CHAPTER 4

RESULTS

In this chapter the experimental results are shown by graphs and tables. It is arranged step by step from the data obtained experimentally, then followed by the result obtained from the method of calculation as shown in appendix A until the shear stress components and torsional stiffness are found and compared with the analytical results.

Table 1. Boundary potential of square specimen

x	y	v	x	y	v	x	y	v	x	y	v
0.2	10.0	.009	5.2	10.0	2.84	10.0	0.2	.086	10.0	5.2	2.73
0.4	"	.168	5.4	"	3.03	"	0.4	.098	"	5.4	2.94
0.6	"	.132	5.6	"	3.22	"	0.6	.117	"	5.6	3.16
0.8	"	.077	5.8	"	3.43	"	0.8	.145	"	5.8	3.37
1.0	"	.112	6.0	"	3.64	"	1.0	.180	"	6.0	3.60
1.2	"	.252	6.2	"	3.84	"	1.2	.223	"	6.2	3.84
1.4	"	.284	6.4	"	4.10	"	1.4	.274	"	6.4	4.09
1.6	"	.260	6.6	"	4.34	"	1.6	.333	"	6.6	4.34
1.8	"	.372	6.8	"	4.58	"	1.8	.399	"	6.8	4.61
2.0	"	.485	7.0	"	4.82	"	2.0	.474	"	7.0	4.88
2.2	"	.513	7.2	"	5.18	"	2.2	.556	"	7.2	5.16
2.4	"	.561	7.4	"	5.48	"	2.4	.646	"	7.4	5.44
2.6	"	.653	7.6	"	5.68	"	2.6	.744	"	7.6	5.73
2.8	"	.850	7.8	"	5.91	"	2.8	.848	"	7.8	6.04
3.0	"	.937	8.0	"	6.28	"	3.0	.963	"	8.0	6.34
3.2	"	1.011	8.2	"	6.70	"	3.2	1.084	"	8.2	6.66
3.4	"	1.192	8.4	"	7.07	"	3.4	1.213	"	8.4	6.99
3.6	"	1.436	8.6	"	7.28	"	3.6	1.350	"	8.6	7.32
3.8	"	1.615	8.8	"	7.55	"	3.8	1.495	"	8.8	7.66
4.0	"	1.748	9.0	"	8.03	"	4.0	1.648	"	9.0	8.01
4.2	"	1.852	9.2	"	8.48	"	4.2	1.808	"	9.2	8.36
4.4	"	1.942	9.4	"	8.68	"	4.4	1.976	"	9.4	8.73
4.6	"	2.200	9.6	"	8.93	"	4.6	2.153	"	9.6	9.10
4.8	"	2.45	9.8	"	9.78	"	4.8	2.34	"	9.8	9.48
5.0	"	2.64				"	5.0	2.53			

Table 2 Boundary potential of rectangular specimen(W-specimen).

x	y	v	x	y	v	x	y	v	x	y	v
0.2	5.0	.004	4.2	5.0	1.769	8.2	5.0	6.74	10.0	2.2	7.92
0.4	"	.031	4.4	"	1.896	8.4	"	7.06	"	2.4	8.18
0.6	"	.047	4.6	"	2.099	8.6	"	7.32	"	2.6	8.11
0.8	"	.115	4.8	"	2.31	8.8	"	7.71	"	2.8	8.10
1.0	"	.046	5.0	"	2.46	9.0	"	8.13	"	3.0	8.23
1.2	"	.166	5.2	"	2.66	9.2	"	8.48	"	3.2	8.47
1.4	"	.150	5.4	"	2.94	9.4	"	8.82	"	3.4	8.67
1.6	"	.258	5.6	"	3.18	9.6	"	9.17	"	3.6	8.70
1.8	"	.277	5.8	"	3.37	9.8	"	9.70	"	3.8	8.82
2.0	"	.408	6.0	"	3.55				"	4.0	9.14
2.2	"	.383	6.2	"	3.85	10.0	0.2	7.46	10.0	4.2	9.34
2.4	"	.567	6.4	"	4.13	"	0.4	7.47	"	4.4	9.44
2.6	"	.659	6.6	"	4.29	"	0.6	7.51	"	4.6	9.45
2.8	"	.760	6.8	"	4.57	"	0.8	7.54	"	4.8	9.81
3.0	"	.903	7.0	"	4.89	"	1.0	7.54			
3.2	"	1.010	7.2	"	5.23	"	1.2	7.57			
3.4	"	1.238	7.4	"	5.52	"	1.4	7.71			
3.6	"	1.341	7.6	"	5.74	"	1.6	7.73			
3.8	"	1.432	7.8	"	6.10	"	1.8	7.80			
4.0	"	1.570	8.0	"	6.41	"	2.0	7.80			

Table 3 Boundary potential of rectangular specimen (L-specimen).

x	y	v	x	y	v	x	y	v	x	y	v
5.0	0.2	.006	5.0	4.2	1.733	5.0	8.2	6.79	2.2	10.0	8.06
"	0.4	.164	"	4.4	1.914	"	8.4	7.08	2.4	"	8.10
"	0.6	.057	"	4.6	2.120	"	8.6	7.45	2.6	"	8.10
"	0.8	.147	"	4.8	2.36	"	8.8	7.86	2.8	"	8.15
"	1.0	.112	"	5.0	2.50	"	9.0	8.23	3.0	"	8.35
5.0	1.2	.114	5.0	5.2	2.67	5.0	9.2	8.52	3.2	10.0	8.52
"	1.4	.149	"	5.4	2.87	"	9.4	8.88	3.4	"	8.62
"	1.6	.253	"	5.6	3.17	"	9.6	9.23	3.6	"	8.72
"	1.8	.263	"	5.8	3.40	"	9.8	9.76	3.8	"	9.00
"	2.0	.407	"	6.0	3.58				4.0	"	9.18
5.0	2.2	.397	5.0	6.2	3.83	0.2	10.0	7.49	4.2	10.0	9.08
"	2 4	.581	"	6.4	4.15	0.4	"	7.50	4.4	"	9.06
"	2.6	.686	"	6.6	4.40	0.6	"	7.54	4.6	"	9.24
"	2.8	.790	"	6.8	4.62	0.8	"	7.56	4.8	"	9.85
"	3.0	.895	"	7.0	4.84	1.0	"	7.56			
5.0	3.2	1.004	5.0	7.2	5.21	1.2	10.0	7.58			
"	3.4	1.196	"	7.4	5.54	1.4	"	7.70			
"	3.6	1.272	"	7.6	5.78	1.6	"	7.75			
"	3.8	1.438	"	7.8	6.02	1.8	"	7.79			
"	4.0	1.527	"	8.0	6.44	2.0	"	7.83			

Table 4 Boundary potential of I-specimen (W-specimen).

