TABLE I.

Properties of Functions of $\frac{p}{q}$ and of $\theta = \sqrt{\frac{p}{q}} \frac{\pi}{2}$ used in Formula $f = p\,(1 + \varphi \sec \theta)$.

$\frac{p}{q}$	$\frac{q}{p}$	$\sqrt{\frac{p}{q}}$	$\sqrt{\frac{q}{p}}$	$\theta = \sqrt{\frac{p}{q}} \times 90^\circ$	$\cos \theta$	$\log \cos \theta$	$\log \sec \theta$	$\sec \theta$	$\frac{1 + .25 \frac{p}{q}}{1 - \frac{p}{q}}$
.10	10.00000	.31623	3.1623	28°27′39″	.87915	9.94406	.05594	1.1375	1.139
.20	5.00000	.44721	2.2361	40°14′57″	.76324	9.88266	.11734	1.3102	1.313
.30	3.33333	.54772	1.8257	49°17′42″	.65216	9.81436	.18564	1.5334	1.536
.40	2.50000	.63246	1.5811	56°55′16″	.54579	9.73703	.26297	1.8323	1.833
.50	2.00000	.70711	1.4142	63°38′23″	.44402	9.64740	.35260	2.2522	2.250
.60	1.66667	.77460	1.2925	69°42′49″	.34671	9.53997	.46003	2.8842	2.875
.70	1.42857	.83666	1.1952	75°18′00″	.25377	9.40442	.59558	3.9407	3.917
.80	1.12500	.89443	1.1180	80°29′54″	.16507	9.21768	.78232	6.0579	6.000
.90	1.11111	.94868	1.0540	85°22′53″	.08052	8.90594	1.09406	12.4192	12.250
.91	1.09890	.95394	1.0483	85°51′16″	.07229	8.85908	1.14092	13.8334	13.639
.92	1.08696	.95917	1.0426	86°19′30″	.06410	8.80684	1.19316	15.6013	15.375
.93	1.07527	.96437	1.0370	86°47′34″	.05595	8.74778	1.25222	17.8744	17.607
.94	1.06383	.96954	1.0314	87°15′30″	.04783	8.67973	1.32027	20.9054	20.583
.95	1.05263	.97468	1.0260	87°43′16″	.03976	8.59949	1.40051	25.1490	24.750
.96	1.04167	.97980	1.0206	88°10′54″	.03173	8.50148	1.49852	31.5147	31.000
.97	1.03903	.98489	1.0154	88°38′23″	.02374	8.37546	1.62454	42.1246	41.417
.98	1.02041	.98995	1.0102	89°05′44″	.01579	8.19824	1.80176	63.3448	63.250
.99	1.01010	.99949	1.0050	89°32′56″	.00787	7.89616	2.10384	127.0051	124.750
1.00	1.00000	1.00000	1.0000	90°00′00″	.00000	Infinity.	Infinity.	Infinity.	Infinity.

