

APPENDIX F - 1

Table Data of Pumping Test (J-No. 1), 23 Feb. 1982

Time hr min sec	Time after Pumping Started t (sec)	Time after Pumping Stopped t' (sec)	Water Level (m)	Draw- down s (m)	t/t'	log t/t'	Radius of Well r (m)	r ² /t	Pumping Rate Q(m ³ /sec)	Remarks
13 55 00	0		15.44	0			0.108			Pumping Started
55 15	15		16.21	0.77			0.108	8x10 ⁻⁵		
55 30	30		16.98	1.54			0.108	4x10 ⁻⁵		
55 45	45		17.69	2.25			0.108	2.667x10 ⁻⁵		
56 00	60		18.26	2.82			0.108	2x10 ⁻⁵		
56 30	90		19.33	3.89			0.108	1.333x10 ⁻⁵		
57 00	120		20.255	4.815			0.108	1x10 ⁻⁵		
57 30	150		21.062	5.622			0.108	8x10 ⁻⁵		
58 00	180		21.728	6.288			0.108	6.67x10 ⁻⁵		
58 30	210		22.35	6.91			0.108	5.71x10 ⁻⁵		
59 00	240		22.925	7.485			0.108	6x10 ⁻⁵		
59 30	270		23.387	7.947			0.108	4.44x10 ⁻⁵		
14 0 00	300		23.84	8.4			0.108	4x10 ⁻⁵		
1 00	360		24.647	9.207			0.108	3.33x10 ⁻⁵		
2 00	420		25.305	9.865			0.108	2.85x10 ⁻⁵		
3 00	480		25.88	10.44			0.108	2.5x10 ⁻⁵	0.002806	Q = 121.1 l/min = 0.00202 m ³ /sec
4 00	540		26.385	10.945			0.108	2.2x10 ⁻⁵		
5 00	600		26.833	11.393			0.108	2x10 ⁻⁵		
10 00	900		28.482	13.042			0.108	1.33x10 ⁻⁵		
15 00	1200		29.53	14.090			0.108	1x10 ⁻⁵	0.0025081	
20 00	1500		30.068	14.628			0.108	8x10 ⁻⁶		
25 00	1800		30.497	15.057			0.108	6.6x10 ⁻⁶	0.0019903	
35 00	2400		30.70	15.260			0.108	5x10 ⁻⁶	0.001945	
44 50	2990	0	30.90	15.46	0		0.108	4x10 ⁻⁶		Pumping Stopped
45 20	3020	30	28.615	13.175	100.667	2.0029	0.108	3.9x10 ⁻⁶		
45 29	3080	90	26.066	10.626	34.222	1.53431	0.108	3.8x10 ⁻⁶		
46 50	3110	120	25.017	9.577	25.917	1.41358	0.108	3.8x10 ⁻⁶		
47 20	3140	150	24.055	8.615	20.933	1.32093	0.108	3.8x10 ⁻⁶		
47 50	3170	180	23.187	7.747	17.611	1.24578	0.108	3.7x10 ⁻⁶		
48 20	3200	210	22.412	6.972	15.238	1.18293	0.108	3.7x10 ⁻⁶		
48 50	3230	240	21.746	6.306	15.458	1.18915	0.108	3.7x10 ⁻⁶		
49 20	3260	270	21.21	5.77	12.074	1.08185	0.108	3.6x10 ⁻⁶		
49 50	3290	300	20.599	5.159	10.967	1.04009	0.108	3.6x10 ⁻⁶		
50 50	3350	360	19.577	4.137	9.306	0.968763	0.108	3.5x10 ⁻⁶		
51 50	3410	420	19.025	3.585	8.119	0.909053	0.108	3.5x10 ⁻⁶		
52 50	3470	480	18.466	3.026	7.229	0.859078	0.108	3.4x10 ⁻⁶		
53 50	3530	540	18.038	2.598	6.537	0.815378	0.108	3.3x10 ⁻⁶		
54 50	3590	600	17.712	2.272	5.983	0.776919	0.108	3.3x10 ⁻⁶		
59 50	3890	900	16.774	1.334	4.322	0.635685	0.108	3x10 ⁻⁶		
15 4 50	4190	1200	16.366	0.896	3.492	0.543074	0.108	2.8x10 ⁻⁶		
9 50	4490	1500	16.118	0.678	2.993	0.476107	0.108	2.6x10 ⁻⁶		
14 50	4790	1800	15.955	0.515	2.661	0.425045	0.108	2.5x10 ⁻⁶		
24 50	5390	2400	15.775	0.335	2.246	0.35141	0.108	2.2x10 ⁻⁶		
34 50	5990	3000	15.692	0.252	1.997	0.296007	0.108	2x10 ⁻⁶		
44 50	6590	3600	15.640	0.2	1.831	0.262688	0.108	1.8x10 ⁻⁶		
16 14 50	8390	5400	15.56	0.12	1.554	0.191451	0.108	1.4x10 ⁻⁶		
44 50	10190	7200	15.512	0.072	1.415	0.150756	0.108	1.1x10 ⁻⁶		
17 14 50	11990	9000	15.503	0.063	1.332	0.124504	0.108	1x10 ⁻⁶		

APPENDIX F - 2

Table Data of Pumping Test (J-No. 2), 4 Mar. 1982

Time hr min sec	Time after Pumping Started t (sec)	Time after Pumping Stopped t'(sec)	Water Level (m)	Draw- down s(m)	t/t'	Log t/t'	Radius of Well r (m)	r ² /t	Pumping Rate Q(m ³ /sec)	Remarks
11 55 00	0		13.67	0			0.108			Pumping Started
	15		14.40	0.73			0.108	8x10 ⁻⁵		
	30		15.36	1.69			0.108	4x10 ⁻⁵		
	45		-	-			0.108	-		
	60		16.64	2.97			0.108	2x10 ⁻⁵		
	90		18.21	4.54			0.108	1.333x10 ⁻⁵		
	120		19.24	5.57			0.108	1x10 ⁻⁵		
	150		20.20	6.53			0.108	8x10 ⁻⁵		
	180		21.15	7.48			0.108	6.667x10 ⁻⁵		
	210		22.39	8.72			0.108	5.714x10 ⁻⁵		
	240		23.43	9.76			0.108	5x10 ⁻⁵		
	270		24.27	10.6			0.108	4.444x10 ⁻⁵		
	300		25.12	11.45			0.108	4x10 ⁻⁵		
	360		26.49	12.82			0.108	3.333x10 ⁻⁵		
	420		27.675	14.005			0.108	2.857x10 ⁻⁵		
	480		28.61	14.94			0.108	2.5x10 ⁻⁵		
	540		29.425	15.755			0.108	2.222x10 ⁻⁵		
	600		30.11	16.44			0.108	2x10 ⁻⁵	0.00177	Q = 103.8 l/min Q = 0.00177 m ³ /sec
	900		32.16	18.49			0.108	1.333x10 ⁻⁵		
	1200		33.40	19.73			0.108	1x10 ⁻⁵		
	1500		34.115	20.445			0.108	8x10 ⁻⁶		
	1800		34.84	21.17			0.108	6.667x10 ⁻⁶		
	2400		35.24	21.57			0.108	5x10 ⁻⁶	0.00181	
	3000		35.37	21.7			0.108	4x10 ⁻⁶	0.00166	
	3600		34.255	20.585			0.108	3.333x10 ⁻⁶		
	5400	0	33.530	19.86			0.108	2.222x10 ⁻⁶	0.00167	Pumping Stopped
	5415	15	32.645	18.975	361	2.558	0.108	2.216x10 ⁻⁶		
	5430	30	31.910	18.23	181	2.258	0.108	2.21x10 ⁻⁶		
	5445	45	31.111	17.441	121	2.083	0.108	2.204x10 ⁻⁶		
	5460	60	30.321	16.651	91	1.959	0.108	2.198x10 ⁻⁶		
	5490	90	28.775	15.105	61	1.785	0.108	2.186x10 ⁻⁶		
	5520	120	27.31	13.64	46	1.663	0.108	2.174x10 ⁻⁶		
	5550	150	25.935	12.265	37	1.568	0.108	2.167x10 ⁻⁶		
	5580	180	24.68	11.01	31	1.491	0.108	2.151x10 ⁻⁶		
	5610	210	23.515	9.845	26.714	1.427	0.108	2.139x10 ⁻⁶		
	5640	240	22.37	8.7	23.5	1.371	0.108	2.128x10 ⁻⁶		
	5670	270	21.575	7.905	21	1.322	0.108	2.116x10 ⁻⁶		
	5700	300	20.875	7.205	19	1.279	0.108	2.105x10 ⁻⁶		
	5760	360	19.615	5.945	16	1.204	0.108	2.083x10 ⁻⁶		
	5820	420	18.52	4.85	13.857	1.142	0.108	2.062x10 ⁻⁶		
	5880	480	17.59	3.92	12.25	1.088	0.108	2.041x10 ⁻⁶		
	5940	540	16.845	3.175	11	1.041	0.108	2.02x10 ⁻⁶		
	6000	600	16.193	2.523	10	1	0.108	2x10 ⁻⁶		
	6300	900	14.51	0.84	7	0.845	0.108	1.905x10 ⁻⁶		
	6600	1200	14.074	0.404	5.5	0.740	0.108	1.818x10 ⁻⁶		
	6900	1500	13.918	0.248	4.6	0.663	0.108	1.739x10 ⁻⁶		
	7200	1800	13.837	0.167	4	0.602	0.108	1.667x10 ⁻⁶		
	7800	2400	13.747	0.077	3.25	0.512	0.108	1.538x10 ⁻⁶		
	8400	3000	13.705	0.035	2.8	0.447	0.108	1.429x10 ⁻⁶		
	10200	4800	13.64	-0.03	2.125	0.327	0.108	1.176x10 ⁻⁶		
11 15 00	12000	6600	13.577	-0.093	1.818	0.26	0.108	1x10 ⁻⁶		

APPENDIX F - 3

Table Data of Pumping Test (J-No. 3), 29 Mar. 1982

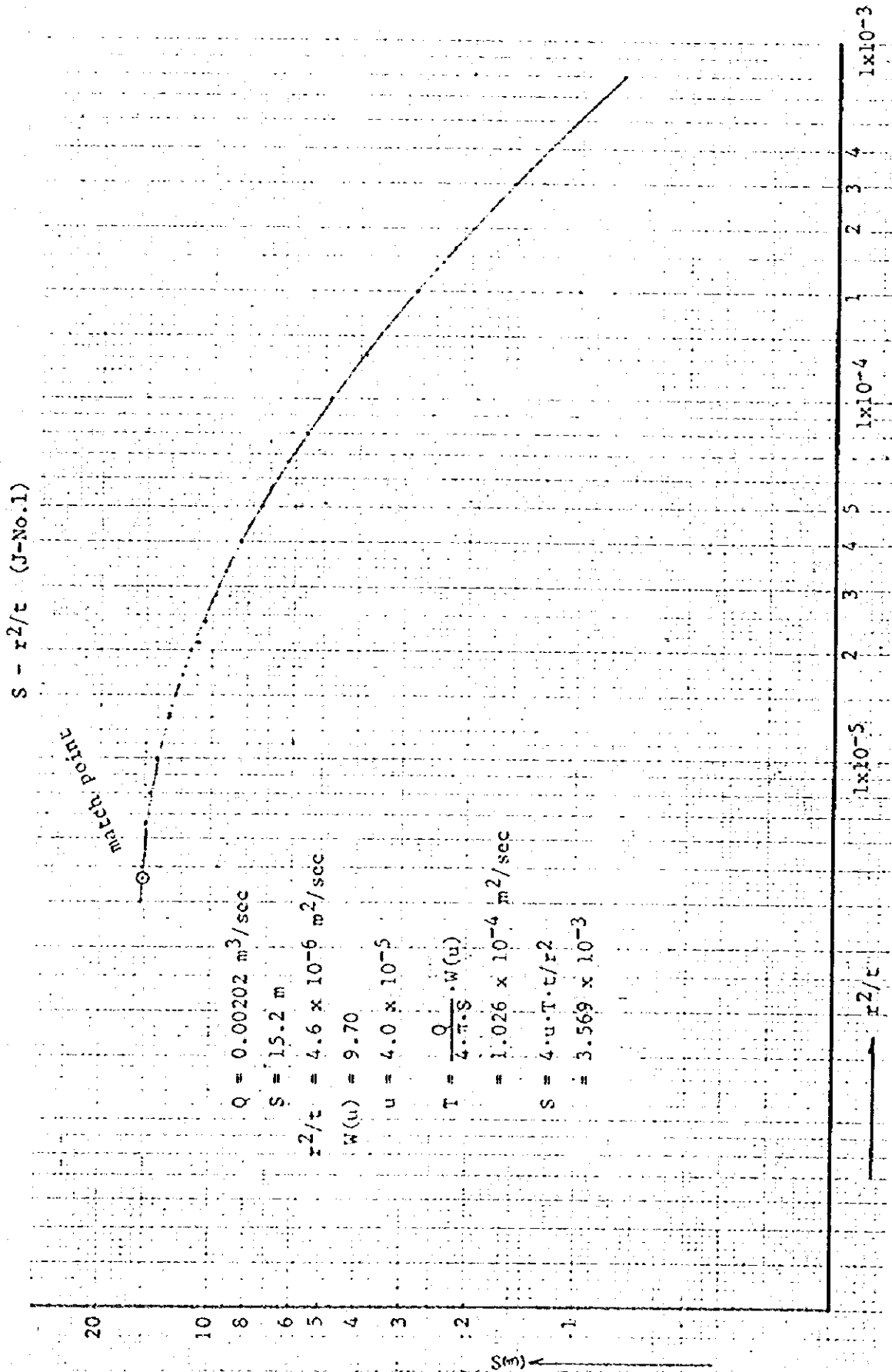
Time min sec	Time after Pumping Started t (sec)	Time after Pumping Stopped t' (sec)	Water Level (m)	Draw- down s(m)	t/t'	Log t/t'	Radius of Well r (m)	r ² /t	Pumping Rate Q(m ³ /sec)	Remarks
08 00	0		13.555	0			0.108			
	30		15.71	2.155			0.108	3.888x10 ⁻⁶		
	60		17.332	3.777			0.108	1.944x10 ⁻⁶		
	90		19.07	5.515			0.108	1.29333x10 ⁻⁶		
	120		20.475	6.92			0.108	9.7x10 ⁻⁷		
	150		21.633	8.078			0.108	7.76x10 ⁻⁷		
	180		22.663	9.108			0.108	6.46666x10 ⁻⁷		
	210		23.437	9.882			0.108	5.54285x10 ⁻⁷		
	240		24.131	10.576			0.108	4.85x10 ⁻⁷		
	270		24.772	11.217			0.108	4.31111x10 ⁻⁷		
	300		25.30	11.745			0.108	3.88x10 ⁻⁷		
	360		26.182	12.627			0.108	3.23333x10 ⁻⁷		
	420		26.866	13.311			0.108	2.77142x10 ⁻⁷		
	480		27.407	13.852			0.108	2.425x10 ⁻⁷		
	540		27.815	14.26			0.108	2.15555x10 ⁻⁷		
	600		28.15	14.595			0.108	1.94x10 ⁻⁷		
	900		29.127	15.572			0.108	1.29333x10 ⁻⁷		
	1200		29.61	16.055			0.108	9.7x10 ⁻⁸		
	1500		29.895	16.34			0.108	7.76x10 ⁻⁸		
	1800		30.04	16.485			0.108	6.46666x10 ⁻⁸		
	2400		30.20	16.645			0.108	4.85x10 ⁻⁸		
	3000		30.476	16.921			0.108	3.88x10 ⁻⁸		
	3600	0	30.477	16.922			0.108	3.23338x10 ⁻⁸		
	3660	60	28.052	14.502	61	1.78533				
	3690	90	25.717	12.162	41	1.61278				
	3720	120	23.605	10.05	31	1.49136				
	3750	150	21.838	8.283	25	1.39794				
	3780	180	20.27	6.715	21	1.32222				
	3810	210	18.977	5.422	18.142857	1.25871				
	3840	240	17.936	4.381	16	1.20412				
	3870	270	17.091	3.536	14.3333	1.15635				
	3900	300	16.437	2.882	13	1.11394				
	3930	330	15.879	2.324	11.90909	1.07588				
	3960	360	15.421	1.866	11	1.04139				
	4020	420	14.736	1.181	9.5714285	0.980977				
	4080	480	14.322	0.767	8.5	0.929419				
	4140	540	14.042	0.465	7.6666666	0.88467				
	4200	600	13.849	0.294	7	0.845098				
	4260	660	13.715	0.16	6.4545454	0.809866				
	4360	960	13.332	-0.223	4.75	0.676694				
	4860	1260	13.141	-0.414	3.8571428	0.586266				
	5160	1560	13.0	-0.555	3.3076923	0.519525				
	5460	1860	12.913	-0.625	2.9354838	0.46768				
	6060	2460	12.778	-0.777	2.4634146	0.391538				
	6660	3060	12.685	-0.87	2.1764705	0.337753				
	7260	3660	12.624	-0.931	1.9836065	0.297456				