x	y	v	x	y	v	x	y	v	x	y	v
2.0	0.1	.0336	2.0	2.1	.699	2.1	4.0	2.61	4.1	4.0	4.32
"	0.2	.0420	"	2.2	.734	2.2	"	2.84	4.2	"	4.42
"	0.3	.0413	"	2.3	.812	2.3	"	2.94	4.3	"	4.47
"	0.4	.0448	"	2.4	.917	2.4	"	2.93	4.4	"	4.72
"	0.5	.0919	"	2.5	.984	2.5	"	2.77	4.5	"	4.86
2.0	0.6	.0705	2.0	2.6	1.037	2.6	4.0	2.79	4.6	4.0	4.97
"	0.7	.0744	"	2.7	1.122	2.7	"	2.90	4.7	"	5.13
"	0.8	.1489	"	2.8	1.235	2.8	"	3.07	4.8	"	5.37
"	0.9	.1557	"	2.9	1.291	2.9	"	3.09	4.9	"	5.48
"	1.0	.1511	"	3.0	1.357	3.0	"	3.14	5.0	"	5.54
2.0	1.1	.2093	2.0	3.1	1.413	3.1	4.0	3.20	5.1	4.0	5.71
"	1.2	.268	"	3.2	1.564	3.2	"	3.46	5.2	"	5.91
"	1.3	.283	"	3.3	1.649	3.3	"	3.53	5.3	"	5.97
"	1.4	.299	"	3.4	1.734	3.4	"	3.55	5.4	"	6.12
"	1.5	.352	"	3.5	1.852	3.5	"	3.45	5.5	"	6.27
2.0	1.6	.431	2.0	3.6	2.018	3.6	4.0	3.77	5.6	4.0	6.46
"	1.7	.458	"	3.7	2.149	3.7	"	3.87	5.7	"	6.62
"	1.8	.494	"	3.8	2.246	3.8	"	3.94	5.8	"	6.76
"	1.9	.557	"	3.9	2.300	3.9	"	4.02	5.9	"	7.37
"	2.0	.643	"	4.0	2.42	4.0	"	4.25	6.0	"	—

Table 4. (continue)

x	y	v	x	y	v	x	y	v	x	y	v
6.0	4.1	7.17	5.9	6.0	10.00	3.9	6.0	6.99	1.9	6.0	5.31
"	4.2	7.24	5.8	"	9.74	3.8	"	6.84	1.8	"	5.21
"	4.3	7.45	5.7	"	9.66	3.7	"	6.78	1.7	"	5.20
"	4.4	7.70	5.6	"	9.50	3.6	"	6.70	1.6	"	5.16
"	4.5	7.77	5.5	"	9.41	3.5	"	6.60	1.5	"	5.13
6.0	4.6	7.82	5.4	6.0	9.12	3.4	6.0	6.43	1.4	6.0	5.04
"	4.7	8.04	5.3	"	8.92	3.3	"	6.37	1.3	"	5.02
"	4.8	8.22	5.2	"	8.81	3.2	"	6.33	1.2	"	5.00
"	4.9	8.25	5.1	"	8.69	3.1	"	6.19	1.1	"	4.98
"	5.0	8.37	5.0	"	8.45	3.0	"	6.06	1.0	"	4.88
6.0	5.1	8.59	4.9	6.0	8.32	2.9	6.0	6.01	0.9	6.0	4.86
"	5.2	8.80	4.8	"	8.24	2.8	"	5.97	0.8	"	4.86
"	5.3	8.89	4.7	"	8.00	2.7	"	5.90	0.7	"	4.85
"	5.4	9.00	4.6	"	7.82	2.6	"	5.75	0.6	"	4.76
"	5.5	9.22	4.5	"	7.74	2.5	"	5.68	0.5	"	4.76
6.0	5.6	9.50	4.4	6.0	7.69	2.4	6.0	5.63	0.4	6.0	4.78
"	5.7	9.55	4.3	"	7.57	2.3	"	5.54	0.3	"	4.74
"	5.8	9.68	4.2	"	7.35	2.2	"	5.43	0.2	"	4.71
"	5.9	9.99	4.1	"	7.26	2.1	"	5.39	0.1	"	4.76
"	6.0	–	4.0	"	7.18	2.0	"	5.38	0.0	"	–

Table 5 Boundary potential of I-specimen (L-specimen).

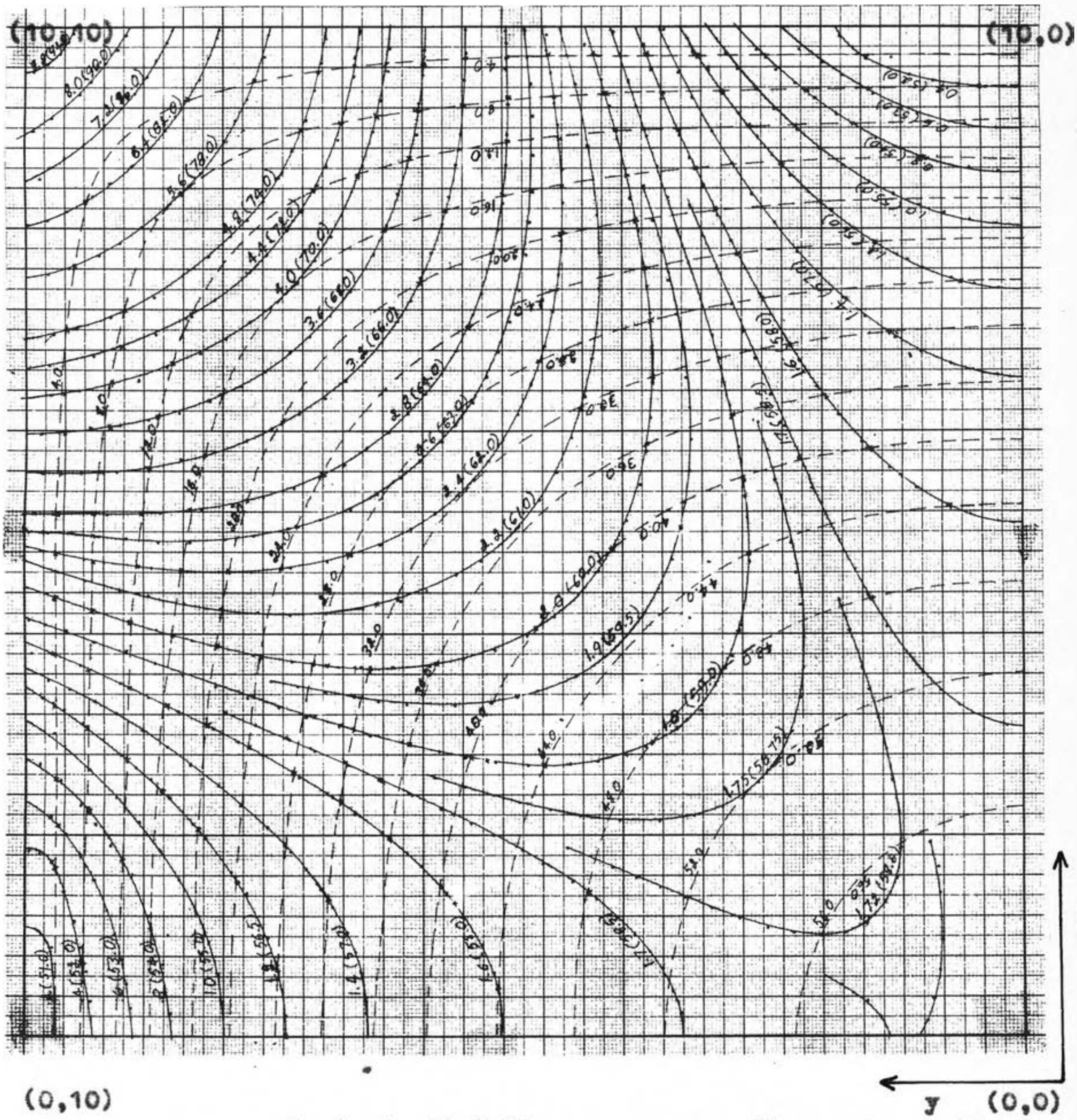
x	y	v	x	y	v	x	y	v	x	y	v
2.0	0.1	.0427	2.0	2.1	.696	2.1	4.0	2.54	4.1	4.0	4.31
"	0.2	.0410	"	2.2	.732	2.2	"	2.83	4.2	"	4.42
"	0.3	.0356	"	2.3	.813	2.3	"	2.94	4.3	"	4.52
"	0.4	.0510	"	2.4	.923	2.4	"	2.94	4.4	"	4.74
"	0.5	.0953	"	2.5	.984	2.5	"	2.82	4.5	"	4.84
2.0	0.6	.0896	2.0	2.6	1.039	2.6	4.0	2.76	4.6	4.0	5.00
"	0.7	.0684	"	2.7	1.108	2.7	"	2.91	4.7	"	5.19
"	0.8	.1404	"	2.8	1.222	2.8	"	3.10	4.8	"	5.38
"	0.9	.1660	"	2.9	1.287	2.9	"	3.12	4.9	"	5.46
"	1.0	.1628	"	3.0	1.332	3.0	"	3.10	5.0	"	5.56
2.0	1.1	.1996	2.0	3.1	1.412	3.1	4.0	3.22	5.1	4.0	5.76
"	1.2	.253	"	3.2	1.560	3.2	"	3.47	5.2	"	5.93
"	1.3	.277	"	3.3	1.651	3.3	"	3.53	5.3	"	6.00
"	1.4	.307	"	3.4	1.729	3.4	"	3.50	5.4	"	6.19
"	1.5	.346	"	3.5	1.847	3.5	"	3.51	5.5	"	6.36
2.0	1.6	.426	2.0	3.6	2.023	3.6	4.0	3.76	5.6	4.0	6.51
"	1.7	.457	"	3.7	2.159	3.7	"	3.86	5.7	"	6.63
"	1.8	.486	"	3.8	2.249	3.8	"	3.93	5.8	"	6.84
"	1.9	.557	"	3.9	2.300	3.9	"	4.06	5.9	"	7.21
"	2.0	.647	"	4.0	2.40	4.0	"	4.25	6.0	"	—