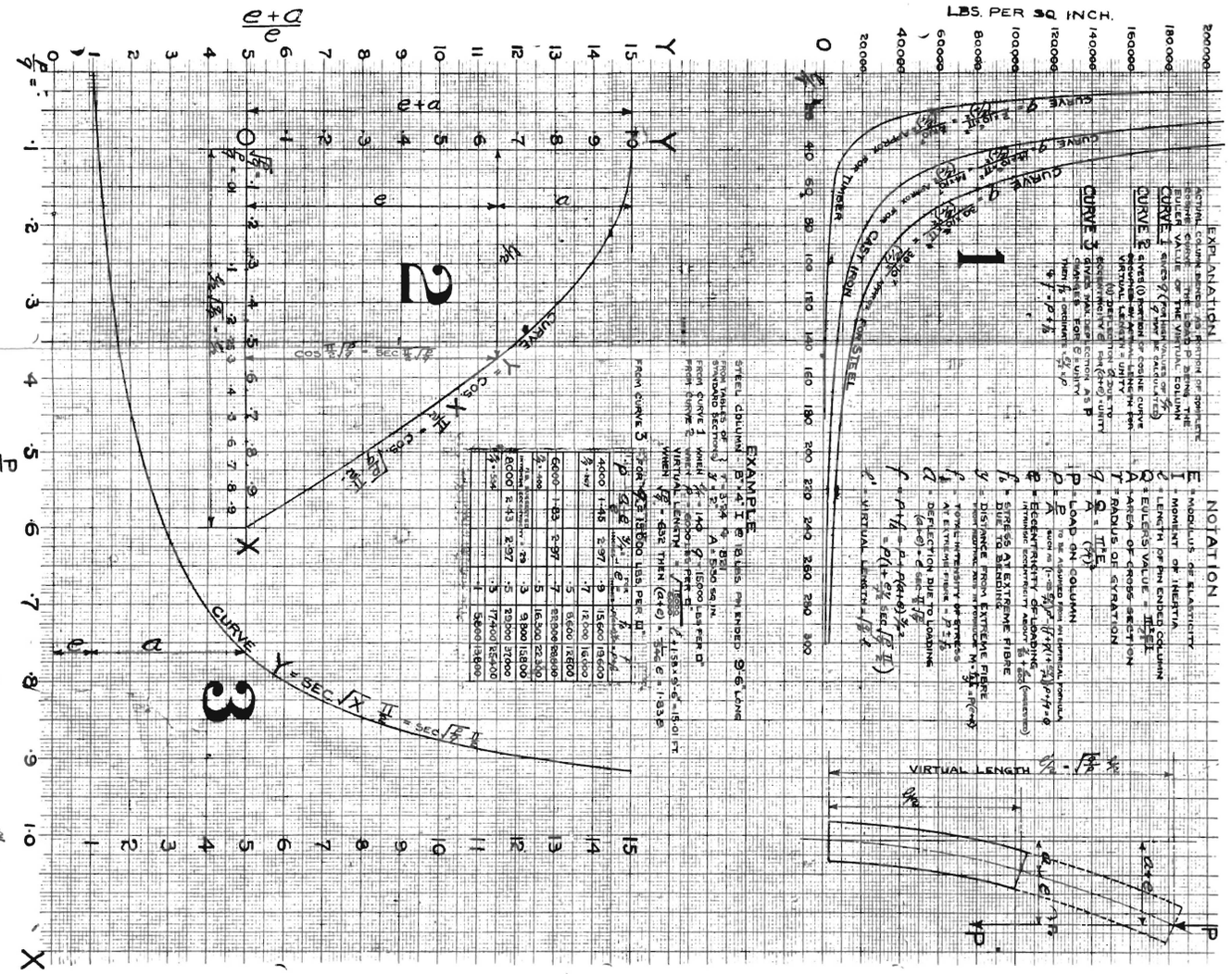


TABLE II. (see sheet No. 2)

Approximations to curve $\frac{f_b}{p}\frac{1}{\varphi} = \sec \sqrt{\left(\frac{p}{q}\right)}\frac{\pi}{2}$ from $\frac{p}{q} = 0$ to $\frac{p}{q} = 1$

Used in Column Formula where $\frac{p}{q} = \frac{P/A}{Q/A} = \frac{\text{Applies load/Area}}{\text{Euler's value of Column/Area}}$

$\frac{p}{q}$	S: $\sec\sqrt{\left(\frac{p}{q}\right)}\frac{\pi}{2}$ (Theoretic after Euler)	1 Johnson: $\frac{1}{1-\frac{\pi^2}{10}\frac{p}{q}}$	2 Fidler: $\frac{1}{1-\frac{p}{q}}$	3 Andrews: $\frac{1}{1-\frac{\pi^2}{8}\frac{p}{q}}$	4 Perry: $\frac{1\cdot2}{1-\frac{p}{q}}$	5 Moncreiff: $\frac{1+\cdot2\frac{5\pi^2}{48}\frac{p}{q}}{1-\frac{5\pi^2}{48}\frac{p}{q}}$	6 Hawken: $\frac{1+\cdot25\frac{p}{q}}{1-\frac{p}{q}}$	C: $\frac{1}{\varphi}\frac{f_b}{q}$
.1	1.137	1.095	1.111	1.141	1.333	1.137	1.139	.114
.2	1.310	1.246	1.250	1.328	1.500	1.311	1.313	.262
.3	1.533	1.421	1.429	1.588	1.714	1.535	1.536	.460
.4	1.832	1.652	1.667	1.974	2.000	1.838	1.833	.733
.5	2.252	1.974	2.000	2.610	2.400	2.269	2.250	1.126
.6	2.884	2.452	2.500	3.849	3.000	2.932	2.875	1.730
.7	3.941	3.235	3.333	7.331	4.000	4.081	3.917	2.759
.8	6.058	4.752	5.000	76.087	6.000	6.559	6.000	4.846
.9	12.419	8.950	10.000	Negve.	12.000	15.857	12.250	11.177
1.0	Infinity	76.087	Infinity	Negve.	Infinity	Negve.	Infinity	Inf'ty.