Q = 154.9 l/min
= 0.00258 m³/sec

APPENDIX F - 4

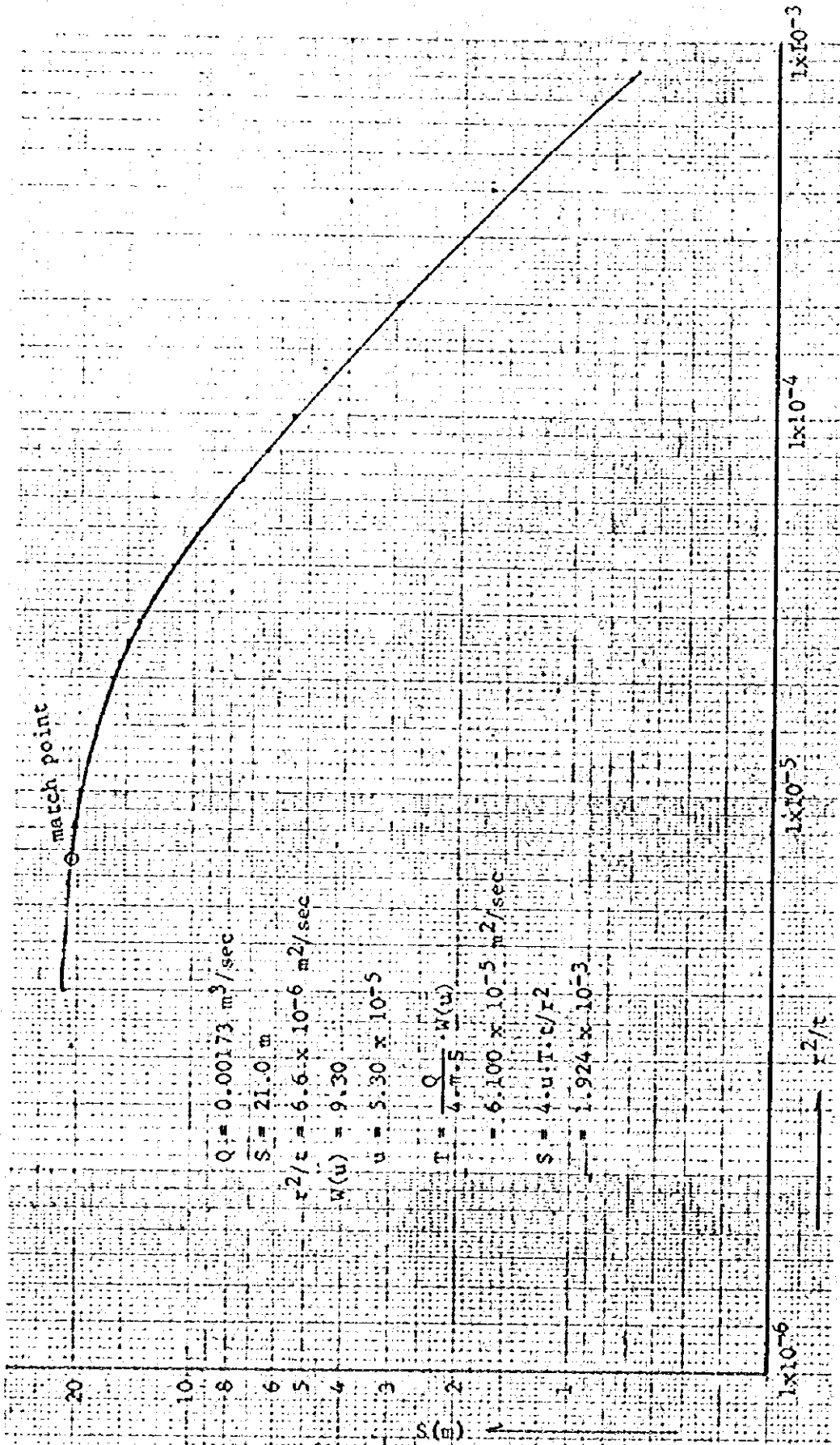
Table Data of Pumping Test (J-No. 4), 6 Apr. 1982

Time min sec	Time after Pumping Started t (sec)	Time after Pumping Stopped t' (sec)	Water Level (m)	Draw- down s (m)	t/t'	Log t/t'	Radius of Well r (m)	r ² /t	Pumping Rate Q(m ³ /sec)	Remarks
15 00	0		5.500	0			0.108	0		Pumping Started
	15		6.325	0.825			0.108	7.78x10 ⁻⁵		
	30		6.720	1.220			0.108	3.89x10 ⁻⁵		
	45		6.825	1.325			0.108	2.59x10 ⁻⁵		
	60		6.954	1.454			0.108	1.94x10 ⁻⁵		
	90		7.092	1.592			0.108	1.30x10 ⁻⁵		
	120		7.205	1.705			0.108	9.72x10 ⁻⁶		
	150		7.294	1.794			0.108	7.78x10 ⁻⁶		
	180		7.370	1.870			0.108	6.48x10 ⁻⁶		
	210		7.430	1.930			0.108	5.55x10 ⁻⁶		
	240		7.489	1.989			0.108	4.86x10 ⁻⁶		
	270		7.550	2.050			0.108	4.32x10 ⁻⁶		
	300		7.593	2.093			0.108	3.89x10 ⁻⁶		
	360		7.670	2.170			0.108	3.24x10 ⁻⁶		
	420		7.745	2.245			0.108	2.78x10 ⁻⁶		
	480		7.812	2.312			0.108	2.43x10 ⁻⁶		
	540		7.875	2.375			0.108	2.16x10 ⁻⁶		
	600		7.912	2.412			0.108	1.94x10 ⁻⁶		
	900		8.140	2.640			0.108	1.30x10 ⁻⁶		
	1200		8.285	2.785			0.108	9.72x10 ⁻⁷		
	1500		8.408	2.908			0.108	7.78x10 ⁻⁷		
	1800		8.500	3.000			0.108	6.48x10 ⁻⁷		Q = 244.26 l/min
	2400		8.647	3.147			0.108	4.86x10 ⁻⁷		= 0.004071 m ³ /sec
	3000		8.755	3.255			0.108	3.89x10 ⁻⁷		
	3600		8.836	3.336			0.108	3.24x10 ⁻⁷	0.004071	
	5625		9.020	3.520			0.108	2.15x10 ⁻⁷		
15 00	7200	0	9.100	3.600	0		0.108	1.62x10 ⁻⁷		Pumping Stopped
	7215	15	8.277	2.777	481	2.682	0.108	1.62x10 ⁻⁶		
	7230	30	7.873	2.373	241	2.382	0.108	1.61x10 ⁻⁶		
	7245	45	7.746	2.246	161	2.207	0.108	1.61x10 ⁻⁶		
	7260	60	7.664	2.164	121	2.083	0.108	1.61x10 ⁻⁶		
	7290	90	7.467	1.967	81	1.908	0.108	1.60x10 ⁻⁶		
	7320	120	7.358	1.858	61	1.785	0.108	1.59x10 ⁻⁶		
	7350	150	7.267	1.767	49	1.690	0.108	1.59x10 ⁻⁶		
	7380	180	7.191	1.691	41	1.613	0.108	1.58x10 ⁻⁶		
	7410	210	7.135	1.635	35.3	1.548	0.108	1.57x10 ⁻⁶		
	7440	240	7.071	1.571	31	1.491	0.108	1.57x10 ⁻⁶		
	7470	270	7.030	1.530	27.7	1.442	0.108	1.56x10 ⁻⁶		
	7500	300	6.970	1.470	25	1.398	0.108	1.55x10 ⁻⁶		
	7560	360	6.897	1.397	21	1.322	0.108	1.54x10 ⁻⁶		
	7620	420	6.830	1.330	18.1	1.258	0.108	1.53x10 ⁻⁶		
	7680	480	6.765	1.265	16	1.204	0.108	1.52x10 ⁻⁶		
	7740	540	6.710	1.210	14.3	1.155	0.108	1.51x10 ⁻⁶		
	7800	600	6.662	1.162	13	1.114	0.108	1.50x10 ⁻⁶		
	8400	1200	6.324	0.824	7	0.845	0.108	1.39x10 ⁻⁶		
	9000	1800	6.146	0.646	5	0.699	0.108	1.30x10 ⁻⁶		
	12600	5400	5.765	0.265	2.3	0.362	0.108	9.26x10 ⁻⁷		
45 00	16200	9000	5.665	0.165	1.8	0.255	0.108	7.20x10 ⁻⁷		

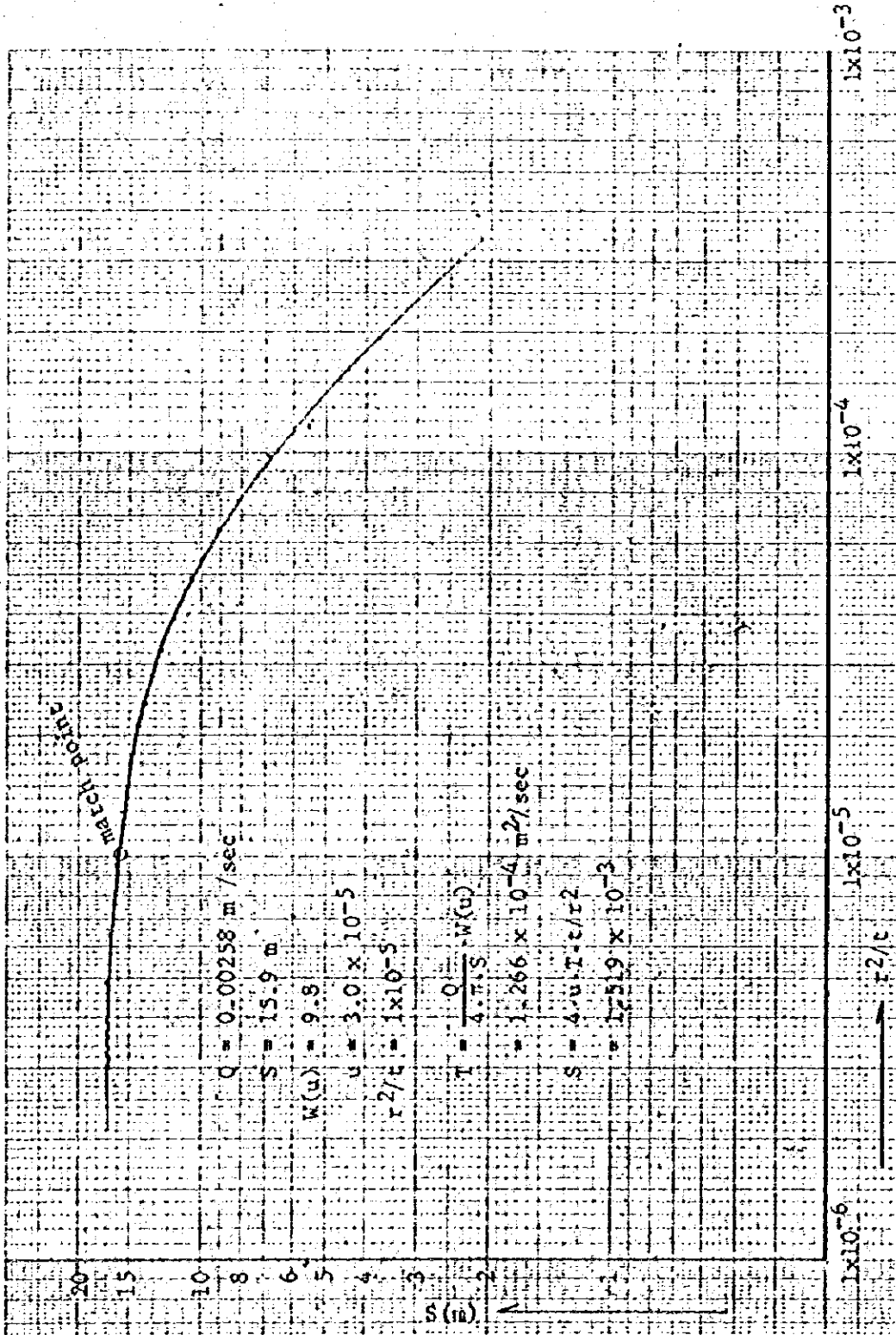




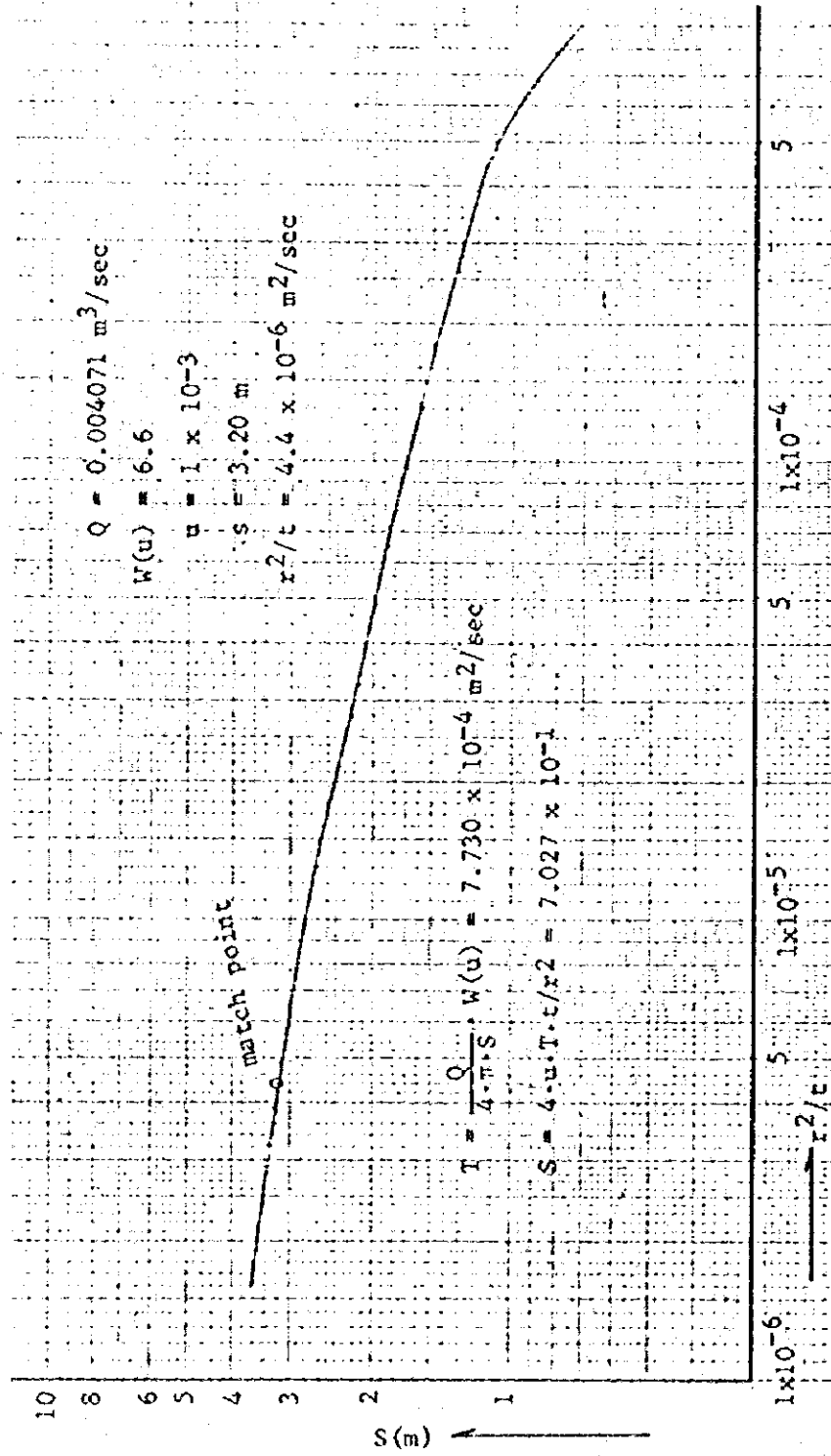
S - r²/t (J-No.2)

