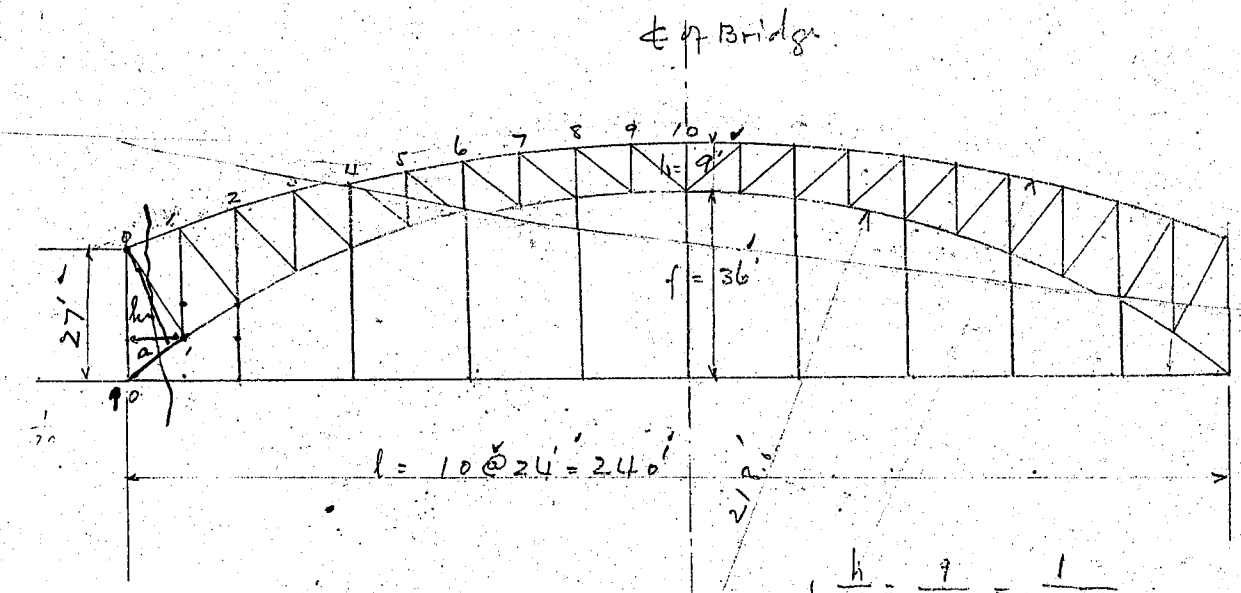
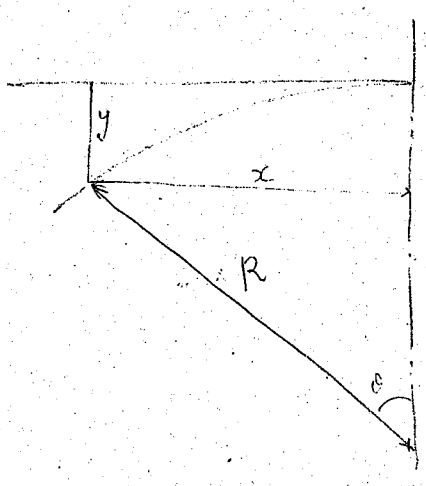


$\frac{h}{l} = \frac{9}{240} = \frac{1}{26.7}$		$\frac{1}{27.1}$
$\frac{f}{l} \cdot \frac{36}{240} = \frac{1}{6.7}$		$\frac{1}{6.4}$

409.0'

Ordinate of each panel.



$\sin\theta = \frac{x}{R}$

$y = R - R\cos\theta = R(1-\cos\theta)$ (18)

Curved circle

$$\text{radius } R_0 = \frac{4f^2+l^2}{8f} = \frac{4\times(45-27)^2+240^2}{8\times(45-27)} = \frac{4\times 18^2+240^2}{8\times 18}$$

$$= \frac{1296+57600}{144} = \frac{58896}{144} = 409.0$$

Inner circle

$$R_i = \frac{4\times 36^2+240^2}{8\times 36} = \frac{5184+57600}{288} = \frac{62784}{288} = 218.0$$

Upper chord

$R = 409.0'$

$\log R = \log 409 = 2.6117233$

$\log\frac{1}{R} = \bar{3}.388276\overset{2611}{7} - 0.0024449876 = \frac{1}{R}$

$d = 175$

$$\frac{12}{R} = 0.0024449876\times 12 = 0.0293398512 = 0.029340$$

R = 409.0

panel	x in ft	$\frac{x}{12}$	$\Delta L\theta = \frac{x}{R}$	θ	$\cos\theta$	$1-\cos\theta$	$y = R(1-\cos\theta)$
10	0	0	0.000 0000	0° — 0.000′	1.0000000	0.0000000	0
9	12	1	0.0293400	1° — 40.878′	0.9995695	0.0004305	0.1760745
8	24	2	0.0586800	3° — 21.843′	0.9982769	0.0017231	0.7047479
7	36	3	0.0880200	5° — 2.982′	0.9961188	0.0038812	1.5874108
6	48	4	0.1173600	6° — 44.386′	0.9930894	0.0069106	2.8264354
5	60	5	0.1467000	8° — 26.144′	0.9891810	0.0108190	4.4249710
4	72	6	0.1760400	10° — 8.352′	0.9843830	0.0156170	6.3873530
3	84	7	0.2053800	11° — 51.105′	0.9786828	0.0213177	8.7189393
2	96	8	0.2347200	13° — 34.508′	0.9720629	0.0279371	11.426739
1	108	9	0.2640600	15° — 18.666′	0.9645062	0.0354938	14.516964
0	120	10	0.2934000	17° — 3.698′	0.9559897	0.0440103	18.000 = 12.9

$\frac{12}{R}$

0.0293400 →
0.0290847 → 1° — 40′ → 0.9995770 (diff = 56)
2553 → .878 — 0.9995695
d = 2906 1° — 40.878′

0.0586800
0.0584352 → 3° — 21′ → 0.9982912
2448 .843 — 143 (d = 170)
d = 2904 3° — 21.843′ 0.9982769

0.0880200
0.0877353 → 5° — 2′ → 0.9961438 (d = 255)
2847 .952 — 250
d = 2898 5° — 2.982′ 0.9961188

0.1173600
0.1172485 → 6° — 44′ → 0.9931026 (d = 341)
1115 .386 — 132
d = 2659 6° — 44.386′ 0.9930894

0.1467000
0.1465855 → 8° — 26′ → 0.9891872 (d = 1127)
415 .144 — 62
d = 2878 8° — 26.144′ 0.9891810

panel	
10	0′ — 2 1/8″
9	0′ — 8 15/32″
8	1′ — 7 1/16″
7	2′ — 9 29/32″
6	4′ — 5 3/32″
5	6′ — 4 21/32″
4	8′ — 8 5/8″
3	11′ — 5 1/8″
2	14′ — 6 3/16″
1	18′ — 0″
0	

0.1760400
0.1759395 → 10°−8.′0 → 0.9544010 d=5-12
1005 ,352 180
d=2863 10°−8.352 0.9843830

0.2053800
0.2053502 → 11°−51.′ → 0.9786886 d=598
298 0.105 63
d=2817 11°−51.105′ → 0.9786823

0.2347200
0.2345766 → 13°−34.′ → 0.9720976 d= 684
1434 ,508 347
d=2825 13°−34.508 0.9720629

0.2640600
0.2638730 → 15°−18.′ → 0.9645574 d=768
1870 ,166 512
d=2806 15°−18.166 0.9645062

(15)
0.2934000
0.2932061 → 17°−3.′0 0.9560492 d=853
1939 195
1934 ,698 (2)
d=2781 17°−3.698 0.9559897

Lower chord

$R_i = 218.0$

$\log R_i = \log 218 = 2.3384565$

$\log \frac{1}{R_i} = \overline{3}.6615435$

$6615382 \rightarrow 0.004587155$

53

$d = 95$

$\frac{12}{R_i} = \frac{12}{218} = 0.004587155 \times 12 = 0.055045896$

panel	$\frac{x}{12}$	$\frac{x}{R} = \sin\theta$	θ	$\cos\theta$	$1-\cos\theta$	$y = R(1-\cos\theta)$
10	0	0.0000000	0°-0000′	1.0000000	0.0000000	0.0000000
9	1	0.0550459	3°-9.329	0.9984838	0.0015162	0.3305316
8	2	0.1100918	6°-19.236	0.9939214	0.0060786	1.3251348
7	3	0.1651377	9°-30.314	0.9862705	0.0137295	2.9930310
6	4	0.2201836	12°-43.189	0.9754585	0.0245415	5.3500470
5	5	0.2752295	15°-58.542	0.9613785	0.0386215	8.4194870
4	6	0.3302754	19°-17.130	0.9438846	0.0561154	12.2331572
3	7	0.3853213	22°-39.822	0.9227825	0.0772175	16.8334150
2	8	0.4403672	26°-7.640	0.8978177	0.1021823	22.2757414
1	9	0.4954131	29°-41.819	0.8686576	0.1313424	28.6326432
0	10	0.5504590	33°-23.910	0.8348623	0.1651377	36.0000186

panel	
10	0′-0″
9	0′-3 31/32″
8	1′-3 29/32″
7	2′-11 29/32″
6	5′-4 3/16″
5	8′-5 1/32″
4	12′-2 13/16″
3	16′-10″
2	22′-3 5/16″
1	28′-7 19/32″
0	36′-0″

0.0550459 ✓			
0.0549502	→ 3°-9.0′	→ 0.9984891 ✓	d= 160
957 ✓	.329	53 -	
d= 2904	3°- 9.329	0.9984838 ✓	
0.1100918			
0.1100234	→ 6°-19.0′	→ 0.9939290	d= 321
684	.236	76 -	
d=2892	6°- 19.236	0.9939214 ✓	
0.1651377			
0.1650476	→ 9°-30.0′	→ 0.9862856	d= 481
901	.314	151	
d=2869	9°-30.314	0.9862705 ✓	
0.2201836			
0.2201300	→ 12°-43.0′ →	0.9754706	d= 641
536	.189	121	
d=2837	12°-43.189	0.9754585 ✓	
0.2752295			
0.2750781	→ 15°-58.0′ →	0.9614219	d= 801
~~1514~~	.542	434 -	
d=2796	15°- 58.542	0.9613785 ✓	
0.3302754			
0.3302398	→ 19°-17.′0 →	0.9438971	d=961
356	.130	125	
d=2746	19°-17.130′	0.9438846 ✓	
0.3853213			
0.3851008	→ 22°-39.′0 →	0.9228745	d= 1121
2205	.822	920	
d=2688	22°-39.822	0.9227825 ✓	
0.4403672			
0.4402004	→ 26°-7.0′ →	0.8978996	d=1281
1670	.640	819	
d=2611	26°-7.640	0.8978177 ✓	
0.4954131			
0.4952060	→ 29°-41.0′	→ 0.8687756	d= 1441
2071	.819	1180	
d= 2527	29°-41.819	0.8686576 ✓	
0.5504590			
0.5502379	→ 33°-23.0′	→ 0.8350080	d= 1601
2211	.910	1457	
d=2428	33°-23.910	0.8348623 ✓	

Length of Each members

Vm ~~Sm~~ Verticals.

panel				Sm.
10	0'-0"	0'-0"	9'-0"	9'-0"
9	0'-3 31/32"	0'-2 1/8"	"	9'-1 27/32"
8	1'-3 29/32"	0'-8 15/32	"	9'-7 7/16"
7	2'-11 29/32"	1'-7 1/16"	"	10'-4 27/32"
6	5'-4 3/16"	2'-9 29/32"	"	11'-6 9/32"
5	8'-5 1/32"	4'-5 3/32"	"	12'-11 15/16"
4	12'-2 13/16"	6'-4 21/32"	"	14'-10 5/32"
3	16'-10"	8'-8 5/8"	"	17'-1 3/8"
2	22'-3 5/16"	11'-5 1/8"	"	19'-10 3/16"
1	28'-7 19/32"	14'-6 3/16"	"	23'-1 13/32"
0	36'-0"	18'-0"	"	27'-0"

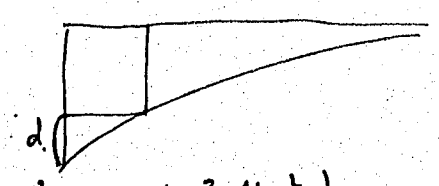
Hm ~~Tm~~ Suispenders (conventional)

panel		
0	36'-0"	0-0"
1	28'-7 19/32"	~~7'-4 13/32"~~
2	22'-3 5/16"	13'-8 11/16"
3	16'-10"	~~19'-2"~~
4	12'-2 13/16"	23'-9 3/16"
5	8'-5 1/32"	~~27'-6 31/32"~~
6	5'-4 3/16"	30'-7 13/16"
7	2'-11 29/32"	~~33'-0 3/32"~~
8	1'-3 29/32"	34'-8 3/32"
9	0'-3 31/32"	~~35'-8 1/32"~~
10	0'-0"	36'-0"

U_m Upper chords.

panel			diff.	(diff)^2	$12^2=144$	
0	18'-0"	− 14'-6 3/16"	= 3'-5 13/16"	12.1409	156.1409	12'-5 15/16"
1	14'-6 3/16"	− 11'-5 1/8"	= 3'-1 1/16"	9.5391	153.5391	12'-4 11/16"
2	11'-5 1/8"	− 8'-8 5/8"	= 2'-8 1/2"	7.3351	151.3351	12'-3 5/8"
3	8'-8 5/8"	− 6'-4 21/32"	= 2'-3 31/32"	5.4323	149.4323	12'-2 11/16"
4	6'-4 21/32"	− 4'-5 3/32"	= 1'-11 9/16"	3.8555	147.8555	12'-1 29/32"
5	4'-5 3/32"	− 2'-9 29/32"	= 1'-7 3/16"	2.5567	146.5567	12'-1 9/32"
6	2'-9 29/32"	− 1'-7 1/16"	= 1'-2 27/32"	1.5301	145.5301	12'-3/4"
7	1'-7 1/16"	− 0'-8 15/32"	= 0'-10 19/32"	0.779358	144.7794	12'-3/8"
8	0'-8 15/32"	− 0'-~~8 15/32~~ 2 1/8"	= 0'-6 11/32"	0.279466	144.2795	12'-1/8"
9	0'-2 1/8"	− 0'-~~2 1/8~~ 0"	= 0'-2 1/8"	0.031359	144.0314	12'-0"
10	0'-0"					

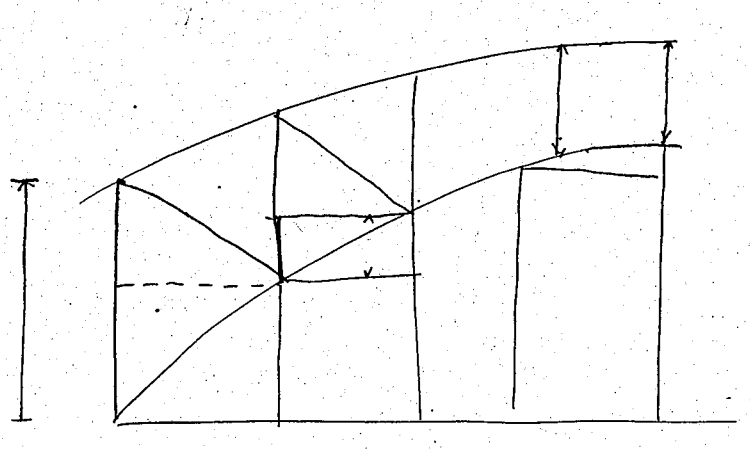
b_m Lower chords.

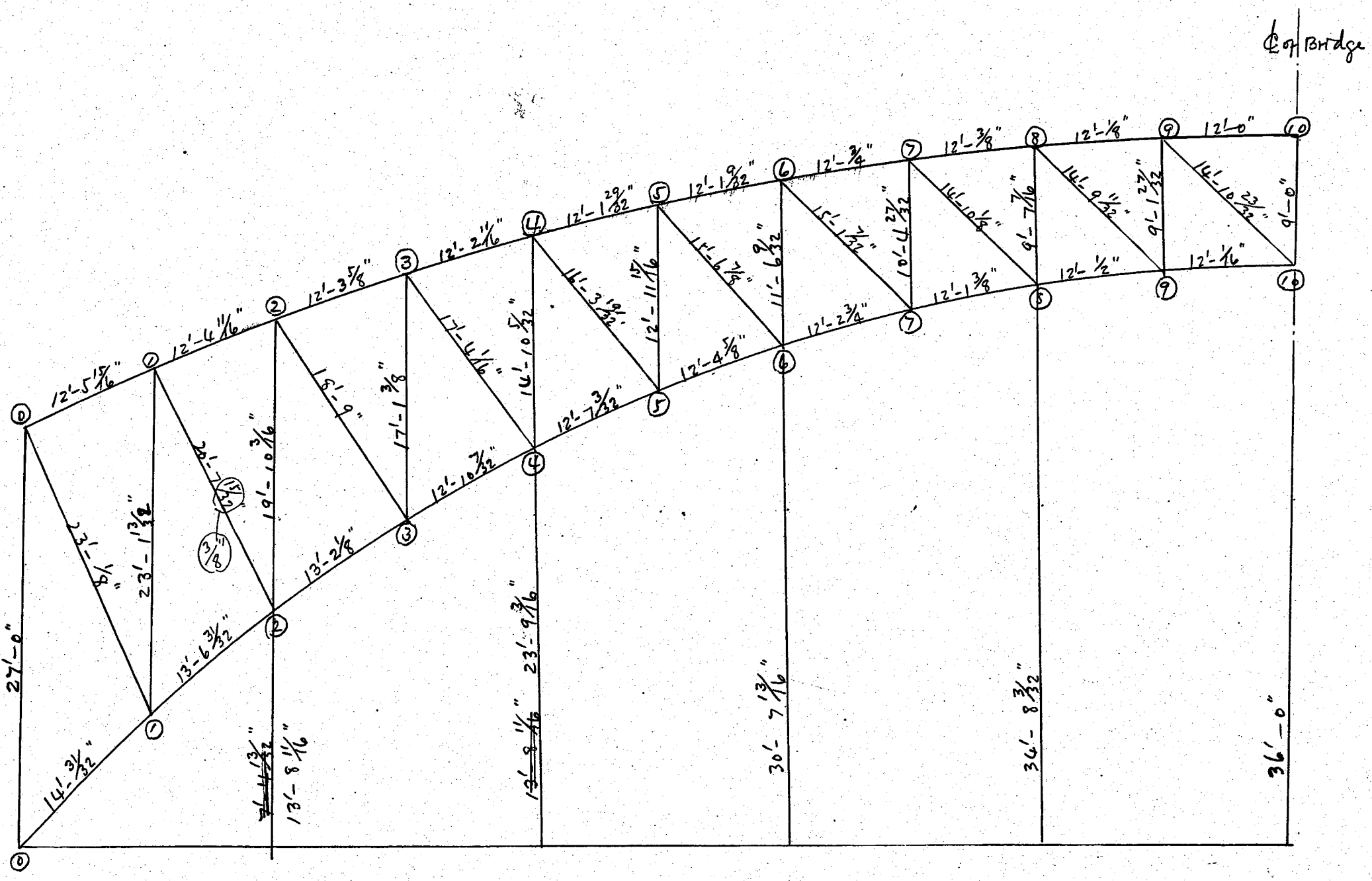


panel		diff.	(diff)^2	(12^2+diff^2)	
0	36'-0"	7'-4 13/32"	54.2755	198.2755	14'-31/32"
1	28'-7 19/32"	6'-4 9/32"	40.4085	184.4085	13'-6 31/32"
2	22'-3 5/16"	5'-5 5/16"	29.6231	173.6231	13'-2 1/8"
3	16'-10"	4'-7 13/16"	21.1504	165.1504	12'-10 7/32"
4	12'-2 13/16"	3'-9 25/32"	14.5550	158.5550	12'-7 3/32"
5	8'-5 1/32"	3'-27/32"	9.4268	153.4268	12'-4 5/8"
6	5'-4 3/16"	2'-4 9/32"	5.5544	149.5544	12'-2 3/4"
7	2'-11 29/32"	1'-8"	2.7778	146.7778	12'-1 3/8"
8	1'-3 29/32"	~~1'-11 15/16~~"	~~0.9948~~ ~~0.9385~~ 0.9896	144.98 96/85	12'-1/2"
9	0'-3 31/32"	8'-3 31/32"	0.1094	144.1094	12'-1/16"
10	0'-0"				

dm diagonals.

	δ_m		Square.	+144	d_m
10	9′- 0″	0 - 0			
9	(9′- $1\frac{27}{32}$″) − (0′- $3\frac{31}{32}$″)	= 8′- $9\frac{7}{8}$″	77.8439	221.8439	14′- $10\frac{23}{32}$″
8	(9′- $7\frac{7}{16}$″) − (0′- $11\frac{15}{16}$″)	= 8′- $7\frac{1}{2}$″	74.3906	218.3906	14′- $9\frac{11}{32}$″
7	(10′- $4\frac{27}{32}$″) − (1′- 8″)	= 8′- $8\frac{27}{32}$″	76.3348	220.3348	14′- $10\frac{1}{8}$″
6	(11′- $6\frac{9}{32}$″) − (2′- $4\frac{9}{32}$″)	= 9′- 2″	84.0278	228.0278	15′- $1\frac{7}{32}$″
5	(12′- $11\frac{15}{16}$″) − (3′- $\frac{27}{32}$″)	= 9′- $11\frac{3}{32}$″	98.4953	242.4953	15′- $6\frac{7}{8}$″
4	(14′- $10\frac{5}{32}$″) − (3′- $9\frac{25}{32}$″)	= 11′- $0\frac{3}{8}$″	121.6885	265.6885	16′- $3\frac{19}{32}$″
3	(17′- $1\frac{3}{8}$″) − (4′- $7\frac{3}{16}$″)	= 12′- $6\frac{3}{16}$″	156.6409	300.6409	17′- $4\frac{1}{16}$″
2	(19′- $10\frac{3}{16}$″) − (5′- $5\frac{5}{16}$″)	= 14′- $4\frac{7}{8}$″	207.5400	351.5400	18′- 9″
1	(23′- $1\frac{13}{32}$″) − (6′- $4\frac{9}{32}$″)	= 16′- $9\frac{1}{4}$″ ($9\frac{1}{8}$″)	280.9116 / 281.2609	424.9116 / 425.2609	20′- $7\frac{15}{32}$″ ($7\frac{3}{8}$″)
0	(27′- 0″) − (7′- $4\frac{13}{32}$″)	= 19′- $7\frac{19}{32}$″	385.4473	529.4473	23′- $\frac{1}{8}$″




℄ of Bridge
0
1
2
3
4
5
6
7
8
9
10
12'-5 15/16"
12'-4 11/16"
12'-3 5/8"
12'-2 1/16"
12'-1 29/32"
12'-1 9/32"
12'-3/4"
12'-3/8"
12'-1/8"
12'-0"
27'-0"
23'-8 1/16"
23'-1 3/8"
19'-7 3/16"
16'-9"
14'-3/32"
13'-6 3/32"
13'-2 1/8"
12'-10 7/32"
12'-7 3/32"
12'-4 5/8"
12'-2 3/4"
12'-1 3/8"
12'-1/2"
12'-1/16"
14'-3 3/32"
14'-10 5/32"
14'-11 1/16"
14'-11 15/32"
14'-10 1/8"
14'-9 1/2"
14'-9 27/32"
14'-10 23/32"
13'-8 1/16"
19'-10 3/16"
19'-8 1/16"
23'-9 3/16"
30'-7 13/16"
34'-8 3/32"
36'-0"

Length of Each members

m	upper chord (um)		Lower chord (bm)		Verticals (sm)		diagonals (dm)		Suspenders (rm)		rm(actual)
0	—	—	14'-3/32"	1.14863 / 14.0807	27'-0"	1.43136 / 27.0000	—	—	0	0	0
1	12'-5 15/16"	1.09673 / 12.4948	13'-6 3/32"	1.13292 / 13.5807	23'-13/32"	1.36393 / 23.1172	23'-1/8"	1.36192 / 23.0104	7'-4 13/32"	7.3672	7.18
2	12'-4 11/16"	1.09309 / 12.3906	13'-2 1/8"	1.11982 / 13.1771	19'-10 3/16"	1.29774 / 19.8490	20'-7 3/8"	1.31437 / 20.6224	13'-8 11/16"	13.7240	
3	12'-3 5/8"	1.08998 / 12.3021	12'-10 7/32"	1.10896 / 12.8516	17'-1 3/8"	1.23337 / 17.1146	18'-9"	1.27300 / 18.7500	19'-2"	19.1667	
4	12'-2 11/16"	1.08721 / 12.2240	12'-7 3/32"	1.10007 / 12.5911	14'-10 5/32"	1.17162 / 14.8464	17'-4 1/16"	1.23901 / 17.3385	23'-9 3/16"	23.7656	
5	12'-1 29/32"	1.08489 / 12.1589	12'-4 5/8"	1.09291 / 12.3854	12'-11 17/16"	1.11377 / 12.4948	16'-3 19/32"	1.21217 / 16.2995	27'-6 3/32"	27.5807	
6	12'-1 9/32"	1.08383 / 12.1068	12'-2 3/4"	1.08740 / 12.2292	11'-6 9/32"	1.06158 / 11.5234	15'-6 7/8"	1.19237 / 15.5729	30'-7 13/16"	30.6172	
7	12'-3/4"	1.08144 / 12.0625	12'-1 3/8"	1.08331 / 12.1146	10'-4 27/32"	1.01719 / 10.4036	15'-1 7/32"	1.17902 / 15.1016	33'-3/32"	33.0078	
8	12'-3/8"	1.08531 / 12.0313	12'-1/2"	1.08069 / 12.0417	9'-7 7/16"	0.98317 / 9.6198	14'-10 1/8"	1.17154 / 14.8438	34'-8 3/32"	34.6745	
9	12'-1/8"	1.07956 / 12.0104	12'-1/16"	1.07937 / 12.0052	9'-1 27/32"	0.96159 / 9.1536	14'-9 11/32"	1.16963 / 14.7786	35'-5 1/32"	35.6693	
10	12'-0"	1.07918 / 12.0000	—	—	9'-0"	0.95424 / 9.0000	14'-10 23/32"	1.17299 / 14.8932	36'-0"	36.0000	

k=2.39

m	gm	hm	fm	em	im	im-ma	ma	ma/gm	ma/hm	em/fm	im/im-ma	rm+im	em-ma / fm	12/fm
1	22.20	20.43	83.83	83.44	108.58	96.58	12	0.54	0.59	0.99	1.12	30.48	83.44	0.143
2	19.22	18.08	81.70	96.88	125.18	101.18	24	1.25	1.33	1.18	1.24	33.57	84.88	0.148 0.1487
3	16.70	15.98	79.51	111.11	144.63	108.63	36	2.15	2.25	1.40	1.33	36.28	87.11	0.302 0.151
4	14.58	14.15	77.53	126.55	168.02	120.02	48	3.29	3.39	1.63	1.40	38.61	90.55	0.464 0.155
5	12.83	12.59	76.71	144.22	200.90	140.90	60	4.68	4.76	1.88	1.42	40.58	96.72	0.626 0.157
6	11.42	11.31	78.42	165.98	254.48	182.48	72	6.30	6.37	2.12	1.39	42.14	105.98	0.766 0.153
7	10.35	10.30	85.07	195.49	374.55	290.55	84	7.40	8.16	2.30	1.29	43.41	123.49	0.845 0.141
8	9.59	9.59	103.22	243.27	1126.90	1030.90	96	10.01	10.01	2.36	1.09	44.29	159.27	0.814 0.116
9	9.15	9.15	153.39	343.65	-447.00	-555.00	108	11.80	11.80	2.24	0.81	44.82	247.65	0.676 0.078
10	9.00	—	432.02	822.91	—		120	13.33	—	1.90	—	45.00	714.91	0.250 0.028

8.70

Notation.

a = panel distance

g_m = perpendicular distance from lower panel pt m. to upper chord $\overline{U_{m-1}-U_m}$

h_m = " " " upper " " m " lower chord $\overline{L_{m+1}-L_m}$

f_m = perpendicular distance from H (intersection pt of $\overline{U_{m-1}-U_m}$ and $\overline{L_{m+1}-L_m}$) to the diagonal d_m $(U_{m-1}-L_m)$

l_m = horizontal distance from H to left support.

i_m = " " " from I (intersection pt of $\overline{U_{m-1}-U_m}$ and $(\overline{L_{m+1}-L_{m+1}})$ to the left support.

$$g_m = \frac{a}{L_m} f_m \qquad V_m \quad V_{m+1}$$

$$h_m = \frac{a}{b_m} f_m \qquad V_{m+1} \qquad L_m$$

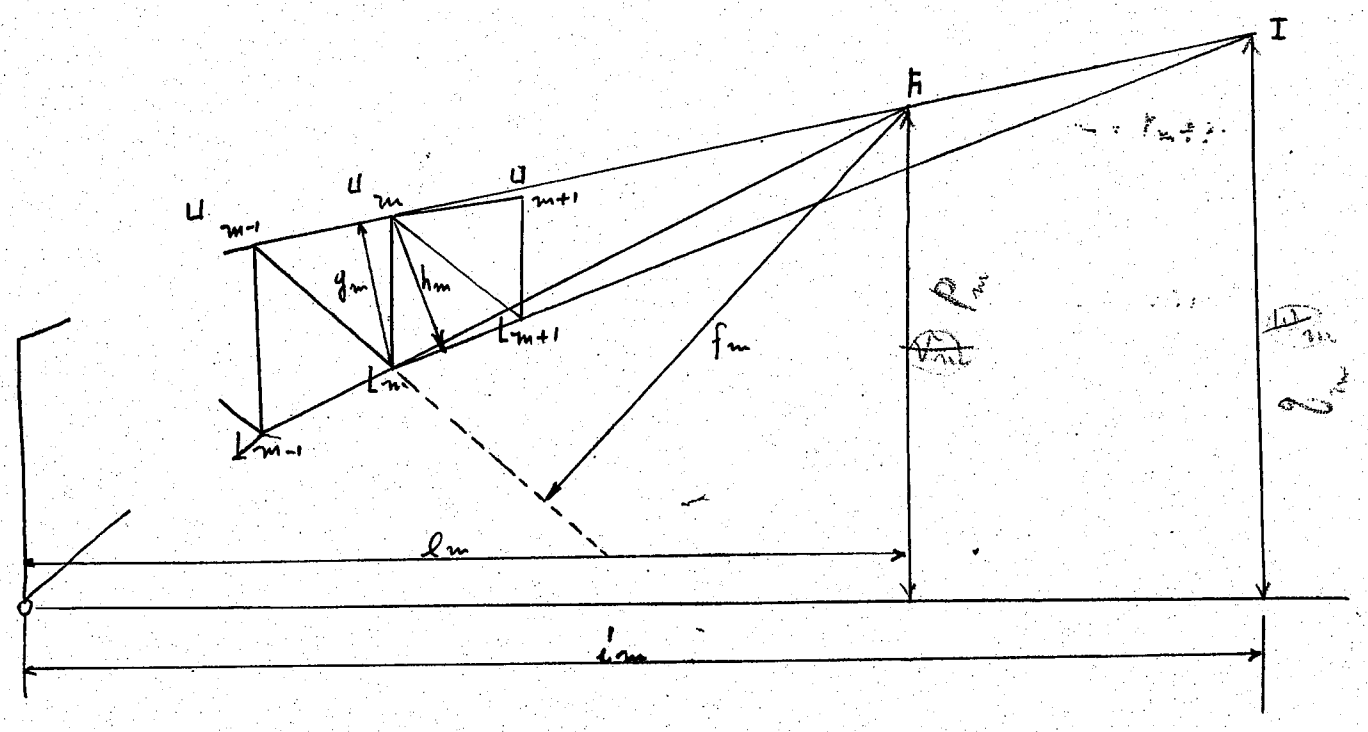
$$f_m = \frac{f_{m-1}}{f_{m-1}-f_m} \frac{a}{d_m} f_m \qquad V \quad V_{m+1}$$

$$l_m = \frac{f_{m-1}}{f_{m-1}-f_m} a + (m-1)a \qquad V$$

$$i_m = \frac{f_m \quad V_{m+1}}{(r_{m+1}-r_m)-(y_m-y_{m-1})} a + ma \qquad H$$

$H_m + V_m$

where $y_m = r_m + f_m$



$$g_m = \frac{a}{d_m}\,\delta_m$$

m	a	$\frac{\delta_m}{d_m}$	d_m	$\log \delta_m \cdot a$			
	12.W						
1	1.07918	1.36393	1.09673	2.44311	1.34638	22'-2 13/32"	22.20
2	"	1.29774	1.09309	2.37692	1.28383	19'-2 11/16"	19.22
3	"	1.23337	1.08998	2.31255	1.22257	16'-8 11/32"	16.70
4	"	1.17162	1.08721	2.25080	1.16359	14'-6 29/32"	14.58
5	"	1.11377	1.08489	2.19295	1.10806	12'-9 29/32"	12.81 ③
6	"	1.06158	1.08303	2.14076	1.05773	11'-5 1/16"	11.42
7	"	1.01719	1.08144	2.09637	1.01493	10'-4 7/32"	10.35
8	"	0.98317	1.08031	2.06235	0.98204	9'-7 1/8"	9.59
9	"	0.96159	1.07956	2.04077	0.96121	9'-1 3/4"	9.15
10	"	0.95424	1.07918	2.03342	0.95424	9'-0"	9.02

$$h_m = \frac{a \cdot \delta_m}{b_m}$$

m	a	δ_m	b_m	$\log a \cdot \delta_m$			
0		1.43136	1.14863	2.51058	1.36191		23.01
1	1.07918	1.36393	1.13292	2.44311	1.31019	20'-5 1/8"	20.43
2	"	1.29774	1.11982	2.37692	1.25710	18'-3 29/32"	18.08
3	"	1.23337	1.10896	2.31255	1.20359	15'-11 25/32"	15.98
4	"	1.17162	1.10007	2.25080	1.15073	14'-1 25/32"	14.15
5	"	1.11377	1.09291	2.19295	1.10004	12'-7 1/16"	12.59
6	"	1.06158	1.08740	2.14076	1.05336	11'-3 11/16"	11.31
7	"	1.01719	1.08331	2.09637	1.01306	10'-3 21/32"	10.30
8	"	0.98317	1.08069	2.06235	0.98166	9'-7 3/32"	9.59
9	"	0.96159	1.07937	2.04077	0.96140	9'-1 25/32"	9.15
10	"	0.95424	——				

$$f_m = \frac{\delta_{m-1}}{\delta_{m-1}-\delta_m}\,\frac{a}{d_m}\,\delta_m.$$

m	$\delta_{m-1}-\delta_m$	$\log a.\delta_m$	$\log \delta_{m-1}$	$\log \delta_{m-1}-\delta_m$	$\log d_m$		
1	3′-10 19/32″ ✓	2.443 11 ✓	1.431 36 ✓	0.589 15 ✓	1.361 92 ✓	1.923 40 ✓	83′-9 31/32″ ✓ 83.83
2	3′-3 7/32″ ✓	2.376 92 ✓	1.363 93 ✓	0.514 31 ✓	1.314 34 ✓	1.912 20 ✓	81′-8 1/32″ 81.70 73.
3	2′-8 13/16″ ✓	2.312 55 ✓	1.297 74 ✓	0.436 86 ✓	1.273 00 ✓	1.900 43 ✓	79′-6 1/8″ ✓ 79.51
4	2′-3 7/32″ ✓	2.250 80 ✓	1.233 37 ✓	0.355 69 ✓	1.239 01 ✓	1.889 47 ✓	77′-6 3/8″ ✓ 77.53
5	1′-10 7/32″ ✓	2.192 95 ✓	1.171 62 ✓	0.267 54 ✓	1.212 17 ✓	1.884 86 ✓	76′-8 17/32″ ✓ 76.71
(6)	1′-5 21/32″ ✓	2.140 76 ✓	1.113 77 ✓	0.167 72 ✓	1.192 37 ✓	1.894 44 ✓	78′-5-1/16″ ~~78.42~~ 7.842 ✓
7	1′-1 7/16″ ✓	2.096 37 ✓	1.061 58 ✓	0.049 14 ✓	1.179 02 ✓	1.892 79 ✓	85′-7/8″ ✓ 85.07
8	0′-9 13/32″ ✓	2.062 35 ✓	1.017 19 ✓	T.894 24 ✓	1.171 54 ✓	2.013 76 ✓	103.22 ✓
9	0′-5 19/32″ ✓	2.040 77 ✓	0.983 17 ✓	T.668 52 ✓	1.169 63 ✓	2.185 ~~49~~ 79 ✓	~~153.39~~ ~~104.37~~ ✓
10.	0′-1 27/32″ ✓	2.033 42 ✓	0.961 59 ✓	T.186 52 ✓	1.172 99 ✓	2.635 50 ✓	432.02 ✓

$$l_m = \frac{\delta_{m-1}}{\delta_{m-1}-\delta_m}\,a. + (m-1)\,a.$$

$\frac{13.0 \times 12 \times 11.52}{(18.m - 11.52)\,15.17}$
1.48

m	$\log a$	$\log \delta_{m-1}$.	$\log \delta_{m-1}-\delta_m$			l_m
1	1.079 18 ✓	1.431 36 ✓	0.589 15 ✓	= 1.921 39 ✓	83.44 ✓	— 83.44 ✓
2	〃	1.363 93 ✓	0.514 31 ✓	= 1.728 80 ✓	84.88 ✓	12 ✓ 96.88 ✓
3	〃	1.297 74 ✓	0.436 86 ✓	= 1.940 06 ✓	87.11 ✓	24 ✓ 111.11 ✓
4	〃	1.233 37 ✓	0.355 69 ✓	= 1.954.86 ✓	90.55 ✓	36 ✓ 126.55 ✓
5	〃	1.171 62 ✓	0.267 54 ✓	= 1.983.26 ✓	96.22 ✓	48 ✓ 144.22 ✓
6	〃	1.113 77 ✓	0.167 72 ✓	= 2.025.23 ✓	105.98 ✓	60 ✓ 165.98 ✓
7	〃	1.061 58 ✓	0.049 14 ✓	= 2.091 62 ✓	123.49 ✓	72 ✓ 195.49 ✓
8	〃	1.017 19 ✓	T.894 24 ✓	= 2.020 13 ✓	159.27 ✓	84 ✓ 243.27 ✓
9	〃	0.983 17 ✓	T.668 52 ✓	= 2.353 83 ✓	247.65 ✓	96 ✓ 343.65 ✓
10	〃	0.961 59 ✓	T.186 52 ✓	= 2.854 25 ✓	714.91 ✓	108 ✓ 822.91 ✓

