NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

TECHNICAL NOTE

No. 1777

DIRECT-READING DESIGN CHARTS FOR 24S-T ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL STRAIGHT-WEB Y-SECTION STIFFENERS

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Langley Field, Va.

Washington
January 1949

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SUMMARY

Direct-reading design charts are presented for 24S-T aluminum-alloy flat compression panels having longitudinal straight-web Y-section stiffeners. These charts make possible the direct determination of the stress and all the panel proportions required to carry a given intensity of loading with a given skin thickness and effective length of panel.

INTRODUCTION

Design charts for wing compression panels have been presented in several different forms. (See references 1 and 2.) In reference 3, a form was developed which permitted the direct selection of proportions for given values of the principal design conditions - intensity of loading, skin thickness, and effective length of panel. This form also made possible the ready determination of the proportions having minimum weight to meet these conditions. The charts presented in reference 3 covered 75S-T aluminum-alloy flat compression panels having longitudinal straight-web Y-section stiffeners. Similar charts for 24S-T aluminum-alloy panels with formed Z-section stiffeners are presented in reference 4 and direct-reading design charts for 24S-T aluminum-alloy Y-stiffened panels are presented herein.

SYMBOLS

The symbols used for the panel dimensions are given in figure 1. In addition, the following symbols are used:

c coefficient of end fixity as used in Euler column formula

d rivet diameter, inches

L length of panel, inches

p rivet pitch, inches

P_i compressive load per inch of panel width, kips per inch

r all fillet radii, inches

$\bar{t}$ cross-sectional area per inch of panel width, expressed as an equivalent or average thickness, inches

ρ radius of gyration, inches

$\bar{\sigma}_f$ average stress at failing load, ksi

σ_{cr} stress for local buckling of sheet, ksi

σ_{cy} compressive yield stress, ksi

DIRECT-READING DESIGN CHARTS

Direct-reading design charts for 24S-T aluminum-alloy flat compression panels with longitudinal straight-web Y-section stiffeners having the properties and proportions given in tables 1 to 6 are presented in two forms in figures 2 to 11. In the first form (figs. 2 to 6), the design conditions of intensity of loading, effective length of panel, and skin thickness are incorporated in the ordinate P_i/t_S and the abscissa $\frac{P_i}{L/\sqrt{c}}$. This form, having the design conditions incorporated in the ordinate and abscissa, is the more useful for most design purposes because the curves are more widely spaced and interpolation is more straightforward. In the second (alternate) form (figs. 7 to 11), the average stress at failure $\bar{\sigma}_f$ is plotted against P_i/t_S as was done in the summary plots of reference 5. This alternate form, having the stress – an inverse measure of weight for a given load – as ordinate, is the more useful for making generalizations and comparisons of structural efficiency because it shows how nearly the stress actually carried approaches the upper limit corresponding to the stress that would be achieved by a pure shell construction if a pure shell could carry the load without failure. This upper limit of stress is represented by the lines for $\bar{\sigma}_f = \frac{P_i}{t_S}$ (infinite stiffener spacing) in figures 7 to 11.

Values of the ratios of stiffener thickness to skin thickness t_W/t_S, average spacing of rivet lines to skin thickness S/t_S (because there are two rivet lines associated with each Y-section, the stiffener spacing equals 2S), and height of stiffener to stiffener thickness H/t_W, which will satisfy the design conditions, may be found directly from these charts, and the corresponding section properties $\bar{t}/t_S$, $\bar{h}/t_S$, and ρ/t_S may be found from tables 2 to 6. In the first form of design chart (figs. 2 to 6) dashed lines are used to indicate values of average stress at failure $\bar{\sigma}_f$; whereas, on the alternate form of design chart (figs. 7 to 11) dashed lines are used to indicate values of $\frac{P_i}{L/\sqrt{c}}$. In both forms the value of $\bar{\sigma}_f$ corresponding to the point at which each curve is cut by a short heavy line is the value of the stress for local buckling σ_{cr} for the proportions represented by the curve. For example, the value of σ_{cr} for $\frac{H}{t_W} = 33.8$ and $\frac{S}{t_S} = 16.2$ in figure 2 is approximately 41.3 ksi. (Only a very short panel of these proportions would buckle before failure – one having a value of $\frac{P_i}{L/\sqrt{c}} \geqq 0.60$.) If the value of σ_{cr} is so low that the short heavy line would fall outside the boundaries of the chart, a numerical value of σ_{cr} is given and is associated with the proper proportions by a leader to the curve. The panel proportions which have minimum weight are indicated on both forms of these charts by the use of colors as follows:

(1) If the proportions correspond to a blue region, they are the proportions which give the lightest possible 24S-T Y-stiffened panel which will meet the design conditions

(2) If the proportions correspond to a red region, they are the lightest possible at the ratio of stiffener thickness to skin thickness given by that particular chart, but some other thickness ratio would give a lighter design

(3) If the proportions correspond to a white region, the proportions meet the design conditions, but they are not the lightest which will meet the conditions

Because in many cases the proportions may be varied somewhat from those indicated by the red and blue regions with little change in the value of the stress that can be carried, too much importance should not be attached to the exact proportions indicated by the colors to have minimum weight. In any particular case for which a deviation from the minimum-weight proportions is made, however, caution dictates that the weight penalty associated with this deviation be determined.

The direct-reading design charts presented herein were developed in the manner described in reference 3 from the test data and resulting curves given in reference 5.

USE OF THE DIRECT-READING DESIGN CHARTS

The manner of using the direct-reading design charts depends in some measure on the desired degree of precision of interpolation among the curves. For many purposes, interpolation by inspection is of adequate accuracy, and the use of the charts requires only the calculation of the values of the design parameters P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ to permit the desired proportions to be read directly from the curves. The proportions for minimum weight, moreover, may be found directly as those corresponding to the blue region on the curves.

If more accurate interpolation is desired, a plot can readily be made of H/t_W, $\bar{\sigma}_f$, and σ_{cr} against S/t_S at the given values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ and the proportions can be picked from it. (This plot is similar to that which results from the use of the minimum-weight design procedure with the previously available design charts as illustrated in reference 2.) On a plot of this type, the proportions for minimum weight correspond to those associated with the highest value of $\bar{\sigma}_f$.

As a check on the accuracy of interpolation, the cross-sectional area per inch of width of the design may be determined from the values of $\bar{t}/t_S$ given in tables 2 to 6 and the value of the intensity of loading P_i that can be carried on this cross-sectional area per inch at the value of $\bar{\sigma}_f$ given by the charts may then be compared with the design value of P_i.

ILLUSTRATIVE EXAMPLE

In order to illustrate the use of the direct-reading design charts and the simplicity of the computations associated with them, a panel will be designed for minimum weight to meet the same principal design conditions used to illustrate the design procedures in reference 2, namely:

1. Intensity of loading $P_i = 3.0$ kips per inch

2. Skin thickness $t_S = 0.064$ inch

3. Effective length $L/\sqrt{c} = 20$ inches

As was pointed out in reference 5, an intensity of loading as small as 3.0 kips per inch may require a stiffener thickness smaller than can be successfully extruded. The value of P_i of 3.0 kips per inch is retained for the example, however, in order to provide a ready comparison with the examples of reference 2.

First the values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ are calculated

$$\frac{P_i}{t_S} = \frac{3.0}{0.064}$$

$$= 46.9 \text{ ksi}$$

$$\frac{P_i}{L/\sqrt{c}} = \frac{3.0}{20/\sqrt{1}}$$

$$= 0.15 \text{ ksi}$$

Then a trial value of t_W/t_S is assumed $\left(\text{for the example } \frac{t_W}{t_S} = 0.51 \text{ will be used}\right)$. In the chart for this value of t_W/t_S (fig. 3) the points corresponding to the design values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ lie above the red line at $\frac{H}{t_W} \leqq 44.6$ $\left(\text{or } \frac{b_W}{t_W} \leqq 24\right)$, below the red line at $\frac{H}{t_W} \geqq 55.3$ $\left(\text{or } \frac{b_W}{t_W} \geqq 30\right)$, and very nearly on the red line at $\frac{H}{t_W} = 49.9$ $\left(\text{or } \frac{b_W}{t_W} = 27\right)$. Accordingly, the value of H/t_W for minimum weight for $\frac{t_W}{t_S} = 0.51$ lies between 44.6 and 55.3, and because the values are established by red lines, not blue lines, some value of t_W/t_S other than 0.51 will give less weight. Inspection of the charts for other values of t_W/t_S reveals that at the given design values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ the blue region lies between $\frac{H}{t_W} = 55.3$ and $\frac{H}{t_W} = 60.7$ on the chart for $\frac{t_W}{t_S} = 0.40$. By interpolation, the panel proportions corresponding to this blue region are found to be $\frac{H}{t_W} \approx 60.5$ $\left(\frac{b_W}{t_W} \approx 33\right)$ and $\frac{S}{t_S} \approx 27.0$ $\left(\frac{b_S}{t_S} \approx 38.0\right)$, and for these proportions $\bar{\sigma}_f \approx 31.3$ ksi and $\sigma_{cr} \approx 31.3$ ksi, which are the values for minimum weight. The actual panel dimensions can be calculated from these proportions as

$$t_W = \frac{t_W}{t_S} t_S$$

$$= 0.40(0.064)$$

$$\approx 0.025 \text{ inch}$$

$$H = \frac{H}{t_W} t_W$$

$$= 60.5(0.025)$$

$$= 1.51 \text{ inches}$$

$$S = \frac{S}{t_S} t_S$$

$$= 27.0(0.064)$$

$$= 1.73 \text{ inches}$$

and the section properties can be determined from table 2 as

$$\bar{h} = \frac{\bar{h}}{t_S} t_S$$

$$= 4.90(0.064)$$

$$= 0.314 \text{ inch}$$

$$\rho = \frac{\rho}{t_S} t_S$$

$$= 8.13(0.064)$$

$$= 0.521 \text{ inch}$$

In order to illustrate the use of the direct-reading design charts when more accuracy than that corresponding to interpolation by inspection is desired, a plot has been made (fig. 12) of the values of $\bar{\sigma}_f$, σ_{cr}, and H/t_W given by the charts at the design values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$. The proportions which give the highest value of $\bar{\sigma}_f$ can be readily selected from a plot of this kind. (For the example these proportions are so nearly the same as were obtained by inspection that the values will not be repeated; however, the flatness of the curve of $\bar{\sigma}_f$ against S/t_S in figure 12 shows that, for a fairly wide range of proportions for this particular design, the stress that could be carried would be substantially the same as that for minimum weight.)

As a check on the accuracy of interpolation, the magnitude of $\bar{t}/t_S$ for these proportions can be determined from table 2 and multiplied by the values of t_S and $\bar{\sigma}_f$ for the design. This product should be equal to the design value of P_i. For the example

$$\bar{\sigma}_f = 31.3 \text{ ksi}$$

$$\frac{\bar{t}}{t_S} = 1.500$$

and

$$P_i = \bar{\sigma}_f \bar{t}$$

$$= \bar{\sigma}_f \frac{\bar{t}}{t_S} t_S$$

$$= 31.3(1.500)(0.064)$$

$$= 3.0 \text{ kips per inch}$$

which agrees with the design value of P_i originally assumed.

Langley Aeronautical Laboratory
National Advisory Committee for Aeronautics
Langley Field, Va., July 30, 1948

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TABLE 1.- MATERIAL PROPERTIES AND PROPORTIONS OF

24S-T ALUMINUM-ALLOY PANELS HAVING EXTRUDED

STRAIGHT-WEB Y-SECTION STIFFENERS

[For details of stiffener proportions and diameter and pitch of rivets, see tables 2 to 6; for panel dimensions, see fig. 1]

Material properties		
	Aluminum alloy	σ_{cy} (ksi)
Sheet	24S-T	44.0
Stiffeners	24S-T	42.3

Proportions

$$\frac{b_W}{t_W} = 0.56 \frac{H}{t_W} - 0.89$$

$$\frac{H}{t_W} = 1.79 \frac{b_W}{t_W} + 1.6$$

$$\frac{b_S}{t_S} = \frac{2S}{t_S} - \left(0.58 \frac{H}{t_W} + 3.7\right) \frac{t_W}{t_S}$$

$$\frac{S}{t_S} = 0.5 \frac{b_S}{t_S} + \left(0.52 \frac{b_W}{t_W} + 2.3\right) \frac{t_W}{t_S}$$

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TABLE 2.- Y-PANEL PROPERTIES $\left[\frac{t_W}{t_S} = 0.40;\ \frac{b_A}{t_W} = 9.3;\ \frac{b_Y}{b_W} = 1.04;\ \frac{t_L}{t_W} = 1.06;\ \frac{b_L}{b_W} = 0.94;\ \frac{t_F}{t_W} = 2.13;\ \frac{b_F}{b_W} = 0.69;\ \frac{r}{t_W} = 1;\ \frac{d}{t_S} = 1.5;\ \frac{p}{t_S} = 4.6\right]$

$\frac{b_S}{t_S}$ \ $\frac{b_W}{t_W}$		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
23	$\frac{\bar{t}}{t_S}$	1.496	1.512	1.527	1.542	1.557	1.571	1.585	1.598	1.612	1.624	1.637	1.649	1.661	1.673	1.685	1.696
24		1.481	1.497	1.512	1.526	1.541	1.555	1.568	1.582	1.595	1.608	1.620	1.632	1.644	1.656	1.667	1.678
25		1.467	1.482	1.497	1.512	1.526	1.539	1.553	1.566	1.579	1.591	1.604	1.616	1.628	1.639	1.650	1.662
26		1.454	1.469	1.483	1.497	1.511	1.525	1.538	1.551	1.564	1.576	1.588	1.600	1.612	1.623	1.635	1.646
27		1.441	1.456	1.470	1.484	1.498	1.511	1.524	1.537	1.550	1.562	1.574	1.586	1.597	1.608	1.619	1.630
28		1.429	1.444	1.458	1.472	1.485	1.498	1.511	1.524	1.536	1.548	1.560	1.572	1.583	1.594	1.605	1.616
29		1.418	1.432	1.446	1.460	1.473	1.486	1.498	1.511	1.523	1.535	1.547	1.558	1.569	1.580	1.591	1.602
30		1.407	1.421	1.435	1.448	1.461	1.474	1.486	1.499	1.511	1.522	1.534	1.545	1.556	1.567	1.578	1.589
31		1.397	1.411	1.424	1.437	1.450	1.463	1.475	1.487	1.499	1.510	1.522	1.533	1.544	1.555	1.565	1.576
32		1.388	1.401	1.414	1.427	1.440	1.452	1.464	1.476	1.488	1.499	1.510	1.521	1.532	1.543	1.553	1.564
33		1.378	1.391	1.404	1.417	1.430	1.442	1.454	1.465	1.477	1.488	1.499	1.510	1.521	1.531	1.542	1.552
34		1.370	1.382	1.395	1.408	1.420	1.432	1.444	1.455	1.467	1.478	1.489	1.500	1.510	1.521	1.531	1.541
35		1.361	1.374	1.386	1.399	1.411	1.423	1.434	1.446	1.457	1.468	1.479	1.489	1.500	1.510	1.520	1.530
36		1.353	1.366	1.378	1.390	1.402	1.414	1.425	1.436	1.447	1.458	1.469	1.479	1.490	1.500	1.510	1.520
37		1.346	1.358	1.370	1.382	1.394	1.405	1.416	1.427	1.438	1.449	1.460	1.470	1.480	1.490	1.500	1.510
38		1.338	1.350	1.362	1.374	1.385	1.397	1.400	1.419	1.430	1.440	1.451	1.461	1.471	1.481	1.491	1.500
39		1.331	1.343	1.355	1.366	1.378	1.389	1.392	1.411	1.421	1.432	1.442	1.452	1.462	1.472	1.482	1.491
40		1.324	1.336	1.348	1.359	1.370	1.381	1.389	1.403	1.413	1.424	1.434	1.444	1.454	1.463	1.473	1.482
42		1.312	1.323	1.334	1.345	1.356	1.367	1.378	1.388	1.398	1.408	1.418	1.428	1.437	1.447	1.456	1.465
44		1.300	1.311	1.322	1.333	1.343	1.354	1.364	1.374	1.384	1.394	1.403	1.413	1.422	1.432	1.441	1.450
46		1.289	1.300	1.310	1.321	1.331	1.341	1.351	1.361	1.371	1.380	1.390	1.399	1.408	1.417	1.426	1.435
48		1.279	1.289	1.300	1.310	1.320	1.330	1.339	1.349	1.359	1.368	1.377	1.386	1.395	1.404	1.413	1.421
50		1.270	1.280	1.289	1.300	1.309	1.319	1.328	1.338	1.347	1.356	1.365	1.374	1.383	1.391	1.400	1.408
52		1.261	1.271	1.280	1.290	1.299	1.309	1.318	1.327	1.336	1.345	1.354	1.363	1.371	1.380	1.388	1.396
54		1.252	1.261	1.272	1.281	1.290	1.299	1.308	1.317	1.326	1.335	1.343	1.352	1.360	1.369	1.377	1.385
56		1.245	1.254	1.263	1.272	1.282	1.290	1.299	1.308	1.317	1.325	1.334	1.342	1.350	1.358	1.366	1.374
58		1.237	1.247	1.256	1.265	1.273	1.282	1.291	1.299	1.308	1.316	1.324	1.332	1.340	1.348	1.356	1.364
60		1.231	1.239	1.248	1.257	1.266	1.274	1.283	1.291	1.299	1.307	1.315	1.323	1.331	1.339	1.347	1.354
63		1.221	1.230	1.238	1.246	1.255	1.263	1.271	1.279	1.287	1.295	1.303	1.311	1.318	1.326	1.333	1.341
66		1.212	1.220	1.229	1.237	1.245	1.253	1.261	1.269	1.276	1.284	1.291	1.299	1.306	1.314	1.321	1.328
69		1.204	1.212	1.220	1.228	1.236	1.243	1.251	1.259	1.266	1.273	1.281	1.288	1.295	1.302	1.309	1.316
72		1.196	1.204	1.212	1.220	1.227	1.235	1.242	1.249	1.257	1.264	1.271	1.278	1.285	1.292	1.299	1.306
75		1.189	1.197	1.204	1.212	1.219	1.226	1.234	1.241	1.248	1.255	1.262	1.269	1.275	1.282	1.289	1.295
78		1.183	1.190	1.197	1.205	1.212	1.219	1.226	1.233	1.240	1.246	1.253	1.260	1.266	1.273	1.279	1.286
81		1.177	1.184	1.191	1.198	1.205	1.212	1.218	1.225	1.232	1.238	1.245	1.252	1.258	1.264	1.271	1.277
84		1.171	1.178	1.185	1.192	1.198	1.205	1.212	1.218	1.225	1.231	1.237	1.244	1.250	1.256	1.262	1.269
23	$\frac{\bar{h}}{t_S}$	2.788	2.979	3.172	3.369	3.571	3.773	3.979	4.185	4.398	4.607	4.823	5.038	5.256	5.477	5.700	5.922
24		2.741	2.931	3.122	3.314	3.514	3.715	3.914	4.122	4.330	4.541	4.752	4.965	5.181	5.401	5.619	5.839
25		2.697	2.881	3.071	3.264	3.459	3.654	3.856	4.059	4.265	4.470	4.683	4.895	5.110	5.323	5.539	5.763
26		2.655	2.838	3.022	3.210	3.403	3.600	3.797	3.998	4.203	4.406	4.613	4.824	5.037	5.249	5.468	5.686
27		2.612	2.793	2.976	3.162	3.354	3.545	3.741	3.940	4.143	4.346	4.551	4.760	4.971	5.178	5.391	5.607
28		2.572	2.751	2.932	3.118	3.304	3.494	3.688	3.886	4.083	4.284	4.488	4.695	4.901	5.110	5.322	5.537
29		2.534	2.709	2.888	3.072	3.257	3.445	3.634	3.830	4.026	4.225	4.428	4.629	4.834	5.041	5.252	5.465
30		2.496	2.669	2.847	3.026	3.209	3.396	3.583	3.778	3.972	4.166	4.367	4.567	4.770	4.977	5.186	5.398
31		2.461	2.633	2.805	2.983	3.164	3.350	3.535	3.725	3.918	4.110	4.310	4.509	4.711	4.916	5.118	5.329
32		2.429	2.596	2.767	2.943	3.123	3.303	3.487	3.675	3.867	4.058	4.252	4.449	4.650	4.854	5.055	5.265
33		2.393	2.558	2.728	2.902	3.081	3.260	3.443	3.625	3.816	4.005	4.198	4.394	4.594	4.791	4.996	5.199
34		2.364	2.524	2.692	2.865	3.039	3.217	3.398	3.579	3.768	3.957	4.145	4.343	4.536	4.738	4.937	5.139
35		2.330	2.493	2.656	2.828	3.000	3.177	3.353	3.537	3.720	3.907	4.098	4.286	4.484	4.678	4.876	5.077
36		2.300	2.462	2.624	2.790	2.961	3.136	3.311	3.490	3.672	3.857	4.047	4.234	4.430	4.624	4.821	5.020
37		2.274	2.430	2.591	2.756	2.926	3.096	3.269	3.446	3.627	3.812	4.000	4.186	4.376	4.568	4.764	4.963
38		2.243	2.398	2.558	2.722	2.886	3.059	3.193	3.407	3.587	3.766	3.953	4.138	4.326	4.518	4.713	4.904
39		2.216	2.370	2.528	2.687	2.855	3.022	3.154	3.368	3.542	3.724	3.905	4.089	4.276	4.467	4.660	4.851
40		2.189	2.341	2.499	2.656	2.818	2.984	3.140	3.328	3.501	3.682	3.862	4.045	4.231	4.415	4.608	4.797
42		2.141	2.287	2.438	2.594	2.754	2.917	3.086	3.252	3.423	3.597	3.775	3.956	4.134	4.322	4.506	4.694
44		2.092	2.237	2.386	2.539	2.692	2.854	3.015	3.180	3.349	3.521	3.691	3.870	4.046	4.232	4.415	4.601
46		2.047	2.190	2.332	2.484	2.635	2.790	2.949	3.112	3.278	3.443	3.617	3.788	3.963	4.141	4.321	4.505
48		2.005	2.141	2.287	2.432	2.581	2.734	2.886	3.047	3.212	3.375	3.541	3.711	3.884	4.060	4.239	4.415
50		1.967	2.102	2.236	2.384	2.526	2.678	2.828	2.987	3.145	3.306	3.470	3.638	3.809	3.977	4.155	4.329
52		1.928	2.061	2.194	2.335	2.476	2.626	2.774	2.926	3.082	3.241	3.404	3.571	3.734	3.907	4.076	4.248
54		1.889	2.015	2.156	2.291	2.430	2.573	2.719	2.870	3.024	3.182	3.337	3.502	3.663	3.835	4.002	4.173
56		1.858	1.983	2.112	2.245	2.388	2.524	2.669	2.819	2.971	3.122	3.281	3.438	3.598	3.761	3.927	4.096
58		1.822	1.950	2.078	2.210	2.341	2.481	2.624	2.766	2.918	3.066	3.218	3.374	3.532	3.694	3.858	4.026
60		1.795	1.912	2.038	2.169	2.303	2.437	2.579	2.719	2.863	3.010	3.161	3.315	3.472	3.632	3.795	3.954
63		1.749	1.869	1.988	2.112	2.244	2.375	2.510	2.648	2.789	2.935	3.083	3.235	3.383	3.541	3.696	3.860
66		1.707	1.820	1.943	2.064	2.189	2.318	2.451	2.587	2.721	2.864	3.004	3.154	3.300	3.456	3.608	3.763
69		1.669	1.780	1.896	2.016	2.139	2.260	2.391	2.525	2.657	2.792	2.937	3.078	3.222	3.369	3.520	3.673
72		1.630	1.740	1.854	1.972	2.088	2.213	2.336	2.463	2.599	2.732	2.868	3.008	3.150	3.296	3.444	3.596
75		1.597	1.705	1.812	1.928	2.042	2.160	2.287	2.412	2.540	2.672	2.806	2.944	3.077	3.221	3.368	3.510
78		1.567	1.669	1.774	1.889	2.001	2.118	2.237	2.361	2.487	2.610	2.743	2.879	3.011	3.153	3.290	3.438
81		1.538	1.638	1.741	1.849	1.948	2.075	2.187	2.308	2.433	2.555	2.686	2.820	2.951	3.084	3.227	3.366
84		1.507	1.606	1.708	1.815	1.918	2.032	2.149	2.262	2.386	2.505	2.628	2.761	2.890	3.021	3.156	3.301
23	$\frac{\rho}{t_S}$	4.393	4.684	4.974	5.266	5.560	5.846	6.133	6.427	6.725	7.003	7.299	7.585	7.879	8.158	8.444	8.708
24		4.361	4.650	4.940	5.232	5.524	5.809	6.094	6.390	6.686	6.966	7.247	7.545	7.840	8.118	8.402	8.667
25		4.329	4.616	4.905	5.197	5.488	5.771	6.058	6.352	6.647	6.925	7.221	7.506	7.801	8.077	8.361	8.628
26		4.297	4.584	4.871	5.160	5.451	5.736	6.021	6.314	6.609	6.887	7.181	7.466	7.760	8.037	8.323	8.588
27		4.266	4.552	4.838	5.127	5.418	5.700	5.984	6.278	6.573	6.851	7.144	7.429	7.721	7.997	8.281	8.546
28		4.235	4.521	4.807	5.094	5.383	5.665	5.949	6.243	6.535	6.813	7.106	7.391	7.682	7.959	8.243	8.508
29		4.206	4.489	4.775	5.063	5.350	5.632	5.913	6.206	6.498	6.776	7.069	7.351	7.643	7.919	8.203	8.468
30		4.175	4.458	4.744	5.029	5.316	5.598	5.878	6.171	6.463	6.738	7.031	7.313	7.604	7.881	8.165	8.430
31		4.147	4.429	4.712	4.996	5.283	5.565	5.846	6.135	6.427	6.702	6.995	7.277	7.568	7.844	8.125	8.391
32		4.121	4.400	4.684	4.966	5.253	5.531	5.812	6.101	6.392	6.667	6.957	7.239	7.530	7.806	8.087	8.353
33		4.090	4.369	4.651	4.935	5.221	5.500	5.780	6.066	6.357	6.632	6.921	7.203	7.494	7.767	8.051	8.314
34		4.066	4.341	4.622	4.906	5.189	5.467	5.747	6.033	6.324	6.598	6.888	7.170	7.457	7.734	8.014	8.278
35		4.037	4.315	4.593	4.876	5.159	5.437	5.713	6.000	6.290	6.564	6.853	7.132	7.422	7.696	7.976	8.240
36		4.011	4.288	4.566	4.845	5.128	5.406	5.682	5.966	6.254	6.529	6.818	7.096	7.387	7.660	7.941	8.204
37		3.987	4.261	4.538	4.817	5.100	5.374	5.650	5.933	6.222	6.296	6.785	7.063	7.350	7.623	7.904	8.167
38		3.959	4.233	4.509	4.789	5.066	5.344	5.620	5.903	6.192	6.462	6.751	7.029	7.316	7.589	7.870	8.130
39		3.934	4.208	4.484	4.759	5.041	5.314	5.589	5.873	6.157	6.432	6.717	6.994	7.281	7.554	7.835	8.095
40		3.909	4.182	4.458	4.733	5.010	5.284	5.557	5.843	6.126	6.400	6.685	6.963	7.249	7.519	7.799	8.059
42		3.864	4.132	4.404	4.678	4.955	5.228	5.501	5.783	6.065	6.335	6.619	6.897	7.179	7.452	7.729	7.989
44		3.817	4.084	4.355	4.629	4.901	5.174	5.444	5.724	6.005	6.275	6.555	6.832	7.114	7.387	7.663	7.924
46		3.772	4.039	4.304	4.577	4.849	5.117	5.387	5.666	5.947	6.212	6.496	6.769	7.050	7.319	7.595	7.856
48		3.729	3.991	4.260	4.529	4.800	5.067	5.332	5.611	5.891	6.156	6.437	6.708	6.988	7.257	7.533	7.789
50		3.689	3.950	4.210	4.482	4.748	5.015	5.279	5.558	5.833	6.098	6.376	6.648	6.929	7.193	7.469	7.725
52		3.648	3.908	4.167	4.434	4.699	4.966	5.230	5.503	5.778	6.042	6.320	6.592	6.868	7.136	7.407	7.663
54		3.605	3.860	4.128	4.390	4.654	4.915	5.179	5.451	5.726	5.990	6.262	6.534	6.809	7.078	7.348	7.604
56		3.571	3.825	4.083	4.343	4.612	4.868	5.131	5.403	5.677	5.935	6.213	6.479	6.753	7.017	7.287	7.543
58		3.531	3.789	4.046	4.306	4.564	4.824	5.087	5.353	5.627	5.885	6.156	6.423	6.696	6.959	7.219	7.485
60		3.499	3.747	4.003	4.262	4.525	4.779	5.042	5.307	5.575	5.833	6.104	6.369	6.643	6.906	7.176	7.426
63		3.446	3.697	3.947	4.204	4.462	4.715	4.971	5.236	5.503	5.760	6.032	6.296	6.563	6.826	7.089	7.345
66		3.395	3.640	3.895	4.147	4.401	4.655	4.910	5.174	5.434	5.691	5.954	6.219	6.485	6.748	7.011	7.261
69		3.348	3.592	3.840	4.091	4.346	4.591	4.846	5.109	5.353	5.618	5.888	6.146	6.412	6.667	6.930	7.179
72		3.300	3.543	3.790	4.040	4.287	4.539	4.786	5.042	5.307	5.557	5.819	6.077	6.342	6.597	6.859	7.109
75		3.256	3.498	3.738	3.987	4.234	4.478	4.731	4.986	5.244	5.493	5.754	6.012	6.269	6.524	6.786	7.028
78		3.218	3.452	3.691	3.940	4.185	4.428	4.674	4.929	5.186	5.427	5.688	5.944	6.201	6.456	6.710	6.959
81		3.178	3.411	3.649	3.890	4.138	4.377	4.616	4.869	5.126	5.366	5.626	5.883	6.139	6.385	6.647	6.888
84		3.137	3.369	3.606	3.847	4.083	4.325	4.570	4.815	5.071	5.311	5.563	5.819	6.074	6.321	6.573	6.823

