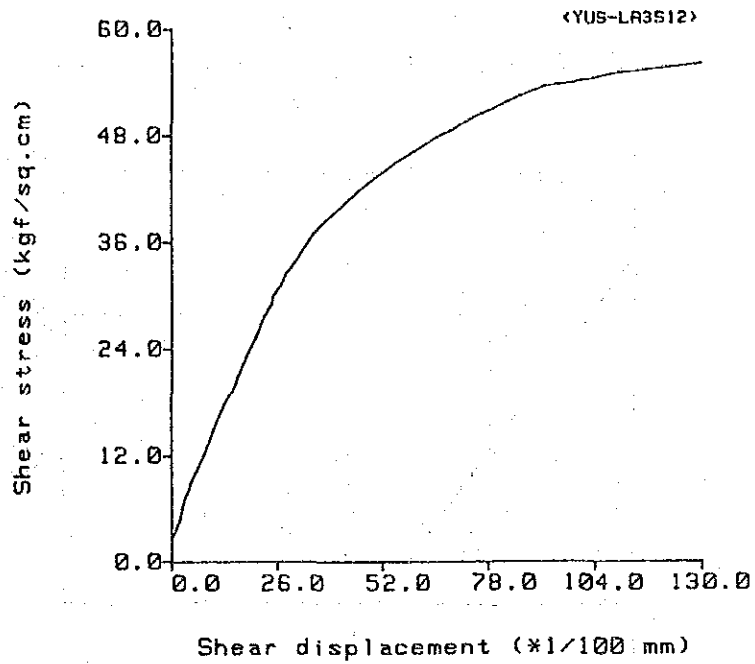


Fig. AP. 3-34 Block Shear Test, LA-3, S-12 (1-2)

SHEAR stress-displacement



Heaving during shear test

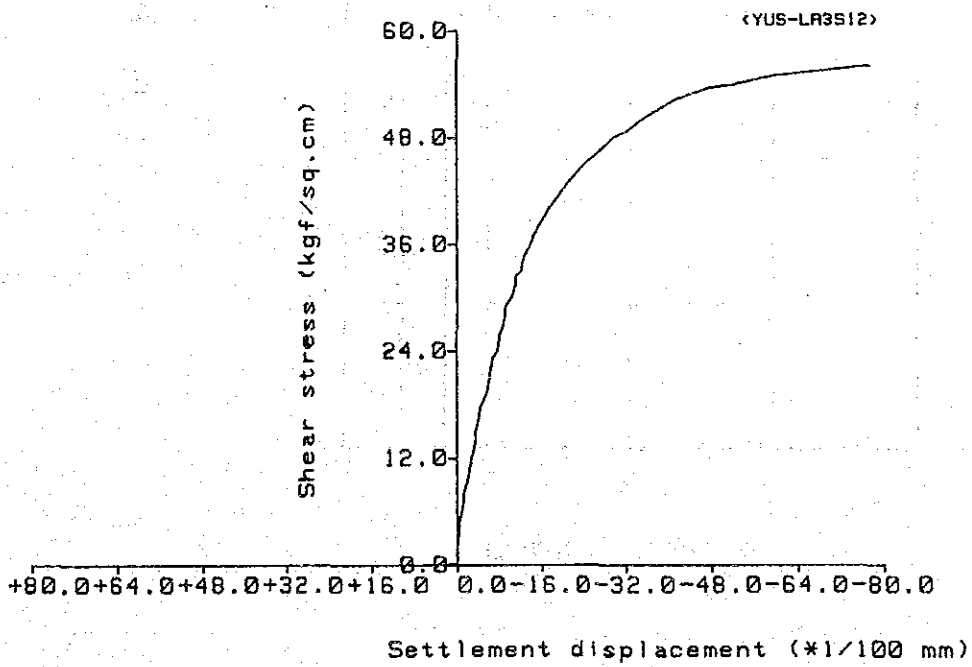


Fig. AP. 3-35 Block Shear Test, LA-3, S-12 (2-2)