Table 5. (continue)

x	y	v	x	y	v	x	y	v	x	y	v
6.0	4.1	7.36	5.9	6.0	10.12	3.9	6.0	7.03	1.9	6.0	5.32
"	4.2	7.39	5.8	"	9.78	3.8	"	6.86	1.8	"	5.21
"	4.3	7.51	5.7	"	9.67	3.7	"	6.78	1.7	"	5.19
"	4.4	7.73	5.6	"	9.50	3.6	"	6.72	1.6	"	5.18
"	4.5	7.79	5.5	"	9.42	3.5	"	6.62	1.5	"	5.13
6.0	4.6	7.85	5.4	6.0	9.12	3.4	6.0	6.44	1.4	6.0	5.04
"	4.7	8.10	5.3	"	8.94	3.3	"	6.38	1.3	"	5.02
"	4.8	8.24	5.2	"	8.81	3.2	"	6.34	1.2	"	5.03
"	4.9	8.28	5.1	"	8.75	3.1	"	6.19	1.1	"	4.99
"	5.0	8.46	5.0	"	8.48	3.0	"	6.06	1.0	"	4.89
6.0	5.1	8.66	4.9	6.0	8.34	2.9	6.0	6.01	0.9	6.0	4.87
"	5.2	8.86	4.8	"	8.24	2.8	"	5.97	0.8	"	4.88
"	5.3	8.92	4.7	"	8.06	2.7	"	5.91	0.7	"	4.88
"	5.4	9.03	4.6	"	7.85	2.6	"	5.75	0.6	"	4.78
"	5.5	9.25	4.5	"	7.76	2.5	"	5.68	0.5	"	4.78
6.0	5.6	9.52	4.4	6.0	7.73	2.4	6.0	5.66	0.4	6.0	4.80
"	5.7	9.58	4.3	"	7.59	2.3	"	5.58	0.3	"	4.75
"	5.8	9.73	4.2	"	7.37	2.2	"	5.44	0.2	"	4.72
"	5.9	10.08	4.1	"	7.28	2.1	"	5.40	0.1	"	4.77
"	6.0	_	4.0	"	7.19	2.0	"	5.40	0.0	"	_