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TABLE 3.- Y-PANEL PROPERTIES $\left[\frac{t_W}{t_S}=0.51;\ \frac{b_A}{t_W}=9.3;\ \frac{b_Y}{b_W}=1.04;\ \frac{t_L}{t_W}=1.06;\ \frac{b_L}{b_W}=0.94;\ \frac{t_F}{t_W}=2.13;\ \frac{b_F}{b_W}=0.69;\ \frac{r}{t_W}=1;\ \frac{d}{t_S}=2.0;\ \frac{p}{t_S}=6.0\right]$

$\frac{b_S}{t_S}$ \ $\frac{b_W}{t_W}$		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
23	$\frac{\bar{t}}{t_S}$	1.749	1.770	1.792	1.812	1.832	1.852	1.871	1.889	1.907	1.924	1.941	1.958	1.974	1.989	2.004	2.019
24		1.728	1.749	1.770	1.790	1.810	1.829	1.848	1.866	1.884	1.901	1.918	1.934	1.950	1.966	1.981	1.996
25		1.708	1.729	1.750	1.770	1.789	1.808	1.827	1.845	1.862	1.880	1.896	1.912	1.928	1.944	1.959	1.974
26		1.689	1.710	1.730	1.750	1.769	1.788	1.807	1.824	1.842	1.859	1.875	1.891	1.907	1.923	1.938	1.952
27		1.671	1.692	1.712	1.731	1.750	1.769	1.787	1.805	1.822	1.839	1.855	1.871	1.887	1.902	1.917	1.932
28		1.654	1.674	1.694	1.714	1.732	1.751	1.769	1.786	1.803	1.820	1.836	1.852	1.868	1.883	1.898	1.912
29		1.638	1.658	1.678	1.697	1.715	1.734	1.751	1.769	1.785	1.802	1.818	1.834	1.849	1.864	1.879	1.893
30		1.623	1.642	1.662	1.681	1.699	1.717	1.734	1.752	1.768	1.785	1.801	1.816	1.832	1.847	1.861	1.875
31		1.608	1.628	1.647	1.665	1.683	1.701	1.718	1.735	1.752	1.768	1.784	1.799	1.815	1.829	1.844	1.858
32		1.594	1.613	1.632	1.650	1.668	1.686	1.703	1.720	1.736	1.752	1.768	1.783	1.798	1.813	1.827	1.841
33		1.581	1.600	1.618	1.636	1.654	1.671	1.688	1.705	1.721	1.737	1.752	1.768	1.783	1.797	1.811	1.826
34		1.568	1.587	1.605	1.623	1.640	1.657	1.674	1.691	1.707	1.722	1.738	1.753	1.767	1.782	1.796	1.810
35		1.556	1.574	1.592	1.610	1.627	1.644	1.661	1.677	1.693	1.708	1.723	1.738	1.753	1.767	1.781	1.795
36		1.544	1.562	1.580	1.598	1.615	1.631	1.648	1.664	1.679	1.695	1.710	1.725	1.739	1.753	1.767	1.781
37		1.533	1.551	1.569	1.586	1.602	1.619	1.635	1.651	1.666	1.682	1.697	1.711	1.726	1.740	1.753	1.767
38		1.522	1.540	1.557	1.574	1.591	1.607	1.623	1.639	1.654	1.669	1.684	1.698	1.713	1.727	1.740	1.754
39		1.512	1.529	1.546	1.563	1.580	1.596	1.611	1.627	1.642	1.657	1.672	1.686	1.700	1.714	1.727	1.741
40		1.502	1.519	1.536	1.553	1.569	1.585	1.600	1.616	1.631	1.645	1.660	1.674	1.688	1.702	1.715	1.728
42		1.483	1.500	1.516	1.533	1.548	1.564	1.579	1.594	1.609	1.623	1.637	1.651	1.665	1.679	1.692	1.705
44		1.466	1.482	1.498	1.514	1.529	1.545	1.559	1.574	1.589	1.603	1.617	1.630	1.644	1.657	1.670	1.683
46		1.450	1.466	1.481	1.497	1.512	1.526	1.541	1.555	1.569	1.583	1.597	1.610	1.623	1.636	1.649	1.662
48		1.435	1.450	1.465	1.480	1.495	1.510	1.524	1.538	1.552	1.565	1.579	1.592	1.605	1.617	1.630	1.642
50		1.420	1.436	1.451	1.465	1.480	1.494	1.508	1.521	1.535	1.548	1.561	1.574	1.587	1.599	1.612	1.624
52		1.407	1.422	1.437	1.450	1.465	1.479	1.492	1.506	1.519	1.532	1.545	1.558	1.570	1.582	1.594	1.606
54		1.394	1.409	1.423	1.437	1.451	1.465	1.478	1.491	1.504	1.517	1.530	1.542	1.554	1.566	1.578	1.590
56		1.383	1.397	1.411	1.425	1.438	1.452	1.465	1.478	1.490	1.503	1.515	1.527	1.539	1.551	1.563	1.574
58		1.372	1.386	1.399	1.413	1.426	1.439	1.452	1.464	1.477	1.489	1.501	1.513	1.525	1.537	1.548	1.559
60		1.362	1.375	1.388	1.402	1.414	1.427	1.440	1.452	1.464	1.476	1.488	1.500	1.511	1.523	1.534	1.545
63		1.347	1.360	1.373	1.386	1.398	1.411	1.423	1.435	1.447	1.459	1.470	1.481	1.493	1.504	1.515	1.525
66		1.334	1.346	1.359	1.371	1.383	1.395	1.407	1.419	1.430	1.442	1.453	1.464	1.475	1.486	1.496	1.507
69		1.321	1.334	1.346	1.358	1.369	1.381	1.393	1.404	1.415	1.426	1.437	1.448	1.459	1.469	1.480	1.490
72		1.310	1.322	1.333	1.345	1.356	1.368	1.379	1.390	1.401	1.412	1.422	1.433	1.443	1.454	1.464	1.474
75		1.299	1.311	1.322	1.333	1.344	1.355	1.366	1.377	1.388	1.398	1.409	1.419	1.429	1.439	1.449	1.459
78		1.289	1.300	1.311	1.322	1.333	1.344	1.354	1.365	1.375	1.386	1.396	1.406	1.416	1.425	1.435	1.445
81		1.280	1.291	1.301	1.312	1.323	1.333	1.343	1.354	1.364	1.374	1.383	1.393	1.403	1.413	1.422	1.431
84		1.271	1.281	1.292	1.302	1.313	1.323	1.333	1.343	1.353	1.362	1.372	1.382	1.391	1.400	1.410	1.419
23	$\frac{\bar{h}}{t_S}$	4.209	4.502	4.803	5.103	5.409	5.719	6.031	6.344	6.661	6.979	7.300	7.626	7.951	8.275	8.603	8.934
24		4.149	4.439	4.735	5.035	5.337	5.642	5.952	6.263	6.578	6.894	7.214	7.533	7.857	8.183	8.509	8.838
25		4.091	4.378	4.672	4.968	5.267	5.570	5.878	6.187	6.497	6.815	7.129	7.447	7.768	8.093	8.417	8.796
26		4.034	4.319	4.608	4.902	5.198	5.500	5.806	6.110	6.422	6.734	7.046	7.362	7.682	8.005	8.328	8.650
27		3.978	4.262	4.549	4.838	5.132	5.432	5.733	6.038	6.344	6.655	6.965	7.280	7.598	7.916	8.237	8.561
28		3.925	4.204	4.488	4.779	5.068	5.366	5.665	5.965	6.269	6.578	6.887	7.200	7.517	7.833	8.152	8.470
29		3.874	4.151	4.433	4.719	5.006	5.302	5.596	5.898	6.197	6.504	6.811	7.123	7.434	7.748	8.066	8.383
30		3.825	4.096	4.378	4.661	4.947	5.237	5.529	5.830	6.127	6.433	6.739	7.044	7.358	7.671	7.983	8.298
31		3.775	4.048	4.324	4.602	4.886	5.175	5.465	5.760	6.060	6.360	6.664	6.968	7.281	7.587	7.903	8.216
32		3.728	3.996	4.270	4.546	4.828	5.116	5.405	5.698	5.992	6.291	6.593	6.896	7.202	7.512	7.821	8.133
33		3.683	3.949	4.218	4.493	4.774	5.056	5.343	5.635	5.927	6.224	6.521	6.826	7.131	7.435	7.743	8.059
34		3.638	3.902	4.170	4.443	4.718	4.998	5.284	5.574	5.865	6.156	6.456	6.756	7.055	7.362	7.668	7.978
35		3.595	3.854	4.120	4.392	4.665	4.944	5.228	5.513	5.803	6.092	6.386	6.684	6.986	7.287	7.592	7.901
36		3.552	3.810	4.074	4.344	4.616	4.889	5.172	5.455	5.739	6.032	6.324	6.621	6.917	7.217	7.520	7.828
37		3.512	3.768	4.030	4.295	4.561	4.837	5.114	5.396	5.679	5.970	6.261	6.552	6.852	7.150	7.447	7.753
38		3.471	3.725	3.983	4.246	4.515	4.785	5.061	5.341	5.622	5.908	6.198	6.487	6.785	7.082	7.378	7.683
39		3.433	3.682	3.938	4.200	4.467	4.736	5.006	5.285	5.565	5.849	6.138	6.426	6.718	7.014	7.308	7.612
40		3.395	3.643	3.897	4.157	4.419	4.687	4.955	5.233	5.512	5.790	6.077	6.364	6.655	6.949	7.243	7.540
42		3.321	3.566	3.813	4.071	4.326	4.591	4.857	5.127	5.403	5.678	5.958	6.243	6.531	6.824	7.115	7.409
44		3.253	3.492	3.736	3.987	4.239	4.502	4.760	5.028	5.302	5.575	5.852	6.129	6.415	6.700	6.989	7.281
46		3.188	3.424	3.662	3.910	4.160	4.410	4.671	4.932	5.198	5.468	5.744	6.018	6.296	6.579	6.865	7.156
48		3.126	3.355	3.590	3.831	4.078	4.332	4.585	4.844	5.107	5.370	5.644	5.916	6.192	6.466	6.751	7.033
50		3.062	3.293	3.526	3.760	4.005	4.251	4.502	4.753	5.015	5.276	5.541	5.811	6.085	6.358	6.640	6.920
52		3.006	3.230	3.460	3.688	3.930	4.174	4.418	4.672	4.926	5.185	5.448	5.716	5.982	6.253	6.527	6.805
54		2.948	3.170	3.394	3.623	3.859	4.101	4.342	4.589	4.841	5.098	5.359	5.619	5.883	6.152	6.424	6.700
56		2.899	3.114	3.335	3.563	3.792	4.031	4.271	4.516	4.760	5.015	5.268	5.526	5.788	6.055	6.326	6.594
58		2.848	3.062	3.276	3.502	3.729	3.961	4.198	4.436	4.683	4.930	5.182	5.438	5.698	5.963	6.225	6.491
60		2.802	3.009	3.221	3.445	3.664	3.895	4.130	4.365	4.606	4.850	5.100	5.354	5.607	5.870	6.130	6.394
63		2.731	2.935	3.145	3.360	3.577	3.804	4.032	4.264	4.502	4.744	4.985	5.230	5.486	5.740	5.998	6.252
66		2.669	2.864	3.072	3.279	3.493	3.712	3.937	4.166	4.395	4.635	4.873	5.116	5.363	5.614	5.862	6.122
69		2.605	2.803	3.002	3.208	3.413	3.630	3.852	4.073	4.299	4.530	4.766	5.006	5.250	5.492	5.745	5.995
72		2.550	2.740	2.932	3.134	3.337	3.552	3.765	3.984	4.208	4.436	4.663	4.901	5.136	5.382	5.626	5.873
75		2.494	2.682	2.871	3.066	3.266	3.472	3.683	3.900	4.121	4.341	4.572	4.800	5.033	5.270	5.511	5.757
78		2.442	2.623	2.809	3.002	3.200	3.403	3.606	3.820	4.033	4.257	4.479	4.705	4.936	5.163	5.403	5.646
81		2.395	2.573	2.752	2.942	3.138	3.334	3.534	3.746	3.957	4.172	4.384	4.609	4.837	5.070	5.300	5.533
84		2.347	2.518	2.700	2.882	3.076	3.270	3.468	3.671	3.880	4.085	4.303	4.525	4.744	4.967	5.203	5.434
23	$\frac{\rho}{t_S}$	6.055	6.435	6.822	7.210	7.594	7.976	8.361	8.739	9.128	9.492	9.878	10.25	10.64	10.99	11.36	11.70
24		6.024	6.410	6.789	7.177	7.562	7.942	8.327	8.705	9.094	9.458	9.845	10.22	10.60	10.96	11.33	11.67
25		5.993	6.372	6.758	7.146	7.529	7.909	8.295	8.673	9.060	9.426	9.809	10.18	10.57	10.93	11.30	11.64
26		5.963	6.342	6.725	7.113	7.496	7.876	8.262	8.639	9.028	9.392	9.777	10.15	10.53	10.89	11.26	11.60
27		5.932	6.311	6.695	7.081	7.464	7.844	8.228	8.607	8.994	9.359	9.744	10.12	10.50	10.86	11.23	11.57
28		5.902	6.279	6.663	7.051	7.432	7.812	8.196	8.573	8.960	9.325	9.710	10.08	10.47	10.83	11.20	11.54
29		5.873	6.250	6.633	7.019	7.400	7.781	8.163	8.542	8.927	9.292	9.678	10.05	10.43	10.79	11.16	11.50
30		5.844	6.219	6.602	6.988	7.370	7.748	8.130	8.509	8.895	9.260	9.645	10.02	10.40	10.76	11.13	11.47
31		5.814	6.191	6.573	6.953	7.337	7.716	8.098	8.475	8.863	9.226	9.612	9.982	10.37	10.73	11.10	11.44
32		5.786	6.160	6.541	6.925	7.306	7.685	8.067	8.444	8.829	9.193	9.579	9.949	10.33	10.69	11.06	11.40
33		5.758	6.132	6.511	6.895	7.276	7.652	8.035	8.412	8.797	9.161	9.544	9.917	10.30	10.66	11.03	11.37
34		5.729	6.104	6.482	6.866	7.245	7.621	8.003	8.381	8.766	9.128	9.513	9.884	10.27	10.63	10.99	11.34
35		5.719	6.074	6.453	6.836	7.215	7.591	7.977	8.348	8.734	9.096	9.479	9.850	10.23	10.59	10.96	11.30
36		5.674	6.045	6.424	6.807	7.186	7.560	7.942	8.317	8.700	9.065	9.448	9.819	10.20	10.56	10.93	11.27
37		5.647	6.019	6.397	6.778	7.154	7.530	7.910	8.285	8.668	9.033	9.416	9.785	10.17	10.53	10.90	11.24
38		5.619	5.991	6.367	6.747	7.126	7.500	7.880	8.255	8.638	9.000	9.384	9.752	10.14	10.50	10.86	11.21
39		5.594	5.963	6.338	6.719	7.097	7.471	7.848	8.223	8.606	8.969	9.352	9.721	10.01	10.46	10.83	11.17
40		5.567	5.936	6.311	6.692	7.067	7.441	7.818	8.194	8.578	8.936	9.320	9.689	10.01	10.43	10.80	11.14
42		5.515	5.883	6.254	6.636	7.008	7.382	7.759	8.132	8.514	8.875	9.255	9.625	10.01	10.37	10.73	11.08
44		5.465	5.831	6.198	6.580	6.952	7.326	7.700	8.072	8.455	8.815	9.196	9.563	9.944	10.30	10.67	11.01
46		5.417	5.782	6.150	6.527	6.899	7.266	7.643	8.013	8.392	8.753	9.152	9.500	9.879	10.24	10.61	10.95
48		5.369	5.730	6.098	6.471	6.890	7.214	7.587	7.957	8.336	8.694	9.075	9.441	9.820	10.18	10.54	10.89
50		5.319	5.683	6.051	6.418	6.792	7.159	7.532	7.898	8.277	8.635	9.013	9.379	9.758	10.11	10.49	10.82
52		5.274	5.634	6.001	6.367	6.738	7.105	7.474	7.844	8.220	8.577	8.955	9.322	9.697	10.05	10.42	10.76
54		5.226	5.587	5.950	6.318	6.686	7.053	7.422	7.787	8.163	8.521	8.898	9.262	9.637	9.993	10.36	10.70
56		5.185	5.541	5.904	6.272	6.636	7.002	7.371	7.736	8.108	8.466	8.839	9.203	9.578	9.934	10.30	10.64
58		5.142	5.498	5.856	6.224	6.587	6.949	7.318	7.679	8.055	8.409	8.782	9.146	9.521	9.877	10.24	10.58
60		5.102	5.453	5.811	6.178	6.537	6.899	7.267	7.629	7.999	8.354	8.727	9.090	9.461	9.818	10.18	10.52
63		5.044	5.389	5.746	6.109	6.467	6.829	7.193	7.553	7.924	8.278	8.647	9.006	9.381	9.734	10.10	10.43
66		4.981	5.326	5.683	6.041	6.398	6.755	7.118	7.479	7.845	8.199	8.567	8.926	9.297	9.650	10.01	10.35
69		4.921	5.270	5.622	5.979	6.331	6.683	7.050	7.406	7.771	8.120	8.488	8.847	9.218	9.566	9.929	10.27
72		4.868	5.212	5.558	5.914	6.265	6.621	6.979	7.334	7.699	8.048	8.411	8.770	9.135	9.489	9.846	10.18
75		4.813	5.156	5.501	5.851	6.202	6.553	6.910	7.265	7.629	7.973	8.341	8.694	9.059	9.408	9.765	10.10
78		4.761	5.098	5.442	5.792	6.140	6.492	6.843	7.198	7.556	7.906	8.268	8.621	8.986	9.329	9.686	10.02
81		4.713	5.049	5.387	5.736	6.086	6.429	6.780	7.134	7.492	7.836	8.192	8.545	8.909	9.258	9.610	9.942
84		4.662	4.992	5.335	5.678	6.021	6.370	6.720	7.068	7.426	7.763	8.125	8.478	8.836	9.179	9.536	9.868