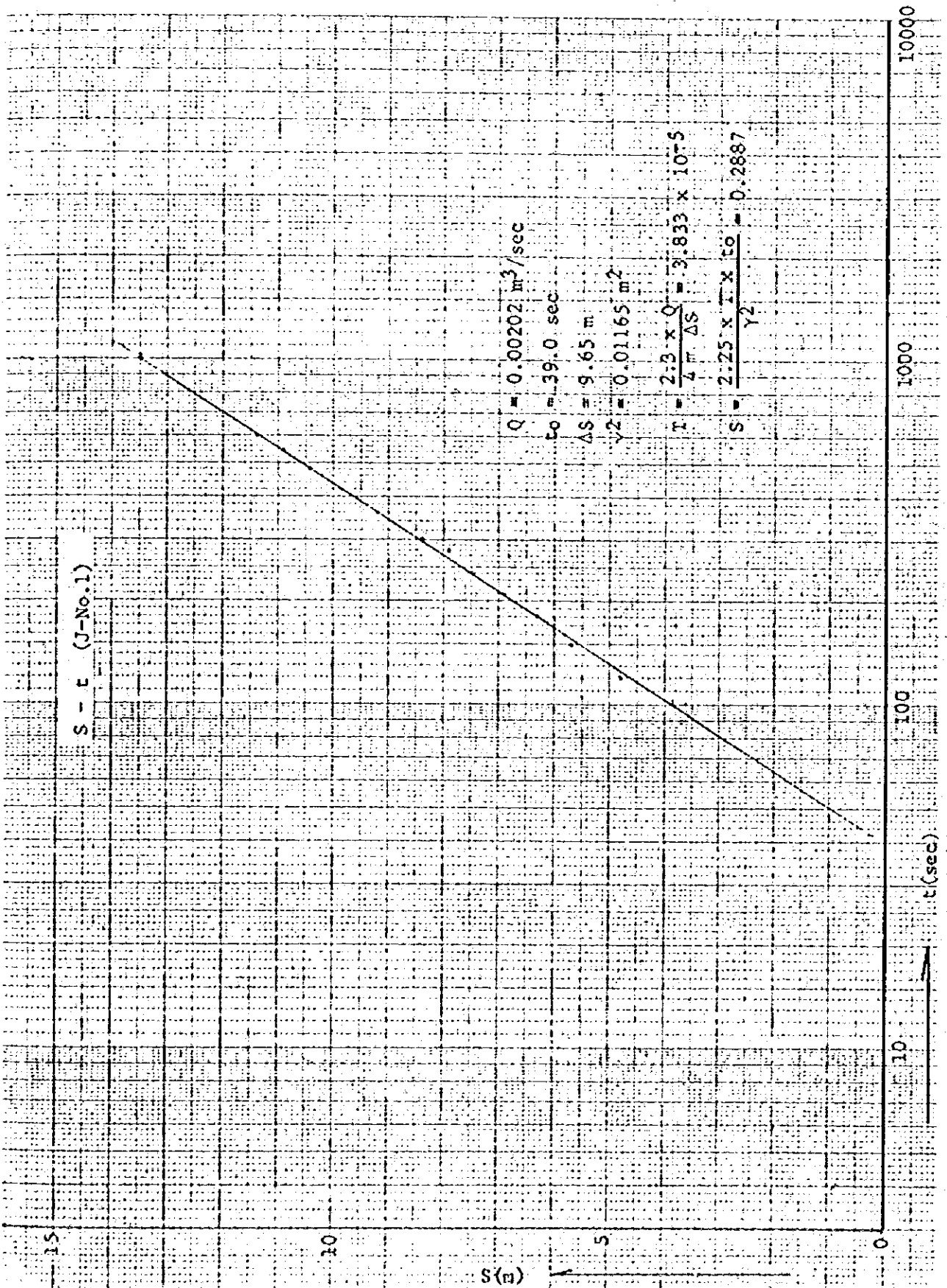


$S = r^2/\tau$ (J-No.3)

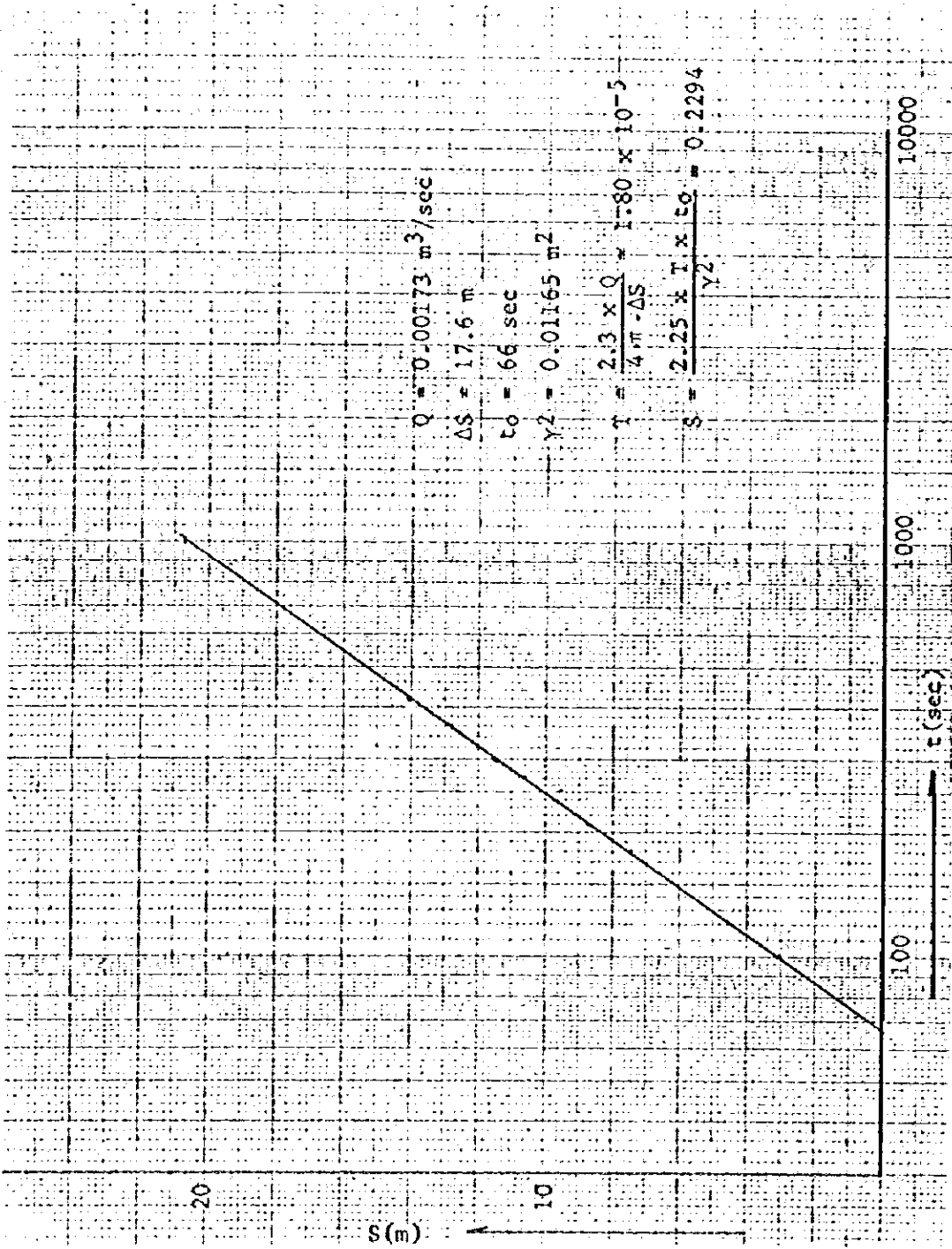


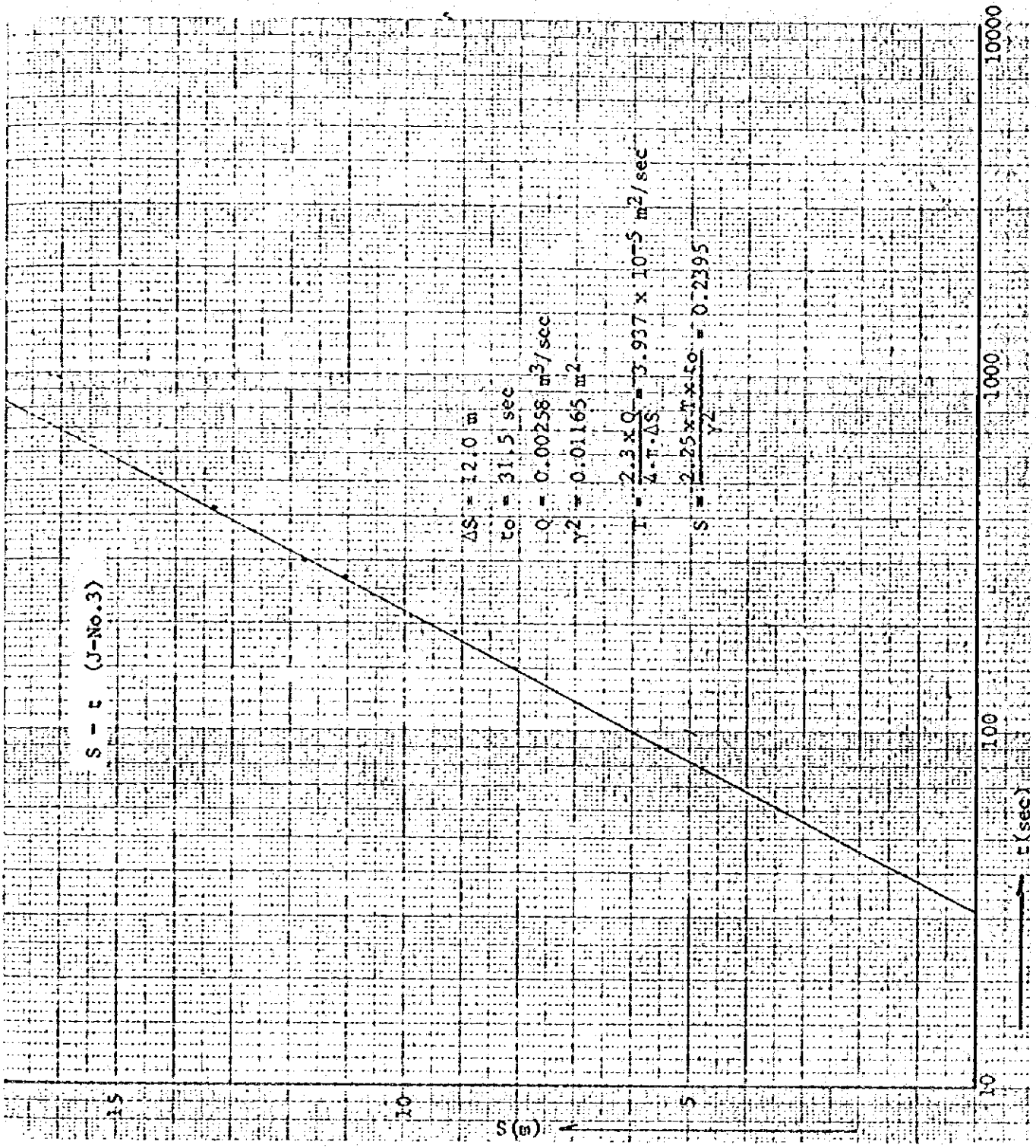
S - r²/t (J-No.4)



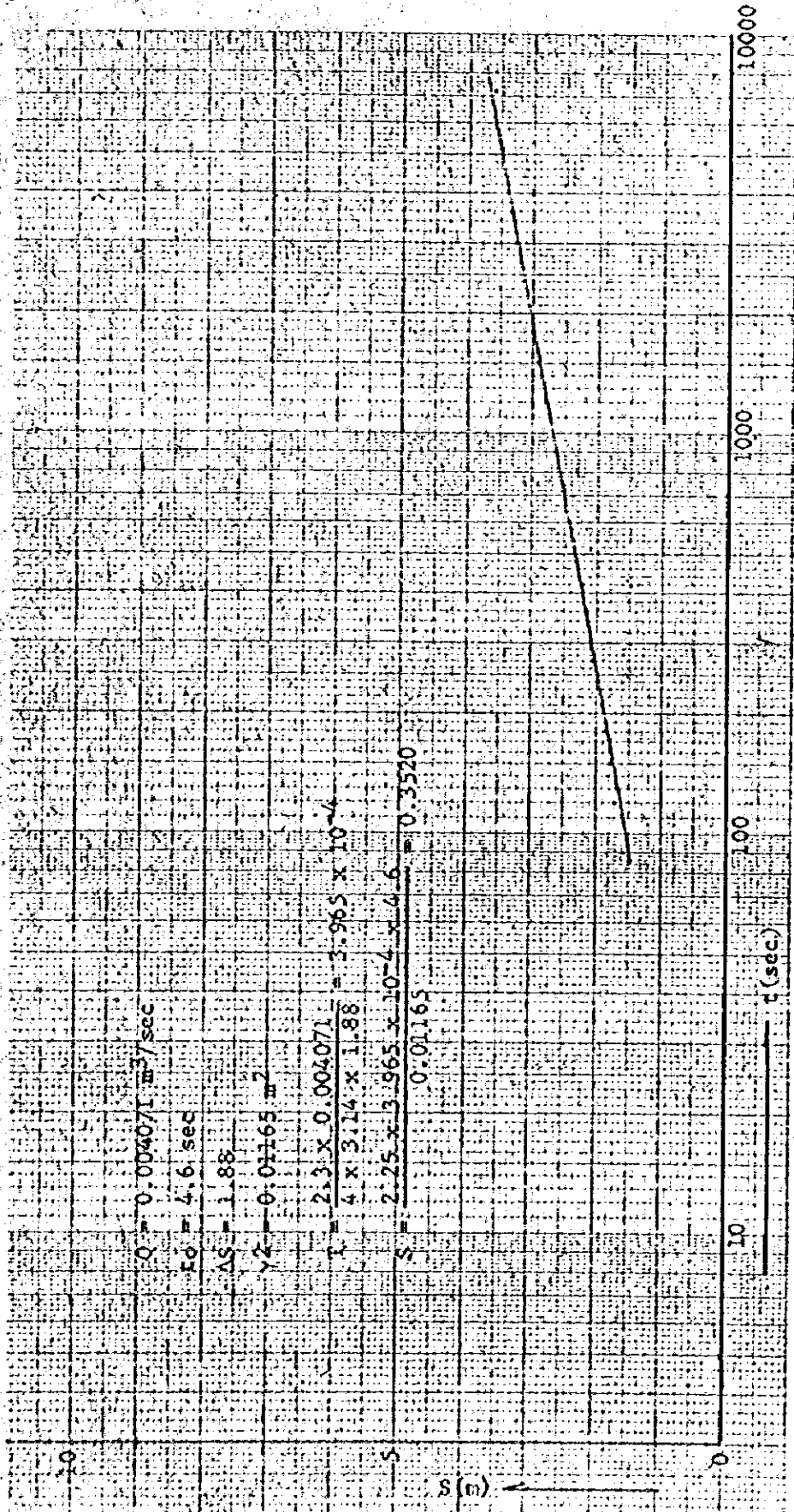


S - t (J-No.2)





S - t (F-No.4)



APPENDIX

STANDARD OF DRINKING WATER
(The Ministry of Public Health No.61, 1981)

1) Physical Properties

- . Colour not more than 20
- . Odor no other odor
(not include chlorine)
- . Turbidity not more than 5
- . PH value between 6.5 - 8.5

2) Chemical Properties

- . Total solid not more than 500 mg/kg
- . Total hardness not more than 100 mg/kg
- . Arsenic not more than 0.05 mg/kg
- . Barium not more than 1.0 mg/kg
- . Cadmium not more than 0.01 mg/kg
- . Chloride (expressed as chlorine) not more than 250 mg/kg
- . Chromium not more than 0.05 mg/kg
- . Copper not more than 1.0 mg/kg
- . Iron not more than 0.5 mg/kg
- . Lead not more than 0.1 mg/kg
- . Manganese Not more than 0.05 mg/kg
- . Mercury (Hg) not more than 0.002 mg/kg
- . Nitrates (expressed as nitrogen) not more than 4.0 mg/kg
- . PL not more than 0.001 mg/kg
- . Silver not more than 0.01 mg/kg
- . Sulfate not more than 250.0 mg/kg
- . Zinc not more than 5.0 mg/kg
- . Fluoride (express as fluorine) not more than 1.5 mg/kg

3) Bacterial Properties

- . Most probable number of coliform organism per 100 ml (M.P.N.) less than 2.2
- . Free from Escherichia coli type 1
- . There are not bacterial for illness

APPENDIX H - 1

BORING LOG

PROJECT - LOCATION BAN NA PHO GROUND ELEVATION 161.15 m DATE OF INVESTIGATION 13 ~ 18 FEB. 1982

BORING HOLE No. J-1 DEPTH TO GROUND WATER LEVEL IN HOLE 16.30 m INVESTIGATED BY K. NARITA

START DEPTH m	STOP DEPTH m	DIAMETER m	FIELD OBSERVATIONAL RECORD	COLOR TONE	DESCRIPTION	DRILLING TIME (min)	CASING PIPE and PUMP	ELECTRICAL LOG	
								RESISTIVITY (Ω-m)	RESISTIVITY (Ω-m)
0	1.0	10	Sandy Clay	Reddish Brown	Very Stiff	50		0	30
2	5.6	5.60	Clay	Dark Brown	Stiff and Slicky			5	10
6	14.0	14.00			5.6 m to 14 m Soft and Permeable (a little)			10	15
8	20.0	20.00						15	20
10	25.0	25.00			25 m to 32 m Hard			20	25
12	29.7	29.70			29.7 m Permeable			25	30
14	34.2	34.20			34.2 m Permeable			30	35
16	35.0	35.00			35 m to 39 m Hard			35	40
18	39.0	39.00						40	45
20	42.0	42.00	Shale	Pale Reddish Brown to Dark Brown				45	50
22	46.0	46.00						50	55
24	50.0	50.00						55	60
26	54.0	54.00						60	65
28	58.0	58.00						65	70
30	62.0	62.00						70	75
32	66.0	66.00						75	80
34	70.0	70.00						80	85
36	74.0	74.00						85	90
38	78.0	78.00						90	95
40	82.0	82.00						95	100
42	86.0	86.00						100	105
44	90.0	90.00						105	110
46	94.0	94.00						110	115
48	98.0	98.00						115	120
50	102.0	102.00						120	125
52	106.0	106.00						125	130
54	110.0	110.00						130	135
56	114.0	114.00						135	140
58	118.0	118.00						140	145
60	122.0	122.00						145	150

APPENDIX H - 2

BORING LOG

PROJECT LOCATION BAN NA PHO GROUND ELEVATION 160.385 m DATE OF INVESTIGATION 19~28 FEB. 1982

BORING HOLE No. J-2 DEPTH TO GROUND WATER LEVEL IN HOLE 13.50 m INVESTIGATED BY K. NARITA

STATION ELEVATION (m)	DEPTH (m)	THICKNESS (m)	FIELD OBSERVATIONAL RECORD		DRILLING TIME (min)	CASING	ELECTRICAL LOG	
			COLUMN SECTION (Graphic mark)	Soil or Rock NAME OF CLASSIFICATION			RESISTIVITY (Ω-m)	RESISTIVITY (Ω-m)
159.5	0.9	0.9		Sandy Clay				
156.3	4.1	3.2		Clay				
				Very stiff				
				Sluff and sticky 5.5m to 17m				
				Soft and permeable (a little) 17m to 29m				
				Hard 29m to 42m				
118.4	42.0	38.8		Shale				