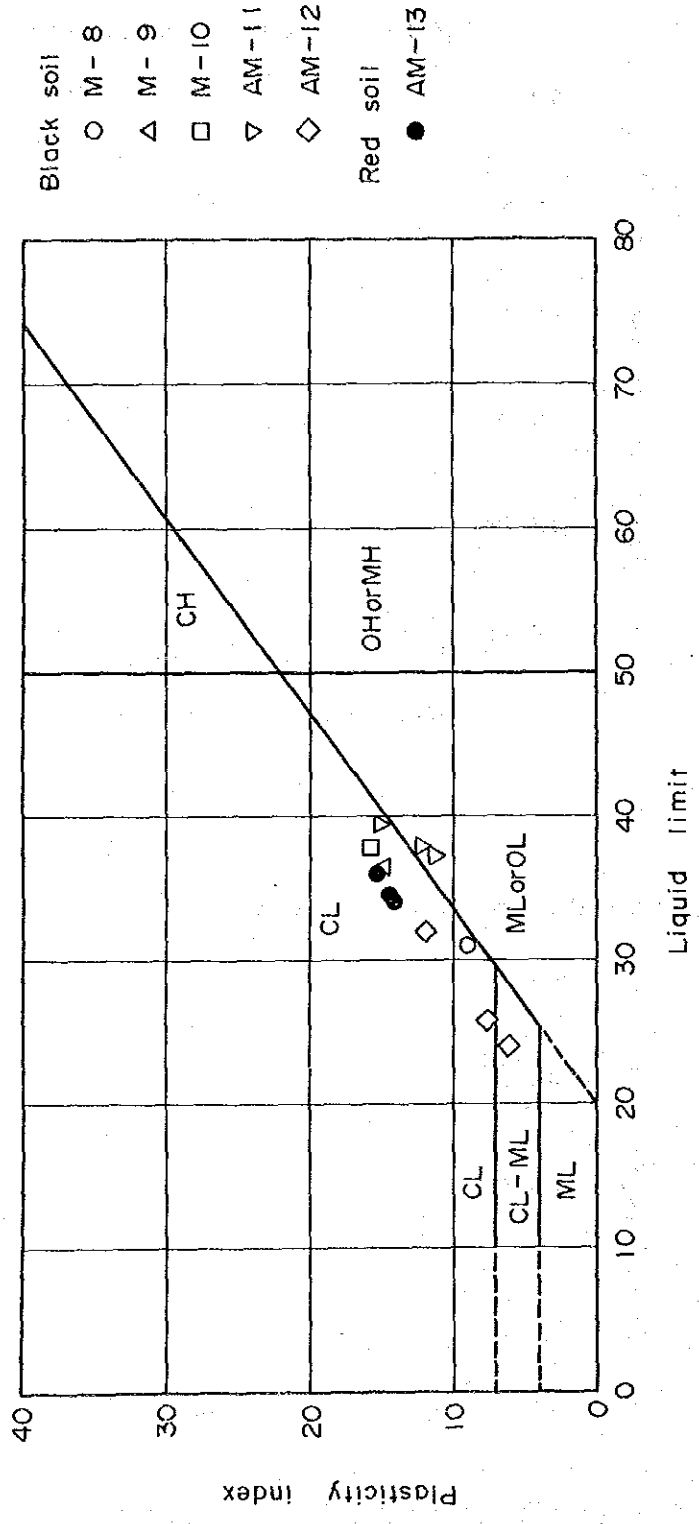


Fig. AP. 3-36 Plasticity Chart

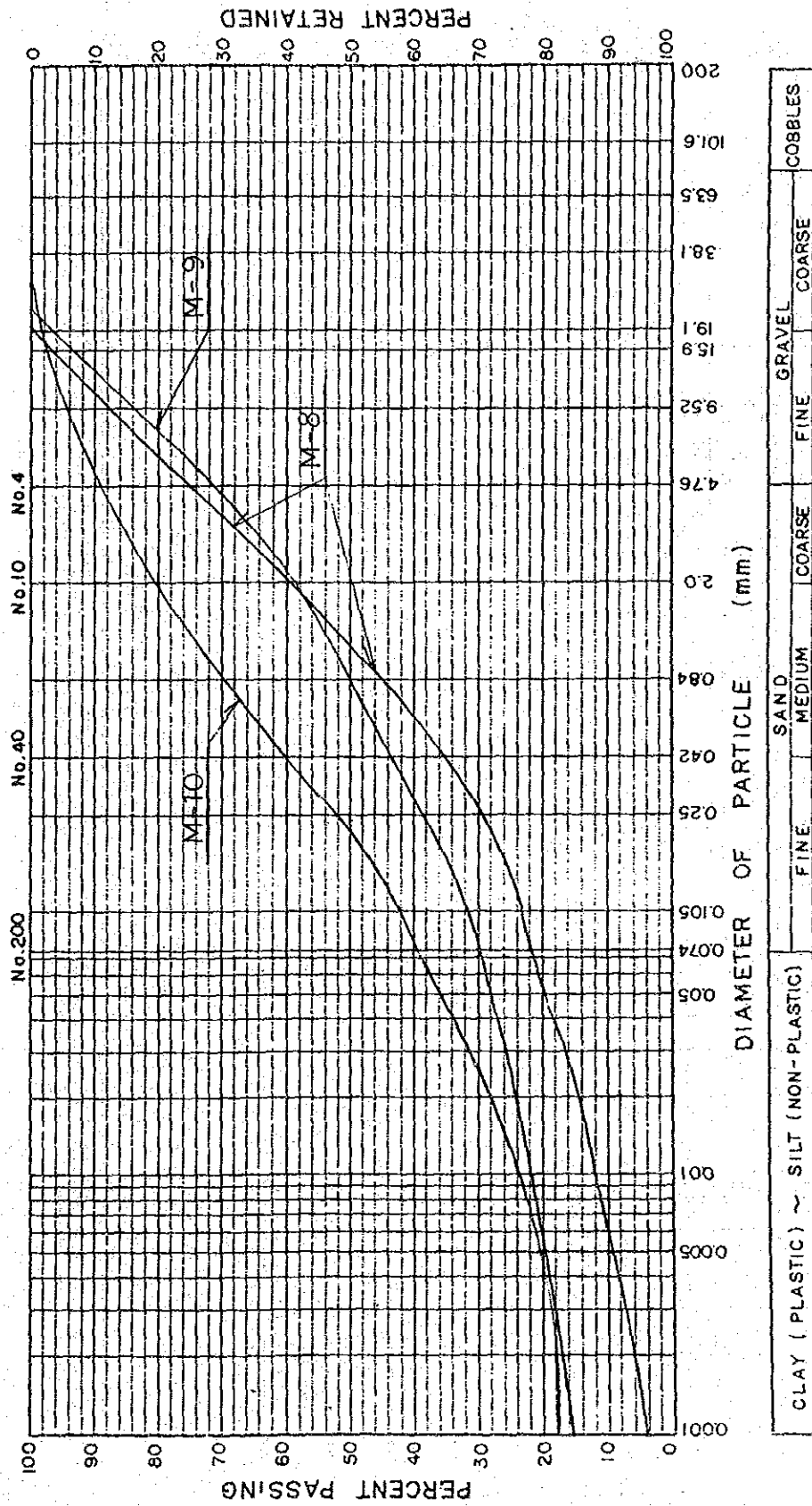