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TABLE 4.- Y-PANEL PROPERTIES $\left[\frac{t_W}{t_S} = 0.63;\ \frac{b_A}{t_W} = 9.3;\ \frac{b_Y}{b_W} = 1.04;\ \frac{t_L}{t_W} = 1.06;\ \frac{b_L}{b_W} = 0.94;\ \frac{t_F}{t_W} = 2.13;\ \frac{b_F}{b_W} = 0.69;\ \frac{r}{t_W} = 1;\ \frac{d}{t_S} = 1.8;\ \frac{p}{t_S} = 6.1\right]$

b_S/t_S \ b_W/t_W		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
23	$\bar{t}/t_S$	2.059	2.080	2.115	2.142	2.167	2.192	2.216	2.240	2.263	2.285	2.306	2.327	2.347	2.366	2.385	2.404
24		2.031	2.059	2.087	2.113	2.139	2.164	2.188	2.211	2.234	2.255	2.277	2.297	2.318	2.337	2.357	2.375
25		2.005	2.033	2.060	2.086	2.112	2.136	2.160	2.184	2.206	2.228	2.249	2.270	2.290	2.309	2.328	2.347
26		1.980	2.008	2.035	2.061	2.086	2.110	2.134	2.157	2.180	2.201	2.222	2.243	2.263	2.282	2.301	2.320
27		1.956	1.984	2.010	2.036	2.061	2.085	2.109	2.132	2.154	2.176	2.197	2.217	2.238	2.257	2.276	2.294
28		1.934	1.961	1.987	2.013	2.038	2.062	2.085	2.108	2.130	2.151	2.172	2.193	2.213	2.232	2.251	2.269
29		1.912	1.939	1.965	1.990	2.015	2.039	2.062	2.085	2.107	2.128	2.149	2.169	2.189	2.208	2.227	2.245
30		1.892	1.918	1.944	1.969	1.993	2.017	2.040	2.062	2.084	2.106	2.126	2.146	2.166	2.185	2.205	2.222
31		1.872	1.898	1.924	1.948	1.973	1.996	2.019	2.041	2.063	2.084	2.104	2.125	2.144	2.163	2.182	2.200
32		1.853	1.879	1.904	1.929	1.953	1.976	1.999	2.021	2.042	2.063	2.084	2.104	2.123	2.142	2.161	2.179
33		1.835	1.861	1.886	1.910	1.934	1.957	1.979	2.001	2.022	2.043	2.064	2.083	2.110	2.122	2.140	2.158
34		1.818	1.843	1.868	1.892	1.915	1.938	1.960	1.982	2.003	2.024	2.044	2.064	2.083	2.102	2.120	2.138
35		1.801	1.826	1.851	1.874	1.898	1.920	1.942	1.964	1.985	2.005	2.025	2.045	2.064	2.083	2.101	2.120
36		1.785	1.810	1.834	1.858	1.881	1.903	1.925	1.946	1.967	1.988	2.007	2.027	2.046	2.064	2.083	2.100
37		1.770	1.794	1.818	1.842	1.864	1.887	1.908	1.929	1.950	1.970	1.990	2.009	2.028	2.047	2.065	2.082
38		1.755	1.779	1.803	1.826	1.849	1.871	1.892	1.913	1.934	1.954	1.973	1.992	2.011	2.029	2.047	2.065
39		1.741	1.765	1.788	1.811	1.834	1.855	1.877	1.897	1.918	1.938	1.957	1.976	1.995	2.013	2.031	2.048
40		1.727	1.751	1.774	1.797	1.819	1.840	1.861	1.882	1.902	1.922	1.941	1.959	1.979	1.997	2.014	2.032
42		1.702	1.725	1.747	1.769	1.791	1.812	1.833	1.853	1.873	1.892	1.911	1.930	1.948	1.966	1.983	2.001
44		1.678	1.700	1.722	1.744	1.765	1.786	1.806	1.826	1.845	1.865	1.883	1.902	1.919	1.937	1.954	1.971
46		1.655	1.677	1.699	1.720	1.741	1.761	1.781	1.801	1.820	1.838	1.857	1.875	1.892	1.910	1.927	1.944
48		1.634	1.656	1.677	1.698	1.718	1.738	1.757	1.777	1.795	1.814	1.832	1.850	1.867	1.884	1.901	1.917
50		1.614	1.635	1.656	1.677	1.696	1.716	1.735	1.754	1.772	1.791	1.808	1.826	1.843	1.860	1.876	1.893
52		1.596	1.616	1.637	1.657	1.676	1.695	1.714	1.733	1.751	1.769	1.786	1.803	1.820	1.837	1.853	1.869
54		1.578	1.599	1.619	1.638	1.657	1.676	1.695	1.713	1.731	1.748	1.765	1.782	1.799	1.815	1.831	1.847
56		1.562	1.582	1.601	1.620	1.639	1.657	1.676	1.694	1.711	1.728	1.745	1.762	1.778	1.794	1.810	1.826
58		1.546	1.566	1.585	1.604	1.622	1.640	1.658	1.676	1.693	1.710	1.726	1.743	1.759	1.775	1.790	1.806
60		1.532	1.551	1.569	1.588	1.606	1.624	1.641	1.658	1.675	1.692	1.708	1.725	1.740	1.756	1.772	1.787
63		1.511	1.529	1.548	1.566	1.583	1.601	1.618	1.634	1.651	1.667	1.683	1.699	1.714	1.730	1.745	1.759
66		1.492	1.510	1.528	1.545	1.562	1.579	1.597	1.612	1.628	1.644	1.659	1.675	1.690	1.705	1.720	1.734
69		1.474	1.491	1.509	1.526	1.543	1.559	1.575	1.591	1.607	1.622	1.637	1.653	1.667	1.682	1.696	1.711
72		1.458	1.475	1.491	1.508	1.524	1.540	1.556	1.572	1.587	1.602	1.617	1.632	1.646	1.660	1.674	1.688
75		1.442	1.459	1.475	1.491	1.507	1.523	1.538	1.553	1.568	1.583	1.598	1.612	1.626	1.640	1.654	1.668
78		1.428	1.444	1.460	1.476	1.491	1.506	1.521	1.536	1.551	1.565	1.579	1.594	1.607	1.621	1.635	1.648
81		1.415	1.430	1.446	1.461	1.476	1.491	1.506	1.520	1.534	1.548	1.562	1.576	1.590	1.603	1.616	1.629
84		1.402	1.417	1.432	1.447	1.462	1.476	1.491	1.505	1.519	1.535	1.546	1.560	1.573	1.586	1.599	1.612
23	$\bar{h}/t_S$	5.943	6.339	6.778	7.202	7.627	8.057	8.489	8.927	9.366	9.806	10.25	10.69	11.14	11.58	12.03	12.49
24		5.872	6.284	6.702	7.122	7.547	7.975	8.405	8.837	9.274	9.710	10.15	10.59	11.04	11.48	11.94	12.38
25		5.805	6.214	6.628	7.045	7.468	7.891	8.319	8.752	9.184	9.621	10.06	10.50	10.94	11.38	11.83	12.28
26		5.738	6.145	6.557	6.972	7.390	7.811	8.237	8.665	9.098	9.529	9.965	10.41	10.85	11.29	11.73	12.18
27		5.672	6.027	6.484	6.897	7.313	7.732	8.156	8.582	9.010	9.443	9.877	10.31	10.75	11.19	11.64	12.08
28		5.611	6.011	6.415	6.826	7.240	7.657	8.076	8.501	8.927	9.355	9.787	10.22	10.66	11.10	11.54	11.98
29		5.600	5.946	6.348	6.754	7.166	7.581	7.999	8.421	8.846	9.272	9.708	10.13	10.57	11.00	11.44	11.88
30		5.489	5.882	6.283	6.687	7.094	7.507	7.922	8.340	8.763	9.190	9.615	10.05	10.48	10.91	11.35	11.79
31		5.430	5.768	6.219	6.618	7.026	7.434	7.848	8.264	8.685	9.107	9.531	9.962	10.39	10.82	11.26	11.70
32		5.372	5.761	6.154	6.554	6.958	7.364	7.776	8.190	8.606	9.027	9.452	9.878	10.31	10.74	11.17	11.61
33		5.316	5.703	6.094	6.489	6.891	7.296	7.702	8.115	8.529	8.948	9.372	9.793	10.25	10.65	11.08	11.51
34		5.262	5.644	6.033	6.427	6.823	7.226	7.631	8.042	8.454	8.872	9.290	9.714	10.14	10.57	10.99	11.43
35		5.207	5.587	5.975	6.363	6.761	7.159	7.562	7.972	8.382	8.794	9.212	9.633	10.06	10.48	10.91	11.34
36		5.154	5.533	5.915	6.305	6.698	7.094	7.496	7.900	8.309	8.724	9.135	9.556	9.976	10.40	10.83	11.25
37		5.104	5.477	5.858	6.246	6.634	7.032	7.429	7.831	8.239	8.648	9.062	9.477	9.896	10.32	10.74	11.17
38		5.053	5.424	5.804	6.187	6.577	6.969	7.364	7.765	8.171	8.579	8.987	9.401	9.819	10.24	10.66	11.09
39		5.004	5.374	5.748	6.130	6.518	6.905	7.303	7.698	8.103	8.509	8.916	9.328	9.745	10.16	10.58	11.00
40		4.955	5.323	5.696	6.076	6.458	6.844	7.236	7.634	8.033	8.438	8.844	9.250	9.670	10.09	10.50	10.92
42		4.865	5.226	5.592	5.965	6.345	6.727	7.116	7.507	7.904	8.302	8.704	9.112	9.521	9.933	10.35	10.77
44		4.776	5.130	5.493	5.863	6.236	6.616	6.998	7.386	7.775	8.175	8.571	8.976	9.377	9.787	10.20	10.61
46		4.688	5.040	5.399	5.762	6.133	6.505	6.885	7.270	7.657	8.045	8.443	8.841	9.239	9.647	10.06	10.47
48		4.606	4.955	5.307	5.668	6.031	6.401	6.773	7.156	7.535	7.925	8.316	8.712	9.108	9.508	9.914	10.32
50		4.526	4.867	5.217	5.575	5.931	6.298	6.668	7.044	7.420	7.808	8.191	8.585	8.978	9.377	9.774	10.18
52		4.452	4.787	5.134	5.484	5.838	6.198	6.565	6.938	7.313	7.693	8.074	8.460	8.851	9.248	9.643	10.04
54		4.376	4.713	5.053	5.396	5.747	6.105	6.470	6.836	7.208	7.581	7.959	8.343	8.732	9.121	9.514	9.912
56		4.308	4.637	4.970	5.311	5.659	6.010	6.372	6.736	7.101	7.471	7.848	8.229	8.611	8.997	9.388	9.784
58		4.237	4.564	4.895	5.234	5.575	5.923	6.278	6.640	7.002	7.371	7.739	8.119	8.498	8.883	9.266	9.660
60		4.175	4.495	4.818	5.155	5.494	5.840	6.187	6.541	6.901	7.268	7.634	8.012	8.383	8.765	9.153	9.539
63		4.079	4.391	4.716	5.043	5.374	5.717	6.061	6.406	6.763	7.121	7.484	7.853	8.221	8.601	8.979	9.356
66		3.990	4.298	4.615	4.934	5.261	5.596	5.943	6.279	6.627	6.982	7.336	7.703	8.068	8.438	8.814	9.188
69		3.903	4.203	4.517	4.833	5.157	5.483	5.815	6.154	6.500	6.846	7.197	7.561	7.917	8.284	8.651	9.029
72		3.824	4.121	4.421	4.735	5.050	5.373	5.702	6.039	6.375	6.718	7.067	7.421	7.775	8.133	8.497	8.865
75		3.744	4.038	4.335	4.640	4.952	5.272	5.593	5.920	6.254	6.594	6.940	7.285	7.636	7.992	8.353	8.719
78		3.672	3.958	4.252	4.554	4.858	5.169	5.487	5.812	6.143	6.474	6.811	7.160	7.501	7.855	8.214	8.570
81		3.604	3.881	4.173	4.466	4.768	5.076	5.392	5.707	6.030	6.358	6.692	7.032	7.378	7.722	8.071	8.425
84		3.534	3.809	4.092	4.383	4.682	4.981	5.294	5.608	5.927	6.253	6.578	6.916	7.252	7.593	7.940	8.292
23	ρ/t_S	7.833	8.194	8.808	9.292	9.776	10.23	10.71	11.20	11.68	12.13	12.61	13.07	13.55	13.99	14.45	14.86
24		7.806	8.174	8.781	9.265	9.750	10.20	10.69	11.17	11.66	12.11	12.59	13.05	13.52	13.97	14.42	14.84
25		7.780	8.149	8.755	9.239	9.724	10.17	10.66	11.15	11.63	12.08	12.56	13.02	13.50	13.94	14.40	14.81
26		7.754	8.124	8.726	9.213	9.697	10.15	10.63	11.12	11.60	12.05	12.53	12.99	13.47	13.92	14.37	14.79
27		7.724	8.100	8.701	9.185	9.670	10.12	10.61	11.09	11.58	12.03	12.51	12.97	13.45	13.89	14.35	14.76
28		7.702	8.073	8.674	9.159	9.644	10.10	10.58	11.07	11.55	12.00	12.48	12.94	13.42	13.87	14.32	14.74
29		7.675	8.047	8.648	9.131	9.616	10.07	10.55	11.04	11.52	11.98	12.46	12.92	13.40	13.84	14.30	14.71
30		7.649	8.022	8.621	9.105	9.589	10.04	10.53	11.01	11.50	11.95	12.43	12.89	13.37	13.81	14.27	14.69
31		7.623	7.996	8.595	9.078	9.563	10.02	10.50	10.98	11.47	11.92	12.40	12.87	13.34	13.79	14.25	14.67
32		7.597	7.971	8.567	9.052	9.536	9.988	10.47	10.96	11.44	11.90	12.38	12.84	13.32	13.76	14.22	14.64
33		7.571	7.946	8.542	9.025	9.509	9.962	10.45	10.93	11.42	11.87	12.35	12.81	13.30	13.74	14.20	14.61
34		7.545	7.920	8.515	8.998	9.481	9.934	10.42	10.90	11.39	11.84	12.32	12.79	13.26	13.71	14.17	14.59
35		7.519	7.895	8.489	8.970	9.455	9.907	10.39	10.88	11.36	11.81	12.30	12.76	13.24	13.68	14.15	14.56
36		7.493	7.870	8.462	8.945	9.428	9.880	10.37	10.85	11.33	11.79	12.27	12.73	13.21	13.66	14.12	14.54
37		7.468	7.844	8.435	8.919	9.400	9.854	10.34	10.82	11.31	11.76	12.24	12.70	13.18	13.63	14.09	14.51
38		7.442	7.819	8.409	8.891	9.374	9.828	10.31	10.80	11.28	11.73	12.21	12.68	13.16	13.60	14.06	14.48
39		7.417	7.795	8.383	8.865	9.348	9.800	10.29	10.77	11.25	11.71	12.19	12.65	13.13	13.58	14.04	14.46
40		7.392	7.770	8.354	8.839	9.321	9.773	10.26	10.74	11.23	11.68	12.16	12.62	13.10	13.55	14.01	14.43
42		7.343	7.721	8.305	8.785	9.268	9.720	10.20	10.69	11.17	11.62	12.11	12.57	13.05	13.50	13.96	14.38
44		7.294	7.672	8.254	8.735	9.215	9.668	10.15	10.63	11.12	11.57	12.05	12.52	12.99	13.44	13.90	14.33
46		7.245	7.623	8.204	8.683	9.164	9.615	10.10	10.58	11.06	11.52	11.99	12.46	12.94	13.39	13.85	14.27
48		7.197	7.577	8.154	8.633	9.111	9.563	10.04	10.53	11.01	11.46	11.94	12.41	12.89	13.33	13.79	14.22
50		7.149	7.528	8.104	8.583	9.059	9.511	9.991	10.47	10.95	11.41	11.89	12.35	12.83	13.28	13.74	14.17
52		7.104	7.481	8.056	8.532	9.009	9.459	9.939	10.42	10.90	11.36	11.84	12.30	12.78	13.23	13.69	14.11
54		7.056	7.437	8.009	8.482	8.958	9.409	9.890	10.37	10.85	11.30	11.78	12.24	12.72	13.17	13.63	14.06
56		7.012	7.391	7.959	8.433	8.909	9.357	9.838	10.32	10.80	11.25	11.73	12.19	12.67	13.12	13.58	14.04
58		6.966	7.346	7.913	8.386	8.860	9.309	9.786	10.27	10.75	11.20	11.68	12.14	12.62	13.06	13.52	13.95
60		6.925	7.302	7.865	8.338	8.812	9.261	9.736	10.21	10.69	11.15	11.62	12.09	12.56	13.01	13.47	13.90
63		6.859	7.235	7.798	8.269	8.739	9.189	9.664	10.14	10.62	11.07	11.55	12.01	12.48	12.93	13.39	13.82
66		6.796	7.173	7.732	8.199	8.669	9.116	9.594	10.07	10.54	10.99	11.47	11.93	12.40	12.85	13.31	13.74
69		6.733	7.108	7.665	8.132	8.602	9.045	9.517	9.991	10.47	10.92	11.39	11.85	12.32	12.77	13.25	13.66
72		6.674	7.050	7.598	8.065	8.531	8.975	9.446	9.921	10.40	10.84	11.32	11.77	12.25	12.69	13.15	13.58
75		6.613	6.989	7.536	7.998	8.464	8.909	9.376	9.847	10.32	10.77	11.24	11.70	12.17	12.62	13.08	13.51
78		6.558	6.930	7.475	7.937	8.399	8.839	9.307	9.777	10.25	10.70	11.17	11.63	12.10	12.54	13.00	13.43
81		6.503	6.872	7.415	7.873	8.335	8.775	9.243	9.709	10.18	10.62	11.09	11.55	12.02	12.47	12.92	13.35
84		6.446	6.816	7.354	7.811	8.272	8.709	9.176	9.642	10.11	10.56	11.02	11.48	11.95	12.39	12.85	13.28

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TABLE 5.- Y-PANEL PROPERTIES $\left[\frac{t_W}{t_S}=0.79;\ \frac{b_A}{t_W}=9.3;\ \frac{b_Y}{b_W}=1.04;\ \frac{t_L}{t_W}=1.06;\ \frac{b_L}{b_W}=0.94;\ \frac{t_F}{t_W}=2.13;\ \frac{b_F}{b_W}=0.69;\ \frac{r}{t_W}=1;\ \frac{d}{t_S}=2.3;\ \frac{p}{t_S}=7.7\right]$

