

LUMBER DESIGN VALUES AND FRAMING SPANS FOR DOUGLAS FIR-LARCH, HEM-FIR, SOUTHERN PINE AND SPRUCE-PINE-FIR



Lumber Design Values and Framing Spans

Wood framing is the material of choice for residential construction and is increasing its market share in non-residential construction. Wood frame construction design relies on the lumber design values and allowable span tables published in building codes and standards, and industry technical publications. The most commonly used lumber species groups are Douglas Fir-Larch, Hem-Fir and Southern Pine grown in the U.S. and Canadian Spruce-Pine-Fir.

Selected lumber design values and span tables for these species groups are provided in this publication. Comprehensive information for Western species lumber products (Douglas Fir-Larch, Douglas Fir South, Hem-Fir, Spruce-Pine-Fir South, Western Cedars and Western Woods) can be found at www.wvpa.org.

Lumber Design Values

Structural lumber design values are assigned by Western Wood Products Association and other lumber rules-writing agencies according to ASTM Standards. Each agency develops and maintains the design values for the species in their region. Full-size lumber samples collected from lumber mills representative of the products going to the marketplace are tested. The design values are published by the lumber rules-writing agencies after the test results and the derived design values are reviewed by the USDA Forest Products Laboratory and approved by the Board of Review of the American Lumber Standard Committee.

Western Species Lumber Testing

The testing of Western species lumber is conducted periodically to monitor the reliability of the published design values, and to allow for timely actions to be taken, if needed, to support Western lumber products. In 2012, testing of Douglas Fir-Larch lumber samples was completed. All Western lumber rules-writing and inspection agencies cooperated in the lumber sampling and testing program. Other Western species are currently under evaluation or will be evaluated in the future.

The 2012 Douglas Fir-Larch lumber testing results have been reviewed by the USDA Forest Products Laboratory. The analysis of the 2012 test data showed no indication of a downward shift in the present design values for Douglas Fir-Larch. In January, 2013, the Board of Review of the American Lumber Standard Committee accepted the monitoring report and the present design values remain in effect.

New Design Values for Southern Pine Lumber

On January 30, 2013, the Board of Review of the American Lumber Standard Committee approved new design values for Southern Pine dimension lumber of all sizes and grades to be effective June 1, 2013. These design values for selected lumber sizes are tabulated in this publication.