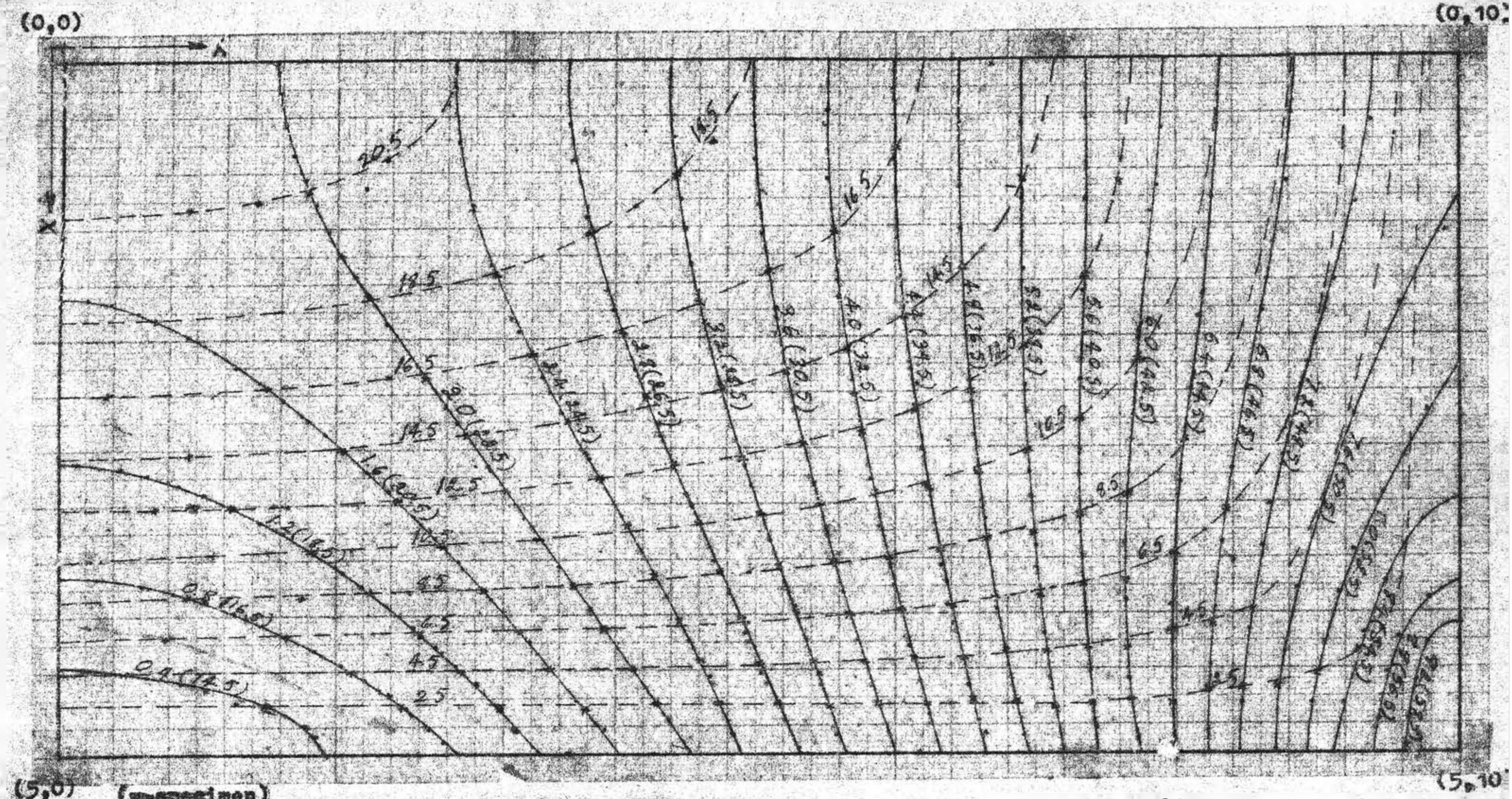
		Fitting equation	Theoretical
Square		$V = .09796x^2+.0825$	$V = 0.1x^2$
Rectangular	W	$V = .09968(x^2+y^2)-2.494$	$V = 0.1\ (x^2+y^2) - 2.5$
	L	$V = .09963(x^2+y^2)-2.481$	$V = 0.1\ (x^2+y^2) - 2.5$
I - croos section	W	$V = .1474(x^2+y^2)-.5196$	$V = 0.15(x^2+y^2) - 0.6$
	L	$V = .1485(x^2+y^2)-.5471$	$V = 0.15(x^2+y^2) - 0.6$

Table 6 Comparison of fitting equations and analytical equations of the boundary potential.



