Western Lumber Span Tables
for Floor and Ceiling Joists and Roof Rafters

Western Wood Products Association

computed with BASE VALUES for dimension lumber
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ABOUT WWPA

Western Wood Products Association (WWPA) provides lumber grading, technical support and business information services for the Western lumber products of its Member companies. Approved by the Board of Review of the American Lumber Standard Committee, Inc. (ALSC), which operates under the jurisdiction of the U.S. Department of Commerce, WWPA is accredited as a lumber inspection and rules-writing agency.

Lumber buyers can look to WWPA’s registered grade mark for the assurance that lumber consistently meets grade specifications and performance standards. The Association monitors lumber grading and product quality control at its Member mills and provides mill inspection, lumber grader training and incentive programs, MSR and glued products standards, resource recovery and mill efficiency studies.

In addition, WWPA provides technical support services and information on Western lumber end uses to lumber buyers throughout the world, and publishes a variety of statistical reports on Western lumber production, distribution and consumption. The Member companies of WWPA support the many programs that assist buyers in specifying and using Western lumber products. These companies are among the leaders in the lumber industry in supplying quality products to users worldwide.

Additional information about WWPA is available online at www.wwpa.org. Web site visitors can view technical information on Western lumber, order publications, download the Lumber Design Suite and access a searchable, interactive Buyer’s Guide.

SPECIES GROUPINGS—Marketing Categories

Western lumber is often harvested, manufactured and sold in species groupings known as marketing categories. Some of the more than 20 commercially important softwood species are interchangeable in that they share performance properties and are similar in appearance. For structural applications, Western species readily combine into six Species Groups, shown below. The Standard Species Combinations for structurally graded Western lumber are also shown on this page.

Alternate Combinations are available in non-structural grades. Some species are also available separately, in both structural and non-structural grades. However, when a species combination other than one of those shown on this page is used for structural applications, the species within the combination with the lowest assigned design value will govern. Refer to WWPA’s Western Lumber Product Use Manual or the Western Lumber Grading Rules for additional information.

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<td>Pacific Silver Fir—Abies amabilis</td>
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DESIGN VALUES

Design values for North American softwood structural lumber are computed in accordance with ASTM standards based on clear-wood tests or on tests of full-size pieces in specific grades, conducted in cooperation with the USDA Forest Products Laboratory. The applicable standards are ASTM Standards D2555 and D245 for clear wood, and D1990 for full-size specimens (the In-Grade Testing Program). Refer to Sections 100.00 to 170.00 of the Western Lumber Grading Rules for additional information.

For load conditions or deflection limit settings outside the scope of this publication, use the WWPA Lumber Design Suite, the newest design tool available to help architects, engineers, designers and code officials in properly specifying and using Western lumber products. For more information on the suite, go to the Association’s web site at www.wwpa.org
MECHANICAL PROPERTIES RELATED TO BENDING MEMBERS

Lumber strength properties are assigned to five basic strength properties: fiber stress in bending ($F_b$), tension parallel-to-grain ($F_t$), horizontal shear ($F_v$), compression perpendicular-to-grain ($F_{c,L}$) and compression parallel-to-grain ($F_{c,H}$). The modulus of elasticity (E or MOE) is a ratio of the amount a piece of lumber will deflect in proportion to an applied load. It is a measurement of stiffness and not a strength property.

These span tables are calculated based on MOE and $F_b$ values. In addition $F_{c,H}$ and $F_v$ are included as a consideration for selection of joist and rafters.

**Extreme Fiber Stress in Bending - $F_b$** (Fig. 1) When loads are applied, structural members bend, producing tension in the fibers along the faces farthest from the applied load and compression in the fibers along the face nearest to the applied load. These induced stresses in the fibers are designated as “extreme fiber stress in bending” ($F_b$).

**Single Member $F_b$** design values are used in design where the strength of an individual piece, such as a beam, may be solely responsible for carrying a specific design load.

**Repetitive Member $F_b$** design values are used in design when three or more load sharing members, such as joists, rafters, or studs, are spaced no more than 24” apart and are joined by flooring, sheathing or other load-distributing elements. Repetitive members are also used where pieces are adjacent, such as decking.

**Horizontal Shear - $F_v$** (Fig. 2) Horizontal shear stresses tend to slide fibers over each other horizontally. Most predominate in short, heavily loaded deep beams. Increasing beam cross section decreases shear stresses*.

**Compression Perpendicular to Grain - $F_{c,L}$** (Fig. 3) Where a joist, beam or similar piece of lumber bears on supports, the load tends to compress the fibers. It is necessary that the bearing area be sufficient to prevent excessive side-grain crushing.

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### BASE VALUES FOR WESTERN DIMENSION LUMBER

Grades described in Western Lumber Grading Rules, Sections 42.00 and 62.00.