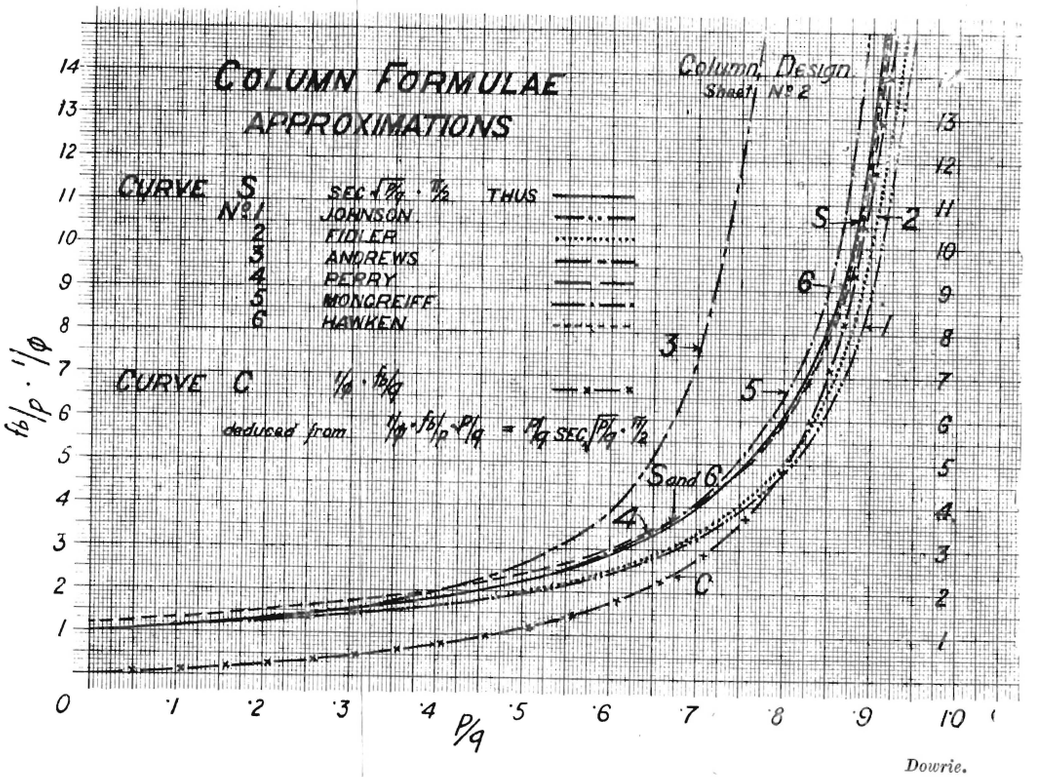
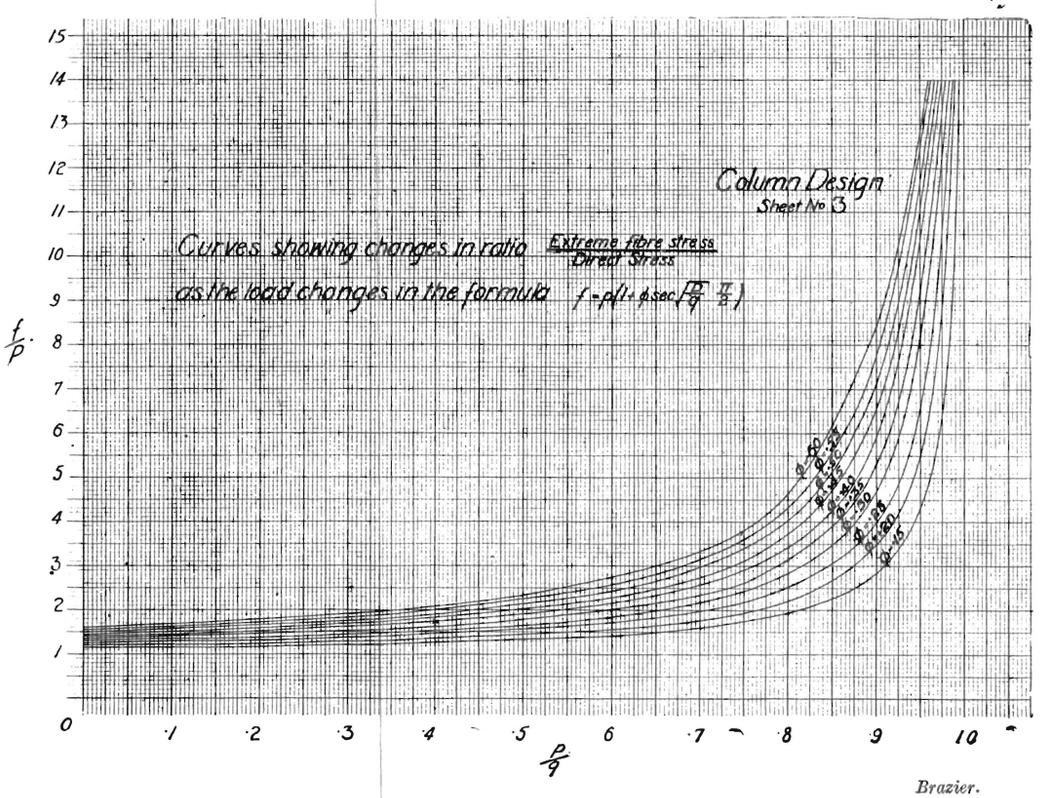