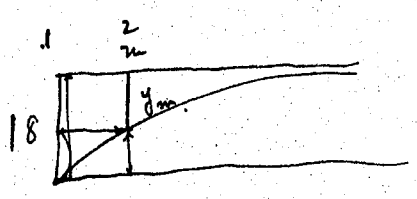
13

$$i_m = \frac{\delta_m \cdot a}{(r_{m+1} - r_m) - (y_m - y_{m-1})} + m\,a.$$

$$y_m = r_m + \delta_m.$$

~~$(r_{m+1} - r_m) = (r_m +$~~

	$r_{m+1} - r_m$	$-(y_m - y_{m-1})$	$=$	$\log[(r_{m+1} - r_m) + (y_m - y_{m-1})]$	$\log \delta_m \cdot a$		
0.	$(7' - 4\frac{11}{32}")$ ✓						
1	$6' - 4\frac{9}{32}"$ ✓	$3' - 5\frac{13}{16}"$ ✓	$2' - 10\frac{15}{32}"$ ✓	0.45824 ✓	2.44311 ✓	1.98487 ✓	96.58 ✓
2	$5' - 5\frac{5}{16}"$ ✓	$3' - 1\frac{1}{16}"$ ✓	$2' - 4\frac{1}{4}"$ ✓	0.37184 ✓	2.37692 ✓	2.00508 ✓	101.18 ✓
3	$4' - 7\frac{3}{16}"$ ✓	$2' - 8\frac{1}{2}"$ ✓	$1' - 10\frac{11}{16}"$ ✓	0.27661 ✓	2.31255 ✓	2.03594 ✓	108.63 ✓
4	$3' - 9\frac{25}{32}"$ ✓	$2' - 3\frac{31}{32}"$ ✓	$1' - 5\frac{13}{16}"$ ✓	0.17154 ✓	2.25080 ✓	2.07926 ✓	120.0 ✓
5	$3' - \frac{27}{32}"$ ✓	$1' - 11\frac{9}{16}"$ ✓	$1' - 1\frac{9}{32}"$ ✓	0.04406 ✓	2.19295 ✓	2.14889 ✓	140.90 ✓
6	$2' - 4\frac{9}{32}"$ ✓	$1' - 7\frac{3}{16}"$ ✓	$0' - 9\frac{3}{32}"$ ✓	$\bar{1}.87956$ ✓	2.14076 ✓	2.26120 ✓	182.48 ✓
7	$1' - 8"$ ✓	$1' - 2\frac{27}{32}"$ ✓	$0' - 5\frac{5}{32}"$ ✓	$\bar{1}.63315$ ✓	2.09637 ✓	2.46322 ✓	290.55 ✓
8	$0' - 11\frac{15}{16}"$ ✓	$0' - 10\frac{19}{32}"$ ✓	$0' - 1\frac{11}{32}"$ ✓	$\bar{1}.04914$ ✓	2.06235 ✓	3.01321 ✓	1030.90 ✓
9	$0' - 3\frac{31}{32}"$ ✓	$0' - 6\frac{11}{32}"$ ✓	$-(0' - 2\frac{3}{8}")$ ✓	$-(\bar{1}.29648)$ ✓	2.04077 ✓	-2.74429 ✓	$-.555.00$ ✓
10							



1	96.58 ✓	12 ✓	108.58 ✓
2	101.18 ✓	24 ✓	125.18 ✓
3	108.63 ✓	36 ✓	144.63 ✓
4	120.0 ✓	48 ✓	168.02 ✓
5	140.90 ✓	60 ✓	200.90 ✓
6	182.48 ✓	72 ✓	254.48 ✓
7	290.55 ✓	84 ✓	374.55 ✓
8	1030.90 ✓	96 ✓	1126.90 ✓
9	-555.00 ✓	108 ✓	-447.00 ✓

$$U_m = -\frac{R_A \cdot m a}{g_m} \qquad U_m' = -\left(\frac{m a}{g_m}\right)(1-R_A) \qquad U_m' = -\left\{\left(\frac{m a}{g_m}\right) - \left(\frac{m a}{g_m}\right) R_A\right\}$$

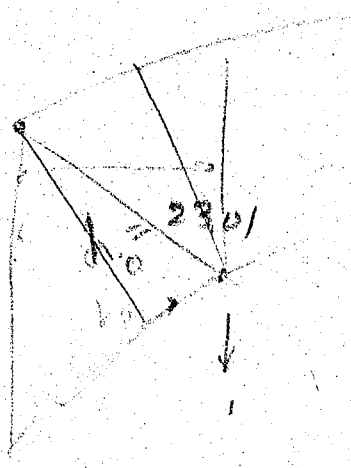
Load on (1')

$R_A = \frac{1}{20}$.

member	Upper chord.	Lower chord.	diagonals	Verticals
		0.026	0.050	0.056
1	0.027	0.030	~~0.050~~	
	063	0.067	0.059	0.062
2	0.~~625~~		~~0.590~~	
	0.108	0.113	0.070	0.067
3	~~1.075~~			
	0.165	0.170	0.082	0.070
4	~~1.645~~			
	0.224	0.238	0.094	0.071
5	~~2.240~~			
	0.315	0.319	0.106	0.0~~7~~0
6	~~3.150~~			
	0.370	0.403	0.115	0.065
7	~~3.700~~			
	0.501	0.5~~9~~0	0.118	0.0~~5~~5
8	~~5.005~~			
	0.5~~0~~9		0.112	0.041
9	~~5.590~~			
10.	0.667		0.095	

$12 \times \frac{1}{20} \cdot \frac{1}{23.01} = 0.026$

23.01



Upper chord.

load m	A U_1	B U_2	C U_3	D U_4	E U_5	F U_6	G U_7	H U_8	K U_9	L U_{10}
1	0.027	0.063	0.108	0.165	0.234	0.315	0.406 ~~0.370~~	0.501	0.590	0.667
2	0.054	0.125	0.215	0.329	0.469	0.630	0.812	1.002	1.180	1.333
3	0.081	0.187	0.323	0.494	0.703	0.945	1.217	1.502	1.770	2.000
4	0.108	0.250	0.431	0.658	0.937	1.260	1.623	2.003	2.360	2.666
5	0.135	0.312	0.539	0.823	1.171	1.575	2.028	2.504	2.950	3.333
6	0.162	0.375 ~~0.378~~	0.646	0.987	1.405	1.890	2.434	3.005	3.540	4.000
7	0.189	0.437 ~~0.441~~	0.754	1.152	1.639	2.205	2.840	3.505	4.130	4.667
8	0.216	0.500	0.862	1.317	1.874	2.520	3.245	4.006	4.720	5.333
9	0.243	0.562 ~~0.567~~	0.970	1.482	2.107	2.835	3.652	4.506	5.310	6.000
10	0.270	0.624 ~~0.630~~	1.077	1.646	2.342	3.150	4.058	5.007	5.900	6.667
11	9' 0.297	0.687 ~~0.693~~	1.185	1.810	2.578	3.465	4.464	5.508	6.490	6.000
12	8' 0.324	0.750	1.293	1.975	2.812	3.780	4.870	6.009	5.769	5.333
13	7' 0.351	0.812	1.400	2.140	3.044 ~~3.040~~	4.095	5.275	5.258	5.048 ~~4.998~~ 4.9 ~~5.000~~	4.667
14	6' 0.378	0.874 ~~0.882~~	1.508	2.304	3.280	4.410	4.522	4.507	4.327 ~~4.274~~	4.000
15	5' 0.405	0.937 ~~0.945~~	1.616	2.468	3.515	3.675	3.768	3.756	3.560	3.333
16	4' 0.432	1.000	1.723	2.633	2.812	2.940	3.014	3.005	2.884	2.666
17	3' 0.459	1.061 ~~1.071~~	1.832	1.985 ~~1.995~~	2.109	2.205	2.261	2.253	2.163	2.000
18	2' 0.486	1.123 ~~1.134~~	1.221	1.327	1.406	1.470	1.507	1.502	1.442	1.333
19	1' 0.513	0.562 ~~0.567~~	0.611	0.658	0.703	0.735	0.754	0.751	0.721	0.667

-16-
-15-

Lower chord s.

$b_0 = \cancel{\ell} \cos\theta$ $\quad \frac{2\pi\theta}{n} = \frac{7.3672}{14.0807} = 0.523.$ $\quad \sec\theta = 1.9$

all studs = 0

Load on	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8	b_9	~~b_{10}~~
1	~~0.095~~ 0.095	0.029	0.066	0.113	0.170	0.238	0.318	0.408	0.501	0.590	
2	~~0.190~~ 0.190	0.059	0.133	0.225	0.339	0.476	0.637	0.816	1.002	1.180	
3	~~0.285~~ 0.285	0.088	0.199	0.338	0.509	0.714	0.955	1.223	1.502	1.770	
4	~~0.380~~ 0.380	0.117	0.265	0.450	0.678	0.952	1.273	1.632	2.003	2.360	
5	~~0.475~~ 0.475	0.147	0.332	0.563	0.848	1.191	1.592	2.038	2.504	2.950	
6	~~0.570~~ 0.570	0.176	0.398	0.676	1.018	1.428	1.910	2.447	3.005	3.540	
7	~~0.665~~ 0.665	0.206	0.464	0.788	1.187	1.667	2.228	2.854	3.505	4.130	
8	~~0.760~~ 0.760	0.235	0.531	0.901	1.357	1.905	2.547	3.262	4.006	4.720	
9	~~0.855~~ 0.855	0.264	0.597	1.013	1.527	2.143	2.866	3.670	4.506	5.310	
10	~~0.950~~ 0.950	0.294	0.664	1.126	1.697	2.382	3.184	4.076	5.007	5.900	
9'	~~1.045~~ 0.288	0.323	0.730	1.238	1.867	2.619	3.502	4.485	5.508	6.490	
8'	~~1.140~~ 0.314	0.352	0.797	1.352	2.036	2.858	3.820	4.892	6.009	5.769	
7'	~~1.235~~ 0.340	0.382	0.863	1.464	2.205	3.096	4.140	5.300	5.258	5.048	
6'	~~1.330~~ 0.366	0.411	0.929	1.577	2.374	3.334	4.456	4.543	4.507	4.327	
5'	~~1.425~~ 0.392	0.440	0.995	1.689	2.544	3.572	3.713	3.786	3.756	3.606	
4'	~~1.520~~ 0.418	0.470	1.062	1.802	2.714	2.858	2.971	3.028	3.005	2.884	
3'	~~1.615~~ 0.445	0.499	1.128	1.915	2.036	2.143	2.228	2.271	2.253	2.163	
2'	~~1.710~~ 0.471	0.528	1.194	1.277	1.357	1.429	1.485	1.514	1.502	1.442	
1'	~~1.805~~ 0.497	0.558	0.597	0.638	0.679	0.714	0.743	0.757	0.751	0.721	

upper chord

Load on member	1	2	3	4	5	6	7	8	9	10
1	0.027	0.054	0.081	0.108	0.135	0.162	0.189	0.216	0.243	0.270
2	0.062	0.125	0.187	0.250	0.312	0.375	0.437	0.500	0.562	0.624
3	0.108	0.215	0.323	0.431	0.539	0.646	0.754	0.862	0.970	1.077
4	0.165	0.329	0.494	0.658	0.823	0.987	1.152	1.317	1.482	1.646
5	0.234	0.469	0.703	0.937	1.171	1.405	1.639	1.874	2.107	2.342
6	0.315	0.630	0.945	1.260	1.575	1.890	2.205	2.520	2.835	3.150
7	0.406	0.812	1.217	1.623	2.028	2.434	2.840	3.245	3.652	4.058
8	0.501	1.002	1.502	2.003	2.504	3.005	3.505	4.006	4.506	5.007
9	0.590	1.180	1.770	2.360	2.950	3.540	4.130	4.720	5.310	5.900
10	0.667	1.333	2.000	2.666	3.333	4.000	4.667	5.333	6.000	6.667
~~10'~~	~~0.667~~	~~1.333~~	~~2.000~~	~~2.666~~	~~3.333~~	~~4.000~~	~~4.667~~	~~5.333~~	~~6.000~~	~~6.667~~
9'	0.721	1.442	2.163	2.884	3.606	4.327	5.048	5.769	6.490	5.900
8'	0.751	1.502	2.253	3.005	3.756	4.507	5.258	6.009	5.508	5.007
7'	0.754	1.507	2.261	3.014	3.768	4.522	5.275	4.870	4.464	4.058
6'	0.735	1.470	2.205	2.940	3.675	4.410	4.095	3.780	3.465	3.150
5'	0.703	1.406	2.109	2.812	3.515	3.280	3.040	2.812	2.578	2.342
4'	0.658	1.327	1.975	2.633	2.468	2.304	2.140	1.975	1.810	1.646
3'	0.611	1.221	1.832	1.723	1.616	1.508	1.400	1.293	1.185	1.077
2'	0.562	1.123	1.061	1.000	0.937	0.874	0.812	0.750	0.687	0.624
1'	0.513	0.486	0.459	0.432	0.405	0.378	0.351	0.324	0.297	0.270

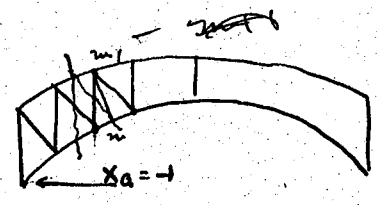
Lower chords.

Member \ Load on	1	2	3	4	5	6	7	8	9	10
0	~~0.095~~ ~~0.026~~	~~0.190~~ 0.052	~~0.285~~ ~~0.078~~	0.380 0.105	~~0.475~~ 0.131	0.570 ~~0.157~~	0.665 0.183	0.760 0.209	0.855 0.235	0.950 0.262
1	0.029	0.059	0.088	0.117	0.147	0.176	0.206	0.235	0.264	0.294 ✓
2	0.066	0.133	0.199	0.265	0.332	0.398	0.464	0.531	0.597	0.664 ✓
3	0.113	0.225	0.338	0.450	0.563	0.676	0.788	0.901	1.013	1.126 ✓
4	0.170	0.339	0.509	0.678	0.848	1.018	1.187	1.357	1.527	1.697 ✓
5	0.238	0.476	0.714	0.952	1.199	1.428	1.667	1.905	2.143	2.382 ✓
6	0.318	0.637	0.955	1.273	1.592	1.910	2.228	2.547	2.866	3.184 ✓
7	0.408	0.816	1.228	1.632	2.038	2.447	2.854	3.262	3.670	4.076 ✓
8	0.501 ✓	1.002	1.502	2.003	2.504	3.005	3.505	4.006	4.506	5.007 ✓
9	0.590	1.180	1.770	2.360	2.950	3.540	4.130	4.720	5.310	5.900
9'	0.721	1.442	2.163	2.884	3.606	4.327	5.048	5.769	6.490	5.900
8'	0.751	1.502	2.253	3.005	3.756	4.507	5.258	6.009	5.508	5.007
7'	0.757	1.514	2.271	3.028	3.786	4.543	5.300	4.892	4.485	4.076
6'	0.743	1.485	2.228	2.971	3.713	4.456	4.140	3.820	3.502	3.184
5'	0.714	1.429	2.143	2.858	3.572	3.334	3.096	2.858	2.619	2.382
4'	0.679	1.357	2.036	2.714	2.544	2.374	2.205	2.036	1.867	1.697
3'	0.638	1.277	1.915	1.802	1.689	1.577	1.464	1.352	1.238	1.126
2'	0.597	1.194	1.128	1.062	0.995	0.929	0.863	0.797	0.730	0.664
1'	0.558	0.528	0.499	0.470	0.440	0.411	0.382	0.352	0.323	0.294
0'	1.8057	0.4774	1.6455	1.5728	1.4925	1.3360	1.2350	1.1449	1.0045	0.9252

0

-19-

Stress due to $X_a = -1$.



$$U_m = -\frac{X_a \cdot r_m}{g_m} = -\frac{r_m}{g_m}.$$

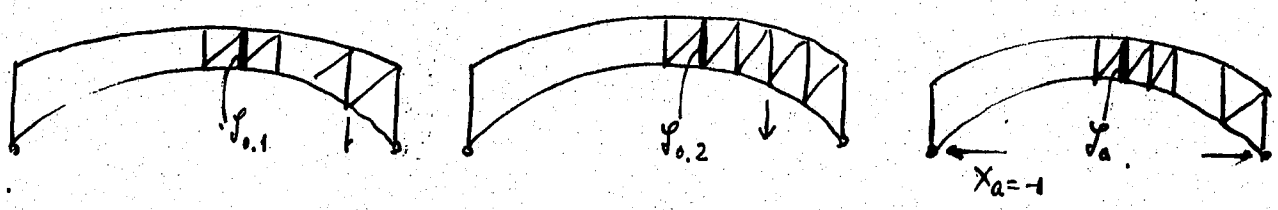
$$B_m = \frac{X_a y_m}{h_m} = +\frac{y_m}{h_m} = +\frac{r_m + \beta_m}{h_m}$$

	Upper chord.	Lower chord.
0		1.173
1	0.332 ✓	~~1.372~~ 1.492
2	0.714 ✓	~~1.747~~ 1.857
3	1.147 ✓	~~2.172~~ 2.268
4	1.618	2.728
5	~~2.150~~ 1.997	3.220
6	2.580 ✓	3.725
7	3.188 ✓	4.214
8	3.615 ✓	4.618
9	3.900	5.000
10	4.000	

$$B_1 = \frac{14.0507}{12} = 1.173$$

$$X_a = \frac{\Sigma \varphi_0 \varphi_a S}{\Sigma \varphi_a^2 S + \frac{lt}{E_t A_t}}$$

S_a



upper chord.

X_a (Unit load on 1 panel.) load on 1. ✓

member	φ_a ✓	$\frac{1}{2} l$ ~~$\varphi_a l$~~	$\varphi_a l$ ✓	S_{01}	$\varphi_0 \varphi_a l$	$\frac{\varphi_a \varphi_a l}{0.112}$	$\varphi_a^2 l$
1	0.332	12.49	4.15	× 0.027 A	0.112	1.00	1.379
2	0.714	12.39	8.86	× 0.062 B	0.549	4.90	6.326
3	1.147	12.30	14.12	× 0.108 C	1.525	13.62	16.196
4	1.630	12.22	19.92	× 0.165 D	3.287	29.4/~~35~~	32.470
5	1.997	12.16	24.30	× 0.234 E	5.686	50.8	48.527
6	2.580	12.11	31.24	× 0.315 F	9.841	87.8	80.599
7	~~3~~.188	12.06	38.45	× 0.406 G	15.611	139.4	122.581
8	3.615	12.03	43.49	× 0.501 H	21.788	191.0	157.216
9	3.900	12.01	46.84	× 0.590 K	26.636	237.8	182.676
10	4.000	12.00	48.00	× 0.667 L	32.016	285.8	192.000
10'			~~48.00~~ 46.84	× 0.667 L	32.016	285.8	Σ = 839.97×2
9'			~~43.49~~ 46.84	× 0.721 1/9 K	33.772	301.5 ~~315.4~~	= 1679.94
8'			~~38.45~~ 43.49	× 0.751 1/8 H	32.661	291.6	
7'			~~31.24~~ 38.45	× 0.754 13/7 G	28.991	258.8	
6'			~~24.30~~ 31.24	× 0.735 1/6 F	22.961	205.0	
5'			~~19.92~~ 24.30	× 0.703 1/5 E	17.083	152.5	
4'			~~14.12~~ 19.92	× 0.658 1/4 D	13.107	117.0	
3'			~~8.86~~ 14.12	× 0.611 1/3 C	8.627	76.8	
2'			8.86	× 0.562 1/2 B	4.979	44.4	
1'			4.15	× 0.513 (19-A)	2.129	19.0	

Upper chord　Load on ↓'

Member	Mark	value ①	2 ②	3	4	5	6	7	8	9	10
1	A	1.00	2	3	4	5	6	7	8	9	10
2	B	4.9	2	3	4	5	6	7	8	9	10
3	C	13.6	2	3	4	5	6	7	8	9	10
4	D	29.4	2	3	4	5	6	7	8	9	10
5	E	50.8	2	3	4	5	6	7	8	9	10
6	F	87.8	2	3	4	5	6	7	8	9	10
7	G	139.4	2	3	4	5	6	7	8	9	10
8	H	191.0	2	3	4	5	6	7	8	9	10
9	K	237.8	2	3	4	5	6	7	8	9	10
10	L	285.8	2	3	4	5	6	7	8	9	10
10'	M	285.8	2	3	4	5	6	7	8	9	10
9'	N	301.5	2	3	4	5	6	7	8	11 K	
8'	O	291.6	2	3	4	5	6	7	12 H	11 H	
7'	P	258.8	2	3	4	5	6	13 G	12 G	11 G	
6'	Q	205.0	2	3	4	5	14 F	13 F	12 F	11 F	
5'	R	152.5	2	3	4	15 E	14 E	13 E	12 E	11 E	
4'	S	117.0	2	3	16 D	15 D	14 D	13 D	12 D	11 D	
3'	T	76.8	2	17 C	16 C	15 C	14 C	13 C	12 C	11 C	
2'	U	44.4	18 B	17 B	16 B	15 B	14 B	13 B	12 B	11 B	
1'	V.	19.0	18 A	17 A	16 A	15 A	14 A	13 A	12 A	11 A	10

Summation

A →	B	5.9	A →	M	1327.3
	C	19.5		N	1628.8
	D	48.9		O	1920.4
	E	99.7		P	2179.2
	F	187.5		Q	2384.2
	G	326.9		R	2536.7
	H	517.9		S	2653.7
	K	755.7		T	2730.5
	L	1041.5		U	2774.9
				V	2793.9

Load on		$\frac{\Sigma \varphi_{0.1} \varphi_a P}{0.027}$ 0.112	$A = 0.112$	$\Sigma \varphi_{0.m} \varphi_a P$
1	2793.9		= 2793.9	312.917
2	2730.5×2 + 18×5.9 =	5461. + 111.2 =	5572.2	624.086
3	2653.7×3 + 17×19.5 =	6961.1 + 331.5 =	7292.6	816.771
4	2536.7×4 + 16×48.9 =	10146.8 + 782.4 =	10929.2	1224.070
5	2384.2×5 + 15×99.7 =	11921.0 + 1495.5 =	13416.5	1502.748
6	2179.2×6 + 14×187.5 =	13075.2 + 2625. =	15700.2	1758.422
7	1920.4×7/5 + 13×326.9 =	13442.8 + 4249.7 =	17692.5	1981.560
8	1628.8×8/4 + 12×517.9 =	13030.4 + 6214.8 =	19245.2 / ~~17245.1~~	2156.462
9	1327.3×8/9 + 11×755.7 =	11945.7 + 8312.7 =	20258.4	2269.053
10	1041.5×10×2 =		= 20830.0	2332.960

Leg. (

Load on

1. 406.32 = 406.32

365.19×2 + 18×2.16 = 730.38 + 38.88 = 769.26

350.58×3 + 17×3.78 = 1051.74 + 64.26 = 1116.00

331.99×4 + 16×7.07 = 1327.96 + 113.11 = 1441.07

308.67×5 + 15×14.61 = 1543.35 + 219.15 = 1762.50

280.18×6 + 14×24.11 = 1681.08 + 289.54 = 1970.62

246.33×7 + 13×38.60 = 1724.31 + 501.80 = 2226.11

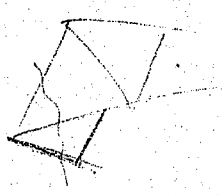
207.70×8 + 12×59.42 = 1661.60 + 713.04 = 2374.64

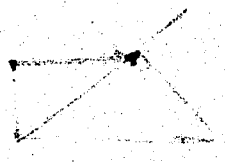
165.94×9 + 11×87.28 = 1493.46 + 960.08 = 2453.54

122.68×10×2 = = 2453.60

b_0.

1	0.095	0.177	−0.082
2	0.190	0.346	−0.156
3	0.285	0.514	−0.229
4	0.380	0.667	−0.287
5	0.475	0.818	−0.343
6	0.570	0.945	−0.375
7	0.665	1.052	−0.387
8	0.760	1.131	−0.371
9	0.855	1.178	−0.323
10	0.950	1.190	−0.240
9'	1.045	1.178	−0.133
8'	1.140	1.131	
7'	1.235	1.052	
6'	1.330	0.945	
5'	1.425	0.818	
4'	1.520	0.667	
3'	1.615	0.514	
2'	1.710	0.341	
1'	1.805	0.346	





Lower chord. $X_a = \dfrac{\Sigma \varphi_0 \varphi_a s}{\Sigma \varphi_a^2 s + \dfrac{l_t}{E_t A_t}}$

Unit load on 1.

Member.	φ_a	l	$\varphi_a l$.	$\varphi_0.1$.	$\varphi_0.\varphi_a.l$.		Summation.	$\varphi_a^2 l$
0	1.173	14.08	16.52	~~0.026~~	~~1.570 / 0.43~~	A	(1.570) / 0.43	19.378
1	1.492	13.58	20.26	0.029	0.59	B	2.106	30.228
2	1.857	13.18	24.48	0.066	1.62	C	3.780 / 2.64	45.459
3	2.268	12.85	29.14	0.113	3.29	D	7.07 / 5.93	66.090
4	2.728	12.59	34.35	0.170	7.54	E	14.61 / 13.47	93.707
5	3.220	12.39	39.90	0.238	9.50	F	24.11 / 22.97	128.478
6	3.725	12.23	45.56	0.318	14.49	G	38.60 / 37.46	169.711
7	4.214	12.11	51.03	0.408	20.82	H	59.42 / 58.28	215.040
8	4.618	12.04	55.60	0.501	27.86	K	87.28 / 86.14	256.768
9	5.000	12.00	60.00	0.590	35.40	L	122.68 / 121.54	300.000
9'			60.00	0.721	43.26	M	165.94 / 164.80	1324.859
8'			55.60	0.751	41.76	N	207.700 / 206.56	$\Sigma\varphi_0^2 l$ 2649.718
7'			51.03	0.757	38.63	O	246.330 / 245.19	
6'			45.56	0.743	33.85	P	280.18 / 279.04	
5'			39.90	0.714	28.49	Q	308.67 / 307.53	
4'			34.35	0.679	23.32	R	331.99 / 330.85	
3'			29.14	0.638	18.59	S	350.58 / 349.44	
2'			24.48	0.597	14.61	T	365.19 / 364.05	
1'			20.26	0.558	11.31	U	376.50 / 375.36	
0'			16.52	1.805 / 0.497	~~2.982 / 0.821~~	V.	406.32 / 383.57	

load on

$$1 \quad \frac{406.32}{383.57} = \frac{\Sigma \varphi_0 \varphi_a s}{383.57}$$

365

2 $\frac{364.05}{325.36} \times 2 + 18 \times 1.02 = 728.10 + 18.36 = 746.46$

3 $\frac{349.44}{364.05} \times 3 + 17 \times 2.64 = 1148.32 + 34.88 = 1183.20$

4 $\frac{330.85}{349.44} \times 4 + 16 \times 5.93 = 1323.40 + 94.88 = 1418.28$

5 $\frac{307.53}{330.85} \times 5 + 15 \times 13.47 = 1537.65 + 202.05 = 1739.70$

6 $\frac{279.04}{307.53} \times 6 + 14 \times 22.97 = 1674.24 + 321.58 = 1995.82$

7 $\frac{245.19}{279.04} \times 7 + 13 \times 37.46 = 1716.34 + 486.98 = 2203.32$

8 $\frac{206.56}{245.19} \times 8 + 12 \times 58.28 = 1652.48 + 699.36 = 2351.84$

9 $\frac{164.80}{206.56} \times 9 + 11 \times 86.14 = 1483.20 + 947.54 = 2430.74$

10 $\frac{121.54}{164.80} \times 10 \times 2 = 2430.80$

Xa Surface.

unit load on 1. = $\frac{312.92 + \overset{40.6.32}{383.57}}{1679.94 + 2649.72 + 240} = \frac{696.49}{4569.66} =$ ~~0.744~~ 0.152

2 = $\frac{624.09 + \overset{769.26}{746.46}}{"} = \frac{1370.55}{"} =$ ~~0.213~~ $\overset{0.300}{0.291}$ ✓

3 = $\frac{816.77 + 1183.20}{"} = \frac{1999.70}{"} =$ ~~0.425~~ .438

4 = $\frac{1224.07 + 1418.28}{"} = \frac{2642.35}{"} =$ ~~0.562~~ 0.578 ✓

5 = $\frac{1502.75 + 1739.70}{"} = \frac{3242.45}{"} =$ ~~0.664~~ .705

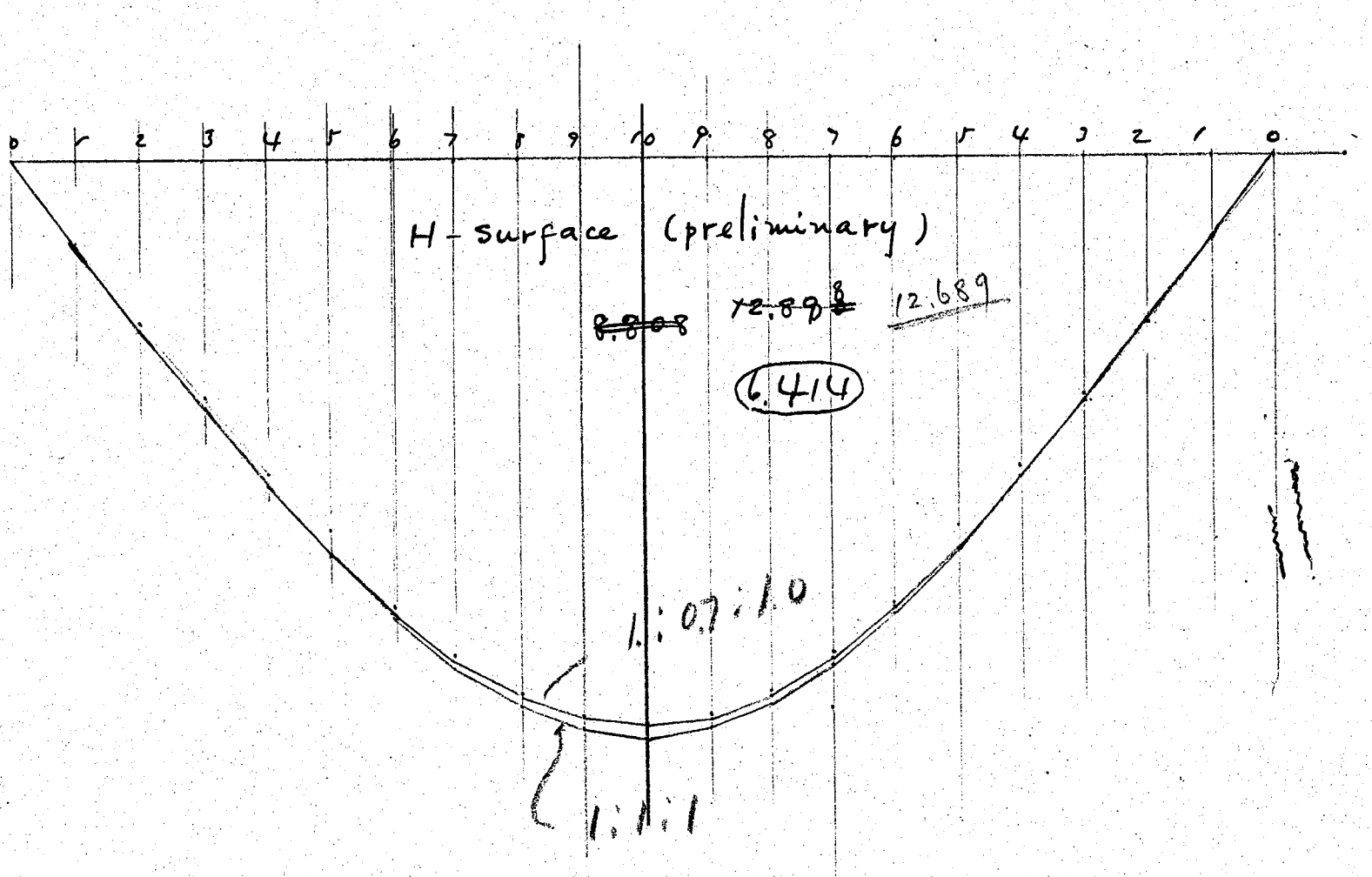
6 = $\frac{1758.42 + 1995.82}{"} = \frac{3754.24}{"} =$ ~~0.798~~ .822 ✓

7 = $\frac{1981.56 + 2203.32}{"} = \frac{4184.88}{"} =$ ~~0.890~~ .916

8 = $\frac{2156.46 + 2351.84}{"} = \frac{4508.30}{"} =$ ~~0.959~~ 0.986 ✓

9 = $\frac{2269.05 + 2430.74}{"} = \frac{4699.79}{"} =$ ~~1.000~~ 1.028

10 = $\frac{2332.96 + 2430.80}{"} = \frac{4763.76}{"} =$ ~~1.013~~ 1.042 ✓



assumed.