$\frac{b_S}{t_S}$ \ $\frac{b_W}{t_W}$		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
23	$\frac{\bar{t}}{t_S}$	2.517	2.554	2.590	2.624	2.657	2.689	2.720	2.749	2.778	2.806	2.832	2.858	2.883	2.907	2.931	2.953
24		2.481	2.518	2.553	2.588	2.621	2.652	2.683	2.713	2.741	2.769	2.796	2.822	2.847	2.871	2.895	2.917
25		2.446	2.483	2.519	2.552	2.585	2.617	2.648	2.677	2.706	2.734	2.761	2.787	2.812	2.836	2.860	2.883
26		2.414	2.450	2.485	2.519	2.552	2.584	2.614	2.644	2.672	2.700	2.727	2.753	2.778	2.803	2.826	2.849
27		2.382	2.418	2.453	2.487	2.520	2.551	2.582	2.611	2.640	2.668	2.694	2.720	2.746	2.770	2.794	2.817
28		2.352	2.388	2.423	2.456	2.489	2.520	2.551	2.580	2.609	2.636	2.663	2.689	2.714	2.739	2.763	2.786
29		2.323	2.359	2.394	2.427	2.459	2.490	2.521	2.550	2.579	2.606	2.633	2.659	2.684	2.709	2.733	2.756
30		2.296	2.331	2.366	2.399	2.431	2.462	2.492	2.521	2.550	2.577	2.604	2.630	2.655	2.680	2.704	2.727
31		2.269	2.304	2.339	2.371	2.403	2.434	2.464	2.494	2.522	2.549	2.576	2.602	2.627	2.651	2.675	2.698
32		2.244	2.279	2.313	2.345	2.377	2.408	2.438	2.467	2.495	2.522	2.549	2.575	2.600	2.624	2.648	2.671
33		2.219	2.254	2.288	2.320	2.352	2.382	2.412	2.441	2.469	2.496	2.523	2.548	2.573	2.598	2.622	2.645
34		2.196	2.230	2.264	2.296	2.327	2.358	2.387	2.416	2.444	2.471	2.497	2.523	2.548	2.572	2.596	2.619
35		2.173	2.207	2.241	2.272	2.304	2.334	2.363	2.392	2.420	2.447	2.473	2.498	2.523	2.548	2.571	2.594
36		2.152	2.185	2.218	2.250	2.281	2.311	2.340	2.368	2.396	2.423	2.449	2.475	2.499	2.524	2.547	2.570
37		2.131	2.164	2.197	2.228	2.259	2.289	2.318	2.346	2.373	2.400	2.426	2.451	2.476	2.500	2.524	2.547
38		2.110	2.144	2.176	2.208	2.238	2.267	2.296	2.324	2.351	2.378	2.404	2.429	2.454	2.478	2.501	2.524
39		2.091	2.124	2.156	2.187	2.233	2.246	2.275	2.303	2.330	2.357	2.382	2.408	2.432	2.456	2.479	2.502
40		2.072	2.105	2.136	2.167	2.197	2.226	2.255	2.283	2.310	2.336	2.362	2.387	2.411	2.435	2.458	2.481
42		2.036	2.068	2.100	2.130	2.159	2.188	2.216	2.244	2.270	2.296	2.322	2.346	2.371	2.394	2.417	2.440
44		2.003	2.034	2.065	2.095	2.124	2.152	2.180	2.207	2.233	2.259	2.284	2.308	2.332	2.356	2.379	2.401
46		1.971	2.002	2.032	2.062	2.090	2.118	2.145	2.172	2.198	2.223	2.248	2.275	2.296	2.319	2.342	2.364
48		1.942	1.972	2.002	2.031	2.059	2.086	2.113	2.139	2.165	2.190	2.215	2.239	2.262	2.285	2.308	2.329
50		1.914	1.944	1.973	2.001	2.029	2.056	2.083	2.108	2.134	2.159	2.183	2.206	2.230	2.252	2.275	2.296
52		1.888	1.917	1.946	1.974	2.001	2.028	2.054	2.079	2.104	2.129	2.153	2.176	2.199	2.221	2.243	2.265
54		1.864	1.892	1.920	1.948	1.974	2.001	2.026	2.051	2.076	2.100	2.124	2.147	2.170	2.192	2.214	2.235
56		1.840	1.868	1.896	1.923	1.949	1.975	2.000	2.025	2.049	2.073	2.096	2.119	2.142	2.164	2.185	2.206
58		1.818	1.846	1.873	1.899	1.925	1.951	1.975	2.000	2.024	2.047	2.070	2.093	2.114	2.137	2.158	2.179
60		1.797	1.824	1.851	1.877	1.902	1.927	1.952	1.976	2.000	2.023	2.045	2.067	2.090	2.111	2.132	2.153
63		1.767	1.794	1.820	1.845	1.870	1.895	1.919	1.942	1.965	1.988	2.010	2.032	2.054	2.075	2.095	2.116
66		1.740	1.766	1.791	1.816	1.840	1.864	1.888	1.911	1.933	1.956	1.977	1.999	2.020	2.041	2.061	2.081
69		1.715	1.740	1.764	1.789	1.812	1.836	1.859	1.881	1.903	1.925	1.947	1.968	1.988	2.009	2.029	2.048
72		1.691	1.715	1.739	1.763	1.786	1.809	1.832	1.854	1.875	1.897	1.918	1.938	1.959	1.979	1.998	2.017
75		1.668	1.692	1.716	1.739	1.762	1.784	1.806	1.828	1.849	1.870	1.890	1.911	1.931	1.950	1.970	1.988
78		1.648	1.671	1.694	1.716	1.739	1.761	1.782	1.803	1.824	1.845	1.865	1.885	1.904	1.924	1.943	1.961
81		1.628	1.651	1.673	1.695	1.717	1.738	1.760	1.780	1.801	1.821	1.841	1.860	1.879	1.898	1.917	1.935
84		1.609	1.632	1.654	1.675	1.697	1.718	1.738	1.759	1.779	1.798	1.818	1.837	1.856	1.875	1.893	1.911
23	$\frac{\bar{h}}{t_S}$	8.442	9.003	9.590	10.18	10.77	11.37	11.97	12.56	13.17	13.77	14.38	14.99	15.60	16.21	16.83	17.44
24		8.346	8.925	9.507	10.10	10.69	11.28	11.87	12.47	13.07	13.68	14.28	14.89	15.50	16.11	16.65	17.33
25		8.270	8.847	9.428	10.01	10.60	11.19	11.78	12.38	12.98	13.58	14.18	14.79	15.40	16.00	16.62	17.22
26		8.199	8.771	9.348	9.930	10.52	11.11	11.70	12.29	12.88	13.49	14.09	14.69	15.30	15.90	16.51	17.12
27		8.126	8.695	9.270	9.850	10.43	11.02	11.61	12.20	12.80	13.39	13.99	14.59	15.20	15.80	16.41	17.02
28		8.056	8.623	9.195	9.770	10.35	10.94	11.52	12.11	12.71	13.30	13.90	14.50	15.10	15.71	16.31	16.92
29		7.986	8.551	9.121	9.694	10.27	10.85	11.44	12.03	12.62	13.21	13.81	14.41	15.00	15.61	16.21	16.82
30		7.919	8.480	9.048	9.619	10.19	10.77	11.36	11.94	12.53	13.12	13.72	14.31	14.91	15.51	16.12	16.72
31		7.851	8.409	8.976	9.542	10.12	10.69	11.27	11.86	12.45	13.03	13.63	14.22	14.82	15.41	16.02	16.62
32		7.787	8.343	8.905	9.469	10.04	10.62	11.19	11.78	12.36	12.95	13.54	14.13	14.73	15.32	15.92	16.52
33		7.721	8.275	8.835	9.397	9.966	10.54	11.11	11.69	12.28	12.86	13.45	14.04	14.63	15.23	15.83	16.43
34		7.659	8.208	8.766	9.327	9.891	10.46	11.04	11.61	12.19	12.78	13.36	13.95	14.54	15.14	15.73	16.33
35		7.595	8.143	8.699	9.255	9.821	10.39	10.96	11.53	12.11	12.70	13.28	13.86	14.45	15.05	15.64	16.24
36		7.536	8.079	8.631	9.187	9.749	10.31	10.88	11.45	12.03	12.61	13.19	13.78	14.37	14.96	15.55	16.14
37		7.476	8.017	8.567	9.119	9.678	10.24	10.81	11.38	11.95	12.53	13.11	13.69	14.28	14.87	15.46	16.06
38		7.415	7.957	8.502	9.055	9.610	10.17	10.73	11.30	11.87	12.45	13.03	13.61	14.20	14.78	15.37	15.96
39		7.358	7.895	8.439	8.987	9.593	10.10	10.66	11.22	11.79	12.37	12.94	13.53	14.11	14.70	15.28	15.87
40		7.300	7.836	8.374	8.921	9.472	10.03	10.59	11.15	11.72	12.30	12.87	13.45	14.03	14.61	15.20	15.79
42		7.188	7.717	8.256	8.796	9.341	9.893	10.45	11.01	11.57	12.14	12.72	13.29	13.87	14.45	15.03	15.61
44		7.082	7.604	8.136	8.673	9.215	9.761	10.31	10.87	11.43	11.99	12.56	13.13	13.70	14.28	14.86	15.44
46		6.975	7.494	8.020	8.554	9.089	9.632	10.18	10.73	11.29	11.84	12.41	12.99	13.55	14.12	14.70	15.28
48		6.876	7.388	7.910	8.438	8.970	9.506	10.05	10.60	11.15	11.71	12.27	12.83	13.40	13.97	14.54	15.11
50		6.777	7.286	7.802	8.322	8.852	9.385	9.926	10.47	11.02	11.57	12.13	12.68	13.25	13.81	14.39	14.96
52		6.682	7.185	7.698	8.216	8.738	9.269	9.803	10.34	10.89	11.44	11.99	12.54	13.10	13.66	14.23	14.80
54		6.592	7.089	7.594	8.110	8.626	9.154	9.681	10.22	10.76	11.30	11.85	12.41	12.96	13.52	14.09	14.65
56		6.500	6.994	7.497	8.005	8.519	9.040	9.565	10.10	10.63	11.18	11.72	12.27	12.83	13.38	13.94	14.50
58		6.414	6.904	7.401	7.903	8.413	8.932	9.450	9.981	10.51	11.05	11.59	12.14	12.69	13.24	13.80	14.36
60		6.329	6.813	7.307	7.806	8.310	8.822	9.342	9.866	10.40	10.93	11.46	12.00	12.56	13.10	13.66	14.22
63		6.205	6.685	7.171	7.662	8.162	8.670	9.183	9.698	10.22	10.75	11.28	11.82	12.36	12.91	13.45	14.01
66		6.090	6.562	7.039	7.526	8,018	8.518	9.027	9.540	10.05	10.58	11.10	11.64	12.17	12.71	13.26	13.80
69		5.980	6.443	6.913	7.396	7.880	8.377	8.878	9.381	9.898	10.41	10.94	11.46	11.99	12.53	13.07	13.61
72		5.871	6.326	6.792	7.267	7.747	8.236	8.734	9.289	9.737	10.25	10.77	11.29	11.82	12.35	12.88	13.41
75		5.764	6.215	6.678	7.145	7.622	8.102	8.591	9.089	9.589	10.10	10.60	11.12	11.65	12.17	12.80	13.23
78		5.668	6.112	6.566	7.024	7.498	7.976	8.456	8.945	9.442	9.946	10.45	10.96	11.48	12.00	12.53	13.05
81		5.570	6.010	6.456	6.912	7.377	7.846	8.329	8.809	9.303	9.799	10.30	10.80	11.31	11.83	12.35	12.88
84		5.475	5.912	6.354	6.801	7.264	7.730	8.199	8.682	9.167	9.654	10.15	10.65	11.16	11.67	12.19	12.71
23	$\frac{\rho}{t_S}$	10.15	10.76	11.37	11.98	12.59	13.17	13.75	14.36	14.97	15.53	16.13	16.70	17.30	17.85	18.41	18.91
24		10.15	10.74	11.35	11.96	12.57	13.15	13.74	14.35	14.95	15.51	16.11	16.69	17.28	17.84	18.40	18.90
25		10.11	10.72	11.33	11.94	12.55	13.13	13.72	14.32	14.94	15.50	16.10	16.67	17.27	17.82	18.38	18.89
26		10.09	10.70	11.31	11.92	12.53	13.12	13.70	14.31	14.92	15.48	16.08	16.66	17.25	17.81	18.37	18.88
27		10.07	10.68	11.29	11.90	12.51	13.10	13.68	14.29	14.90	15.46	16.07	16.64	17.24	17.80	18.35	18.86
28		10.05	10.66	11.27	11.88	12.49	13.08	13.67	14.28	14.88	15.44	16.05	16.62	17.22	17.78	18.34	18.85
29		10.03	10.64	11.25	11.86	12.47	13.06	13.65	14.26	14.87	15.43	16.03	16.61	17.20	17.76	18.32	18.83
30		10.01	10.62	11.23	11.84	12.45	13.04	13.63	14.24	14.85	15.41	16.01	16.59	17.19	17.75	18.31	18.82
31		9.991	10.60	11.21	11.82	12.43	13.02	13.61	14.22	14.83	15.39	16.00	16.57	17.17	17.73	18.29	18.81
32		9.970	10.58	11.19	11.80	12.41	13.00	13.59	14.20	14.81	15.37	15.98	16.56	17.15	17.72	18.28	18.79
33		9.949	10.56	11.17	11.78	12.39	12.98	13.57	14.18	14.79	15.36	15.96	16.54	17.14	17.70	18.26	18.78
34		9.929	10.54	11.15	11.76	12.37	12.96	13.55	14.16	14.77	15.34	15.94	16.52	17.12	17.68	18.24	18.76
35		9.907	10.52	11.13	11.74	12.35	12.94	13.53	14.14	14.75	15.32	15.92	16.50	17.10	17.66	18.23	18.74
36		9.887	10.50	11.11	11.72	12.33	12.92	13.51	14.12	14.73	15.30	15.90	16.48	17.08	17.65	18.21	18.73
37		9.866	10.48	11.09	11.70	12.31	12.90	13.49	14.10	14.71	15.28	15.88	16.46	17.07	17.63	18.19	18.71
38		9.844	10.46	11.07	11.68	12.29	12.88	13.47	14.08	14.69	15.26	15.87	16.45	17.05	17.61	18.17	18.69
39		9.824	10.44	11.05	11.66	12.29	12.86	13.45	14.06	14.67	15.24	15.85	16.43	17.03	17.59	18.16	18.68
40		9.802	10.41	11.03	11.64	12.25	12.84	13.43	14.04	14.65	15.22	15.83	16.41	17.01	17.57	18.14	18.66
42		9.760	10.37	10.98	11.60	12.21	12.80	13.39	14.00	14.61	15.18	15.79	16.37	16.97	17.54	18.10	18.62
44		9.718	10.33	10.94	11.55	12.17	12.76	13.35	13.96	14.57	15.14	15.75	16.33	16.93	17.50	18.06	18.59
46		9.675	10.29	10.90	11.51	12.12	12.71	13.30	13.92	14.53	15.10	15.71	16.29	16.89	17.46	18.03	18.55
48		9.633	10.24	10.86	11.47	12.08	12.67	13.26	13.87	14.49	15.06	15.67	16.25	16.85	17.42	17.99	18.51
50		9.591	10.20	10.81	11.42	12.04	12.63	13.22	13.83	14.45	15.02	15.62	16.21	16.81	17.38	17.95	18.47
52		9.549	10.16	10.77	11.38	11.99	12.59	13.18	13.78	14.41	14.97	15.58	16.16	16.77	17.34	17.91	18.43
54		9.508	10.12	10.73	11.34	11.95	12.54	13.13	13.75	14.36	14.93	15.54	16.12	16.73	17.30	17.87	18.39
56		9.466	10.05	10.68	11.30	11.91	12.50	13.09	13.70	14.32	14.89	15.50	16.08	16.69	17.26	17.83	18.35
58		9.424	10.03	10.64	11.25	11.86	12.46	13.05	13.66	14.27	14.84	15.45	16.04	16.64	17.21	17.78	18.31
60		9.383	9.990	10.60	11.21	11.82	12.41	13.00	13.62	14.23	14.80	15.41	15.99	16.60	17.17	17.74	18.27
63		9.321	9.928	10.54	11.14	11.76	12.35	12.94	13.55	14.16	14.74	15.35	15.93	16.54	17.11	17.68	18.21
66		9.261	9.867	10.47	11.08	11.69	12.28	12.88	13.49	14.10	14.67	15.28	15.87	16.47	17.04	17.62	18.15
69		9.202	9.806	10.41	11.02	11.63	12.22	12.81	13.42	14.03	14.61	15.22	15.80	16.41	16.98	17.55	18.08
72		9.143	9.744	10.35	10.96	11.56	12.15	12.75	13.36	13.97	14.54	15.15	15.73	16.34	16.92	17.49	18.02
75		9.082	9.684	10.29	10.89	11.50	12.09	12.68	13.30	13.90	14.48	15.08	15.67	16.28	16.85	17.42	17.96
78		9.027	9.626	10.23	10.83	11.44	12.03	12.62	13.23	13.84	14.41	15.02	15.61	16.21	16.79	17.36	17.89
81		8.969	9.568	10.17	10.77	11.38	11.96	12.56	13.16	13.78	14.35	14.96	15.54	16.14	16.72	17.29	17.83
84		8.911	9.510	10.11	10.71	11.32	11.91	12.49	13.10	13.71	14.28	14.89	15.48	16.08	16.65	17.23	17.77

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TABLE 6.- Y-PANEL PROPERTIES $\left[\frac{t_W}{t_S} = 1.00;\ \frac{b_A}{t_W} = 9.3;\ \frac{b_Y}{b_W} = 1.04;\ \frac{t_L}{t_W} = 1.06;\ \frac{b_L}{b_W} = 0.94;\ \frac{t_F}{t_W} = 2.13;\ \frac{b_F}{b_W} = 0.69;\ \frac{r}{t_W} = 1;\ \frac{d}{t_S} = 2.4;\ \frac{p}{t_S} = 7.8\right]$