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<td>Western Woods</td>
<td>Select Structural</td>
<td>900</td>
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<td>1,100</td>
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<tr>
<td></td>
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<td>375</td>
<td>900,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

1 Design values in pounds per square inch.
2 Multiply with appropriate Size Factor ($C_F$) shown below.

### SIZE ADJUSTMENT FACTORS ($C_F$)

Apply to Dimension Lumber Base Values

<table>
<thead>
<tr>
<th>Grades</th>
<th>Nominal Width (depth)</th>
<th>2&quot; &amp; 3&quot; thick nominal</th>
<th>4&quot; thick nominal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select</td>
<td>2&quot;, 3&quot; and 4&quot;</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Structural</td>
<td>5&quot;</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>No. 1 &amp; Btr.</td>
<td>6&quot;</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>No. 1, No. 2, and No. 3</td>
<td>8&quot;</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>10&quot;</td>
<td>1.1</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>12&quot;</td>
<td>1.0</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>14&quot; &amp; wider</td>
<td>0.9</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

* Loads within the net depth of the member away from the end support can be excluded in design analysis.
Modulus of Elasticity - $E$ (Fig. 4)
The modulus of elasticity is a ratio of the amount a material will deflect in proportion to an applied load.

DESIGN CRITERIA

The following span tables were calculated using Western Lumber Base Values as published in WWPA’s Western Lumber Grading Rules. These spans relate to products manufactured from U.S. Western species (see page 3) and are not appropriate for use with products manufactured from species imported from other countries. Maximum spans were computed using standard engineering procedures for simple spans with uniformly distributed loads. Some building codes permit reductions of certain design loads for large tributary areas and steep-pitch roofs. These reductions may vary from code to code and are not considered in the computations for spans in this publication. Allowable roof snow load rafter spans are based on design snow loads. Ground snow loads must be converted to design snow loads for roofs in accordance with appropriate building code provisions before using the tables. Spans are given in feet and inches of horizontal projection. The spans given are rounded to the nearest inch and represent the maximum allowable span when controlled by deflection and/or bending. Design loads are in pounds per square foot and are designated with a # symbol in the tables.

To minimize serviceability related problems, such as cracking of finishes, deflections are typically limited to span/360 for plaster finish, and span/240 for drywall finish.

This book is intended for use in structures where the moisture content of lumber in use does not exceed 19% for an extended period of time.

USING WESTERN LUMBER SPAN TABLES

Span Measurement
Span, for joists and rafters, is the clear distance between supports. For sloping rafters, the span is measured along the horizontal projection. The maximum spans provided in these tables were determined according to criteria set forth by the American Forest & Paper Association in its code-recognized Span Tables for Joists and Rafters.

Bending Values
In these Western Lumber Span Tables, Western lumber $F_b$ base values have been adjusted for size by appropriate size factors ($C_R$): no further size-adjustment is necessary.

Repetitive Members
The repetitive member factor ($C_R$) of 1.15 has been applied to the size-adjusted $F_b$ values for the spans in these joist and rafter tables; no further repetitive member-adjustment is necessary.

Duration of Load
The size- and repetitive member-adjusted base values used for these tables have been adjusted for duration of load ($C_D$), where appropriate, by the following factors:

<table>
<thead>
<tr>
<th>Load Duration</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (floor and ceiling joists)</td>
<td>1.00</td>
</tr>
<tr>
<td>Snow Load (roof)</td>
<td>1.15</td>
</tr>
<tr>
<td>Minimum Design Live Load (roof)</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Deflection
Structural members deflect or bend under load. Although not considered a safety factor, deflection is limited in most span applications when appearance or stiffness is important. Deflection may be the controlling factor for certain size/grade combinations depending on the required stiffness of the system. Deflection limits are expressed as a ratio of the span in inches divided by the limiting factor. Live load (only) deflection is considered in these Western Lumber Span Tables, in accordance with established engineering practices for joists and rafters. The model building codes set maximum allowable deflection criteria for structural members based on their end use. The most common deflection criteria are provided in the following span tables and are expressed as $L/360$, $L/240$ and $L/180$, where "L" is the length in inches.

When span lengths in the tables are controlled by the deflection limit, spans are shown in italicized type:

15-4 15-4 15-4 15-4

In cases where a stiffer system or a higher level of vibration control is desired, the deflection-limited spans should be multiplied by the adjustment factors shown below:

<table>
<thead>
<tr>
<th>Deflection Limit</th>
<th>Adjustment Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>L/480</td>
<td>0.91</td>
</tr>
<tr>
<td>L/600</td>
<td>0.84</td>
</tr>
</tbody>
</table>

Horizontal Shear and Compression Perpendicular-to-Grain
Shear design values for lumber recently have been revised and approved by the American Lumber Standard Committee, Inc., in accordance with changes in ASTM Standard D245. These new lumber shear values are higher than earlier assigned values. A reduction is made to compensate for any degree of shake, check or split that might develop in a piece. Horizontal shear base values ($F_v$) and compression perpendicular-to-grain values ($F_{cv}$) for Western lumber species groupings are shown on the next page for your convenience.
Horizontal shear ($F_v$) and compression perpendicular-to-grain ($F_{c\perp}$) have been considered in the development of these span tables. However, there is one exception: Maximum spans have not been reduced when compression perpendicular-to-grain exceeds the assigned $F_{c\perp}$ values, based on a bearing area of two inches times the net joist thickness. (Two inches is the assumed bearing length in the routine calculation of spans.)

