

# SECTION PROPERTIES

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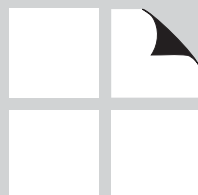
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## 3.1 Section Properties of Sawn Lumber and Structural Glued Laminated Timber

### 3.1.1 Standard Sizes of Sawn Lumber

Details regarding the dressed sizes of various species of lumber in the grading rules of the agencies which formulate and maintain such rules. The dressed sizes in Table 1A conform to the sizes set forth in U.S. Department of Commerce Voluntary Product Standard PS 20-10 (American Softwood Lumber Standard). While these sizes are generally available on a commercial basis, it is good practice to consult the local lumber dealer to determine what sizes are on hand or can be readily secured.

Dry lumber is defined as lumber which has been seasoned to a moisture content of 19% or less. Green lumber is defined as lumber having a moisture content in excess of 19%.

### 3.1.2 Properties of Standard Dressed Sizes

Certain mathematical expressions of the properties or elements of sections are used in design calculations for various member shapes and loading conditions. The section properties for selected standard sizes of boards, dimension lumber, and timbers are given in Table 1B. Section properties for selected standard sizes of structural glued laminated timber are given in Tables 1C and 1D.

### 3.1.3 Definitions

NEUTRAL AXIS, in the cross section of a beam, is the line on which there is neither tension nor compression stress.

MOMENT OF INERTIA,  $I$ , of the cross section of a beam is the sum of the products of each of its elementary areas multiplied by the square of their distance from the neutral axis of the section.

SECTION MODULUS,  $S$ , is the moment of inertia divided by the distance from the neutral axis to the extreme fiber of the section.

CROSS SECTION is a section taken through the member perpendicular to its longitudinal axis.

The following symbols and formulas apply to rectangular beam cross sections:

X-X = neutral axis for edgewise bending (load applied to narrow face)

Y-Y = neutral axis for flatwise bending (load applied to wide face)

$b$  = breadth (thickness) of rectangular bending member, in.

$d$  = depth (width) of rectangular bending member, in.

$A = bd$  = area of cross section, in.<sup>2</sup>

$c$  = distance from neutral axis to extreme fiber of cross section, in.

$I_x = bd^3/12$  = moment of inertia about the X-X axis, in.<sup>4</sup>

$I_y = db^3/12$  = moment of inertia about the Y-Y axis, in.<sup>4</sup>

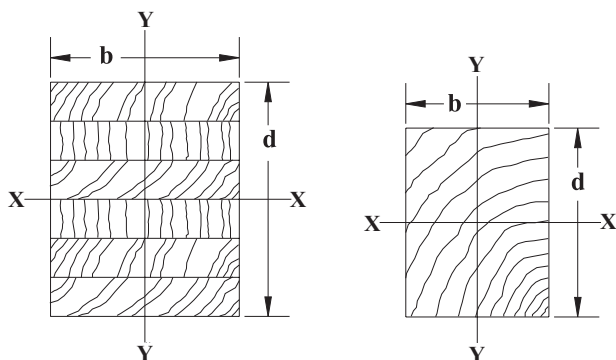
$r_x = \sqrt{I_x/A} = d/\sqrt{12}$  = radius of gyration about the X-X axis, in.

$r_y = \sqrt{I_y/A} = b/\sqrt{12}$  = radius of gyration about the Y-Y axis, in.

$S_x = I_x/c = bd^2/6$  = section modulus about the X-X axis, in.<sup>3</sup>

$S_y = I_y/c = db^2/6$  = section modulus about the Y-Y axis, in.<sup>3</sup>

**Figure 1A Dimensions for Rectangular Cross Section**



Structural Glued Laminated Timber

Sawn Lumber

The following formula shall be used to determine the density in lbs/ft<sup>3</sup> of wood:

$$\text{density} = 62.4 \left[ \frac{G}{1 + G(0.009)(\text{m.c.})} \right] \left[ 1 + \frac{\text{m.c.}}{100} \right]$$

where:

$G$  = specific gravity of wood

m.c. = moisture content of wood, %

**Table 1A Nominal and Minimum Dressed Sizes of Sawn Lumber**

Item	Thickness (in.)			Face Widths (in.)			
	Nominal	Minimum dressed		Nominal	Minimum dressed		
		Dry	Green		Dry	Green	
Boards	3/4	5/8	11/16	2	1-1/2	1-9/16	
	1	3/4	25/32	3	2-1/2	2-9/16	
	1-1/4	1	1-1/32	4	3-1/2	3-9/16	
	1-1/2	1-1/4	1-9/32	5	4-1/2	4-5/8	
				6	5-1/2	5-5/8	
				7	6-1/2	6-5/8	
				8	7-1/4	7-1/2	
				9	8-1/4	8-1/2	
				10	9-1/4	9-1/2	
				11	10-1/4	10-1/2	
				12	11-1/4	11-1/2	
				14	13-1/4	13-1/2	
				16	15-1/4	15-1/2	
	Dimension Lumber	2	1-1/2	1-9/16	2	1-1/2	1-9/16
		2-1/2	2	2-1/16	3	2-1/2	2-9/16
		3	2-1/2	2-9/16	4	3-1/2	3-9/16
3-1/2		3	3-1/16	5	4-1/2	4-5/8	
4		3-1/2	3-9/16	6	5-1/2	5-5/8	
4-1/2		4	4-1/16	8	7-1/4	7-1/2	
				10	9-1/4	9-1/2	
				12	11-1/4	11-1/2	
				14	13-1/4	13-1/2	
Timbers	5 & 6 thick	1/2 off	1/2 off	5 & 6 wide	1/2 off	1/2 off	
	7-15 thick	3/4 off	1/2 off	7-15 wide	3/4 off	1/2 off	
	≥16 thick	1 off	1/2 off	≥16 wide	1 off	1/2 off	