Fig. AP. 3-37 Gradation Analysis Curve M-8,9,10

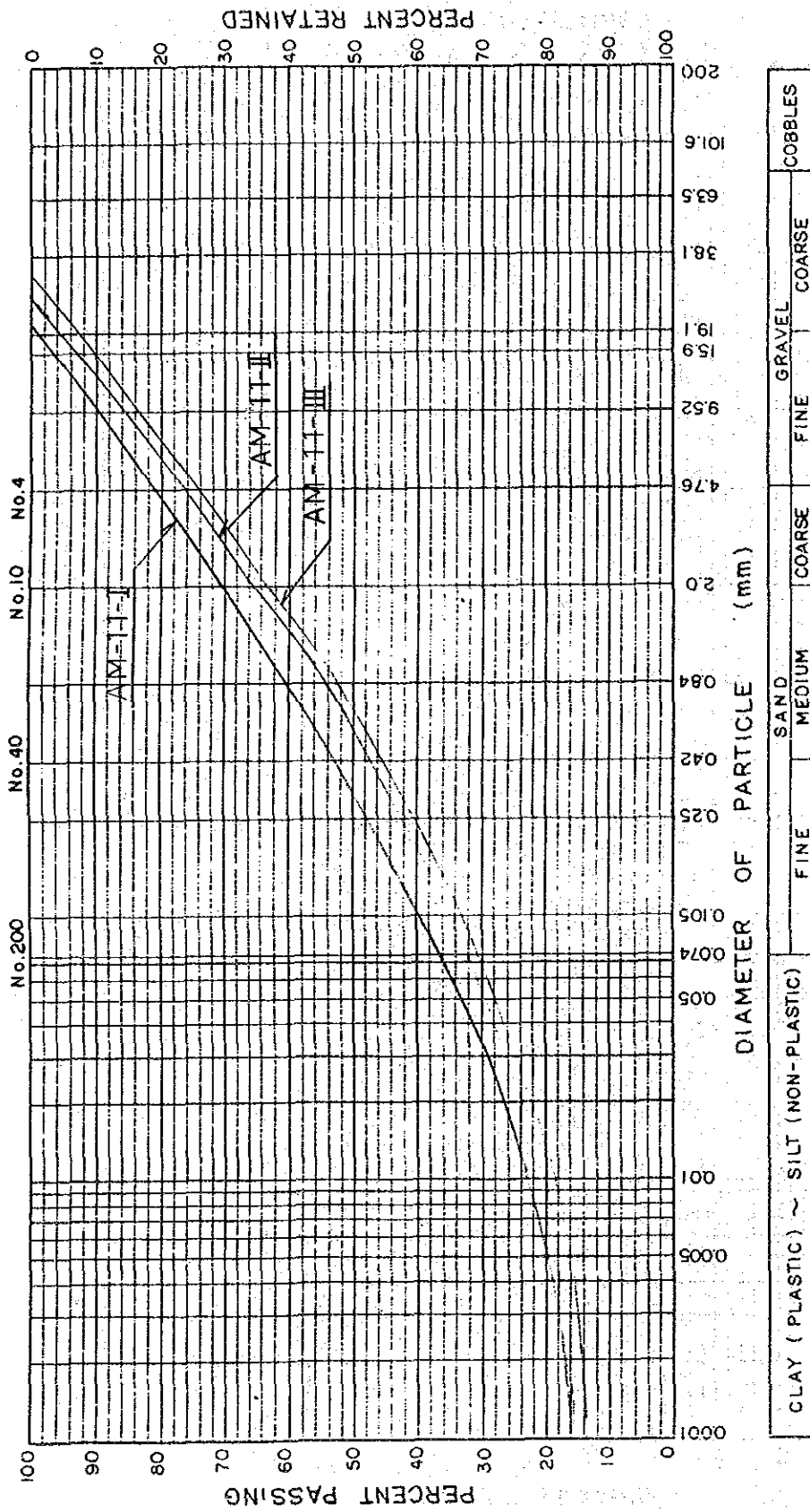