Lumber Design Values

LUMBER DESIGN VALUES IN POUNDS PER SQUARE INCH – 2X4 AND 2X10 SIZES ONLY

| SIZE | SPECIES | GRADE | Extreme Fiber Stress in Bending | Tension Parallel to Grain | Horizontal Shear | Compression | | Modulus of Elasticity <i>E</i> |
|-----------------|-------------------|-----------------------------|---------------------------------|---------------------------|----------------------|---|---|-----------------------------------|
| | | | <i>F_b</i> | <i>F_t</i> | <i>F_v</i> | Perpendicular to Grain <i>F_{c⊥}</i> | Parallel to Grain <i>F_{c//}</i> | |
| 2x4 | Douglas Fir-Larch | Select Structural | 2250 | 1500 | 180 | 625 | 1955 | 1,900,000 |
| | | No. 1 & Btr. | 1800 | 1200 | 180 | 625 | 1785 | 1,800,000 |
| | | No. 1 | 1500 | 1015 | 180 | 625 | 1725 | 1,700,000 |
| | | No. 2 | 1350 | 865 | 180 | 625 | 1555 | 1,600,000 |
| | | No. 3 | 790 | 490 | 180 | 625 | 890 | 1,400,000 |
| | | Construction | 1000 | 650 | 180 | 625 | 1650 | 1,500,000 |
| | | Standard | 575 | 375 | 180 | 625 | 1400 | 1,400,000 |
| | | Utility | 275 | 175 | 180 | 625 | 900 | 1,300,000 |
| | | Stud | 770 | 495 | 180 | 625 | 895 | 1,400,000 |
| | Hem-Fir | Select Structural | 2100 | 1390 | 150 | 405 | 1725 | 1,600,000 |
| | | No. 1 & Btr. | 1650 | 1090 | 150 | 405 | 1555 | 1,500,000 |
| | | No. 1 | 1465 | 940 | 150 | 405 | 1555 | 1,500,000 |
| | | No. 2 | 1275 | 790 | 150 | 405 | 1495 | 1,300,000 |
| | | No. 3 | 750 | 450 | 150 | 405 | 835 | 1,200,000 |
| | | Construction | 975 | 600 | 150 | 405 | 1550 | 1,300,000 |
| | | Standard | 550 | 325 | 150 | 405 | 1300 | 1,200,000 |
| | | Utility | 250 | 150 | 150 | 405 | 850 | 1,100,000 |
| | | Stud | 745 | 440 | 150 | 405 | 840 | 1,200,000 |
| | *Southern Pine | Dense Select Structural | 2700 | 1900 | 175 | 660 | 2050 | 1,900,000 |
| | | Select Structural | 2350 | 1650 | 175 | 565 | 1900 | 1,800,000 |
| | | Non-Dense Select Structural | 2050 | 1450 | 175 | 480 | 1800 | 1,600,000 |
| | | No. 1 Dense | 1650 | 1100 | 175 | 660 | 1750 | 1,800,000 |
| | | No. 1 | 1500 | 1000 | 175 | 565 | 1650 | 1,600,000 |
| | | No. 1 Non-Dense | 1300 | 875 | 175 | 480 | 1550 | 1,400,000 |
| | | No. 2 Dense | 1200 | 750 | 175 | 660 | 1500 | 1,600,000 |
| | | No. 2 | 1100 | 675 | 175 | 565 | 1450 | 1,400,000 |
| | | No. 2 Non-Dense | 1050 | 600 | 175 | 480 | 1450 | 1,300,000 |