**3 SECTION PROPERTIES**

**Table 1B Section Properties of Standard Dressed (S4S) Sawn Lumber**

Nominal Size b x d	Standard Dressed Size (S4S) b x d in. x in.	Area of Section A in. <sup>2</sup>	X-X AXIS		Y-Y AXIS		Approximate weight in pounds per linear foot (lbs/ft) of piece when density of wood equals:					
			Section Modulus S <sub>xx</sub> in. <sup>3</sup>	Moment of Inertia I <sub>xx</sub> in. <sup>4</sup>	Section Modulus S <sub>yy</sub> in. <sup>3</sup>	Moment of Inertia I <sub>yy</sub> in. <sup>4</sup>	25 lbs/ft <sup>3</sup>	30 lbs/ft <sup>3</sup>	35 lbs/ft <sup>3</sup>	40 lbs/ft <sup>3</sup>	45 lbs/ft <sup>3</sup>	50 lbs/ft <sup>3</sup>
<b>Boards<sup>1</sup></b>												
1 x 3	3/4 x 2-1/2	1.875	0.781	0.977	0.234	0.088	0.326	0.391	0.456	0.521	0.586	0.651
1 x 4	3/4 x 3-1/2	2.625	1.531	2.680	0.328	0.123	0.456	0.547	0.638	0.729	0.820	0.911
1 x 6	3/4 x 5-1/2	4.125	3.781	10.40	0.516	0.193	0.716	0.859	1.003	1.146	1.289	1.432
1 x 8	3/4 x 7-1/4	5.438	6.570	23.82	0.680	0.255	0.944	1.133	1.322	1.510	1.699	1.888
1 x 10	3/4 x 9-1/4	6.938	10.70	49.47	0.867	0.325	1.204	1.445	1.686	1.927	2.168	2.409
1 x 12	3/4 x 11-1/4	8.438	15.82	88.99	1.055	0.396	1.465	1.758	2.051	2.344	2.637	2.930
<b>Dimension Lumber (see NDS 4.1.3.2) and Decking (see NDS 4.1.3.5)</b>												
2 x 3	1-1/2 x 2-1/2	3.750	1.56	1.953	0.938	0.703	0.651	0.781	0.911	1.042	1.172	1.302
2 x 4	1-1/2 x 3-1/2	5.250	3.06	5.359	1.313	0.984	0.911	1.094	1.276	1.458	1.641	1.823
2 x 5	1-1/2 x 4-1/2	6.750	5.06	11.39	1.688	1.266	1.172	1.406	1.641	1.875	2.109	2.344
2 x 6	1-1/2 x 5-1/2	8.250	7.56	20.80	2.063	1.547	1.432	1.719	2.005	2.292	2.578	2.865
2 x 8	1-1/2 x 7-1/4	10.88	13.14	47.63	2.719	2.039	1.888	2.266	2.643	3.021	3.398	3.776
2 x 10	1-1/2 x 9-1/4	13.88	21.39	98.93	3.469	2.602	2.409	2.891	3.372	3.854	4.336	4.818
2 x 12	1-1/2 x 11-1/4	16.88	31.64	178.0	4.219	3.164	2.930	3.516	4.102	4.688	5.273	5.859
2 x 14	1-1/2 x 13-1/4	19.88	43.89	290.8	4.969	3.727	3.451	4.141	4.831	5.521	6.211	6.901
3 x 4	2-1/2 x 3-1/2	8.75	5.10	8.932	3.646	4.557	1.519	1.823	2.127	2.431	2.734	3.038
3 x 5	2-1/2 x 4-1/2	11.25	8.44	18.98	4.688	5.859	1.953	2.344	2.734	3.125	3.516	3.906
3 x 6	2-1/2 x 5-1/2	13.75	12.60	34.66	5.729	7.161	2.387	2.865	3.342	3.819	4.297	4.774
3 x 8	2-1/2 x 7-1/4	18.13	21.90	79.39	7.552	9.440	3.147	3.776	4.405	5.035	5.664	6.293
3 x 10	2-1/2 x 9-1/4	23.13	35.65	164.9	9.635	12.04	4.015	4.818	5.621	6.424	7.227	8.030
3 x 12	2-1/2 x 11-1/4	28.13	52.73	296.6	11.72	14.65	4.883	5.859	6.836	7.813	8.789	9.766
3 x 14	2-1/2 x 13-1/4	33.13	73.15	484.6	13.80	17.25	5.751	6.901	8.051	9.201	10.35	11.50
3 x 16	2-1/2 x 15-1/4	38.13	96.90	738.9	15.89	19.86	6.619	7.943	9.266	10.59	11.91	13.24
4 x 4	3-1/2 x 3-1/2	12.25	7.15	12.51	7.146	12.51	2.127	2.552	2.977	3.403	3.828	4.253
4 x 5	3-1/2 x 4-1/2	15.75	11.81	26.58	9.188	16.08	2.734	3.281	3.828	4.375	4.922	5.469
4 x 6	3-1/2 x 5-1/2	19.25	17.65	48.53	11.23	19.65	3.342	4.010	4.679	5.347	6.016	6.684
4 x 8	3-1/2 x 7-1/4	25.38	30.66	111.1	14.80	25.90	4.405	5.286	6.168	7.049	7.930	8.811
4 x 10	3-1/2 x 9-1/4	32.38	49.91	230.8	18.89	33.05	5.621	6.745	7.869	8.993	10.12	11.24
4 x 12	3-1/2 x 11-1/4	39.38	73.83	415.3	22.97	40.20	6.836	8.203	9.570	10.94	12.30	13.67
4 x 14	3-1/2 x 13-1/4	46.38	102.41	678.5	27.05	47.34	8.051	9.661	11.27	12.88	14.49	16.10
4 x 16	3-1/2 x 15-1/4	53.38	135.66	1034	31.14	54.49	9.266	11.12	12.97	14.83	16.68	18.53
<b>Timbers (5" x 5" and larger)<sup>2</sup></b>												
<b>Post and Timber (see NDS 4.1.3.4 and NDS 4.1.5.3)</b>												
5 x 5	4-1/2 x 4-1/2	20.25	15.19	34.17	15.19	34.17	3.516	4.219	4.922	5.625	6.328	7.031
6 x 6	5-1/2 x 5-1/2	30.25	27.73	76.26	27.73	76.26	5.252	6.302	7.352	8.403	9.453	10.50
6 x 8	5-1/2 x 7-1/2	41.25	51.56	193.4	37.81	104.0	7.161	8.594	10.03	11.46	12.89	14.32
8 x 8	7-1/2 x 7-1/2	56.25	70.31	263.7	70.31	263.7	9.766	11.72	13.67	15.63	17.58	19.53
8 x 10	7-1/2 x 9-1/2	71.25	112.8	535.9	89.06	334.0	12.37	14.84	17.32	19.79	22.27	24.74
10 x 10	9-1/2 x 9-1/2	90.25	142.9	678.8	142.9	678.8	15.67	18.80	21.94	25.07	28.20	31.34
10 x 12	9-1/2 x 11-1/2	109.3	209.4	1204	173.0	821.7	18.97	22.76	26.55	30.35	34.14	37.93
12 x 12	11-1/2 x 11-1/2	132.3	253.5	1458	253.5	1458	22.96	27.55	32.14	36.74	41.33	45.92
12 x 14	11-1/2 x 13-1/2	155.3	349.3	2358	297.6	1711	26.95	32.34	37.73	43.13	48.52	53.91
14 x 14	13-1/2 x 13-1/2	182.3	410.1	2768	410.1	2768	31.64	37.97	44.30	50.63	56.95	63.28
14 x 16	13-1/2 x 15-1/2	209.3	540.6	4189	470.8	3178	36.33	43.59	50.86	58.13	65.39	72.66
16 x 16	15-1/2 x 15-1/2	240.3	620.6	4810	620.6	4810	41.71	50.05	58.39	66.74	75.08	83.42
16 x 18	15-1/2 x 17-1/2	271.3	791.1	6923	700.7	5431	47.09	56.51	65.93	75.35	84.77	94.18
18 x 18	17-1/2 x 17-1/2	306.3	893.2	7816	893.2	7816	53.17	63.80	74.44	85.07	95.70	106.3
18 x 20	17-1/2 x 19-1/2	341.3	1109	10813	995.3	8709	59.24	71.09	82.94	94.79	106.6	118.5
20 x 20	19-1/2 x 19-1/2	380.3	1236	12049	1236	12049	66.02	79.22	92.4	105.6	118.8	132.0
20 x 22	19-1/2 x 21-1/2	419.3	1502	16150	1363	13285	72.79	87.34	101.9	116.5	131.0	145.6
22 x 22	21-1/2 x 21-1/2	462.3	1656	17806	1656	17806	80.25	96.30	112.4	128.4	144.5	160.5
22 x 24	21-1/2 x 23-1/2	505.3	1979	23252	1810	19463	87.72	105.3	122.8	140.3	157.9	175.4
24 x 24	23-1/2 x 23-1/2	552.3	2163	25415	2163	25415	95.88	115.1	134.2	153.4	172.6	191.8