____________ Equipotential line, _ _ _ _ _ Shear stress line

Fig.13 Equipotential lines and shear stress lines on the square specimen obtained experimentally.



———————— Equipotential line, - - - - - - - Shear stress line

Fig. 14 Equipotential lines and shear stress lines on the rectangular specimen obtained experimentally.

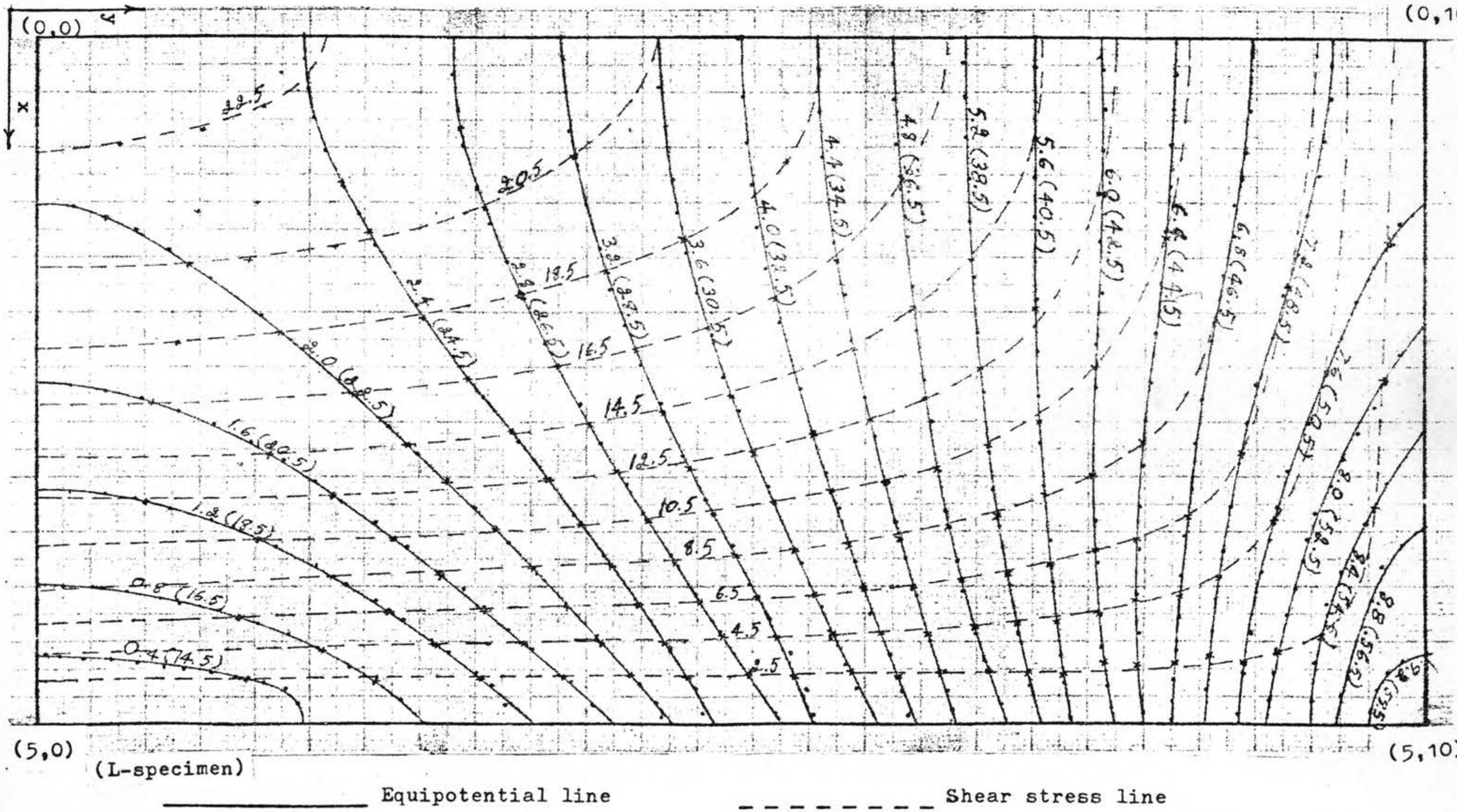
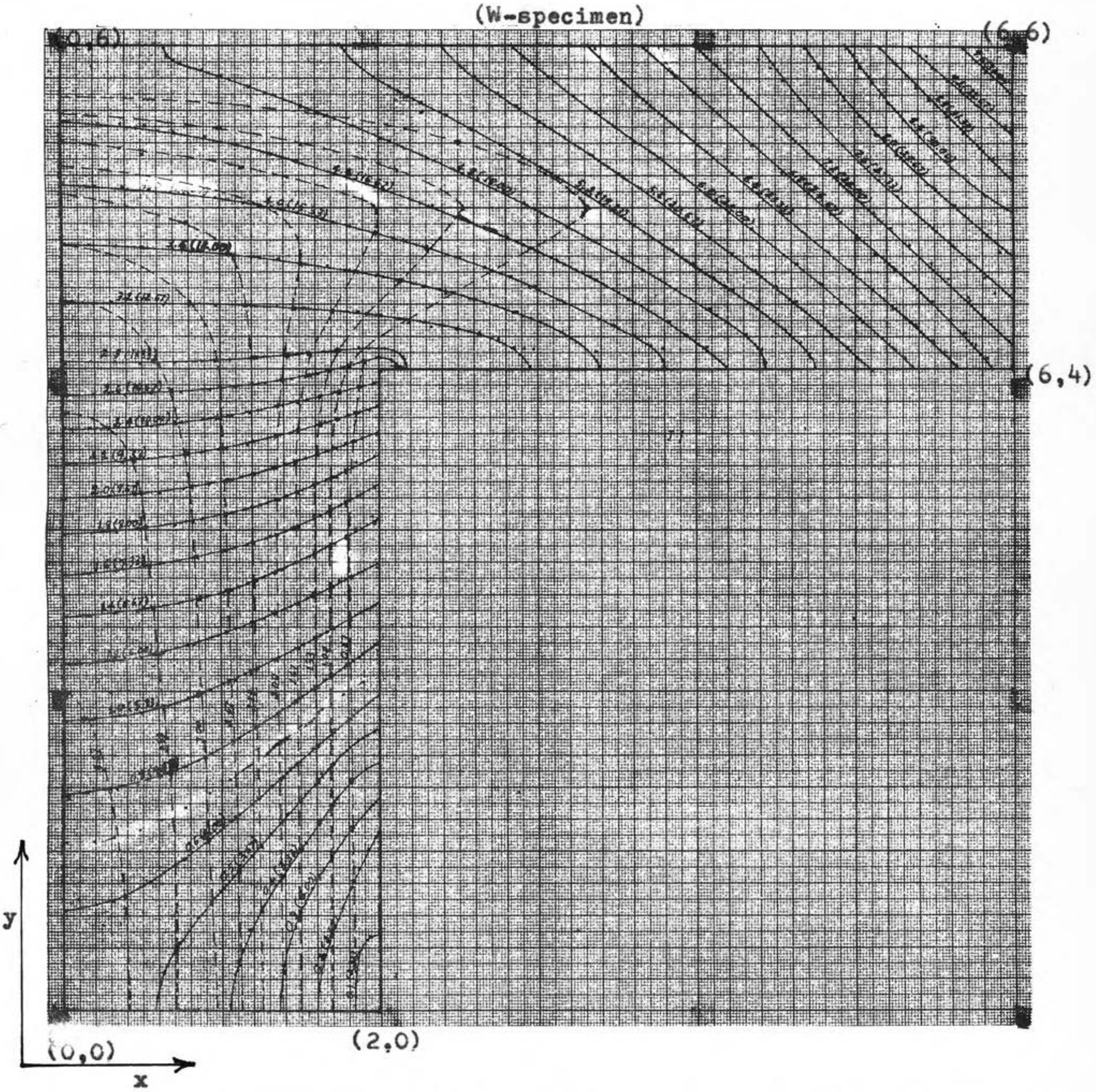