Area Upper chord : Area Lower chord : Area Tie = 1.0 : 0.7 : 1.0 (0.68)

Unit load on 1. $= \dfrac{\frac{312.92}{1.0} + \frac{383.57}{0.7}}{\frac{1679.94}{1.0} + \frac{2649.72}{0.7} + \frac{240}{1.0}} = \dfrac{312.92 + 547.96}{1679.94 + 378.530 + 240} = \dfrac{860.88}{5708.24} = 0.151$ (546.32)

2 = $\dfrac{624.09 + 746.46 \div 0.7}{''} = \dfrac{624.09 + 1066.37}{''} = \dfrac{1690.46}{''} = 0.296$

3 = $\dfrac{816.77 + 1183.20 \div 0.7}{''} = \dfrac{816.77 + 1690.29}{''} = \dfrac{2507.06}{''} = 0.439$

4 = $\dfrac{1224.07 + 1418.28 \div 0.7}{''} = \dfrac{1224.07 + 2026.13}{''} = \dfrac{3250.20}{''} = 0.570$

5 = $\dfrac{1502.75 + 1739.70 \div 0.7}{''} = \dfrac{1502.75 + 2485.30}{''} = \dfrac{3988.05}{''} = 0.699$

6 = $\dfrac{1758.42 + 1995.82 \div 0.7}{''} = \dfrac{1758.42 + 2851.17}{''} = \dfrac{4609.59}{''} = 0.808$

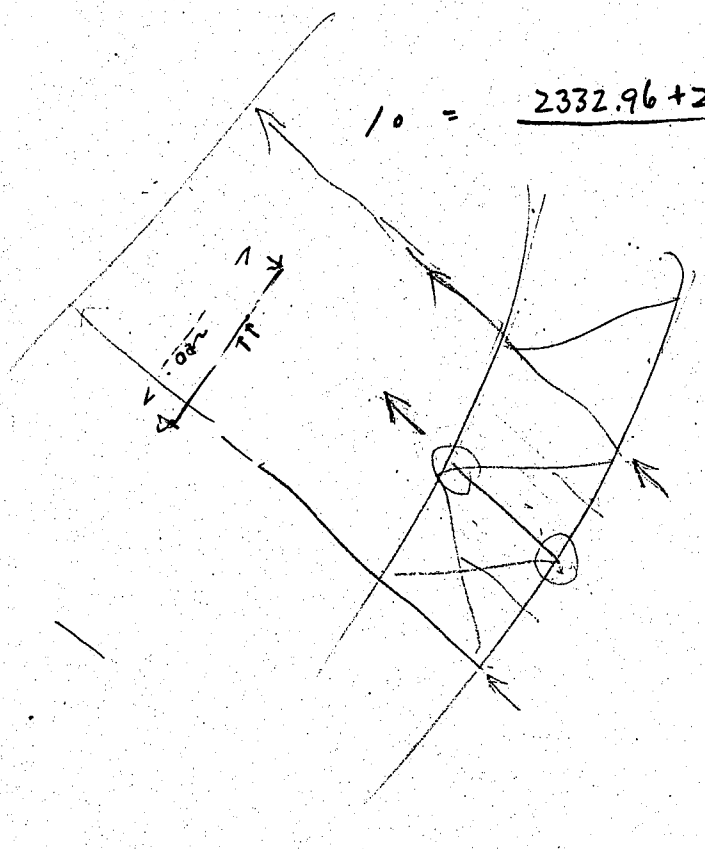
7 = $\dfrac{1981.56 + 2203.32 \div 0.7}{''} = \dfrac{1981.56 + 3147.60}{''} = \dfrac{5129.16}{''} = 0.899$

8 = $\dfrac{2156.46 + 2351.84 \div 0.7}{''} = \dfrac{2156.46 + 3359.77}{''} = \dfrac{5516.23}{''} = 0.967$

9 = $\dfrac{2269.05 + 2430.74 \div 0.7}{''} = \dfrac{2269.05 + 3472.50}{''} = \dfrac{5741.55}{''} = 1.007$

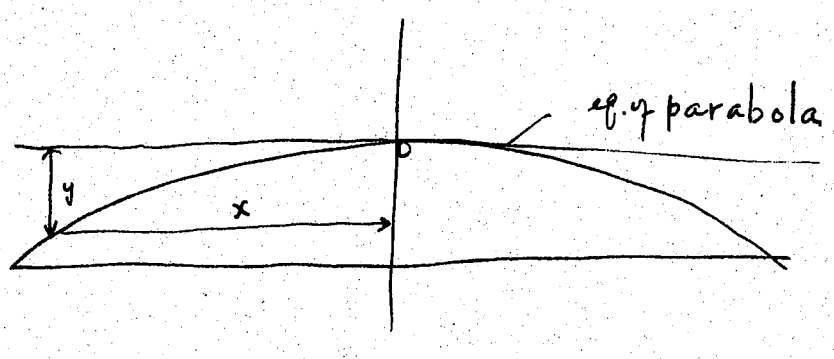
10 = $\dfrac{2332.96 + 2430.80 \div 0.7}{''} = \dfrac{2332.96 + 3472.57}{''} = \dfrac{5805.53}{''} = 1.017$

1.0



odd. ~~5,383~~ 6,390

even 6,299



eq. of parabola $y = ax^2$

$y = ax^2$

$\begin{cases} x = 120 \\ y = 1. \end{cases}$ $\therefore a = \frac{y}{x^2} = \frac{1}{120^2}$

panel	x	$\frac{x}{12}$	$(\frac{x}{12})^2$	y	Y = 1.0 − y.	
10	0	0	0	0	1.00	36.00
9	12	1	1	0.01	0.99	35.67
8	24	2	4	0.04	0.96	34.67
7	36	3	9	0.09	0.91	33.01
6	48	4	16	0.16	0.84	30.62
5	60	5	25	0.25	0.75	27.58
4	72	6	36	0.36	0.64	23.77
3	84	7	49	0.49	0.51	19.17
2	96	8	64	0.64	0.36	13.72
1	108	9	81	0.81	0.19	7.87
0	120	10	100	1.00	0.00	0

Stress for upper chord.

$$U_m = U_{m.0} - (H)\frac{(r_m - Y)}{g_m}$$

panel	r_m	Y	$r_m - Y$	H	g_m	$\frac{(r_m-Y)}{g_m}$
1	7.37	0.19	7.18	0.151	22.20	0.32
2	13.72	0.36	13.36	0.296	19.22	0.70
3	19.17	0.51	18.66	0.439	16.70	1.12
4	23.77	0.64	23.13	0.570	14.58	1.59
5	27.58	0.75	26.83	0.699	12.83	2.09
6	30.62	0.84	29.78	0.808	11.42	2.61
7	34.01	0.91	32.10	0.899	10.35	3.10
8	34.67	0.96	33.71	0.967	9.59	3.51
9	35.67	0.99	34.68	1.007	9.15	3.80 3.79
10	36.00	1.00	35.00	1.017	9.00	3.89

Lower chord.

$$B_m = B_{m.0} - (H)\frac{(y_m - Y)}{h_m}$$

panel	y_m	Y	$y_m - Y$	h_m	H	$\frac{(y_m-Y)}{h_m}$
0	~~27.00~~	~~0.00~~	~~27.00~~	~~23.01~~	0.151	1.17
1	30.48	0.19	30.29	20.43	0.296	1.48
2	33.57	0.36	33.21	18.08	0.439	1.83
3	36.28	0.51	35.77	15.98	0.570	2.24
4	38.61	0.64	37.97	14.15	0.699	2.68
5	40.58	0.75	39.83	12.59	0.808	3.16
6	42.14	0.84	41.30	11.31	0.899	3.65
7	43.41	0.91	42.50	10.30	0.967	4.13
8	44.29	0.96	43.33	9.59	1.007	4.52
9	~~44.82~~	0.99	43.83	9.15	1.017	4.79

Upper chord.

member	H. → / $\frac{y_m - Y}{g_m}$ ↓	1 0.151	2 0.296	3 0.439	4 0.570	5 0.699	6 0.808	7 0.899	8 0.967	9 1.007	10 1.017
1	0.32	0.048	0.085	0.141	0.182	0.257	0.905	0.287	0.309	0.322	0.325
2	0.70	0.106	0.207	0.307	0.399	0.489	0.566	0.639	0.677	0.704	0.712
3	1.12	0.169	0.332	0.492	0.638	0.783	0.905	1.007	1.083	1.127	1.149
4	1.59	0.240	0.471	0.698	0.906	1.112	1.285	1.428	1.537	1.600	1.617
5	2.09	0.316	0.619	0.918	1.192	1.462	1.690	1.878	2.020	2.103	2.125
6	2.61	0.394	0.773	1.146	1.487	1.825	2.118	2.346	2.523	2.627	2.653
7	3.10	0.468	0.918	1.362	1.767	2.166	2.505	2.787	2.995	3.120	3.162
8	3.51	0.530	1.038	1.542	2.000	2.453	2.837	3.155	3.394	3.533	3.568
9	3.79 / 3.80	0.597	1.125	1.668	2.168	2.655	3.070	3.476	3.674	3.824	3.863
10	3.89	0.588	1.152	1.707	2.217	2.788	3.225	3.497	3.760	3920	3.960

Lower chord.

member	H. → / $\frac{y_m - Y}{g_m}$	1 0.151	2 0.296	3 0.439	4 0.570	5 0.699	6 0.808	7 0.899	8 0.967	9 1.007	10 1.017
0	1.17	0.177	0.346	0.514	0.667	0.818	0.945	1.052	1.131	1.178	1.196
1	1.48	0.223	0.438	0.640	0.844	1.034	1.196	1.331	1.431	1.490	1.505
2	1.83	0.276	0.541	0.803	1.043	1.279	1.479	1.645	1.770	1.843	1.861
3	2.24	0.338	0.663	0.983	1.277	1.566	1.810	2.014	2.166	2.256	2.278
4	2.68	0.405	0.793	1.177	1.528	1.873	2.165	2.409	2.591	2.699	2.726
5	3.16	0.477	0.935	1.387	1.801	2.209	2.553	2.841	3.056	[illegible]	3.214
6	3.65	0.551	1.080	1.602	2.081	2.551	2.949	3.281	3.530	3.676	3.712
7	4.13	0.624	1.222	1.813	2.354	2.887	3.337	3.713	3.994	4.158	4.200
8	4.52	0.683	1.338	1.979	2.576	3.159	3.652	4.063	4.371	4.552	4.597
9	4.79	0.723	1.418	2.103	2.730	3.348	3.870	4.306	4.632	4.824	4.871

Upper chord. $U_m = U_{m,0} - H\frac{r_m - y}{g_m}$

member \ Load on	1	2	3	4	5	6	7	8	9	10
1	−0.021	−0.041	−0.060	−0.074	−0.088	−0.097	−0.098	−0.093	−0.078	−0.055
2	−0.044	−0.082	−0.120	−0.149	−0.177	−0.191	−0.202	−0.177	−0.142	−0.088
3	−0.061	−0.117	−0.~~176~~ 169	−0.207	−0.244	−0.259	−0.253	−0.221	−0.157	−0.072
4	−0.075	−0.142	−0.~~202~~ 204	−0.248	−0.289	−0.298	~~−0.313~~ −0.276	−0.220	−0.118	0.029
5	−0.082	−0.150	−0.215	−0.255	−0.291	−0.285	−0.239	−0.146	0.004	0.217
6	−0.079	−0.143	−0.201	−0.227	−0.250	−0.228	−0.141	−0.002	0.208	0.497
7	−0.062	−0.106	−0.145	−0.144	−0.138	−0.071	0.053	0.250	0.532	0.906
8	−0.029	−0.036	−0.040	0.003	0.051	0.168	0.350	0.612	0.973	1.439
9	0.0~~16~~ 18	0.0~~55~~ 8	0.10~~8~~ 6	~~0.194~~ 0.200	~~0.295~~ 0.301	~~0.470~~ 0.478	~~0.714~~ 0.723	1.~~046~~ 055	~~1.486~~ 1.493	~~2.037~~ 2.046
10	0.079	0.181	0.293	0.449	0.613	0.856	~~1.251~~ 1.170	1.573	2.080	2.707
10′	0.079	0.181	0.293	0.449	0.613	0.856	~~1.251~~ 1.170	~~1.6~~ 1.573	2.080	2.707
9′	0.147 ~~0.149~~	~~0.326~~ 0.317	~~0.499~~ ~~0.495~~ 0.503	0.~~718~~ 724	0.957	~~1.257~~ 1.265	~~1.632~~ 1.641	2.~~095~~ 104	~~2.666~~ 2.673	2.0~~37~~ 46
8′	0.221	0.464	0.711	1.005	1.303	1.670	2.103	2.615	1.975	1.439
7′	0.286	0.589	0.899	1.247	1.602	2.017	2.488	1.875	1.344	0.906
6′	0.341	0.697	1.059	1.453	1.850	2.292	1.749	1.257	0.838	0.497
5′	0.387	0.787	1.191	1.620	2.053	1.590	~~1.272~~ 1.162	0.792	0.475	0.217
4′	0.418	0.856	1.287	1.727	1.356	1.019	0.712	0.438	0.210	0.029
3′	0.442	0.889	1.340	1.085	0.833	0.603	0.393	0.210	0.058	−0.072
2′	0.456	0.916	0.754	0.601	0.448	0.308	0.173	0.073	−0.017	−0.088
1′	0.465	~~0.424~~ 0.391	0.318	0.250	0.182	0.119	0.064	0.015	−0.025	−0.055

Influence Surface for upper chord.

load on. \ member	U_1	U_2	U_3	U_4	U_5	U_6	U_7	U_8	U_9	U_{10}
1	−0.021	−0.044	−0.061	−0.075	−0.082	−0.079	−0.062	−0.029	0.018 ~~0.016~~	0.079
2	−0.041	−0.082	−0.117	−0.142	−0.150	−0.143	−0.106	−0.036	0.058 ~~0.055~~	0.181
3	−0.060	−0.120	−0.169	−0.204	−0.215	−0.201	−0.145	−0.040	0.106 ~~0.108~~	0.293
4	−0.074	−0.149	−0.207	−0.248	−0.255	−0.227	−0.144	0.003	0.200 ~~0.194~~	0.449
5	−0.088	−0.177	−0.244	−0.289	−0.291	−0.250	−0.138	0.051	0.301 ~~0.295~~	0.613
6	−0.097	−0.191	−0.259	−0.298	−0.285	−0.228	−0.071	0.168	0.478 ~~0.470~~	0.856
7	−0.098	−0.202	−0.253	−0.276	−0.239	−0.141	0.053	0.350	0.723 ~~0.714~~	1.170
8	−0.093	−0.177	−0.221	−0.220	−0.146	−0.002	0.250	0.612	1.055 ~~1.046~~	1.573
9	−0.078	−0.142	−0.157	−0.118	0.004	0.208	0.532	0.973	1.493 ~~1.486~~	2.080
10	−0.055	−0.088	−0.072	0.029	0.217	0.497	0.906	1.439	2.046 ~~2.037~~	2.707
9′	−0.025	−0.017	+0.058	0.210	0.475	0.838	1.344	1.995	2.673 ~~2.666~~	2.080
8′	0.015	0.073	0.210	0.438	0.792	1.257	1.875	2.615	2.104 ~~2.095~~	1.573
7′	0.064	0.173	0.393	0.712	1.162	1.749	2.488	2.103	1.641 ~~1.632~~	1.170
6′	0.119	0.308	0.603	1.019	1.590	2.292	2.017	1.670	1.265 ~~1.257~~	0856
5′	0.182	0.448	0.833	1.356	2.053	1.850	1.602	1.303	0.957 ~~0.951~~	0.613
4′	0.250	0.601	1.085	1.727	1.620	1.453	1.247	1.005	0.724 ~~0.718~~	0.449
3′	0.318	0.754	1.340	1.287	1.191	1.059	0.899	0.711	0.499 ~~0.495~~	1.293
2′	0.391	0.916	0889	0.856	0.787	0.697	0.589	0.464	0.320 ~~0.317~~	0.181
1′	0.465	0.456	0.442	0.418	0.387	0.341	0.286	0.221	0.149 ~~0.147~~	0.079
	−0.730	−1.389	−1.760	−1.870	−1.663	−1.271	−0.666	−0.105	−0.000	−0.000
	+1.804	3.729	+5.853	+8.052	+10.278	+12.241	+14.088	+15.663	+16.693	+17.295
	+1.074	+2.340	4.093	6.182	8.615	10.970	13.422	15.558	16.693	17.295
	2.878	6.069	9.946	14.234	18.893	23.211	27.510	31.221	33.386	34.590
	Σ = 201.938 / 10 − 20.2									
odd.	−0.370′	−0.702′	−0.884	−0.962	−0.827	−0.671	−0.345	−0.069	−0.000	−0.000
	1.029′	1.831	3.066	3.983	5.272	6.045	7.204	7.687	8.564	8.476
even	−0.360′	−0.687′	−0.876	−0.908	−0.836	−0.600	−0.321	−0.036	−0.000	−0.000
	0.775′	1.898	2.787	4.069	5.006	6.196	6.884	7.976	8.189	8.825
									8.250	

Lower chord.

Load on / member	1	2	3	4	5	6	7	8	9	10
	-0.287	-0.562	-0.834	-1.083	-1.328	-1.535	-1.708	-1.837	-1.913	-1.932
0	~~-0.154~~	~~-0.294~~	~~-0.436~~	~~-0.562~~	~~-0.687~~	~~-0.788~~	~~-0.869~~	~~-0.922~~	~~-0.943~~	~~-0.928~~
		~~-0.346~~	~~-0.514~~	~~-0.667~~	~~-0.818~~	~~-0.945~~	~~-1.052~~	~~-1.131~~	~~-1.2~~	
1	~~-0.194~~	~~-0.379~~	~~-0.552~~	-0.727	-0.887	-1.020	-1.125	-1.196	-1.226	-1.227
	~~-0.287~~	~~-0.562~~	~~-0.834~~	~~-1.267~~	~~-1.328~~	~~-1.535~~	~~-1.708~~	~~-1.837~~	~~-1.913~~	~~-1.932~~
				-1.093						
2	-0.210	-0.408	-0.604	-0.778	-0.947	-1.081	-1.181	-1.239	-1.246	-1.197
3	-0.225	-0.438	-0.645	-0.827	-1.003	-1.134	-1.226	-1.265	-1.243	-1.152
4	-0.235	-0.454	-0.668	-0.850	-1.025	-1.147	-1.222	-1.234	-1.172	-1.029
5	-0.239	-0.459	-0.673	-0.849	-1.010	-1.125	-1.174	-1.151	-1.039	-0.832
6	-0.233	-0.443	-0.647	-0.808	-0.959	-1.039	-1.053	-0.983	-0.816	-0.528
7	-0.216	-0.406	-0.590	-0.722	-0.807 (49)	-0.890	-0.859	-0.732	-0.488	-0.124
8	-0.182	-0.336	-0.477	-0.573	-0.655	-0.647	-0.558	-0.365	-0.046	0.410
9	-0.133	-0.238	-0.333	-0.370	-0.398	-0.330	-0.176	0.088	+0.486	1.029
9'	~~-0.002~~ ~~-0.133~~	0.024	0.060	0.154	0.258	0.457	0.742	1.137	1.666	~~0.410~~ 1.029
8'	0.068	0.164	0.274	0.429	0.597	0.855	1.195	1.638	0.956	~~-0.124~~ 0.410
7'	0.133	0.292	0.458	0.674	0.899	1.206	1.587	0.898	0.327	~~-0.528~~ -0.124
6'	0.192	0.405	0.626	0.890	1.162	1.507	0.859	0.290	-0.174	~~-0.832~~ -0.528 -0.832
5'	0.237	0.494	0.756	1.057	1.363	0.781	0.255	-0.198	-0.563	~~-1.029~~ -0.832
4'	0.274	0.564	0.859	1.186	0.671	0.209	-0.204	-0.555	-0.832	~~-1.152~~ -1.029
3'	0.300	0.614	0.932	0.525	-0.123	-0.233	-0.550	-0.814	-1.018	~~-1.197~~ -1.152
2'	0.321	0.653	0.325	-0.019	-0.284	-0.550	-0.782	-0.973	-1.113	~~-1.26~~ -1.197
1'	0.335	0.090	-0.141	-0.374	-0.594	-0.785	-0.949	~~-1.079~~	-1.167	-1.26 (11)
0'	~~0.320~~	~~0.125~~	~~-0.069~~	~~0.249~~	~~-0.426~~	~~-0.579~~	~~-0.712~~	~~-0.817~~	~~-0.890~~	~~-0.928~~
	-0.287	-0.562	-0.834	~~-1.267~~ -1.083	-1.328	-1.535	-1.708	-1.837	-1.913	-1.932

Influence line for Lower chord.

Load on \ member	B_0	B_1	B_2	B_3	B_4	B_5	B_6	B_7	B_8	B_9
1	−0.151	−0.194	−0.210	−0.225	−0.235	−0.239	−0.233	−0.216	−0.182	−0.133
2	−0.294	−0.379	−0.408	−0.438	−0.454	−0.459	−0.443	−0.406	−0.336	−0.238
3	−0.436	−0.552	−0.604	−0.645	−0.668	−0.673	−0.647	−0.590	−0.477	−0.333
4	−0.562	−0.729	−0.778	−0.827	−0.850	−0.849	−0.808	−0.722	−0.573	−0.370
5	−0.687	−0.887	−0.947	−1.003	−1.025	−1.010	−0.959	−0.849	−0.655	−0.398
6	−0.798	−1.020	−1.081	−1.134	−1.147	−1.125	−1.039	−0.890	−0.647	−0.330
7	−0.869	−1.125	−1.181	−1.226	−1.222	−1.174	−1.053	−0.859	−0.558	−0.176
8	−0.922	−1.196	−1.239	−1.265	−1.234	−1.151	−0.983	−0.732	−0.365	0.088
9	−0.943	−1.226	−1.246	−1.243	−1.172	−1.039	−0.810	−0.488	−0.046	0.486
10	−0.928	−1.211	−1.197	−1.152	−1.029	−0.832	−0.528	−0.124	0.410	1.029
9'	−0.890	−1.167	−1.113	−1.018	−0.832	−0.563	−0.174	0.327	0.956	1.666
8'	−0.817	−1.079	−0.973	−0.814	−0.555	−0.198	0.290	0.898	1.638	1.137
7'	−0.712	−0.949	−0.782	−0.550	−0.204	0.255	0.859	1.587	1.195	0.742
6'	−0.579	−0.785	−0.550	−0.233	0.209	0.781	1.507	1.206	0.855	0.457
5'	−0.426	−0.594	−0.284	0.123	0.671	1.363	1.162	0.899	0.597	0.258
4'	−0.249	−0.374	−0.019	0.525	1.186	1.057	0.890	0.674	0.429	0.154
3'	−0.069	−0.141	0.325	0.932	0.859	0.756	0.626	0.458	0.274	0.060
2'	0.125	+0.090	0.653	0.614	0.564	0.494	0.405	0.292	0.164	0.024
1'	0.320	0.335	0.321	0.300	0.274	0.237	0.192	0.133	0.068	−0.002
*	−10.322	−13.606	−12.612	−11.773	−10.627	−9.312	−7.677	−5.876	−3.839	−1.980
	+0.445	+0.425	+1.299	+2.494	+3.763	+4.943	+5.931	+6.474	+6.586	+6.101
	−9.877	−13.181	−11.313	9.279	−6.864	−4.369	−1.746	(±0.598)	+2.747	+4.121
	20.199	26.787	23.925	21.052	17.491	13.681	9.423	7.072	9.333	10.222
odd	−5.183	−6.835	−6.867	−5.910	−5.358	−4.698	−3.576	−3.002	−1.918	−1.042
	−0.320	0.335	0.646	1.355	1.804	2.611	2.839	3.404	3.090	3.212
even	−5.139	−6.771	−6.245	−5.863	−5.269	−4.614	−3.801	−2.874	−1.921	−0.938
	0.125	0.090	0.653	1.139	1.959	2.332	3.092	3.070	3.496	2.889

$\Sigma \frac{159.185}{10} = 15.9$

Diagonals.

$d_m = \left(\frac{l_m}{f_m}\right) R_A$. $d_m' = \left(\frac{l_m}{f_m}\right)(1-R_A)$ $d_m' = \left\{\left(\frac{n_a}{f_m}\right) - \left(\frac{l_m}{f_m} R_A\right)\right\}$.

n_a/f_m	1	2	3	4	5	6	7	8	9	10
load in 1.	0.143	0.147	0.151	0.155	0.157	0.153	0.141	0.116	0.078	0.028

load in \ member	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	Q_8	Q_9	Q_{10}
1	0.050 ~~0.05~~	0.059 ~~0.06~~	0.070 0.07	0.082 0.08	0.094 ~~0.094~~	0.106 ~~0.11~~	0.115 0.12	0.118 0.12	0.112 0.11	0.095 0.10
2	0.100 ~~0.100~~	0.119 0.12	0.140 0.14	0.163 0.16	0.188 0.19	0.212 0.21	0.230 0.23	0.236 0.24	0.224 0.22	0.190 0.19
3	0.149 ~~0.15~~	0.178 0.18	0.210 0.21	0.245 0.24	0.282 ~~0.28~~	0.317 0.32	0.345 0.35	0.353 0.35	0.336 0.34	0.286 0.29
4	0.199 ~~0.20~~	0.237 0.24	0.280 0.28	0.326 0.33	0.376 0.38	0.423 0.42	0.460 0.46	0.471 0.47	0.448 0.45	0.381 0.38
5	0.249 0.25	0.297 0.30	0.350 0.35	0.408 0.41	0.470 0.47	0.529 0.53	0.575 0.58	0.589 0.59	0.561 0.56	0.476 0.48
6	0.299 0.30	0.356 0.36	0.419 0.42	0.490 0.49	0.564 0.56	0.635 0.63	0.689 0.69	0.707 0.71	0.673 0.67	0.571 0.57
7	0.349 0.35	0.415 0.42	0.489 0.49	0.571 0.57	0.658 0.66	0.741 0.74	0.804 0.81	0.825 0.82	0.785 0.78	0.666 0.67
8	0.398 0.40	0.474 0.47	0.559 0.56	0.653 0.65	0.752 0.75	0.846 0.85	0.919 0.92	0.942 0.94	0.897 0.90	0.762 0.76
9	0.448 ~~0.45~~	0.534 0.53	0.629 0.63	0.734 0.73	0.846 0.85	0.952 0.95	1.034 1.04	1.060 1.06	1.009 1.01	0.857 0.86
10	0.498 0.50	0.593 0.59	0.699 0.70	0.816 0.82	0.940 ~~0.940~~	1.058 1.06	1.149 1.15	1.178 1.18	1.121 1.12	0.952 0.95
9'	0.548 0.55	0.652 0.65	0.769 0.77	0.898 0.90	1.034 1.03	1.164 1.16	1.264 1.27	1.296 1.30	1.233 1.23	-0.603 -0.60
8'	0.598 0.60	0.712 0.71	0.839 0.84	0.979 0.98	1.128 1.13	1.270 1.27	1.379 1.38	1.414 1.41	-0.272 -0.27	-0.536 -0.54
7'	0.647 0.65	0.771 0.77	0.909 0.91	1.061 1.06	1.222 1.22	1.375 1.38	1.494 1.50	-0.014 ~~-0.02~~	-0.238 -0.24	-0.469 -0.47
6'	0.697 0.70	0.830 0.83	0.979 0.98	1.142 1.14	1.316 1.32	1.481 1.48	0.156 0.16	-0.012 ~~-0.01~~	-0.204 -0.20	-0.402 -0.40
5'	0.747 0.75	0.890 0.89	1.049 1.05	1.224 1.22	1.410 1.41	0.235 0.24	0.130 0.13	-0.010 ~~-0.01~~	-0.170 -0.17	-0.335 -0.34
4'	0.797 0.80	0.949 0.95	1.118 1.12	1.306 1.31	0.252 0.25	0.188 0.19	0.104 0.10	-0.008 ~~-0.01~~	-0.136 -0.14	-0.268 -0.27
3'	0.847 0.85	1.008 1.01	1.188 1.19	0.219 0.22	0.189 0.19	0.141 0.14	0.078 0.08	-0.006 ~~-0.01~~	-0.102 -0.10	-0.201 -0.20
2'	0.896 0.90	1.067 1.07	0.16 ✓	0.146 0.15	0.126 0.13	0.094 0.09	0.052 0.05	-0.004 ~~-0.00~~	-0.068 -0.07	-0.134 -0.13
1'	0.946 0.95	0.088 0.09	0.08 ✓	0.073 0.07	0.063 0.06	0.047 0.05	0.026 0.03	-0.002 ~~-0.00~~	-0.034 -0.03	-0.067 -0.07

Verticals.

$$S_m = -\left(\frac{i_m}{i_m - m_a}\right) R_A \qquad S_m' = -\left(\frac{i_m}{i_m - m_a}\right)(1 - R_A) \qquad S_m' = -\left\{\frac{m_a}{i_m - m_a} - \frac{i_m}{i_m - m_a} R_A\right\}$$

	$\frac{i_m}{i_m - m_a}$	1	2	3	4	5	6	7	8	9
		1.124	1.237	1.337	1.400	1.426	1.394	1.288 ~~0.945~~	1.094	0.805
		~~0.056~~ 0.06	0.062 0.06	0.070 0.07	0.070 ~~0.14~~	0.071 0.07	0.070 0.07	0.064 0.06	0.055 ~~0.08~~	0.040 0.04
1		0.112 0.11	0.124 0.12	0.134 0.13	0.140 ~~0.28~~	0.143 0.14	0.139 0.14	0.129 0.13	0.109 0.11	0.080 0.08
2		0.169 0.17	0.186 0.19	0.201 0.20	0.210 ~~0.42~~	0.214 0.21	0.209 0.21	0.193 0.19	0.164 0.16	0.121 0.12
3		0.225 0.22	0.248 0.25	0.268 0.27	0.280 ~~0.56~~	0.285 0.29	0.279 0.28	0.258 0.26	0.219 0.22	0.161 0.16
4		0.281 0.28	0.310 0.31	0.335 0.33	0.350 ~~0.70~~	0.356 0.36	0.349 0.35	0.322 0.32	0.274 0.27	0.202 0.20
5		0.337 0.34	0.371 0.37	0.401 0.40	0.420 ~~0.84~~	0.428 0.43	0.418 0.42	0.386 0.39	0.328 0.33	0.242 0.24
6		0.393 0.39	0.433 0.43	~~0.468 0.57~~	0.490 ~~0.98~~	0.499 0.50	0.488 0.49	~~0.451 0.55~~	0.383 0.38	0.282 0.28
7		0.450 0.45	0.495 0.49	0.535 0.53	0.560 ~~1.12~~	0.570 0.57	0.558 0.56	0.515 0.52	0.438 0.44	0.322 0.32
8		0.506 0.51	0.557 0.56	0.602 0.60	0.630 ~~1.26~~	0.642 0.64	0.627 0.63	0.580 0.58	0.492 0.49	0.363 0.36
9		0.562 0.56	0.619 0.62	0.669 0.67	0.700 ~~1.40~~	0.713 ~~0.71~~	0.697 0.70	0.644 0.64	0.547 0.55	0.403 0.40
10		0.618 0.62	0.681 0.68	0.736 0.74	0.770 ~~1.54~~	0.784 0.78	0.767 0.77	0.708 0.71	0.602 0.60	0.447 0.44
11	9'	0.674 0.67	0.743 0.74	0.803 0.80	0.840 ~~1.68~~	0.856 0.86	0.836 0.84	0.773 0.77	0.656 0.66	−0.488 −0.49
12	8'	0.731 0.73	0.805 0.80	0.870 0.87	0.910 ~~1.82~~	0.927 0.93	0.906 0.91	0.837 0.84	−0.301 −0.30	−0.427 −0.43
13	7'	0.787 0.79	0.867 0.87	0.937 0.94	0.980 ~~1.96~~	0.998 1.00	0.976 0.98	−0.138 −0.14	−0.258 −0.26	−0.366 −0.37
14	6'	0.843 0.84	0.929 0.93	1.004 1.00	1.050 ~~2.10~~	1.070 1.07	−0.020 −0.02	−0.115 −0.12	−0.215 −0.22	−0.305 −0.31
15	5'	0.899 0.90	0.990 0.99	1.070 1.07	1.120 ~~2.24~~	0.056 0.06	−0.016 ~~−0.02~~	−0.092 −0.09	−0.172 −0.17	−0.244 −0.24
16	4'	0.955 0.96	1.052 1.05	1.137 1.14	0.090	0.042 0.04	−0.012 −0.01	−0.069 −0.07	−0.129 −0.13	−0.183 −0.18
17	3'	1.012 1.01	1.114 1.11	0.080 ~~0.09~~	0.060	0.028 0.03	−0.008 −0.01	−0.046 −0.05	−0.086 −0.09	−0.122 −0.12
18	2'	1.068 1.07	~~0.160.057~~	0.040 ~~0.04~~	0.030	0.014 0.01	−0.004 ~~−0.00~~	−0.023 −0.02	−0.043 −0.04	−0.061 −0.06
19	1'									
	$\frac{12_{ma}}{i_m - m_a}$	0.124	0.119	.110	0.100	0.085	0.066	0.041	0.012	−0.021

P_m V_m = Vertical distance from intersection pt (F) of $\overline{U_{m-1}U_m}$ and $\overline{L_{m-1}L_m}$ to the tie.

q_m W_m = Vertical distance from intersection pt (I) of $\overline{U_{m-1}U_m}$ and $\overline{L_m L_{m+1}}$ to the tie.

$$P_m \quad (V_m) = \frac{\delta_{m-1}}{\delta_{m-1}-\delta_m}(r_m - r_{m-1}) + r_{m-1}$$

$$q_m \quad (W_m) = \frac{\delta_m}{(r_{m+1}-r_m)-(y_m-y_{m-1})}(r_{m+1}-r_m) + r_m$$

where $y_m = r_m + \delta_m$.