Fig. AP. 3-38 Gradation Analysis Curve AM-11

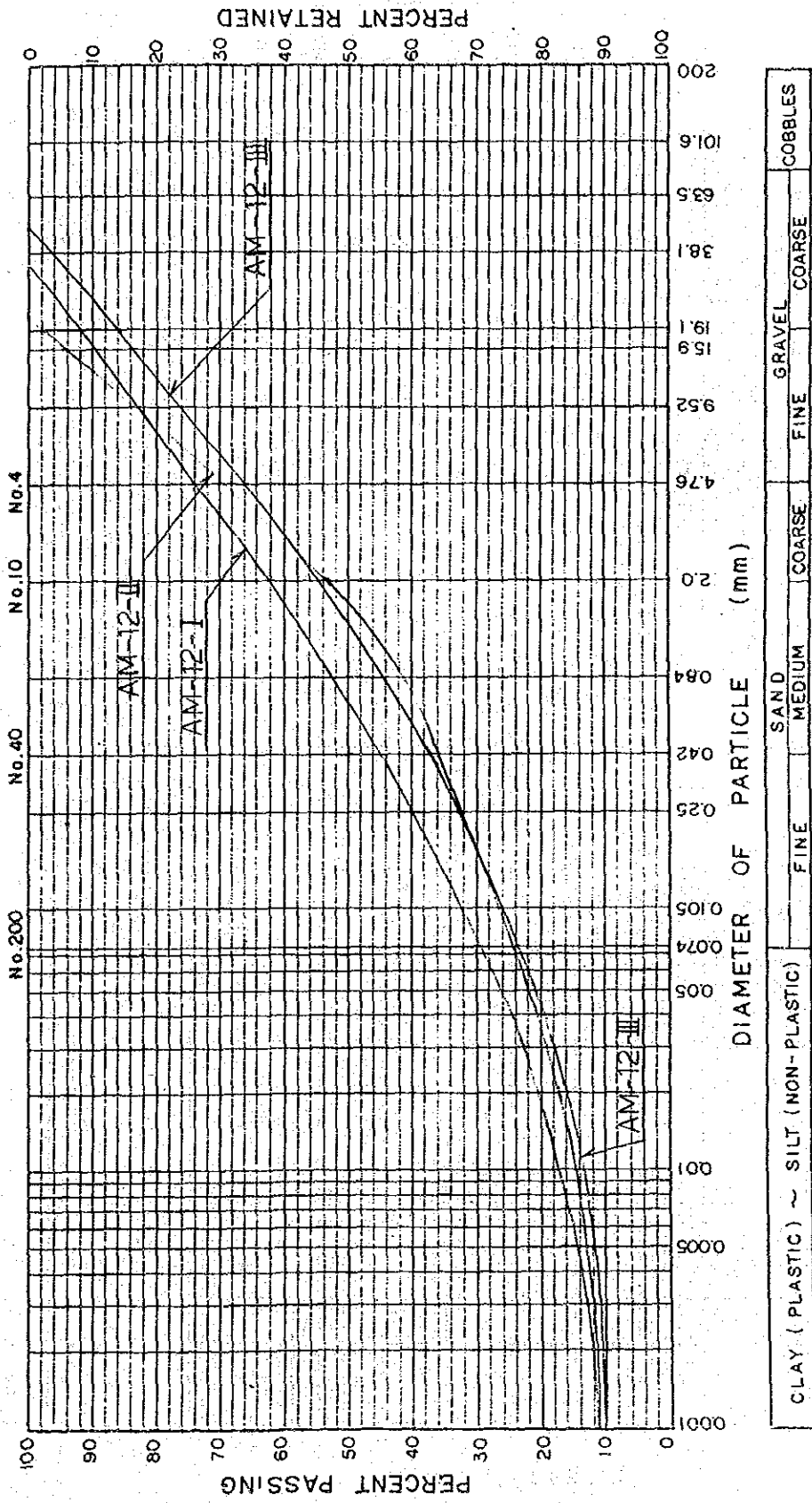


Fig. AP. 3-39 Gradation