b_S/t_S \ b_W/t_W		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
23	$\bar{r}/t_S$	3.177	3.225	3.270	3.313	3.355	3.395	3.433	3.470	3.505	3.539	3.572	3.604	3.634	3.663	3.692	3.719
24		3.131	3.178	3.223	3.267	3.309	3.349	3.387	3.424	3.460	3.494	3.527	3.559	3.590	3.619	3.648	3.676
25		3.086	3.133	3.179	3.222	3.264	3.304	3.343	3.380	3.416	3.450	3.483	3.516	3.547	3.576	3.605	3.633
26		3.043	3.090	3.136	3.179	3.221	3.261	3.300	3.338	3.373	3.408	3.441	3.474	3.505	3.535	3.564	3.592
27		3.002	3.049	3.095	3.138	3.180	3.220	3.259	3.296	3.333	3.367	3.401	3.433	3.465	3.495	3.524	3.553
28		2.963	3.010	3.055	3.098	3.140	3.181	3.219	3.257	3.293	3.328	3.362	3.394	3.426	3.456	3.486	3.514
29		2.925	2.972	3.017	3.060	3.102	3.142	3.181	3.219	3.255	3.290	3.324	3.356	3.388	3.418	3.448	3.477
30		2.888	2.935	2.980	3.023	3.065	3.105	3.144	3.182	3.218	3.253	3.287	3.320	3.351	3.382	3.412	3.441
31		2.853	2.900	2.944	2.988	3.029	3.070	3.108	3.146	3.182	3.217	3.251	3.284	3.316	3.347	3.376	3.405
32		2.819	2.865	2.910	2.953	2.995	3.035	3.074	3.111	3.148	3.183	3.217	3.249	3.281	3.312	3.342	3.371
33		2.786	2.833	2.877	2.920	2.962	3.002	3.040	3.078	3.114	3.149	3.183	3.216	3.248	3.279	3.309	3.338
34		2.755	2.801	2.845	2.888	2.929	2.969	3.008	3.045	3.081	3.117	3.150	3.183	3.215	3.246	3.276	3.306
35		2.725	2.770	2.814	2.857	2.898	2.938	2.977	3.014	3.050	3.085	3.119	3.152	3.184	3.215	3.245	3.274
36		2.695	2.741	2.785	2.827	2.868	2.908	2.946	2.983	3.019	3.054	3.088	3.121	3.153	3.184	3.214	3.244
37		2.667	2.712	2.756	2.798	2.839	2.878	2.917	2.954	2.990	3.025	3.058	3.091	3.123	3.154	3.184	3.214
38		2.639	2.684	2.728	2.770	2.810	2.850	2.888	2.925	2.961	2.996	3.030	3.062	3.094	3.125	3.155	3.185
39		2.613	2.657	2.701	2.742	2.783	2.822	2.860	2.897	2.933	2.968	3.001	3.034	3.066	3.097	3.127	3.156
40		2.587	2.631	2.674	2.716	2.756	2.795	2.833	2.870	2.906	2.940	2.974	3.007	3.039	3.070	3.100	3.129
42		2.538	2.582	2.624	2.665	2.705	2.744	2.782	2.818	2.854	2.888	2.921	2.954	2.986	3.017	3.047	3.076
44		2.492	2.535	2.577	2.618	2.657	2.695	2.733	2.769	2.804	2.838	2.872	2.904	2.936	2.966	2.996	3.026
46		2.448	2.491	2.532	2.573	2.612	2.650	2.686	2.722	2.757	2.791	2.824	2.857	2.888	2.919	2.948	2.977
48		2.408	2.450	2.490	2.530	2.569	2.606	2.643	2.678	2.713	2.747	2.779	2.811	2.843	2.873	2.903	2.932
50		2.369	2.410	2.451	2.490	2.528	2.565	2.601	2.636	2.671	2.704	2.737	2.768	2.799	2.830	2.859	2.888
52		2.332	2.373	2.413	2.451	2.489	2.526	2.562	2.596	2.630	2.663	2.696	2.727	2.758	2.788	2.817	2.846
54		2.297	2.338	2.377	2.415	2.452	2.489	2.524	2.558	2.592	2.625	2.657	2.688	2.719	2.748	2.778	2.806
56		2.264	2.304	2.343	2.380	2.417	2.453	2.488	2.522	2.555	2.588	2.620	2.651	2.681	2.711	2.739	2.768
58		2.233	2.272	2.310	2.348	2.384	2.419	2.454	2.488	2.520	2.553	2.584	2.615	2.645	2.674	2.703	2.731
60		2.203	2.242	2.279	2.316	2.352	2.387	2.421	2.454	2.487	2.519	2.550	2.581	2.610	2.639	2.668	2.696
63		2.161	2.199	2.236	2.272	2.307	2.341	2.375	2.408	2.440	2.471	2.502	2.532	2.561	2.590	2.618	2.646
66		2.122	2.159	2.195	2.230	2.265	2.298	2.331	2.364	2.395	2.426	2.456	2.486	2.515	2.543	2.571	2.598
69		2.085	2.121	2.157	2.191	2.225	2.258	2.291	2.322	2.353	2.384	2.413	2.443	2.471	2.499	2.527	2.554
72		2.051	2.086	2.121	2.155	2.188	2.220	2.252	2.283	2.314	2.344	2.373	2.402	2.430	2.458	2.485	2.511
75		2.019	2.053	2.087	2.120	2.153	2.185	2.216	2.247	2.277	2.306	2.335	2.363	2.391	2.418	2.445	2.471
78		1.988	2.022	2.055	2.088	2.120	2.151	2.182	2.212	2.242	2.271	2.299	2.327	2.354	2.381	2.408	2.433
81		1.960	1.993	2.026	2.057	2.089	2.120	2.150	2.179	2.208	2.237	2.265	2.292	2.319	2.346	2.372	2.397
84		1.933	1.965	1.997	2.029	2.059	2.090	2.119	2.148	2.177	2.205	2.232	2.259	2.286	2.312	2.338	2.363
23	$\bar{h}/t_S$	11.81	12.61	13.42	14.23	15.04	15.85	16.67	17.49	18.31	19.13	19.96	20.79	21.61	22.44	23.27	24.10
24		11.73	12.53	13.34	14.14	14.95	15.77	16.58	17.40	18.22	19.04	19.86	20.69	21.52	22.34	23.17	24.00
25		11.66	12.45	13.26	14.06	14.87	15.68	16.49	17.31	18.13	18.95	19.77	20.59	21.42	22.24	23.07	23.90
26		11.58	12.38	13.18	13.98	14.78	15.59	16.40	17.21	18.03	18.85	19.67	20.50	21.32	22.14	22.97	23.80
27		11.51	12.30	13.10	13.90	14.70	15.51	16.32	17.13	17.94	18.76	19.58	20.40	21.22	22.05	22.87	23.70
28		11.44	12.22	13.02	13.82	14.62	15.42	16.23	17.04	17.85	18.67	19.49	20.31	21.13	21.95	22.77	23.60
29		11.36	12.15	12.94	13.74	14.54	15.34	16.14	16.95	17.77	18.58	19.40	20.21	21.03	21.85	22.68	23.50
30		11.29	12.08	12.87	13.66	14.46	15.26	16.06	16.87	17.68	18.49	19.30	20.12	20.94	21.76	22.58	23.40
31		11.22	12.00	12.79	13.58	14.38	15.18	15.98	16.78	17.59	18.40	19.21	20.03	20.85	21.66	22.48	23.30
32		11.15	11.93	12.71	13.50	14.30	15.09	15.90	16.70	17.51	18.31	19.13	19.94	20.75	21.57	22.39	23.21
33		11.08	11.86	12.64	13.43	14.22	15.02	15.81	16.62	17.42	18.23	19.04	19.85	20.66	21.48	22.29	23.11
34		11.01	11.79	12.57	13.35	14.14	14.93	15.73	16.53	17.33	18.14	18.95	19.76	20.57	21.38	22.20	23.02
35		10.95	11.72	12.50	13.28	14.07	14.86	15.65	16.45	17.25	18.05	18.86	19.67	20.48	21.29	22.11	22.92
36		10.88	11.65	12.43	13.21	13.99	14.78	15.57	16.37	17.17	17.97	18.77	19.58	20.39	21.20	22.02	22.83
37		10.82	11.58	12.36	13.13	13.92	14.70	15.50	16.29	17.09	17.89	18.69	19.49	20.30	21.11	21.92	22.74
38		10.75	11.52	12.29	13.06	13.84	14.63	15.42	16.21	17.01	17.80	18.61	19.41	20.22	21.02	21.83	22.65
39		10.69	11.45	12.22	12.99	13.77	14.55	15.34	16.13	16.92	17.72	18.52	19.32	20.13	20.94	21.75	22.56
40		10.63	11.38	12.15	12.92	13.70	14.48	15.26	16.05	16.85	17.64	18.44	19.24	20.04	20.85	21.66	22.47
42		10.50	11.26	12.02	12.78	13.56	14.33	15.12	15.90	16.69	17.48	18.27	19.07	19.87	20.68	21.48	22.29
44		10.38	11.13	11.89	12.65	13.42	14.19	14.97	15.75	16.53	17.32	18.12	18.91	19.71	20.51	21.31	22.12
46		10.26	11.01	11.76	12.52	13.28	14.05	14.82	15.60	16.38	17.17	17.96	18.75	19.54	20.34	21.14	21.94
48		10.15	10.89	11.64	12.39	13.15	13.91	14.68	15.46	16.24	17.02	17.80	18.59	19.38	20.18	20.97	21.77
50		10.04	10.77	11.52	12.27	13.02	13.78	14.55	15.31	16.09	16.87	17.65	18.43	19.22	20.02	20.81	21.61
52		9.928	10.66	11.40	12.14	12.89	13.65	14.41	15.18	15.95	16.72	17.50	18.28	19.07	19.86	20.65	21.44
54		9.820	10.55	11.28	12.02	12.77	13.52	14.28	15.04	15.81	16.58	17.35	18.13	18.92	19.70	20.49	21.28
56		9.715	10.44	11.17	11.90	12.64	13.39	14.15	14.91	15.67	16.44	17.21	17.99	18.76	19.55	20.33	21.12
58		9.614	10.33	11.05	11.79	12.53	13.27	14.02	14.78	15.53	16.30	17.07	17.84	18.62	19.39	20.18	20.96
60		9.513	10.23	10.94	11.67	12.41	13.15	13.89	14.64	15.40	16.16	16.93	17.70	18.47	19.25	20.03	20.81
63		9.367	10.07	10.79	11.51	12.24	12.97	13.71	14.46	15.21	15.96	16.72	17.49	18.26	19.03	19.80	20.58
66		9.227	9.925	10.63	11.35	12.07	12.79	13.53	14.27	15.02	15.77	16.52	17.28	18.05	18.81	19.59	20.36
69		9.089	9.779	10.48	11.19	11.90	12.63	13.36	14.09	14.83	15.58	16.33	17.08	17.84	18.60	19.37	20.14
72		8.958	9.640	10.34	11.04	11.75	12.46	13.19	13.91	14.65	15.39	16.14	16.89	17.64	18.40	19.17	19.93
75		8.830	9.505	10.19	10.89	11.59	12.30	13.02	13.75	14.48	15.21	15.95	16.70	17.45	18.20	18.96	19.72
78		8.703	9.374	10.05	10.75	11.44	12.15	12.86	13.58	14.31	15.04	15.77	16.51	17.26	18.01	18.76	19.52
81		8.584	9.248	9.924	10.60	11.30	12.00	12.71	13.42	14.13	14.86	15.59	16.33	17.07	17.82	18.57	19.32
84		8.466	9.122	9.791	10.47	11.15	11.85	12.55	13.26	13.97	14.69	15.42	16.15	16.89	17.63	18.37	19.12
23	ρ/t_S	13.08	13.85	14.61	15.38	16.14	16.87	17.60	18.37	19.13	19.83	20.58	21.30	22.04	22.72	23.43	24.05
24		13.07	13.84	14.60	15.37	16.13	16.87	17.60	18.36	19.12	19.82	20.58	21.29	22.04	22.72	23.42	24.05
25		13.06	13.82	14.59	15.36	16.12	16.86	17.59	18.35	19.12	19.81	20.57	21.28	22.03	22.71	23.42	24.04
26		13.04	13.81	14.58	15.35	16.11	16.85	17.58	18.35	19.11	19.81	20.56	21.28	22.03	22.71	23.42	24.04
27		13.03	13.80	14.57	15.34	16.10	16.84	17.57	18.34	19.10	19.80	20.56	21.27	22.02	22.70	23.41	24.04
28		13.02	13.79	14.56	15.33	16.09	16.83	17.56	18.33	19.09	19.79	20.55	21.27	22.02	22.70	23.41	24.03
29		13.01	13.78	14.55	15.31	16.08	16.82	17.55	18.32	19.08	19.78	20.54	21.26	22.01	22.69	23.40	24.03
30		12.99	13.76	14.53	15.30	16.07	17.81	17.54	18.31	19.08	19.78	20.53	21.25	22.00	22.69	23.40	24.03
31		12.98	13.75	14.52	15.29	16.06	16.80	17.53	18.30	19.07	19.77	20.53	21.24	22.00	22.68	23.39	24.02
32		12.97	13.74	14.51	15.28	16.05	16.79	17.52	18.29	19.06	19.76	20.52	21.24	21.99	22.67	23.39	24.02
33		12.95	13.72	14.50	15.27	16.04	16.77	17.51	18.28	19.05	19.75	20.51	21.23	21.98	22.67	23.38	24.01
34		12.94	13.71	14.48	15.25	16.02	16.76	17.50	18.27	19.04	19.74	20.50	21.22	21.97	22.66	23.37	24.00
35		12.92	13.70	14.47	15.24	16.01	16.75	17.49	18.26	19.03	19.73	20.49	21.21	21.96	22.65	23.36	24.00
36		12.91	13.68	14.46	15.23	16.00	16.74	17.48	18.25	19.02	19.72	20.48	21.20	21.96	22.64	23.36	23.99
37		12.90	13.67	14.44	15.21	15.99	16.73	17.47	18.24	19.00	19.71	20.47	21.19	21.95	22.64	23.35	23.99
38		12.88	13.65	14.43	15.21	15.97	16.71	17.45	18.22	18.99	19.70	20.46	21.18	21.94	22.63	23.34	23.98
39		12.87	13.64	14.41	15.19	15.96	16.70	17.44	18.21	18.98	19.69	20.45	21.17	21.93	22.62	23.33	23.97
40		12.85	13.63	14.40	15.17	15.95	16.69	17.43	18.20	18.97	19.67	20.44	21.16	21.92	22.61	23.33	23.96
42		12.82	13.60	14.37	15.14	15.92	16.66	17.40	18.17	18.95	19.65	20.42	21.14	21.90	22.59	23.31	23.95
44		12.79	13.57	14.34	15.12	15.89	16.63	17.38	18.15	18.92	19.63	20.39	21.12	21.88	22.57	23.29	23.93
46		12.76	13.54	14.31	15.09	15.86	16.61	17.35	18.12	18.90	19.61	20.37	21.10	21.86	22.55	23.27	23.91
48		12.73	13.50	14.28	15.06	15.83	16.58	17.32	18.10	18.87	19.58	20.35	21.08	21.83	22.53	23.25	23.89
50		12.70	13.47	14.25	15.03	15.80	16.55	17.29	18.07	18.84	19.55	20.32	21.05	21.81	22.51	23.23	23.87
52		12.68	13.44	14.22	14.99	15.77	16.52	17.26	18.04	18.81	19.53	20.29	21.02	21.78	22.48	23.20	23.85
54		12.63	13.41	14.19	14.96	15.74	16.49	17.23	18.01	18.79	19.50	20.27	21.00	21.76	22.46	23.18	23.83
56		12.60	13.38	14.15	14.93	15.71	16.46	17.20	17.98	18.76	19.47	20.24	20.97	21.73	22.43	23.16	23.81
58		12.56	13.34	14.12	14.90	15.68	16.43	17.17	17.95	18.73	19.44	20.21	20.95	21.71	22.41	23.13	23.78
60		12.53	13.31	14.09	14.87	15.65	16.40	17.14	17.92	18.70	19.41	20.18	20.92	21.68	22.38	23.11	23.76
63		12.48	13.26	14.04	14.82	15.60	16.35	17.10	17.87	18.65	19.37	20.14	20.88	21.64	22.34	23.07	23.72
66		12.43	13.21	13.99	14.77	15.55	16.30	17.05	17.83	18.61	19.33	20.10	20.83	21.60	22.30	23.03	23.69
69		12.38	13.16	13.94	14.72	15.50	16.25	17.00	17.78	18.56	19.28	20.05	20.79	21.55	22.26	22.99	23.65
72		12.33	13.11	13.89	14.67	15.45	16.20	16.95	17.73	18.51	19.23	20.00	20.74	21.51	22.22	22.95	23.60
75		12.28	13.06	13.83	14.62	15.40	16.15	16.90	17.68	18.46	19.18	19.96	20.70	21.46	22.17	22.90	23.56
78		12.23	13.01	13.79	14.57	15.35	16.10	16.85	17.63	18.41	19.14	19.91	20.65	21.42	22.13	22.86	23.52
81		12.18	12.96	13.74	14.52	15.30	16.05	16.80	17.58	18.36	19.09	19.86	20.60	21.37	22.08	22.81	23.48
84		12.13	12.91	13.69	14.47	15.24	16.00	16.75	17.53	18.31	19.04	19.81	20.55	21.32	22.03	22.77	23.43

NACA

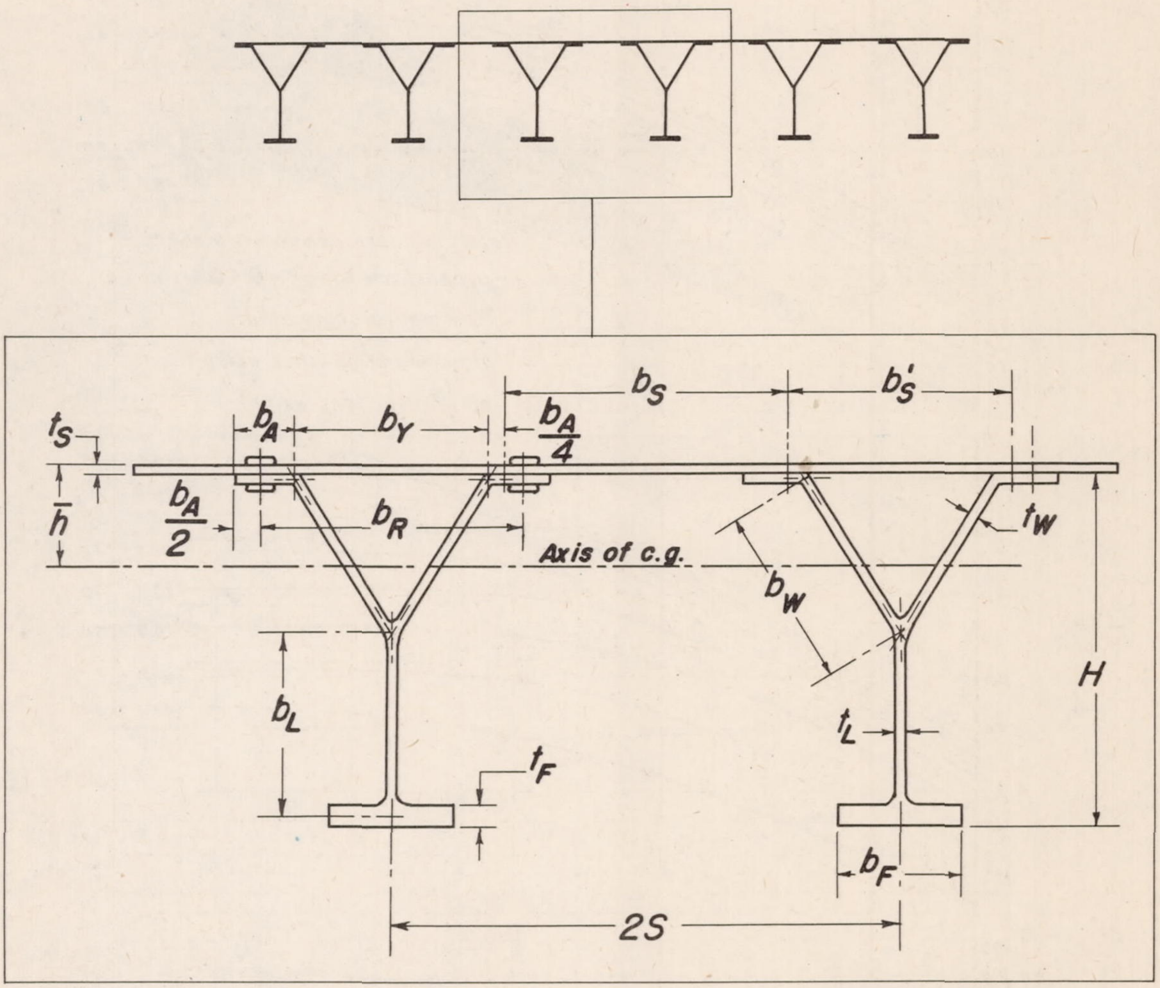

Figure 1.- Symbols for panel dimensions.

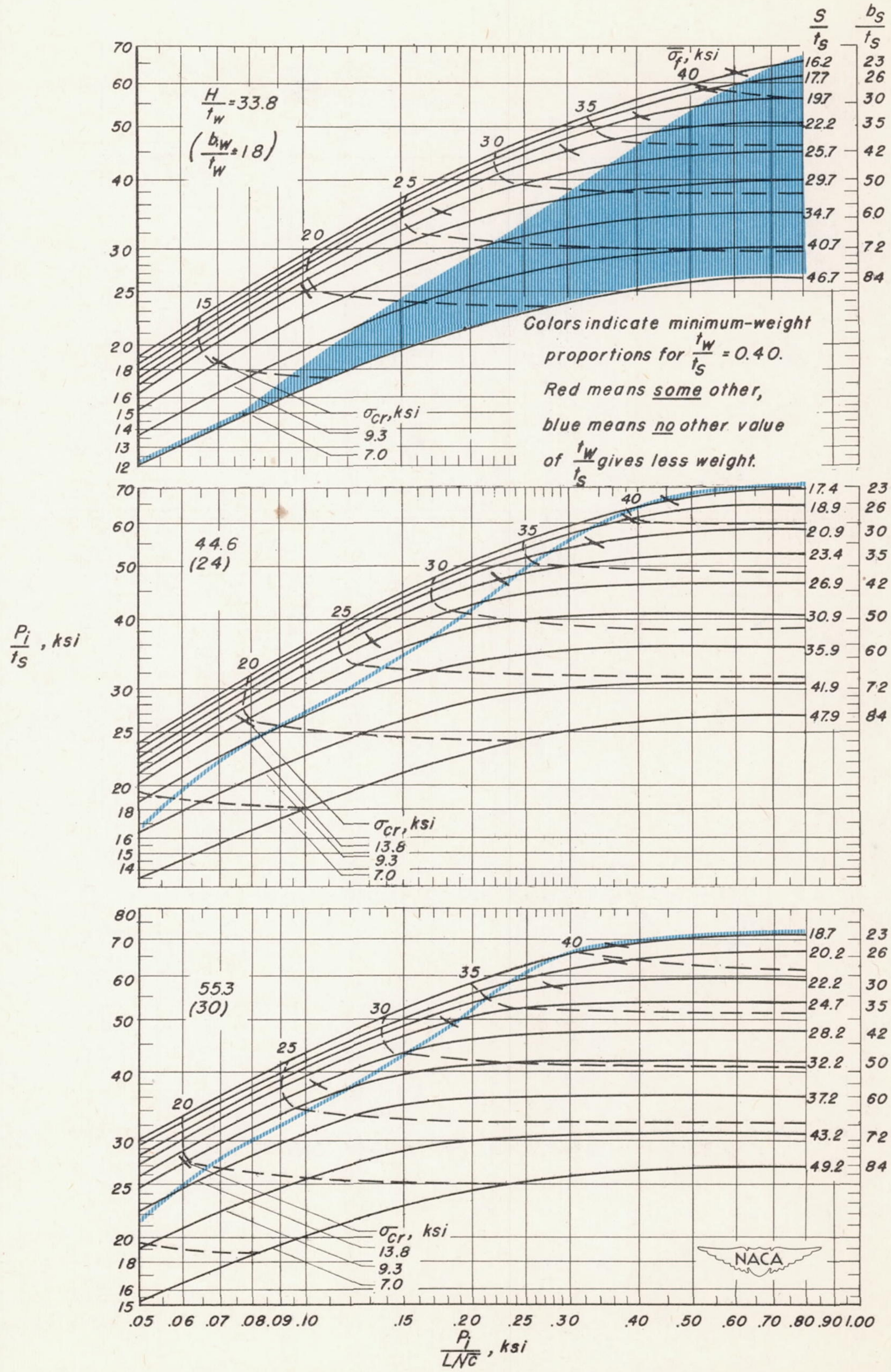

Figure 2.- Direct-reading design chart for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S} = 0.40$.

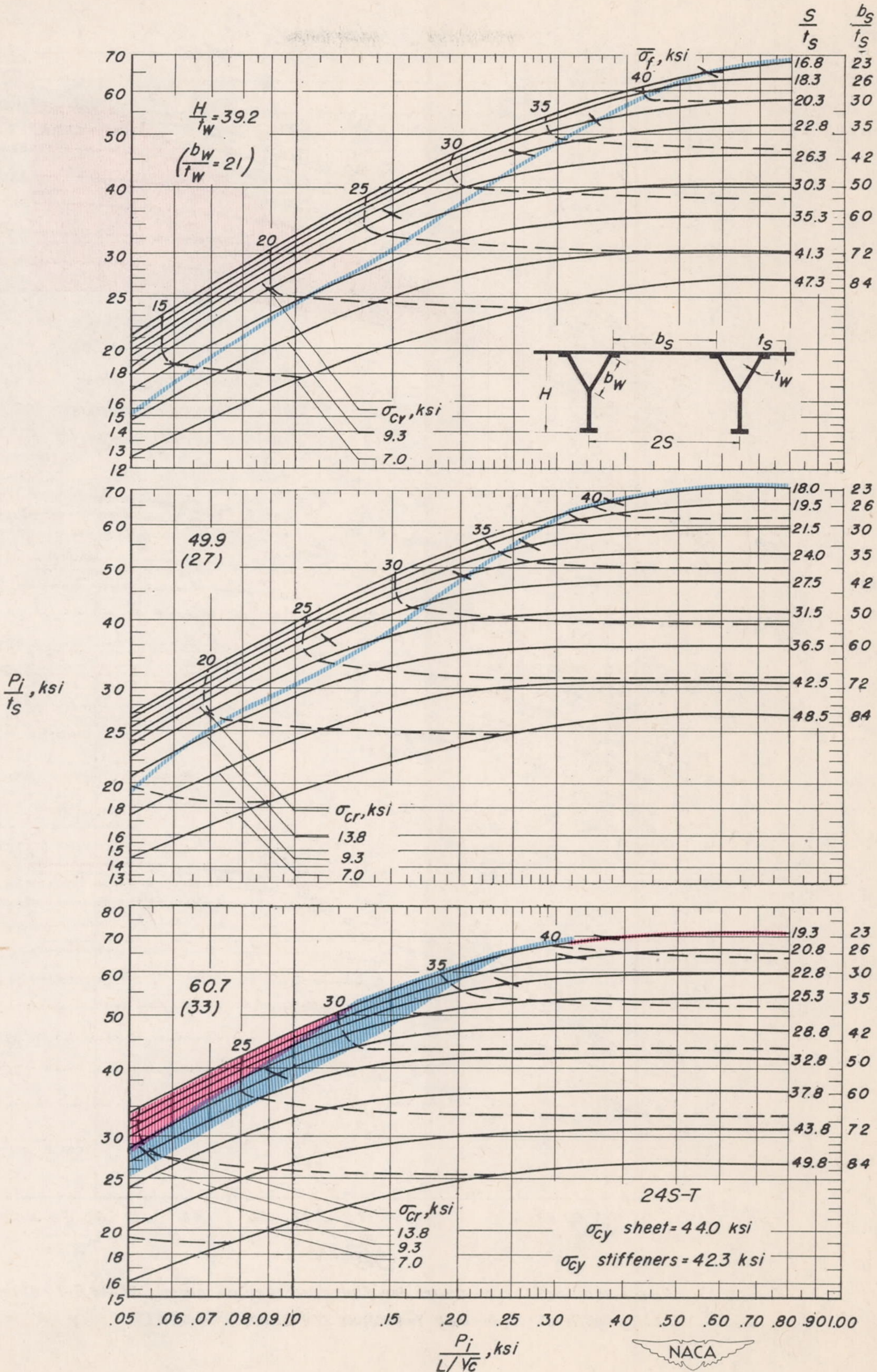

Figure 2.- Concluded. $\frac{t_w}{t_s} = 0.40$.

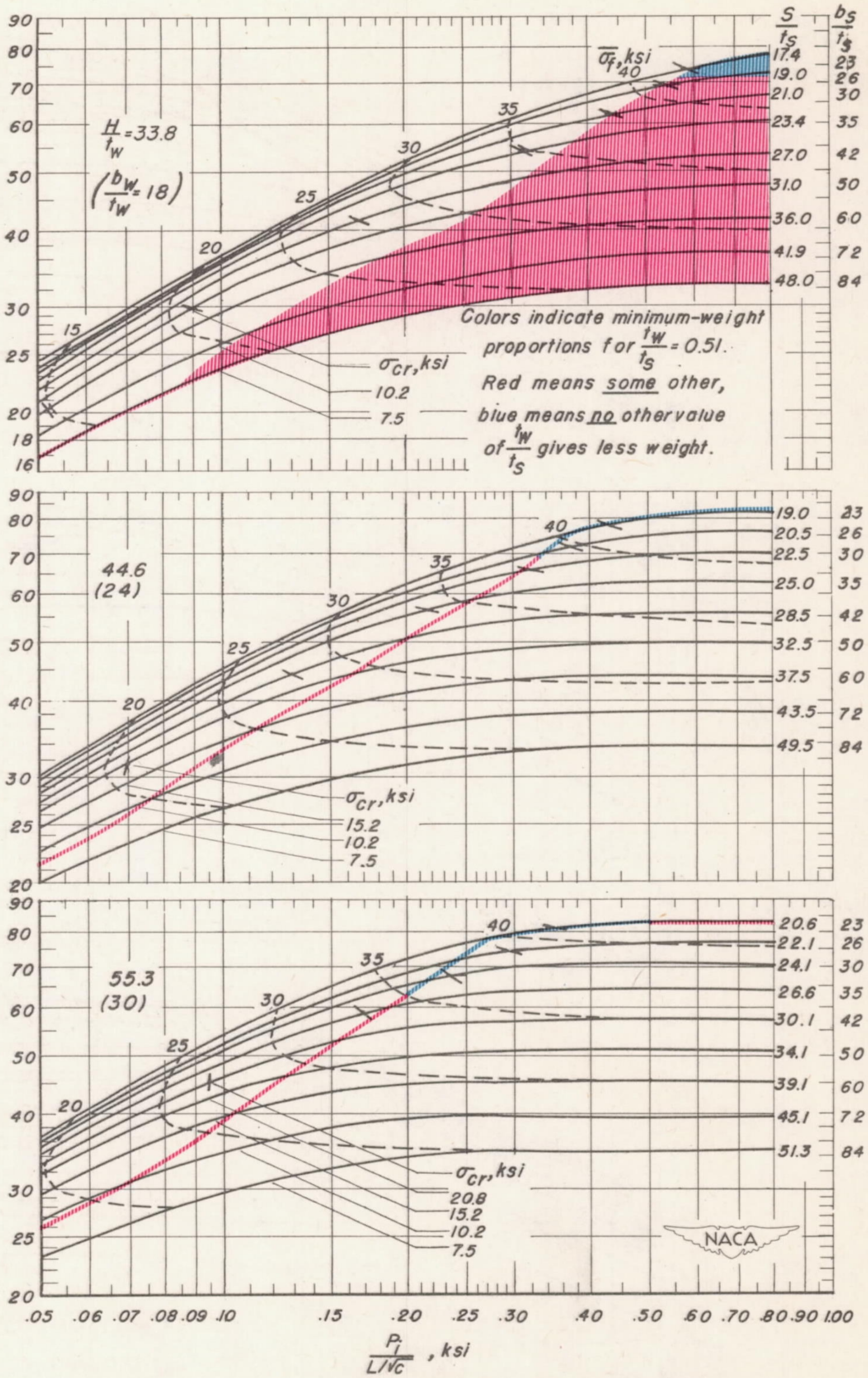

Figure 3.—Direct-reading design chart for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S}$ = 0.51.