TABLE III—Coefficient of 'p' to get 'f' per unit p (see Sheet No. 3)

i.e. $\frac{f}{p} = (1 + \varphi \sec \sqrt{\frac{p}{q}}\frac{\pi}{2})$

$\frac{p}{q}$	$\sec\sqrt{\frac{p}{q}}\frac{\pi}{2}$	φ .15	.20	.25	.30	.35	.40	.45	.50	.55	.60
.1	1.137	1.171	1.227	1.284	1.341	1.398	1.455	1.512	1.569	1.626	1.682
.2	1.310	1.197	1.262	1.328	1.393	1.459	1.524	1.590	1.655	1.721	1.786
.3	1.533	1.230	1.307	1.383	1.460	1.537	1.613	1.690	1.767	1.843	1.920
.4	1.832	1.275	1.366	1.458	1.550	1.641	1.733	1.825	1.916	2.008	2.099
.5	2.252	1.338	1.450	1.563	1.676	1.788	1.901	2.013	2.126	2.239	2.351
.6	2.884	1.433	1.577	1.721	1.865	2.009	2.154	2.298	2.442	2.586	2.731
.7	3.941	1.591	1.788	1.985	2.182	2.379	2.576	2.773	2.970	3.167	3.364
.8	6.058	1.909	2.212	2.514	2.817	3.120	3.423	3.726	4.029	4.332	4.635
.9	12.419	2.863	3.484	4.105	4.726	5.347	5.968	6.589	7.210	7.831	8.452
1.0	Infny.	Infny.	Infny.	Infny.	Infny.	Infny.	Infny.	Infny.	Infny.	Infny.	Infny.

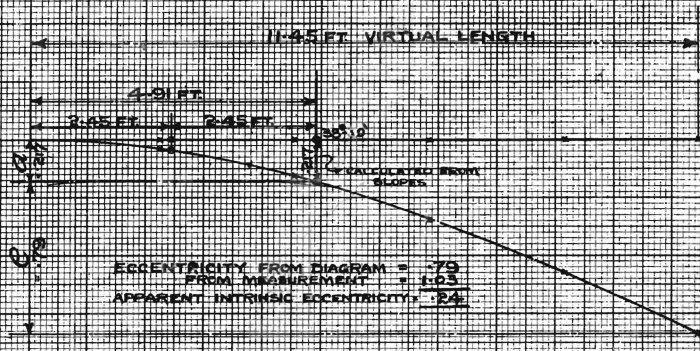


SHEET No. 6.

CURVES SHOWING COMPARISON OF EXPERIMENTAL RESULTS WITH THEORETICAL CURVE.

NOTE:- POINTS MARKED ⊙ ARE THOSE FOR EXPERIMENTAL RESULT
" " X " " " THEORETICAL CURVE
RESULTS ARE FOR HALF LENGTH OF FREELY SUPPORTED COLUMN
FOR NOTATION USED - SEE DIAGRAM (SHEET M1) LOADS ARE IN LBS.
COLUMNS WERE GIVEN A DEFINITE ECCENTRICITY AS SHOWN

4"×4"×½" T COLUMN $\frac{l}{\rho} = \frac{30800}{5700}$ LENGTH = 9·82 FT. $\frac{l}{r} = 196$ $e = 1·05$"



8"×2"×15·1 LBS. I SECTION COLUMN $\frac{l}{\rho} = \frac{10400}{5700}$ LENGTH = 10 FT. $\frac{l}{r} = 170$ $e = ·52$