**Table 1B Section Properties of Standard Dressed (S4S) Sawn Lumber (Cont.)**

Nominal Size b x d	Standard Dressed Size (S4S) b x d in. x in.	Area of Section A in. <sup>2</sup>	X-X AXIS		Y-Y AXIS		Approximate weight in pounds per linear foot (lbs/ft) of piece when density of wood equals:					
			Section Modulus S <sub>xx</sub> in. <sup>3</sup>	Moment of Inertia I <sub>xx</sub> in. <sup>4</sup>	Section Modulus S <sub>yy</sub> in. <sup>3</sup>	Moment of Inertia I <sub>yy</sub> in. <sup>4</sup>	25 lbs/ft <sup>3</sup>	30 lbs/ft <sup>3</sup>	35 lbs/ft <sup>3</sup>	40 lbs/ft <sup>3</sup>	45 lbs/ft <sup>3</sup>	50 lbs/ft <sup>3</sup>
<b>Beams &amp; Stringers (see NDS 4.1.3.3 and NDS 4.1.5.3)</b>												
6 x 10	5-1/2 x 9-1/2	52.25	82.73	393.0	47.90	131.7	9.071	10.89	12.70	14.51	16.33	18.14
6 x 12	5-1/2 x 11-1/2	63.25	121.2	697.1	57.98	159.4	10.98	13.18	15.37	17.57	19.77	21.96
6 x 14	5-1/2 x 13-1/2	74.25	167.1	1128	68.06	187.2	12.89	15.47	18.05	20.63	23.20	25.78
6 x 16	5-1/2 x 15-1/2	85.25	220.2	1707	78.15	214.9	14.80	17.76	20.72	23.68	26.64	29.60
6 x 18	5-1/2 x 17-1/2	96.25	280.7	2456	88.23	242.6	16.71	20.05	23.39	26.74	30.08	33.42
6 x 20	5-1/2 x 19-1/2	107.3	348.6	3398	98.31	270.4	18.62	22.34	26.07	29.79	33.52	37.24
6 x 22	5-1/2 x 21-1/2	118.3	423.7	4555	108.4	298.1	20.53	24.64	28.74	32.85	36.95	41.06
6 x 24	5-1/2 x 23-1/2	129.3	506.2	5948	118.5	325.8	22.44	26.93	31.41	35.90	40.39	44.88
8 x 12	7-1/2 x 11-1/2	86.3	165.3	950.5	107.8	404.3	14.97	17.97	20.96	23.96	26.95	29.95
8 x 14	7-1/2 x 13-1/2	101.3	227.8	1538	126.6	474.6	17.58	21.09	24.61	28.13	31.64	35.16
8 x 16	7-1/2 x 15-1/2	116.3	300.3	2327	145.3	544.9	20.18	24.22	28.26	32.29	36.33	40.36
8 x 18	7-1/2 x 17-1/2	131.3	382.8	3350	164.1	615.2	22.79	27.34	31.90	36.46	41.02	45.57
8 x 20	7-1/2 x 19-1/2	146.3	475.3	4634	182.8	685.5	25.39	30.47	35.55	40.63	45.70	50.78
8 x 22	7-1/2 x 21-1/2	161.3	577.8	6211	201.6	755.9	27.99	33.59	39.19	44.79	50.39	55.99
8 x 24	7-1/2 x 23-1/2	176.3	690.3	8111	220.3	826.2	30.60	36.72	42.84	48.96	55.08	61.20
10 x 14	9-1/2 x 13-1/2	128.3	288.6	1948	203.1	964.5	22.27	26.72	31.17	35.63	40.08	44.53
10 x 16	9-1/2 x 15-1/2	147.3	380.4	2948	233.1	1107	25.56	30.68	35.79	40.90	46.02	51.13
10 x 18	9-1/2 x 17-1/2	166.3	484.9	4243	263.2	1250	28.86	34.64	40.41	46.18	51.95	57.73
10 x 20	9-1/2 x 19-1/2	185.3	602.1	5870	293.3	1393	32.16	38.59	45.03	51.46	57.89	64.32
10 x 22	9-1/2 x 21-1/2	204.3	731.9	7868	323.4	1536	35.46	42.55	49.64	56.74	63.83	70.92
10 x 24	9-1/2 x 23-1/2	223.3	874.4	10274	353.5	1679	38.76	46.51	54.26	62.01	69.77	77.52
12 x 16	11-1/2 x 15-1/2	178.3	460.5	3569	341.6	1964	30.95	37.14	43.32	49.51	55.70	61.89
12 x 18	11-1/2 x 17-1/2	201.3	587.0	5136	385.7	2218	34.94	41.93	48.91	55.90	62.89	69.88
12 x 20	11-1/2 x 19-1/2	224.3	728.8	7106	429.8	2471	38.93	46.72	54.51	62.29	70.08	77.86
12 x 22	11-1/2 x 21-1/2	247.3	886.0	9524	473.9	2725	42.93	51.51	60.10	68.68	77.27	85.85
12 x 24	11-1/2 x 23-1/2	270.3	1058	12437	518.0	2978	46.92	56.30	65.69	75.07	84.45	93.84
14 x 18	13-1/2 x 17-1/2	236.3	689.1	6029	531.6	3588	41.02	49.22	57.42	65.63	73.83	82.03
14 x 20	13-1/2 x 19-1/2	263.3	855.6	8342	592.3	3998	45.70	54.84	63.98	73.13	82.27	91.41
14 x 22	13-1/2 x 21-1/2	290.3	1040	11181	653.1	4408	50.39	60.47	70.55	80.63	90.70	100.8
14 x 24	13-1/2 x 23-1/2	317.3	1243	14600	713.8	4818	55.08	66.09	77.11	88.13	99.14	110.2
16 x 20	15-1/2 x 19-1/2	302.3	982.3	9578	780.8	6051	52.47	62.97	73.46	83.96	94.45	104.9
16 x 22	15-1/2 x 21-1/2	333.3	1194	12837	860.9	6672	57.86	69.43	81.00	92.57	104.1	115.7
16 x 24	15-1/2 x 23-1/2	364.3	1427	16763	941.0	7293	63.24	75.89	88.53	101.2	113.8	126.5
18 x 22	17-1/2 x 21-1/2	376.3	1348	14493	1097	9602	65.32	78.39	91.45	104.5	117.6	130.6
18 x 24	17-1/2 x 23-1/2	411.3	1611	18926	1199	10495	71.40	85.68	99.96	114.2	128.5	142.8
20 x 24	19-1/2 x 23-1/2	458.3	1795	21089	1489	14521	79.56	95.47	111.4	127.3	143.2	159.1

1. According to the Southern Pine Inspection Bureau's (SPIB) Standard Grading Rules for Southern Pine Lumber: Section 265 stress rated boards:

- Industrial 55 (IND 55) shall be graded as per No. 1 dimension
- Industrial 45 (IND 45) shall be graded as per No. 2 dimension
- Industrial 26 (IND 26) shall be graded as per No. 3 dimension

See Table 4B for Southern Pine dimension lumber design values.