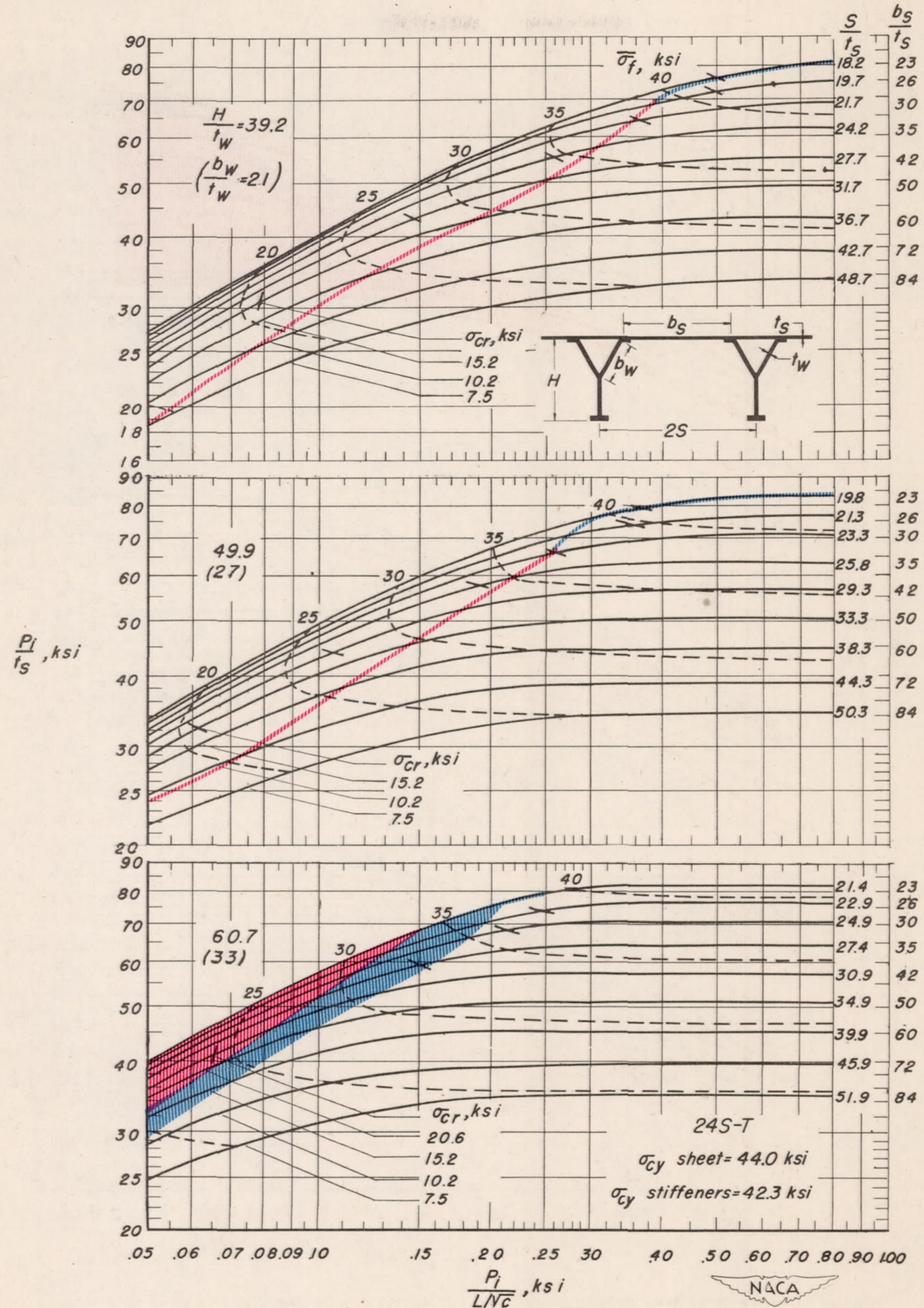

Figure 3.—Concluded. $\frac{t_w}{t_s} = 0.51$.

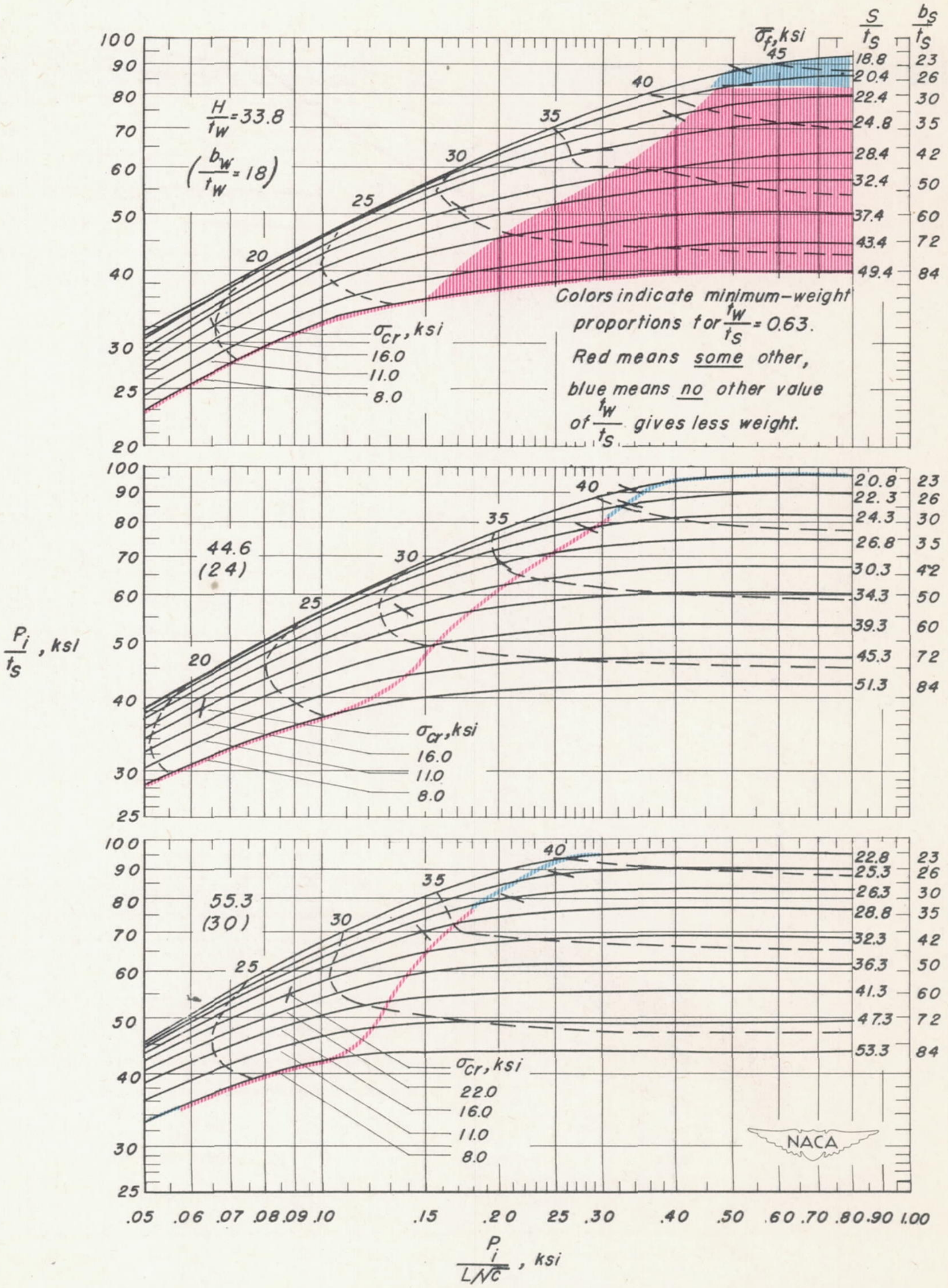

Figure 4.- Direct-reading design chart for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_w}{t_S}$ 0.63.

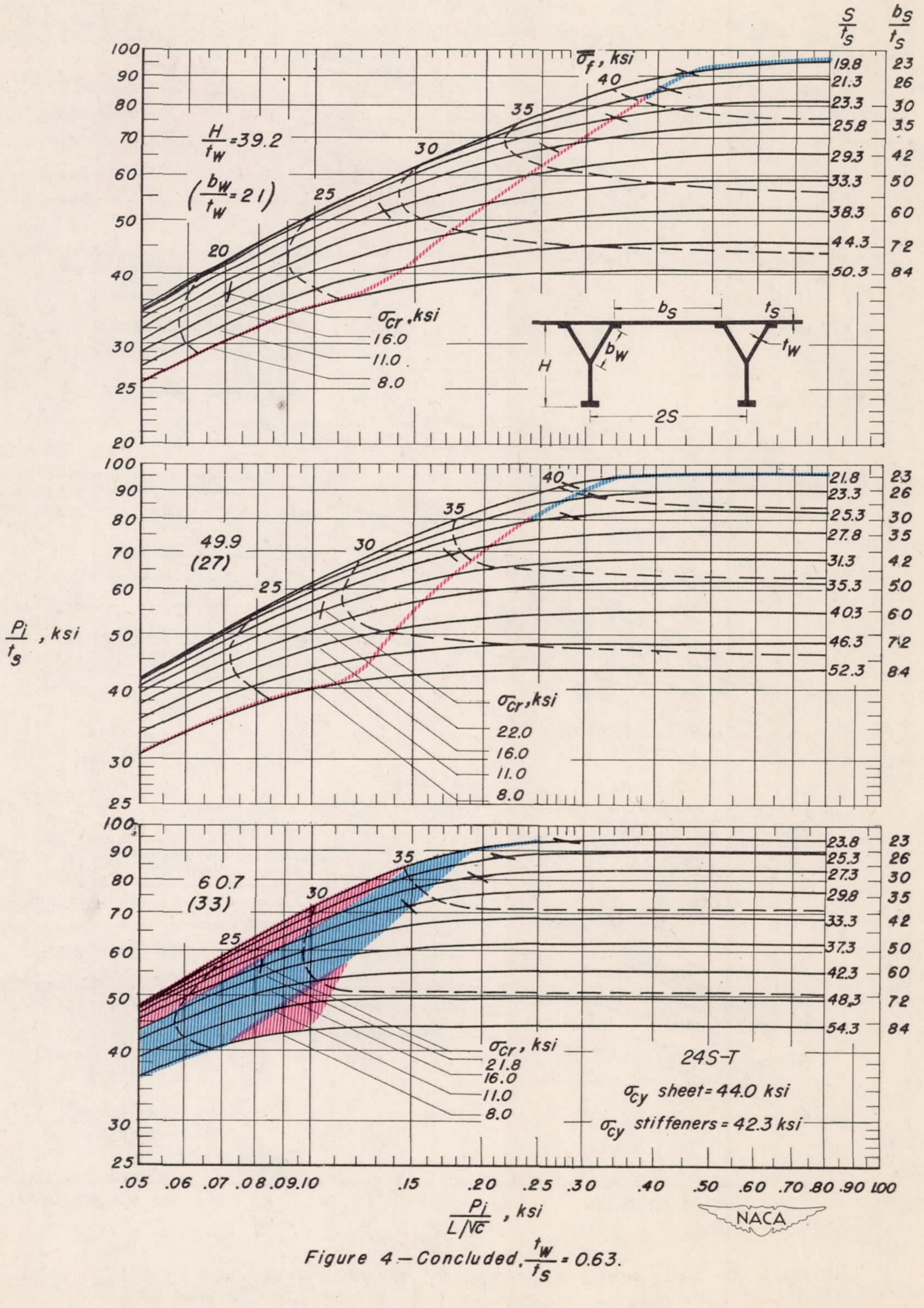

Figure 4.— Concluded. $\frac{t_W}{t_S}=0.63$.

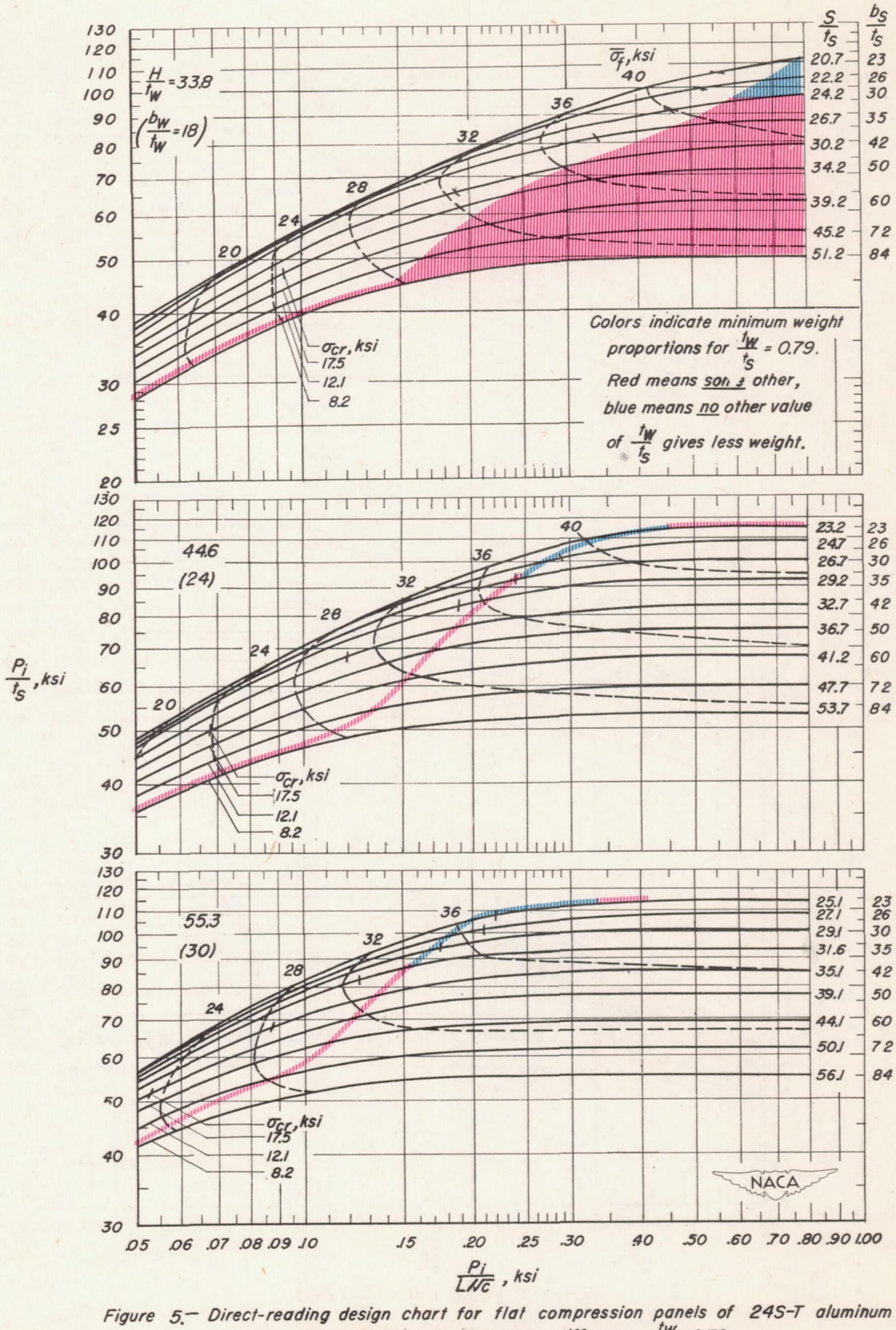

Figure 5.— Direct-reading design chart for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_w}{t_s} = 0.79$.

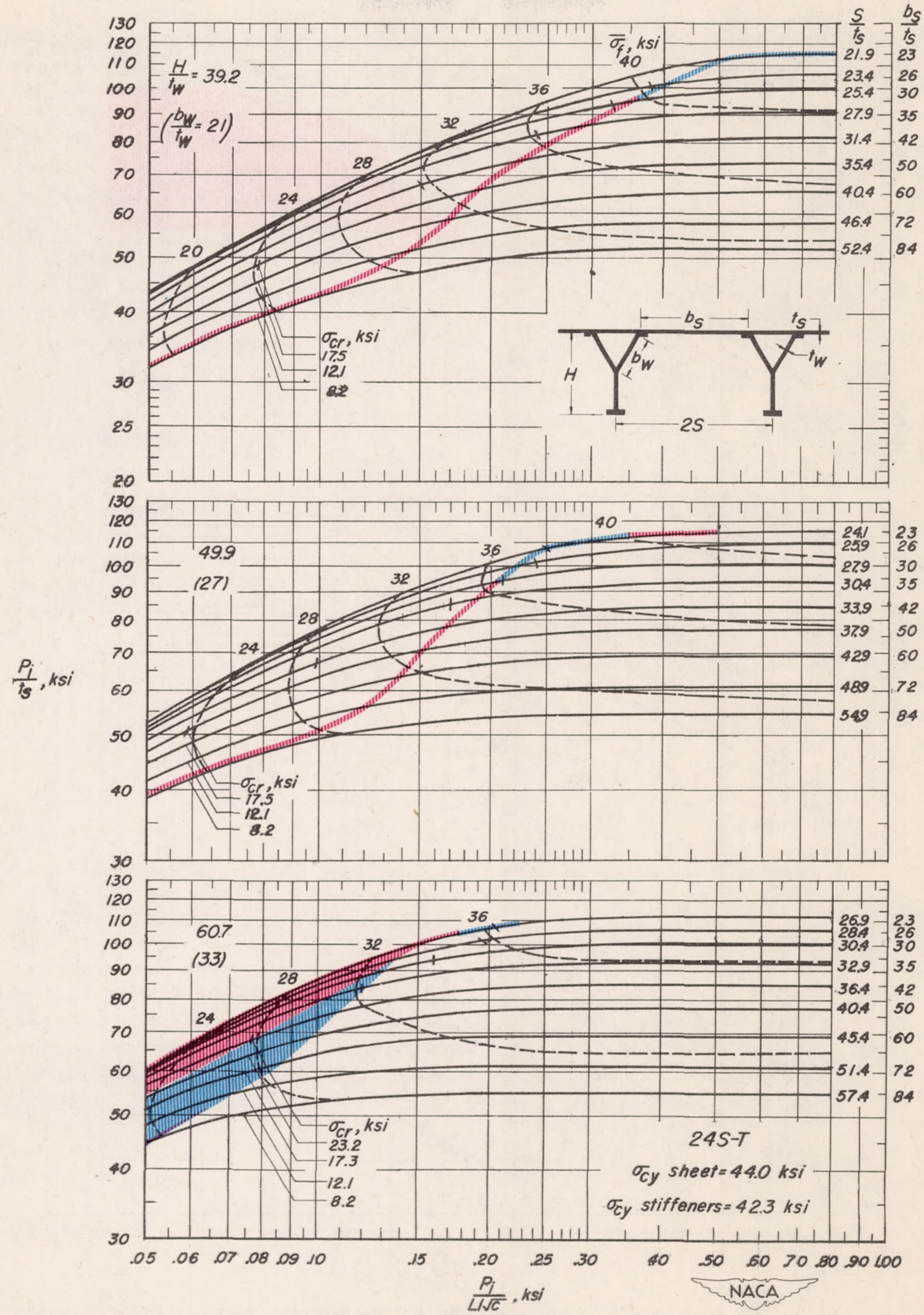

Figure 5.-Concluded. $\frac{t_W}{t_S}$=0.79.

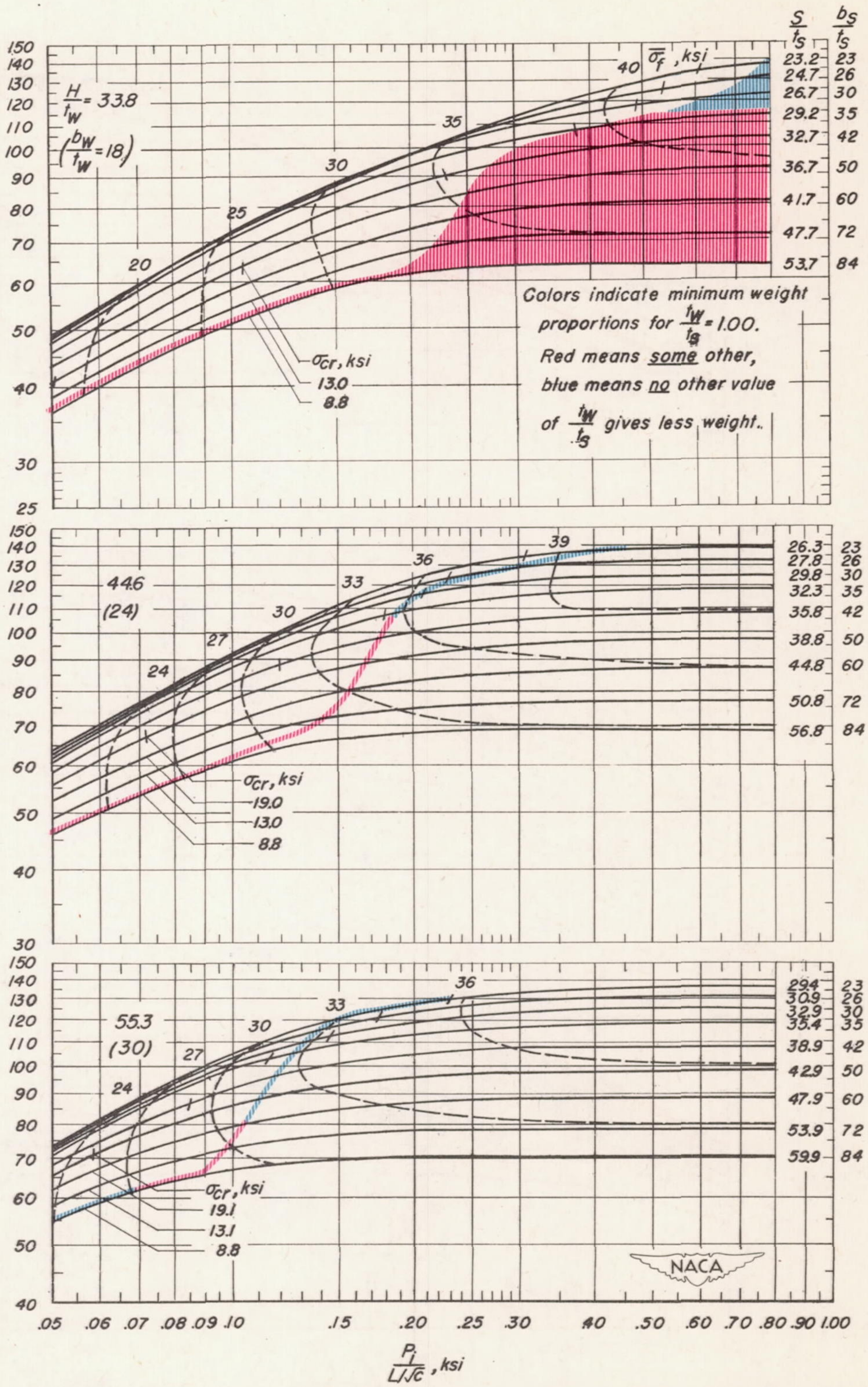

Figure 6.– Direct-reading design chart for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S}$ = 1.00.