| | | No. 3/Stud | 650 | 400 | 175 | 565 | 850 | 1,300,000 |
| | | Construction | 875 | 500 | 175 | 565 | 1600 | 1,400,000 |
| | | Standard | 475 | 275 | 175 | 565 | 1300 | 1,200,000 |
| Utility | 225 | 125 | 175 | 565 | 850 | 1,200,000 | | |
| Spruce-Pine-Fir | Select Structural | 1875 | 1050 | 135 | 425 | 1610 | 1,500,000 | |
| | No. 1/No. 2 | 1310 | 675 | 135 | 425 | 1320 | 1,400,000 | |
| | No. 3 | 750 | 375 | 135 | 425 | 745 | 1,200,000 | |
| | Construction | 1000 | 500 | 135 | 425 | 1400 | 1,300,000 | |
| | Standard | 550 | 275 | 135 | 425 | 1150 | 1,200,000 | |
| | Utility | 275 | 125 | 135 | 425 | 750 | 1,100,000 | |
| | Stud | 740 | 385 | 135 | 425 | 760 | 1,200,000 | |
| 2x10 | Douglas Fir-Larch | Select Structural | 1650 | 1100 | 180 | 625 | 1700 | 1,900,000 |
| | | No. 1 & Btr. | 1320 | 880 | 180 | 625 | 1550 | 1,800,000 |
| | | No. 1 | 1100 | 745 | 180 | 625 | 1500 | 1,700,000 |
| | | No. 2 | 990 | 635 | 180 | 625 | 1350 | 1,600,000 |
| | | No. 3/Stud | 580 | 360 | 180 | 625 | 775 | 1,400,000 |
| | Hem-Fir | Select Structural | 1540 | 1020 | 150 | 405 | 1500 | 1,600,000 |
| | | No. 1 & Btr. | 1210 | 800 | 150 | 405 | 1350 | 1,500,000 |
| | | No. 1 | 1075 | 690 | 150 | 405 | 1350 | 1,500,000 |
| | | No. 2 | 935 | 580 | 150 | 405 | 1300 | 1,300,000 |
| | | No. 3/Stud | 550 | 330 | 150 | 405 | 725 | 1,200,000 |
| | *Southern Pine | Dense Select Structural | 1950 | 1300 | 175 | 660 | 1800 | 1,900,000 |
| | | Select Structural | 1700 | 1150 | 175 | 565 | 1650 | 1,800,000 |
| | | Non-Dense Select Structural | 1500 | 1050 | 175 | 480 | 1600 | 1,600,000 |
| | | No. 1 Dense | 1200 | 800 | 175 | 660 | 1550 | 1,800,000 |
| | | No. 1 | 1050 | 700 | 175 | 565 | 1450 | 1,600,000 |
| | | No. 1 Non-Dense | 950 | 625 | 175 | 480 | 1400 | 1,400,000 |
| | | No. 2 Dense | 850 | 525 | 175 | 660 | 1350 | 1,600,000 |
| | | No. 2 | 800 | 475 | 175 | 565 | 1300 | 1,400,000 |
| | | No. 2 Non-Dense | 750 | 425 | 175 | 480 | 1250 | 1,300,000 |
| | | No. 3/Stud | 475 | 275 | 175 | 565 | 750 | 1,300,000 |
| | Spruce-Pine-Fir | Select Structural | 1375 | 770 | 135 | 425 | 1400 | 1,500,000 |
| | | No. 1/No. 2 | 960 | 495 | 135 | 425 | 1150 | 1,400,000 |
| | | No. 3/Stud | 550 | 275 | 135 | 425 | 650 | 1,200,000 |

* Tabulated Southern Pine lumber design values were approved by the ALSC Board of Review on January 30, 2013 to be effective June 1, 2013.