Analysis Curve AM-12

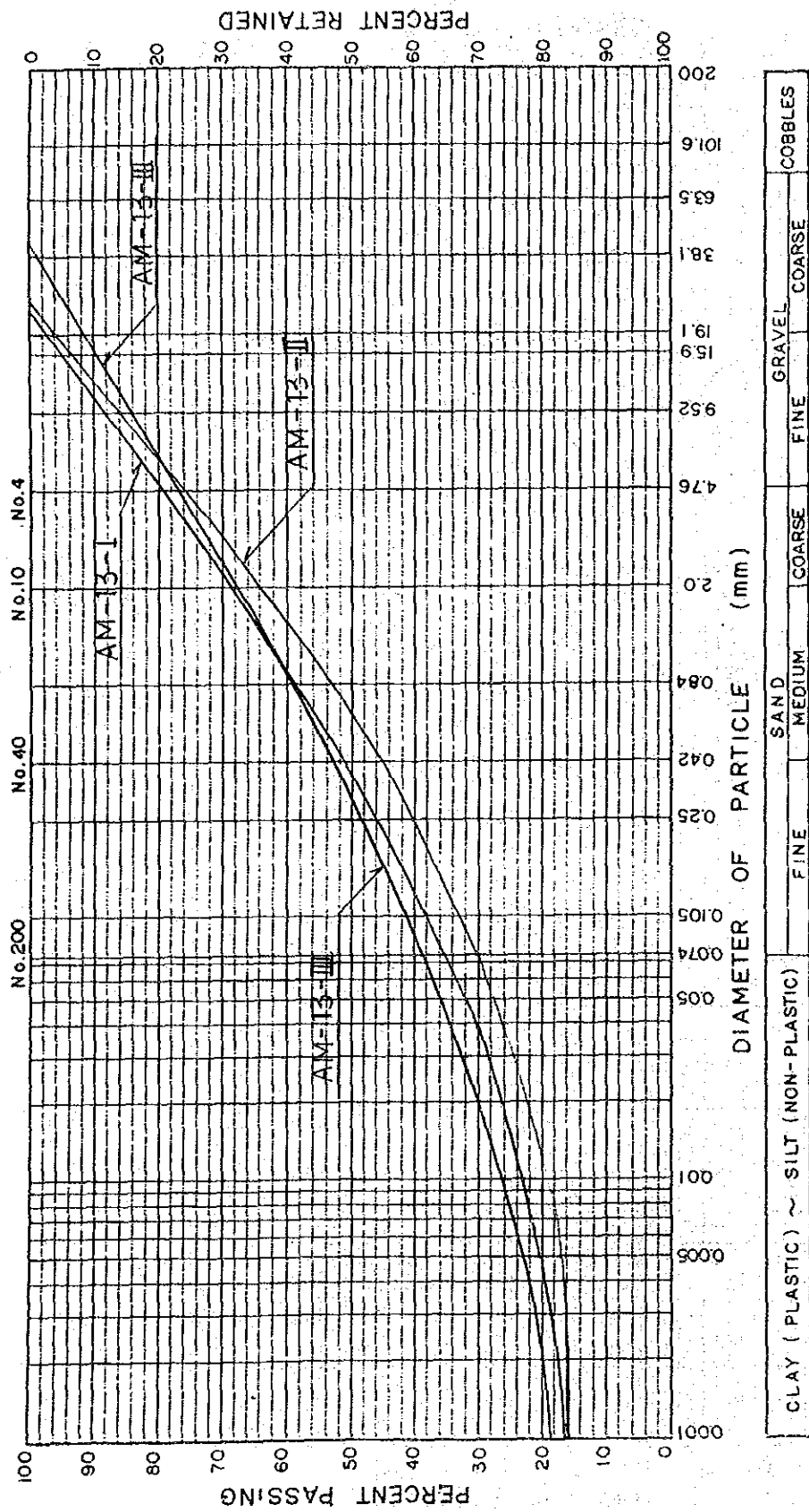
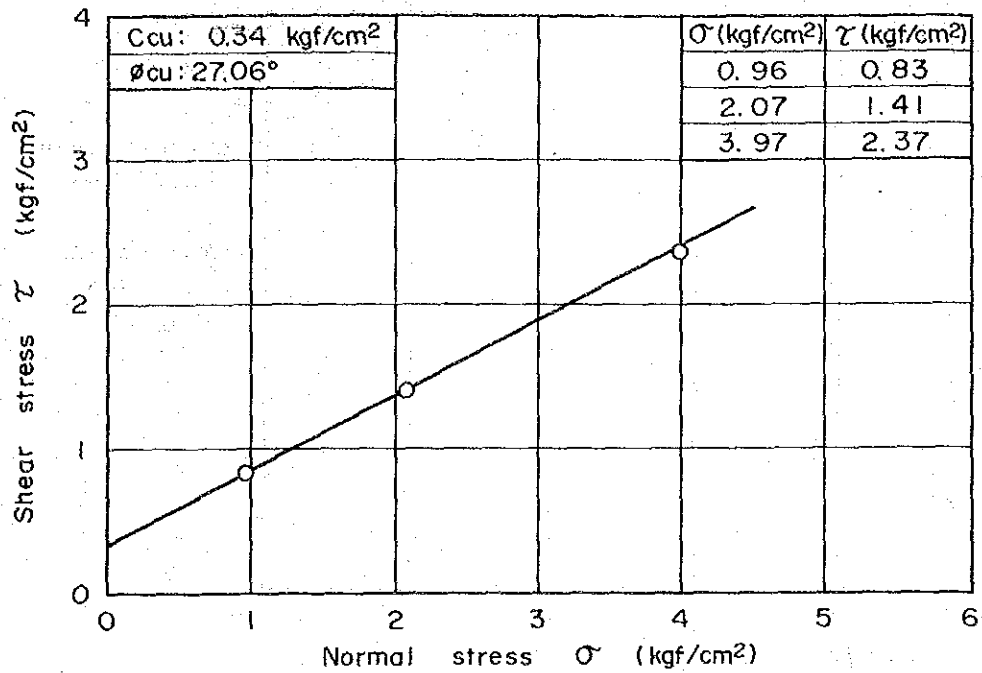