2. Neither Redwood nor Southern Pine are classified as Beams and Stringers or Posts and Timbers.

**Table 1C Section Properties of Western Species Structural Glued Laminated Timber**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>2-1/2 in. Width</b>					<b>(r<sub>y</sub> = 0.722 in.)</b>	
6	15.00	45.00	15.00	1.732	7.813	6.250
7-1/2	18.75	87.89	23.44	2.165	9.766	7.813
9	22.50	151.9	33.75	2.598	11.72	9.375
10-1/2	26.25	241.2	45.94	3.031	13.67	10.94
12	30.00	360.0	60.00	3.464	15.63	12.50
13-1/2	33.75	512.6	75.94	3.897	17.58	14.06
15	37.50	703.1	93.75	4.330	19.53	15.63
16-1/2	41.25	935.9	113.4	4.763	21.48	17.19
18	45.00	1215	135.0	5.196	23.44	18.75
19-1/2	48.75	1545	158.4	5.629	25.39	20.31
21	52.50	1929	183.8	6.062	27.34	21.88
<b>3-1/8 in. Width</b>					<b>(r<sub>y</sub> = 0.902 in.)</b>	
6	18.75	56.25	18.75	1.732	15.26	9.766
7-1/2	23.44	109.9	29.30	2.165	19.07	12.21
9	28.13	189.8	42.19	2.598	22.89	14.65
10-1/2	32.81	301.5	57.42	3.031	26.70	17.09
12	37.50	450.0	75.00	3.464	30.52	19.53
13-1/2	42.19	640.7	94.92	3.897	34.33	21.97
15	46.88	878.9	117.2	4.330	38.15	24.41
16-1/2	51.56	1170	141.8	4.763	41.96	26.86
18	56.25	1519	168.8	5.196	45.78	29.30
19-1/2	60.94	1931	198.0	5.629	49.59	31.74
21	65.63	2412	229.7	6.062	53.41	34.18
22-1/2	70.31	2966	263.7	6.495	57.22	36.62
24	75.00	3600	300.0	6.928	61.04	39.06

**Table 1C Section Properties of Western Species Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>3-1/2 in. Width</b>					<b>(r<sub>y</sub> = 1.010 in.)</b>	
6	21.00	63.00	21.00	1.732	21.44	12.25
7-1/2	26.25	123.0	32.81	2.165	26.80	15.31
9	31.50	212.6	47.25	2.598	32.16	18.38
9-1/4	32.38	230.8	49.91	2.670	33.05	18.89
9-1/2	33.25	250.1	52.65	2.742	33.94	19.40
10-1/2	36.75	337.6	64.31	3.031	37.52	21.44
11-1/4	39.38	415.3	73.83	3.248	40.20	22.97
11-7/8	41.56	488.4	82.26	3.428	42.43	24.24
12	42.00	504.0	84.00	3.464	42.88	24.50
13-1/2	47.25	717.6	106.3	3.897	48.23	27.56
14	49.00	800.3	114.3	4.041	50.02	28.58
15	52.50	984.4	131.3	4.330	53.59	30.63
16	56.00	1195	149.3	4.619	57.17	32.67
16-1/2	57.75	1310	158.8	4.763	58.95	33.69
18	63.00	1701	189.0	5.196	64.31	36.75
19-1/2	68.25	2163	221.8	5.629	69.67	39.81
20	70.00	2333	233.3	5.774	71.46	40.83
21	73.50	2701	257.3	6.062	75.03	42.88
22	77.00	3106	282.3	6.351	78.60	44.92
22-1/2	78.75	3322	295.3	6.495	80.39	45.94
24	84.00	4032	336.0	6.928	85.75	49.00
<b>5-1/8 in. Width</b>					<b>(r<sub>y</sub> = 1.479 in.)</b>	
6	30.75	92.25	30.75	1.732	67.31	26.27
7-1/2	38.44	180.2	48.05	2.165	84.13	32.83
9	46.13	311.3	69.19	2.598	101.0	39.40
10-1/2	53.81	494.4	94.17	3.031	117.8	45.96
12	61.50	738.0	123.0	3.464	134.6	52.53
13-1/2	69.19	1051	155.7	3.897	151.4	59.10
15	76.88	1441	192.2	4.330	168.3	65.66
16-1/2	84.56	1919	232.5	4.763	185.1	72.23
18	92.25	2491	276.8	5.196	201.9	78.80
19-1/2	99.94	3167	324.8	5.629	218.7	85.36
21	107.6	3955	376.7	6.062	235.6	91.93
22-1/2	115.3	4865	432.4	6.495	252.4	98.50
24	123.0	5904	492.0	6.928	269.2	105.1
25-1/2	130.7	7082	555.4	7.361	286.0	111.6
27	138.4	8406	622.7	7.794	302.9	118.2
28-1/2	146.1	9887	693.8	8.227	319.7	124.8
30	153.8	11530	768.8	8.660	336.5	131.3
31-1/2	161.4	13350	847.5	9.093	353.4	137.9
33	169.1	15350	930.2	9.526	370.2	144.5
34-1/2	176.8	17540	1017	9.959	387.0	151.0
36	184.5	19930	1107	10.39	403.8	157.6

**Table 1C Section Properties of Western Species Structural Glued Laminated Timber (Cont.)**

Depth	Area	X-X Axis			Y-Y Axis	
d (in.)	A (in. <sup>2</sup> )	I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>5-1/2 in. Width</b>					<b>(r<sub>y</sub> = 1.588 in.)</b>	
6	33.00	99.00	33.00	1.732	83.19	30.25
7-1/2	41.25	193.4	51.56	2.165	104.0	37.81
9	49.50	334.1	74.25	2.598	124.8	45.38
9-1/4	50.88	362.7	78.43	2.670	128.2	46.64
9-1/2	52.25	393.0	82.73	2.742	131.7	47.90
10-1/2	57.75	530.6	101.1	3.031	145.6	52.94
11-1/4	61.88	652.6	116.0	3.248	156.0	56.72
11-7/8	65.31	767.5	129.3	3.428	164.6	59.87
12	66.00	792.0	132.0	3.464	166.4	60.50
13-1/2	74.25	1128	167.1	3.897	187.2	68.06
14	77.00	1258	179.7	4.041	194.1	70.58
15	82.50	1547	206.3	4.330	208.0	75.63
16	88.00	1877	234.7	4.619	221.8	80.67
16-1/2	90.75	2059	249.6	4.763	228.8	83.19
18	99.00	2673	297.0	5.196	249.6	90.75
19-1/2	107.3	3398	348.6	5.629	270.4	98.31
20	110.0	3667	366.7	5.774	277.3	100.8
21	115.5	4245	404.3	6.062	291.2	105.9
22	121.0	4880	443.7	6.351	305.0	110.9
22-1/2	123.8	5221	464.1	6.495	312.0	113.4
24	132.0	6336	528.0	6.928	332.8	121.0
25-1/2	140.3	7600	596.1	7.361	353.5	128.6
27	148.5	9021	668.3	7.794	374.3	136.1
28-1/2	156.8	10610	744.6	8.227	395.1	143.7
30	165.0	12380	825.0	8.660	415.9	151.3
31-1/2	173.3	14330	909.6	9.093	436.7	158.8
33	181.5	16470	998.3	9.526	457.5	166.4
34-1/2	189.8	18820	1091	9.959	478.3	173.9
36	198.0	21380	1188	10.39	499.1	181.5