Lumber Framing Spans

MAXIMUM ALLOWABLE LUMBER FRAMING SPANS

FLOOR JOISTS

40# LIVE LOAD 10# DEAD LOAD L/360

Design Criteria: Strength - 40 lbs. per sq. ft. live load, plus 10 lbs. per sq. ft. dead load. Deflection - Limited in span in inches divided by 360 for live load only.

| Species or Group | | Grade | | Span (feet and inches) | | | | | | | | | | | | | | | |
|---------------------|-------------|-------|------|------------------------|------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|--------|-------|--|--|
| | | | | 2 x 6 | | | | 2 x 8 | | | | 2 x 10 | | | | 2 x 12 | | | |
| | | | | spacing on center | | | | | | | | | | | | | | | |
| 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | | | | |
| Douglas Fir-Larch | Sel. Struc. | 11-4 | 10-4 | 9-8 | 9-0 | 15-0 | 13-7 | 12-10 | 11-11 | 19-1 | 17-4 | 16-4 | 15-2 | 23-3 | 21-1 | 19-10 | 18-5 | | |
| | No.1 & Btr. | 11-2 | 10-2 | 9-6 | 8-10 | 14-8 | 13-4 | 12-7 | 11-8 | 18-9 | 17-0 | 16-0 | 14-9 | 22-10 | 20-9 | 19-1 | 17-1 | | |
| | No.1 | 10-11 | 9-11 | 9-4 | 8-8 | 14-5 | 13-1 | 12-4 | 11-0 | 18-5 | 16-5 | 15-0 | 13-5 | 22-0 | 19-1 | 17-5 | 15-7 | | |
| | No.2 | 10-9 | 9-9 | 9-2 | 8-3 | 14-2 | 12-9 | 11-8 | 10-5 | 18-0 | 15-7 | 14-3 | 12-9 | 20-11 | 18-1 | 16-6 | 14-9 | | |
| Hem-Fir | Sel. Struc. | 10-9 | 9-9 | 9-2 | 8-6 | 14-2 | 12-10 | 12-1 | 11-3 | 18-0 | 16-5 | 15-5 | 14-4 | 21-11 | 19-11 | 18-9 | 17-5 | | |
| | No.1 & Btr. | 10-6 | 9-6 | 9-0 | 8-4 | 13-10 | 12-7 | 11-10 | 11-0 | 17-8 | 16-0 | 15-1 | 14-0 | 21-6 | 19-6 | 18-3 | 16-4 | | |
| | No.1 | 10-6 | 9-6 | 9-0 | 8-4 | 13-10 | 12-7 | 11-10 | 10-10 | 17-8 | 16-0 | 14-10 | 13-3 | 21-6 | 18-10 | 17-2 | 15-5 | | |
| | No.2 | 10-0 | 9-1 | 8-7 | 7-11 | 13-2 | 12-0 | 11-3 | 10-2 | 16-10 | 15-2 | 13-10 | 12-5 | 20-4 | 17-7 | 16-1 | 14-4 | | |
| *** Southern Pine | Sel. Struc. | 11-4 | 10-4 | 9-8 | 9-0 | 15-0 | 13-7 | 12-10 | 11-11 | 19-1 | 17-4 | 16-4 | 15-2 | 23-3 | 21-1 | 19-10 | 18-5 | | |
| | No.1 | 10-9 | 9-9 | 9-2 | 8-6 | 14-2 | 12-10 | 12-1 | 11-3 | 18-0 | 16-1 | 14-8 | 13-1 | 21-11 | 19-1 | 17-5 | 15-7 | | |
| | No.1 D* | 11-2 | 10-2 | 9-6 | 8-10 | 14-8 | 13-4 | 12-7 | 11-8 | 18-9 | 17-0 | 16-0 | 14-9 | 22-10 | 20-9 | 19-1 | 17-1 | | |
| | No.1 ND** | 10-3 | 9-4 | 8-9 | 8-2 | 13-6 | 12-3 | 11-7 | 10-6 | 17-3 | 15-3 | 13-11 | 12-6 | 20-11 | 18-1 | 16-6 | 14-9 | | |
| | No.2 D* | 10-9 | 9-7 | 8-9 | 7-10 | 14-0 | 12-2 | 11-1 | 9-11 | 16-8 | 14-6 | 13-2 | 11-10 | 19-8 | 17-1 | 15-7 | 13-11 | | |
| | No.2 ND** | 10-0 | 9-1 | 8-4 | 7-5 | 13-2 | 11-6 | 10-6 | 9-5 | 15-8 | 13-7 | 12-5 | 11-1 | 18-5 | 16-0 | 14-7 | 13-0 | | |
| | No.3 | 8-2 | 7-1 | 6-5 | 5-9 | 10-3 | 8-11 | 8-2 | 7-3 | 12-6 | 10-10 | 9-10 | 8-10 | 14-9 | 12-10 | 11-8 | 10-5 | | |
| | Sel. Struc. | 10-6 | 9-6 | 9-0 | 8-4 | 13-10 | 12-7 | 11-10 | 11-0 | 17-8 | 16-0 | 15-1 | 14-0 | 21-6 | 19-6 | 18-4 | 17-0 | | |
| | No.1/No.2 | 10-3 | 9-4 | 8-9 | 8-1 | 13-6 | 12-3 | 11-6 | 10-3 | 17-3 | 15-5 | 14-1 | 12-7 | 20-7 | 17-10 | 16-3 | 14-7 | | |
| | No.3 | 8-8 | 7-6 | 6-10 | 6-2 | 11-0 | 9-6 | 8-8 | 7-9 | 13-5 | 11-8 | 10-7 | 9-6 | 15-7 | 13-6 | 12-4 | 11-0 | | |