BORING LOG

APPENDIX H - 3

PROJECT LOCATION BAN NA PHO GROUND ELEVATION 156.035 m DATE OF INVESTIGATION 21~25 MAR. 1981

BORING HOLE No. J-3 DEPTH TO GROUND WATER LEVEL IN HOLE 13.50 m INVESTIGATED BY K. NARITA

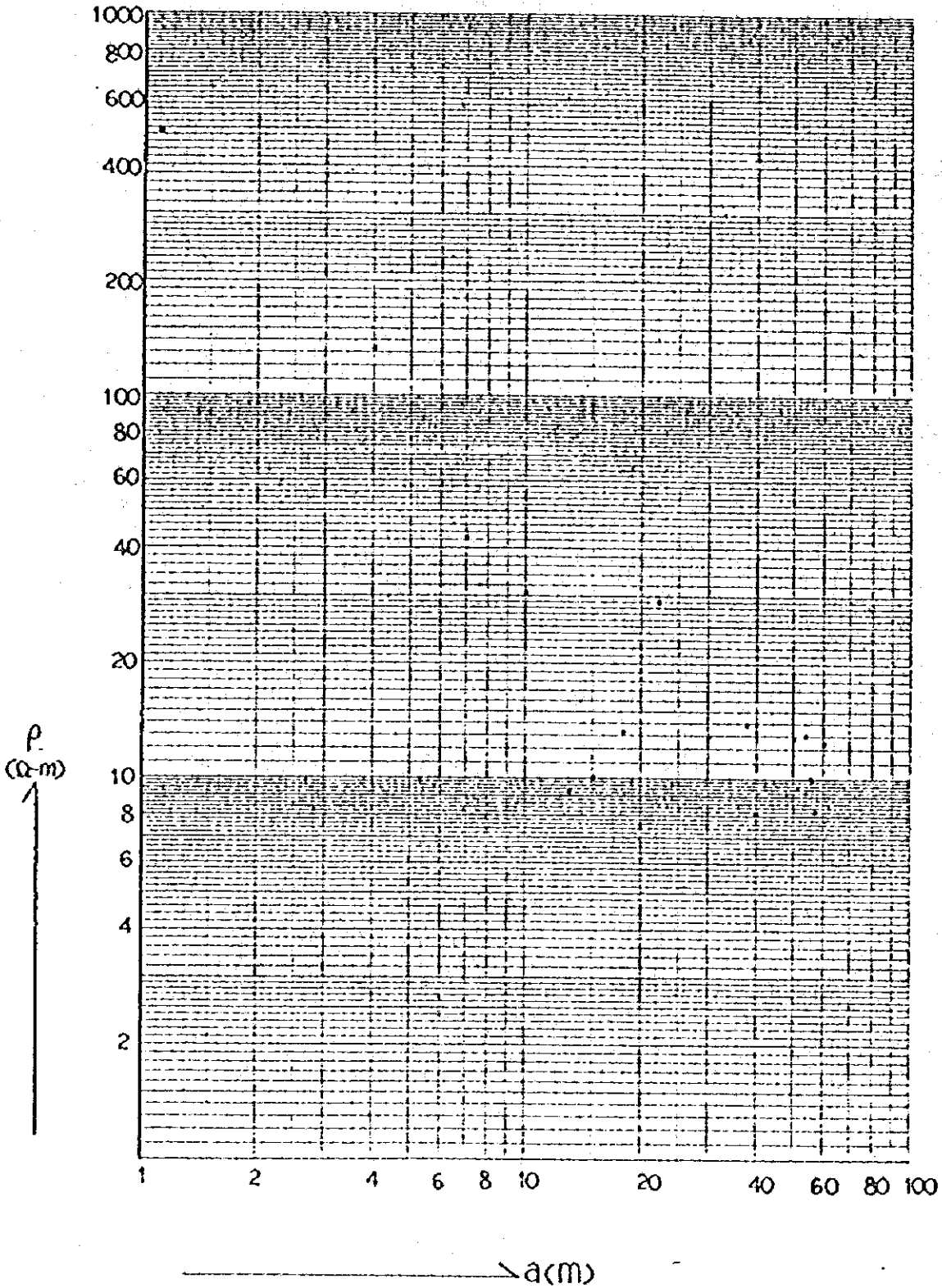
DEPTH (m)	DIAMETER (m)	FIELD OBSERVATIONAL RECORD	DRILLING TIME (min)	CASING PIPE and PUMP	ELECTRICAL LOG		
					RESISTIVITY (Ω -m)	RESISTIVITY (Ω -m)	
2							
4	151.5	4.50	4.50				
6							
8							
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42	114.0	42.0	37.5				
44							
46							
48							
50							
52							
54							
56							
58							
60							

BORING LOG

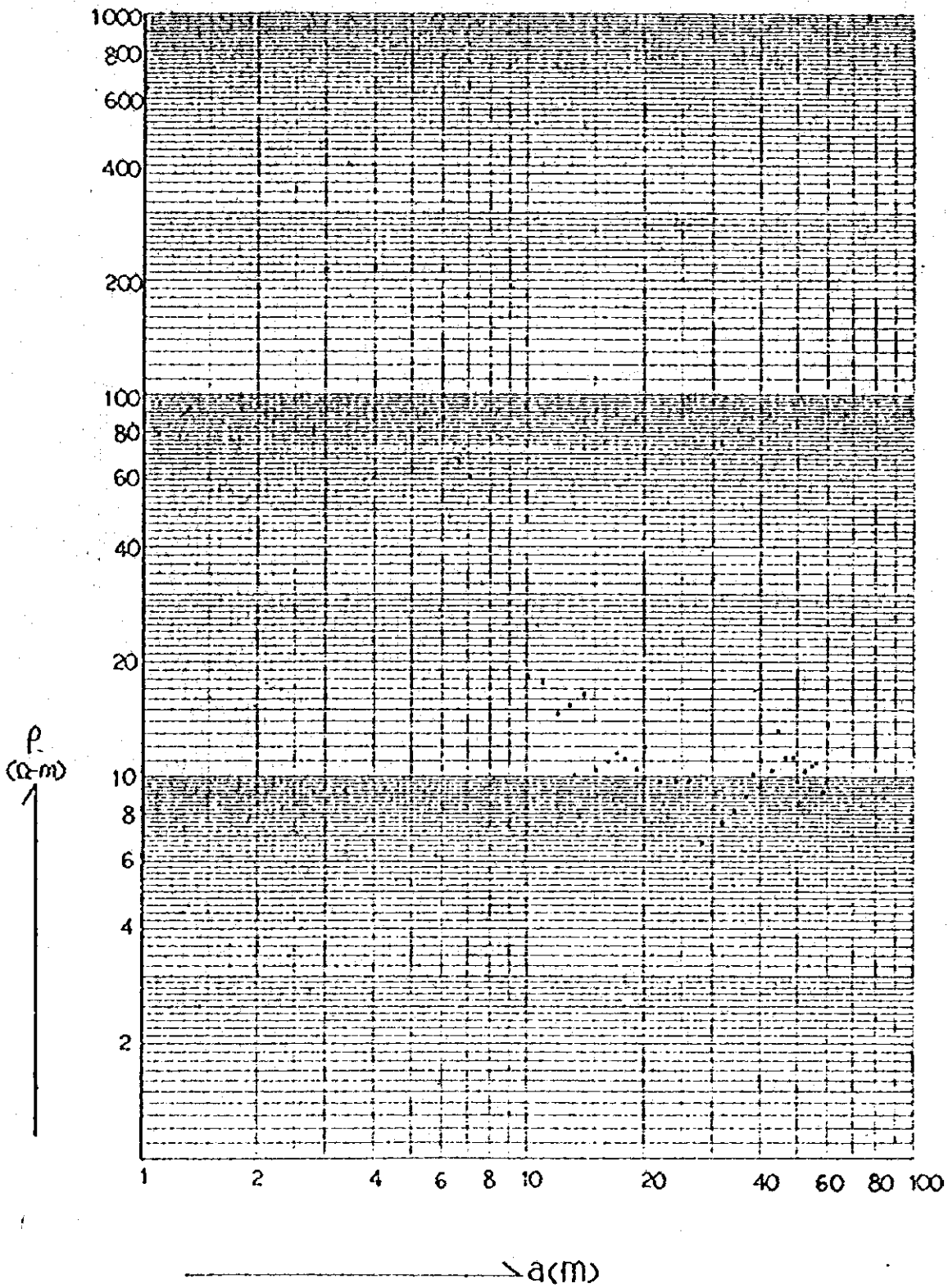
ADDRESS - LOCATION BAN NA PHO GROUND ELEVATION 151.651 m DATE OF INVESTIGATION 28 MAR. 1982
 BORING HOLE No. J-4 DEPTH TO GROUND WATER LEVEL IN HOLE 5.50 m INVESTIGATED BY K. NARITA

DEPTH m	DEPTH m	THICK- NESS m	FIELD OBSERVATIONAL RECORD		DRILLING TIME (min)	CASING PIPE and PUMP	ELECTRICAL LOG	
			Soil or Rock NAME OR CLASSIFICATION	DESCRIPTION			RESISTIVITY (Ω -m)	RESISTIVITY (Ω -m)
2	147.9	3.70		0 to 0.2 m Sandy Clay				
4	3.70	3.70	Clay	Stiff and Sticky 4.0 m to 4.4 m Very Soft 6 m to 7 m Crack a little				
12				12.5 m to 14 m Crack and Permeable				
23				23 m Permeable				
25				25 m to 27 m Hard				
27				27 m to 29 m Soft				
29				29 m to 33 m Very Hard				
42	109.6	42.0	Shale					

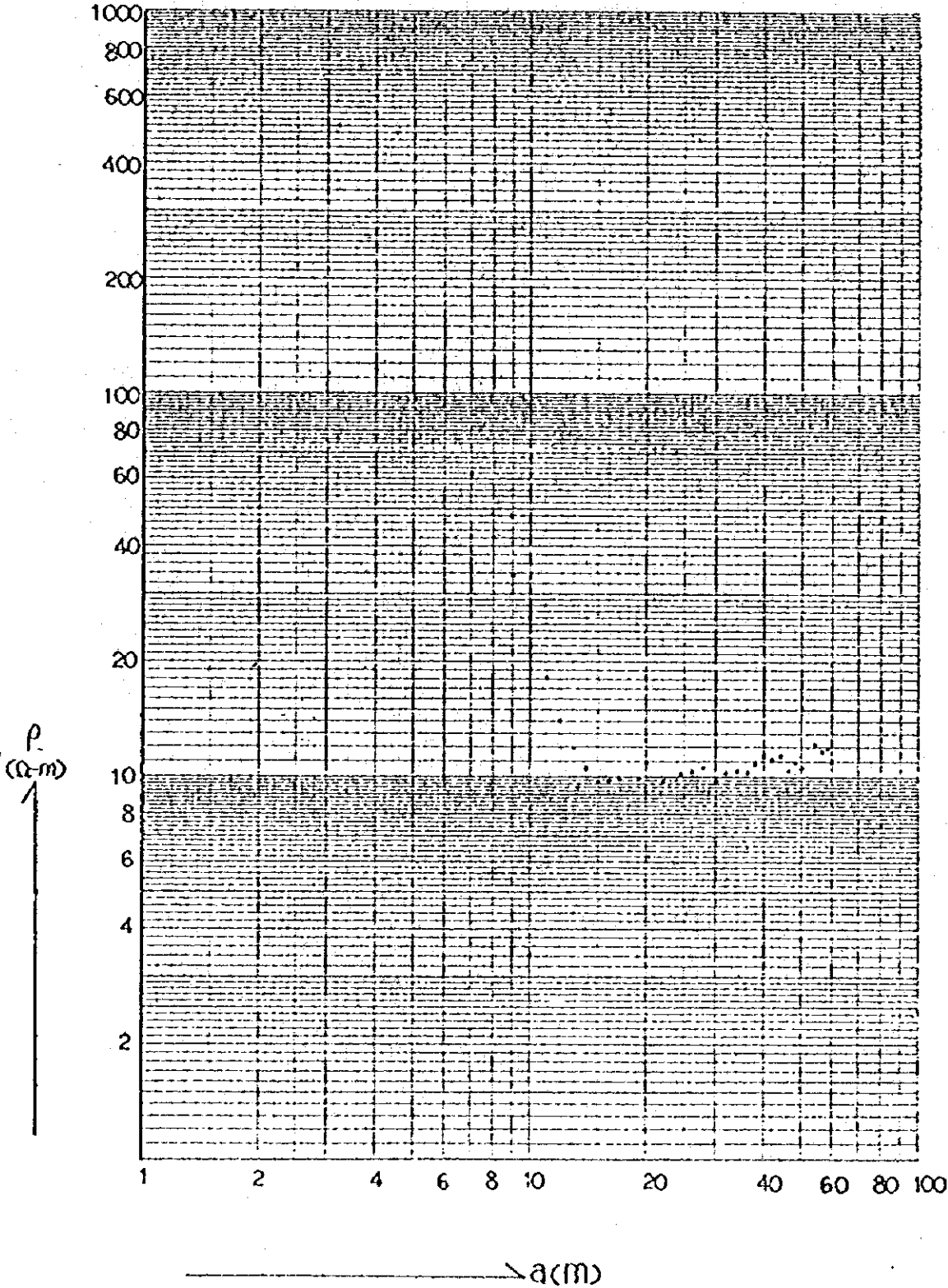
$\rho - a$ Curve (E - 1)



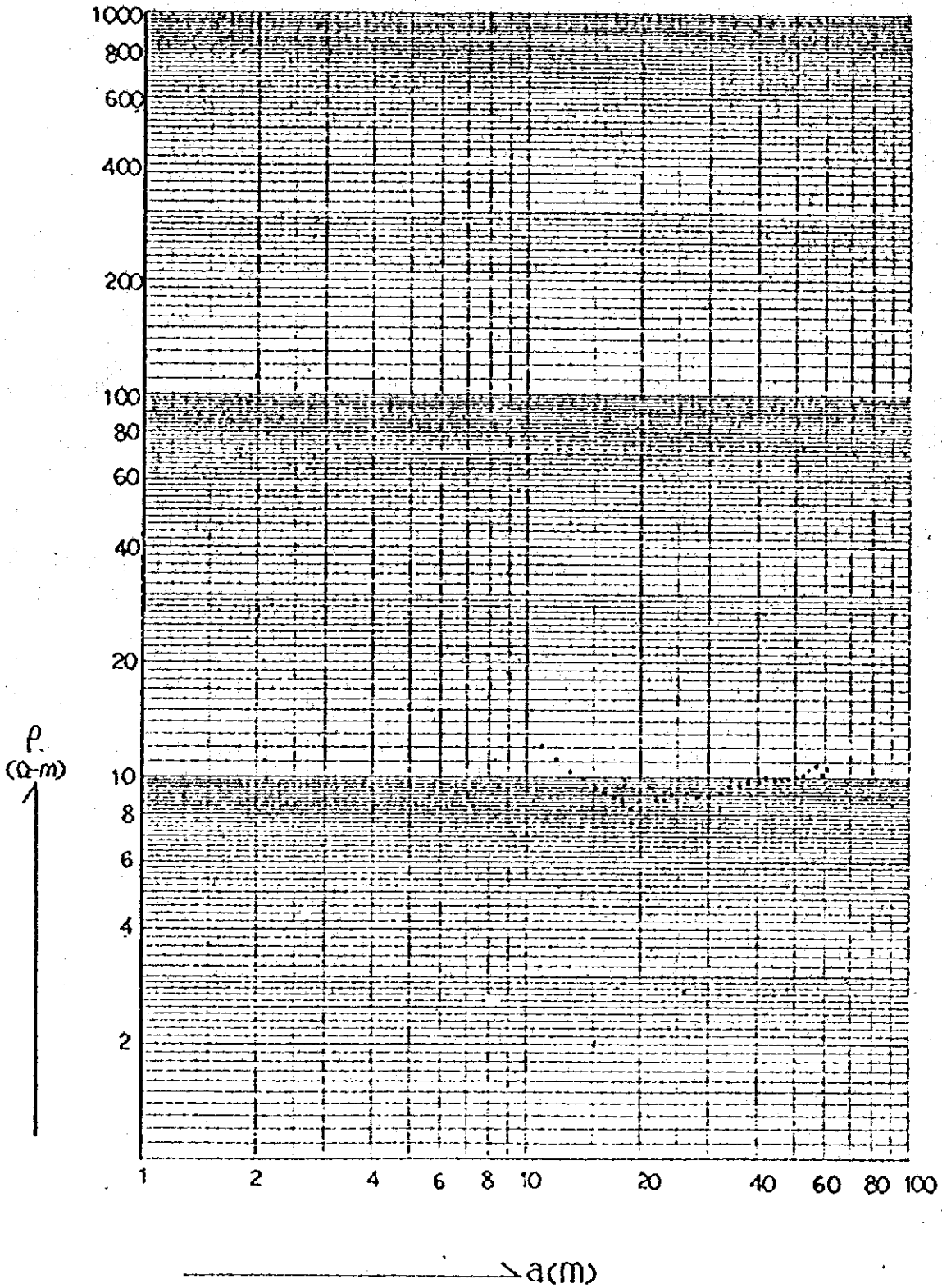
$\rho - a$ Curve (E - 2)