m	log δ_{m-1}	log $(r_m - r_{m-1})$	log $(\delta_{m-1}-\delta_m)$		(r_{m-1})	V_m	P_m
1	1.43136 ✓	0.86699 ✓	0.58915 ✓	1.70920 ✓	51.23 ✓	0 ✓	51.23 ✓
2	1.36393 ✓	0.80324 ✓	0.51431 ✓	1.65286 ✓	44.96 ✓	7.18 ✓	52.14 ✓
3	1.29774 ✓	0.73582 ✓	0.43686 ✓	1.59670 ✓	39.51 ✓	13.36 ✓	52.87 ✓
4	1.23337 ✓	0.66266 ✓	0.35569 ✓	1.54034 ✓	34.70 ✓	18.66 ✓	53.36 ✓
5	1.17162 ✓	0.58151 ✓	0.26754 ✓	1.48559 ✓	30.59 ✓	23.13 ✓	53.72 ✓
6	1.11377 ✓	0.48718 ✓ 0.55271	0.16772 ✓	1.43823 ✓	27.12 ✓ 31.53	26.83 ✓	53.95 ✓ 58.36
7	1.06158 ✓	0.37232 ✓	0.04914 ✓	1.38476 ✓	24.25 ✓	29.78 ✓	54.03 ✓
8	1.01719 ✓	0.22185 ✓	1.89424 ✓	1.34480 ✓	22.12 ✓	32.10 ✓	54.22 ✓
9	0.98317 ✓	1.99773 ✓	1.66852 ✓	1.31612 ✓	20.71 ✓	33.71 ✓	54.42 ✓
10	0.96159 ✓	1.51947 ✓	1.18652 ✓	1.29454 ✓	19.70 ✓	34.76 ✓	54.46 ✓

W_m

m	log δ_m	log $(r_{m+1}-r_m)$	log $(r_{m+1}-r_m)-(y_m-y_{m-1})$		r_m	W_m
1	1.36393 ✓	0.80324 ✓	0.45824 ✓	1.70893 ✓	51.16 ✓	7.18 ✓	58.34 ✓
2	1.29774 ✓	0.73582 ✓	0.37184 ✓	1.66172 ✓	45.89 ✓	13.36 ✓	59.25 ✓
3	1.23337 ✓	0.66266 ✓	0.27661 ✓	1.61942 ✓	41.63 ✓	18.66 ✓	60.29 ✓
4	1.17162 ✓	0.58151 ✓	0.17154 ✓	1.58159 ✓	38.16 ✓	23.13 ✓	61.29 ✓
5	1.11377 ✓	0.48718 ✓ 0.55271	0.04406 ✓	1.55689 ✓ 1.62247	36.05 ✓ 41.92	26.83 ✓	62.88 ✓ 68.75
6	1.06158 ✓	0.37232 ✓	1.87956 ✓	1.55434 ✓	35.84 ✓	29.78 ✓	65.62 ✓
7	1.01719 ✓	0.22185 ✓	1.63315 ✓	1.60589 ✓	40.36 ✓	32.10 ✓	72.46 ✓
8	0.98317 ✓	1.99773 ✓	1.04914 ✓	1.93176 ✓	85.46 ✓	33.71 ✓	119.17 ✓
9	0.96159 ✓	1.51947 ✓	−(1.29648) ✓	−1.18458 ✓	−15.30 ✓	34.76 ✓	19.46 ✓
10	0.95424 ✓	——					

Diagonal Tension

member	$P_m V_m$	f_m	V_m/f_m
1	51.19	83.83	0.61
2	52.14	81.73	0.64
3	52.87	79.51	0.67
4	53.36	77.53	0.69
5	53.72	76.71	0.70
6	53.95 ~~58.36~~	~~84.50~~ 78.42	~~0.64~~ ~~0.74~~
7	54.03	85.07	0.63
8	54.27	103.22	0.52
9	54.42	153.39	0.35
10	54.46	432.62	0.13

H	1	2	3	4	5	6	7	8	9	10
	0.151	0.296	0.439	0.570	0.699	0.808	0.899	0.967	1.007	1.017
1	0.092 0.09	0.181 0.18	0.268 0.27	0.348 0.35	0.426 0.43	0.493 0.49	0.548 0.55	0.590 0.59	0.614 0.61	0.620 0.62
2	0.097 0.10	0.189 0.19	0.281 0.28	0.365 0.37	0.447 0.45	0.517 0.52	0.575 0.58	0.619 0.62	0.644 0.64	0.651 0.65
3	0.101 0.10	0.198 0.20	0.294 0.29	0.381 0.38	0.468 0.47	0.541 0.54	0.602 0.60	0.648 0.65	0.675 0.67	0.681 0.68
4	0.104 0.10	0.204 0.20	0.303 0.30	0.393 0.39 ~~0.40~~	0.482 0.48	0.558 0.56	0.620 0.62	0.667 0.67	0.695 0.69	0.702 0.70
5	0.106 0.11	0.207 0.21	0.307 0.31	0.399 0.40	0.489 0.49	0.566 0.57	0.629 0.63	0.677 0.68	0.705 0.70	0.712 0.71
6	~~0.104~~ 0.112 0.11	~~0.204~~ 0.219 0.22	~~0.303~~ ~~0.325~~ 0.33	~~0.393~~ ~~0.422~~ 0.42	~~0.482~~ 0.517 0.52	~~0.558~~ 0.598 0.60	0.620 0.665 0.67	0.667 0.716 0.72	0.695 0.745 0.74	~~0.702~~ 0.753 0.75
7	0.095 0.10	0.186 0.19	0.277 0.28	0.359 0.36	0.440 0.44	0.509 0.51	0.566 0.57	0.609 0.61	0.634 0.63	0.641 0.64
8	0.079 0.08	~~0.154~~ 0.15	0.228 0.23	0.296 0.30	0.363 0.36	0.420 0.42	0.467 0.47	0.503 0.50	0.524 0.52	0.529 0.53
9	0.053 0.05	0.104 0.10	0.154 0.15	0.200 0.20	0.245 0.25	0.283 0.28	0.315 0.32	0.338 0.34	0.352 0.35	0.356 0.36
10	0.020 0.02	~~0.038~~ 0.04	0.057 0.06	0.074 0.07	0.091 0.09	0.105 0.11	0.117 0.12	0.126 0.13	0.131 0.13	0.132 0.13 ~~0.14~~

Horizontal

member	q_m ~~w_m~~	w_m-m_a	q_m/w_m-m_a
1	58.34	96.58	0.60
2	59.25	101.18	0.59
3	60.29	108.63	0.55
4	61.29	120.02	0.51
5	6.288 ~~68.75~~	140.90	0.45 ~~0.44~~
6	65.62	182.48	0.36
7	72.46	290.55	0.25
8	119.17	1030.90	0.12
9	19.38 ~~19.46~~	-555.00	-0.04

H	1	2	3	4	5	6	7	8	9	10
1	0.091 ~~0.081~~ 0.09	0.178 0.18	0.263 0.26	0.342 0.34	0.419 0.42	0.485 0.49	0.539 0.54	0.580 0.58	0.604 0.60	0.616 0.61
2	~~0.089~~ 0.09 0. ~~20~~	0.175 0.17	0.259 0.26	0.336 0.34	0.412 0.41	0.477 0.48	0.530 0.53	0.571 0.57	0.594 0.59	0.600 0.60
3	0.083 0.08	0.163 0.16	0.241 0.24	0.314 0.31	0.384 0.38	0.444 0.44	0.494 ~~0.54~~	0.532 0.53	0.554 0.55	0.559 0.56
4	0.077 0.08	0.151 0.15	0.224 0.22	0.291 0.29	0.356 0.36	0.412 0.41	0.458 0.46	0.493 0.49	0.514 0.51	0.519 0.52
5	~~0.067~~ ~~0.074~~ 0.07	~~0.133~~ ~~0.145~~ 0.15	~~0.198~~ 0.215 0.22	~~0.257~~ ~~0.279~~ 0.28	~~0.315~~ ~~0.342~~ 0.34	~~0.364~~ 0.396 0.40	~~0.405~~ 0.441 0.44	~~0.435~~ 0.474 0.47	~~0.453~~ 0.493 0.49	~~0.458~~ 0.498 0.50
6	0.054 0.05	0.107 0.11	0.158 0.16	0.205 0.21	0.252 0.25	0.291 0.29	0.324 0.32	0.348 0.35	0.363 0.36	0.366 0.37
7	~~0.038~~ 0.04	0.074 0.07	0.110 0.11	0.143 0.14	0.175 0.18	0.202 0.20	0.225 0.22	0.242 0.24	0.252 0.25	0.254 0.26
8	0.018 6.02	0.036 6.04	0.053 0.05	0.068 0.07	0.084 0.08	0.097 0.10	0.108 0.11	0.116 0.12	0.121 0.12	0.122 0.12
9	-0.006 -0.01	-0.012 -0.01	-0.018 -0.02	-0.023 -0.02	-0.030 -0.03	-0.032 -0.03	-0.036 -0.04	-0.039 -0.04	-0.040 -0.04	-0.041 -0.04

361

123 45 364 125 123

-36-

Diagonals.

not considering Redundancy. $X_a = 1$.
except

member \ Load on	1	2	3	4	5	6	7	8	9	10
1	0.050 0.05	0.100 0.10	0.149 0.15	0.199 0.20	0.249 0.25	0.299 0.30	0.349 0.35	0.398 0.40	0.448 0.45	0.498 0.50
2	0.059 0.06	0.119 0.12	0.178 0.18	0.237 0.24	0.297 0.30	0.356 0.36	0.415 0.42	0.474 0.47	0.534 0.53	0.593 0.59
3	0.070 0.07	0.140 0.14	0.210 0.21	0.280 0.28	0.350 0.35	0.419 0.42	0.489 0.49	0.559 0.56	0.629 0.63	0.699 0.70
4	0.082 0.08	0.163 0.16	0.245 0.24	0.326 0.33	0.408 0.41	0.490 0.49	0.571 0.57	0.653 0.65	0.734 0.73	0.816 0.82
5	0.094 0.09	0.188 0.19	0.282 0.28	0.376 0.38	0.470 0.47	0.564 0.56	0.658 0.66	0.752 0.75	0.846 0.85	0.940 0.94
6	0.106 0.11	0.212 0.21	0.317 0.32	0.423 0.42	0.529 0.53	0.635 0.63	0.741 0.74	0.846 0.85	0.952 0.95	1.058 1.06
7	0.115 0.12	0.230 0.23	0.345 0.35	0.460 0.46	0.575 0.58	0.689 0.69	0.804 0.81	0.919 0.92	1.034 1.04	1.149 1.15
8	0.118 0.12	0.236 0.24	0.353 0.35	0.471 0.47	0.589 0.59	0.707 0.71	0.825 0.82	0.942 0.94	1.060 1.06	1.178 1.18
9	0.112 0.11	0.224 0.22	0.336 0.34	0.448 0.45	0.561 0.56	0.673 0.67	0.785 0.78	0.897 0.90	1.009 1.01	1.121 1.12
10	0.095 0.10	0.190 0.19	0.286 0.29	0.381 0.38	0.476 0.48	0.571 0.57	0.666 0.67	0.762 0.76	0.857 0.86	0.952 0.95
10'	−0.067 −0.07	−0.134 −0.13	−0.201 −0.20	−0.268 −0.27	−0.335 −0.34	−0.402 −0.40	−0.469 −0.47	−0.536 −0.54	−0.603 −0.60	0.952 0.95
9'	−0.034 −0.03	−0.068 −0.07	−0.102 −0.10	−0.136 −0.14	−0.170 −0.17	−0.204 −0.20	−0.238 −0.24	−0.272 −0.27	1.233 1.23	1.12
8'	−0.002 −0.00	−0.004 0.00	−0.006 −0.01	−0.008 −0.01	−0.010 −0.01	−0.012 −0.01	−0.014 −0.02	1.414 1.41	1.296 1.30	1.18
7'	0.026 0.03	0.052 0.05	0.078 0.08	0.104 0.10	0.130 0.13	0.156 0.16	1.494 1.50	1.379 1.38	1.264 1.27	1.15
6'	0.047 0.05	0.094 0.09	0.141 0.14	0.188 0.19	0.235 0.24	1.481 1.48	1.375 1.38	1.270 1.27	1.164 1.16	1.06
5'	0.063 0.06	0.126 0.13	0.189 0.19	0.252 0.25	1.410 1.41	1.316 1.32	1.222 1.22	1.128 1.13	1.034 1.03	0.94
4'	0.073 0.07	0.146 0.15	0.219 0.22	1.306 1.31	1.224 1.22	1.142 1.14	1.061 1.06	0.979 0.98	0.898 0.90	0.82
3'	0.080 0.08	0.160 0.16	1.188 1.19	1.118 1.12	1.049 1.05	0.979 0.98	0.909 0.91	0.839 0.84	0.769 0.77	0.70
2'	0.088 0.09	1.067 1.07	1.008 1.01	0.949 0.95	0.890 0.89	0.830 0.83	0.771 0.77	0.712 0.71	0.652 0.65	0.59
1'	0.946 0.95	0.896 0.90	0.847 0.85	0.797 0.80	0.747 0.75	0.697 0.70	0.647 0.65	0.598 0.60	0.548 0.55	0.50

Verticals.

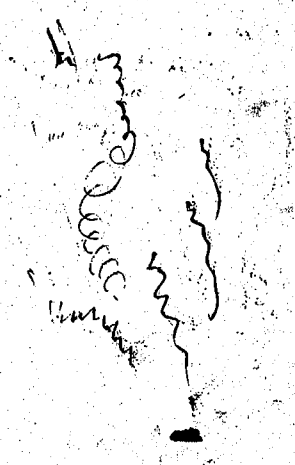
member \ Loading	1	2	3	4	5	6	7	8	9	10
1	0.056 0.06	0.112 0.11	0.169 0.17	0.225 0.22	0.281 0.28	0.337 0.34	0.393 0.39	0.450 0.45	0.506 0.51	0.562 0.56
2	0.062 0.06	0.124 0.12	0.186 0.19	0.248 0.25	0.310 0.31	0.371 0.37	0.433 0.43	0.495 0.49	0.557 0.56	0.619 0.62
3	0.070 0.07	0.134 0.13	0.201 0.20	0.268 0.27	0.335 0.33	0.401 0.40	0.468 ~~0.47~~	0.535 0.53	0.602 0.60	0.669 0.67
4	0.070 0.07	0.140 0.14	0.210 0.21	0.280 0.28	0.350 0.35	0.420 0.42	0.490 0.49	0.560 0.56	0.630 0.63	0.700 0.70
5	0.071 0.07	0.143 0.14	0.214 0.21	0.285 0.29	0.356 0.36	0.428 0.43	0.499 0.50	0.576 0.57	0.642 0.64	0.713 0.71
6	0.070 0.07	0.139 0.14	0.209 0.21	0.279 0.28	0.349 0.35	0.418 0.42	0.488 0.49	0.558 0.56	0.627 0.63	0.697 0.70
7	0.064 0.06	0.129 0.13	0.193 0.19	0.258 0.26	0.322 0.32	0.386 0.39	0.451 ~~0.45~~	0.515 0.52	0.580 0.58	0.644 0.64
8	0.055 0.05	0.109 0.11	0.164 0.16	0.219 0.22	0.274 0.27	0.328 0.33	0.383 0.38	0.438 0.44	0.492 0.49	0.547 0.55
9	0.040 0.04	0.080 0.08	0.121 0.12	0.161 0.16	0.202 0.20	0.242 0.24	0.282 0.28	0.322 0.32	0.363 0.36	0.403 0.40
9'	−0.061 −0.06	−0.122 −0.12	−0.183 −0.18	−0.244 −0.24	−0.305 −0.31	−0.366 −0.37	−0.427 −0.43	−0.488 −0.49	0.443 0.44	0.40
8'	−0.043 −0.04	−0.086 −0.09	−0.129 −0.13	−0.172 −0.17	−0.215 −0.22	−0.258 −0.26	−0.301 −0.30	0.656 0.66	0.602 0.60	0.55
7'	−0.023 −0.02	−0.046 −0.05	−0.069 −0.07	−0.092 ~~−0.09~~	−0.115 −0.12	−0.138 −0.14	0.837 0.84	0.773 0.77	0.708 0.71	0.64
6'	−0.004 0.00	−0.008 −0.01	−0.012 −0.01	−0.016 −0.02	−0.020 ~~−0.02~~	0.976 0.98	0.906 0.91	0.836 0.84	0.767 0.77	0.70
5'	0.014 0.01	0.028 0.03	0.042 0.04	0.056 0.06	1.070 1.05	0.998 1.00	0.927 0.93	0.856 0.86	0.784 0.78	0.71
4'	0.030 0.03	0.060 0.06	0.090 0.09	1.120 1.12	1.050 1.05	0.980 0.98	0.910 .91	0.840 0.84	0.770 0.77	0.70
3'	0.040 0.04	0.080 0.09	1.137 1.14	1.070 1.07	1.004 ~~1.03~~	0.937 0.94	0.870 0.87	0.803 0.80	0.736 0.74	0.67
2'	0.057 0.11	1.114 1.11	1.052 1.05	0.990 0.99	0.923 0.93	0.867 0.87	0.805 0.80	0.743 0.74	0.681 0.68	0.62
1'	1.068 1.07	1.012 1.01	0.955 0.96	0.899 0.90	0.843 0.84	0.787 0.79	0.731 0.73	0.674 0.67	0.618 0.62	0.56

Diagonals.

considering Redundancy $X_a = 1$.

member \ Load on	1	2	3	4	5	6	7	8	9	10
1	−0.047 −0.04	−0.081 −0.08	−0.119 −0.12	−0.149 −0.15	−0.177 −0.18	−0.194 −0.19	−0.199 −0.20	−0.192 −0.19	−0.166 −0.16	−0.122 −0.12
2	−0.0438 −0.04	−0.070 −0.07	−0.103 −0.10	−0.128 −0.13	−0.15 −0.15	−0.161 −0.16	−0.16 −0.16	−0.145 −0.15	−0.11 −0.11	−0.058 −0.06
3	−0.031 −0.03	−0.058 −0.06	−0.084 −0.08	−0.101 −0.10	−0.118 −0.12	−0.122 −0.12	−0.113 −0.11	−0.089 −0.09	−0.046 −0.04	−0.028 −0.02
4	−0.022 −0.02	−0.041 −0.04	−0.058 −0.06	−0.067 −0.06	−0.074 −0.07	−0.068 −0.07	−0.049 −0.05	−0.014 0.02	0.039 0.04	0.114 0.12
5	−0.012 −0.02	−0.019 −0.03	−0.025 −0.03	−0.023 −0.02	−0.019 −0.02	−0.002 −0.01	0.029 0.03	0.075 0.07	0.141 0.15	0.228 0.23
6	+0.002 −0.00	+0.008 −0.01	0.014 −0.01	0.030 0.00	0.047 +0.01	+0.077 +0.03	0.121 0.07	0.179 0.13	0.257 0.21	0.356 0.31
7	0.020 0.02	0.044 0.04	+0.068 0.07	+0.101 0.10	+0.135 0.14	+0.18 0.18	0.238 0.24	0.31 0.31	0.400 0.41	0.504 0.51
8	0.039 0.04	0.082 0.09	+0.125 0.12	+0.175 0.17	+0.226 0.23	+0.287 0.29	0.358 0.35	0.439 0.44	0.526 0.54	0.649 0.65
9	0.059 0.06	0.120 0.12	+0.182 0.19	+0.248 0.25	+0.316 0.31	+0.39 0.39	0.47 0.46	0.559 0.56	0.657 0.66	0.765 0.76
10	0.075 0.08	0.152 0.15	+0.229 0.23	+0.305 0.31	+0.385 0.39	+0.466 0.46	0.549 0.55	0.636 0.63	0.726 0.73	0.820 0.82
10'	−0.087 −0.09	−0.172 −0.17	−0.258 −0.26	−0.342 −0.34	−0.426 −0.43	−0.507 −0.51	−0.586 −0.59	−0.662 −0.67	−0.734 −0.73	0.82
9'	−0.087 −0.08	−0.172 −0.17	−0.256 −0.25	−0.336 −0.34	−0.415 −0.42	−0.487 −0.48	−0.552 −0.56	−0.61 −0.61	0.881 +0.88	0.76
8'	−0.081 −0.08	−0.158 −0.15	−0.234 −0.24	−0.304 −0.31	−0.373 −0.37	−0.432 −0.43	−0.481 −0.49	0.911 0.91	0.772 0.78	0.65
7'	+0.069 −0.07	−0.134 −0.14	−0.199 −0.20	−0.255 −0.26	−0.31 −0.41	−0.353 −0.35	0.928 0.93	0.777 0.77	0.630 0.64	0.51
6'	−0.057 −0.06	−0.110 +0.03	−0.162 −0.19	−0.205 −0.23	−0.247 −0.28	0.923 0.88	0.755 0.71	0.603 0.55	0.459 0.42	0.31
5'	−0.043 −0.06	−0.081 −0.08	−0.118 −0.12	−0.147 −0.15	+0.921 0.92	+0.775 0.75	0.593 0.59	0.451 0.45	0.329 0.33	0.23
4'	−0.031 −0.03	−0.058 −0.05	−0.084 −0.08	−0.913 0.92	+0.742 0.74	+0.584 0.58	0.441 0.44	0.312 0.32	0.203 0.21	0.12
3'	−0.021 −0.02	−0.038 −0.04	+0.894 0.90	+0.737 0.74	+0.581 0.58	+0.438 0.44	0.307 0.31	0.171 0.19	0.094 0.10	+0.02
2'	−0.008 −0.01	0.878 0.86	+0.728 0.73	+0.584 0.58	+0.443 0.54	+0.313 0.31	0.196 0.19	0.093 0.06	0.098	−0.06
1'	0.854 +0.86	0.715 0.72	+0.579 0.58	+0.449 0.45	+0.321 0.32	+0.204 0.21	0.099 0.10	0.008 0.01	−0.066 −0.06	−0.12

Vertical strength



-39-
-38-

Verticals

member \ Load	1	2	3	4	5	6	7	8	9	10
1	-0.035 -0.03	-0.066 -0.07	-0.095 -0.09	-0.117 -0.12	-0.136 -0.14	-0.148 -0.15	-0.146 -0.19 -0.15	-0.13	-0.098 -0.09	-0.048 -0.05
2	-0.027 -0.03	-0.051 -0.05	-0.073 -0.07	-0.088 -0.09	-0.102 -0.10	-0.106 -0.11	-0.098 -0.14	-0.076 -0.08	-0.037 -0.03	+0.019 +0.02
3	-0.013 -0.01	-0.029 -0.03	-0.04 -0.04	-0.046 -0.04	-0.049 -0.05	-0.043 -0.04	-0.166 -0.328 +0.04	+0.008 0.00	0.048 0.05	0.11 0.11
4	-0.007 -0.01	-0.011 -0.01	-0.014 -0.01	-0.011 -0.01	-0.006 -0.01	0.008 0.01	-0.03 0.032 0.03	0.067 0.07	0.186 0.12	0.181 0.18
5	+0.003 0.00	+0.004 0.01	-0.016 -0.01	0.028 0.01	0.044 0.02	0.064 0.03	0.094 0.06	0.135 0.10	0.189 0.15	0.255 0.21
6	0.026	0.032	0.051	0.074	0.097	0.127	0.164 0.17	0.21	0.264 0.27	0.331 0.23
7	0.026	0.055 0.06	0.083 0.08	0.085 0.12	0.147 0.14	0.184 0.19	0.226 0.33	0.273 0.28	0.328 0.33	0.39 0.38
8	0.038 0.03	0.073 0.07	0.11 0.11	0.151 0.15	0.188 0.19	0.231 0.23	0.275 0.27	0.322 0.32	0.371 0.37	0.425 0.83
9	0.046 0.05	0.092 0.09	0.139 0.14	0.184 0.18	0.232 0.23	0.274 0.27	0.318 0.32	0.361 0.36	0.403 0.40	0.444 0.44
9'	-0.055 -0.05	-0.111 -0.11	-0.165 -0.16	-0.221 -0.22	-0.268 -0.28	-0.334 -0.34	-0.391 -0.39	-0.449 -0.45	0.483 0.48	0.44
8'	-0.061 -0.06	-0.122 -0.13	-0.182 -0.18	-0.24 -0.24	-0.299 -0.30	-0.355 -0.36	-0.409 -0.41	0.54 0.54	0.481 0.48	0.43
7'	-0.061 -0.06	-0.12 -0.12	-0.179 -0.18	-0.235 -0.23	-0.290 -0.30	-0.346 -0.34	0.612 0.62	0.531 0.53	0.456 0.46	0.38
6'	-0.058 -0.05	-0.115 -0.12	-0.17 -0.17	-0.221 -0.23	-0.272 -0.27	0.685 0.69	0.582 0.59	0.488 0.49	0.397 0.41	0.23
5'	-0.054 -0.06	-0.105 -0.12	-0.136 -0.18	-0.203 -0.22	0.755 0.73	0.634 0.60	0.522 0.49	0.424 0.39	0.331 0.29	0.21
4'	-0.047 -0.05	-0.091 -0.09	-0.134 -0.13	0.829 0.83	0.694 0.69	0.568 0.57	0.452 0.45	0.347 0.35	0.256 0.26	0.18
3'	-0.033 -0.04	-0.083 -0.07	0.896 0.90	0.756 0.76	0.62 0.62	0.493 0.50	0.376 0.33	0.271 0.27	0.182 0.19	0.11
2'	0.032 0.02	0.939 0.94	0.793 0.79	0.654 0.65	0.511 0.52	0.39 0.39	0.275 0.27	0.172 0.17	0.087 0.09	0.02
1'	0.977 0.98	0.834 0.83	0.692 0.70	0.557 0.56	0.424 0.42	0.302 0.30	0.192 0.19	0.094 0.09	0.014 0.02	-0.05

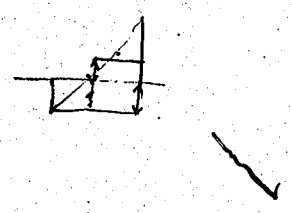
34
35
36
37

Influence Surfaces for Verticals.

Load on \ member	1	2	3	4	5	6	7	8	9	No
1	-0.035	-0.027	-0.013	-0.007	+0.003	0.016	0.026	0.038	0.046	
2	-0.066	-0.051	-0.029	-0.011	~~+0.002~~ +0.010	0.032	0.055	0.073	0.092	
3	-0.095	-0.073	-0.040	-0.014	~~+0.001~~ 0.016	0.051	0.083	0.110	0.139	
4	-0.117	-0.088	-0.046	-0.011	~~0.006~~ 0.028	0.074	0.085	0.151	0.184	
5	-0.136	-0.102	-0.049	-0.006	~~0.014~~ 0.041	0.097	0.147	0.188	0.232	
6	-0.148	-0.106	-0.043	0.008	~~0.032~~ 0.064	0.127	0.184	0.231	0.274	
7	-0.146	-0.097	-0.028	0.032	~~0.058~~ 0.094	0.164	0.226	0.275	0.318	
8	-0.130	-0.076	0.003	0.067	~~0.096~~ 0.135	0.210	0.273	0.322	0.361	
9	-0.098	-0.037	0.048	0.116	~~0.149~~ 0.189	0.264	0.328	0.371	0.403	
10	-0.048	0.019	0.110	0.181	~~0.215~~ 0.255	0.331	0.390	0.425	0.444	
9'	0.014	0.087	0.182	0.256	~~0.291~~ 0.331	0.397	0.456	0.481	0.483	
8'	0.094	0.172	0.271	0.347	~~0.382~~ 0.421	0.488	0.531	0.540	0.449	
7'	0.192	0.275	0.376	0.452	~~0.486~~ 0.522	0.582	0.612	0.409	0.391	
6'	0.302	0.390	0.493	0.568	~~0.602~~ 0.634	0.685	0.346	0.355	0.324	
5'	0.424	0.511	0.620	0.694	~~0.728~~ 0.755	0.272	0.290	0.299	0.268	
4'	0.557	0.654	0.756	0.829	~~0.223~~ 0.261	0.221	0.235	0.240	0.221	
3'	0.692	0.793	0.896	0.134	~~0.173~~ 0.136	0.170	0.179	0.182	0.165	
2'	0.834	0.939	0.083	0.091	~~0.117~~ 0.105	0.115	0.120	0.122	0.110	
1'	0.977	0.032	0.033	0.047	~~0.060~~ 0.054	0.058	0.061	0.061	0.055	
	~~0.977~~ 1.019	0.657	0.364	0.321	0.579	0.836	1.231	1.668	1.993	
	+4.086	+3.872	+3.755	+3.550	3.059	3.518	~~3.406~~ 3.399	3.205	2.976	
odd	-0.510	-0.336	-0.163	-0.208	-0.198	-0.500	-0.536	-0.951	-0.879	
	2.299	1.698	2.122	1.550	1.954	1.571	1.878	1.463	1.621	
even	-0.509	-0.321	-0.201	-0.113	-0.306	-0.336	-0.701	-0.717	-1.114	
	1.787	2.174	1.633	2.000	1.547	1.947	1.518	1.742	1.355	

3.994

Influence lines for diagonals.



load on \ member	1	2	3	4	5	6	7	8	9	10	
1	-0.042	-0.038	-0.031	-0.022	-0.012	+0.004 +0.006	+0.002 0.020	0.039	0.059	-0.087	0.075
2	-0.081	-0.070	-0.058	-0.041	-0.019	+0.007 +0.013	+0.008 0.044	0.082	0.120	-0.172	0.152
3	-0.119	-0.103	-0.084	-0.058	-0.025	+0.008 +0.022	+0.014 +0.068	+0.125	0.182	-0.258	0.229
4	-0.149	-0.128	-0.101	-0.067	-0.023	+0.001 +0.039	0.030 +0.101	0.175	0.248	-0.342	0.305
5	-0.177	-0.150	-0.118	-0.074	-0.019	+0.012 +0.058	0.044 0.135	0.226	0.316	-0.426	0.385
6	-0.194	-0.161	-0.122	-0.068	-0.002	+0.037 +0.089	0.077 0.180	0.287	0.390	-0.507	0.466
7	-0.199	-0.160	-0.113	-0.049	0.029	+0.076 +0.104	0.124 0.238	0.358	0.470	-0.586	0.549
8	-0.192	-0.145	-0.089	-0.014	0.075	+0.133 +0.186	0.179 0.310	0.439	0.559	-0.662	0.636
9	-0.166	-0.110	-0.046	+0.039	0.141	+0.207 +0.271	0.257 0.400	0.526	0.657	-0.734	0.726
10	-0.122	-0.058	+0.018	0.114	0.228	+0.305 +0.366	0.356 0.504	0.649	0.765		0.820
9'	-0.066	0.008	0.094	0.203	0.329	+0.419 +0.480	0.459 0.630	0.772	0.881	-0.734	
8'	0.008	0.093	0.181	0.312	0.451	+0.554 +0.611	0.603 0.770	0.911	-0.610	-0.662	
7'	0.099	0.196	0.307	0.441	0.593	+0.710 +0.761	0.755 0.928	-0.481	-0.552	-0.586	
6'	0.204	0.313	0.438	0.584	0.750	+0.883 +0.925	0.923 -0.353	-0.432	-0.487	-0.507	
5'	0.321	0.443	0.581	0.742	0.921	-0.282	-0.247 -0.310	-0.373	-0.415	-0.426	
4'	0.449	0.584	0.737	+0.913	-0.147	-0.234	-0.205 -0.255	-0.304	-0.336	-0.342	
3'	0.579	0.728	0.894	-0.084	-0.118	-0.184	-0.167 -0.199	-0.234	-0.256	-0.258	
2'	0.715	0.878	-0.038	-0.058	-0.081	-0.125	-0.110 -0.134	-0.158	-0.172	-0.172	
1'	0.854	-0.008	-0.021	-0.031	-0.043	-0.065	-0.057 -0.069	-0.081	-0.087	-0.087	
	-1.507	-1.131	-0.839	-0.566	-0.489	-0.912	-1.320	-2.063	-2.955	-3.774	
	+3.229	+3.243	+3.232	+3.348	+3.517	+3.333	4.328	4.589	4.647	4.343	
odd	-0.769	-0.569	-0.413	-0.318	-0.217	-0.466	-0.578	-1.169	-1.310	-2.091	
	+1.853	1.375	1.876	1.425	2.013	1.424 1.655	2.419	2.046	2.565	1.964	
even	-0.738	-0.562	-0.426	-0.248	-0.272	-0.315	-0.742	-0.894	-1.605	-1.683	
	+1.376	1.868	1.356	1.923	1.504	1.909	2.543	2.082		2.379	
						2.176					

panel load.

Dead load = ~~174,700~~ 165,100 ~~16[illegible]~~ # for main panel.
= 13,300 for intermediate panel.
17,300

Live load = 34,000 # for max. concentration.
= 21,000 # for other panel.
(34,000 − 21,000 = 13,000 #.)
= 39,700 # for side walk.

stress of tie.

influence surfaces

for main panel: 6.299

for intermediate panel: 6.390

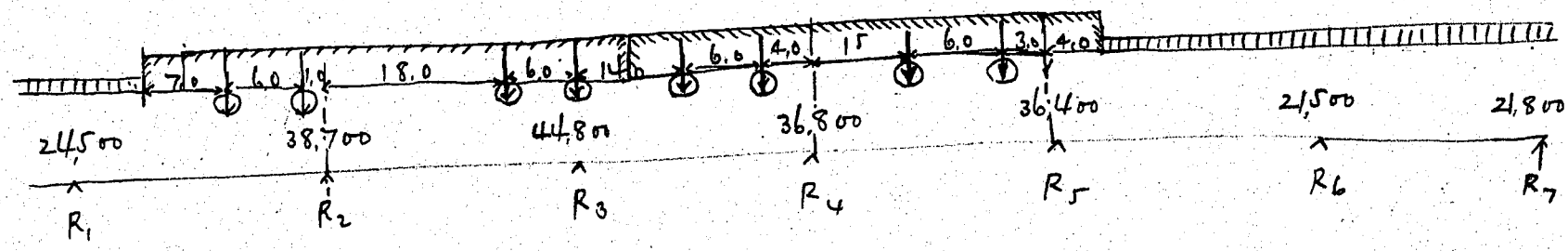
due to dead L. 174,700 × 6.299 + 13,300 × 6.390 = 1,100,000 + 85,000 = 1,185,000 #

L. L $\frac{21}{34}$,000 × 6.299 + 13,000 × 1.017 = 132,300 + 13,200 = 145,500 #

↳ due to motor truck.

side walk → 39,700 × 6.299 = 259,040.3 # = 259,100 # say.

Electric car loading.



Stress due to electric car loading.