D* - Dense

ND** - Non-Dense

*** Tabulated framing spans are based on Southern Pine lumber design values approved by the ALSC Board of Review on January 30, 2013 to be effective on June 1, 2013.

FLOOR JOISTS

30# LIVE LOAD 10# DEAD LOAD L/360

Design Criteria: Strength - 30 lbs. per sq. ft. live load, plus 10 lbs. per sq. ft. dead load. Deflection - Limited in span in inches divided by 360 for live load only.

| Species or Group | | Grade | | Span (feet and inches) | | | | | | | | | | | | | | | |
|---------------------|-------------|-------|-------|------------------------|------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|--------|------|--|--|
| | | | | 2 x 6 | | | | 2 x 8 | | | | 2 x 10 | | | | 2 x 12 | | | |
| | | | | spacing on center | | | | | | | | | | | | | | | |
| 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | | | | |
| Douglas Fir-Larch | Sel. Struc. | 12-6 | 11-4 | 10-8 | 9-11 | 16-6 | 15-0 | 14-1 | 13-1 | 21-0 | 19-1 | 18-0 | 16-8 | 25-7 | 23-3 | 21-10 | 20-3 | | |
| | No.1 & Btr. | 12-3 | 11-2 | 10-6 | 9-9 | 16-2 | 14-8 | 13-10 | 12-10 | 20-8 | 18-9 | 17-8 | 16-5 | 25-1 | 22-10 | 21-4 | 19-1 | | |
| | No.1 | 12-0 | 10-11 | 10-4 | 9-7 | 15-10 | 14-5 | 13-7 | 12-4 | 20-3 | 18-5 | 16-9 | 15-0 | 24-8 | 21-4 | 19-6 | 17-5 | | |
| | No.2 | 11-10 | 10-9 | 10-1 | 9-3 | 15-7 | 14-2 | 13-0 | 11-8 | 19-10 | 17-5 | 15-11 | 14-3 | 23-4 | 20-3 | 18-6 | 16-6 | | |
| Hem-Fir | Sel. Struc. | 11-10 | 10-9 | 10-1 | 9-4 | 15-7 | 14-2 | 13-4 | 12-4 | 19-10 | 18-0 | 17-0 | 15-9 | 24-2 | 21-11 | 20-8 | 19-2 | | |
| | No.1 & Btr. | 11-7 | 10-6 | 9-10 | 9-2 | 15-3 | 13-10 | 13-0 | 12-1 | 19-5 | 17-8 | 16-7 | 15-5 | 23-7 | 21-6 | 20-2 | 18-3 | | |
| | No.1 | 11-7 | 10-6 | 9-10 | 9-2 | 15-3 | 13-10 | 13-0 | 12-1 | 19-5 | 17-8 | 16-7 | 14-10 | 23-7 | 21-1 | 19-3 | 17-2 | | |
| | No.2 | 11-0 | 10-0 | 9-5 | 8-9 | 14-6 | 13-2 | 12-5 | 11-4 | 18-6 | 16-10 | 15-6 | 13-10 | 22-6 | 19-8 | 17-11 | 16-1 | | |
| *** Southern Pine | Sel. Struc. | 12-6 | 11-4 | 10-8 | 9-11 | 16-6 | 15-0 | 14-1 | 13-1 | 21-0 | 19-1 | 18-0 | 16-8 | 25-7 | 23-3 | 21-10 | 20-3 | | |
| | No.1 | 12-0 | 10-11 | 10-4 | 9-7 | 15-10 | 14-5 | 13-7 | 12-4 | 20-3 | 18-5 | 16-9 | 15-0 | 24-8 | 21-4 | 19-6 | 17-5 | | |
| | No.1 D* | 12-3 | 11-2 | 10-6 | 9-9 | 16-2 | 14-8 | 13-10 | 12-10 | 20-8 | 18-9 | 17-6 | 15-9 | 25-1 | 22-4 | 20-5 | 18-3 | | |
| | No.1 ND** | 11-3 | 10-3 | 9-8 | 8-11 | 14-11 | 13-6 | 12-9 | 11-9 | 19-0 | 17-1 | 15-7 | 13-11 | 23-1 | 20-3 | 18-6 | 16-6 | | |
| | No.2 D* | 11-10 | 10-8 | 9-9 | 8-9 | 15-7 | 13-7 | 12-5 | 11-1 | 18-8 | 16-2 | 14-9 | 13-2 | 22-0 | 19-1 | 17-5 | 15-7 | | |
| | No.2 ND** | 11-3 | 10-3 | 9-6 | 8-6 | 14-11 | 13-3 | 12-1 | 10-10 | 18-1 | 15-8 | 14-4 | 12-10 | 21-4 | 18-6 | 16-10 | 15-1 | | |
| | No.3 | 9-2 | 7-11 | 7-3 | 6-5 | 11-6 | 10-0 | 9-1 | 8-2 | 13-11 | 12-1 | 11-0 | 9-10 | 16-6 | 14-4 | 13-1 | 11-8 | | |
| | Sel. Struc. | 11-7 | 10-6 | 9-10 | 9-2 | 15-3 | 13-10 | 13-0 | 12-1 | 19-5 | 17-8 | 16-7 | 15-5 | 23-7 | 21-6 | 20-2 | 18-9 | | |
| | No.1/No.2 | 11-3 | 10-3 | 9-8 | 8-11 | 14-11 | 13-6 | 12-9 | 11-6 | 19-0 | 17-2 | 15-8 | 14-1 | 23-0 | 19-11 | 18-3 | 16-3 | | |
| | No.3 | 9-8 | 8-5 | 7-8 | 6-10 | 12-4 | 10-8 | 9-9 | 8-8 | 15-0 | 13-0 | 11-10 | 10-7 | 17-5 | 15-1 | 13-9 | 12-4 | | |

D* - Dense

ND** - Non-Dense

*** Tabulated framing spans are based on Southern Pine lumber design values approved by the ALSC Board of Review on January 30, 2013 to be effective on June 1, 2013.

Lumber Framing Spans

MAXIMUM ALLOWABLE LUMBER FRAMING SPANS

CEILING JOISTS

20# LIVE LOAD 10# DEAD LOAD L/240

Design Criteria: Strength - 20 lbs. per sq. ft. live load, plus 10 lbs. per sq. ft. dead load. Deflection - Limited in span in inches divided by 240 for live load only.