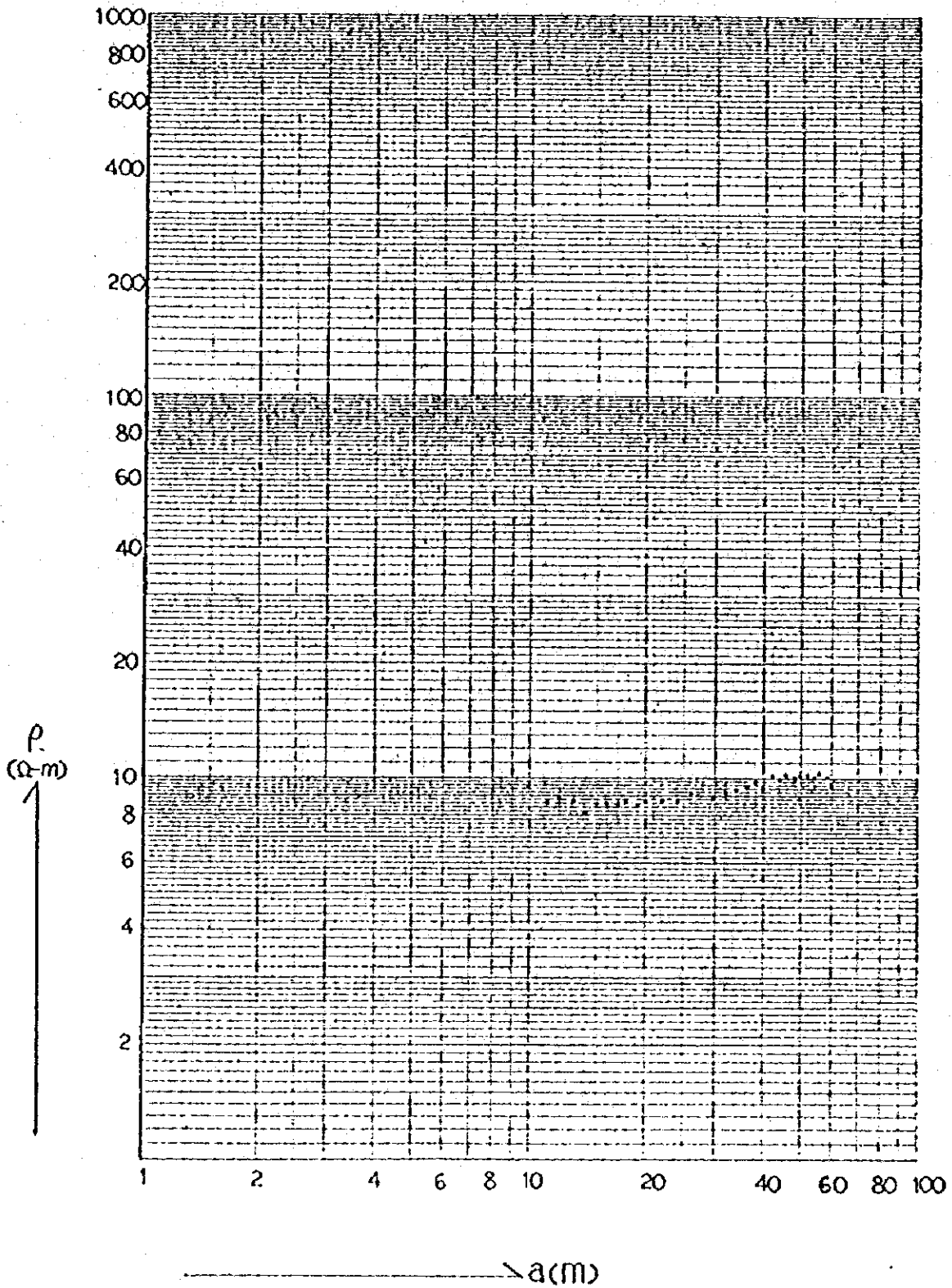
$\rho - a$ Curve (E - 3)



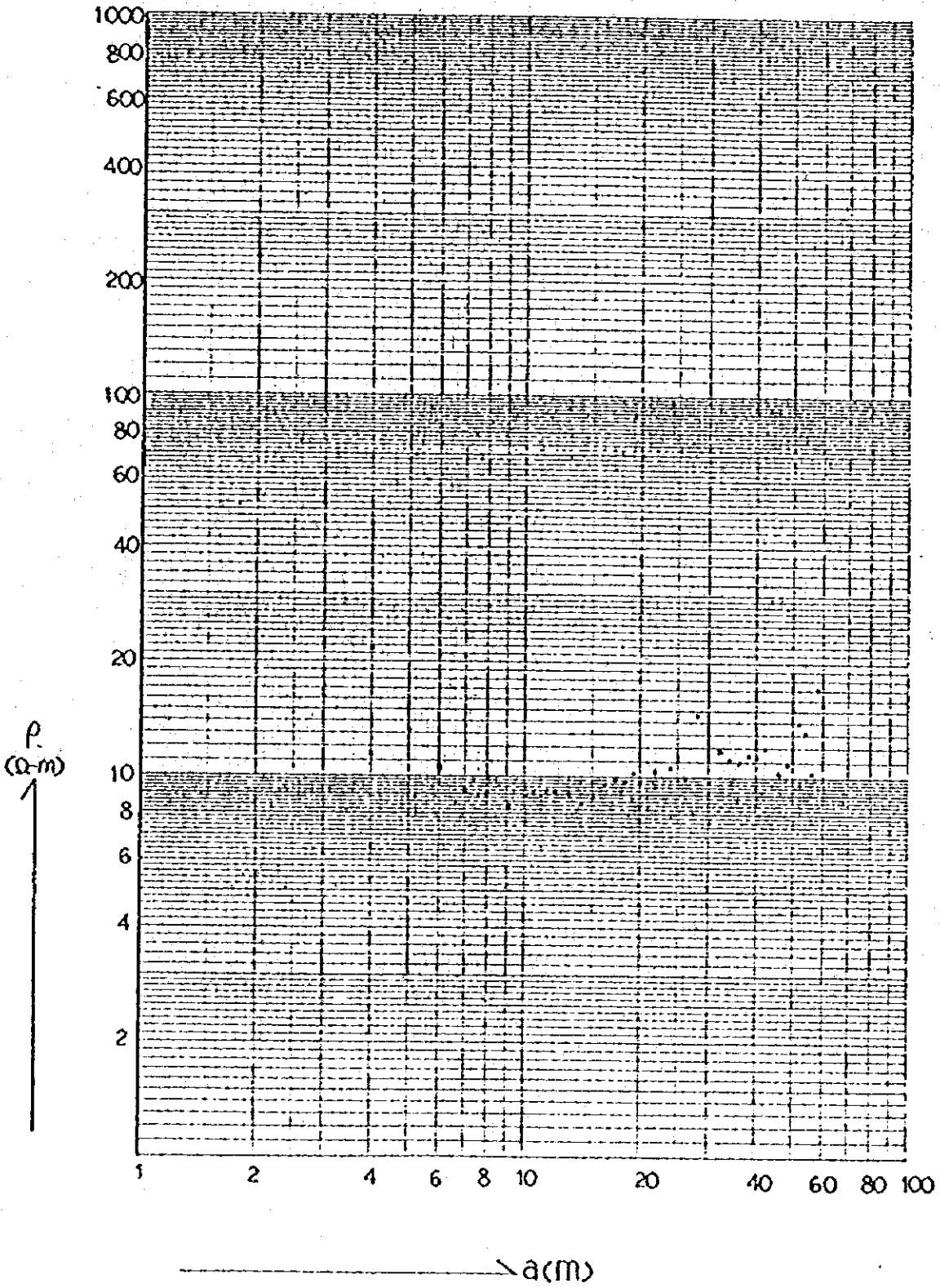
$\rho - a$ Curve (E - 4)



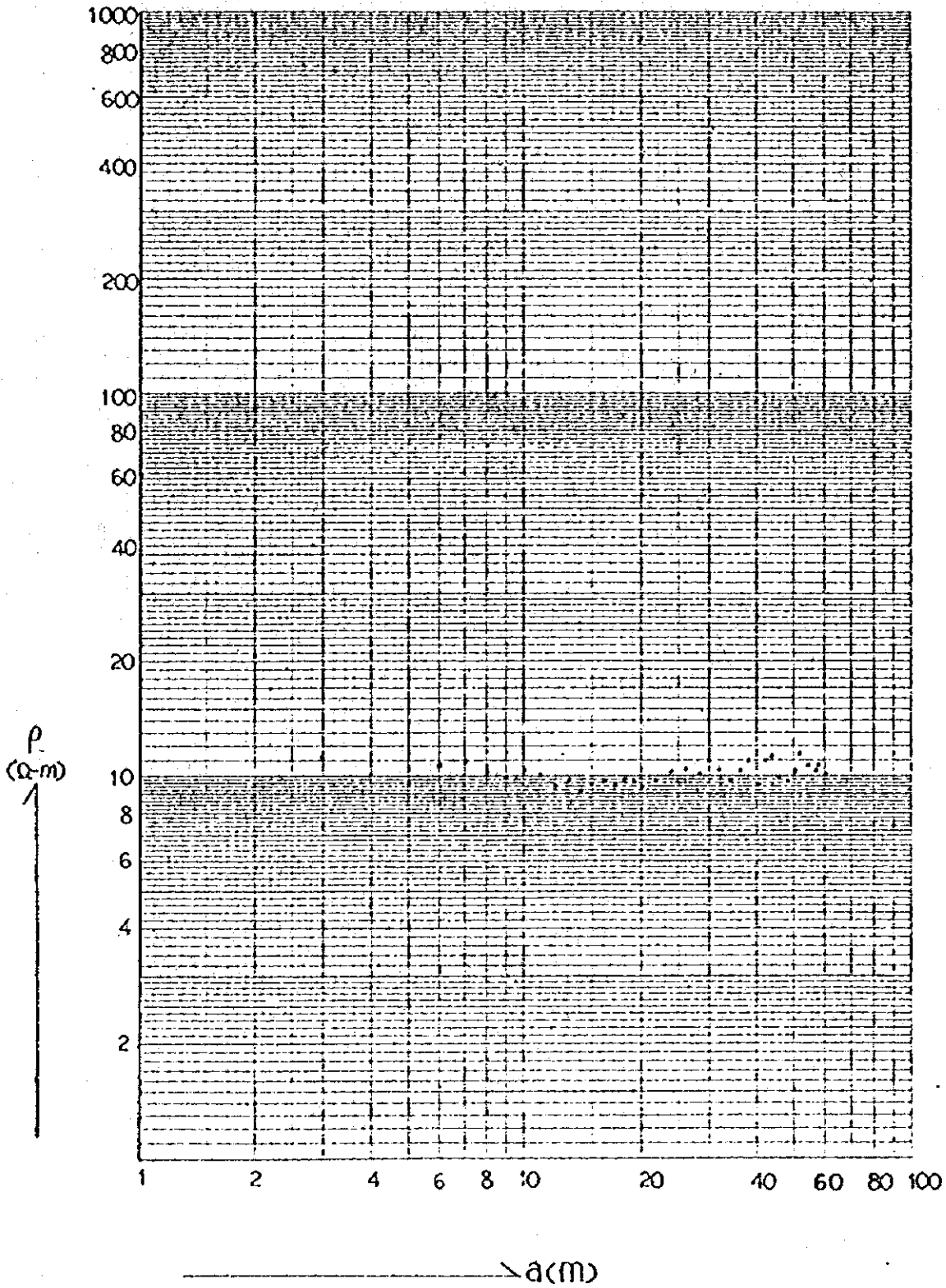
$\rho - a$ Curve (E - 5)



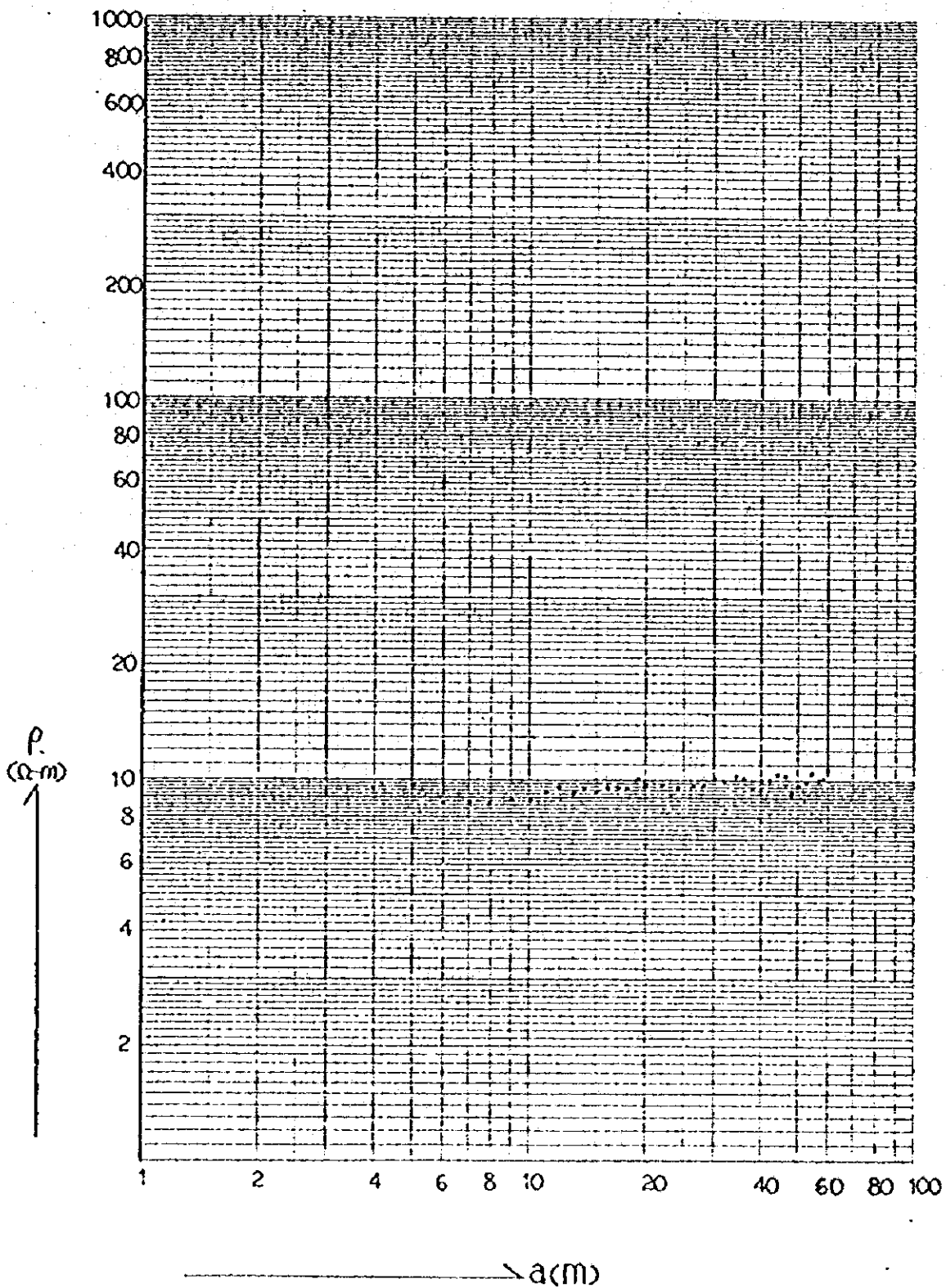
$\rho - a$ Curve (E - 6)