44,800 × 1.017 → 45,561.6
38,700 × 0.967 → 73,008.5
24,500 × 0.808 → 49,207.2
36,800 × 0.967 →
36,400 × 0.808 →
21,500 × 0.570 → 12,255.0
21,800 × (0.296 + 0.570 + 0.296) → 25,331.6

205,364 = 205,400 # say

Total stress due to live load

= 145,500 + 259,100 + 205,400 = 610,000 #

Upper chord stress.

member	main panel +	main panel −	main panel diff.	intermediate panel +	intermediate panel −	intermediate panel diff.
1	0.775	0.360	0.415	1.029	0.370	0.659
2	1.898	0.687	1.211	1.831	0.702	1.129
3	2.787	0.876	1.911	3.066	0884	2.182
4	4.069	0.908	3.161	3.983	0.962	3.021
5	5.006	0.836	4.170	5.272	0827	4.445
6	6.196	0.600	5.596	6.045	0.671	5.374
7	6.884	0.321	6.563	7.204	0.345	6859
8	7.976	0.036	7.940	7.687	0.069	7.618
9	~~8.189~~ 250	0.000	~~8.189~~ 250	~~8.511~~ 60	0.000	~~8.504~~ 60
10	8.825	0.000	8.825	8.470	0.000	8.470

	max. ord of influence surface.	Dead (main) 174,700	(inter. panel) 13,300	Live 21,000	# max. concentration 13,000	Dead load stress.	Live load stress.
1	~~0.465~~ 0.391	72,500	8.8 ㎡	16,300	~~6.000~~ 5,100	80.5 ㎡	21,400 .
2	0.916	Σ11,500	15, ㎡	40, ㎡	12, ㎡	226.5 ㎡	~~52,000~~ .
3	~~1.340~~ 1,085	333,80	29. ㎡	58,5 ㎡	~~17,400~~ 14,100	362,8 ㎡	~~72,600~~ .
4	~~1.727~~ ~~1.620~~ 1,727	552, ㎡	40,2 ㎡	85,5 ㎡	22,5 ㎡	592,200	108,000 .
5	~~2.053~~ 1,620	728, ㎡	59,2 ㎡	105, ㎡	~~26,800~~ 21,500	787.200	~~151,800~~ 126,000 .
6	2,292	978, ㎡	41,5 ㎡	130, ㎡	29.8 ㎡	1049.5 ㎡	~~159,800~~ .
7	~~2.488~~ 2,017	1,143, ㎡	91,2 ㎡	144,5 ㎡	~~32,300~~ 26,200	1234,2 ㎡	176,700 .
8	2.615	1,387. ㎡	101,300	167,5 ㎡	34. ㎡	1488,3 ㎡	~~201,500~~ .
9	~~2.661~~ 2,104	1.441. ㎡	113,800	173,300	~~27,700~~ 27,400	~~1554,800~~ 1554,800	~~199,300~~ .
10	2,707	1.542, ㎡	113, ㎡	185,5 ㎡	35.2 ㎡	1655, ㎡	~~220,700~~ 10

	Total live load stress	Dead load	L/D	Total load stress
1	31,400	~~84,500~~ 80,500	1.05	~~164,600~~ #
2	76,100	185,400	226,500	0.82	411,900
3	112,900	~~309,800~~ 362,800	0,85	~~671,900~~ 668,600
4	164,900	434,400	592,200	0,73	1026,600
5	198,300	~~528,000~~ 787,200	0,67	1310,2 ㎡
6	235,600	641,400	1049,500	0,61	1690,900
7	260,300	~~710,400~~ 1234,200	0,58	~~1944,600~~ 1938,500
8	299,500	817,600	1488,300	0,55	2305,900
9	299,400	~~827,200~~ ~~1540,000~~ 1554,800	0,54	~~2372,200~~ ~~2382,400~~ 2382,400
10	319,300	890,400	1655,000	0,54	2545,400

↑ due to electric car loading.

	side walk loading
1	30,8 ㎡
2	~~57,300~~
3	120,300
4	161,500
5	198,700
6	246,000
7	273,300
8	316,600
9	~~327,500~~
10	350,400

↑ side walk loading

due to motor truck.

(0.7) means

Lower chord stress.

member	main panel +	main panel −	main panel diff.	inter. panel +	inter. panel −	inter. panel diff.	max. ordy influence surface	Dead	live	due to motor truck Dead (8mm)	due to motor truck Live (8mm)
								174,700	13,300	21,000	13,000
0	0.125	5.139	-5.014	0.320	-5.183	-4.863	-0.928	-876,000	-64,700	-107,800	-12,100	-958,700	-119,900
1	0.090	6.771	-6.681	0.335	-6.835	-6.500	-1.211	-1167,000	-86,500	-142,200	-15,700	-1253,200	-157,900
2	0.653	6.245	-5.592	0.646	-6.367	-5.721	-1.2~~46~~39	-977,000	-76,200	-131,200	-16,700	-1053,200	-147,800
3	1.139	5.863	-4.724	1.355	5.910	-4.555	-1.265	-826,000	-60,600	-123,000	-16,400	-886,600	-139,300
4	1.959	5.269	-3.310	1.804	5.358	-3.554	-1.234	-578,000	-47,300	-110,700	-16,000	-625,300	-126,700
5	2.332	4.614	-2.282	2.611	4.698	-2.087	-1.1~~74~~25	-399,000	-27,800	-97,000	-14,600	-426,800	-117,600
6	3.092	3.801	-0.709	2839	3.876	-1.037	-1.0~~53~~38 +1.507 ~~+1.034~~	-124,000	-13,800	-79,800 (+65,000)	-13,500 (+19,600)	-137,800	-93,300 (+84,600)
7	3.070	2.874	+0.196	3.404	3.002	+0.402	~~+1.587~~ +1.206 -0.722	+34,300	+5,300	+64,200 (-60,000)	~~+73,500~~ (-9,400)	+39,600	~~+87,800~~ (-69,400)
8	3.496	1.921	+1.575	3.090	1.918	+1.172	+1.638 -0.647	+275,000	+15,600	+73,200 (-40,000)	+21,300 (-8,400)	+290.600	+94,500 (-48,400)
9	2.889	0.938	+1.951	3.212	1.042	+2.170	~~+1.666~~ +1.137 -0.370	+341,000	+28,900	+60,600 (-19,700)	+21,700 (-4,800)	+369.900	+82,300 (-24,500)

member	due to Electric car loading		due to side walk loading (panel load (39,700)		Total live load stress.		Total stress.	
0	-175,600		-204,000		-499,500		~~-1340,200~~ ~~-651,800~~	
1	-230,300		-268,800		-657,000		-1910,200	
2	-218,200		-247,900		-613,500		-1666,600	
3	-208,200		-232,800		-580,300		-1466,900	
4	-186,900		-209,200		-522,800		-1148,100	
5	-171,900		-183,200		-467,300		-89~~4,100~~350	
6	-144,300	(+122,300)	-150,900	(+122,800)	~~-388,700~~ ~~+329,900~~	(+329,700)	-526,300	(+191,900)
7	~~-116,000~~	(+126,100)	-114,100	(+121,900)	+332,800 ~~+342,500~~	(-299,500)	+465,100 ~~+460~~	(-259,900)
8	-75,600	(+136,800)	~~-76,300~~ ~~-121,900~~	(+103,800)	+335,100	(-200,300)	+625,700	~~(+90,200)~~
9	-111,800	(+113,000)	-37,200	(+114,700)	+310,000	(~~-259,300~~ ~~-173,500~~ -173,500)	+679,900	(——)

Diagonals.

member	main panel +	main panel −	diff.	intermediate panel +	intermediate panel −		max. ord. of influence surface	174,700	13,300	21,000	13,000	Summation. Dead	Summation. Live
1	1.376	0.738	+ 0.638	1.853	0.769	+ 1.084	+ 0.~~854~~ 715 − 0.194	111,500	14,400	29,900 (−15,500)	9,300 (−2,500)	125,900	~~38,200~~ (−18,000)
2	1.868	0.562	+ 1.306	1.375	0.569	+ 0.806	+ 0.878	228,100	10,700	39,300	11,400	239,800	~~50,700~~
3	1.356	0.426	+ 0.930	1.876	0.413	+ 1.463	+ 0.~~894~~ 737	162,500	19,500	28,500	19,600	182,000	~~38,100~~
4	1.923	0.248	+ 1.675	1.425	0.318	+ 1.107	+ 0.913	292,700	14,700	40,400	11,900	307,400	~~52,300~~
5	1.504	0.272	+ 1.232	2.013	0.217	+ 1.796	+ 0.~~921~~ 750	215,200	23,900	31,600	19,800	239,100	~~48,400~~
6	~~2.176~~ 1.904	~~0.315~~ 0.367	+ ~~1.861~~ 1.542	~~1.655~~ 1.424	~~0.466~~ 0.545	+ ~~1.189~~ 0.879	+ ~~0.923~~ 0.883	325,100	15,800	~~45,700~~	~~12,000~~ 11,500	~~340,900~~	~~51,600~~
7	~~2.176~~ 1.904	~~0.315~~ 0.742	+ ~~1.861~~ 1.162	2.419	0.578	+ 1.841	+ 0.~~928~~ 770	203,800	24,500	40,100	~~10,000~~	228,300	~~53,100~~
8	2.543	0.894	+ 1.649	2.046	1.169	+ 0.877	+ 0.911	288,200	11,700	53,200	~~11,800~~	299,900	~~65,000~~
9	2.082	1.605	+ 0.477	2.565	1.310	+ 1.255	± 0.~~887~~ 765 − 0.610	83,400	+16,700	43,700 (−33,700)	~~10,000~~ (−7,900)	100,100	~~53,700~~ (−41,600)
10	2.379	1.683	+ 0.696	~~1.964~~	2.091	− 0.127	+ 0.820 − 0.662	121,700	−1,700	50,000 (−35,300)	~~10,700~~ (−8,600)	~~120,000~~	60,700 (−43,900)

member	due to Electric car loading.	due to side walk loading. (×multiplier 39,700)	total stress (L.L)	Total stress.
1	+56,200 (−28,200)	54,700 (−29,300)	149,100 (−75,500)	275,000
2	74,800	74,200	199,700	439,500
3	54,500	53,800	146,400	328,400
4	74,400	76,300	203,000	510,400
5	59,000	59,700	160,100	399,200
6	~~82,300~~ ~~71,200~~	~~96,100~~ ~~75,800~~	~~236,100~~ ~~201,600~~	577,000 ~~482,500~~
7	72,300	75,800	198,200	426,500
8	94,900	~~91,000~~ ~~80,100~~	170,000	469,900
9	79,400 (−60,300)	82,600 (−63,700)	215,700 (−165,600)	315,800 (−65,500)
10	87,200 (−62,000)	94,500 (−66,800)	242,400 (−172,700)	362,400 (−52,700)

260,000
560,800
5,599,000

201.6
280
482

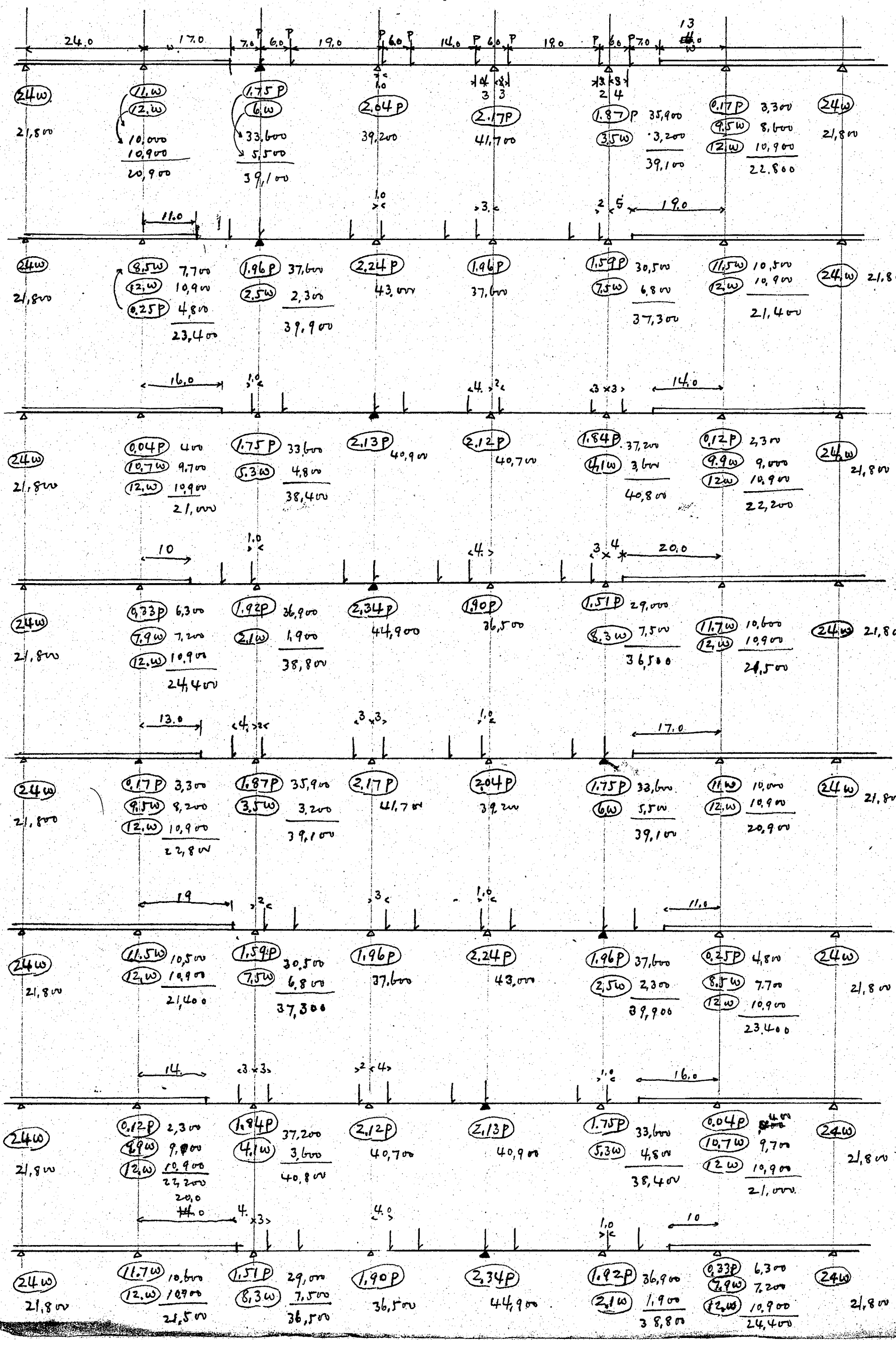
289
93
382

56200
53700
65,000
94,000
101,000
260,000

Verticals.

member	main panel. +	main panel. −	diff.	inter. panel. +	inter. panel. −	diff.	max. ord. of influence surface	174,700	13,300	21,000	13,000	Dead.	Live.
1	1.787	0.509	+1.278	2.299	0.510	+1.789	+0.~~477~~ 834	223,700	23,800	37,500	10,800	247,500 ✓	48,300 ✓
2	2.174	0.321	+1.853	1.698	0.336	+1.362	+0.937	324,000	18,100	45,700	12,200	342,100 ✓	57,900 ✓
3	1.633	0.201	+1.432	2.122	0.163	+1.959	+0.~~896~~ 756	250,400	26,100	34,300	19,800	276,500 ✓	44,100 ✓
4	2.000	0.113	+1.887	1.550	0.208	+1.342	+0.829	330,000	17,900	42,000	10,800	347,900 ✓	52,800
5	~~1.547~~ 1.333	~~0.306~~ 0.342	~~+1.241~~ +0.991	~~1.951~~ 1.726	~~0.190~~ 0.237	~~+1.761~~ +1.489	+0.~~728~~ 634	216,800	23,400	32,500	~~8,200~~ 7,800	240,200 ✓	~~40,700~~ 35,600 ✓
6	1.947	0.336	+1.611	1.571	0.500	+1.071	+0.685	281,600	14,200	40,900	8,900	295,800 ✓	49,800 ✓
7	1.518	0.701	+0.817	1.878	0.530	+1.348	+0.~~672~~ 531	142,800	18,000	31,900	~~8,900~~	160.800 ✓	~~38,800~~
8	1.742	0.717	+1.025	1.463	0.951	+0.512	+0.540 (−0.355)	179,300	6,800	36,600 −20,000	7,000 (−4,600)	186,100 ✓	43,600 (−24,600)
9	1.355	1.114	+0.241	1.621	0.879	+0.742	+0.~~483~~ 444 (−0.449)	42,200	9,900	28,500 (−15,600)	6,800 (−5,800)	52,100 ✓	34,300 ✓ (−21,400)

member	due to electric car loading.	due to sidewalk loading.	Total L.L stress.	Total Stress
1	71,500	70,800	180,600	428,100
2	87,000	86,200	231,100	573,200
3	64,700	64,800	173,600	450,100
4	77,700	79,400	209,900	557,800
5	~~57,700~~ ~~50,400~~	~~61,400~~ ~~53,000~~	~~159,800~~ ~~139,200~~	~~400,000~~ ~~332,000~~
6	70,900	77,300	198,000	493,800
7	55,300	60,300	154,400	315,200
8	62,400 (−25,700)	69,200 (−29,500)	175,200 (−79,800)	361,300 (—)
9	51,300 (−41,600)	58,800 (−44,200)	144,400 (−107,200)	196,500 (−55,100)



upper chord.

	z'	u'	t'	s'	r'	
L_1	$39.9\omega \times 0.391$	$+ 43.\omega\omega \times 0.25\sigma$	$+ 37.b\omega\omega \times 0.119$	$+ 30.5\omega\omega \times 0.015$	=	$31.4\omega\omega$
L_2	$39.9\omega\omega \times 0.916$	$+ 43.\omega\omega \times 0.601$	$+ 37.b\omega\omega \times 0.308$	$+ 30.5\omega\omega \times 0.073$	=	$76.1\omega\omega$
L_3	$38.8\omega\omega \times 0.889$	$+ 44.9\omega\omega \times 1.085$	$+ 36.5\omega\omega \times 0.603$	$+ 24.4\omega\omega \times 0.210$	=	$109.\omega\omega$
	$36.5\omega \times 0.889$	$+ 44.9\omega\omega \times 1.085$	$+ 38.8\omega\omega \times 0.603$	$+ 24.4\omega\omega \times 0.210$	=	$109.\omega\omega$
L_4	$40.7\omega \times 0.889$	$+ 40.9\omega\omega \times 1.085$	$+ 38.4\omega\omega \times 0.603$	$+ 21.\omega\omega \times 0.210$	=	$108.2\omega\omega$
L_5	32.1ω	$40.8\omega \times 0.783$	$+ 40.7\omega \times 1.b2\omega$	$+ 40.9\omega\omega \times 1.590$	$+ 38.4\omega\omega \times 0.792$	$+ 21.\omega\omega \times 0.217$	=	$197.\omega\omega$
	$30.2\omega\omega$	$38.4\omega\omega \times 0.783$	$66.3\omega\omega$	$+ 40.9\omega\omega \times 1.b2\omega$	$+ 40.7\omega\omega \times 1.590$	$+ 40.8\omega\omega \times 0.792$	$+ 22.2\omega\omega \times 0.217$	=	$198.3\omega\omega$
L_6	$9.4\omega\omega$	$13.5\omega\omega \times 0.697$	$+ 38.8\omega\omega \times 1.452$	$+ 44.9\omega\omega \times 2.292$	$102.9\omega\omega$	$+ 40.9\omega\omega \times 1.257$	$+ 36.5\omega\omega \times 0.429$	=	$232.7\omega\omega$
	$14.6\omega\omega$	$2.697 \times 38.8\omega\omega$	$+ 44.9\omega\omega \times 2.292$	$+ 40.7\omega\omega \times 1.257$	$51.2\omega\omega$	$+ 40.8\omega\omega \times 0.429$	=	$235.6\omega\omega$
L_7	2.5ω	$36.5\omega\omega \times 0.589$	$+ 34.5\omega\omega \times 2.417$	$+ 38.8\omega\omega \times 2.017$	$90.6\omega\omega$	$+ 36.5\omega\omega \times 1.873$	$72.8\omega\omega$	$+ 22.1\omega\omega \times 0.906$	$+ 2.8\omega\omega \times 0.252$	=	$258.\omega\omega$
	$5.4\omega\omega$	$33.1\omega\omega \times 0.906$	$+ 36.5\omega\omega \times 1.873$	$68.4\omega\omega$	$+ 38.4\omega\omega \times 2.017$	$+ 38.8\omega\omega \times 1.417$	$14.4\omega\omega$	$\times 0.589$	=	$260.3\omega\omega$
	$5.4\omega\omega$	$+ 2.8\omega\omega \times 0.906$	$+ 2.5\omega\omega \times 0.252$	=						
	$19.4\omega\omega$	$+ 21.5\omega\omega \times 0.589$	$+ 40.7\omega\omega \times 1.b17$	$+ 40.9\omega\omega \times 1.073$	$+ 38.4\omega\omega \times 0.429$	=	$162.9\omega\omega$
L_8	11.3ω	$44.8\omega\omega \times 1.\omega\omega 5$	$+ 40.7\omega\omega \times 1.019$	$+ 40.9\omega\omega \times 0.439$	=	$162.9\omega\omega$
	$22.2\omega\omega \times 0.146$	$+ 36.5\omega\omega \times 1.473$	$+ 38.4\omega\omega \times 0.612$			
	11.3ω	$44.8\omega\omega \times 1.\omega\omega 5$	$68.\omega\omega\omega$	$+ 40.7\omega\omega \times 1.019$	$+ 40.9\omega\omega \times 2.615$	$+ 38.4\omega\omega \times 1.439$	$+ 21.\omega\omega \times 0.612$	$12.9\omega\omega$
	$19\omega\omega\omega$	$+ 21.5\omega\omega \times 0.146$	$+ 36.5\omega\omega \times 1.473$	$+ 38.8\omega\omega \times 1.612$	$+ 21.9\omega\omega \times 0.146$	$18.9\omega\omega$
				$3.7\omega\omega$		
				$+ 21.8\omega \times 0.165$	= (299.5ω)	
L_9	$6.9\omega\omega$	$17.5\omega\omega$	$42.8\omega\omega$	$91.1\omega\omega$	$76.4\omega\omega$	$38.2\omega\omega$
	$21.8\omega\omega \times 0.317$	$+ 24.4\omega\omega \times 0.448$	$+ 38.8\omega\omega \times 1.457$	$+ 44.9\omega\omega \times 2.092$	$+ 36.5\omega\omega \times 1.046$	$+ 36.5\omega\omega \times 1.042$
	0.326	0.772ω	1.10ω	2.606	0.446	1.042
	$7.0\omega\omega$	$15.2\omega\omega$	$64\omega\omega$	$0.170 \times 21.0\omega$	$+ 21.5\omega\omega \times 0.826$	$5.4\omega\omega$
	$21.8\omega\omega \times 0.917$	$+ 21.\omega\omega \times 0.448$	$+ 38.4\omega\omega \times 1.457$	$+ 40.9\omega\omega \times 2.092$	$+ 40.7\omega\omega \times 1.046$	$+ 21.5\omega\omega \times 0.826$
	0.326	0.772ω	1.10ω	2.606	0.446	1.042
	$3.9\omega\omega$	$9.7\omega\omega$	$31.2\omega\omega$	$57.4\omega\omega$	$121.5\omega\omega$	$+ 38.8\omega\omega \times 1.573$
L_{10}	$21.8\omega\omega \times 0.181$	$+ 21.5\omega\omega \times 0.449$	$+ 36.5\omega\omega \times 0.854$	$+ 40.9\omega\omega \times 2.707$	$+ 40.7\omega\omega \times 1.573$	$+ 38.8\omega\omega \times 1.573$
				$+ 21.8\omega \times (0.449 + 0.854) =$		
				$20.9\omega\omega$	$13.7\omega\omega$	$61.\omega\omega\omega$
				$+ 42.4\omega\omega \times 0.854$		
				$= (319.3\omega)$		

Focus words

L。 ５，４００ × ０.２４９ ＋２１，８００ × ０.３１７ ＋ ３８，０００ × ０.９２８ ＋ ４０，７００ × ０.９２２ ＋４０，８００ × ０.７８８
　　１２，２００ × ０.５６２ ＋２２，２００ × ０.２９４ ＝ １７５，６００
　　５，４００ × ０.２４９ ＋２２，２００ × ０.５７９ ＋４０，８００ × ０.８１７ ＋４０，７００ × ０.９２８ ＋４０，９００ × ０.９２２ ＋３８，４００ × ０.７８８
　　２，４００ × ０.５６２ ＋２１，８００ × ０.２９４ ＝ ２１４，８００

L₃ ５，０００ × ０.２３３ ＋２４，４００ × ０.８１４ ＋３８，８００ × ０.１５２ ＋４４，９００ × ０.２８５ ＋３６，２００ × ０.８２７
　　９，４００ × ０.４３８ ＝ ２０７，５００
　　２１，８００ × ０.２３３ ＋２１，０００ × ０.８１４ ＋３８，４００ × ０.９１５２ ＋４０，９００ × ０.７３２ ＋４０，８００ × ０.８２７
　　９，７００ × ０.４３８ ＝ ４２２，２００

L₄ ７，５００ × ０.５５２ ＋３８，８００ × ０.８２９ ＋４４，９００ × ０.１４７ ＋３６，５００ × ０.４２９ ＋２１，５００ × ０.４５２
　　１０，７００ × ０.５５２ ＋３８，４００ × ０.６７４ ＋４０，９００ × ０.１４７ ＋３６，２００ × ０.４２９ ＋３８，４００ × ０.４５２ ＝ １８６，９００

L_8.

$\left\{\begin{array}{l} 36,9\text{m}^{13,5\text{m}} \times 0,365 + 44,9\text{m}^{29,1\text{m}} \times 0,647 + 36,5\text{m}^{20,9\text{m}} \times 0,573 + 36,5\text{m}^{12,3\text{m}} \times 0,336 = \\ -4\text{m}^{2\text{m}} \times 0,410 + 33,6\text{m}^{12,3\text{m}} \times 0,365 + 40,9\text{m}^{26,5\text{m}} \times 0,647 + 40,7\text{m}^{23,3\text{m}} \times 0,573 + 40,8\text{m}^{13,7\text{m}} \times 0,336 = \end{array}\right.$ 658m

75,600
~~76,000~~

$\left\{\begin{array}{l} 22,2\text{m}^{3,5\text{m}} \times 0,164 + 40,8\text{m}^{17,5\text{m}} \times 0,429 + 40,7\text{m}^{34,8\text{m}} \times 0,855 + 40,9\text{m}^{67,2\text{m}} \times 1,638 + 33,6\text{m}^{13,8\text{m}} \times 0,410 \\ 21,5\text{m}^{3,5\text{m}} \times 0,164 + 36,5\text{m}^{15,7\text{m}} \times 0,429 + 36,5\text{m}^{31,2\text{m}} \times 0,855 + 44,9\text{m} \times 1,638 + 36,9\text{m} \times 0,410 \end{array}\right.$

$-4\text{m}^{73,7\text{m}} \times 0,365 =$ 136,800

$-6,3\text{m}^{14,7\text{m}} \times 0,365 =$ 136,500

L_9.

$21,8\text{m}^{,5\text{m}} \times 0,024 + 21,0\text{m}^{3,2\text{m}} \times 0,154 + 38,4\text{m}^{17,2\text{m}} \times 1,137 + 40,9\text{m}^{46,5\text{m}} \times 1,029 + 40,7\text{m}^{41,9\text{m}} \times 0,088$

$+ 37,2\text{m}^{3,3\text{m}} \times 0,088 - 2,3\text{m}^{,8\text{m}} \times 0,330 =$ 111,800

$21,8\text{m}^{5\text{m}} \times 0,024 + 24,4\text{m}^{3,8\text{m}} \times 0,154 + 38,8\text{m} \times 0,457^{17,400} + 44,9\text{m}^{51,800} \times 1,137 + 36,5\text{m}^{37,6\text{m}} \times 1,029$

$+ 29,0\text{m}^{2,6\text{m}} \times 0,088 =$ 113,000

Diagonals.

θ_1 $-\left\{\begin{array}{l} 40,8\text{m}^{5,0\text{m}} \times 0,122 + 40,7\text{m}^{7,8\text{m}} \times 0,192 + 40,9\text{m}^{8,0\text{m}} \times 0,194 + 38,4\text{m}^{5,7\text{m}} \times 0,149 + 21,0\text{m}^{1,7\text{m}} \times 0,081 = \\ 36,5\text{m}^{4,5\text{m}} \times 0,122 + 36,5\text{m}^{7,0\text{m}} \times 0,192 + 44,9\text{m}^{8,7\text{m}} \times 0,194 + 38,8\text{m}^{5,8\text{m}} \times 0,149 + 24,4\text{m}^{2,0\text{m}} \times 0,081 = \end{array}\right.$ 28,200 / 28,000

$+ 44,9\text{m}^{32,2\text{m}} \times 0,715 + 36,5\text{m}^{16,4\text{m}} \times 0,449 + 36,5\text{m}^{7,5\text{m}} \times 0,204 + 10,6\text{m}^{1,0\text{m}} \times 0,008 =$ 56,200

θ_2 $+ 39,9\text{m}^{35,0\text{m}} \times 0,878 + 43,0\text{m}^{25,2\text{m}} \times 0,584 + 37,6\text{m}^{11,8\text{m}} \times 0,313 + 30,5\text{m}^{2,8\text{m}} \times 0,093 =$ 74,800

θ_3 $-36,9\text{m}^{1,4\text{m}} \times 0,038 + 44,9\text{m}^{33,1\text{m}} \times 0,737 + 36,5\text{m}^{16,0\text{m}} \times 0,438 + 36,5\text{m}^{6,6\text{m}} \times 0,181 + 10,6\text{m}^{2,0\text{m}} \times 0,018 =$ 54,500

$-33,6\text{m}^{1,3\text{m}} \times 0,038 + 40,9\text{m}^{30,2\text{m}} \times 0,737 + 40,7\text{m}^{17,9\text{m}} \times 0,438 + 40,8\text{m}^{7,4\text{m}} \times 0,181 + 11,3\text{m}^{2,0\text{m}} \times 0,018 =$ ~~54,400~~

θ_4 $-36,9\text{m}^{2,1\text{m}} \times 0,058 + 44,9\text{m}^{41,0\text{m}} \times 0,913 + 36,5\text{m}^{21,3\text{m}} \times 0,584 + 36,5\text{m}^{11,4\text{m}} \times 0,312 + 21,5\text{m}^{2,5\text{m}} \times 0,114 =$ ~~74,100~~ ~~54,500~~

$-33,6\text{m}^{2,0\text{m}} \times 0,058 + 40,9\text{m}^{37,4\text{m}} \times 0,913 + 40,7\text{m}^{23,8\text{m}} \times 0,584 + 40,8\text{m}^{12,7\text{m}} \times 0,312 + 22,2\text{m}^{2,5\text{m}} \times 0,114 =$ 74,400

θ_5 $37,6\text{m}^{28,2\text{m}} \times 0,750 + 43,0\text{m}^{19,4\text{m}} \times 0,451 + 37,6\text{m}^{8,6\text{m}} \times 0,228 + 37,3\text{m}^{2,8\text{m}} \times 0,075 =$ 59,000

θ_6 $37,6\text{m}^{34,7\text{m}}$ ~~$33,200$~~ $\times$ ~~$0,883$~~ $0,923 + 43,0\text{m}^{25,9\text{m}}$ ~~$23,800$~~ $\times$ ~~$0,554$~~ $0,603 + 37,6\text{m}^{13,4\text{m}}$ ~~$11,500$~~ $\times 0,305$ $0,356 + 37,3\text{m}^{6,7\text{m}}$ ~~$4,900$~~ $\times 0,130$ $0,179 + 21,4\text{m}^{1,6\text{m}}$ ~~$0,0$~~ $\times$ ~~$0,137$~~ $0,077 =$ ~~74,000~~ 82,300

θ_7 $37,6\text{m}^{29,0\text{m}} \times 0,770 + 43,0\text{m} \times 0,504^{21,700} + 37,6\text{m}^{11,7\text{m}} \times 0,310 + 37,3\text{m}^{6,7\text{m}} \times 0,180 + 21,4\text{m}^{2,2\text{m}} \times 0,101$

$+ 21,8\text{m}^{1,0\text{m}} \times 0,044 =$ 73,300

-57-

$$+\ \frac{1.4\text{m}}{\text{ZL.4m}} \times 0.067 \;=\; \frac{\text{ZZ.Zm}}{\text{ZZ.Zm}}$$

$$V_5\ \frac{-1.0\text{m}}{-\text{4.8m}\times 0.223} + \frac{\text{23.8m}}{\text{23.8m}} + 37.6\text{m}\times 0.602 + \frac{\text{18.2m}}{\text{18.2m}} + \text{Y3.0m}\times 0.982 + \frac{\text{9.6m}}{\text{9.6m}} + 37.6\text{m}\times 0.234 + 37.3\text{m}\times 0.009 + \frac{3.0\text{m}}{3.0\text{m}}$$

$$\frac{-1.0\text{m}}{-\text{4.8m}\times 0.201} + 37.6\text{m}\times 0.634 + \frac{18.2\text{m}}{18.2\text{m}} + 37.6\text{m}\times 0.621 + \frac{9.6\text{m}}{9.6\text{m}} + 37.3\text{m}\times 0.134 = \frac{\text{57.7m}}{\text{50.4m}}$$

$$+\ \left\{ \frac{\text{Z1.4m}}{\text{Z1.4m}\times 0.032} + \frac{\text{Z1.8m}}{\text{Z1.8m}\times 0.038} \right.$$

$$V_6\ \frac{-1.4\text{m}}{-\text{4.8m}\times 0.221} + 37.6\text{m}\times 0.685 + \text{Y3.0m}\times 0.431 + 37.3\text{m}\times 0.210 + \frac{\text{12.4m}}{0.06\text{4}} + \frac{7.8\text{m}}{\text{7.8m}} =$$

$$+\ \text{Z1.4m}\times 0.127 + \text{Z1.8m}\,(0.07\text{4}+0.032) = \frac{\text{2.7m}}{\text{0.12}} \quad (70.90)$$

$$V_7\ \frac{-1.7\text{m}}{-\text{4.8m}\times 0.3\text{4}\text{6}} + 37.6\text{m}\times 0.251 + \text{43.8m}\times 0.390 + 37.6\text{m}\times 0.273 + 37.3\text{m}\times 0.18\text{4} + \frac{\text{20.0m}}{\text{20.0m}} + \frac{\text{10.3m}}{\text{10.3m}} + \frac{\text{6.9m}}{\text{6.9m}}$$

$$+\ \text{Z1.4m}\times 0.085 + \text{Z1.8m}\times 0.05\text{7} = \frac{\text{4.2m}}{\text{4.2m}} \quad (55.30)$$

$$\beta_{10}\ \frac{\text{27.6m}}{\text{33.6m}\times 0.82\text{m}} + \text{39.2m}\times 0.63\text{6} + \frac{\text{24.4m}}{\text{19.4m}}\times 0.4\text{66} + \frac{\text{19.4m}}{\text{11.9m}}\times 0.305 + \frac{\text{3.4m}}{\text{3.4m}} + \text{22.8m}\times 0.152 = \frac{\text{87.2m}}{\text{87.2m}}$$

$$+\left\{ \begin{array}{l} \frac{\text{23.6m}}{-\text{4.8m}\times 0.8\text{2m}} + 37.6\text{m}\times 0.63\text{6} + \frac{\text{20.0m}}{\text{43.0m}}\times 0.4\text{6}\text{6} + \frac{\text{11.5m}}{\text{37.6m}}\times 0.305 + 37.3\text{m}\times 0.152 = \frac{\text{57.2m}}{\text{57.2m}} \end{array} \right.$$

$$= \quad \frac{\text{24.8m}}{\text{24.8m}}$$

$$\frac{\text{6.4m}}{37.3\text{m}\times 0.172} + \frac{\text{12.9m}}{37.6\text{m}\times 0.3\text{42}} + \frac{\text{21.8m}}{\text{43.0m}\times 0.5\text{07}} + \frac{\text{24.8m}}{37.6\text{m}\times 0.66\text{2}} - 4.8\text{m}\times 0.8\text{2m} = \frac{\text{3.9m}}{\text{6.2m}}$$

$$V_1\ \frac{33.3\text{m}}{39.9\text{m}\times 0.83\text{4}} + \frac{\text{23.9m}}{\text{43.0m}\times 0.5\text{57}} + \frac{\text{11.4m}}{37.6\text{m}\times 0.302} + \frac{\text{0.5m}}{\text{37.3m}\times 0.09\text{4}\cdot} + \frac{\text{2.9m}}{\text{2.9m}} = \frac{\text{71.5m}}{\text{71.5m}}$$

$$V_2\ \frac{37.5\text{m}}{39.9\text{m}\times 0.93\text{9}} + \frac{\text{28.2m}}{\text{43.0m}\times 0.6\text{5}\text{4}} + \frac{\text{14.7m}}{37.6\text{m}\times 0.390} + \frac{\text{6.4m}}{37.3\text{m}\times 0.172} + \frac{\text{2m}}{10.5\text{m}\times 0.019} = \frac{\text{87.0m}}{\text{87.0m}}$$

$$V_3\ \frac{-\text{4.0m}}{-12.5\text{m}\times 0.083} + \frac{\text{30.2m}}{39.9\text{m}\times 0.7\text{5}\text{6}} + \frac{\text{21.2m}}{\text{43.0m}\times 0.4\text{93}} + \frac{\text{10.2m}}{37.6\text{m}\times 0.271} + \frac{\text{41.1m}}{37.3\text{m}\times 0.110} = \frac{\text{64.7m}}{\text{64.7m}}$$

$$V_4\ \frac{-1.8\text{m}}{-12.5\text{m}\times 0.091} + \frac{\text{33.1m}}{39.9\text{m}\times 0.8\text{2}\text{9}} + \frac{\text{24.5m}}{\text{43.0m}\times 0.5\text{68}} + \frac{\text{13.0m}}{37.6\text{m}\times 0.3\text{47}} + \frac{\text{6.8m}}{37.3\text{m}\times 0.181} +$$

$$+\ \text{Z1.4m}\times 0.085 + \text{Z1.8m}\times 0.05\text{7} = \frac{\text{4.2m}}{\text{4.2m}} \quad (55.30)$$

$$\beta_9\ \frac{\text{28.8m}}{37.6\text{m}\times 0.76\text{5}} + \frac{\text{24.0m}}{\text{43.0m}\times 0.5\text{59}} + \frac{\text{14.7m}}{37.6\text{m}\times 0.390} + \frac{\text{9.3m}}{37.3\text{m}\times 0.2\text{4}\text{8}} + \frac{\text{2.6m}}{\text{2.6m}} + \text{21.4m}\times 0.120 = \frac{\text{79.4m}}{\text{79.4m}}$$

$$+\ \left\{ \begin{array}{l} \frac{\text{6.7m}}{39.1\text{m}\times 0.172} + \frac{\text{14.0m}}{\text{44.7m}\times 0.336} + \frac{\text{19.1m}}{39.2\text{m}\times 0.4\text{87}} + \frac{\text{12.5m}}{\text{33.6m}\times 0.610} = \frac{\text{60.3m}}{\text{3.7m}} \\ \frac{\text{6.4m}}{37.3\text{m}\times 0.172} + \frac{\text{12.6m}}{37.6\text{m}\times 0.336} + \frac{\text{20.9m}}{\text{43.0m}\times 0.4\text{87}} + \frac{\text{22.9m}}{37.6\text{m}\times 0.6\text{10}} - 4.8\text{m}\times 0.7\text{6}\text{6} = 59.1\text{m} \end{array} \right.$$

$$=$$

V_8

(+) $-4.8\text{m} \times 0.355$ $+37.6\text{m} \times 0.540$ $+43.0\text{m} \times 0.425$ $+37.6\text{m} \times 0.322$ $+37.3\text{m} \times 0.231$

$+21.4\text{m} \times 0.151$ $+21.8\text{m} \times 0.073$ $= 62.4$

(−) ~~$4.8\text{m} \times$ $+37.6\text{m} \times$ $+43.0\text{m} \times$ $+37.6\text{m} \times$~~

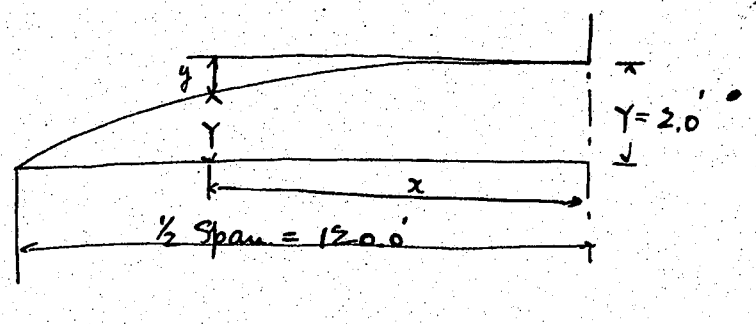
$37.6\text{m} \times 0.127$ $+43.0\text{m} \times 0.240$ $+37.6\text{m} \times 0.355$ $-4.8\text{m} \times 0.540$ $= 25.7$

V_9.