| Species or Group | | Grade | | Span (feet and inches) | | | | | | | | | | | | | | | |
|-------------------|------------------|-------|------|------------------------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|--------|-------|--|--|
| | | | | 2 x 4 | | | | 2 x 6 | | | | 2 x 8 | | | | 2 x 10 | | | |
| | | | | spacing on center | | | | | | | | | | | | | | | |
| 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | | | | |
| Douglas Fir-Larch | Sel. Struc. | 10-5 | 9-6 | 8-11 | 8-3 | 16-4 | 14-11 | 14-0 | 13-0 | 21-7 | 19-7 | 18-5 | 17-2 | 27-6 | 25-0 | 23-7 | 21-3 | | |
| | No.1 & Btr. | 10-3 | 9-4 | 8-9 | 8-1 | 16-1 | 14-7 | 13-9 | 12-3 | 21-2 | 19-1 | 17-5 | 15-7 | 26-10 | 23-3 | 21-3 | 19-0 | | |
| | No.1 | 10-0 | 9-1 | 8-7 | 7-8 | 15-9 | 13-9 | 12-6 | 11-2 | 20-1 | 17-5 | 15-10 | 14-2 | 24-6 | 21-3 | 19-5 | 17-4 | | |
| | No.2 | 9-10 | 8-11 | 8-2 | 7-3 | 15-0 | 13-0 | 11-11 | 10-8 | 19-1 | 16-6 | 15-1 | 13-6 | 23-3 | 20-2 | 18-5 | 16-5 | | |
| | No.3 | 7-10 | 6-10 | 6-2 | 5-7 | 11-6 | 9-11 | 9-1 | 8-1 | 14-7 | 12-7 | 11-6 | 10-3 | 17-9 | 15-5 | 14-1 | 12-7 | | |
| Hem-Fir | Sel. Struc. | 9-10 | 8-11 | 8-5 | 7-10 | 15-6 | 14-1 | 13-3 | 12-3 | 20-5 | 18-6 | 17-5 | 16-2 | 26-0 | 23-8 | 22-3 | 20-6 | | |
| | No.1 & Btr. | 9-8 | 8-9 | 8-3 | 7-8 | 15-2 | 13-9 | 12-11 | 11-9 | 19-11 | 18-2 | 16-8 | 14-11 | 25-5 | 22-3 | 20-4 | 18-2 | | |
| | No.1 | 9-8 | 8-9 | 8-3 | 7-7 | 15-2 | 13-7 | 12-4 | 11-1 | 19-10 | 17-2 | 15-8 | 14-0 | 24-3 | 21-0 | 19-2 | 17-1 | | |
| | No.2 | 9-2 | 8-4 | 7-10 | 7-1 | 14-5 | 12-8 | 11-7 | 10-4 | 18-6 | 16-0 | 14-8 | 13-1 | 22-7 | 19-7 | 17-10 | 16-0 | | |
| | No.3 | 7-8 | 6-8 | 6-1 | 5-5 | 11-2 | 9-8 | 8-10 | 7-11 | 14-2 | 12-4 | 11-3 | 10-0 | 17-4 | 15-0 | 13-8 | 12-3 | | |
| *** Southern Pine | D* Sel. Struc. | 10-5 | 9-6 | 8-11 | 8-3 | 16-4 | 14-11 | 14-0 | 13-0 | 21-7 | 19-7 | 18-5 | 17-2 | 27-6 | 25-0 | 23-7 | 21-10 | | |
| | Sel. Struc. | 10-3 | 9-4 | 8-9 | 8-1 | 16-1 | 14-7 | 13-9 | 12-9 | 21-2 | 19-3 | 18-2 | 16-10 | 27-1 | 24-7 | 23-1 | 21-6 | | |
| | ND** Sel. Struc. | 9-10 | 8-11 | 8-5 | 7-10 | 15-6 | 14-1 | 13-3 | 12-3 | 20-5 | 18-6 | 17-5 | 16-2 | 26-0 | 23-8 | 22-3 | 20-3 | | |
| | No.1 D* | 10-3 | 9-4 | 8-9 | 8-0 | 16-1 | 14-7 | 13-6 | 12-0 | 21-2 | 18-5 | 16-10 | 15-1 | 25-7 | 22-2 | 20-3 | 18-1 | | |
| | No.1 | 9-10 | 8-11 | 8-5 | 7-8 | 15-6 | 14-0 | 12-9 | 11-5 | 20-5 | 17-9 | 16-2 | 14-6 | 23-11 | 20-9 | 18-11 | 16-11 | | |
| | No.1 ND** | 9-5 | 8-7 | 8-0 | 7-2 | 14-9 | 13-2 | 12-0 | 10-9 | 19-3 | 16-8 | 15-2 | 13-7 | 22-9 | 19-9 | 18-0 | 16-1 | | |
| | No.2 D* | 9-8 | 8-5 | 7-8 | 6-10 | 14-3 | 12-4 | 11-3 | 10-1 | 18-1 | 15-8 | 14-4 | 12-10 | 21-7 | 18-8 | 17-0 | 15-3 | | |
| | No.2 | 9-3 | 8-0 | 7-4 | 6-7 | 13-11 | 12-0 | 11-0 | 9-10 | 17-7 | 15-3 | 13-11 | 12-6 | 20-11 | 18-1 | 16-6 | 14-9 | | |
| | No.2 ND** | 9-1 | 7-10 | 7-2 | 6-5 | 13-7 | 11-9 | 10-9 | 9-7 | 17-2 | 14-10 | 13-7 | 12-1 | 20-3 | 17-6 | 16-0 | 14-4 | | |
| | No.3 | 7-2 | 6-2 | 5-8 | 5-1 | 10-7 | 9-2 | 8-4 | 7-5 | 13-3 | 11-6 | 10-6 | 9-5 | 16-1 | 13-11 | 12-9 | 11-5 | | |
| Spruce-Pine-Fir | Sel. Struc. | 9-8 | 8-9 | 8-3 | 7-8 | 15-2 | 13-9 | 12-11 | 12-0 | 19-11 | 18-2 | 17-1 | 15-10 | 25-5 | 23-2 | 21-8 | 19-5 | | |
| | No.1/No.2 | 9-5 | 8-7 | 8-0 | 7-2 | 14-9 | 12-10 | 11-9 | 10-6 | 18-9 | 16-3 | 14-10 | 13-3 | 22-11 | 19-10 | 18-2 | 16-3 | | |
| | No. 3 | 7-8 | 6-8 | 6-1 | 5-5 | 11-2 | 9-8 | 8-10 | 7-11 | 14-2 | 12-4 | 11-3 | 10-0 | 17-4 | 15-0 | 13-8 | 12-3 | | |