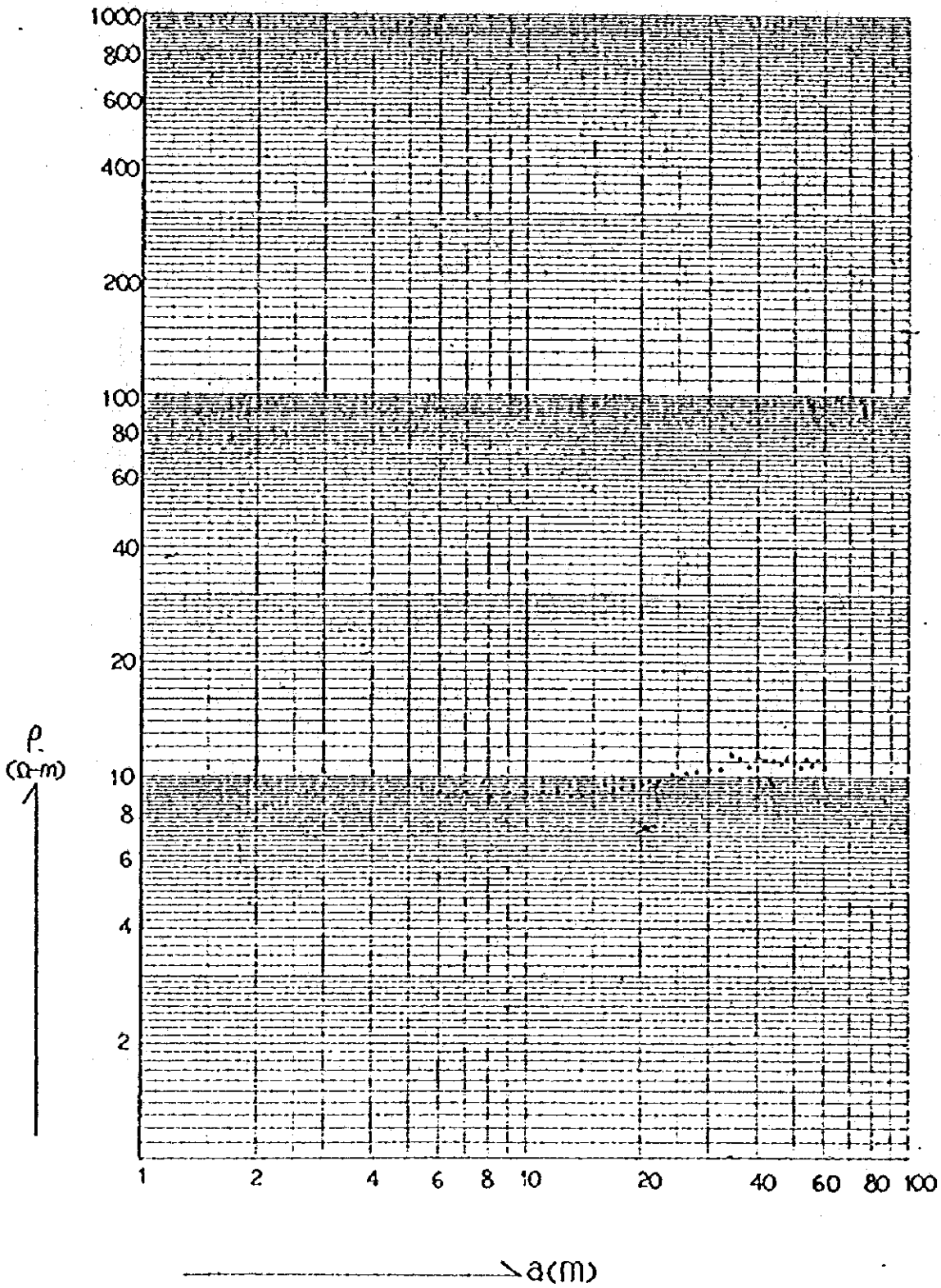
$\rho - a$ Curve (E - 7)



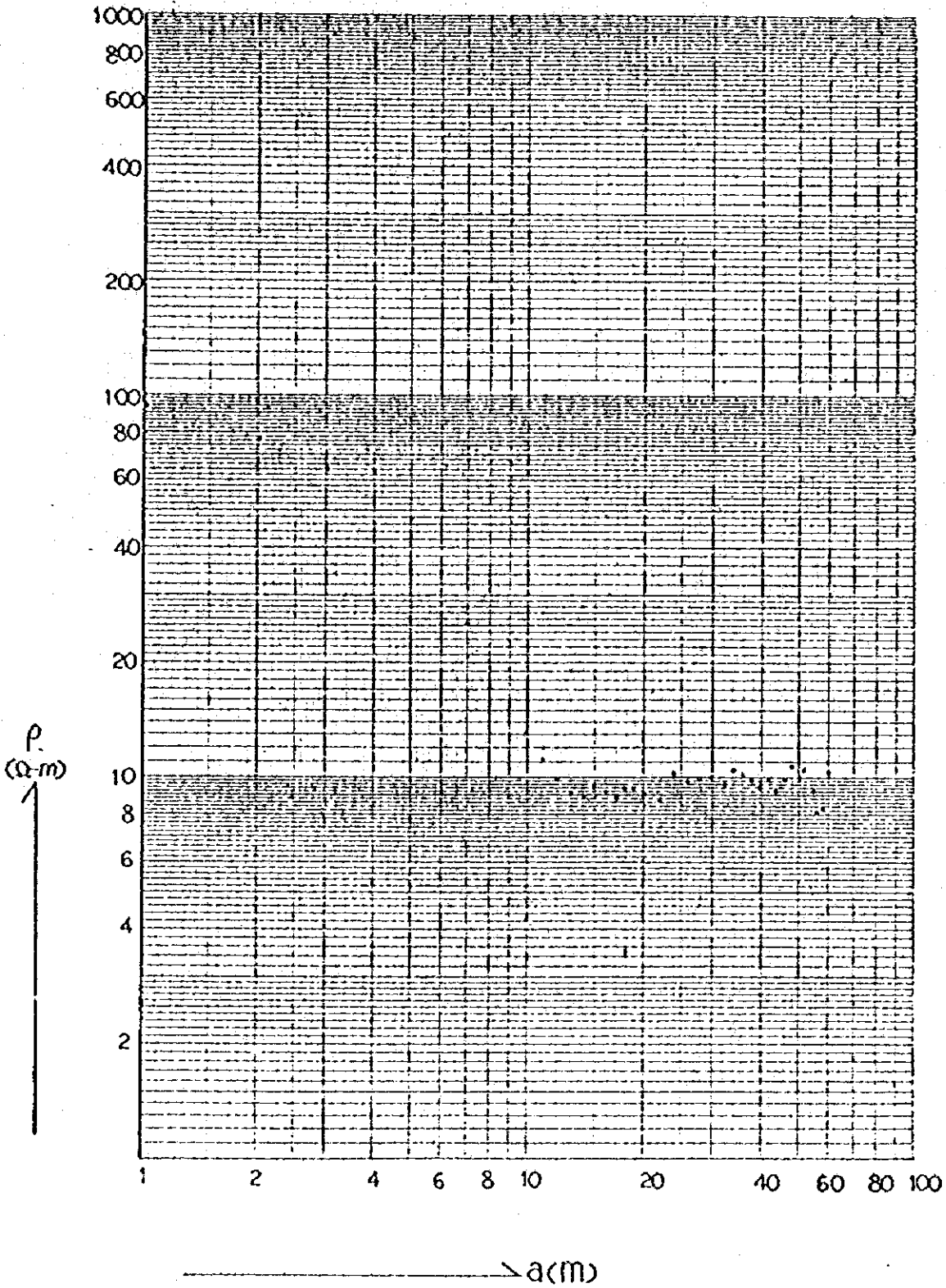
$\rho - a$ Curve (E - 8)



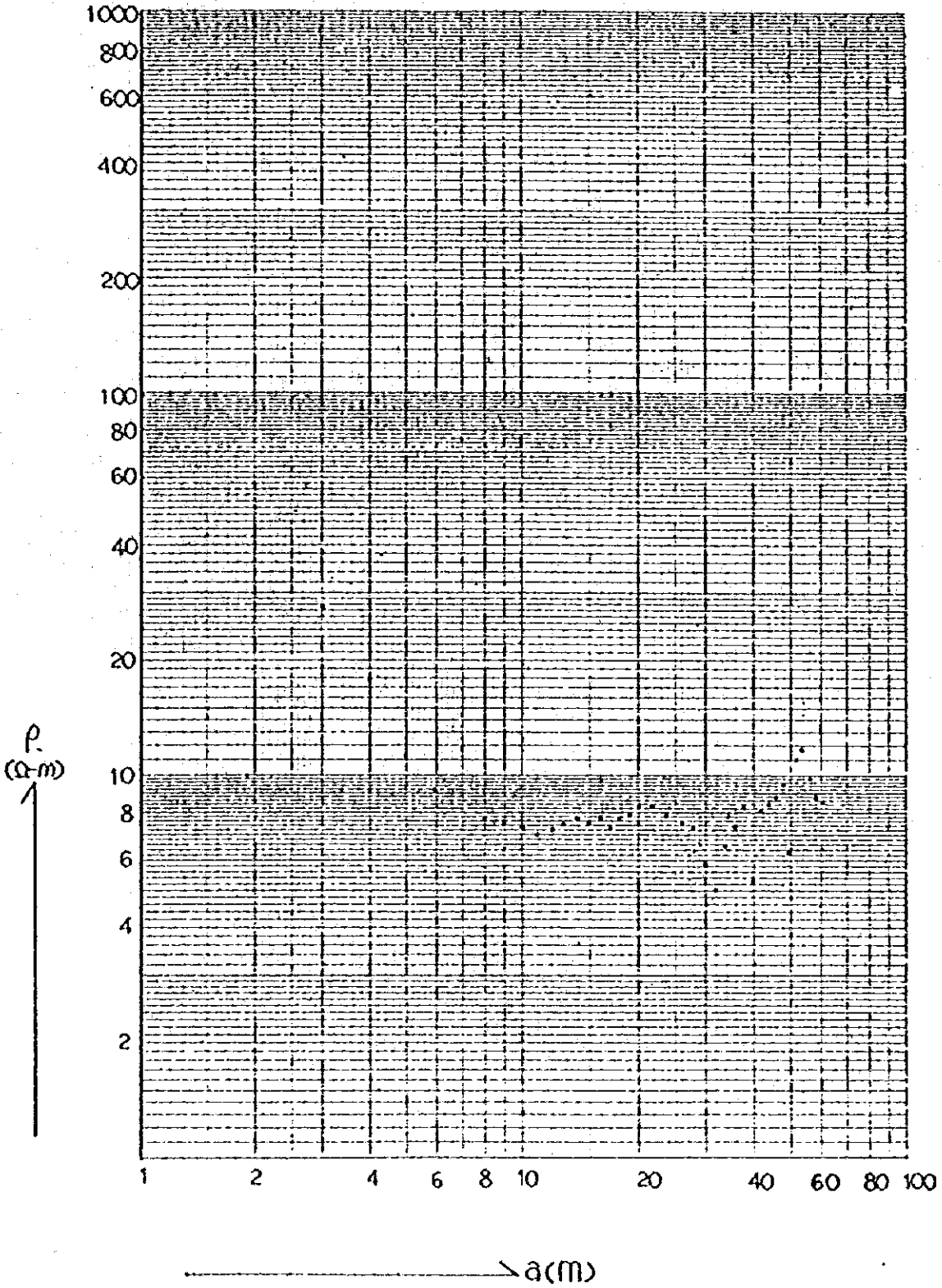
$\rho - a$ Curve (E - 9)



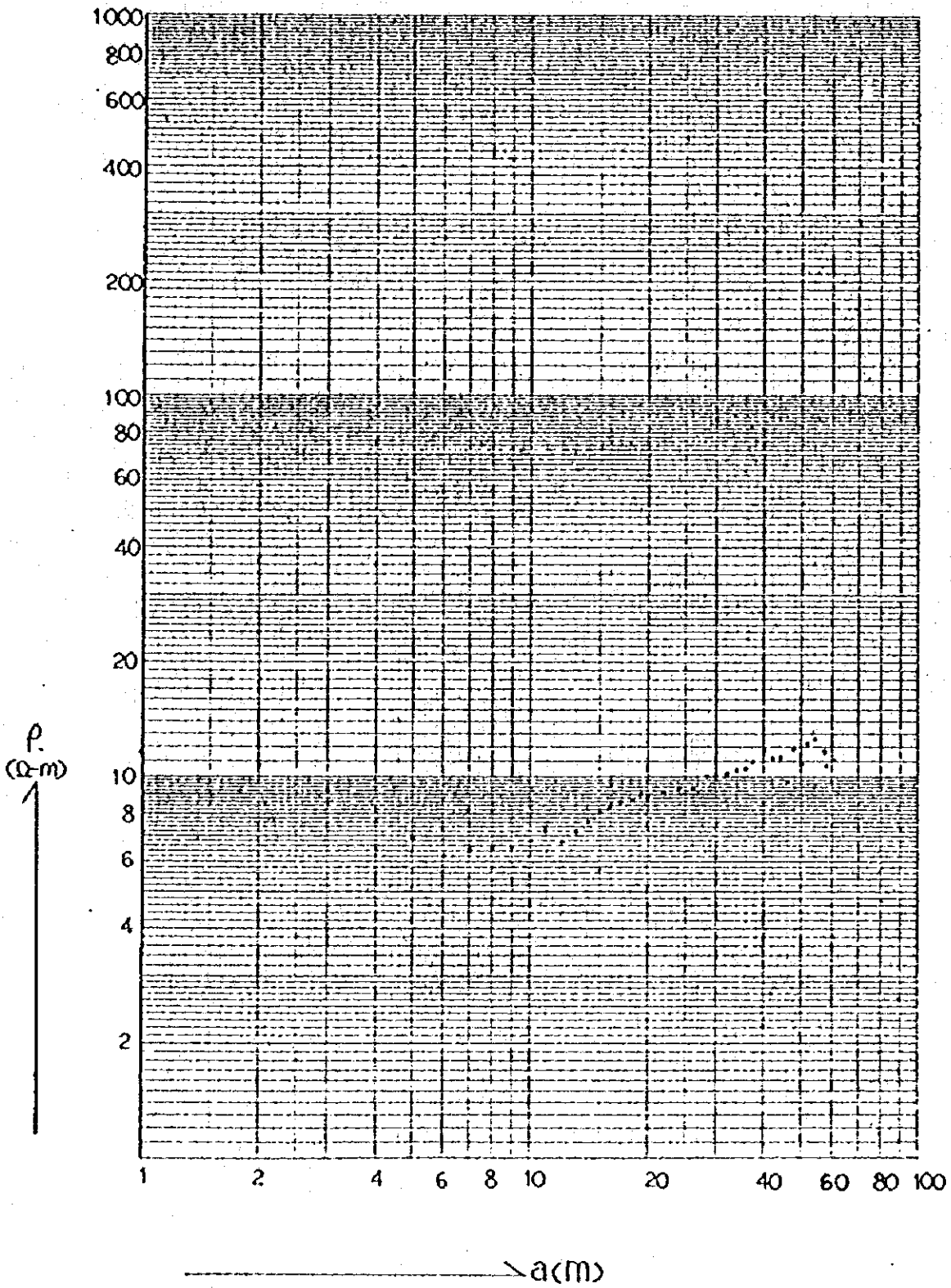
$\rho - a$ Curve (E - 10)



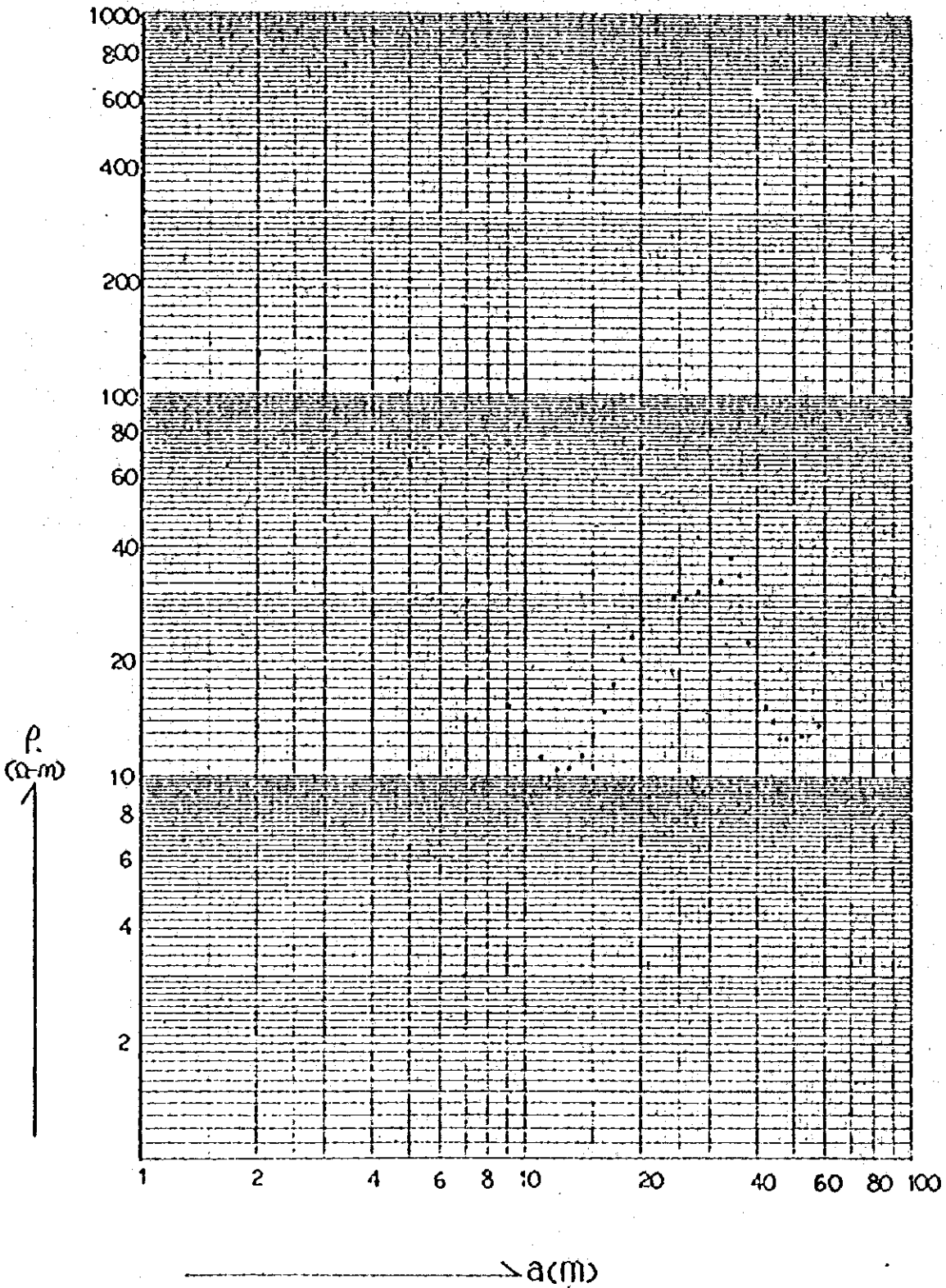
$\rho - a$ Curve (E - 11)