Fig.15 Equipotential lines and shear stress lines on the rectangular specimen obtained experimentally.



Equipotential line _ _ _ _ _ _ Shear stress line

Fig.16 Equipotential lines and shear stress lines on the I-specimen obtained experimentally.

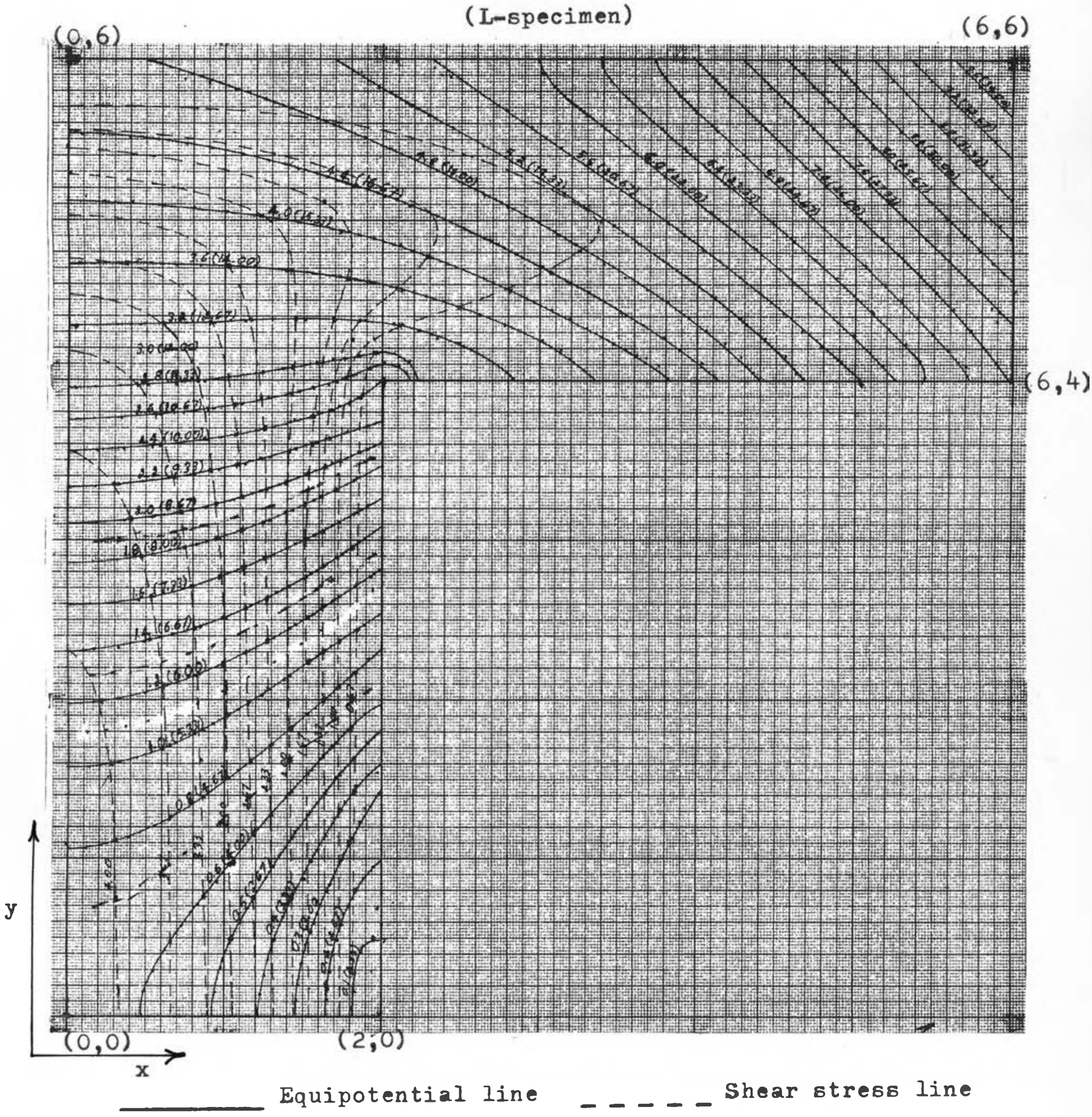
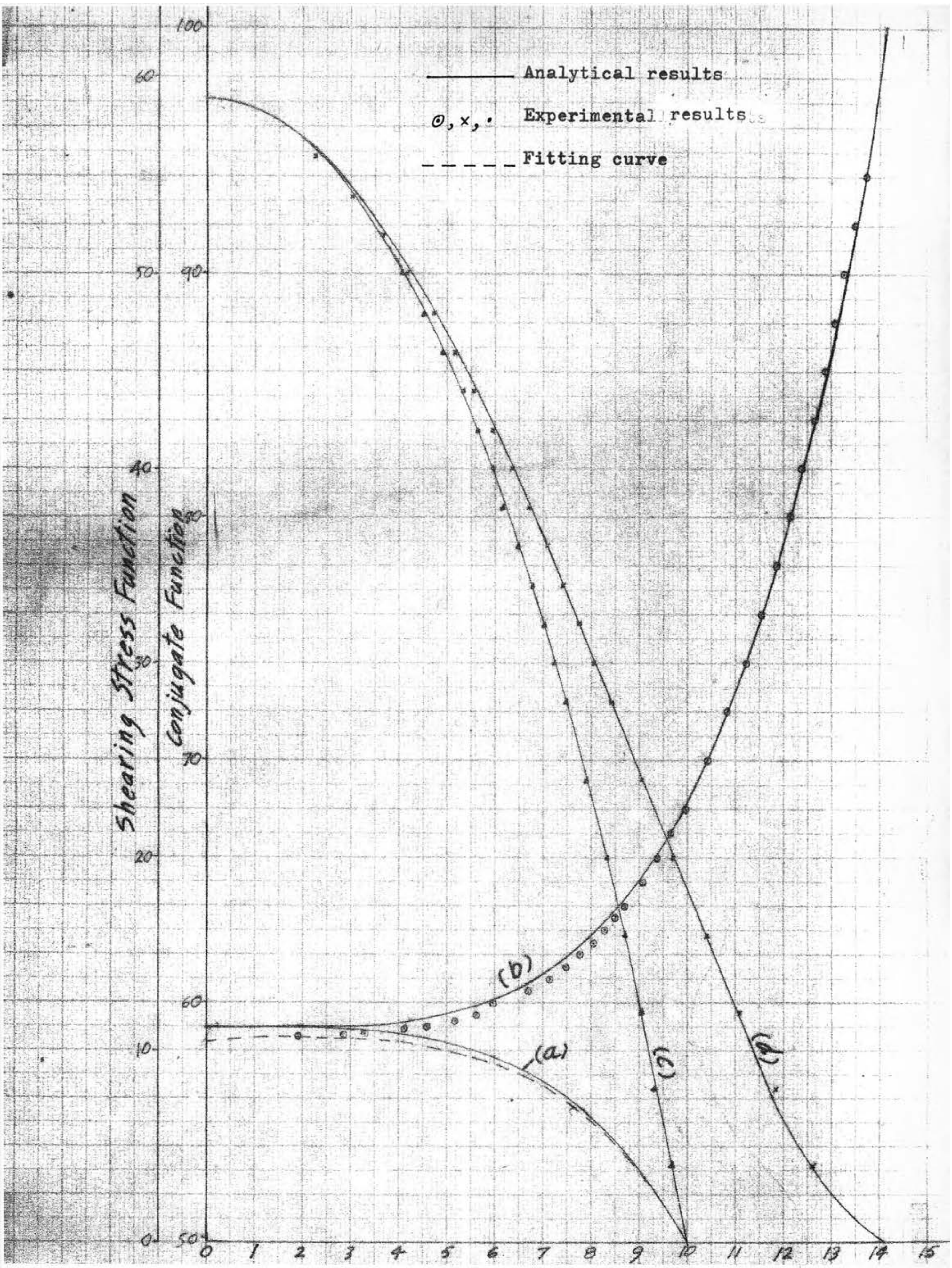


Fig.17 Equipotential lines and Shear stress lines on the I-specimen obtained experimentally.



Analytical results
⊙, ×, · Experimental results
Fitting curve
Shearing Stress Function
Conjugate Function
(a)
(b)
(c)
(d)

Fig. 18

Fig. 18 Compares the results of the square specimen.

Curve a Compares the experimental results and the analytical results of conjugate function along co - ordinate axis.

Curve b Compares the experimental results and the analytical results of conjugate function along diagonal line.

Curve c Compares the experimental results and analytical results of shearing stress function along co - ordinate axis.

Curve d Compare the experimental results and analytical results of shearing stress function along diagonal line.

Y_{obs}	V_{obs}	Y_{obs}	V_{obs}	Y_{obs}	V_{obs}	Y_{obs}	V_{obs}
2.34	1.715	4.20	1.670	6.58	1.400	9.03	.600
2.82	1.710	4.59	1.650	7.00	1.300	9.31	.400
3.42	1.700	5.22	1.600	7.38	1.200	9.70	.200
3.70	1.690	5.63	1.550	8.00	1.000	-	-
4.03	1.680	6.06	1.500	8.56	.800	-	-

Table 7. Co-ordinate and potential where equipotential line cut the y-axis of square specimen.

X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}
1.69	1.715	3.97	1.67	6.53	1.40	9.00	.60
2.32	1.710	4.39	1.65	7.01	1.30	9.38	.40
3.07	1.700	5.08	1.60	7.40	1.20	9.67	.20
3.43	1.69	5.55	1.55	8.04	1.00	-	-
3.73	1.68	5.92	1.50	8.56	.80	-	-

Table 8. Co-ordinate and potential where equipotential lines cut the x-axis of square specimen.

D_{obs}	V_{obs}	D_{obs}	V_{obs}	D_{obs}	V_{obs}	D_{obs}	V_{obs}
1.937	1.72	6.760	2.10	9.376	3.20	12.403	6.40
2.857	1.73	7.156	2.20	9.673	3.40	12.657	6.80
3.323	1.74	7.495	2.30	9.942	3.60	12.883	7.20
3.366	1.75	7.821	2.40	10.409	4.00	13.081	7.60
4.101	1.77	8.061	2.50	10.819	4.40	13.279	8.00
4.596	1.80	8.287	2.60	11.215	4.80	13.506	8.40
5.204	1.85	8.514	2.70	11.540	5.20	13.718	8.80
5.629	1.90	8.712	2.80	11.865	5.60	-	-
6.251	2.00	9.065	3.00	12.134	6.00	-	-

Table 9. Distance from origin and potential where equipotential lines cut the diagonal line of square specimen.