Fig. AP. 3-40 Gradation Analysis Curve AM-13

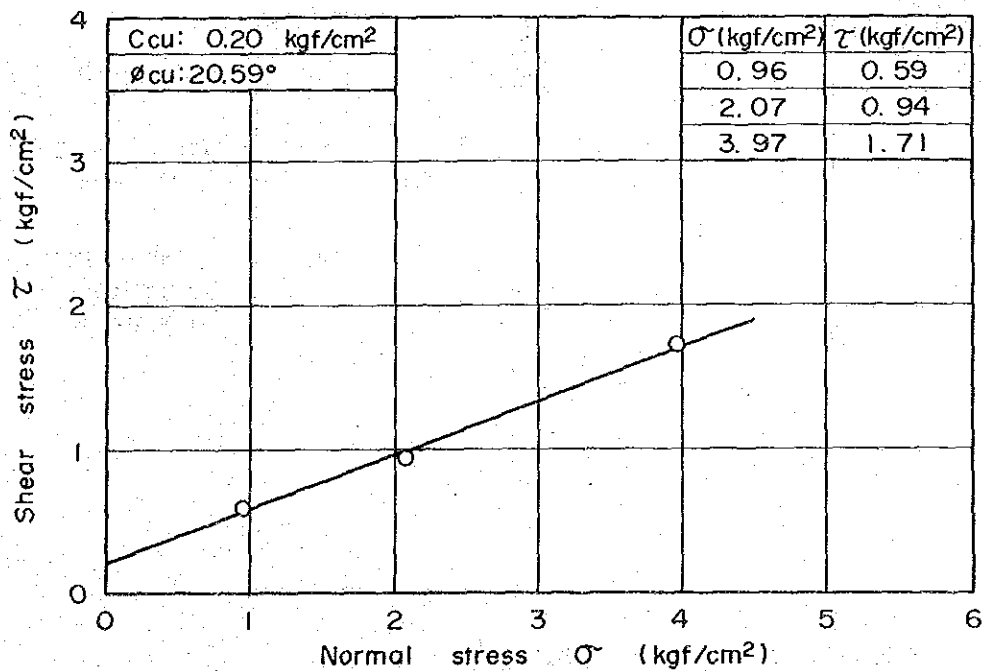


AM-11-II

Wet unit weight
: 2.03 (t/m³)

Water content
before test
: 17.3 (%)

Fig. AP. 3-41 Result of Direct Shear Test AM-11-II

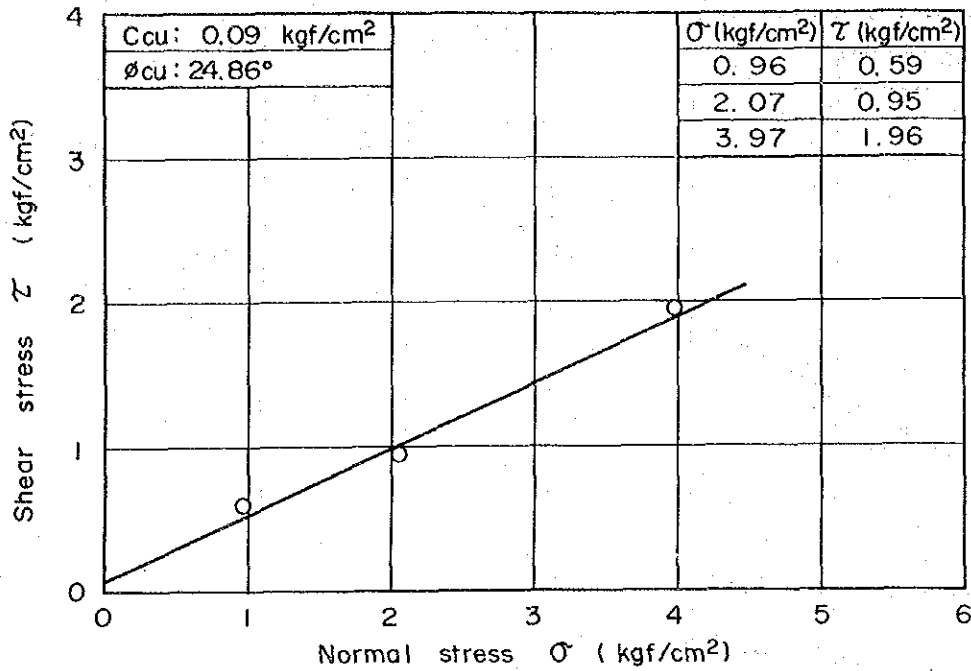


AM-11-III

Wet unit weight
: 2.03 (t/m³)

Water content
before test
: 19.3 (%)

Fig. AP. 3-42 Result of Direct Shear Test AM-11-III

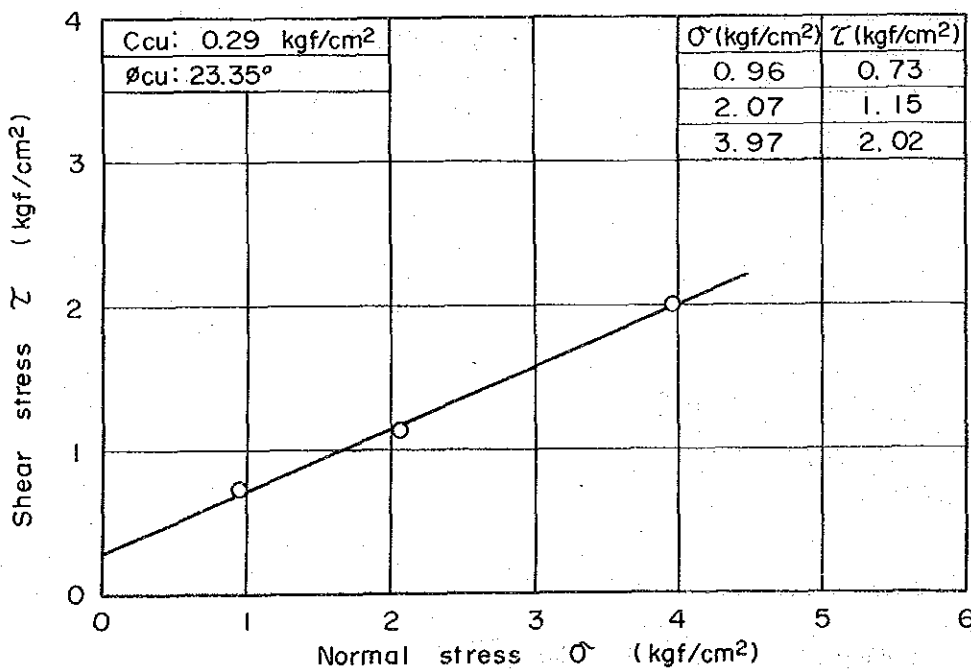


AM-12-I

Wet unit weight
: 2.20 (t/m³)