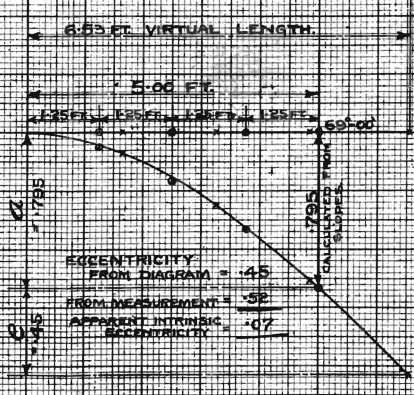


TABLE IV.—Coefficient of 'f' to get 'p' (see Sheet No. 4)

$$i.e.\quad \frac{p}{f} = \frac{1}{1 + \varphi \sec \sqrt{\frac{p}{q}\frac{\pi}{2}}}$$

$\frac{p}{q}$	$\sec \sqrt{\frac{p}{q}\frac{\pi}{2}}$	φ .15	.2	.25	.3	.35	.4	.45	.5	.55	.6
.1	1.137	.854	.815	.779	.746	.715	.687	.661	.637	.615	.594
.2	1.310	.836	.792	.753	.718	.686	.656	.629	.604	.581	.560
.3	1.533	.813	.765	.723	.685	.651	.620	.592	.566	.542	.521
.4	1.832	.784	.732	.686	.645	.609	.577	.548	.522	.498	.476
.5	2.252	.747	.689	.640	.597	.559	.526	.497	.470	.447	.425
.6	2.884	.698	.634	.581	.536	.498	.464	.435	.409	.387	.366
.7	3.941	.628	.559	.504	.458	.420	.388	.361	.337	.316	.297
.8	6.058	.524	.452	.398	.355	.320	.292	.268	.248	.231	.216
.9	12.419	.349	.287	.244	.212	.187	.168	.152	.139	.128	.118
1.0	Infny.	0	0	0	0	0	0	0	0	0	0