**Table 1C Section Properties of Western Species Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>6-3/4 in. Width</b>					<b>(r<sub>y</sub> = 1.949 in.)</b>	
7-1/2	50.63	237.3	63.28	2.165	192.2	56.95
9	60.75	410.1	91.13	2.598	230.7	68.34
10-1/2	70.88	651.2	124.0	3.031	269.1	79.73
12	81.00	972.0	162.0	3.464	307.5	91.13
13-1/2	91.13	1384	205.0	3.897	346.0	102.5
15	101.3	1898	253.1	4.330	384.4	113.9
16-1/2	111.4	2527	306.3	4.763	422.9	125.3
18	121.5	3281	364.5	5.196	461.3	136.7
19-1/2	131.6	4171	427.8	5.629	499.8	148.1
21	141.8	5209	496.1	6.062	538.2	159.5
22-1/2	151.9	6407	569.5	6.495	576.7	170.9
24	162.0	7776	648.0	6.928	615.1	182.3
25-1/2	172.1	9327	731.5	7.361	653.5	193.6
27	182.3	11070	820.1	7.794	692.0	205.0
28-1/2	192.4	13020	913.8	8.227	730.4	216.4
30	202.5	15190	1013	8.660	768.9	227.8
31-1/2	212.6	17580	1116	9.093	807.3	239.2
33	222.8	20210	1225	9.526	845.8	250.6
34-1/2	232.9	23100	1339	9.959	884.2	262.0
36	243.0	26240	1458	10.39	922.6	273.4
37-1/2	253.1	29660	1582	10.83	961.1	284.8
39	263.3	33370	1711	11.26	999.5	296.2
40-1/2	273.4	37370	1845	11.69	1038	307.5
42	283.5	41670	1985	12.12	1076	318.9
43-1/2	293.6	46300	2129	12.56	1115	330.3
45	303.8	51260	2278	12.99	1153	341.7
46-1/2	313.9	56560	2433	13.42	1192	353.1
48	324.0	62210	2592	13.86	1230	364.5
49-1/2	334.1	68220	2757	14.29	1269	375.9
51	344.3	74620	2926	14.72	1307	387.3
52-1/2	354.4	81400	3101	15.16	1346	398.7
54	364.5	88570	3281	15.59	1384	410.1
55-1/2	374.6	96160	3465	16.02	1422	421.5
57	384.8	104200	3655	16.45	1461	432.8
58-1/2	394.9	112600	3850	16.89	1499	444.2
60	405.0	121500	4050	17.32	1538	455.6

**Table 1C Section Properties of Western Species Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>8-3/4 in. Width</b>					<b>(r<sub>y</sub> = 2.526 in.)</b>	
9	78.75	531.6	118.1	2.598	502.4	114.8
10-1/2	91.88	844.1	160.8	3.031	586.2	134.0
12	105.0	1260	210.0	3.464	669.9	153.1
13-1/2	118.1	1794	265.8	3.897	753.7	172.3
15	131.3	2461	328.1	4.330	837.4	191.4
16-1/2	144.4	3276	397.0	4.763	921.1	210.5
18	157.5	4253	472.5	5.196	1005	229.7
19-1/2	170.6	5407	554.5	5.629	1089	248.8
21	183.8	6753	643.1	6.062	1172	268.0
22-1/2	196.9	8306	738.3	6.495	1256	287.1
24	210.0	10080	840.0	6.928	1340	306.3
25-1/2	223.1	12090	948.3	7.361	1424	325.4
27	236.3	14350	1063	7.794	1507	344.5
28-1/2	249.4	16880	1185	8.227	1591	363.7
30	262.5	19690	1313	8.660	1675	382.8
31-1/2	275.6	22790	1447	9.093	1759	402.0
33	288.8	26200	1588	9.526	1842	421.1
34-1/2	301.9	29940	1736	9.959	1926	440.2
36	315.0	34020	1890	10.39	2010	459.4
37-1/2	328.1	38450	2051	10.83	2094	478.5
39	341.3	43250	2218	11.26	2177	497.7
40-1/2	354.4	48440	2392	11.69	2261	516.8
42	367.5	54020	2573	12.12	2345	535.9
43-1/2	380.6	60020	2760	12.56	2428	555.1
45	393.8	66450	2953	12.99	2512	574.2
46-1/2	406.9	73310	3153	13.42	2596	593.4
48	420.0	80640	3360	13.86	2680	612.5
49-1/2	433.1	88440	3573	14.29	2763	631.6
51	446.3	96720	3793	14.72	2847	650.8
52-1/2	459.4	105500	4020	15.16	2931	669.9
54	472.5	114800	4253	15.59	3015	689.1
55-1/2	485.6	124700	4492	16.02	3098	708.2
57	498.8	135000	4738	16.45	3182	727.3
58-1/2	511.9	146000	4991	16.89	3266	746.5
60	525.0	157500	5250	17.32	3350	765.6

**Table 1C Section Properties of Western Species Structural Glued Laminated Timber (Cont.)**

Depth	Area	X-X Axis			Y-Y Axis	
d (in.)	A (in. <sup>2</sup> )	I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>10-3/4 in. Width</b>				<b>(r<sub>y</sub> = 3.103 in.)</b>		
12	129.0	1548	258.0	3.464	1242	231.1
13-1/2	145.1	2204	326.5	3.897	1398	260.0
15	161.3	3023	403.1	4.330	1553	288.9
16-1/2	177.4	4024	487.8	4.763	1708	317.8
18	193.5	5225	580.5	5.196	1863	346.7
19-1/2	209.6	6642	681.3	5.629	2019	375.6
21	225.8	8296	790.1	6.062	2174	404.5
22-1/2	241.9	10200	907.0	6.495	2329	433.4
24	258.0	12380	1032	6.928	2485	462.3
25-1/2	274.1	14850	1165	7.361	2640	491.1
27	290.3	17630	1306	7.794	2795	520.0
28-1/2	306.4	20740	1455	8.227	2950	548.9
30	322.5	24190	1613	8.660	3106	577.8
31-1/2	338.6	28000	1778	9.093	3261	606.7
33	354.8	32190	1951	9.526	3416	635.6
34-1/2	370.9	36790	2133	9.959	3572	664.5
36	387.0	41800	2322	10.39	3727	693.4
37-1/2	403.1	47240	2520	10.83	3882	722.3
39	419.3	53140	2725	11.26	4037	751.2
40-1/2	435.4	59510	2939	11.69	4193	780.0
42	451.5	66370	3161	12.12	4348	808.9
43-1/2	467.6	73740	3390	12.56	4503	837.8
45	483.8	81630	3628	12.99	4659	866.7
46-1/2	499.9	90070	3874	13.42	4814	895.6
48	516.0	99070	4128	13.86	4969	924.5
49-1/2	532.1	108700	4390	14.29	5124	953.4
51	548.3	118800	4660	14.72	5280	982.3
52-1/2	564.4	129600	4938	15.16	5435	1011
54	580.5	141100	5225	15.59	5590	1040
55-1/2	596.6	153100	5519	16.02	5746	1069
57	612.8	165900	5821	16.45	5901	1098
58-1/2	628.9	179300	6132	16.89	6056	1127
60	645.0	193500	6450	17.32	6211	1156