(+) $37.6\text{m} \times 0.444$ $+43.0\text{m} \times 0.361$ $+37.6\text{m} \times 0.274$ $+37.3\text{m} \times 0.184$ $+21.4\text{m} \times 0.092 = 51.3$

(−) $37.3\text{m} \times 0.110$ $+37.6\text{m} \times 0.221$ $+43.0\text{m} \times 0.334$ $+37.6\text{m} \times 0.449$ $-4.8\text{m} \times 0.444 = 41.6$

Camber of the 2'-0" at ℄ span:



$y = ax^2$

when $\begin{cases} x = \frac{240}{2} = 120.0 \\ y = 2.0 \end{cases}$

$\therefore \quad a = \frac{y}{x^2} = \frac{2.0}{120^2}$

$y = \frac{2.0}{120^2} x^2 \qquad y = \frac{2.0}{120^2} 12^2 = \frac{2.0}{100} = 0.02$

panel pt	dist. from ℄ span = x	$\frac{x}{12}$	$(\frac{x}{12})^2$	y	Y	
10	0	0	0	0	2.00	2'-6"
9	12	1	1	0.02	1.98	~~1 - 11 3/4"~~
8	24	2	4	0.08	1.92	1'-11 1/32"
7	36	3	9	0.18	1.82	~~1 - 8 5/32"~~
6	48	4	16	0.32	1.68	1'- 8 5/32"
5	60	5	25	0.50	1.500	
4	72	6	36	0.72	1.28	1'- 3 3/8"
3	84	7	49	0.98	1.02	
2	96	8	64	1.28	0.72	0'- 8 5/8"
1	108	9	81	1.62	0.38	
0	120	10	100	2.00	0.00	

22'-5 13/16
1 3 6/16
19/16
23'-9 3/16

Upper chord.

panel pt.	H_m	Y	$H_m - Y$	g_m	$\frac{H_m - Y}{g_m}$
1	7.37	0.38	6.99	22.20	0.32
2	13.72	0.72	13.00	19.22	0.68
3	19.17	1.02	18.15	16.70	1.09
4	23.77	1.28	22.49	14.58	1.54
5	27.58	1.50	26.08	12.81	2.04
6	30.62	1.68	28.94	11.42	2.53
7	33.01	1.82	31.19	10.35	3.01
8	34.67	1.92	32.75	9.59	3.42
9	35.67	1.98	33.69	9.15	3.68
10	36.00	2.00	34.00	9.00	3.78

Lower chord.

	y_m	$H_m - Y$	$\frac{H_m - Y}{h_m}$	$\frac{y_m - Y}{h_m}$
0	27.00	27.00	23.01	1.17
1	30.48	30.10	20.43	1.47
2	33.57	32.85	18.08	1.82
3	36.28	35.26	15.98	2.20
4	38.61	37.33	14.15	2.64
5	40.58	39.08	12.59	3.11
6	42.14	40.46	11.31	3.58
7	43.41	41.59	10.30	4.03
8	44.29	42.37	9.59	4.42
9	~~44.82~~	42.84	9.15	4.68

(1)

-1-

upper chord.

member	$\frac{H_m - Y}{g_m}$ \ K_a	1	2	3	4	5	6	7	8	9	10
		0.151	0.296	0.439	0.570	0.699	0.808	0.899	0.967	1.007	1.017
1	0.32	0.048	0.095	0.141	0.182	0.223	0.259	0.287	0.309	0.322	0.325
2	0.68	0.103	0.201	0.299	0.388	0.475	0.549	0.611	0.658	0.685	0.692
3	1.09	0.165	0.323	0.479	0.621	0.762	0.881	0.986	1.054	1.098	1.109
4	1.54	0.233	0.456	0.676	0.878	1.076	1.244	1.384	1.489	1.551	1.566
5	2.04	0.308	0.604	0.896	1.163	1.426	1.648	1.834	1.973	2.054	2.075
6	2.53	0.382	0.749	1.111	1.442	1.768	2.044	2.274	2.447	2.548	2.573
7	3.01	0.455	0.891	1.321	1.716	2.104	2.432	2.706	2.911	3.031	3.061
8	3.42	0.516	1.012	1.501	1.949	2.391	2.763	3.075	3.307	3.444	3.478
9	3.68	0.556	1.089	1.616	2.098	2.572	2.973	3.308	3.559	3.706	3.743
10	3.78	0.571	1.117	1.659	2.155	2.642	3.033	3.398	3.655	3.806	3.844

$$U_m = U_{m.o} - \frac{H_m - Y}{g_m}$$

Load on / member	U_1	U_2	U_3	U_4	U_5	U_6	U_7	U_8	U_9	U_{10}
1	−0.021	−0.041	−0.060	−0.074	−0.088	−0.097	−0.098	−0.093	−0.075	−0.055
2	−0.041	−0.076	−0.112	−0.138	−0.163	−0.174	−0.174	−0.158	−0.123	−0.068
3	−0.057	−0.108	−0.156	−0.190	−0.223	−0.235	−0.226	−0.192	−0.128	−0.032
4	−0.069	−0.127	−0.182	−0.220	−0.253	−0.257	−0.232	−0.172	−0.069	0.080
5	−0.074	−0.135	−0.193	−0.226	−0.255	−0.243	−0.195	−0.099	0.053	0.267
6	−0.067	−0.119	−0.166	−0.182	−0.193	−0.154	−0.069	0.073	0.287	0.577
7	−0.049	−0.079	−0.104	−0.093	−0.076	−0.002	0.134	0.334	0.621	0.997
8	−0.015	−0.010	0.001	0.054	0.113	0.242	0.430	0.699	1.062	1.529
9	0.034	0.091	0.154	0.262	0.378	0.567	0.822	1.161	1.604	2.157
10	0.096	0.216	0.341	0.511	0.691	0.967	1.269	1.678	2.194	2.823
~~10'~~	~~0.096~~						1.740 ~~1.950~~	2.210	2.784	2.157
9'	0.165	0.353	0.547	0.786	1.034	1.354	2.183 ~~2.200~~	2.702	2.064	1.529
8'	0.235	0.490	0.752	1.056	1.365	1.744	2.569 ~~1.389~~	1.959	1.433	0.997
7'	0.299	0.616	0.940	1.298	1.664	2.090	1.826 ~~0.766~~	1.333	0.917	0.577
6'	0.353	0.721	1.094	1.498	1.907	2.366	1.206 ~~0.306~~	0.839	0.524	0.267
5'	0.395	0.802	1.213	1.649	2.089	1.632	0.766 ~~0.076~~	0.486	0.259	0.080
4'	0.425	0.871	1.309	1.755	1.392	1.060	0.420 ~~0.168~~	0.239	0.087	−0.032
3'	0.446	0.898	1.353	1.102	0.854	0.627	+0.201	0.092	0.002	−0.068
2'	0.459	0.922	0.762	0.612	0.462	0.325	+0.064	0.015	−0.025	−0.055
1'	0.465	0.391	0.318	0.250	0.182	0.119				

even ~~odd~~ 0.191 1.568

odd ~~even~~ 0.201 1.804

Influence surfaces for Upper chords.

load on \ number	u_1	u_2	u_3	u_4	u_5	u_6	u_7	u_8	u_9	u_{10}
1	−0.021	−0.041	−0.057	−0.068	−0.074	−0.067	−0.049	−0.015	0.034	0.096
2	−0.041	−0.076	−0.108	−0.127	−0.135	−0.119	−0.079	−0.010	0.091	0.216
3	−0.060	−0.112	−0.156	−0.182	−0.193	−0.166	−0.104	0.001	0.154	0.341
4	−0.074	−0.138	−0.190	−0.220	−0.226	−0.182	−0.093	0.054	0.262	0.511
5	−0.088	−0.163	−0.223	−0.253	−0.255	−0.192	−0.076	0.113	0.378	0.691
6	−0.097	−0.174	−0.235	−0.257	−0.243	−0.154	0.002	0.242	0.567	0.967
7	−0.098	−0.174	−0.226	−0.232	−0.195	−0.069	0.134	0.430	0.822	1.269
8	−0.093	−0.158	−0.192	−0.172	−0.099	0.073	0.334	0.699	1.161	1.678
9	−0.075	−0.123	−0.128	−0.069	0.053	0.287	0.621	1.062	1.604	2.194
10	−0.055	−0.068	~~−0.032~~ ~~−0.032~~	0.080	0.267	0.577	0.997	1.529	2.157	2.823
9′	−0.025	0.002	0.087	0.259	0.524	0.917	1.433	2.064	2.784	2.194
8′	0.015	0.092	0.239	0.486	0.839	1.333	1.959	2.702	2.210	1.678
7′	0.064	0.201	0.420	0.766	1.206	1.821	2.569	2.183	1.740	1.269
6′	0.119	0.325	0.627	1.060	1.623	2.366	2.090	1.744	1.354	0.967
5′	0.182	0.462	0.854	1.392	2.089	1.907	1.664	1.365	1.034	0.691
4′	0.250	0.612	1.102	1.755	1.649	1.498	1.298	1.056	0.786	0.511
3′	0.318	0.762	1.353	1.309	1.213	1.094	9940	0.752	0.547	0.341
2′	0.391	0.922	0.898	0.871	0.802	0.721	0.616	0.490	0.353	0.216
1′	0.465	0.459	0.446	0.425	0.395	0.353	0.299	0.235	0.165	0.096

odd panel	−0.370 +1.029	−0.613 +1.886	−0.790 +3.160	−0.864 4.151	−0.717 5.480	−0.494 6.379	−0.229 7.660	−0.015 8.205	0 9.262	0 9.182
Even panel	−0.360 +0.775	−0.614 +1.951	−0.757 +2.866	−0.776 4.252	−0.703 +5.180	−0.455 6.568	−0.172 +7.296	−0.010 +8.516	0 8.941	0 9.567

Upper chord stress.

member	main. comp.	main. tens.	main. sum.	intermediate. comp.	intermediate. tension	intermediate. sum.	Dead load. 174,700 #	conc. 17,300 #	
U_0-U_1	0.775	0.360	0.415	1.029	0.370	0.659	72,500	11,400	83,900
U_1-U_2	1.951	0.614	1.337	1.886	0.613	1.273	233,600	22,000	255,600
U_2-U_3	2.866	0.757	2.109	3.160	0.790	2.370	368,400	41,000	409,400
U_3-U_4	4.252	0.776	3.476	4.151	0.804	3.347	607,300	57,900	665,200
U_4-U_5	5.180	0.803	4.377	5.480	0.717	4.763	764,700	82,400	847,100
U_5-U_6	6.568	0.455	6.113	6.379	0.494	5.885	1067,900	101,800	1169,700
U_6-U_7	7.296	0.172	7.124	7.660	0.229	7.431	1244,600	128,600	1373,200
U_7-U_8	8.516	0.010	8.506	8.205	0.015	8.190	1486,000	159,000	1645,000
U_8-U_9	8.941	0.567	8.941	9.262	0	9.262	1562,000	160,200	1722,200
U_9-U_{10}	9.567	0	9.567	9.182	0	9.182	1671,400	158,800	1830,200

U_1	1.00	1.00	mean
U_2	1.03	1.10	0.06
U_3	1.03	1.10	0.06
U_4	1.04	1.10	0.07
U_5	1.04	1.05	0.06
U_6	1.06	1.09	0.07
U_7	1.06	1.08	0.07
U_8	1.07	1.07	0.07
U_9	1.08	1.08	0.08
U_{10}	1.08	1.08	0.08

(0.06)

Lower chord.

member	$\frac{y_m - Y}{h_m}$	1 0.151	2 0.296	3 0.439	4 0.570	5 0.699	6 0.808	7 0.899	8 0.961	9 1.007	10 1.017
0	1.17	0.177	0.346	0.514	0.669	0.818	0.945	1.052	1.131	1.178 ~~1.131~~	1.190
1	1.47	0.222	0.435	0.645	0.838	1.028	1.188	1.322	1.418	1.480	1.495
2	1.82	0.275	0.539	0.799	1.037	1.272	1.471	1.636	1.749	1.833	1.851
3	2.20	0.332	0.651	0.966	1.254	1.538	1.778	1.978	2.114	2.215	2.237
4	2.64	0.399	0.781	1.159	1.505	1.845	2.133	2.373	2.537	2.658	2.685
5	3.11	0.470	0.921	1.365	1.773	2.174	2.513	2.796	2.989	3.132	3.163
6	3.58	0.541	1.060	1.572	2.041	2.502	2.893	3.218	3.440	3.605	3.641
7	4.03	0.609	1.193	1.769	2.297	2.817	3.256	3.623	3.873	4.058	4.099
8	4.42	0.667	1.308	1.940	2.519	3.088	3.571	3.974	4.248	4.451	4.495
9	4.68	0.707	1.385	2.055	2.668	3.271	3.781	4.207	4.497	4.718	4.760

$$L_m = L_{m.0} - X \cdot \frac{y_m - Y}{h_m}$$

load on. / member	1 L_0	2 L_1	3 L_2	4 L_3	5 L_4	6 L_5	7 L_6	8 L_7	9 L_8	10 L_9
0	−0.177	−0.346	−0.514	−0.669	−0.818	−0.945	−1.052	−1.131	−1.178	−1.190
1	~~−0.198~~ ~~−0.346~~	−0.376	−0.557	−0.721	−0.881	−1.012	−1.116	−1.178	−1.216	−1.201
2	~~−0.209~~ ~~−0.514~~	−0.406	−0.600	−0.772	−0.940	−1.073	−1.172	−1.218	−1.236	−1.187
3	~~−0.219~~ ~~−0.669~~	−0.426	−0.628	−0.804	−0.975	−1.102	−1.190	−1.213	−1.202	−1.111
4	~~−0.229~~ ~~−0.818~~	−0.442	−0.650	−0.827	−0.997	−1.115	−1.186	−1.180	−1.131	−0.988
5	~~−0.232~~ ~~−0.945~~	−0.445	−0.651	−0.821	−0.975	−1.085	−1.129	−1.084	−0.989	−0.781
6	~~−0.223~~ ~~−1.052~~	−0.423	−0.617	−0.764	−0.910	−0.983	−0.990	−0.893	−0.739	−0.457
7	~~−0.201~~ ~~−1.131~~	−0.377	−0.546	−0.665	−0.779	−0.809	−0.769	−0.611	−0.388	−0.023
8	~~−0.166~~ ~~−1.178~~	−0.306	−0.438	−0.516	−0.586	−0.566	−0.469	−0.242	0.055	0.512
9	~~−0.147~~ ~~−1.190~~	−0.205	−0.285	−0.308	−0.321	−0.241	−0.077	0.223	0.597	1.140
9′	+0.014	−0.056	+0.108	0.216	0.335	0.546	0.841	1.272	1.777	1.140
8′	0.084	0.194	0.313	0.486	0.666	0.936	1.274	1.761	1.057	0.512
7′	0.148	0.321	0.502	0.731	0.969	1.287	1.677	1.019	0.427	−0.023
6′	0.202	0.425	0.656	0.930	1.211	1.563	0.922	0.380	−0.103	−0.457
5′	0.244	0.508	0.778	1.085	1.398	0.821	0.300	−0.131	−0.513	−0.781
4′	0.280	0.576	0.877	1.209	0.699	0.241	−0.168	−0.501	−0.791	−0.988
3′	0.306	0.626	0.949	0.548	0.151	−0.201	−0.514	−0.762	−0.977	−1.111
2′	0.322	0.655	0.329	0.025	−0.277	−0.542	−0.773	−0.952	−1.103	−1.187
1′	0.336	0.093	−0.146	−0.368	−0.588	−0.777	−0.940	−1.061	−1.157	−1.201
0′	−0.177	−0.346	−0.514	−0.669	−0.818	−0.945	−1.052	−1.131	−1.178	−1.190

Influence lines for Lower chords

load on \ member	L_0	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9
1	−0.177	−0.198	−0.209	−0.219	−0.229	−0.232	−0.223	−0.201	−0.166	−0.117
2	−0.346	−0.376	−0.406	−0.426	−0.442	−0.445	−0.423	−0.377	−0.306	−0.205
3	−0.514	−0.557	−0.600	−0.628	−0.650	−0.651	−0.617	−0.546	−0.438	−0.285
4	−0.668	−0.721	−0.772	−0.804	−0.827	−0.821	−0.764	−0.665	−0.516	−0.308
5	−0.818	−0.881	−0.940	−0.975	−0.997	−0.975	−0.910	−0.779	−0.586	−0.321
6	−0.945	−1.012	−1.073	−1.102	−1.115	−1.085	−0.983	−0.809	−0.566	−0.241
7	−1.052	−1.116	−1.172	−1.190	−1.186	−1.129	−0.990	−0.769	−0.469	−0.077
8	−1.131	−1.178	−1.218	−1.213	−1.180	−1.084	−0.898	−0.611	−0.242	0.223
9	−1.178	−1.216	−1.236	−1.202	−1.131	−0.989	−0.739	−0.688	0.055	0.597
10	−1.190	−1.201	−1.187	−1.111	−0.988	−0.781	−0.457	−0.023	0.512	1.140
9′	−1.178	−1.157	−1.103	−0.977	−0.791	−0.513	−0.103	0.427	1.057	1.777
8′	−1.131	−1.061	−0.952	−0.762	−0.501	−0.131	0.380	1.019	1.761	1.272
7′	−1.052	−0.940	−0.773	−0.514	−0.168	0.300	0.922	1.677	1.274	0.841
6′	−0.945	−0.777	−0.542	−0.201	0.241	0.821	1.563	1.287	0.936	0.546
5′	−0.818	−0.588	−0.277	0.151	0.699	1.398	1.211	0.969	0.666	0.335
4′	−0.668	−0.368	0.025	0.548	1.209	1.085	0.930	0.731	0.486	0.216
3′	−0.514	−0.146	0.329	0.949	0.877	0.778	0.656	0.502	0.313	0.108
2′	−0.346	0.093	0.355	0.626	0.576	0.508	0.426	0.321	0.194	0.056
1′	−0.177	0.336	0.322	0.306	0.280	0.244	0.202	0.148	0.084	0.014
odd.	−7.478	−6.799	−6.310	−5.705	−5.152	−4.489	3.582	2,683	1.659	0.801
	0	+0.336	+0.651	+1.406	1.856	+2.720	2.991	3.723	3.449	3.672
even	−7.368	−6.694	−6.150	−5.619	5.053	4.347	3.520	2.485	1.630	0.754
	0	+0.093	0.680	+1.174	2.026	2.414	3.298	3.358	3.889	3.453
	7.368	6.601	5.470	4.445	3.027	1.933	0.222	−0.873	−2.259	−2.699
Diff.	1.000	0.99	0.98	0.94	0.92	0.85	0.31	1.09	1.35	1.38
		−0.01	−0.02	−0.06	−0.08	−0.15	−0.69		±.35	+0.38
Live	1.000	0.99	0.98	0.96	0.96	0.94	0.93	1.09	1.11	1.20
		−0.01	−0.02	−0.04	−0.04	−0.06	−0.07	+.09	+.11	+0.20

Assumed Section.

upper chord.		Lower chord.		Diagonals.		Verticals.		Hanger	Tie.
						V_0 N_0	60.0		
U_1	64.0	L_0	150.0	θ_1	29.	V_1 N_1	44.0	30.0	138.0
U_2	64.0	L_1	135.0	θ_2	33.	V_2 N_2	48.0		
U_3	70.0	L_2	120.0	θ_3	28.	V_3 N_3	35.0		
U_4	77.0	L_3	96.0	θ_4	38.	V_4 N_4	42.0		
U_5	95.0 ~~97.0~~	L_4	85.0	θ_5	42	V_5 N_5	33.0		
U_6	120.0	L_5	65.0	θ_6	42	V_6 N_6	35.0		
U_7	140.0	L_6	50.0	θ_7	33.	V_7 N_7	23.0		
U_8	170.0	L_7	50.0	θ_8	42	V_8 N_8	33.0		
U_9	170.0	L_8	50.0	θ_9	33	V_9 N_9	23.0		
U_{10}	190.0	L_9	50.0	θ_{10}	33	V_{10}	23.0		

$$X_a = \frac{\Sigma \varphi_0 \varphi_a \beta + \Sigma \varphi_a \varepsilon t_0 \delta}{\Sigma \varphi_a^2 \beta + \frac{l_t}{E_t A_t}}$$ — length of member

where $\beta = \frac{\delta}{AE}$

$$= \frac{\Sigma \varphi_0 \varphi_a \frac{\delta}{AE} + \Sigma \varphi_a \varepsilon t_0 s}{\Sigma \varphi_a^2 \frac{s}{AE} + \frac{l_t}{E_t A_t}}$$

where l_t = length of tie.
A_t = area of tie.

$$X_a = \frac{\Sigma \varphi_0 \varphi_a \frac{\delta}{A}}{\Sigma \varphi_a^2 \frac{s}{A} + \frac{l_t}{A_t}}$$ neglecting the temperature effect.

(2)

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Upper chord

Find $S_a = \frac{H_m - Y}{g_m}$

panel	H_m	Y	$H_m - Y$	g_m	$S_a = \frac{H_m - Y}{g_m}$	$\log g_m$	$\log \frac{H_m - Y}{g_m}$	S_a
1	7.37	0.38	6.99	22.20	0.8445	1.3464	T.4981	~~0.125~~ ~~0.0125~~ 0.315
2	13.72	0.72	13.00	19.22	1.1139	1.2838	T.8301	0.676 ~~0.068~~
3	19.17	1.02	18.15	16.70	1.2588	1.2226	0.0362	1.086
4	23.77	1.28	22.49	14.58	1.3519	1.1636	0.1883	1.543
5	27.58	1.50	26.08	12.81	1.4163	1.1081	0.3082	2.033
6	30.62	1.68	28.94	11.42	1.4615	1.0577	0.4038	2.534
7	33.01	1.82	31.19	10.35	1.4940	1.0149	0.4791	3.014
8	34.67	1.92	32.75	9.59	1.5152	0.9820	0.5332	3.414
9	35.67	1.98	33.69	9.15	1.5275	0.9612	0.5663	3.684
10.	36.00	2.00	34.00	9.00	1.5315	0.9542	0.5773	3.779.

Lower chord. $S_a = \frac{y_m - Y}{h_m}$

panel.	y_m	Y.	$y_m - Y$	$\log y_m - Y$.	$\log h_m$.	$\log \frac{y_m - Y}{h_m}$	S_a
0	27.00	0.00	27.00	1.4314	1.3619	0.0615	1.152
1	30.48	0.38	30.10	1.4786	1.3102	0.1684	1.473
2	33.57	0.72	32.85	1.5166	1.2572	0.2594	1.818
3	36.28	1.02	35.26	1.5472	1.2036	0.3436	2.206
4	38.61	1.28	37.33	1.5720	1.1507	0.4213	2.638
5	40.58	1.50	39.08	1.5920	1.1000	0.4920	3.105
6	42.14	1.68	40.46	1.6070	1.0535	0.5535	3.577
7	43.41	1.82	41.59	1.6189	1.0128	0.6061	4.037
8	44.29	1.92	42.37	1.6270	0.9818	0.6452	4.418
9.	44.82	1.98	42.84	1.6318	0.9614	0.6704	4.681

Diagonals.

$$p_m' = \frac{V_{m-1}}{V_{m-1} - V_m} (H_m - H_{m-1})$$

panel.	p_m'	H_{m-1}	$p_m = p_m' + H_{m-1}$	f_m.	log p_m	log f_m	log y_a'	y_a'
1	51.23	0	51.23	83.83	1.7096	1.9234	$\bar{1}$.7862	0.612 ~~0.661~~
2	44.96	6.99	51.95	81.73	1.7156	1.9124	$\bar{1}$.8032	0.635
3	39.51	13.00	52.51	79.51	1.7203	1.9005	$\bar{1}$.8198	0.660
4	34.70	18.15	52.85	77.53	1.7230	1.8895	$\bar{1}$.8335	0.682
5	30.59	22.49	53.08	76.71	1.7249	1.8849	$\bar{1}$.8400	0.692
6	27.12	26.08	53.20	78.42	1.7259	1.8944	$\bar{1}$.8315	0.678
7	24.25	28.94	53.19	85.07	1.7258	1.9298	$\bar{1}$.7960	0.625
8	22.12	31.19	53.31	103.22	1.7268	2.0138	$\bar{1}$.7130	0.516
9	20.71	32.75	53.46	153.39	1.7280	2.1858	$\bar{1}$.5422	0.349
10	19.70	33.69	53.39	432.02	1.7274	2.6355	$\bar{1}$.0919	0.124

Vertical.

$$q_m' = \frac{V_m}{(H_{m+1} - H_m) - (y_m - y_{m-1})} \quad \text{where } y_m = H_m + V_m.$$

	q_m'	H_m	$q_m = q_m' + H_m$.	i_{m-ma}	log q_m	log i_{m-ma}.	log y_a'	
0								
1	51.16	6.99	58.15	96.58	1.7646	1.9849	$\bar{1}$.7797	0.602
2	45.89	13.00	58.89	101.18	1.7701	2.0051 ~~2.0060~~	$\bar{1}$.7765 ~~$\bar{1}$.0765~~	0.582
3	41.63	18.15	59.78	108.63	1.7766	2.0359	$\bar{2}$.7407	0.550
4	38.16	22.49	60.65	120.02	1.7829	2.0793	$\bar{2}$.7036	0.505
5	36.05	26.08	62.13	140.90	1.7933	2.1487	$\bar{2}$.6446	0.441
6	35.84	28.94	64.78	182.48	1.8114	2.2612	$\bar{2}$.5502	0.355
7	40.36	31.19	71.55	290.55	1.8546	2.4647	$\bar{2}$.3899	0.245
8	85.46	32.75	118.22	1030.90	2.0727	3.0132	$\bar{1}$.0595 ~~$\bar{1}$.0595~~	0.115
9	−15.30	33.69	18.39	~~555.00~~	~~2.2646~~	−2.7443	$\bar{2}$.5203	0.033

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(4)

-2-

Find $\sigma_{o.m.}\sigma_a \frac{l}{A}$

Upper chord

	$\sigma_{o.1.}$	σ_a.	l.	A.	log $\sigma_{o.1}$	log σ_a	log l.	log A.	$\sigma_{o.1}\sigma_a \frac{l}{A}$.	
U_1	0.027	0.315	12.495	64.0	$\bar{2}.4314$	$\bar{1}.4981$	1.0967	1.8062	$\bar{3}.2200$	0.00166 A
U_2	0.062	0.676	12.391	64.0	$\bar{2}.7924$	$\bar{1}.8301$	1.0931	1.8062	$\bar{3}.9094$	0.00817 B
U_3	0.108	1.086	12.302	70.0	$\bar{1}.0334$	0.0362	1.0900	1.8451	$\bar{2}.3145$	0.02063 C
U_4	0.165	1.543	12.224	77.0	$\bar{1}.2175$	0.1883	1.0872	1.8865	$\bar{2}.6065$	0.04047 D
U_5	0.234	2.033	12.159	95.0	$\bar{1}.3692$	0.3082	1.0849	1.9777	$\bar{2}.7846$	0.06089 E
U_6	0.315	2.534	12.107	120.0	$\bar{1}.4983$	0.4038	1.0830	2.0792	$\bar{2}.9059$	0.0805X F
U_7	0.406	3.014	12.063	140.0	$\bar{1}.6085$	0.4791	1.0814	2.1461	$\bar{1}.0229$	0.1054 G
U_8	0.501	3.414	12.031	170.0	$\bar{1}.6998$	0.5332	1.0803	2.2304	$\bar{1}.0829$	0.1211 H
U_9	0.590	3.684	12.010	170.0	$\bar{1}.7709$	0.5663	1.0796	2.2304	$\bar{1}.1864$	0.1536 K
U_{10}	0.667	3.779	12.000	190.0	$\bar{1}.8241$	0.5773	1.0792	2.2788	$\bar{1}.2018$	0.1592 L
U_{10}'	0.667	3.779	12.000	190.0	$\bar{1}.8241$	0.5773	1.0792	2.2788	$\bar{1}.2018$	0.1592 M
U_9'	0.721	3.684	12.010	170.0	$\bar{1}.8579$	0.5663	1.0796	2.2304	$\bar{1}.2734$	0.1877 N
U_8'	0.751	3.414	12.031	170.0	$\bar{1}.8756$	0.5332	1.0803	2.2304	$\bar{1}.2587$	0.1814 O
U_7'	0.754	3.014	12.063	140.0	$\bar{1}.8774$	0.4791	1.0814	2.1461	$\bar{1}.2918$	0.1958 P
U_6'	0.735	2.534	12.107	120.0	$\bar{1}.8663$	0.4038	1.0830	2.0792	$\bar{1}.2739$	0.1879 Q
U_5'	0.703	2.033	12.159	95.0	$\bar{1}.8470$	0.3082	1.0849	1.9777	$\bar{1}.2624$	0.1830 R
U_4'	0.658	1.543	12.224	77.0	$\bar{1}.8182$	0.1883	1.0872	1.8865	$\bar{1}.2072$	0.1612 S
U_3'	0.611	1.086	12.302	70.0	$\bar{1}.7860$	0.0362	1.0900	1.8451	$\bar{1}.0671$	0.1167 T.
U_2'	0.562	0.676	12.391	64.0	$\bar{1}.7497$	$\bar{1}.8301$	1.0931	1.8062	$\bar{2}.8667$	0.07357 U.
U_1'	0.513	0.315	12.495	64.0	$\bar{1}.7101$	$\bar{1}.4981$	1.0967	1.8062	$\bar{2}.4987$	0.03153 V.

1 2 3 4 5 6 7 8 9 10 11 12

(5)

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Lower chord.