X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}
.37	1.80	2.38	1.40	3.36	1.00	4.64	.20
1.26	1.70	2.66	1.30	3.72	.80	-	-
1.72	1.60	2.90	1.20	4.08	.60	-	-
2.08	1.50	3.14	1.10	4.37	.40	-	-

Table 10. Co-ordinate and potential where equipotential lines cut the X-axis of rectangularspecimen ([illegible]-specimen).

X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}
.55	2.10	2.28	1.70	3.16	1.30	3.97	.80
1.24	2.00	2.54	1.60	3.32	1.20	4.24	.60
1.66	1.90	2.77	1.50	3.50	1.10	4.52	.40
2.00	1.80	2.95	1.40	3.67	1.00	-	-

Table 11. Co-ordinate and potential where equipotential lines cut the X-axis of rectangular specimen (L-specimen).

X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}
.085	.54	1.055	.40	1.610	.20	-	-
.585	.50	1.370	.30	1.845	.10	-	-

Table 12. Co-ordinate and potential where equipotential lines cut the X-axis of I-specimen (-specimen).

X_{obs}	ϕ_{obs}	X_{obs}	ϕ_{obs}	X_{obs}	ϕ_{obs}	X_{obs}	ϕ_{obs}
.62	3.000	1.20	2.333	1.53	1.667	1.79	1.000
1.00	2.667	1.39	2.000	1.70	1.333	1.89	.667

Table 13. Co-ordinate and shear stress function where shear stress lines cut the axis Y=4 of I-specimen (-specimen).

Y_{obs}	V_{obs}	Y_{obs}	V_{obs}	Y_{obs}	V_{obs}	Y_{obs}	V_{obs}
4.07	2.60	4.45	3.40	4.97	4.20	5.61	5.00
4.13	2.80	4.58	3.60	5.13	4.40	4.79	5.20
4.23	3.00	4.71	3.80	5.29	4.60	-	-
4.33	3.20	4.85	4.00	5.43	4.80	-	-

Table 14. Co-ordinate and potential where equipotential lines cut the axis X=2 of I-specimen (-specimen).

X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}	X_{obs}	V_{obs}
.47	.60	1.22	.40	1.645	.20	-	-
.92	.50	1.455	.30	1.825	.10	-	-

Table 15. Co-ordinate and potential where equipotential lines cut the X- axis of I-specimen (L-specimen).

X_{obs}	ϕ_{obs}	X_{obs}	ϕ_{obs}	X_{obs}	ϕ_{obs}	X_{obs}	ϕ_{obs}
.38	3.333	1.22	2.333	1.71	1.333	-	-
1.84	3.000	1.42	2.000	1.78	1.000	-	-
1.02	2.667	1.58	1.667	1.87	.667	-	-

Table 16. Co-ordinate and shear stress function where shear stress lines cut the axis Y=4 of I-specimen

Y_{obs}	V_{obs}	Y_{obs}	V_{obs}	Y_{obs}	V_{obs}	Y_{obs}	V_{obs}
4.10	2.60	4.48	3.40	5.00	4.20	5.63	5.00
4.18	2.80	4.60	3.60	5.15	4.40	5.79	5.20
4.26	3.00	4.73	3.80	5.30	4.60	-	-
4.36	3.20	4.86	4.00	5.45	4.80	-	-

Table 17. Co-ordinate and potential where equipotential line cut the axis X=2 of I-specimen (L-specimen).

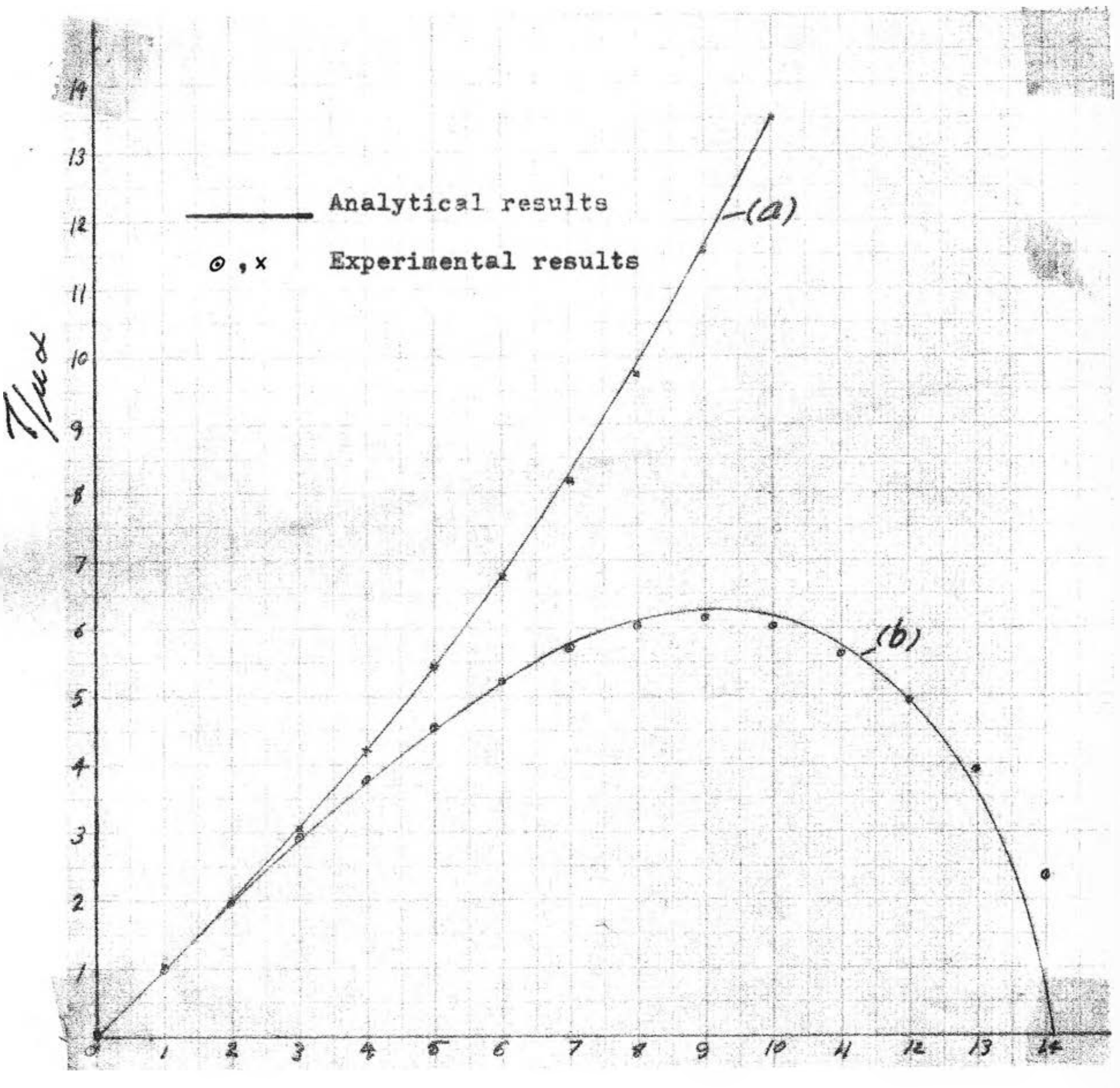


Fig. 19

Curve(a) Compare the experimental results and analytical results of T/μα along the co-ordinate axis of the square specimen