**Table 1C Section Properties of Western Species Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>12-1/4 in. Width</b>					<b>(r<sub>y</sub> = 3.536 in.)</b>	
13-1/2	165.4	2512	372.1	3.897	2068	337.6
15	183.8	3445	459.4	4.330	2298	375.2
16-1/2	202.1	4586	555.8	4.763	2528	412.7
18	220.5	5954	661.5	5.196	2757	450.2
19-1/2	238.9	7569	776.3	5.629	2987	487.7
21	257.3	9454	900.4	6.062	3217	525.2
22-1/2	275.6	11630	1034	6.495	3447	562.7
24	294.0	14110	1176	6.928	3677	600.3
25-1/2	312.4	16930	1328	7.361	3906	637.8
27	330.8	20090	1488	7.794	4136	675.3
28-1/2	349.1	23630	1658	8.227	4366	712.8
30	367.5	27560	1838	8.660	4596	750.3
31-1/2	385.9	31910	2026	9.093	4825	787.8
33	404.3	36690	2223	9.526	5055	825.3
34-1/2	422.6	41920	2430	9.959	5285	862.9
36	441.0	47630	2646	10.39	5515	900.4
37-1/2	459.4	53830	2871	10.83	5745	937.9
39	477.8	60550	3105	11.26	5974	975.4
40-1/2	496.1	67810	3349	11.69	6204	1013
42	514.5	75630	3602	12.12	6434	1050
43-1/2	532.9	84030	3863	12.56	6664	1088
45	551.3	93020	4134	12.99	6893	1125
46-1/2	569.6	102600	4415	13.42	7123	1163
48	588.0	112900	4704	13.86	7353	1201
49-1/2	606.4	123800	5003	14.29	7583	1238
51	624.8	135400	5310	14.72	7813	1276
52-1/2	643.1	147700	5627	15.16	8042	1313
54	661.5	160700	5954	15.59	8272	1351
55-1/2	679.9	174500	6289	16.02	8502	1388
57	698.3	189100	6633	16.45	8732	1426
58-1/2	716.6	204400	6987	16.89	8962	1463
60	735.0	220500	7350	17.32	9191	1501

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>2-1/2 in. Width</b>					<b>(r<sub>y</sub> = 0.722 in.)</b>	
5-1/2	13.75	34.66	12.60	1.588	7.161	5.729
6-7/8	17.19	67.70	19.69	1.985	8.952	7.161
8-1/4	20.63	117.0	28.36	2.382	10.74	8.594
9-5/8	24.06	185.8	38.60	2.778	12.53	10.03
11	27.50	277.3	50.42	3.175	14.32	11.46
12-3/8	30.94	394.8	63.81	3.572	16.11	12.89
13-3/4	34.38	541.6	78.78	3.969	17.90	14.32
15-1/8	37.81	720.9	95.32	4.366	19.69	15.76
16-1/2	41.25	935.9	113.4	4.763	21.48	17.19
17-7/8	44.69	1190	133.1	5.160	23.27	18.62
19-1/4	48.13	1486	154.4	5.557	25.07	20.05
20-5/8	51.56	1828	177.2	5.954	26.86	21.48
22	55.00	2218	201.7	6.351	28.65	22.92
23-3/8	58.44	2661	227.7	6.748	30.44	24.35
<b>3 in. Width</b>					<b>(r<sub>y</sub> = 0.866 in.)</b>	
5-1/2	16.50	41.59	15.13	1.588	12.38	8.250
6-7/8	20.63	81.24	23.63	1.985	15.47	10.31
8-1/4	24.75	140.4	34.03	2.382	18.56	12.38
9-5/8	28.88	222.9	46.32	2.778	21.66	14.44
11	33.00	332.8	60.50	3.175	24.75	16.50
12-3/8	37.13	473.8	76.57	3.572	27.84	18.56
13-3/4	41.25	649.9	94.53	3.969	30.94	20.63
15-1/8	45.38	865.0	114.4	4.366	34.03	22.69
16-1/2	49.50	1123	136.1	4.763	37.13	24.75
17-7/8	53.63	1428	159.8	5.160	40.22	26.81
19-1/4	57.75	1783	185.3	5.557	43.31	28.88
20-5/8	61.88	2193	212.7	5.954	46.41	30.94
22	66.00	2662	242.0	6.351	49.50	33.00
23-3/8	70.13	3193	273.2	6.748	52.59	35.06
<b>3-1/8 in. Width</b>					<b>(r<sub>y</sub> = 0.902 in.)</b>	
5-1/2	17.19	43.33	15.76	1.588	13.99	8.952
6-7/8	21.48	84.62	24.62	1.985	17.48	11.19
8-1/4	25.78	146.2	35.45	2.382	20.98	13.43
9-5/8	30.08	232.2	48.25	2.778	24.48	15.67
11	34.38	346.6	63.02	3.175	27.97	17.90
12-3/8	38.67	493.5	79.76	3.572	31.47	20.14
13-3/4	42.97	677.0	98.47	3.969	34.97	22.38
15-1/8	47.27	901.1	119.1	4.366	38.46	24.62
16-1/2	51.56	1170	141.8	4.763	41.96	26.86
17-7/8	55.86	1487	166.4	5.160	45.46	29.09
19-1/4	60.16	1858	193.0	5.557	48.96	31.33
20-5/8	64.45	2285	221.6	5.954	52.45	33.57
22	68.75	2773	252.1	6.351	55.95	35.81
23-3/8	73.05	3326	284.6	6.748	59.45	38.05

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth	Area	X-X Axis			Y-Y Axis	
d (in.)	A (in. <sup>2</sup> )	I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>3-1/2 in. Width</b>					<b>(r<sub>y</sub> = 1.010 in.)</b>	
5-1/2	19.25	48.53	17.65	1.588	19.65	11.23
6-7/8	24.06	94.78	27.57	1.985	24.56	14.04
8-1/4	28.88	163.8	39.70	2.382	29.48	16.84
9-1/4	32.38	230.8	49.91	2.670	33.05	18.89
9-1/2	33.25	250.1	52.65	2.742	33.94	19.40
9-5/8	33.69	260.1	54.04	2.778	34.39	19.65
11	38.50	388.2	70.58	3.175	39.30	22.46
11-1/4	39.38	415.3	73.83	3.248	40.20	22.97
11-7/8	41.56	488.4	82.26	3.428	42.43	24.24
12-3/8	43.31	552.7	89.33	3.572	44.21	25.27
13-3/4	48.13	758.2	110.3	3.969	49.13	28.07
14	49.00	800.3	114.3	4.041	50.02	28.58
15-1/8	52.94	1009	133.4	4.366	54.04	30.88
16	56.00	1195	149.3	4.619	57.17	32.67
16-1/2	57.75	1310	158.8	4.763	58.95	33.69
17-7/8	62.56	1666	186.4	5.160	63.87	36.49
18	63.00	1701	189.0	5.196	64.31	36.75
19-1/4	67.38	2081	216.2	5.557	68.78	39.30
20	70.00	2333	233.3	5.774	71.46	40.83
20-5/8	72.19	2559	248.1	5.954	73.69	42.11
22	77.00	3106	282.3	6.351	78.60	44.92
23-3/8	81.81	3725	318.7	6.748	83.52	47.72
24	84.00	4032	336.0	6.928	85.75	49.00