D* - Dense ND** - Non-Dense *** Tabulated framing spans are based on Southern Pine lumber design values approved by the ALSC Board of Review on January 30, 2013 to be effective on June 1, 2013.

ROOF RAFTERS

30# SNOW LOAD 10# DEAD LOAD L/240

Design Criteria: Strength - 30 lbs. per sq. ft. snow load, plus 10 lbs. per sq. ft. dead load. Deflection - Limited in span in inches divided by 240 for live load only.

| Species or Group | | Grade | | Span (feet and inches) | | | | | | | | | | | | | | | |
|-------------------|------------------|-------|-------|------------------------|------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|--------|-------|--|--|
| | | | | 2 x 6 | | | | 2 x 8 | | | | 2 x 10 | | | | 2 x 12 | | | |
| | | | | spacing on center | | | | | | | | | | | | | | | |
| 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | 12" | 16" | 19.2" | 24" | | | | |
| Douglas Fir-Larch | Sel. Struc. | 14-4 | 13-0 | 12-3 | 11-4 | 18-10 | 17-2 | 16-1 | 15-0 | 24-1 | 21-10 | 20-7 | 19-1 | 29-3 | 26-7 | 25-0 | 22-10 | | |
| | No.1 & Btr. | 14-1 | 12-9 | 12-0 | 11-2 | 18-6 | 16-10 | 15-10 | 14-5 | 23-8 | 21-6 | 19-9 | 17-8 | 28-9 | 25-1 | 22-10 | 20-5 | | |
| | No.1 | 13-9 | 12-6 | 11-8 | 10-5 | 18-2 | 16-2 | 14-9 | 13-2 | 22-9 | 19-9 | 18-0 | 16-1 | 26-5 | 22-10 | 20-11 | 18-8 | | |
| | No.2 | 13-6 | 12-1 | 11-0 | 9-10 | 17-8 | 15-4 | 14-0 | 12-6 | 21-7 | 18-9 | 17-1 | 15-3 | 25-1 | 21-8 | 19-10 | 17-9 | | |
| | No.3 | 10-8 | 9-3 | 8-5 | 7-7 | 13-6 | 11-8 | 10-8 | 9-7 | 16-6 | 14-3 | 13-1 | 11-8 | 19-2 | 16-7 | 15-2 | 13-6 | | |
| Hem-Fir | Sel. Struc. | 13-6 | 12-3 | 11-7 | 10-9 | 17-10 | 16-2 | 15-3 | 14-2 | 22-9 | 20-8 | 19-5 | 18-0 | 27-8 | 25-1 | 23-7 | 21-11 | | |
| | No.1 & Btr. | 13-3 | 12-0 | 11-4 | 10-6 | 17-5 | 15-10 | 14-11 | 13-10 | 22-3 | 20-2 | 18-11 | 16-11 | 27-1 | 24-0 | 21-11 | 19-7 | | |
| | No.1 | 13-3 | 12-0 | 11-4 | 10-3 | 17-5 | 15-10 | 14-7 | 13-0 | 22-3 | 19-6 | 17-9 | 15-11 | 26-1 | 22-7 | 20-7 | 18-5 | | |
| | No.2 | 12-7 | 11-5 | 10-9 | 9-7 | 16-7 | 14-11 | 13-7 | 12-2 | 21-0 | 18-2 | 16-7 | 14-10 | 24-4 | 21-1 | 19-3 | 17-3 | | |