Water content
before test
: 17.6 (%)

Fig. AP. 3-43 Results of Direct Shear Test AM-12-I

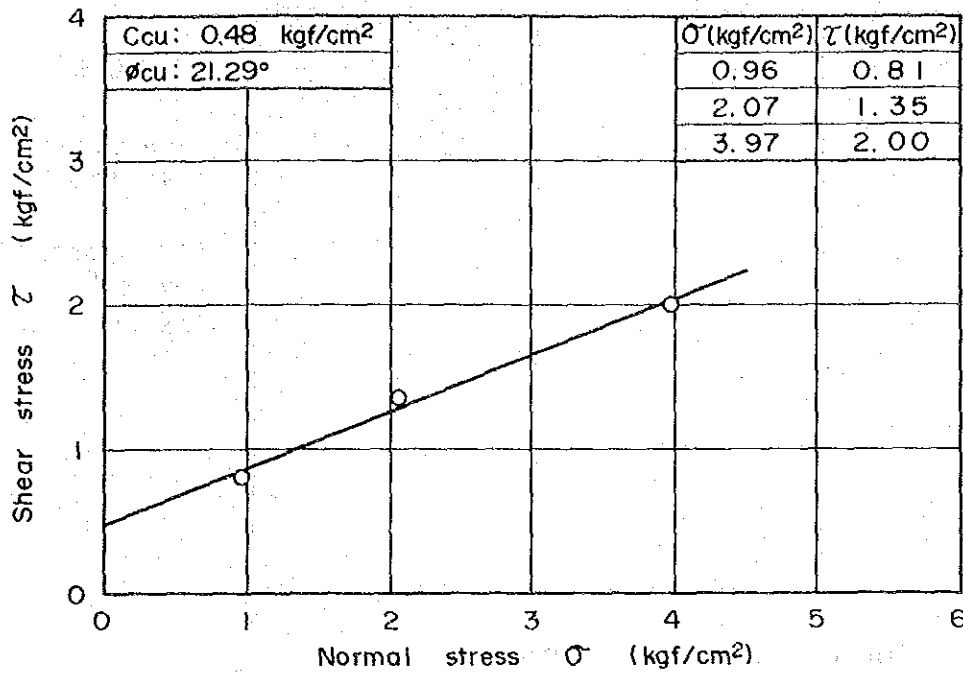


AM-12-II

Wet unit weight
: 2.17 (t/m³)

Water content
before test
: 16.8 (%)

Fig. AP. 3-44 Results of Direct Shear Test AM-12-II

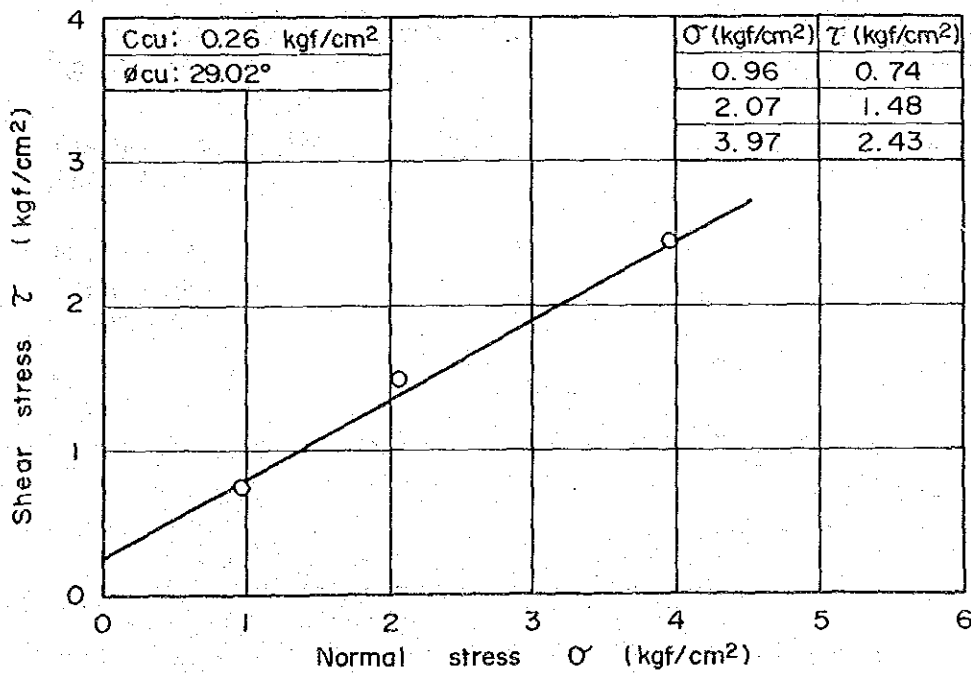


AM-12-III

Wet unit weight : 2.23 (t/m³)