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>5 in. Width</b>					<b>(r<sub>y</sub> = 1.443 in.)</b>	
6-7/8	34.38	135.4	39.39	1.985	71.61	28.65
8-1/4	41.25	234.0	56.72	2.382	85.94	34.38
9-5/8	48.13	371.5	77.20	2.778	100.3	40.10
11	55.00	554.6	100.8	3.175	114.6	45.83
12-3/8	61.88	789.6	127.6	3.572	128.9	51.56
13-3/4	68.75	1083	157.6	3.969	143.2	57.29
15-1/8	75.63	1442	190.6	4.366	157.6	63.02
16-1/2	82.50	1872	226.9	4.763	171.9	68.75
17-7/8	89.38	2380	266.3	5.160	186.2	74.48
19-1/4	96.25	2972	308.8	5.557	200.5	80.21
20-5/8	103.1	3656	354.5	5.954	214.8	85.94
22	110.0	4437	403.3	6.351	229.2	91.67
23-3/8	116.9	5322	455.3	6.748	243.5	97.40
24-3/4	123.8	6317	510.5	7.145	257.8	103.1
26-1/8	130.6	7429	568.8	7.542	272.1	108.9
27-1/2	137.5	8665	630.2	7.939	286.5	114.6
28-7/8	144.4	10030	694.8	8.335	300.8	120.3
30-1/4	151.3	11530	762.6	8.732	315.1	126.0
31-5/8	158.1	13180	833.5	9.129	329.4	131.8
33	165.0	14970	907.5	9.526	343.8	137.5
34-3/8	171.9	16920	984.7	9.923	358.1	143.2
35-3/4	178.8	19040	1065	10.32	372.4	149.0

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth	Area	X-X Axis			Y-Y Axis	
d (in.)	A (in. <sup>2</sup> )	I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>5-1/8 in. Width</b>					<b>(r<sub>y</sub> = 1.479 in.)</b>	
6-7/8	35.23	138.8	40.37	1.985	77.12	30.10
8-1/4	42.28	239.8	58.14	2.382	92.55	36.12
9-5/8	49.33	380.8	79.13	2.778	108.0	42.13
11	56.38	568.4	103.4	3.175	123.4	48.15
12-3/8	63.42	809.4	130.8	3.572	138.8	54.17
13-3/4	70.47	1110	161.5	3.969	154.2	60.19
15-1/8	77.52	1478	195.4	4.366	169.7	66.21
16-1/2	84.56	1919	232.5	4.763	185.1	72.23
17-7/8	91.61	2439	272.9	5.160	200.5	78.25
19-1/4	98.66	3047	316.5	5.557	215.9	84.27
20-5/8	105.7	3747	363.4	5.954	231.4	90.29
22	112.8	4548	413.4	6.351	246.8	96.31
23-3/8	119.8	5455	466.7	6.748	262.2	102.3
24-3/4	126.8	6475	523.2	7.145	277.6	108.3
26-1/8	133.9	7615	583.0	7.542	293.1	114.4
27-1/2	140.9	8882	646	7.939	308.5	120.4
28-7/8	148.0	10280	712.2	8.335	323.9	126.4
30-1/4	155.0	11820	781.6	8.732	339.3	132.4
31-5/8	162.1	13510	854.3	9.129	354.8	138.4
33	169.1	15350	930.2	9.526	370.2	144.5
34-3/8	176.2	17350	1009	9.923	385.6	150.5
35-3/4	183.2	19510	1092	10.32	401.0	156.5



**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>5-1/2 in. Width</b>					<b>(r<sub>y</sub> = 1.588 in.)</b>	
6-7/8	37.81	148.9	43.33	1.985	95.32	34.66
8-1/4	45.38	257.4	62.39	2.382	114.4	41.59
9-1/4	50.88	362.7	78.43	2.670	128.2	46.64
9-1/2	52.25	393.0	82.73	2.742	131.7	47.90
9-5/8	52.94	408.7	84.92	2.778	133.4	48.53
11	60.50	610.0	110.9	3.175	152.5	55.46
11-1/4	61.88	652.6	116.0	3.248	156.0	56.72
11-7/8	65.31	767.5	129.3	3.428	164.6	59.87
12-3/8	68.06	868.6	140.4	3.572	171.6	62.39
13-3/4	75.63	1191	173.3	3.969	190.6	69.32
14	77.00	1258	179.7	4.041	194.1	70.58
15-1/8	83.19	1586	209.7	4.366	209.7	76.26
16	88.00	1877	234.7	4.619	221.8	80.67
16-1/2	90.75	2059	249.6	4.763	228.8	83.19
17-7/8	98.31	2618	292.9	5.160	247.8	90.12
18	99.00	2673	297.0	5.196	249.6	90.75
19-1/4	105.9	3269	339.7	5.557	266.9	97.05
20	110.0	3667	366.7	5.774	277.3	100.8
20-5/8	113.4	4021	389.9	5.954	286.0	104.0
22	121.0	4880	443.7	6.351	305.0	110.9
23-3/8	128.6	5854	500.9	6.748	324.1	117.8
24	132.0	6336	528.0	6.928	332.8	121.0
24-3/4	136.1	6949	561.5	7.145	343.1	124.8
26-1/8	143.7	8172	625.6	7.542	362.2	131.7
27-1/2	151.3	9532	693.2	7.939	381.3	138.6
28-7/8	158.8	11030	764.3	8.335	400.3	145.6
30-1/4	166.4	12690	838.8	8.732	419.4	152.5
31-5/8	173.9	14500	916.8	9.129	438.5	159.4
33	181.5	16470	998.3	9.526	457.5	166.4
34-3/8	189.1	18620	1083	9.923	476.6	173.3
35-3/4	196.6	20940	1172	10.32	495.7	180.2