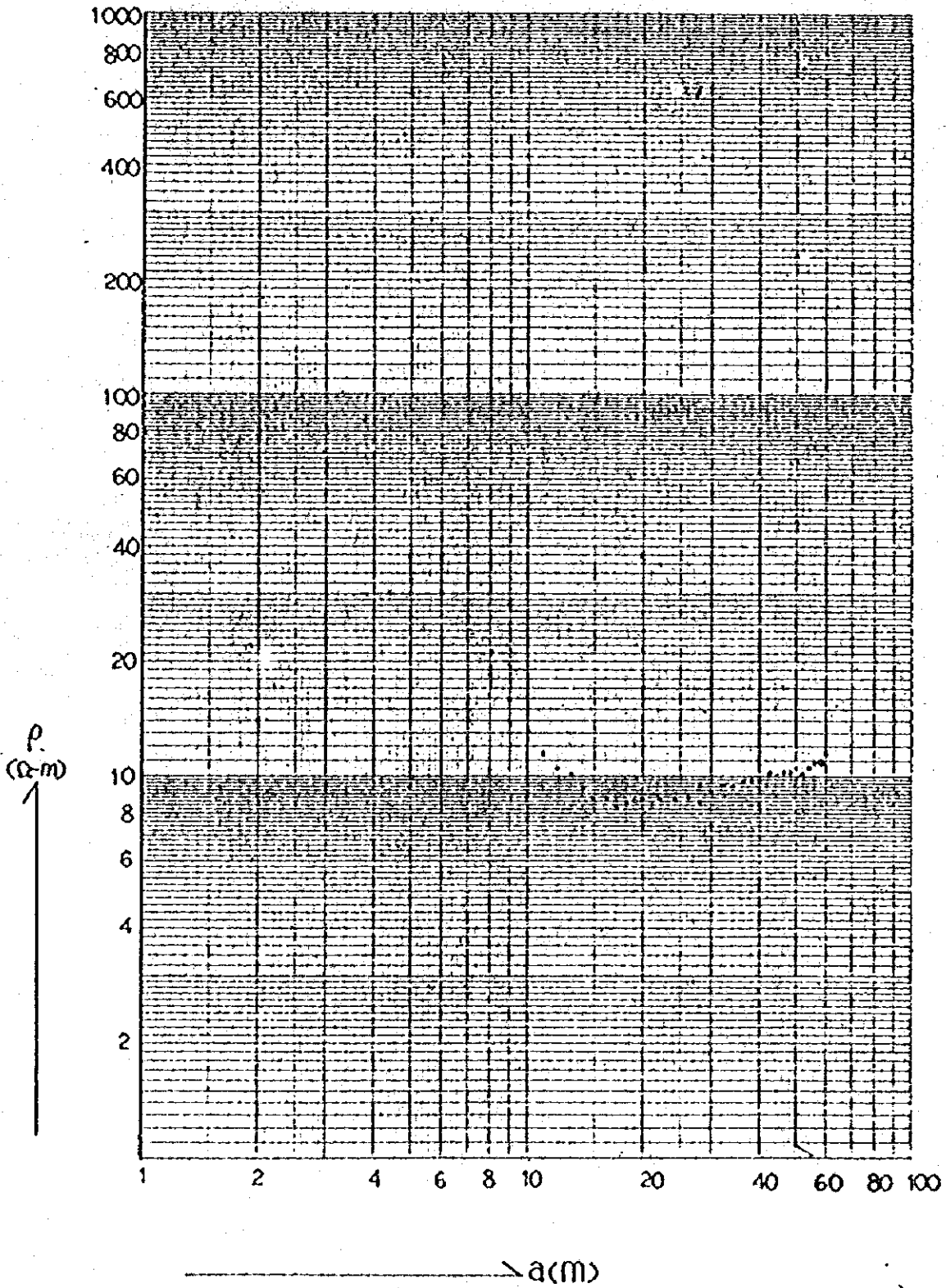
$\rho - a$ Curve (E - 12)



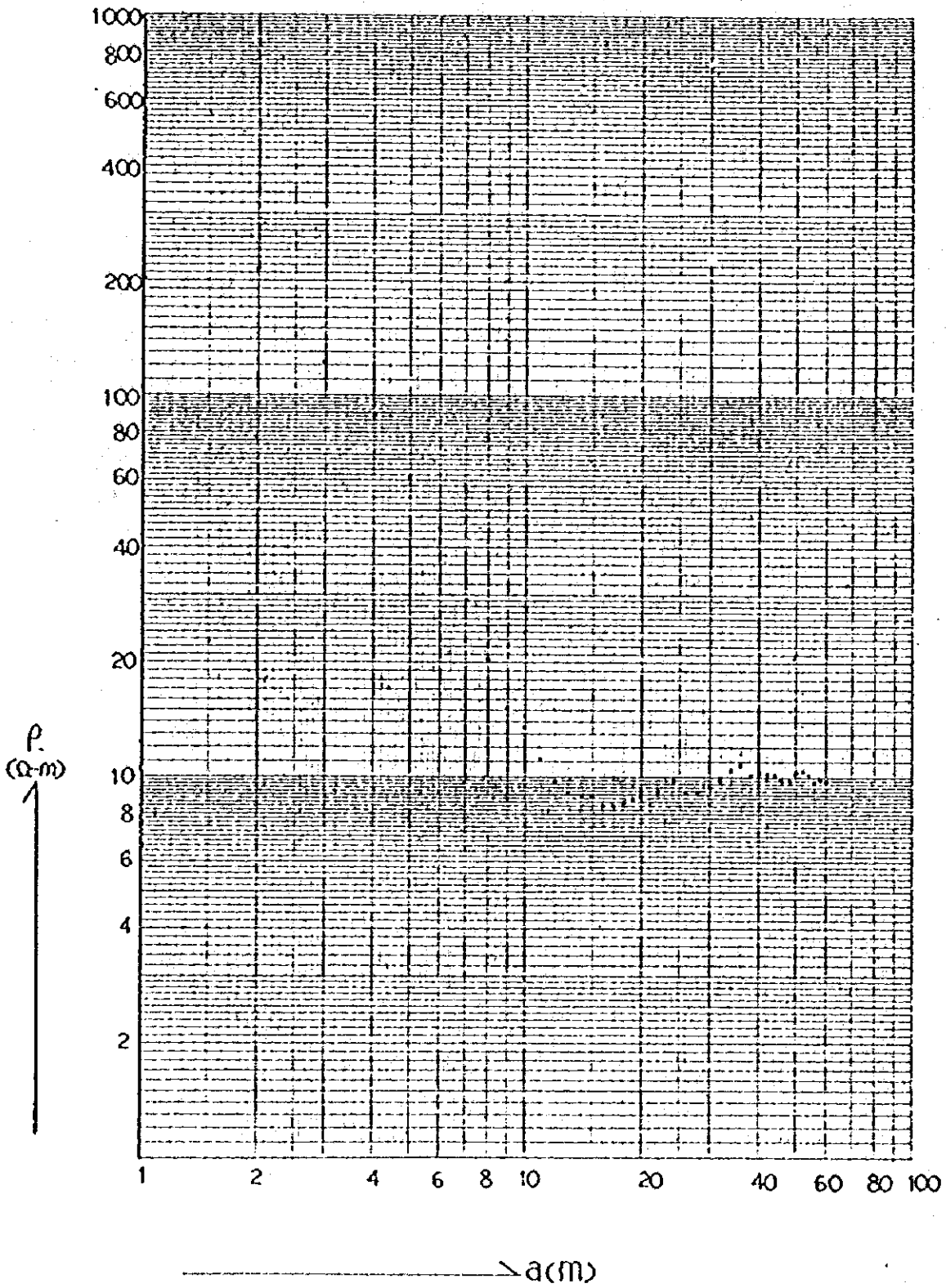
$\rho - a$ Curve (E - 13)



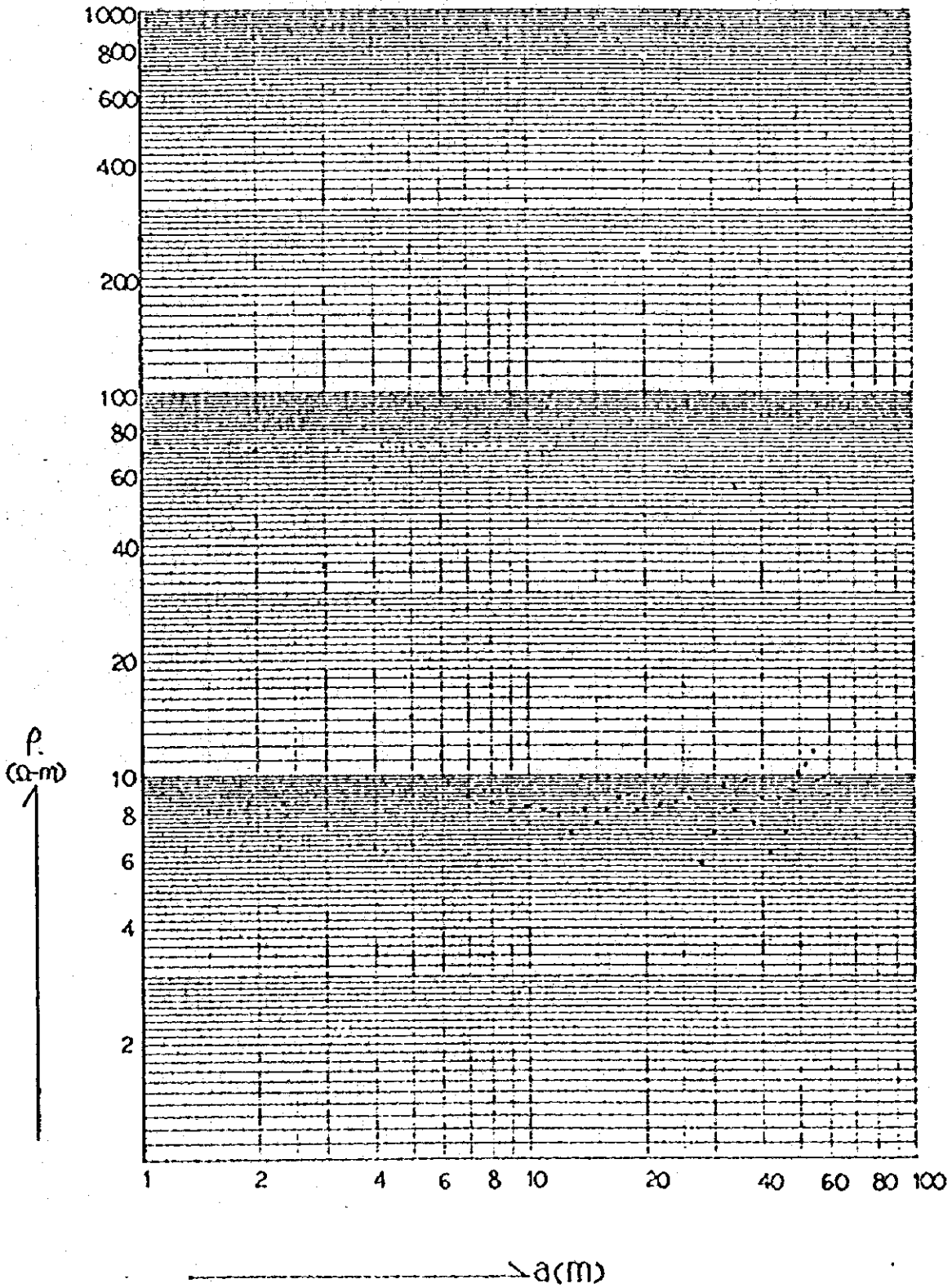
$\rho - a$ Curve (E - 14)



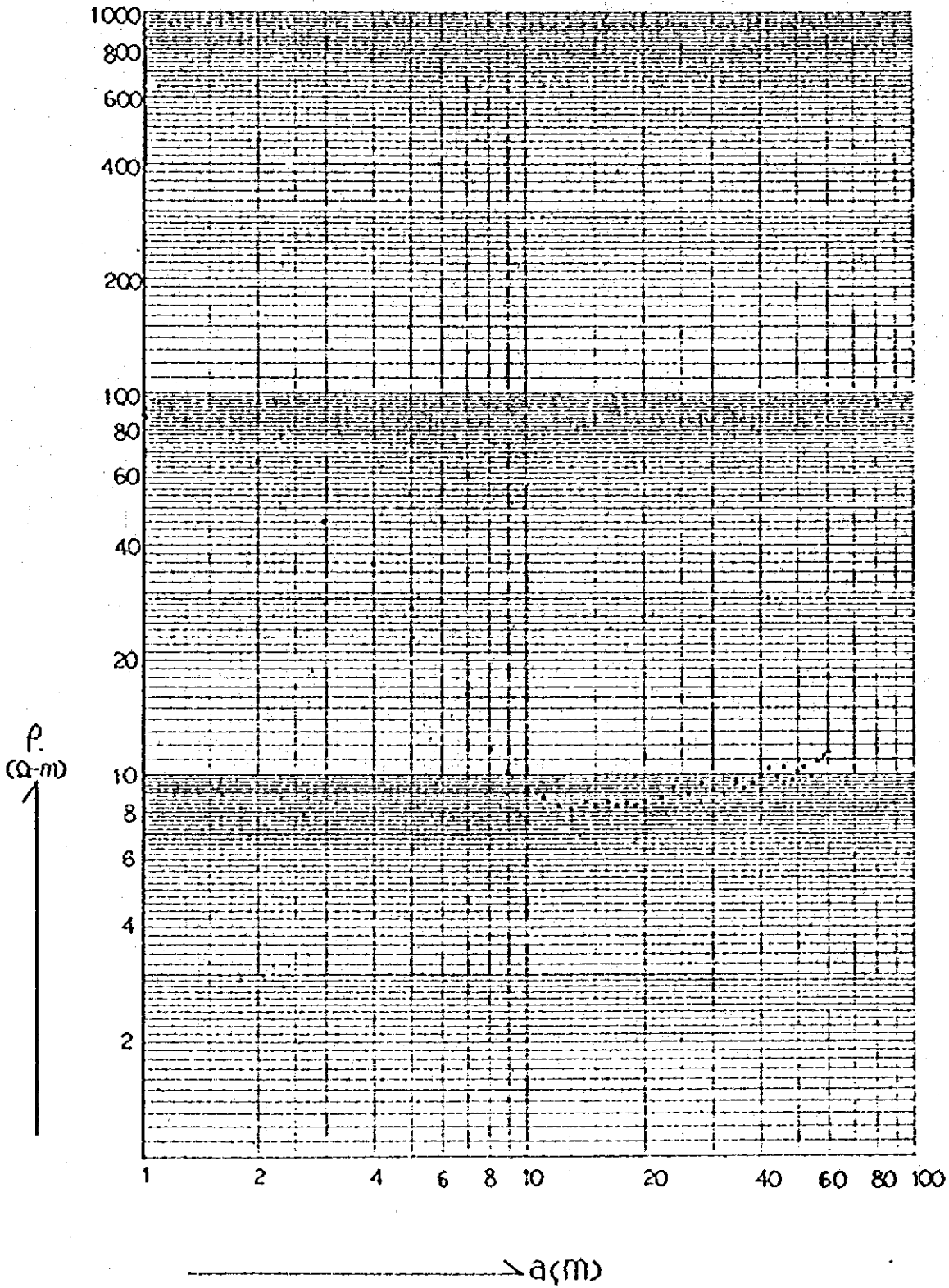
$\rho - a$ Curve (E - 15)



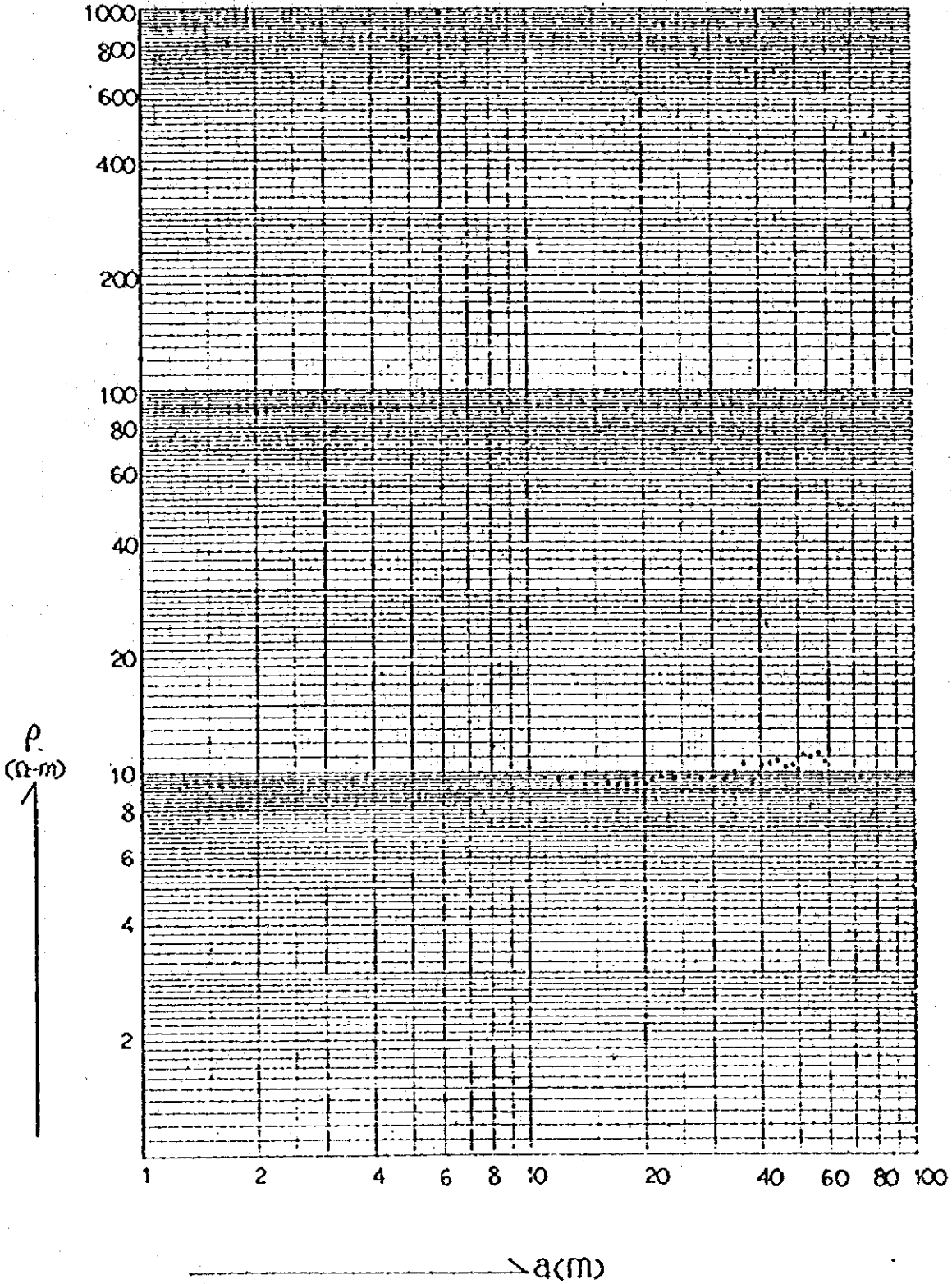
$\rho - a$ Curve (E - 16)