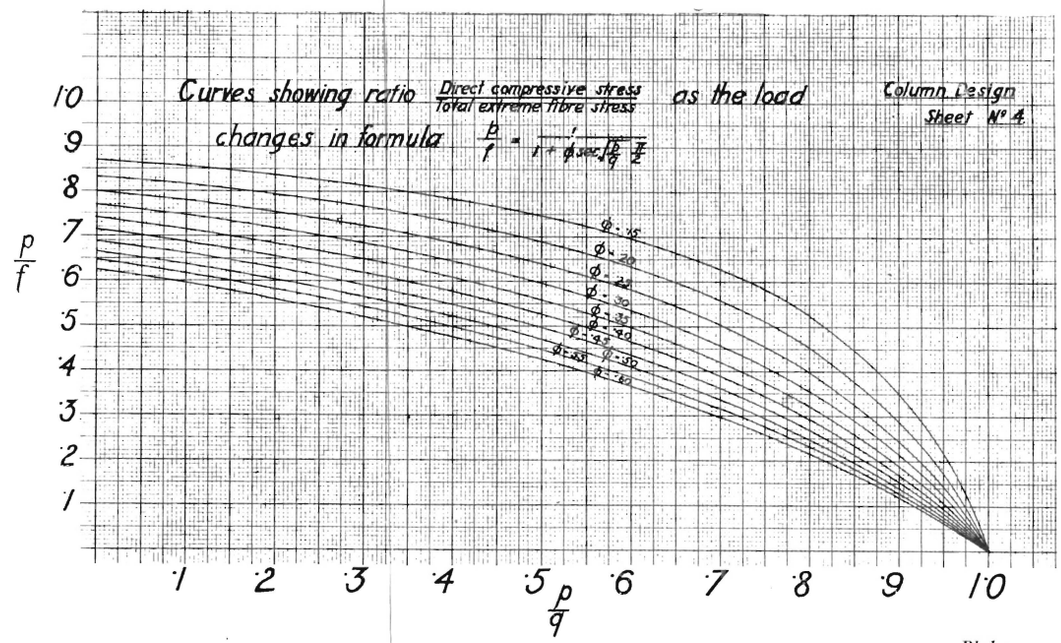


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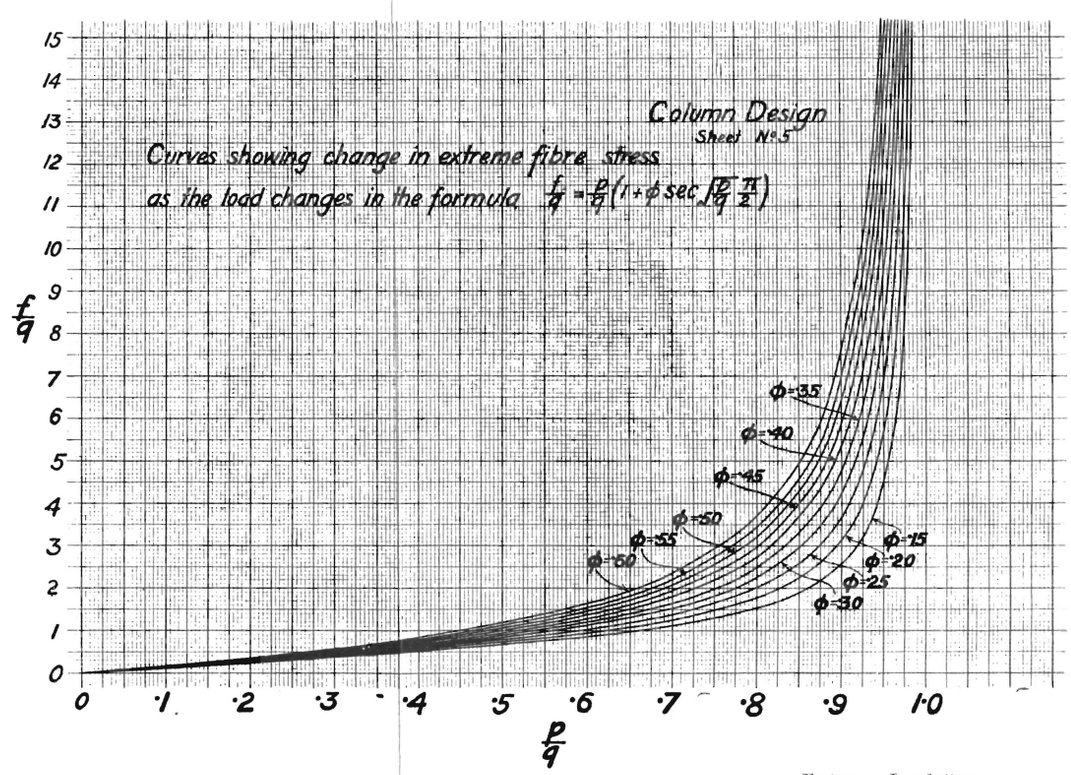
TABLE V.—Co-efficient of "q" to get "f." (See Sheet No 5)

$$\frac{f}{q} = (1 + \varphi \sec \sqrt{\frac{p}{q}\frac{\pi}{2}}) \times \frac{p}{q}$$

$\frac{p}{q}$	φ .15	.2	.25	.3	.35	.4	.45	.5	.55	.6
.1	.117	.123	.128	.134	.140	.145	.151	.157	.163	.168
.2	.239	.252	.266	.279	.292	.305	.311	.331	.344	.357
.3	.369	.392	.415	.438	.461	.484	.507	.530	.553	.576
.4	.510	.547	.583	.620	.657	.693	.730	.766	.803	.840
.5	.669	.725	.782	.838	.894	.950	1.007	1.063	1.119	1.176
.6	.860	.946	1.033	1.119	1.206	1.292	1.379	1.465	1.552	1.638
.7	1.114	1.252	1.390	1.528	1.665	1.803	1.941	2.079	2.217	2.355
.8	1.527	1.769	2.012	2.254	2.496	2.739	2.981	3.223	3.465	3.708
.9	2.577	3.135	3.694	4.253	4.812	5.371	5.930	6.489	7.047	7.606
.92	3.073	3.791	4.416	5.226	5.944	6.661	7.379	8.097	8.814	9.532
.94	3.888	4.870	5.853	6.835	7.818	8.800	9.783	10.766	11.748	12.731
.945	4.182	5.261	6.340	7.419	8.497	9.576	10.655	11.734	12.813	13.892
.95	4.534	5.728	6.923	8.118	9.312	10.507	11.701	12.896	14.090	15.285
.96	5.498	7.011	8.524	9.940	11.549	13.062	14.574	16.087		
.97	7.099	9.142	11.185	13.228	15.271					
.975	8.377	10.844	13.312	15.779						
.977	9.043	11.732	14.421							
.98	10.292	13.396								
1.00	Infinity	Infinity	Infinity	Infinity	Infinity	Infinity	Infinity	Infinity	Infinity	Infinity



Foster. Longbotton.