| | No.3 | 10-5 | 9-0 | 8-3 | 7-4 | 13-2 | 11-5 | 10-5 | 9-4 | 16-1 | 13-11 | 12-9 | 11-5 | 18-8 | 16-2 | 14-9 | 13-2 | | |
| *** Southern Pine | D* Sel. Struc. | 14-4 | 13-0 | 12-3 | 11-4 | 18-10 | 17-2 | 16-1 | 15-0 | 24-1 | 21-10 | 20-7 | 19-1 | 29-3 | 26-7 | 25-0 | 23-3 | | |
| | Sel. Struc. | 14-1 | 12-9 | 12-0 | 11-2 | 18-6 | 16-10 | 15-10 | 14-8 | 23-8 | 21-6 | 20-2 | 18-9 | 28-9 | 26-1 | 24-7 | 22-10 | | |
| | ND** Sel. Struc. | 13-6 | 12-3 | 11-7 | 10-9 | 17-10 | 16-2 | 15-3 | 14-2 | 22-9 | 20-8 | 19-5 | 18-0 | 27-8 | 25-1 | 23-7 | 21-11 | | |
| | No.1 D* | 14-1 | 12-9 | 12-0 | 11-2 | 18-6 | 16-10 | 15-8 | 14-0 | 23-8 | 20-7 | 18-10 | 16-10 | 27-8 | 24-0 | 21-11 | 19-7 | | |
| | No.1 | 13-6 | 12-3 | 11-7 | 10-7 | 17-10 | 16-2 | 15-1 | 13-5 | 22-3 | 19-3 | 17-7 | 15-9 | 26-5 | 22-10 | 20-11 | 18-8 | | |
| | No.1 ND** | 12-11 | 11-9 | 11-1 | 10-0 | 17-0 | 15-5 | 14-1 | 12-7 | 21-2 | 18-4 | 16-9 | 15-0 | 25-1 | 21-8 | 19-10 | 17-9 | | |
| | No.2 D* | 13-3 | 11-5 | 10-6 | 9-4 | 16-10 | 14-7 | 13-3 | 11-11 | 20-0 | 17-4 | 15-10 | 14-2 | 23-7 | 20-5 | 18-8 | 16-8 | | |
| | No.2 | 12-11 | 11-2 | 10-2 | 9-2 | 16-4 | 14-2 | 12-11 | 11-7 | 19-5 | 16-10 | 15-4 | 13-9 | 22-10 | 19-10 | 18-1 | 16-2 | | |
| | No.2 ND** | 12-7 | 10-11 | 9-11 | 8-11 | 15-11 | 13-9 | 12-7 | 11-3 | 18-10 | 16-3 | 14-10 | 13-4 | 22-1 | 19-2 | 17-6 | 15-7 | | |
| | No.3 | 9-9 | 8-6 | 7-9 | 6-11 | 12-4 | 10-8 | 9-9 | 8-9 | 15-0 | 13-0 | 11-10 | 10-7 | 17-9 | 15-4 | 14-0 | 12-6 | | |
| Spruce-Pine-Fir | Sel. Struc. | 13-3 | 12-0 | 11-4 | 10-6 | 17-5 | 15-10 | 14-11 | 13-10 | 22-3 | 20-2 | 19-0 | 17-8 | 27-1 | 24-7 | 23-1 | 20-11 | | |
| | No.1/No.2 | 12-11 | 11-9 | 10-11 | 9-9 | 17-0 | 15-1 | 13-9 | 12-4 | 21-4 | 18-5 | 16-10 | 15-1 | 24-8 | 21-5 | 19-6 | 17-6 | | |
| | No. 3 | 10-5 | 9-0 | 8-3 | 7-4 | 13-2 | 11-5 | 10-5 | 9-4 | 16-1 | 13-11 | 12-9 | 11-5 | 18-8 | 16-2 | 14-9 | 13-2 | | |

D* - Dense ND** - Non-Dense *** Tabulated framing spans are based on Southern Pine lumber design values approved by the ALSC Board of Review on January 30, 2013 to be effective on June 1, 2013.

571-SP/1120/01-2013/POD