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>6-3/4 in. Width</b>					<b>(r<sub>y</sub> = 1.949 in.)</b>	
6-7/8	46.41	182.8	53.17	1.985	176.2	52.21
8-1/4	55.69	315.9	76.57	2.382	211.4	62.65
9-5/8	64.97	501.6	104.2	2.778	246.7	73.09
11	74.25	748.7	136.1	3.175	281.9	83.53
12-3/8	83.53	1066	172.3	3.572	317.2	93.97
13-3/4	92.81	1462	212.7	3.969	352.4	104.4
15-1/8	102.1	1946	257.4	4.366	387.6	114.9
16-1/2	111.4	2527	306.3	4.763	422.9	125.3
17-7/8	120.7	3213	359.5	5.160	458.1	135.7
19-1/4	129.9	4012	416.9	5.557	493.4	146.2
20-5/8	139.2	4935	478.6	5.954	528.6	156.6
22	148.5	5990	544.5	6.351	563.8	167.1
23-3/8	157.8	7184	614.7	6.748	599.1	177.5
24-3/4	167.1	8528	689.1	7.145	634.3	187.9
26-1/8	176.3	10030	767.8	7.542	669.6	198.4
27-1/2	185.6	11700	850.8	7.939	704.8	208.8
28-7/8	194.9	13540	938.0	8.335	740.0	219.3
30-1/4	204.2	15570	1029	8.732	775.3	229.7
31-5/8	213.5	17790	1125	9.129	810.5	240.2
33	222.8	20210	1225	9.526	845.8	250.6
34-3/8	232.0	22850	1329	9.923	881.0	261.0
35-3/4	241.3	25700	1438	10.32	916.2	271.5
37-1/8	250.6	28780	1551	10.72	951.5	281.9
38-1/2	259.9	32100	1668	11.11	986.7	292.4
39-7/8	269.2	35660	1789	11.51	1022	302.8
41-1/4	278.4	39480	1914	11.91	1057	313.2
42-5/8	287.7	43560	2044	12.30	1092	323.7
44	297.0	47920	2178	12.70	1128	334.1
45-3/8	306.3	52550	2316	13.10	1163	344.6
46-3/4	315.6	57470	2459	13.50	1198	355.0
48-1/8	324.8	62700	2606	13.89	1233	365.4
49-1/2	334.1	68220	2757	14.29	1269	375.9
50-7/8	343.4	74070	2912	14.69	1304	386.3
52-1/4	352.7	80240	3071	15.08	1339	396.8
53-5/8	362.0	86740	3235	15.48	1374	407.2
55	371.3	93590	3403	15.88	1410	417.7
56-3/8	380.5	100800	3575	16.27	1445	428.1
57-3/4	389.8	108300	3752	16.67	1480	438.5
59-1/8	399.1	116300	3933	17.07	1515	449.0
60-1/2	408.4	124600	4118	17.46	1551	459.4

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth	Area	X-X Axis			Y-Y Axis	
d (in.)	A (in. <sup>2</sup> )	I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>8-1/2 in. Width</b>					<b>(r<sub>y</sub> = 2.454 in.)</b>	
9-5/8	81.81	631.6	131.2	2.778	492.6	115.9
11	93.50	942.8	171.4	3.175	562.9	132.5
12-3/8	105.2	1342	216.9	3.572	633.3	149.0
13-3/4	116.9	1841	267.8	3.969	703.7	165.6
15-1/8	128.6	2451	324.1	4.366	774.1	182.1
16-1/2	140.3	3182	385.7	4.763	844.4	198.7
17-7/8	151.9	4046	452.6	5.160	914.8	215.2
19-1/4	163.6	5053	525.0	5.557	985.2	231.8
20-5/8	175.3	6215	602.6	5.954	1056	248.4
22	187.0	7542	685.7	6.351	1126	264.9
23-3/8	198.7	9047	774.1	6.748	1196	281.5
24-3/4	210.4	10740	867.8	7.145	1267	298.0
26-1/8	222.1	12630	966.9	7.542	1337	314.6
27-1/2	233.8	14730	1071	7.939	1407	331.1
28-7/8	245.4	17050	1181	8.335	1478	347.7
30-1/4	257.1	19610	1296	8.732	1548	364.3
31-5/8	268.8	22400	1417	9.129	1618	380.8
33	280.5	25460	1543	9.526	1689	397.4
34-3/8	292.2	28770	1674	9.923	1759	413.9
35-3/4	303.9	32360	1811	10.32	1830	430.5
37-1/8	315.6	36240	1953	10.72	1900	447.0
38-1/2	327.3	40420	2100	11.11	1970	463.6
39-7/8	338.9	44910	2253	11.51	2041	480.2
41-1/4	350.6	49720	2411	11.91	2111	496.7
42-5/8	362.3	54860	2574	12.30	2181	513.3
44	374.0	60340	2743	12.70	2252	529.8
45-3/8	385.7	66170	2917	13.10	2322	546.4
46-3/4	397.4	72370	3096	13.50	2393	562.9
48-1/8	409.1	78950	3281	13.89	2463	579.5
49-1/2	420.8	85910	3471	14.29	2533	596.1
50-7/8	432.4	93270	3667	14.69	2604	612.6
52-1/4	444.1	101000	3868	15.08	2674	629.2
53-5/8	455.8	109200	4074	15.48	2744	645.7
55	467.5	117800	4285	15.88	2815	662.3
56-3/8	479.2	126900	4502	16.27	2885	678.8
57-3/4	490.9	136400	4725	16.67	2955	695.4
59-1/8	502.6	146400	4952	17.07	3026	712.0
60-1/2	514.3	156900	5185	17.46	3096	728.5

**Table 1D Section Properties of Southern Pine Structural Glued Laminated Timber (Cont.)**

Depth d (in.)	Area A (in. <sup>2</sup> )	X-X Axis			Y-Y Axis	
		I <sub>x</sub> (in. <sup>4</sup> )	S <sub>x</sub> (in. <sup>3</sup> )	r <sub>x</sub> (in.)	I <sub>y</sub> (in. <sup>4</sup> )	S <sub>y</sub> (in. <sup>3</sup> )
<b>10-1/2 in. Width</b>					<b>(r<sub>y</sub> = 3.031 in.)</b>	
11	115.5	1165	211.8	3.175	1061	202.1
12-3/8	129.9	1658	268.0	3.572	1194	227.4
13-3/4	144.4	2275	330.9	3.969	1326	252.7
15-1/8	158.8	3028	400.3	4.366	1459	277.9
16-1/2	173.3	3931	476.4	4.763	1592	303.2
17-7/8	187.7	4997	559.2	5.160	1724	328.5
19-1/4	202.1	6242	648.5	5.557	1857	353.7
20-5/8	216.6	7677	744.4	5.954	1990	379.0
22	231.0	9317	847.0	6.351	2122	404.3
23-3/8	245.4	11180	956.2	6.748	2255	429.5
24-3/4	259.9	13270	1072	7.145	2388	454.8
26-1/8	274.3	15600	1194	7.542	2520	480.0
27-1/2	288.8	18200	1323	7.939	2653	505.3
28-7/8	303.2	21070	1459	8.335	2786	530.6
30-1/4	317.6	24220	1601	8.732	2918	555.8
31-5/8	332.1	27680	1750	9.129	3051	581.1
33	346.5	31440	1906	9.526	3183	606.4
34-3/8	360.9	35540	2068	9.923	3316	631.6
35-3/4	375.4	39980	2237	10.32	3449	656.9
37-1/8	389.8	44770	2412	10.72	3581	682.2
38-1/2	404.3	49930	2594	11.11	3714	707.4
39-7/8	418.7	55480	2783	11.51	3847	732.7
41-1/4	433.1	61420	2978	11.91	3979	758.0
42-5/8	447.6	67760	3180	12.30	4112	783.2
44	462.0	74540	3388	12.70	4245	808.5
45-3/8	476.4	81740	3603	13.10	4377	833.8
46-3/4	490.9	89400	3825	13.50	4510	859.0
48-1/8	505.3	97530	4053	13.89	4643	884.3
49-1/2	519.8	106100	4288	14.29	4775	909.6
50-7/8	534.2	115200	4529	14.69	4908	934.8
52-1/4	548.6	124800	4778	15.08	5040	960.1
53-5/8	563.1	134900	5032	15.48	5173	985.4
55	577.5	145600	5294	15.88	5306	1011
56-3/8	591.9	156800	5562	16.27	5438	1036
57-3/4	606.4	168500	5836	16.67	5571	1061
59-1/8	620.8	180900	6118	17.07	5704	1086
60-1/2	635.3	193800	6405	17.46	5836	1112