	$y_{o.1}$	$y_a' A.$	log $y_{o.1}$.	log y_a'.	log l.	log A.	log $\frac{y_{o.1} y_a' l}{A}$.	$y_o . y_a' \frac{l}{A}$.	
L_0	0.000	155.0	$-\infty$	0.0615	1.1486	2.1903	$-\infty$.	0.	A
L_1	0.029	135.0	$\bar{2}.4624$	0.1684	1.1329	2.1303	$\bar{3}.6334$	0.0043	B
L_2	0.066	120.0	$\bar{2}.8195$	0.2594	1.1198	2.0792	$\bar{3}.1195$	0.0132	C
L_3	0.113	96.0	$\bar{1}.0531$	0.3436	1.1090	1.9823	$\bar{2}.5234$	0.0333	D
L_4	0.170	85.0	$\bar{1}.2304$	0.4213	1.1001	1.9294	$\bar{2}.8224$	0.0634	E
L_5	0.238	65.0	$\bar{1}.3766$	0.4920	1.0929	1.8129	$\bar{1}.1486$	0.1408	F
L_6	0.318	50.0	$\bar{1}.5024$	0.5535	1.0874	1.6990	$\bar{1}.4443$	0.2782	G
L_7	0.408	50.0	$\bar{1}.6107$	0.6061	1.0833	1.6990	$\bar{1}.6011$	0.3991	H
L_8	0.501	50.0	$\bar{1}.6998$	0.6452	1.0807	1.6990	$\bar{1}.7267$	0.5329	K
L_9	0.590	50.0	$\bar{1}.7709$	0.6704	1.0794	1.6990	$\bar{1}.8217$	0.6633	L
L_9'	0.721	50.0	$\bar{1}.8579$	0.6704	1.0794	1.6990	$\bar{1}.9087$	0.8108	M
L_8'	0.751	50.0	$\bar{1}.8756$	0.6452	1.0807	1.6990	$\bar{1}.9025$	0.7989	N
L_7'	0.757	50.0	$\bar{1}.8791$	0.6061	1.0833	1.6990	$\bar{1}.8695$	0.7404	O
L_6'	0.743	50.0	$\bar{1}.8710$	0.5535	1.0874	1.6990	$\bar{1}.8129$	0.6500	P
L_5'	0.714	65.0	$\bar{1}.8537$	0.4920	1.0929	1.8129	$\bar{1}.6257$	0.4224	Q
L_4'	0.679	85.0	$\bar{1}.8319$	0.4213	1.1001	1.9294	$\bar{1}.4239$	0.2655	R
L_3'	0.638	96.0	$\bar{1}.8048$	0.3436	1.1090	1.9823	$\bar{1}.2751$	0.1884	S
L_2'	0.597	120.0	$\bar{1}.7760$	0.2594	1.1198	2.0792	$\bar{1}.0760$	0.1191	T
L_1'	0.558	135.0	$\bar{1}.7466$	0.1684	1.1329	2.1303	$\bar{2}.9196$	0.0827	U
L_0'	0.000	155.0	$-\infty$	0.0615	1.1486	2.1903	$-\infty$	0.0000	V.

(6)

Diagonals

	$y_{0.1}$	A.	$\log y_{0.1}$	$\log y_a'$	$\log l$.	$\log A$.	$\log y_{0.1} y_a \frac{l}{A}$.	$y_{0.1} y_a \frac{l}{A}$.	
ϑ_1	0.050	21.0	$\bar{2}.6990$	$\bar{1}.7862$	1.3619	1.3222	$\bar{2}.5249$	0.00335	A
ϑ_2	0.059	33.0	$\bar{2}.7709$	$\bar{1}.8032$	1.3143	1.5185	$\bar{2}.3699$	0.0234	B
ϑ_3	0.070	28.0	$\bar{2}.8451$	$\bar{1}.8198$	1.2730	1.4472	$\bar{2}.4907$	0.0310	C
ϑ_4	0.082	38.0	$\bar{2}.9138$	$\bar{1}.8335$	1.2390	1.5798	$\bar{2}.4065$	0.0255	D
ϑ_5	0.094	42.0	$\bar{2}.9731$	$\bar{1}.8400$	1.2122	1.6232	$\bar{2}.4021$	0.0252	E
ϑ_6	0.106	42.0	$\bar{1}.0253$	$\bar{1}.8315$	1.1924	1.6232	$\bar{2}.4260$	0.0267	F
ϑ_7	0.115	33.0	$\bar{1}.0607$	$\bar{1}.7960$	1.1790	1.5185	$\bar{2}.5172$	0.0329	G
ϑ_8	0.118	42.0	$\bar{1}.0719$	$\bar{1}.7130$	1.1715	1.6232	$\bar{2}.7915$	0.0619	H
ϑ_9	0.112	33.0	$\bar{1}.0492$	$\bar{1}.5422$	1.1696	1.5185	$\bar{2}.2425$	0.0175	K
ϑ_{10}*	0.095	33.0	$\bar{2}.9777$	$\bar{1}.0919$	1.1730	1.5185	$\bar{3}.7241$	0.0053	L
$\vartheta_{8'}$	−0.067	33.0	$-\bar{2}.8261$	$\bar{1}.0919$	1.1730	1.5185	$-\bar{3}.5725$	−0.0037	M
$\vartheta_{9'}$	−0.034	33.0	$-\bar{2}.53156$	$\bar{1}.5422$	1.1696	1.5185	$-\bar{3}.7258$	−0.0053	N
$\vartheta_{8'}$	−0.062	42.0	$-\bar{3}.3010$	$\bar{1}.7130$	1.1715	1.6232	$-\bar{4}.5623$	−0.0004	O
$\vartheta_{7'}$	0.026	33.0	$\bar{2}.4150$	$\bar{1}.7960$	1.1790	1.5185	$\bar{3}.8715$	0.0074	P
$\vartheta_{6'}$	0.047	42.0	$\bar{2}.6721$	$\bar{1}.88315$	1.1924	1.6232	$\bar{2}.0728$	0.0118	Q
$\vartheta_{5'}$	0.063	42.0	$\bar{2}.7993$	$\bar{1}.8400$	1.2122	1.6232	$\bar{2}.2283$	0.0169	R
$\vartheta_{4'}$	0.073	38.0	$\bar{2}.8633$	$\bar{1}.8335$	1.2390	1.5798	$\bar{2}.3560$	0.0227	S
$\vartheta_{3'}$	0.080	28.0	$\bar{2}.9031$	$\bar{1}.8198$	1.2730	1.4472	$\bar{2}.5487$	0.0354	T
$\vartheta_{2'}$	0.088	33.0	$\bar{2}.9445$	$\bar{1}.8032$	1.3143	1.5185	$\bar{2}.5435$	0.0350	U
$\vartheta_{1'}$	0.946	21.0	$\bar{1}.9759$	$\bar{1}.7862$	1.3619	1.3222	$\bar{1}.8018$	0.6336	V

(7)

Verticals:

	$y_{0.1}$	y'_a	$\log y_{0.1}$	$\log y'_a$	$\log l$	$\log A$	$y_0 y_a \frac{l}{A}$				
V_0		60.0		$-\infty$	1.4314		$-\infty$	0.0000	A	A	
V_1	0.056	44.0	$\bar{2}.7482$	$\bar{1}.7797$	1.3639	1.6435	$\bar{2}.2483$	0.0177	B	B	A
V_2	0.062	48.0	$\bar{2}.7924$	$\bar{1}.7650$	1.2977	1.6812	$\bar{2}.1739$	0.0149	C	C	B
V_3	0.070	35.0	$\bar{2}.8451$	$\bar{1}.7407$	1.2334	1.5441	$\bar{2}.2751$	0.0188	D	D	C
V_4	0.070	42.0	$\bar{2}.8451$	$\bar{1}.7036$	1.1716	1.6232	$\bar{2}.0971$	0.0125	E	E	D
V_5	0.071	33.0	$\bar{2}.8513$	$\bar{1}.6446$	1.1138	1.5185	$\bar{2}.0912$	0.0123	F	F	E
V_6	0.070	35.0	$\bar{2}.8451$	$\bar{1}.5502$	1.0616	1.5441	$\bar{3}.9128$	0.0082	G	G	F
V_7	0.064	23.0	$\bar{2}.8062$	$\bar{1}.3899$	1.0172	1.3617	$\bar{3}.8516$	0.0071	H	H	G
V_8	0.055	33.0	$\bar{2}.7404$	$\bar{1}.0595$	0.9832	1.5185	$\bar{3}.2646$	0.0018	K	K	H
V_9	0.040	23.0	$\bar{2}.6021$	$-\bar{2}.5203$	0.9616	1.3617	$-\bar{4}.7223$	-0.0005	L	L	K
V_9'	-0.061	23.0	$-\bar{2}.7853$	$-\bar{2}.5203$	~~0.9542~~ 0.9616	1.3617	$+\bar{4}.9055$	0.0008	M	M	N
V_8'	-0.043	33.0	$-\bar{2}.6335$	$\bar{1}.0595$	~~0.9616~~ 0.9832	1.5185	$-\bar{3}.1577$	-0.0014	N	N	O
V_7'	-0.023	23.0	$-\bar{2}.3617$	$\bar{1}.3899$	~~0.9832~~ 1.0172	1.3617	$-\bar{3}.4071$	-0.0026	O	O	P
V_6'	-0.004	35.0	$-\bar{3}.6021$	$\bar{1}.5502$	~~1.0172~~ 1.0616	1.5441	$-\bar{3}.6698$	-0.0047	P	P	Q
V_5'	0.014	33.0	$\bar{2}.1461$	$\bar{1}.6446$	~~1.0616~~ 1.1138	1.5185	$\bar{3}.3860$	0.0024	Q	Q	R
V_4'	0.030	42.0	$\bar{2}.4771$	$\bar{1}.7036$	~~1.1138~~ 1.1716	1.6232	$\bar{3}.7291$	0.0054	R	R	S.
V_3'	0.040	35.0	$\bar{2}.6021$	$\bar{1}.7407$	~~1.1716~~ 1.2334	1.5441	$\bar{2}.0321$	0.0168	S	S	T.
V_2'	0.057	48.0	$\bar{2}.7559$	$\bar{1}.7650$	~~1.2334~~ 1.2977	1.6812	$\bar{2}.1374$	0.0137	T	T	U.
V_1'	1.068	44.0	0.0285	$\bar{1}.7797$	~~1.2~~ 1.3639	1.6435	$\bar{1}.5286$	0.3378	U	U	V.
V_0'		60.0		$-\infty$	1.4314		$-\infty$	0.0000	V	V.	

$\begin{cases} 4 \to 0 \\ M = 0 \end{cases}$

$$\Sigma y_0 y_a \frac{l}{A}$$

~~Upper chord~~ ~~Lower chord~~ etc →

			y_a y_0 $.1\frac{l}{A}$	$y_{0.2}$	$y_{0.3}$	$y_{0.4}$	$y_{0.5}$	$y_{0.6}$	$y_{0.7}$	$y_{0.8}$	$y_{0.9}$	$y_{0.10}$
θ_1	L_0	U_1	A.	2A.	3A	4.A	5.A	6.A	7.A	8.A	9.A	10A.
θ_2	L_1	U_2	B	2B	3B	4B	5B	6B	7B	8,B	9.B	10B
θ_3	L_2	U_3	C	2C	3C	4.C	5C	6C	7C	8.C	9.C	10.C
θ_4	L_3	U_4	D	2D	3D	4D	5D	6D	7D	8.D	9.D	10.D
θ_5	L_4	U_5	E	2E	3E	4E	5E	6E	7E	8.E	9.E	10.E
θ_6	L_5	U_6	F	2F	3F	4F	5F	6F	7F	8.F	9.F	10F
θ_7	L_6	U_7	G	2G	3G	4G	5G	6G	7G	8.G	9.G	10G
θ_8	L_7	U_8	H	2H	3H	4H	5.H	6.H	7H	8H	9.H	10H
θ_9	L_8	U_9	K	2K	3K	4K	5K	6K	7.K	8.K	9.K	10K
θ_{10}	L_9	U_{10}	L.	2L	3L	4L	5L	6L	7L	8.L	9L	10L
θ_{10}'	L_9'	U_{10}'	M	2M	3M	4M	5M	6M	7M	8M	9M	10L
θ_9'	L_8'	U_9'	N	2N	3N	4N	5N	6N	7N	8N	11K	10K
	L_7'	U_8'	O	2O	3O	4.O	5.O	6.O	7.O	$12\frac{2}{8}$H	11H	10H
	L_6'	U_7'	P	2P	3P	4.P	5.P	6P	13G	12G	11G	10G
	L_5'	U_6'	Q	2Q	3Q	4Q	5.Q	14F	13F	12F	11F	10F
	L_4'	U_5'	R	2R	3R	4.R	15E	14E	13E	12E	11.E	10E
	L_3'	U_4'	S	2S	3S	16D	15D	14D	13D	12D	11.D	10D
	L_2'	U_3'	T.	2T	17C	16C	15C	14C	13C	12C	11.C	10C
	L_1'	U_2'	U	18B	17B	16B	15B	14B	13B	12B	11.B	10B
	L_0'	U_1'	V.	18.A.	17A.	16A.	15A.	14A	13A	12A.	11.A.	10.A

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		load on 1.	load on 2	3	4	5	6	7	8	9	10
V_1	ϑ_1	A	2A.	3A	4A	5A	6A	7A	8A	9A	10.A
V_2	ϑ_2	B	2B	3B	4B	5B	6B	7.B	8.B	9.B	10.B
V_3	ϑ_3	C	2C	3C	4C	5C	6C	7C	8.C	9C	10C
V_4	ϑ_4	D	2D	3D	4D	5D	6D	7D	8D	9D	10D
V_5	ϑ_5	E	2E	3E	4E	5E	6E	7E	8E	9E	10E
V_6	ϑ_6	F	2F	3F	4F	5F	6F	7F	8F	9F	10F
V_7	ϑ_7	G	2G	3G	4G	5G	6G	7G	8G	9G	10G
V_8	ϑ_8	H	2H	3H	4H	5H	6H	7H	8H	9H	10H
V_9	ϑ_9	K	2K	3K	4K	5K	6K	7K	8K	9K	10K
V_{10}	ϑ_{10}	L.	2L	3L	4L	5L	6L	7L	8L	9L	10L
$V_{10'}$	$\vartheta_{10'}$	M	2M	3M	4M	5M	6M	7M	8M	9M	10L
$V_{9'}$	$\vartheta_{9'}$	N	2N	3N	4N	5N	6N	7N	8N	11.K	10K
	$\vartheta_{8'}$	O	2.O	3.O	4.O	5.O	6.O	7.O	12H	11H	10H
	$\vartheta_{7'}$	P	2P	3P	4.P	5.P	6.P	13.G	12G	11Q	10G
	$\vartheta_{6'}$	Q	2Q	3Q	4Q	5Q	14F	13F	12F	11F	10F
	$\vartheta_{5'}$	R	2R	3R	4R	15E	14E	13E	12E	11E	10E
	$\vartheta_{4'}$	S.	2S	3S	16D	15D	14D	13D	12D	11D	10D
	$\vartheta_{3'}$	T	2T	17.C	16C	15C	14C	13C	12C	11C	10C
	$\vartheta_{2'}$	U	18B.	17B	16B	15B	14B	13B	12B	11B	10B
	$\vartheta_{1'}$	V.	18A.	17A	16A	15A.	14A	13A	12A	11A	10A

	Upper chord. $\log \varphi_a^2 \frac{l}{A}$		Lower chord $\log \varphi_a'^2 \frac{l}{A}$		Diagonals.		Verticals.	
U_1	$\bar{2}.2867$	0.0194	L_0	$\bar{1}.0813$	0.1206	ϑ_1 $\bar{1}.6121$	04094	V_1 $\bar{1}.2798$ 0.1904
U_2	$\bar{2}.9471$	0.0885	L_1	$\bar{1}.3394$	0.2185	ϑ_2 $\bar{1}.4022$	0.2524	V_2 $\bar{1}.1465$ 0.1402
U_3	$\bar{1}.3173$	0.2076	L_2	$\bar{1}.5594$	0.3625	ϑ_3 $\bar{1}.4654$	0.2920	V_3 $\bar{1}.1707$ 0.1481
U_4	$\bar{1}.5773$	0.3779	L_3	$\bar{1}.8139$	0.6515	ϑ_4 $\bar{1}.3262$	0.2119	V_4 $\bar{2}.9556$ 0.0903
U_5	$\bar{1}.7236$	0.5291	L_4	0.0133	1.0311	ϑ_5 $\bar{1}.2690$	0.1858	V_5 $\bar{2}.8845$ 0.0767
U_6	$\bar{1}.8114$	0.6477	L_5	0.2640	1.8370	ϑ_6 $\bar{1}.2322$	0.1707	V_6 $\bar{2}.6179$ 0.0415
U_7	$\bar{1}.8935$	0.7825	L_6	0.4954	3.1290	ϑ_7 $\bar{1}.2525$	0.1788	V_7 $\bar{2}.4353$ 0.0272
U_8	$\bar{1}.9163$	0.8247	L_7	0.5965	3.9490	ϑ_8 $\bar{2}.9743$	0.0943	V_8 $\bar{3}.5837$ 0.0038
U_9	$\bar{1}.9818$	0.9590	L_8	0.6721	4.7000	ϑ_9 $\bar{2}.7355$	0.0544	V_9 $\bar{4}.6405$ 0.0004
U_{10}	$\bar{1}.9550$	0.9016	L_9	0.7212	5.2620	ϑ_{10} $\bar{3}.8383$	0.0069	~~0.7182~~
	$\Sigma \varphi_a^2 \frac{l}{A} = 10.6760$				42.5224		3.7131	1.4364

$$\Sigma \varphi_a^2 \frac{l}{A} = 10.6760 + 42.5224 + 3.7131 + 1.4364 = 58.3479$$

$l_t = 246$ assumed.

$A_t = 138^{0}$

$\frac{246}{138} = 1.739$

$$\Sigma \varphi_a^2 \frac{l}{A} + \frac{l_t}{A_t} = 58.3479 + 1.7390 = 60.0869$$

1739
132
6956
3478
4273 6

1739
138
13912
5217
1739
23982

2.3807
2.1399
0.2403 → 1.739

Upper chord.

		Summary.
A	0.0017	0.0017
B	0.0081	0.0098
C	0.0206	0.0304
D	0.0404	0.0708
E	0.0609	0.1317
F	0.0805	0.2122
G	0.1054	0.3176
H	0.1211	0.4387
K	0.1536	0.5923
L	0.1592	0.7515
M	0.1592	0.9107
N	0.1877	1.0921
O	0.1814	1.2735
P	0.1958	1.4693
Q	0.1879	1.6572
R	0.1830	1.8402
S	0.1612	2.0014
T	0.1167	2.1181
U	0.0736	2.1917
V	0.0315	2.2232

Load on.

1	U_1	2.2232		2.2232
2	L_2	$2 \times 2.1181 = 4.2362$	$18 \times 0.0098 = 0.1764$	4.4126
3	L_3	$3 \times 2.0014 = 6.0042$	$17 \times 0.0304 = 0.5168$	6.5210
4	L_4	$4 \times 1.8402 = 7.3608$	$16 \times 0.0708 = 1.1328$	8.4936
5	L_5	$5 \times 1.6572 = 8.2860$	$15 \times 0.1317 = 1.9755$	10.2615
6	L_6	$6 \times 1.4693 = 8.8158$	$14 \times 0.2122 = 2.5708$	11.3866
7	L_7	$7 \times 1.2735 = 8.9145$	$13 \times 0.3176 = 4.1288$	13.0433
8	L_8	$8 \times 1.0921 = 8.7368$	$12 \times 0.4387 = 5.2644$	14.0012
9	L_9	$9 \times 0.9107 = 8.1963$	$11 \times 0.5923 = 6.5153$	14.7116
10	U_{10}	$10 \times 0.7515 = 7.5150$	$10 \times 0.7515 = 7.5150$	15.0300

Lower chords

		Summary.
A.	0.0000	0.0000
B	0.0043	0.0043
C	0.0132	0.0175
D	0.0333	0.0508
E	0.0634	0.1142
F	0.1408	0.2550
G	0.2782	0.5332
H	0.3991	0.9323
K	0.5329	1.4652
L	0.6633	2.1285
M	0.8108	2.9393
N	0.7989	3.7382
O	0.7404	4.4786
P	0.6500	5.1286
Q	0.4224	5.5510
R	0.2655	5.8165
S	0.1884	6.0049
T	0.1191	6.1240
U	0.0827	6.2067
V.	0.0000	6.2067

London

	6.2067					6.2067
2	2× 6.1240 =	18 × 0.0043 =	12.2480	0.0774	~~13.022~~	12.3254
3	3× 6.0049 =	17 × 0.0175 =	18.0147	0.2975	18.3122	
4	4× 5.8165 =	16 × 0.0508 =	23.2660	0.8128	24.0788	
5	5× 5.5510 =	15 × 0.1142 =	27.7550	1.7130	29.4680	
6	6× 5.1286 =	14 × 0.2550 =	30.7716	3.5700	34.3416	
7	7× 4.4786 =	13 × 0.5332 =	31.3502	6.9316	38.2818	
8	8× 3.7382 =	12 × 0.9323 =	29.9056	11.1876	41.0932	
9	9× 2.9393 =	11 × 1.4652 =	26.4537	16.1172	42.5709	
10.	10× 2.1285 =	10 × 2.1285 =	21.2850	21.2850	42.5700	

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Diagonals.

		Summary
A.	0.0335	0.0335
B	0.0234	0.0569
C	0.0310	0.0879
D	0.0255	0.1134
E	0.0252	0.1386
F	0.0267	0.1653
G	0.0329	0.1982
H	0.0619	0.2601
K	0.0175	0.2776
L	0.0053	0.2829
M	−0.0037	0.2792
N	−0.0053	0.2739
O	−0.0004	0.2735
P	0.0074	0.2809
Q	0.0118	0.2927
R	0.0169	0.3096
S	0.0227	0.3323
T	0.0354	0.3677
U	0.0350	0.4027
V.	0.6336	1.0363

Load on

1	1.0363		1.0363
2	2× 0.3677 = 0.7354	18× 0.0569 = 1.0242	1.7596
3	3× 0.3323 = 0.9969	17× 0.0879 = 1.4943	2.4912
4	4× 0.3096 = 1.2384	16× 0.1134 = 1.8144	3.0528
5	5× 0.2927 = 1.4635	15× 0.1386 = 2.0790	3.5425
6	6× 0.2809 = 1.6854	14× 0.1653 = 2.3142	3.9996
7	7× 0.2735 = 1.9145	13× 0.1982 = 2.5766	4.4911
8	8× 0.2739 = 2.1912	12× 0.2601 = 3.1212	5.3124
9	9× 0.2792 = 2.5128	11× 0.2776 = 3.0536	5.5664
10	10× 0.2829 = 2.8290	10× 0.2829 = 2.8290	5.6580

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Verticals

		summary
A	0.000	0.000
B	0.0177	0.0177
C	0.0149	0.0326
D	0.0188	0.0514
E	0.0125	0.0639
F	0.0123	0.0762
G	0.0082	0.0844
H	0.0071	0.0915
K	0.0018	0.0933
L	-0.0005	0.0928
M	0.0008	0.0936
N	-0.0014	0.0922
O	-0.0026	0.0896
P	-0.0047	0.0849
Q	0.0024	0.0873
R	0.0054	0.0927
S	0.0108	0.1035
T	0.0137	0.1172
U	0.3378	0.4550
V	0.0000	0.4550

(4)

Loads			Total
1	0.4550	0.4550	0.4550
2	2×0.1172 = 0.2344	18×0.0177 = 0.3186	0.5530
3	3×0.1035 = 0.3105	17×0.0326 = 0.5542	0.8647
4	4×0.0927 = 0.3708	16×0.0514 = 0.8224	1.1932
5	5×0.0873 = 0.4365	15×0.0639 = 0.9585	1.3950
6	6×0.0849 = 0.5094	14×0.0762 = 1.0668	1.5762
7	7×0.0896 = 0.6272	13×0.0844 = 1.0972	1.7244
8	8×0.0922 = 0.7376	12×0.0915 = 1.0980	1.8356
9	9×0.0936 = 0.8424	11×0.0933 = 1.0263	1.8687
10	10×0.0928 = 0.9280	10×0.0928 = 0.9280	1.8560

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(X4)

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Verticals.

		Summary.
A.	0.0177	0.0177
B.	0.0149	0.0326
C	0.0188	0.0514
D	0.0125	0.0639
E	0.0123	0.0762
F	0.0082	0.0844
G	0.0071	0.0915
H	0.0018	0.0933
K	−0.0005	0.0928
L	0.0000	
M	0.0000	
N	0.0008	0.0936
O	−0.0014	0.0922
P	−0.0026	0.0896
Q	−0.0047	0.0849
R	0.0024	0.0873
S	0.0054	0.0927
T	0.0108	0.1035
U	0.0137	0.1172
V.	0.3378	0.4550

Load on			
1	0.4550		0.4550
2	2×0.1035 = 0.2070	18×0.0326 = 0.5868	0.7938
3	3×0.0927 = 0.2481	17×0.0514 = 0.8738	1.1219
4	4×0.0873 = 0.3492	16×0.0639 = 1.0854	1.4346
5	5×0.0849 = 0.4245	15×0.0762 = 1.1430	1.5675
6	6×0.0896 = 0.5376	14×0.0844 = 1.1816	1.7192
7	7×0.0922 = 0.6454	13×0.0915 = 1.1895	1.8349
8	8×0.0936 = 0.7488	12×0.0933 = 1.1196	1.8684
9	9×0.0928 = 0.8352	11×0.0928 = 1.0208	1.8560
10.	10×0.0928 = 0.9280	10×0.0928 = 0.9280	1.8560

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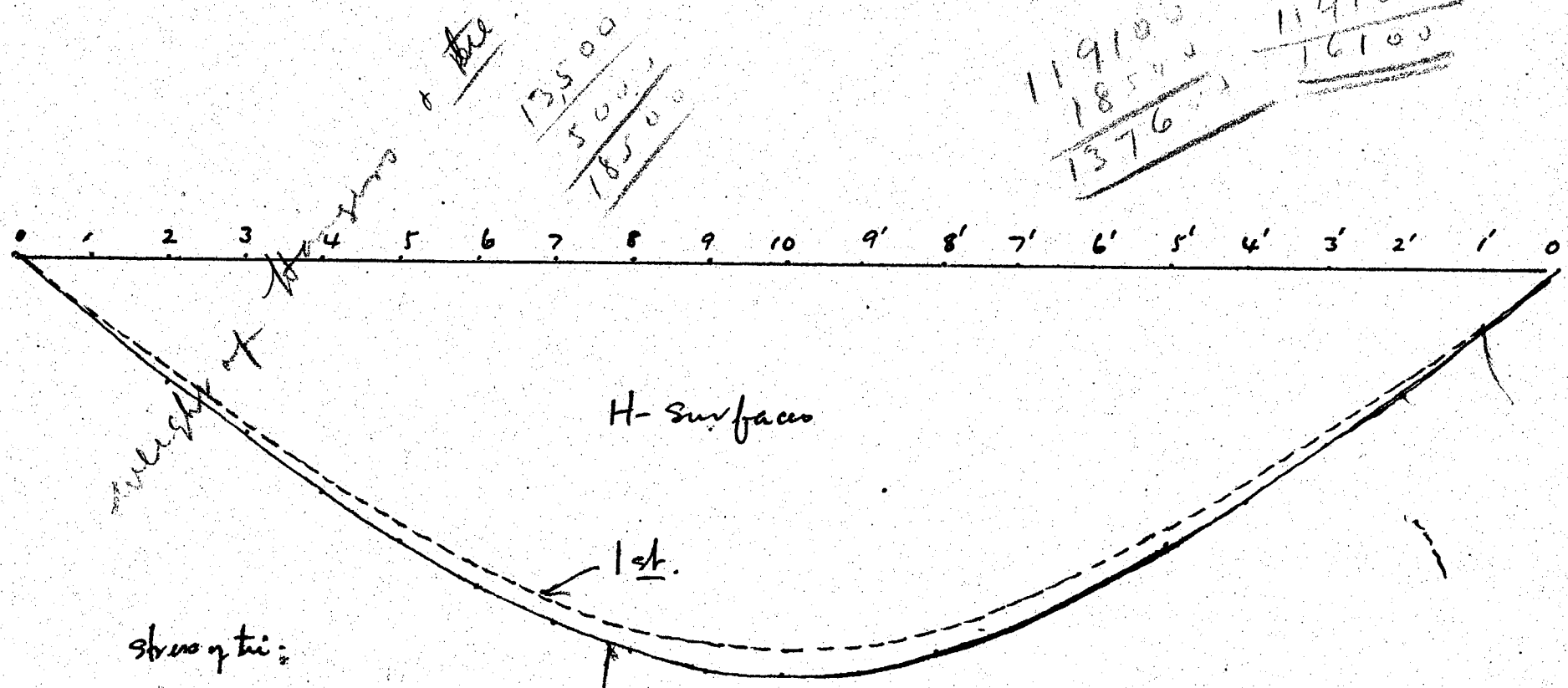
Load on	upper chord.	lower chord.	Diagonals.	Verticals	Summary.	H_2 divided by 60.0869	H_{12}
1	2.2232	6.2067	1.0363	0.4550	9.9212	0.165	0.151
2	4.4126	12.3254	1.7596	0.5530 ~~0.7938~~	19.0506 ~~19.2914~~	0.318 ~~0.322~~	0.296
3	6.5210	18.3122	2.4912	0.8647 ~~1.1219~~	28.1891 ~~28.4463~~	0.470 ~~0.474~~	0.439
4	8.4936	24.0788	3.0528	1.1932 ~~1.4346~~	36.8184 ~~37.0598~~	0.614	0.570
5	10.2615	29.4680	3.5425	1.3950 ~~1.5675~~	44.6670 44.8395	0.744	0.699
6	11.3866	34.3416	3.9996	1.5762 ~~1.7192~~	51.3046 ~~51.4470~~	0.855	0.808
7	13.0433	38.2618	4.4911	1.7244 ~~1.8349~~	57.5406 ~~57.6511~~	0.959 ~~0.961~~	0.899
8	14.0012	41.0932	5.3124	1.8656 ~~1.8684~~	62.2724 ~~62.2752~~	1.038	0.967
9	14.7116	42.5709	5.5664	1.8687 ~~1.8560~~	64.7175 ~~64.7049~~	1.078	1.007
10	15.0300	42.5700	5.6580	1.8560	65.1140	1.085	1.017



Stresses in:

max. tube	max. over	D.L.	Inter	max. conc L.L	
6.735	6.832	1.085	1111.900	118.200	14,100 678.200

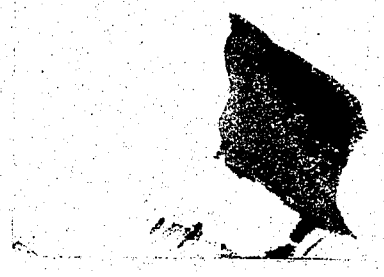
Total	Red. over.
1,922,400	113.0

Upper chord.

member	y_a \ Load x_a	1	2	3	4	5	6	7	8	9	10
		0.165	0.318	0.470	0.614	0.744	0.855	0.959	1.038	1.078	1.085
1	0.315	0.052	0.100	0.148	0.193	0.234	0.269	0.302	0.327	0.340	0.342
2	0.676	0.112	0.215	0.318	0.415	0.503	0.578	0.648	0.702	0.729	0.733
3	1.086	0.179	0.345	0.510	0.667	0.808	0.929	1.041	1.127	1.170	1.178
4	1.543	0.255	0.491	0.725	0.947	1.148	1.319	1.480	1.602	1.663	1.674
5	2.033	0.335	0.646	0.956	1.248	1.513	1.738	1.950	2.110	2.192	2.206
6	2.534	0.418	0.806	1.191	1.556	1.885	2.167	2.430	2.630	2.732	2.749
7	3.014	0.497	0.958	1.417	1.851	2.242	2.577	2.890	3.129	3.249	3.270
8	3.414	0.563	1.086	1.605	2.096	2.540	2.919	3.274	3.544	3.680	3.704
9	3.684	0.608	1.172	1.731	2.262	2.741	3.150	3.533	3.824	3.972	3.997
10	3.779	0.624	1.202	1.771	2.320	2.812	3.231	3.624	3.923	4.074	4.100

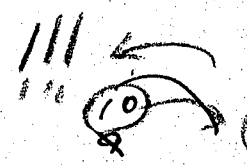
Lower chord

member	y_a \ load x_a	1	2	3	4	5	6	7	8	9	10
		0.165	0.318	0.470	0.614	0.744	0.855	0.959	1.038	1.078	1.085
0	1.152	0.190	0.366	0.541	0.707	0.857	0.985	1.105	1.196	1.242	1.250 1.176
1	1.473	0.243	0.468	0.692	0.904	1.096	1.259	1.413	1.529	1.588	1.598
2	1.818	0.300	0.578	0.854	1.116	1.353	1.554	1.743	1.887	1.942	1.973 1.960
3	2.206	0.364	0.702	1.037	1.354	1.641	1.886	2.116	2.290	2.378	2.394 2.378
4	2.638	0.435 0.430	0.839	1.240	1.620	1.963	2.255	2.530	2.738 2.724	2.844	2.862 2.844
5	3.105	0.512	0.987	1.459	1.906	2.310	2.655	2.978	3.223	3.347	3.369 3.347
6	3.577	0.590	1.137	1.681	2.196	2.661	3.058	3.430	3.712	3.856	3.881 3.856
7	4.037	0.666	1.284	1.897	2479	3.004	3.452	3.871	4.190	4.352	4.379 4.357
8	4.418	0.729	1.405	2.076	2713	3.287	3.777	4.237	4.586	4.763	4.794 4.763
9	4.681	0.772	1.489	2.200	2.874	3.483	4.002	4.489	4.859	5.046	5.079 5.046



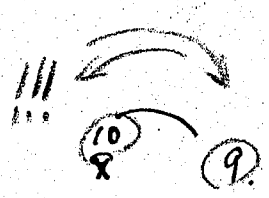
(16)

Diagonals.



member \ load on	1 0.165	2 0.318	3 0.470	4 0.614	5 0.744	6 0.855	7 0.959	8 1.038	10 1.085	9 1.078
1	0.612	0.601	0.195	0.288	0.376	0.455	0.523	0.587	0.636	0.654	0.660
2	0.635	0.105	0.202	0.298	0.390	0.472	0.543	0.606	0.659	0.689	0.685
3	0.660	0.109	0.210	0.310	0.405	0.491	0.564	0.633	0.686	0.716	0.712
4	0.682	0.112	0.217	0.321	0.419	0.508	0.583	0.654	0.708	0.740	0.735
5	0.692	0.114	0.220	0.325	0.425	0.515	0.592	0.664	0.718	0.751	0.746
6	0.678	0.112	0.216	0.319	0.416	0.504	0.580	0.650	0.704	0.736	0.731
7	0.625	0.103	0.199	0.294	0.384	0.465	0.534	0.600	0.649	0.678	0.674
8	0.516	0.085	0.164	0.243	0.317	0.384	0.441	0.495	0.536	0.560	0.556
9	0.349	0.058	0.111	0.164	0.214	0.260	0.298	0.335	0.362	0.379	0.376
10	0.124	0.020	0.039	0.058	0.076	0.092	0.106	0.119	0.129	0.135	0.134

Verticals.



load on \	1	2	3	4	5	6	7	8	10	9
1	0.602	0.099	0.191	0.283	0.370	0.448	0.515	0.577	0.625	0.653	0.649
2	0.582	0.096	0.185	0.274	0.358	0.433	0.498	0.558	0.604	0.632	0.628
3	0.550	0.091	0.175	0.258	0.338	0.409	0.470 0.432	0.528	0.571	0.597	0.593
4	0.505	0.083	0.161	0.237	0.310	0.376	0.432	0.484	0.524	0.548	0.545
5	0.441	0.073	0.140	0.207	0.271	0.328	0.377	0.423	0.458	0.478	0.476
6	0.355	0.059	0.113	0.167	0.218	0.264	0.304	0.341	0.369	0.385	0.373
7	0.245	0.040	0.078	0.115	0.151	0.182	0.210	0.235	0.254	0.266	0.264
8	0.115	0.019	0.037	0.054	0.071	0.086	0.098	0.110	0.119	0.125	0.124
9	-0.033	-0.005	-0.011	-0.016	-0.020	-0.025	-0.028	-0.032	-0.034	-0.036	-0.036

(17)

upper chord influence surfaces for considering redundancy.