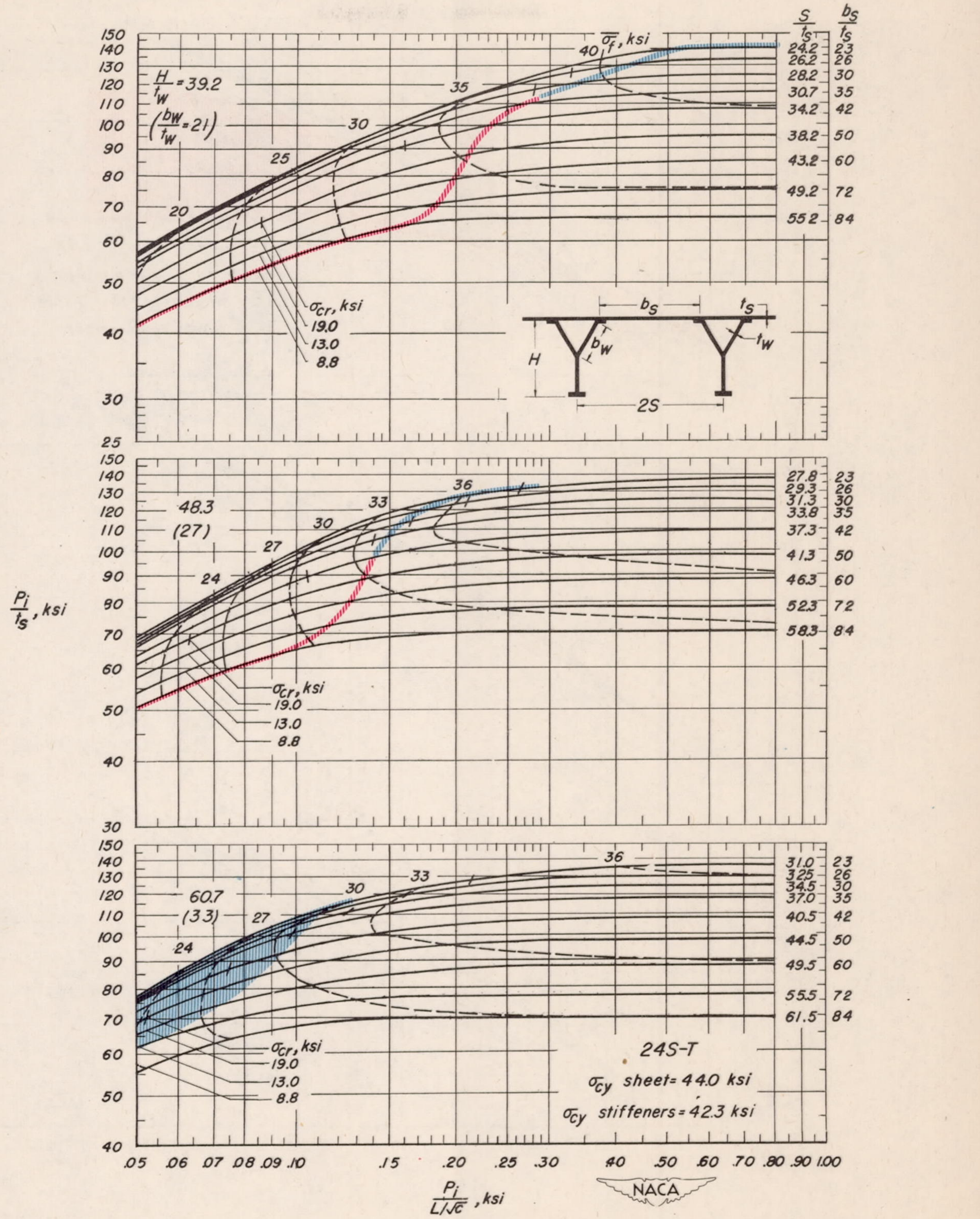

Figure 6.-Concluded. $\frac{t_W}{t_S} = 1.00$.

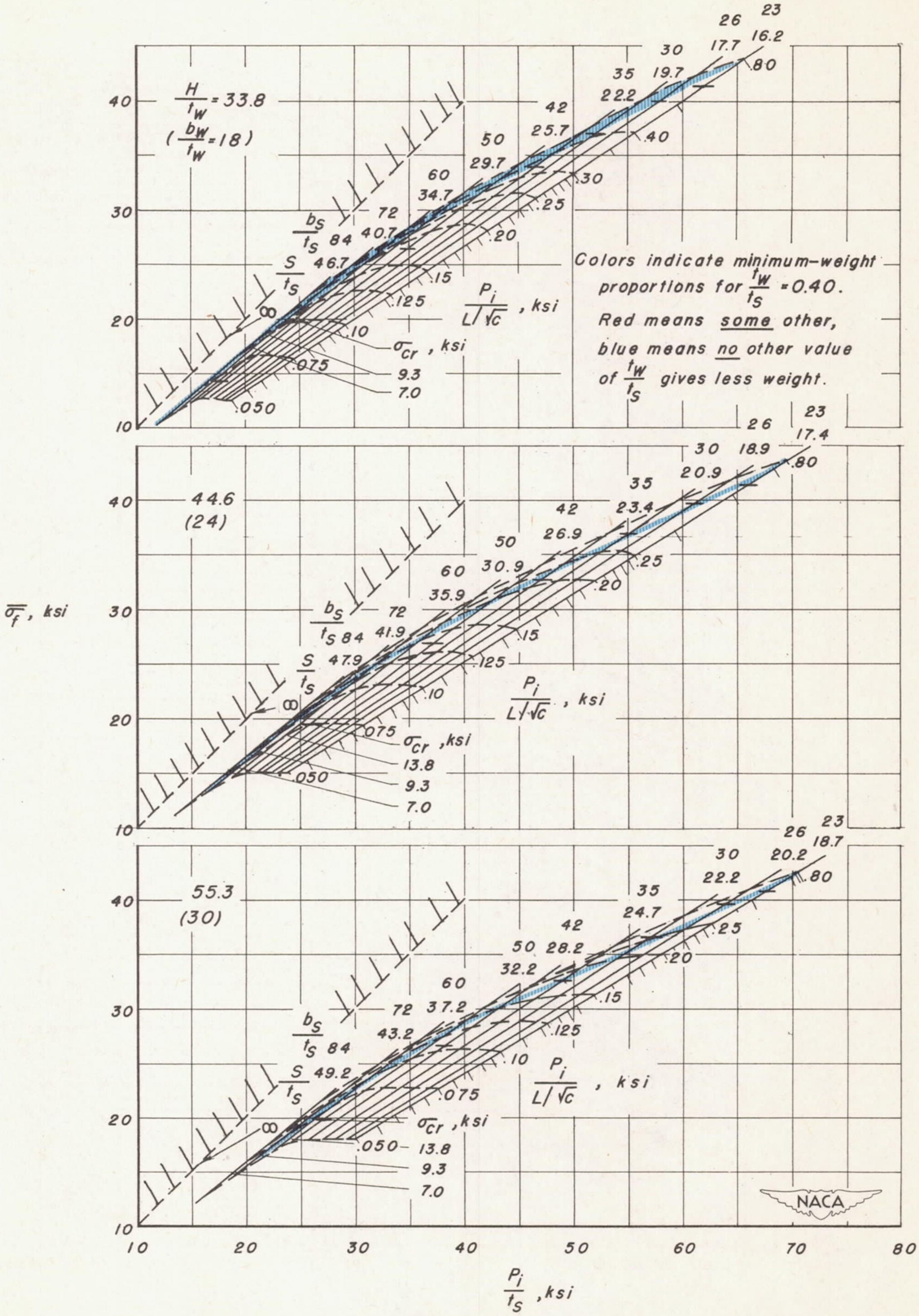

Figure 7.—Direct-reading design chart (alternate form) for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S} = 0.40$.

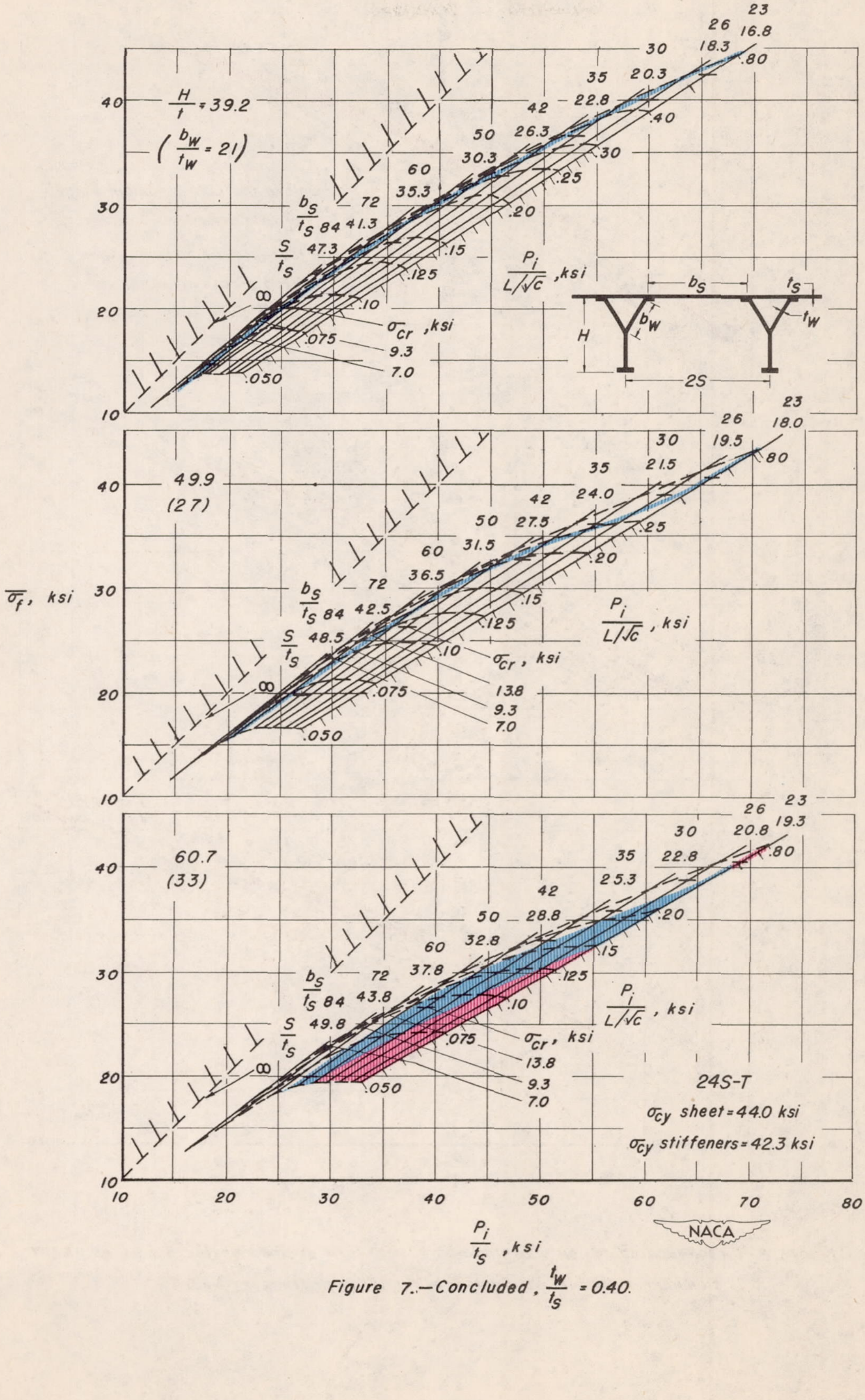

Figure 7.—Concluded, $\frac{t_W}{t_S} = 0.40$.

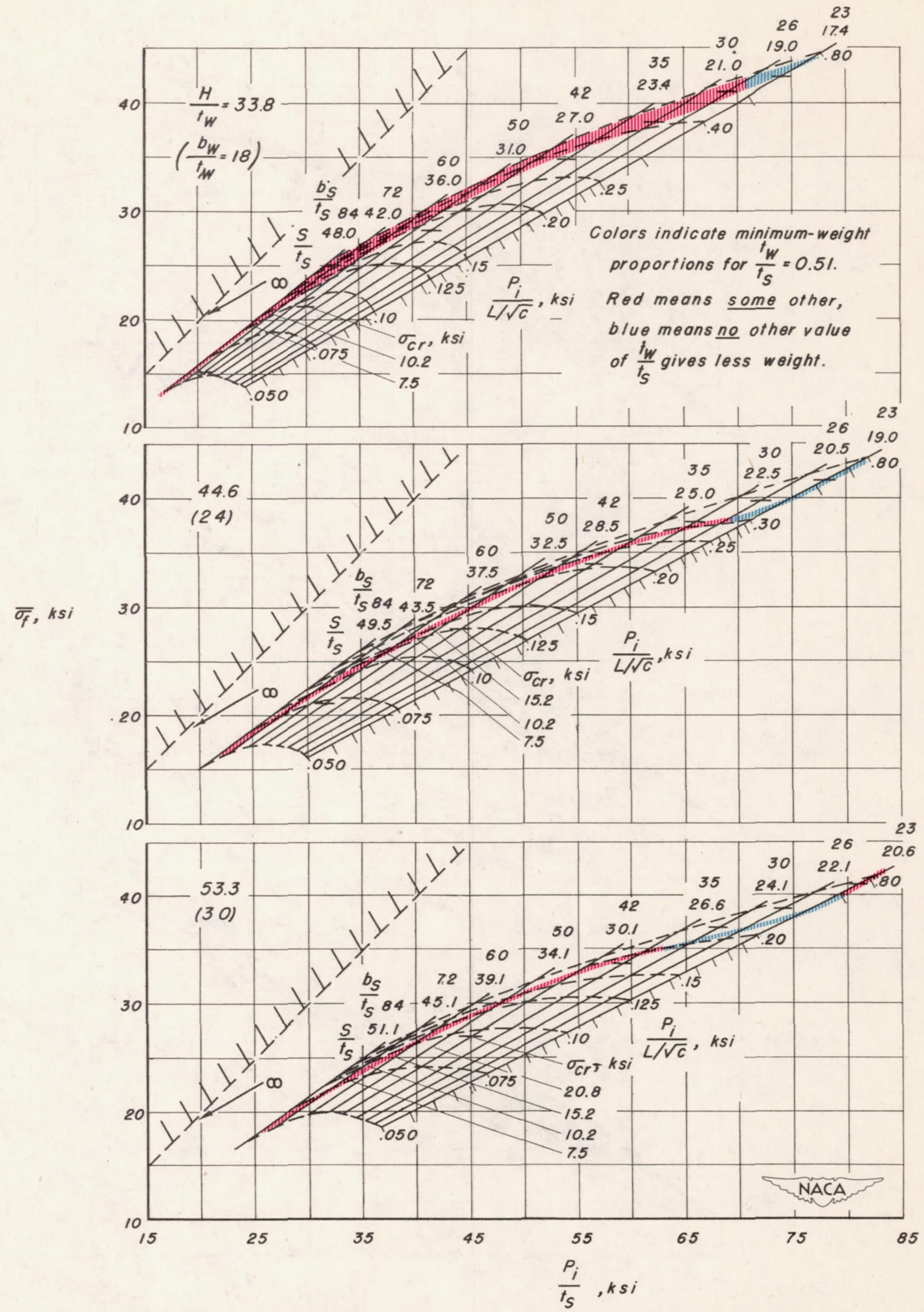

Figure 8.–Direct-reading design chart (alternate form) for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S} = 0.51$.

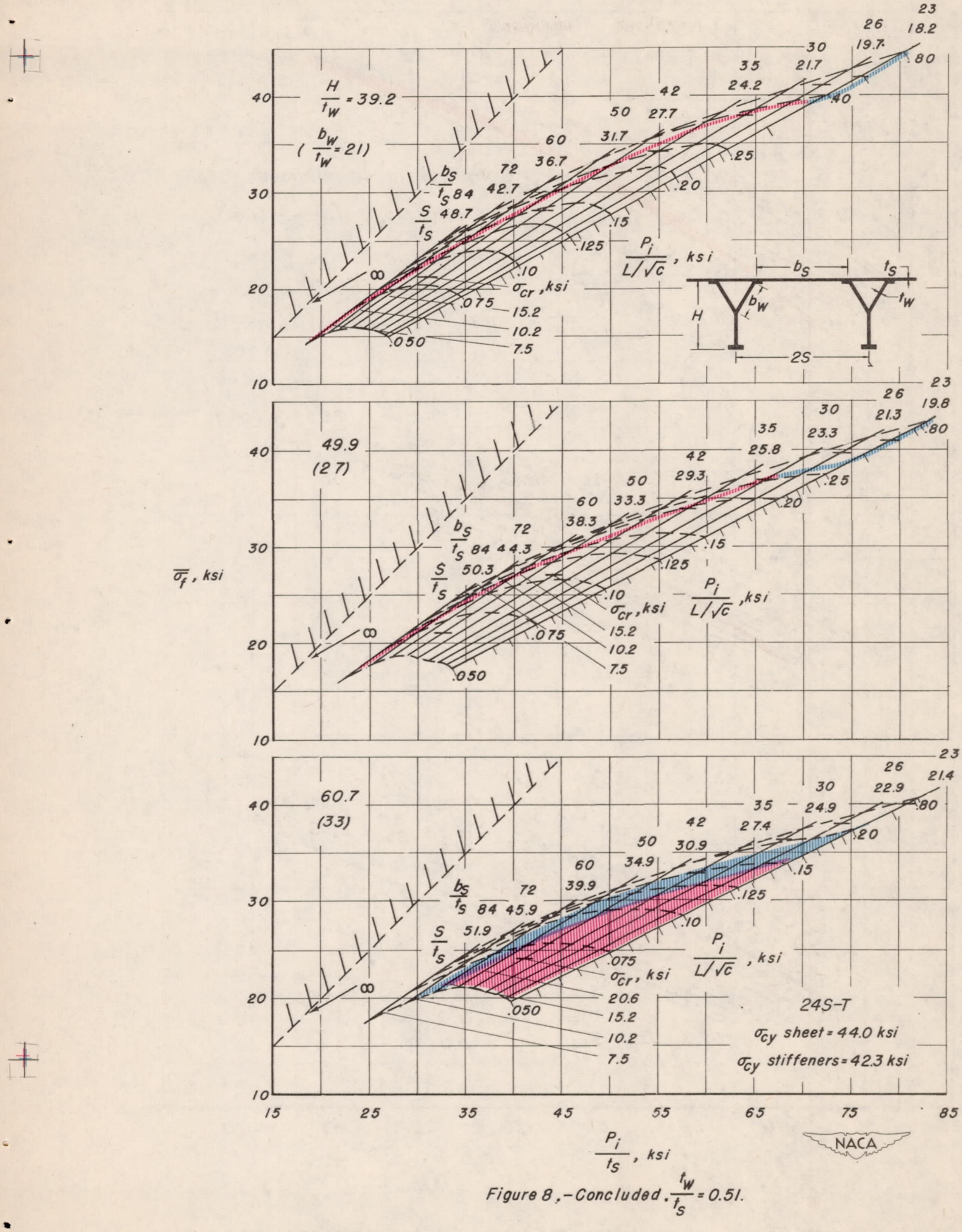

Figure 8.- Concluded. $\frac{t_W}{t_S} = 0.51$.

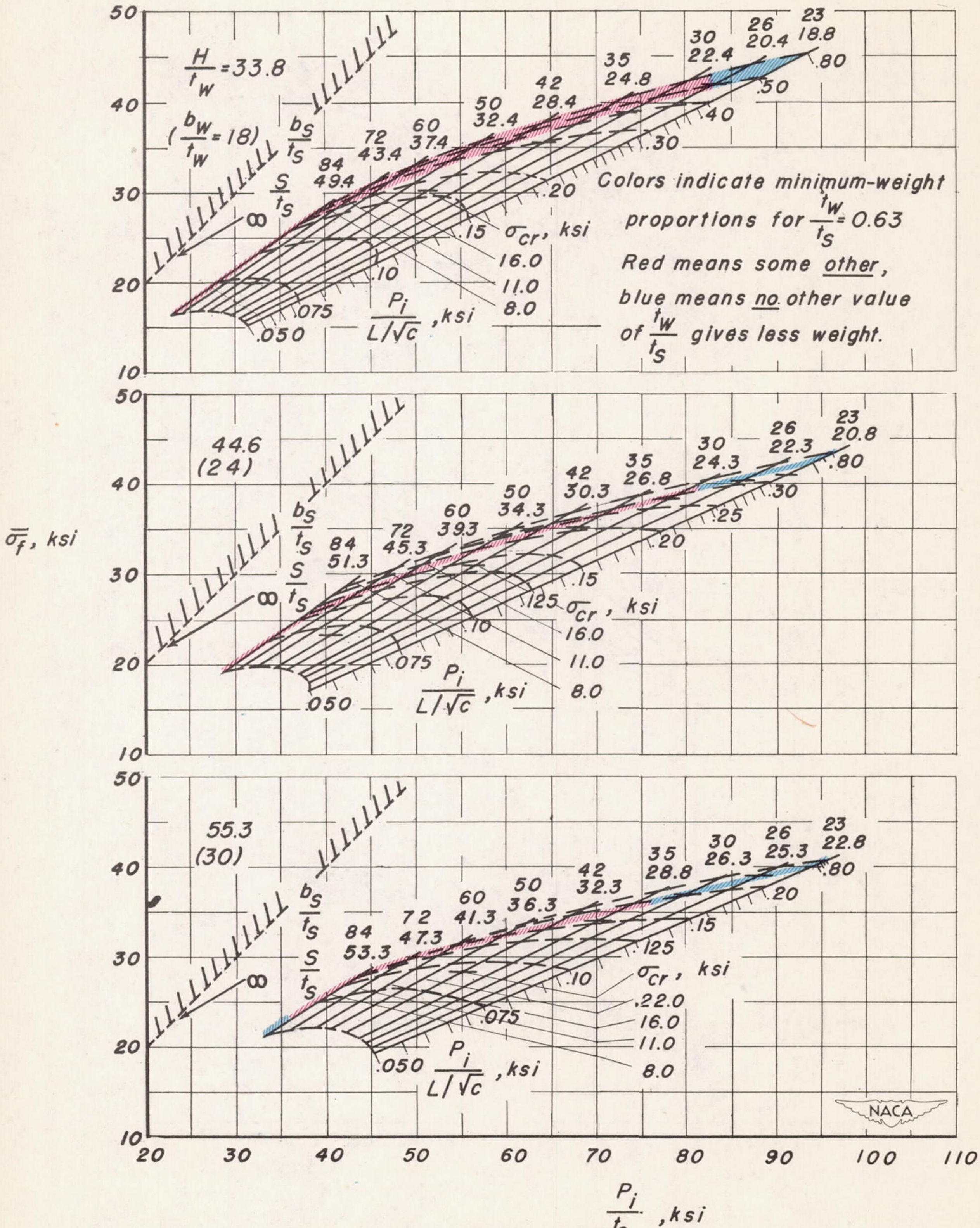

Figure 9.—Direct-reading design chart (alternate form) for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S}$ = 0.63.

