

TABLE 1

MEMBERS	a	l	l+Ed=r	q	p	r.q.p	r.q <sup>2</sup>	W <sub>1</sub>			W <sub>2</sub>			W <sub>3</sub>			W <sub>4</sub>			W <sub>5</sub>			W <sub>6</sub>			Σr.q.p.r	S	a'		
								r	1/4 r <sup>2</sup>	r'	r	1/4 r <sup>2</sup>	r'	r	1/4 r <sup>2</sup>	r'	r	1/4 r <sup>2</sup>	r'	r	1/4 r <sup>2</sup>	r'	r	1/4 r <sup>2</sup>	r'				r	1/4 r <sup>2</sup>
bB	727	306	0.0038	0.76	1.90	0.0055	0.0022	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	7.4704	—	—	7.4129	—	—	0.1591	-32.90	7.37		
bZ	231	387	0.0150	1.59	1.28	0.0305	0.0379	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	7.4704	—	—	—	4.1183	—	0.7818	-9.00	2.01		
bc	1.12	193	0.0154	0.30	0.74	0.0034	0.0014	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	7.4704	—	—	—	—	0.8237	0.0759	+4.80	1.07		
cC	6.43	350	0.0049	0.86	2.15	0.0091	0.0036	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	7.4704	—	—	—	—	0.8237	0.2033	-29.00	6.50		
cd	1.29	306	0.0213	0.34	0.85	0.0061	0.0023	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	7.4704	—	—	—	—	0.8237	0.1363	-5.50	1.23		
dZ	0.70	324	0.0415	2.02	2.37	0.1987	0.1693	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	—	5.0221	—	—	—	0.8237	3.9323	-1.95	0.43		
de	0.49	230	0.0421	0.56	1.40	0.0360	0.0132	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	—	—	2.5738	—	—	0.8237	0.5756	+2.45	0.35		
eE	6.68	311	0.0042	1.35	3.36	0.0190	0.0077	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	—	—	2.5738	—	—	0.8237	0.3314	-30.20	6.77		
ef	0.69	213	0.0355	0.24	1.12	0.0095	0.0020	0.8237	—	—	25738	—	—	4.3920	—	—	6.2553	—	—	—	—	2.5738	—	—	0.8237	0.1657	-3.10	0.69		
fZ	0.20	308	0.1380	2.48	3.88	1.3279	0.8488	0.8237	—	—	25738	—	—	4.3920	—	—	—	5.3256	—	—	—	—	2.5738	—	—	0.8237	21.9244	+1.55	0.34	
fg	0.10	238	0.2133	0.82	2.71	0.4740	0.1434	0.8237	—	—	25738	—	—	4.3920	—	—	—	—	4.3920	—	—	—	—	2.5738	—	—	0.8237	7.3844	+0.35	0.08
gG	2.685	168	0.0022	2.00	5.71	0.0251	0.0088	0.8237	—	—	25738	—	—	4.3920	—	—	—	—	4.3920	—	—	—	—	2.5738	—	—	0.8237	0.3910	-30.75	6.89

1.2408

36.0812

TABLE 2

MEMBERS	SECT <sup>al</sup> AREAS	
	ABUTTING	NON-ABUTTING
bB	7.37	12.27
bZ	2.01	8.31
bc	1.07	3.02
cC	6.50	12.03
cd	1.23	3.42
dZ	0.43	12.67
de	0.55	4.14
eE	6.77	15.48
ef	0.69	2.18
fZ	0.34	16.36
fg	0.08	5.47
gG	6.89	19.73

$$h = \frac{\sum r.q.p.r}{\sum r.q^2}$$

$$\therefore h = \frac{36.0812}{1.2408} = 29.08 \text{ tons}$$

Unit stress = 4.46 tons per square inch

+ denotes tension  
- do compression

TABLE 3

	r	r'	TOTAL
W <sub>1</sub>	0.8237	7.4129	8.2366
W <sub>2</sub>	2.5738	7.4704	10.0442
W <sub>3</sub>	4.3920	6.2553	10.6473
W <sub>4</sub>	6.2553	4.3920	10.6473
W <sub>5</sub>	7.4704	2.5738	10.0442
W <sub>6</sub>	7.4129	0.8237	8.2366

E = modulus of elasticity = 11160 tons per square inch  
 l = length of each member in inches  
 a = sect<sup>al</sup> area do do in square inches (assumed)  
 a' = do do do do (deduced)  
 q = stress due to unit horizontal force  
 p = do do vertical do  
 S = total stress in tons  
 h = horizontal thrust in tons  
 r = reaction of left abutment  
 r' = do right do