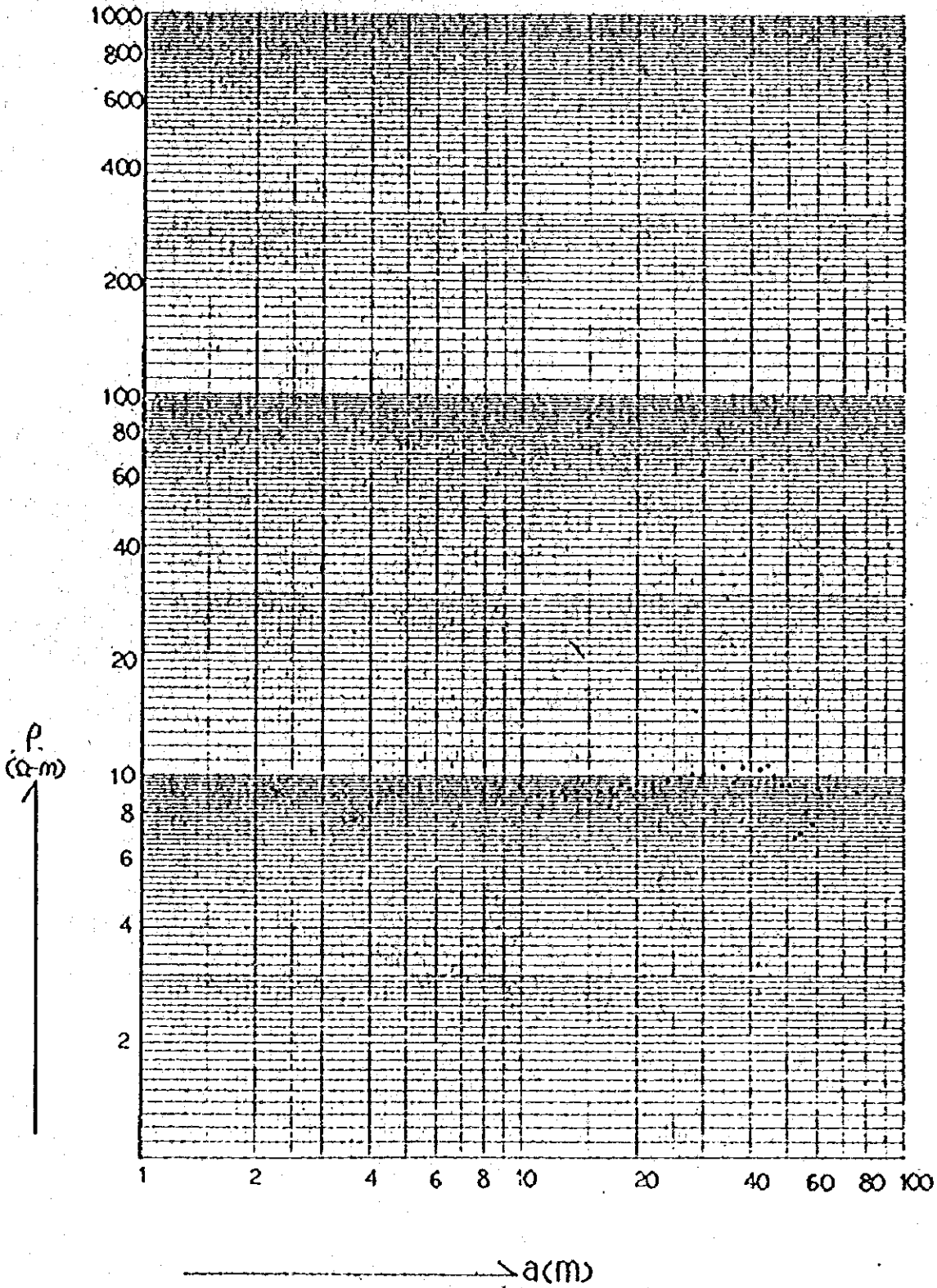
$\rho - a$ Curve (E - 17)



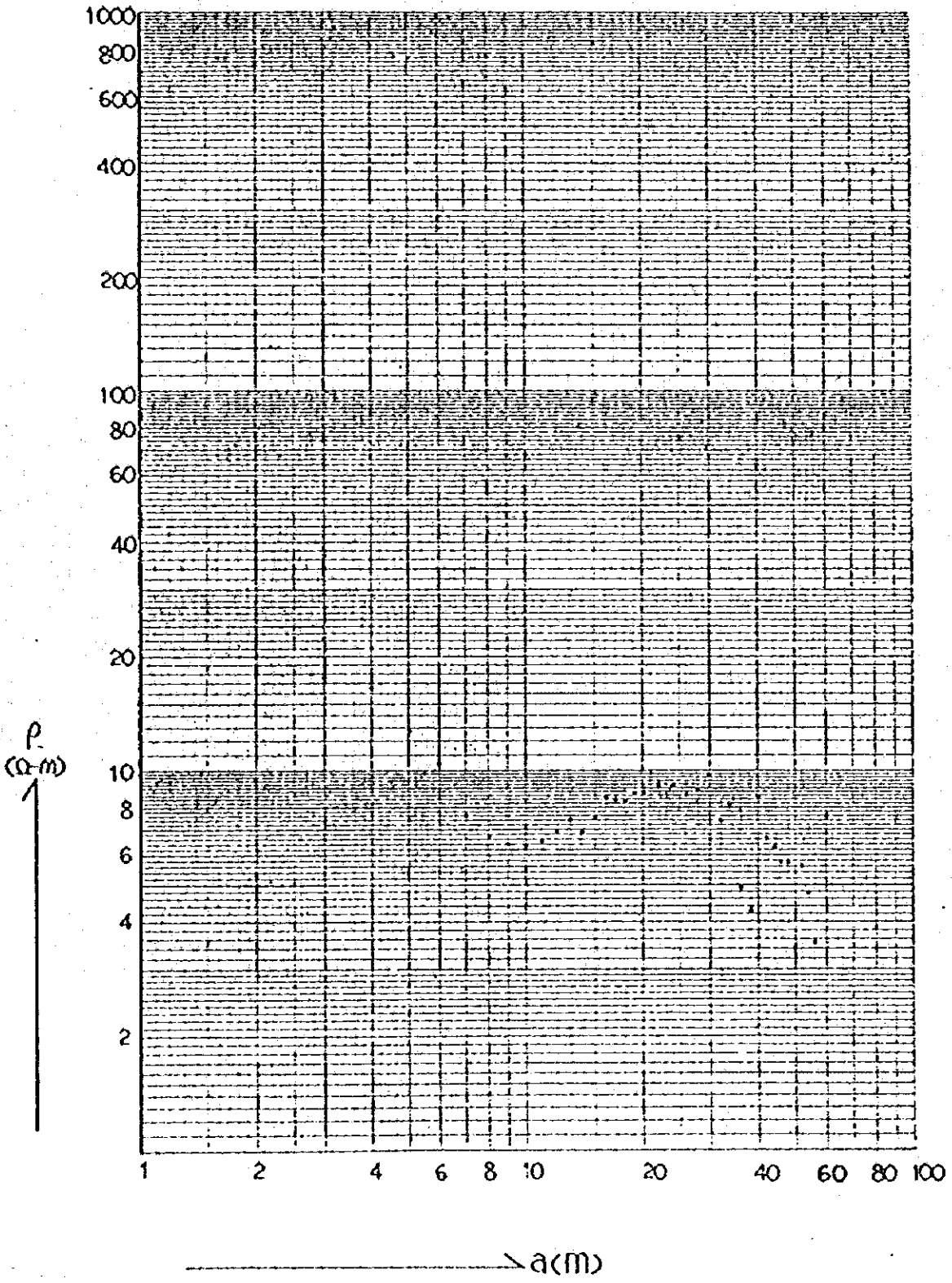
$\rho - a$ Curve (E - 18)



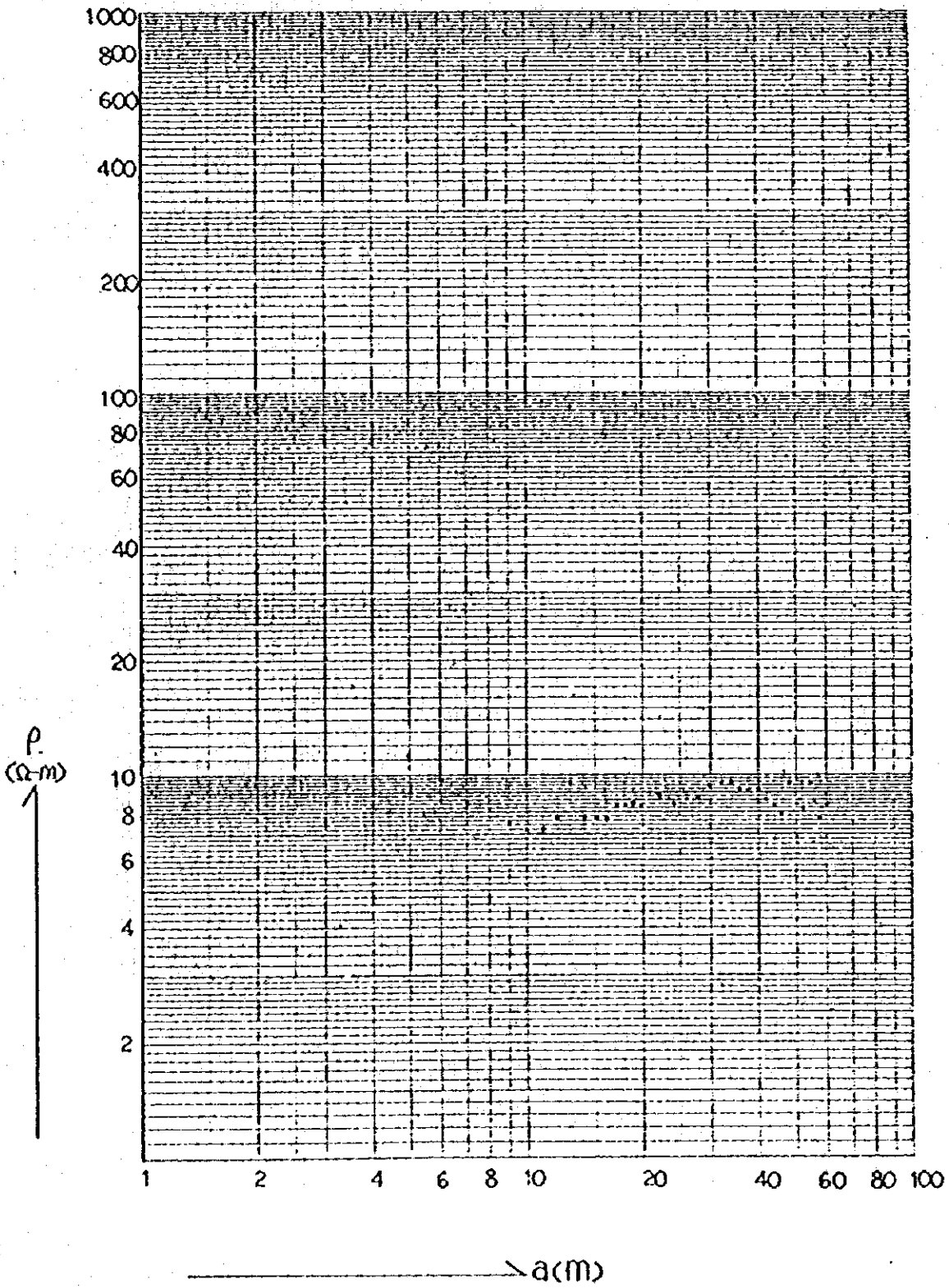
$\rho - a$ Curve (E - 19)



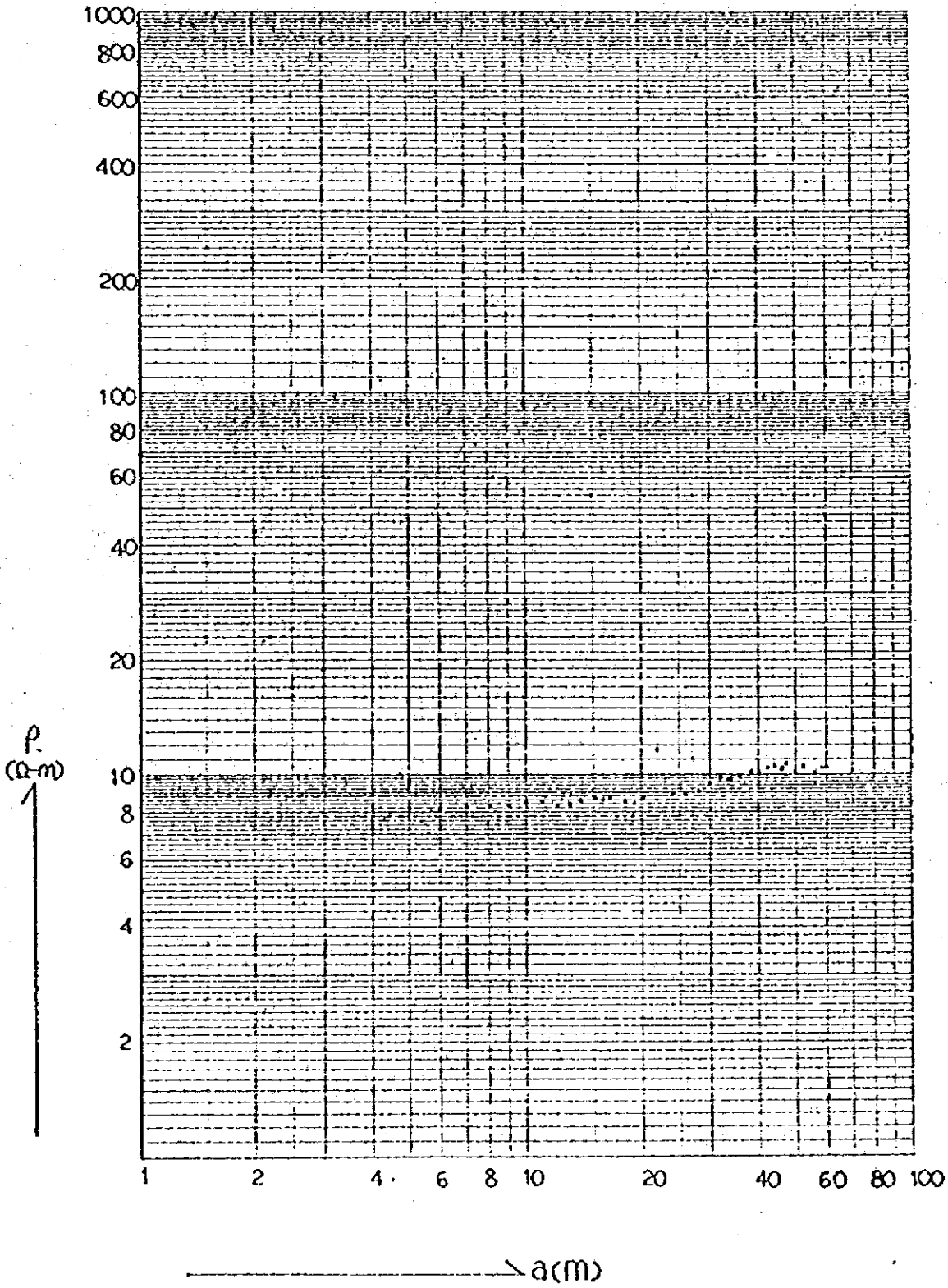
$\rho - a$ Curve (E - 20)



$\rho - a$ Curve (E - 21)



$\rho - a$ Curve (E - 22)



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