member \ load on	1	2	3	4	5	6	7	8	9	10
1	-0.025	-0.046	-0.067	-0.085	-0.099	-0.107	-0.113	-0.111	-0.097	-0.072
2	-0.050	-0.090	-0.131	-0.165	-0.185	-0.203	-0.211	-0.202	-0.167	-0.109
3	-0.071	-0.130	-0.187	-0.236	-0.269	-0.283	-0.287	-0.265	-0.200	-0.101
4	-0.090	-0.162	-0.231	-0.289	-0.275	-0.332	-0.328	-0.235	-0.181	-0.028
5	-0.101	-0.177	-0.253	-0.311	-0.342	-0.333	-0.311	-0.236	-0.085	+0.136
6	-0.103	-0.176	-0.246	-0.296	-0.310	-0.277	-0.225	-0.116	0.103	0.401
7	-0.091	-0.146	-0.200	-0.228	-0.214	-0.143	-0.050	0.216	0.403	0.788
8	-0.062	-0.084	-0.103	-0.093	-0.036	0.086	0.231	0.462	0.826	1.303
9	-0.018	+0.008	0.039	0.098	0.209	0.390	0.597	0.896	1.338	1.903
10	0.043	0.131	0.229	0.346	0.521	0.769	1.043	1.410	1.926	2.567
10'	0.043	0.131	0.229	0.346	0.521	0.769	1.043	1.410	1.926	2.567
9'	0.113	0.270	0.432	0.622	0.865	1.177	1.515	2.945	2.518	1.903
8'	0.183	0.416	0.648	0.909	1.216	1.588	1.984	2.465	1.828	1.303
7'	0.257	0.549	0.844	1.163	1.526	1.945	2.385	1.741	1.215	0.788
6'	0.317	0.664	1.014	1.384	1.790	2.243	1.665	1.150	0.733	0.401
5'	0.368	0.760	1.150	1.564	2.002	1.542	1.090	0.702	0.386	0.136
4'	0.403	0.836	1.250	1.686	1.320	0.985	0.660	0.373	0.147	-0.028
3'	0.432	0.876	1.322	1.056	0.808	0.579	0.359	0.166	0.015	-0.101
2'	0.450	0.908	0.743	0.585	0.434	0.296	0.164	0.048	-0.042	-0.109
1'	0.461	0.386	0.311	0.239	0.171	0.109	0.049	-0.003	-0.043	-0.072

(18)

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Lower chord influence line for considering redundancy.

member \ Load	1	2	3	4	5	6	7	8	9	10
0	0.190 ~~0.164~~ ~~0.026~~	-0.366 ~~-0.313~~ ~~0.053~~	-0.541 ~~-0.463~~ ~~0.078~~	-0.707 ~~-0.602~~ ~~0.105~~	-0.857 ~~-0.726~~ ~~0.131~~	-0.985 ~~-0.828~~ ~~0.157~~	~~-1.105~~ ~~-0.922~~ ~~0.183~~	-1.196 ~~-0.989~~ ~~0.209~~	-1.242 ~~-1.007~~ ~~0.235~~	-1.2500 ~~-0.988~~ ~~0.262~~
1	-0.214	-0.409	-0.604	-0.787 ~~-0.540~~	-0.949	-1.083	-1.207	-1.294	-1.324	~~-1.294~~ 1.304
2	-0.234	-0.445	-0.655	-0.851 ~~-0.639~~	-1.020	-1.156	-1.279	-1.356	-1.345	~~-1.296~~ 1.309
3	-0.251	-0.477	-0.699	-0.904 ~~-0.666~~	-1.078	-1.210	-1.328	-1.389	-1.365	~~-1.252~~ -1.268
4	-0.265	-0.500	-0.731	-0.942 ~~-0.676~~	-1.115	-1.237	-1.343	-1.381	-1.317	~~-1.147~~ -1.165
5	-0.274	-0.511	-0.745	-0.954	-1.111	-1.227	-1.311	-1.318	-1.204	~~-0.965~~ -0.987
6	-0.272	-0.500	-0.726	-0.923	-1.069	-1.148	-1.202	-1.165	-0.990	~~-0.672~~ -0.697
7	-0.258	-0.468	-0.674	-0.847	-0.966	-1.005	-1.017	-0.928	-0.682	~~-0.296~~ -0.304
8	-0.228	-0.403	-0.525	-0.710	-0.783	-0.772	-0.732	-0.580	~~-0.257~~ ~~-0.154~~	~~0.244~~ 0.213
9	-0.188	-0.309	-0.430	-0.514	-0.533	-0.462	-0.359	-0.139	0.264	~~0.854~~ 0.821
9'	-0.051	-0.047	-0.037	0.040	0.123	0.325	~~0.558~~ ~~0.811~~	0.910	1.444	0.854 0.821
8'	0.022	0.097	~~0.177~~ ~~0.053~~	0.292	0.469	0.730	~~1.021~~ ~~1.387~~	1.423	0.745	0.244 0.213
7'	0.091	0.230	~~0.384~~	0.549	0.782	1.091	1.429	0.702	0.133	-0.276 -0.304
6'	0.153	0.348	0.547	0.775	1.052	1.398	0.710	0.108	-0.354	-0.672 -0.697
5'	0.202	0.442	~~0.594~~	0.952	1.262	0.679	0.118	-0.365	-0.728	-0.965 -0.987
4'	0.244	0.518	0.496	1.094	0.581	0.119	-0.325	-0.702	-0.977	-1.147 -1.165
3'	0.277	0.575	0.878	0.448	0.048	-0.309	-0.652	-0.938	-1.146	-1.252 -1.268
2'	0.297	0.616	0.274	-0.054	-0.358	-0.625	-0.880	-1.090	-1.212	-1.296 -1.309
1'	0.315	0.060	0.183	-0.434	-0.686	-0.848	-1.031	-1.177	-1.265	-1.294 1.304
0'	~~0.307~~ -0.190	~~0.105~~ -0.366	~~-0.096~~ -0.541	~~-0.289~~ -0.707	~~-0.465~~ -0.857	~~-0.619~~ -0.985	~~-0.765~~ -1.105	~~-0.887~~ -1.196	~~-0.954~~ -1.242	~~-0.908~~ -1.2500

(19)

Diagonals

member \ Load case	1	2	3	4	5	6	7	8	9	10
1	-0.051	-0.095	-0.139	-0.177	-0.206	-0.224	-0.238	-0.238	-0.212	-0.156
2	-0.046	-0.083	-0.120	-0.153	-0.175	-0.187	-0.191	-0.185	-0.151	-0.096
3	-0.039	-0.070	-0.100	-0.125	-0.141	-0.145	-0.144	-0.127	-0.083	-0.017
4	-0.030	-0.054	-0.076	-0.093	-0.108	-0.093	-0.086	-0.055	-0.001	0.056
5	-0.020	-0.032	-0.043	-0.049	-0.045	-0.028	-0.006	0.034	0.100	0.189
6	-0.006	-0.004	-0.002	0.007	0.025	0.055	0.091	0.142	0.206	0.322
7	0.012	0.031	0.051	0.076	0.116	0.155	0.204	0.270	0.363	0.471
8	0.033	0.072	0.110	0.154	0.205	0.266	0.330	0.406	0.504	0.618
9	0.054	0.113	0.172	0.234	0.301	0.375	0.456	0.535	0.633	0.742
10	0.095	0.151	0.228	0.305	0.384	0.465	0.547	0.633	0.723	0.817
10'	-0.087	-0.173	-0.259	-0.344	-0.427	-0.508	-0.588	-0.665	-0.737	0.847
9'	-0.092	-0.179	-0.266	-0.350	-0.430	-0.502	-0.573	-0.634	-0.857	0.742
8'	-0.087	-0.168	-0.249	-0.325	-0.394	-0.453	-0.509	0.878	0.740	0.618
7'	-0.077	-0.149	-0.216	-0.280	-0.335	-0.378	0.894	0.730	0.590	0.471
6'	-0.065	-0.122	-0.176	-0.228	-0.269	0.901	0.725	0.566	0.433	0.322
5'	-0.041	-0.094	-0.136	-0.173	+0.895	0.724	0.558	0.410	0.288	0.189
4'	-0.039	-0.071	-0.102	0.887	0.716	0.559	0.407	0.271	0.163	0.056
3'	-0.029	-0.050	0.978	0.713	0.558	0.415	0.276	0.153	0.057	-0.017
2'	-0.017	0.865	0.710	0.559	0.418	0.287	0.165	0.053	-0.033	-0.096
1'	0.845	0.701	0.559	0.421	0.292	0.174	0.060	-0.038	-0.112	-0.156

20

Verticals.

Loadm	1	2	3	4	5	6	7	8	9	10
1	-0.043	-0.079	-0.114	-0.145	-0.167	-0.158 (.178)	-0.184	-0.175	-0.143	-0.091
2	-0.034	-0.061	-0.088	-0.110	-0.123	-0.127	-0.125	-0.109	-0.071	-0.013
3	-0.021	-0.041	-0.057	-0.070	-0.074	-0.169 (.069)	-0.060	-0.036	+0.009	0.072
4	-0.013	-0.021	-0.027	-0.030	-0.026	-0.012	0.006	0.036	0.085	0.152
5	-0.002	0.003	0.007	0.014	0.024	0.051	0.076	0.112	0.166	0.235
6	0.011	0.026	0.042	0.061	0.085	0.114	0.147	0.189	0.254	0.312
7	0.024	0.051	0.078	0.107	0.140	0.176	0.216	0.261	0.316	0.378
8	0.036	0.072	0.110	0.148	0.188	0.230	0.273	0.319	0.368	0.422
9	0.045	0.091	0.137	0.182	0.227	0.270	0.314	0.356 (~~0.288~~)	0.404	0.439
9'	-0.056	-0.111	-0.167	-0.224	-0.280	-0.338	-0.395	-0.454	0.479	0.439
8'	-0.062	-0.123	-0.183	-0.243	-0.301 (~~-0.129~~)	-0.356	-0.411	0.537	0.478	0.422
7'	-0.063	-0.124	-0.184	-0.243	-0.297	-0.348	0.602	0.519	0.444	0.378
6'	-0.063	-0.121	-0.179	-0.234	-0.284	0.672	0.565	0.467	0.394	0.312
5'	-0.059	-0.112	-0.165	-0.215	0.742	0.621	0.504	0.398	0.308	0.235
4'	-0.053	-0.099	-0.147	0.810	0.674	0.548	0.426	0.316	0.225	0.152
3'	-0.051	-0.095	0.879	0.732	0.595	0.267	0.342	0.232	0.143	0.072
2'	-0.039	0.929	0.778	0.632	0.490	0.369	0.247	0.139	0.053	-0.013
1'	0.968	0.821	0.572 (.672)	0.529	0.395	0.272	0.154	+0.049	-0.031	-0.091

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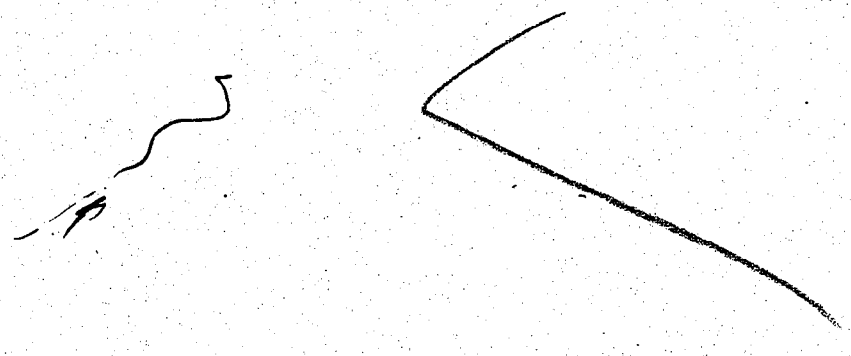
Upper chord influence surfaces.

load on \ member	1	2	3	4	5	6	7	8	9	10
1	-0.025	-0.050	-0.071	-0.090	-0.101	-0.103	-0.091	-0.062	-0.018	0.043
2	-0.046	-0.090	-0.130	-0.162	-0.177	-0.176	-0.146	-0.084	-0.008	0.131
3	-0.067	-0.131	-0.187	-0.231	-0.253	-0.246	-0.200	-0.103	0.039	0.229
4	-0.085	-0.165	-0.236	-0.289	-0.311	-0.296	-0.228	-0.093	0.098	0.346
5	-0.099	-0.185	-0.269	~~-0.275~~ -0.325	-0.342	-0.310	-0.214	-0.036	0.209	0.521
6	-0.107	-0.203	-0.283	-0.332	-0.333	-0.277	-0.143	0.086	0.390	0.769
7	-0.113	-0.211	-0.287	-0.328	-0.311	-0.225	-0.050	~~0.223~~ 0.231	0.597	1.043
8	-0.111	-0.202	-0.265	~~-0.285~~ -0.288	-0.236	-0.110	~~0.116~~ 0.121	0.462	0.896	1.410
9	-0.097	-0.167	-0.200	-0.181	-0.085	0.103	0.403	0.826	1.338	1.926
10 8'	-0.072	-0.109	-0.101	-0.028	0.136	0.401	0.788	1.303	1.903	2.567
~~10' 8'~~	~~-0.072~~	~~-0.109~~	~~-0.101~~	~~-0.208~~	~~0.136~~	~~0.401~~				
9' 7'	-0.043	-0.042	0.015	0.147	0.386	0.733	1.215	1.828	2.518	~~2.567~~ 1.926
8' 6'	-0.003	0.048	0.166	0.373	0.702	1.150	1.741	2.465	~~1.945~~ 2.445	1.410
7' 5'	+0.049	0.164	0.359	0.660	1.090	1.665	2.385	1.984	1.515	1.043
6' 4'	0.109	0.296	0.579	0.985	1.542	2.243	1.945	1.588	1.177	0.769
5' 3'	0.171	0.434	0.808	1.320	2.002	1.790	1.526	1.216	0.865	0.521
4' 2'	0.239	0.585	1.056	1.686	1.564	1.384	1.163	0.909	0.622	0.346
3' 1'	0.311	0.743	1.322	1.250	1.150	1.014	0.844	0.648	0.432	0.229
2'	0.386	0.908	0.876	0.836	0.760	0.664	0.549	0.416	0.270	0.131
1'	0.461	0.450	0.432	0.408	0.368	0.317	0.257	0.183	0.113	0.043
odd.	-0.411	-0.786	-1.014	-1.155	-1.092	-0.884	-0.555	-0.201	-0.018	0.000
	+0.992	+1.791	+2.936	+3.780	+4.996	+5.920	+6.630	+6.916	+7.626	7.524
even	-0.424	-0.769	-1.015	-1.096	-1.057	-0.859	-0.517	-0.177	0.000	0.000
	+0.734	+1.837	+2.677	+3.880	+4.704	+5.842	+6.302	+7.229	7.309	7.879



(22)

Lower chord influence surfaces

loaden \ member	0	1	3	2/3	4	5	6	7	8	9
1	~~-0.190~~ ~~-0.164~~	-0.214	-0.251	-0.234	-0.265	-0.274	-0.272	-0.258	-0.228	-0.188
2	~~-0.366~~ ~~-0.313~~	-0.409	-0.477	-0.445	-0.500	-0.511	-0.500	-0.468	-0.403	-0.309
3	~~-0.541~~ ~~-0.463~~	-0.604	-0.699	-0.655	-0.731	-0.745	-0.726	-0.674	~~-0.525~~ -0.574	-0.430
4	~~-0.707~~ ~~-0.602~~	-0.787	-0.904	-0.851	-0.942	-0.954	-0.923	-0.847	-0.710	-0.514
5	~~-0.857~~ ~~-0.726~~	-0.949	-1.078	-1.020	-1.115	-1.111	-1.069	-0.966	-0.783	-0.533
6	~~-0.985~~ ~~-0.828~~	-1.083	-1.210	-1.156	-1.237	-1.227	-1.148	-1.005	-0.772	-0.462
7	~~-1.105~~ ~~-0.922~~	-1.207	-1.328	-1.279	-1.343	-1.311	-1.202	-1.017	~~-0.773~~ -0.732	-0.359
8	~~-1.196~~ ~~-0.987~~	-1.294	-1.389	-1.356	-1.381	-1.318	-1.165	-0.928	-0.580	-0.139
9	~~-1.242~~ ~~-1.007~~	-1.324	-1.365	-1.345	-1.317	-1.204	-0.990	-0.682	-0.257	0.264
10	~~-1.250~~ ~~-0.908~~	~~-1.309~~ ~~-1.294~~	~~-1.268~~ ~~-1.252~~ ~~-1.169~~	~~-1.165~~ ~~-1.296~~ -1.309	-1.165 ~~-1.147~~	-0.987 ~~-0.965~~	.697 ~~0.692~~	-0.364 ~~-0.276~~	0.213 ~~0.244~~	0.821 ~~0.854~~
9'	~~-1.242~~ ~~-0.954~~	-1.265	-1.140	-1.212	-0.977	-0.728	-0.354	0.133	0.745	~~0.264~~ 1.444
8'	~~-1.196~~ ~~-0.882~~	-1.177	-0.938	-1.090	-0.702	-0.365	0.108	0.702	1.423	~~0.139~~ 0.910
7'	~~-1.105~~ ~~-0.765~~	-1.031	-0.652	-0.880	-0.325	0.118	0.710	1.429	1.021	~~0.359~~ 0.558
6'	~~-0.985~~ ~~-0.679~~	-0.848	-0.309	-0.625	0.119	0.679	1.398	1.091	0.730	~~0.462~~ 0.325
5'	~~-0.854~~ ~~-0.705~~	-0.656	0.048	-0.358	0.581	1.262	1.052	0.782	0.469	~~0.330~~ 0.123
4'	~~-0.467~~ ~~-0.289~~	-0.434	0.448	0.054	1.094	0.952	0.775	0.549	0.292	~~0.~~ 0.010
3'	~~-0.341~~ ~~-0.096~~	-0.183	0.878	0.274	0.796	0.694	0.547	0.374	0.177	-0.037
2'	~~-0.366~~ ~~-0.105~~	0.060	0.575	0.616	0.518	0.442	0.348	0.230	0.097	-0.047
1'	~~-0.190~~ ~~-0.307~~	0.315	0.277	0.297	0.244	0.202	0.153	0.091	0.022	-0.051
odd.	~~7.870~~ ~~5.562~~	-7.433	-6.513	-6.983	-6.073	-5.373	-4.613	-3.597	-2.574	-1.598
	+ ~~0.307~~ 0.315	+0.315	+1.203	+0.571	+1.621	+2.276	+2.462	+2.809	+2.434	+2.389
even	~~-7.758~~ ~~5.508~~	-7.336	-6.495	-6.886	-5.927	-5.362	-4.433	-3.552	-2.465	-1.471
	~~6.000~~ +0.105	+0.060	+1.023	+0.616	+1.731	+2.073	+2.629	+2.572	+2.755	+2.066

(23)

Diagonals.

loadon \ member	1	2	3	4	5	6	7	8	9	10
1	-0.051	-0.046	-0.039	-0.030	-0.020	-0.006	0.012	0.033	0.054	0.075
2	-0.095	-0.083	-0.076	-0.054	-0.032	-0.004	0.031	0.077	0.113	0.151
3	-0.139	-0.120	-0.100	-0.076	-0.043	-0.002	0.051	0.110	0.172	0.228
4	-0.177	-0.153	-0.125	-0.093	-0.049	0.007	0.076	0.154	0.234	0.305
5	-0.206	-0.175	-0.141	-0.108	-0.045	0.025	0.116	0.205	0.301	0.384
6	-0.224	-0.187	-0.145	-0.093	-0.028	0.055	0.155	0.266	0.375	0.465
7	-0.238	-0.191	-0.144	-0.086	0.006	0.091	0.204	0.330	0.450	0.547
8	-0.238	-0.185	-0.127	-0.055	0.034	0.142	0.270	0.406	0.535	0.633
9	-0.212	-0.151	-0.083	-0.001	0.100	0.206	0.363	0.504	0.633	0.723
10	-0.156	-0.096	-0.017	0.056	0.189	0.322	0.471	0.618	0.742	0.817
9'	-0.112	-0.033	0.057	0.163	0.288	0.433	0.590	0.740	+0.857	+0.737
8'	-0.038	0.053	0.153	0.271	0.410	0.566	0.730	0.879	-0.634	-0.665
7'	0.060	0.165	0.276	0.407	0.558	0.725	0.894	+0.509	-0.573	-0.588
6'	0.174	0.287	0.415	0.559	0.724	0.901	+0.378	-0.453	-0.502	-0.508
5'	0.294	0.418	0.558	0.716	0.895	+0.269	-0.385	+0.394	-0.430	-0.427
4'	0.421	0.559	0.713	0.887	+0.173	-0.228	-0.280	+0.325	-0.350	-0.344
3'	0.559	0.710	0.878	+0.102	-0.136	0.176	+0.216	0.249	-0.266	-0.259
2'	0.701	0.865	+0.050	-0.071	-0.094	0.122	+0.147	0.168	-0.179	-0.173
1'	0.845	-0.017	-0.029	-0.039	-0.041	0.065	-0.077	-0.087	-0.092	-0.087

odd.	-0.957	-0.733	-0.536	-0.434	-0.291	-0.518	-0.628	-1.239	-1.361	-2.098
	+1.756	+1.293	+1.769	+1.286	+1.841	+1.480	+2.224	+1.922	+2.467	+1.957
even	-0.938	-0.704	-0.534	-0.366	-0.376	-0.354	-0.805	-0.946	-1.665	-1.690
	+1.296	+1.764	+1.281	+1.793	+1.357	+1.993	+1.733	+2.394	+1.999	+2.371

(24)

Vertical influence Surfaces.

load on \ to member	1	2	3	4	5	6	7	8	9
1	-0.043	-0.034	-0.021	-0.013	-0.002	0.011	0.024	0.036	0.045
2	-0.079	-0.061	-0.041	-0.021	0.003	0.026	0.051	0.072	0.091
3	-0.114	-0.088	-0.057	-0.027	0.007	0.042	0.078	0.110	0.137
4	-0.145	-0.110	-0.070	-0.030	0.014	0.061	0.107	0.148	0.182
5	-0.167	-0.123	-0.074	-0.026	0.024	0.085	0.140	0.188	0.227
6	-0.188	-0.127	-0.069	-0.012	0.051	0.114	0.176	0.230	0.270
7	-0.184	-0.125	-0.060	0.006	0.076	0.147	0.216	0.273	0.314
8	-0.175	-0.109	-0.036	0.036	0.112	0.189	0.261	0.319	0.356
9	-0.143	-0.071	0.009	0.085	0.166	0.254	0.316	0.368	0.404
10	-0.091	-0.013	0.072	0.152	0.235	0.312	0.378	0.422	0.439
9'	-0.031	0.053	0.143	0.225	0.308	0.394	0.444	0.478	0.479
8'	0.049	0.139	0.232	0.316	0.398	0.467	0.519	0.537	0.454
7'	0.154	0.247	0.342	0.426	0.504	0.565	0.602	0.411	0.395
6'	0.272	0.369	0.467	0.548	0.621	0.672	0.348	0.356	0.338
5'	0.395	0.490	0.595	0.674	0.742	0.284	0.297	0.301	0.280
4'	0.529	0.632	0.732	0.810	0.215	0.234	0.243	0.243	0.224
3'	0.672	0.778	0.879	0.147	0.165	0.179	0.184	0.183	0.167
2'	0.821	0.929	0.095	0.099	0.112	0.121	0.124	0.123	0.111
1'	0.968	0.039	0.051	0.053	0.059	0.063	0.063	0.062	0.056
odd.	-0.682	-0.480	-0.263	-0.266	-0.226	-0.526	-0.544	-0.957	-0.898
	+2.189	+1.568	+1.868	+1.416	+1.827	+1.498	+1.820	+1.453	+1.606
even	-0.668	-0.420	-0.311	-0.162	-0.327	-0.355	-0.715	-0.722	-1.127
	+1.671	+2.069	+1.303	+1.862	+1.434	+1.841	+1.492	+1.728	+1.338

(25)

Lower chord stress.

member	main panel. comp.	main panel. tens.	main panel. summary.	intermediate panel. comp.	intermediate panel. ten.	intermediate panel. summary.	max. ord.	Dead L. Main.	Dead L. inter.	Total D.L.	Live Load. carriage way / max. cant. 13,000	carriage way / ead panel 21,000	sidewalk. 39,700	Electiccar 40,000	Total L.L. stress.
								165.100	17,300						
	~~D.L. stress.~~														
0	7.758 ~~8.508~~	0.000 ~~0.105~~	7.758 ~~8.403~~	7.870 ~~5.562~~	0.00 ~~0.307~~	7.870 ~~5.255~~	1.250 ~~0.988~~	1280.800 ~~892,000~~	136,200 ~~90,900~~	1417.000 ~~982.900~~	16,300 ~~12,800~~	162,900 ~~115,700~~	308,000 ~~248,700~~	310,300 ~~220,300~~	797,500 ~~567,200~~
1	7.336	0.060	7,276	7.433	0.315	7,118	1,304	1201.300	123,100	1324,400	17,000 ~~16.~~	154.100	291.200	293,400	755,700
2 3	6.495	1.023	5.472	6.513	1.203	5.310	1.389	903,400	91,900	995,300	18,100	136,400	257,900	259,800	672,200
3 2	6.886	0.616	6,270	6.983	0,571	6,412	1,356	1035,200	110.900	1146,100	17,600	144,600	273,400	275,400	711.000
4	5,927	1,731	4.196	6.073	1.621	4.452	1.381	692,800	77.000	769.800	18,000	124,500	235,300	237,100	614.900
5	5,362	2,073	3,289	5,373	2,276	3,097	1,318	543,000	53,600	596,600	17.100	112.600	212,900	214.500	557.100
6	4,433	2,629	1.804	4,613	2.462	2,151	1.165 (.1398)	297,800	37,200	335,000	15,100 (18,200)	93,100 (55,200)	176,000 (104,400)	177,300 (105,200)	461.500 (283.000)
7	3,552	2,572	0.980	3,597	2,809	0.788	1,005 (1.091)	161.800	13,600	175,400	13,100 (14.100)	74,600 (54,000)	141.000 (102,100)	142,100 (102,900)	370.800 (273,100)
8	2,465	2,755	(0.290)	2,574	2,434	0,141	0.772 (1423)	(47,900)	2,400	45,500	10,000 (18.500)	51,800 (57,900)	97,900 (109.400)	98,600 (110.200)	258,300 (296,000)
9	1,471	2,066	(0.595)	1,598	2,389	(0.791)	0,514 (~~1.~~ 0918)	(98,200)	13,700	(111.900)	6.700 (11.800)	30,900 (43,400)	58,400 (82,000)	58,800 (82,600)	154,800 (219.800)

	Total stress.	Adjusting value	Req'd area		
	2214.500 ~~1550.100~~	2214,500 ~~1550.100~~	158.2 ~~110.7~~	149.0	156.16
0	2080.100	2080.100	148.6	136.0	137.40
1	1667.500	1667.500	119.0	109.0	96.83
2 3	1857.100	1857.100	132.7	119	96.83
3 2	1384.700	1384.700	98.9 ~~82.4~~	82.0	87.77
4	1153.700	1153.700	82.4	64.0	63.01
5	796.500	796.500	56.9	37.7	51.12
6	546.200 (97.700)	595,100 (146.600)	42.5 (8.6)	37.4 (9.4)	51.12
7	303,800 (250,500)	429,100 (375,800)	30.7 (22.1)	36.9 ( )	51.12
8	42,900 (331.700)	64,400 (353,200)	4.6 (20.8)	40.0 ( )	51.12
9					

upper chord stress.

member	main panel. comp.	tens.	summary.	intermediate panel. comp.	tens.	summary.	max. ord.	Main. Dead load. 165,100 #	Inter. 17,300 #	Total. Live	max. conc. L.L. for carriage way.	for side walk. 39,700 #	Electric car loading 40,000 #	Total L.L
											~~34,000~~ 13,000	21,000		
1	0.734	0.424	0.310	0.992	0.411	0.581	0.386	51.280	10.100	61.300 ✓	~~13,100~~ 5,000	15,400	~~12,300~~ 29200	29,400	~~62,700~~ 79000
2	1.837	0.769	1.068	1.791	0.786	1.005	0.908	176,300	17.400	193,700 ✓	~~30,900~~ 11,800	38,600	~~42,400~~ 72900	73,480	~~166,300~~ 196800 ✓
3	2.677	1.015	1.662	2.936	1.014	1.922	1.056	274,300	33.300	307,600 ✓	~~35,900~~ 13,700	56,200	~~66,000~~ 106300	107.100	~~243,000~~ 283400 ✓
4	3.880	1.096	2.784	3.780	1.155	2.625	1.686	459,400	45,400	504,800 ✓	~~57,300~~ 21,900	81,500	~~110,500~~ 154000	155,200	~~369,100~~ 412600 ✓
5	4.704	1.057	3.647	4.996	1.092	3.904	1.564	602,000	67,500	669,500 ✓	~~53,200~~ 20,300	98,800	~~144,800~~ 186700	188,200 ✓	~~452,100~~ 494000 ✓
6	5.842	~~0.859~~	4.983	5.920	0.884	5.036	2.243	822,700	87,100	909,800 ✓	~~76,300~~ 29,200	122,700	~~197,800~~ 232000 ✓	233,700	~~580,400~~ 617600 ✓
7	6.302	0.517	5.785	6.630	0.555	6.075	1.945	955,100	105,100	1060,200 ✓	~~66,100~~ 25,300	132,300	229,700 250200	252,100	~~639,400~~ 659900 ✓
8	7.229	0.177	7.052	6.916	0.201	6.715	2.465	1164.42 ~~1180~~	116.200	1280,600 ✓	32,000 ~~83,800~~	151.800	280,000 287000	289,200	~~753,000~~ 760.000 ✓
9	7.309	0.000	7.309	7.626	0.018	7.608	1.945	1206,700	131,600	1338,300 ✓	25,300 ~~66,100~~	153,500	290,200 ✓	292,500	761.500
10	7.879	0.000	7.879	7.524	0.000	7.524	2.567	1300,800	130.200	1431,000	33,400 ~~87,300~~	165,500	312,800 ✓	315,200 ~~+60~~	826,900

	Total stress.	Req'd area			
1	~~123,400~~ 140300	~~8.8~~ 10.4	11.7	63.50	
2	~~360,000~~ 390500	~~25.7~~ 28.0	28.0	63.50	
3	~~550,600~~ 591000	39.4	42.2	69.14	29.74
4	~~873,900~~ 917400	62.4	65.5	77.39	15.25
5	~~1121,600~~ 1165500	80.1	83.2	84.59	14.39
6	~~1492,900~~ 1527400	109	109	117.39	10.69
7	~~1699,600~~ 1720400	~~121~~ 123.0	123.0	138.62	16.62
8	~~2023,600~~ 2040600	~~145.6~~ 145.6	145.6	169.28	23.68
9	2099.800	150.0	150.0	169.28	19.28
10	2257,900	161.2	152.0	155.03	2.63

Diagonals

	main panels. tens.	comp.	Summary.	intermediate panels. ten.	comp.	Summary.	max. ord.
1	1,296	0.938	0.358	1,756	0.957	0.799	0.845
2	1,764	0,704	1,060	1,293	0,733	0,560	0.865
3	1,281	0,534	0.747	1,769	0.536	1,233	0,713
4	1,793	0,366	1,457	1,286	0,434	0,852	0,887
5	1,357	0,376	0.981	1,841	0,291	1,550	0,724
6	1,993	0,354	1,639	1,480	0.518	0.962	0,901
7	1,733	0,805	0,928	2,224	0.628	1,596	0,730 (0,378)
8	2.394	0,946	1,448	1,922	1,239	0,683	0,878 (0,453)
9	1,999	1,665	0,334	2,467	1,361	1,106	0,742 (0,634)
10	2,371	1,690	0,681	1,957	2098	(0,141)	0,817 (0,665)

	Adjusting stress.	req'd area		
1	214,400	12.7	16,2	21.24
2	373.500	22.0	25.8	33.19
3	282,900	22.5 (16.6)	19.3	27.26
4	447,400	26,3	30.0	37.75
5	334,700	19.7	23.4	41.75
6	499.600	29.4	34.0	41.75
7	364,800	21.5	25.1	33.19
8	503.400	29.6	32.9	41.75
9	336,000 (280,100)	19.8 (16.8)	18.6	33.19
10	393,800	23.2	21.3	33.19

21.000+39.700+40.000 = 100,700

	Dead L.	Inter.	Total.	max. conc. 13.000			
	165.100	17.300					
1	59.100	13.800	72.900	18.000	130.500	141.500	214.400
2	175.000	9.700	184.700	11.200	177.600	188.800	373.500
3	123,300	21.300	144.600	9.300	~~180.600~~ 129.000	138,300	282,900
4	240.600	14.700	255.300	11.500	180.600	192,100	447.400
5	162.000	26.800	188.800	9.400	136.500	145.900	334.700
6	270.600	16.600	287.200	11.700	200,700	212,400	499.600
7	153,200	27,600	180.800	9.500 (4.900)	174.500 (81.100)	184.000 (252,500)	364.800 503,400
8	239.100	11.800	250.900	11.400 (5.900)	241.100 (95.300)		
9	55.100	19.100	74.200	9.600 (8.200)	201.300 (167.700)	210.900 (175.900)	285,100 (101,700)
10	112.400	(2,400)	110.000	10.600 (8.600)	238.800 (170,200)	249.400 (178.800)	359.400 (68.800)

(29)

Verticals

member	main panels comp.	ten.	summary.	intermediate panels comp.	ten.	summary.	max ord.	D.L 165,100	17,300	Total D.L.s	13,000	100,700	Total.		
1	1.671	0.668	1.003	2.189	0.682	1.507	0.821 ~~0.948~~ (0.778)	165,600	26,100	191.700	10.700	168.300	179,000	370.700	1
2	2.069	0.420	1.649	1.568	0.480	1.088	0.929	272,200	18.800	291.000	12.100	208.300	220.400	511.400	2
3	1.303	0.311	0.992	1.968	0.263	1.705	0.732	163.800	29.500	193.300	9.500	131.200	140.700	334,000	3
4	1.862	0.162	1.700	1.416	0.266	1.150	0.810	280.700	19.900	300.600	10.500	187.500	198.000	498,600	4
5	1.434	0.327	1.107	1.827	0.226	1.601	0.621	182.800	27.700	210.500	8.100	144.400	152.500	363,000	5
6	1.841	0.355	1.486	1.498	0.526	0.972	0.672	245.300	16.800	262.100	8.700	185.400	194.100	456,200	6
7	1.492	0.715	0.777	1.820	0.544	1.276	0.519 (0.348)	128.300	22.100	150.400	6.700 (4.500)	150.200 (72.000)	156.900 (~~76.500~~)	307.300	7
8	1.728	0.722	1.006	1.453	0.957	0.496	0.537 (0.356)	166.100	8.600	174.700	~~7.000~~ (4.600)	~~174.000~~ (72.700)	181.000	355.700	8
9	1.338	1.127	0.211	1.606	0.898	0.708	0.439 (0.454)	39.800	12.200	47.000	5.700 (5.900)	134.700 (113.500	140.400 (119.400)	187.400 (72.400)	223.600 (148.600)	9

187.4 ✓

104.0 ✓
119.0 ✓
133.0 ✓
14.0 ✓

	Req'd area		
1	35.6	41.2	44.13
2	43.0	48.1	48.13
3	25.1	32.9	35.47
4	35.6	37.8	41.75
5	25.9	29.3	33.19
6	32.6	35.2	35.47
7	22.0	22.5	23.0
8	25.4	25.8	33.19
9	16.0 (8.7) net	14.0	23.0