Curve(b) compare the experimental results and analytical results of T/μα along the diagonal line of the square specimen

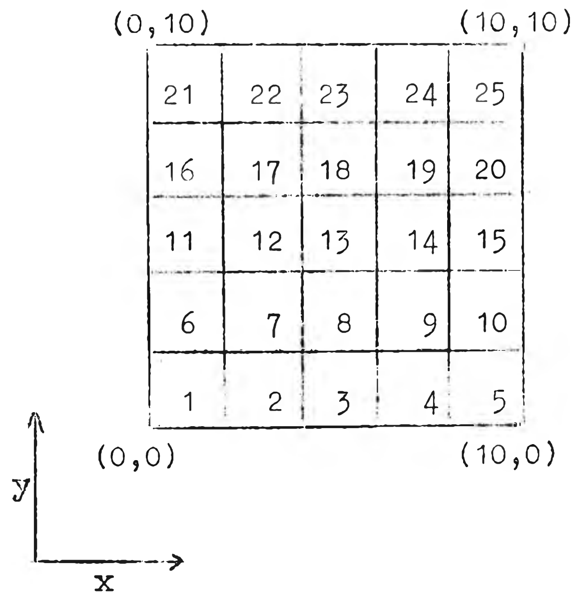


Fig 20. show how the square specimen is divided and the number assigned for the dividing squares

no	ϕ	no	ϕ	no	ϕ	no	ϕ	no	ϕ
1	57.0	6	53.6	11	45.3	16	31.9	21	12.4
2	53.6	7	49.7	12	42.3	17	30.0	22	11.7
3	45.2	8	42.4	13	36.1	18	25.8	23	10.7
4	32.0	9	30.1	14	25.9	19	18.8	24	8.3
5	12.6	10	12.0	15	10.8	20	8.1	25	3.6
								sum	709.6

Table 18 Shearing stress function in the middle of each dividing squares of the square specimen being obtained by interpolation.

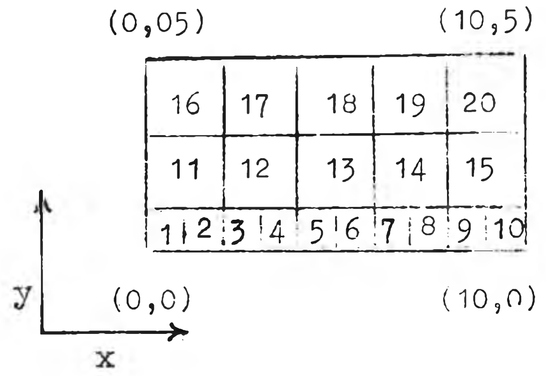


Fig.21 Show how the rectangular specimen is divided and the number assigned for the dividing squares.

(W-specimen)

no.	ϕ	no.	ϕ	no.	ϕ	no.	ϕ
1	21.3	6	17.4	11	18.0	16	7.8
2	20.9	7	15.3	12	17.3	17	7.4
3	20.6	8	12.0	13	15.4	18	6.7
4	19.8	9	9.4	14	12.6	19	5.7
5	18.8	10	4.4	15	6.5	20	3.8
		Sum	159.9			Sum	101.2

Table 19 Shearing stress functions in the middle of each dividing squares of the rectangular specimen being obtained by interpolation.

(L-specimen)

no.	ϕ	no.	ϕ	no.	ϕ	no.	ϕ
1	22.7	6	18.7	11	19.4	16	8.5
2	22.5	7	16.5	12	18.5	17	7.9
3	22.0	8	13.5	13	16.7	18	7.2
4	21.3	9	9.6	14	13.1	19	6.0
5	20.2	10	4.2	15	6.5	20	3.6
		Sum	171.2			Sum	107.4

Table 20 Shearing stress functions in the middle of each dividing squares of the rectangular specimen being obtained by interpolation.

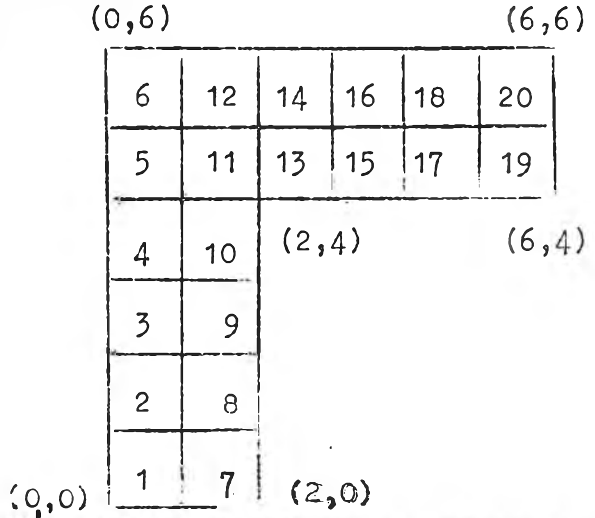


Fig.22 Show how the I-specimen is divided and the number assigned for the dividing squares.

Table 21 Shearing stress function in the middle of each dividing squares of I-specimen being obtained by interpolation.

no.	ϕ	no.	ϕ	no.	ϕ	no.	ϕ
1	3.56	6	1.67	11	2.00	16	.82
2	3.47	7	1.65	12	1.27	17	.46
3	3.34	8	1.61	13	.97	18	.68
4	3.24	9	1.61	14	1.00	19	.23
5	2.78	10	1.61	15	.55	20	.54
(W-specimen)						Sum	33.06

Table 22 Shearing stress functions in the middle of each dividing squares of I-specimen being obtained by interpolation.

	ϕ	no.	ϕ	no.	ϕ	no.	ϕ
1	3.82	6	1.45	11	1.95	16	.75
2	3.80	7	1.81	12	1.16	17	.64
3	3.76	8	1.77	13	1.02	18	.75
4	3.42	9	1.73	14	.93	19	.33
5	2.86	10	1.72	15	.76	20	.42
(L-specimen)						Sum	34.85

	W-side	L-side	Average	Theory
K	.669	.678	.674	.675
K_1	-	-	.1419	.1406

Table 23 Comparison between experimental results and theoretical values of K and K_1 of the square specimen.

	W-specimen	L-specimen	Average	Theory
K	.912	.950	.931	..930
K_1	.226	.240	.233	.229

Table 24 Comparison between experimental results and theoretical values of K and K_1 of the rectangular specimens..

	$\frac{\tau}{\mu\alpha}$		$\frac{M}{\mu\alpha}$
	Max.	at the reentrant corners	
W-specimen	3.47	6.56	264.48
L-specimen	4.08	10.79	278.80
Average	3.77	8.67	271.64
Approximate equation	4		234.67

Table 25 Comparison between experimental results and approximate values of max. $\tau/\mu\alpha$ and $\tau/\mu\alpha$ at the reentrant corner and torsional stiffness of the I-specimens.