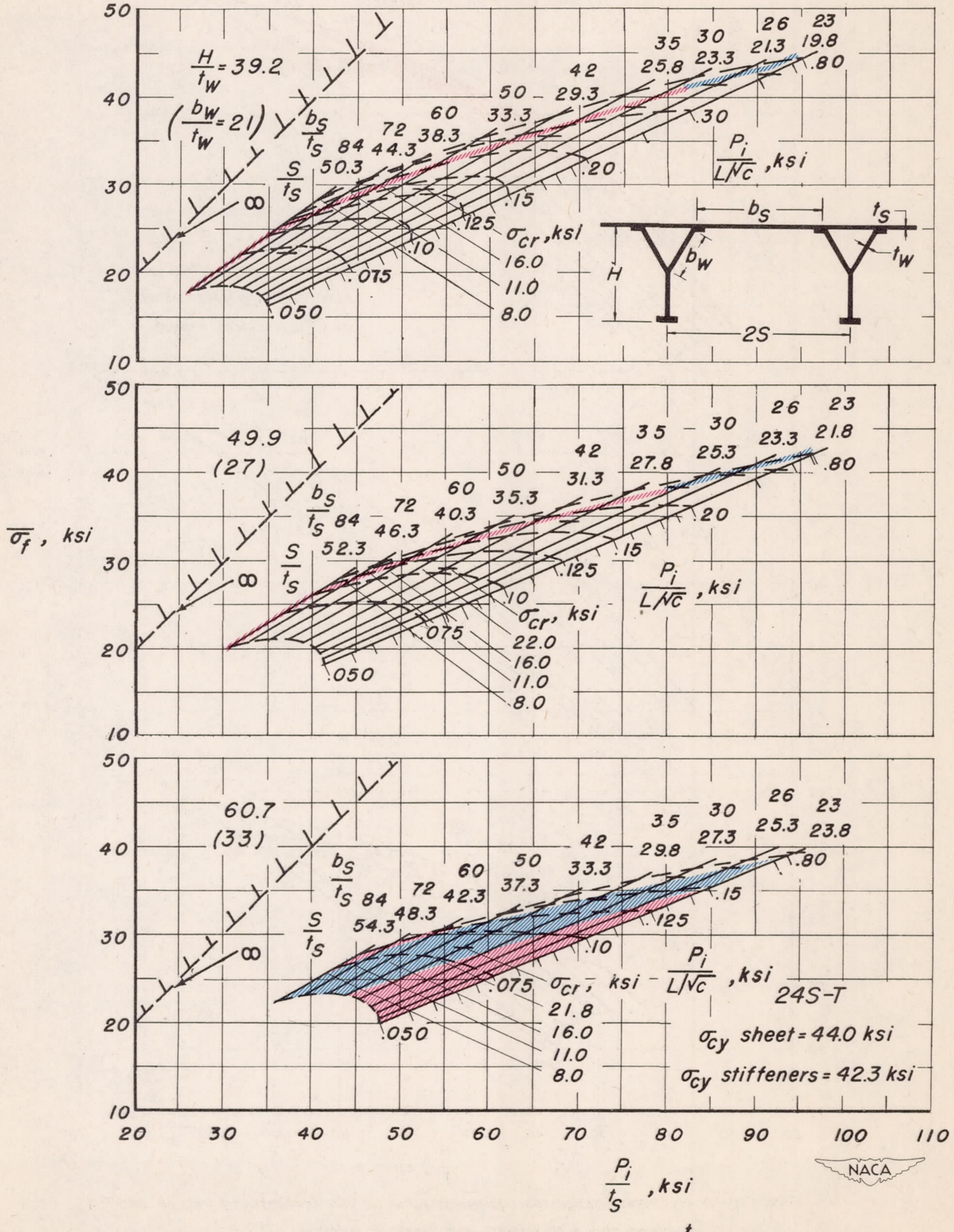

Figure 9.- Concluded. $\frac{t_W}{t_S} = 0.63$.

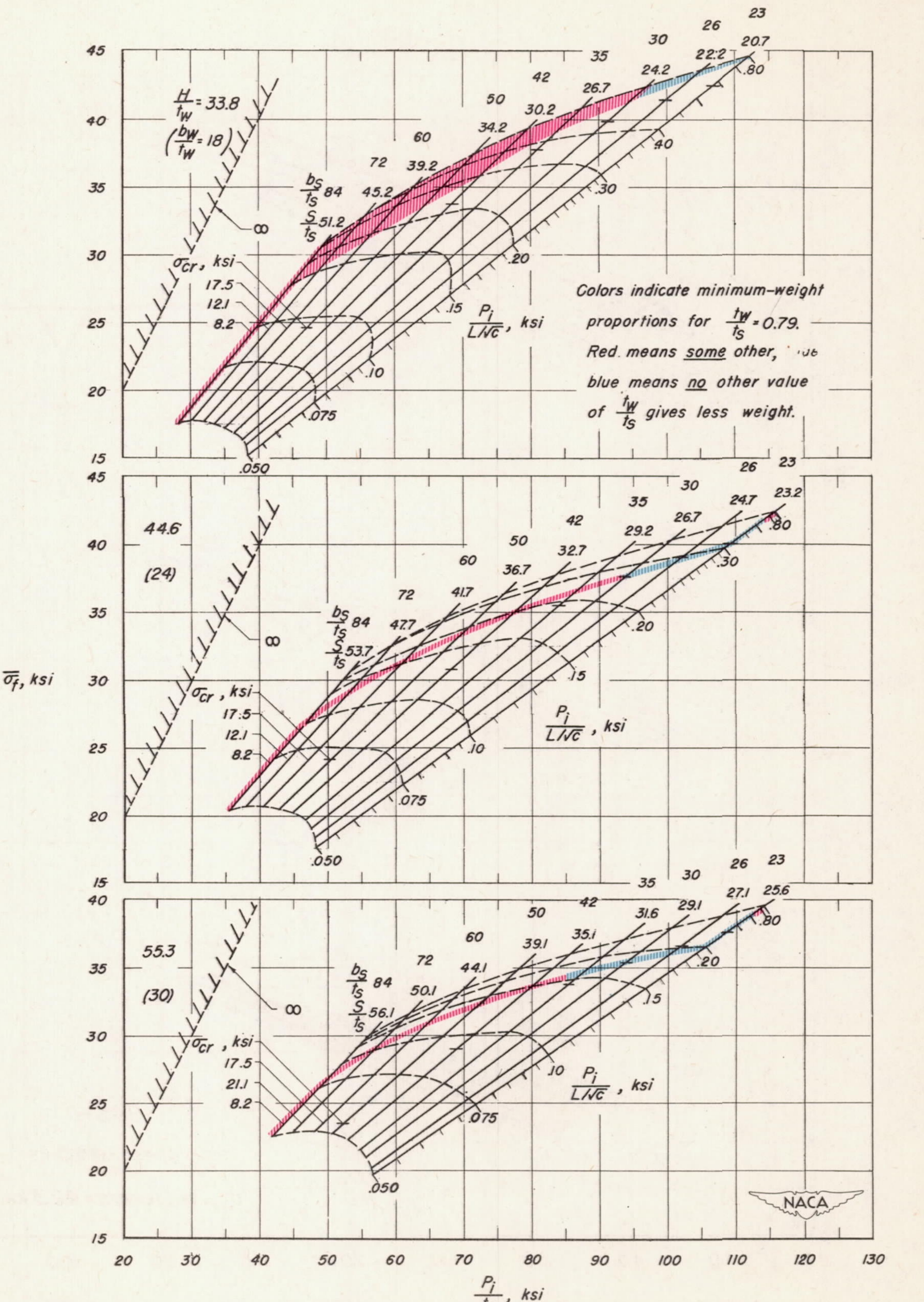

Figure 10.- Direct-reading design chart (alternate form) for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners. $\frac{t_W}{t_S}$ = 0.79.

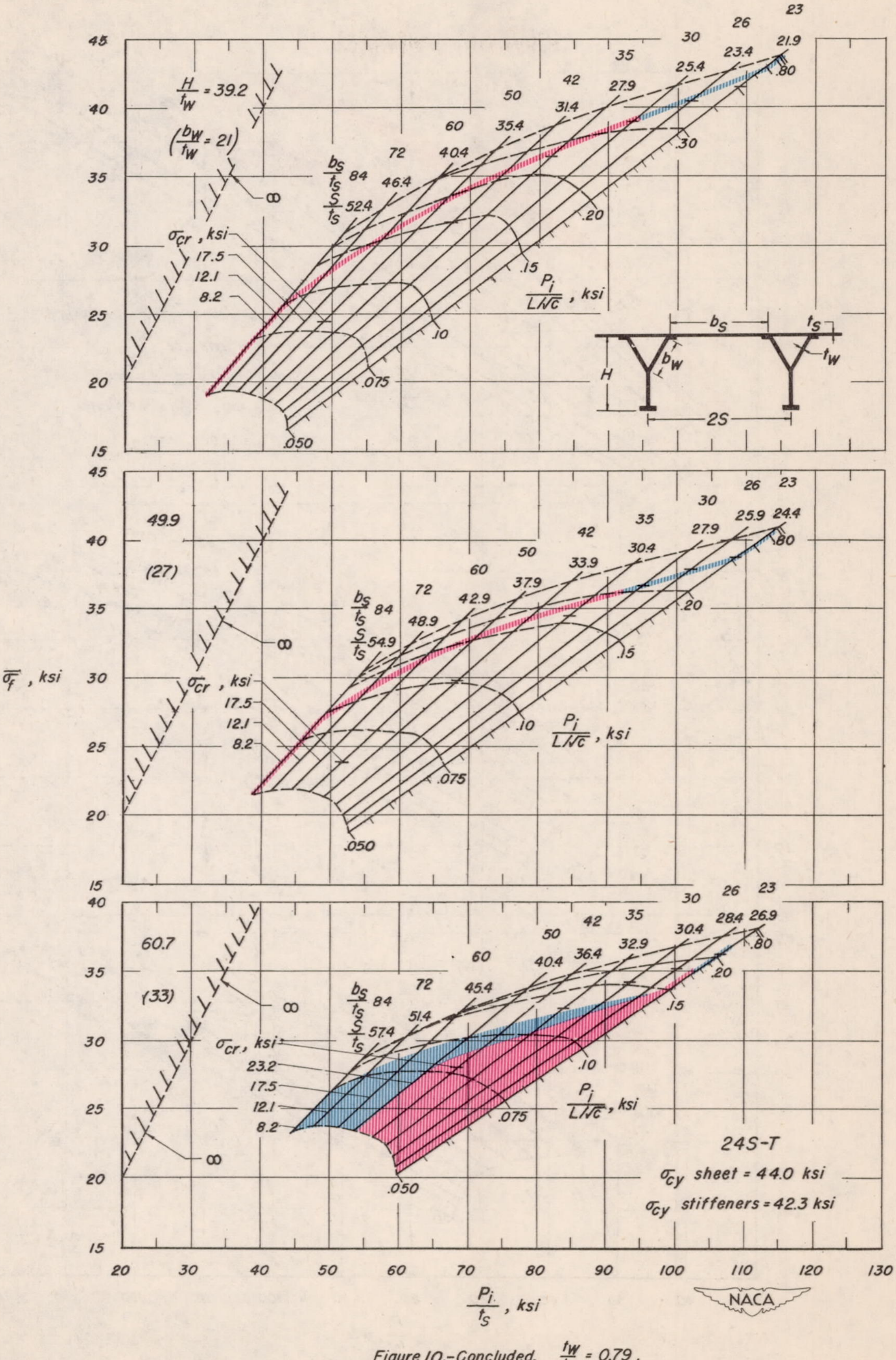

Figure 10.- Concluded. $\frac{t_W}{t_S} = 0.79$.

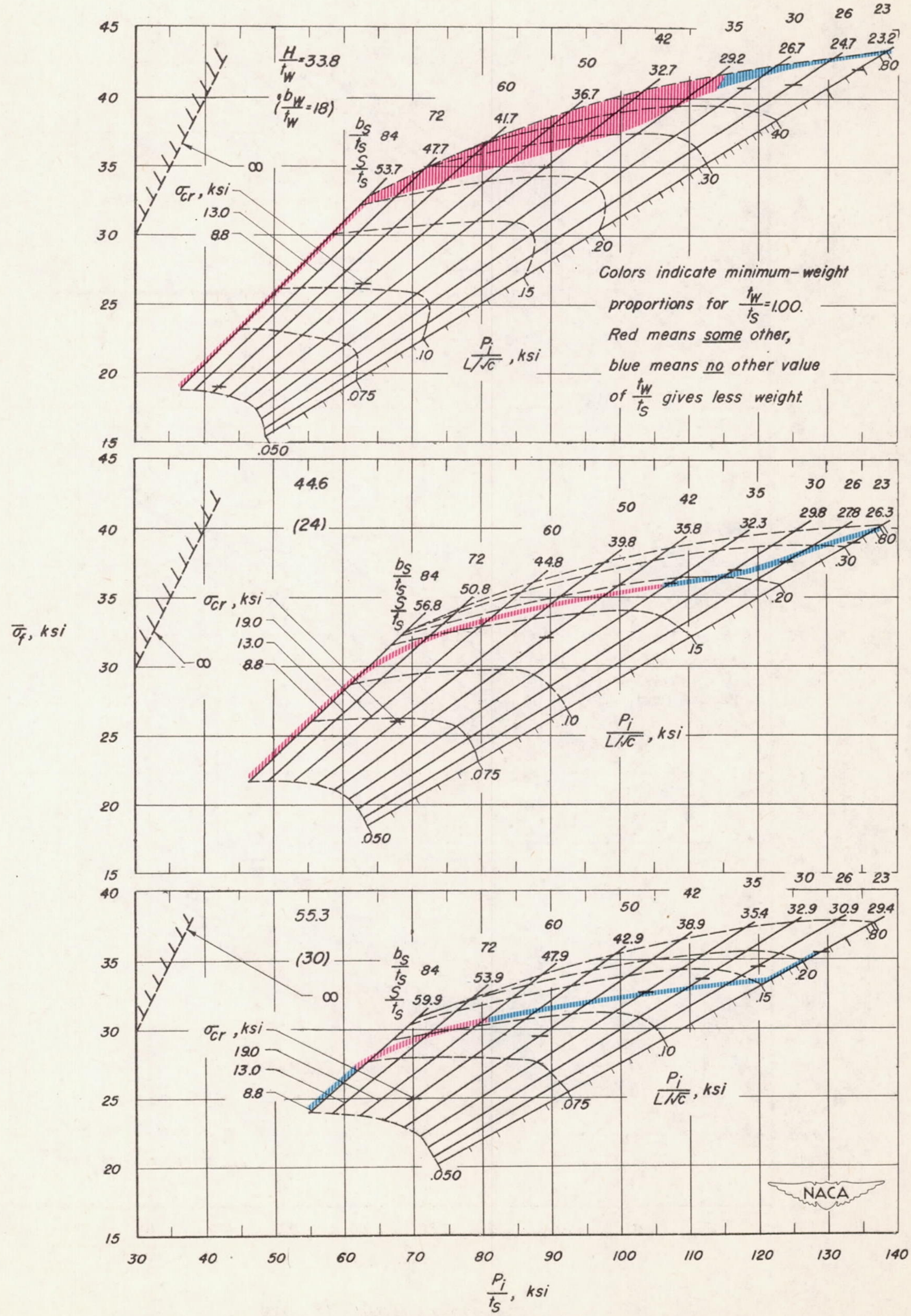

Figure 11.-Direct-reading design chart (alternate form) for flat compression panels of 24S-T aluminum alloy with straight-web Y-section stiffeners, $\frac{t_W}{t_S}$ = 1.00.

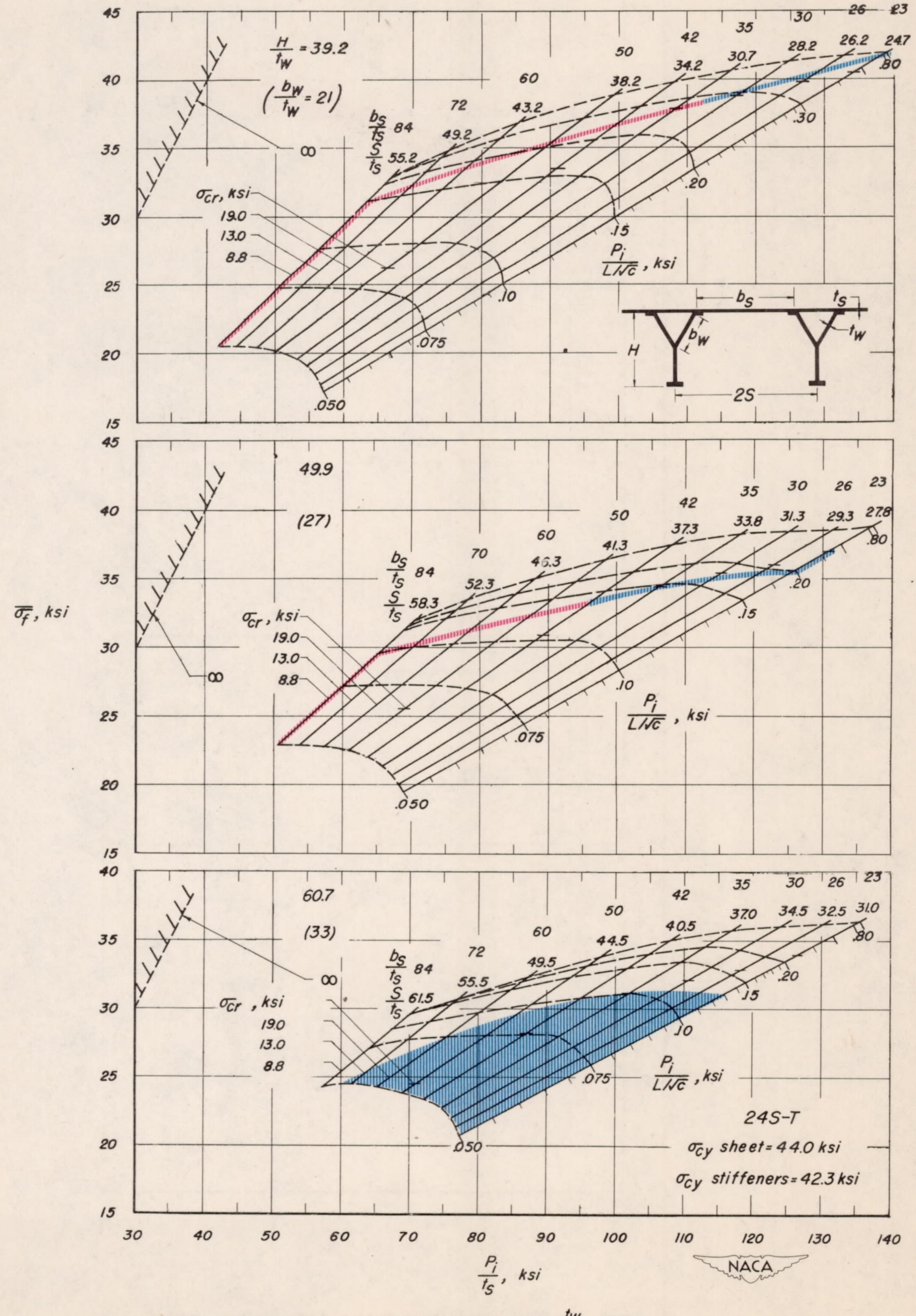

Figure 11.-Concluded. $\frac{t_W}{t_S} = 1.00$.

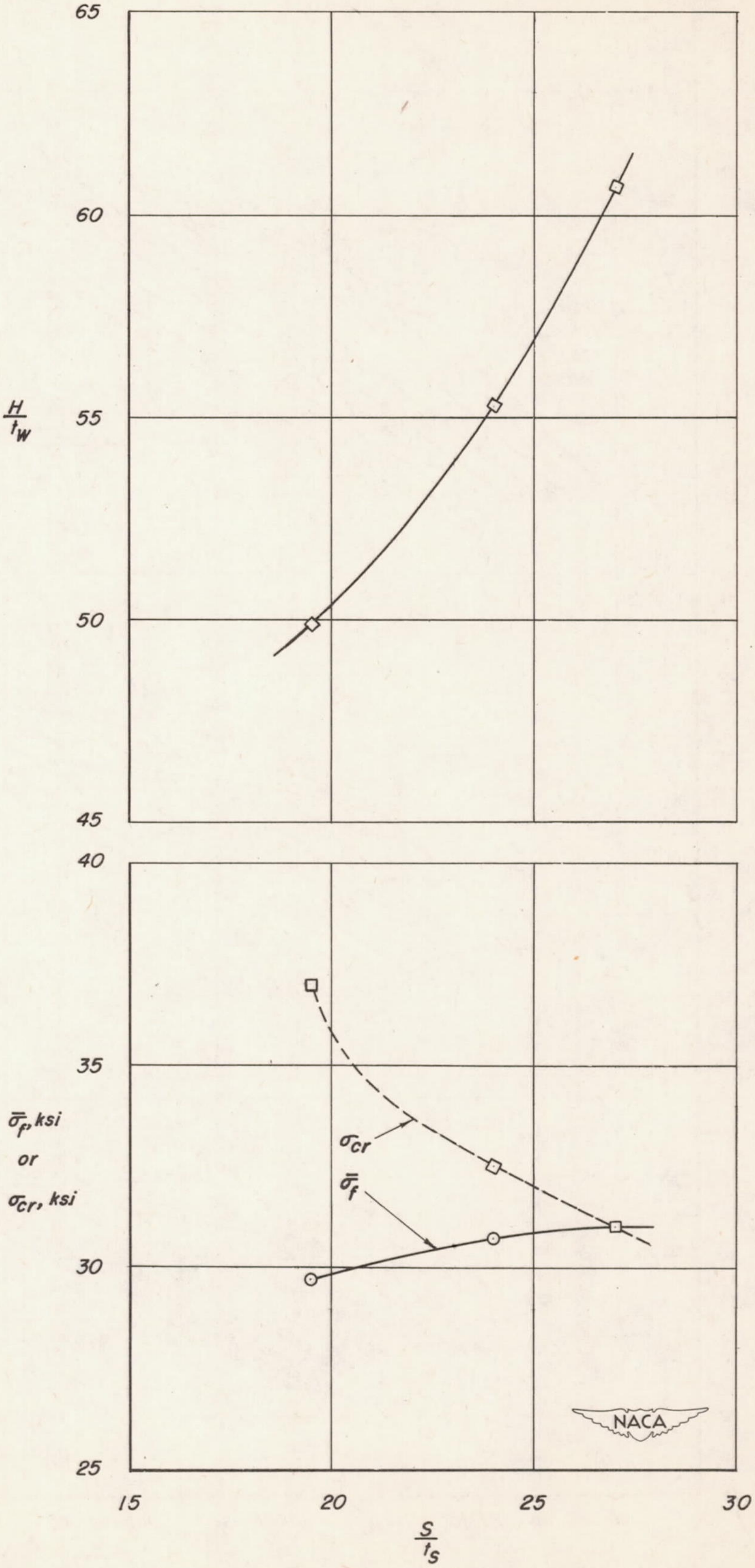

Figure 12.- Plot for obtaining design from design charts.