Water content before test : 14.4%

Fig. AP. 3-45 Result of Direct Shear Test AM-12-III

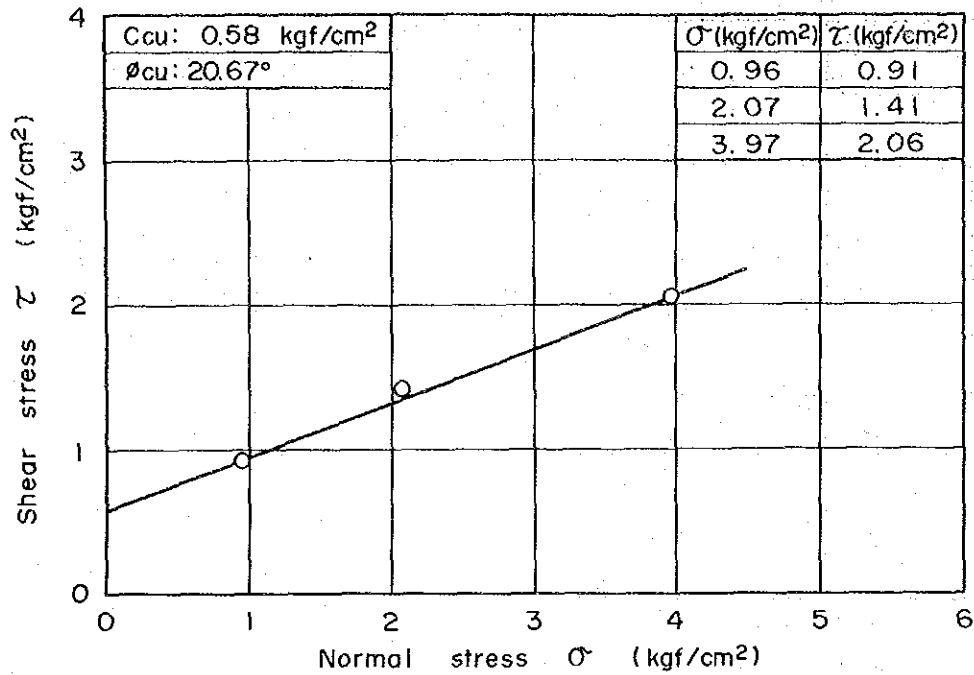


AM-13-I

Wet unit weight : 2.09 (t/m³)

Water content before test : 15.6 (%)

Fig. AP. 3-46 Result of Direct Shear Test AM-13-I

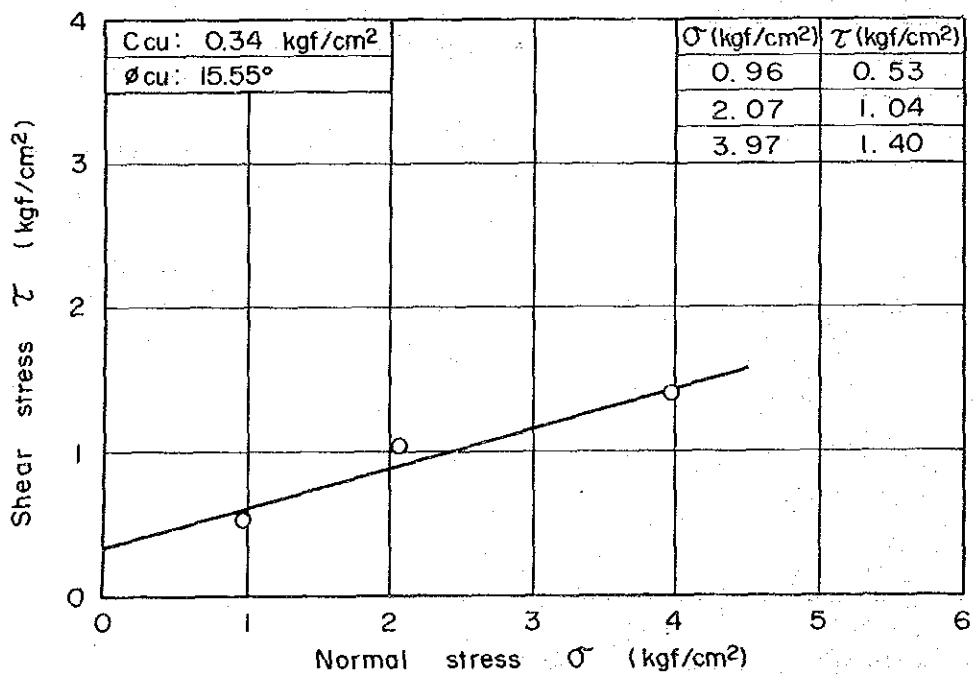


AM-13-II

Wet unit weight
: 2.06 (t/m³)

Water content
before test
: 17.0 (%)

Fig. AP. 3-47 Result of Direct Shear Test AM-13-II



AM-13-III

Wet unit weight
: 2.04 (t/m³)

Water content
before test
: 19.1 (%)

Fig. AP. 3-48 Result of Direct Shear Test AM-13-III