Spans are shown in **bold-faced** type:

- 15-4
- 15-4
- 15-4
- 15-4

for compression perpendicular-to-grain stress exceeding the assigned $F_{c\perp}$ based on two-inch bearing length.

**Example 1—Analysis for Compression Perpendicular-to-Grain** (from Table FJ-18)

Hem-Fir, Select Structural, 2x12, 24" on center

- Span = 12'-5" (12.42')
- $F_{c\perp} = 405$ psi
- Total load per sq. ft. = 110#
- Spacing = 2 ft. on center

Total Load = $\frac{12.42' \times 110 \# \times 2' \text{ o.c.}}{2} = 1366#$

$\frac{1366\#}{405 \text{ psi}} = 3.37$ square inches

$\frac{3.37 \text{ square inches}}{1.5 \text{ inch wide joist}} = 2.25$ inches of bearing required

When span lengths are controlled by deflection and have compression perpendicular-to-grain values, then span lengths are shown in **bold-faced italicized** type.

- 15-4
- 15-4
- 15-4
- 15-4
To use the diagram, select the known horizontal distance and follow the vertical line to its intersection with the radial line of the specified slope, then proceed along the arc to read the sloping distance. In some cases it may be desirable to interpolate between the one-foot separations. The diagram also may be used to find the horizontal distance corresponding to a given sloping distance or to find the slope when the horizontal and sloping distances are known.

Example: With a roof slope of 8 in 12 and a horizontal distance of 20 feet, the sloping distance may be read as 24 feet.
### FLOOR JOISTS

#### 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.

#### Table FJ-1

<table>
<thead>
<tr>
<th>Species or Group</th>
<th>Grade</th>
<th>2 x 6</th>
<th>2 x 8</th>
<th>2 x 10</th>
<th>2 x 12</th>
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<tbody>
<tr>
<td><strong>FLOOR JOISTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>30# LIVE LOAD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10# DEAD LOAD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>L/360</strong></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Design Criteria</strong></td>
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</table>

#### Table FJ-2

<table>
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<th>2 x 10</th>
<th>2 x 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FLOOR JOISTS</strong></td>
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<td></td>
<td></td>
<td></td>
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<td><strong>30# LIVE LOAD</strong></td>
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<td><strong>25# DEAD LOAD</strong></td>
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<td><strong>L/360</strong></td>
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<tr>
<td><strong>Design Criteria</strong></td>
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</tbody>
</table>
### FLOOR JOISTS

**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.

#### Table FJ-3

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<td>16”</td>
<td>19.2”</td>
<td>24”</td>
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</tr>
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<td><strong>Deflection</strong></td>
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</tr>
<tr>
<td></td>
<td>40# Live Load</td>
<td>20# Dead Load</td>
<td>L/360</td>
<td></td>
<td></td>
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<tr>
<td><strong>Douglas Fir-</strong></td>
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<tr>
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#### Table FJ-4

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<tbody>
<tr>
<td><strong>2 x 6</strong></td>
<td>12”</td>
<td>16”</td>
<td>19.2”</td>
<td>24”</td>
<td>12”</td>
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<tr>
<td><strong>Deflection</strong></td>
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<tr>
<td></td>
<td>40# Live Load</td>
<td>20# Dead Load</td>
<td>L/360</td>
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<tr>
<td><strong>Douglas Fir-</strong></td>
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<tr>
<td>Larch</td>
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<td>9-11</td>
<td>9-4</td>
<td>8-8</td>
</tr>
<tr>
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<td><strong>Spruce-</strong></td>
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<td>Woods</td>
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<td>6-6</td>
<td>5-11</td>
<td>5-4</td>
</tr>
</tbody>
</table>
## FLOOR JOISTS

#### Design Criteria:
- **Strength:** - 40 lbs. per sq. ft. live load, plus 25 lbs. per sq. ft. dead load.
- **Deflection:** - Limited in span in inches divided by 360 for live load only.

### Table FJ-5

#### 40# Live Load 25# Dead Load L/360

<table>
<thead>
<tr>
<th>Species or Group</th>
<th>Grade</th>
<th>2 x 6</th>
<th>2 x 8</th>
<th>2 x 10</th>
<th>2 x 12</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Sel. Struc.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No.1 &amp; Btr.</td>
<td>11-4 10-4 9-4 8-4</td>
<td>15-0 13-7 12-10 11-10</td>
<td>12-10 11-10</td>
<td>11-10 10-10</td>
<td>10-10 9-10</td>
</tr>
<tr>
<td>No.2</td>
<td>11-4 10-4 9-4 8-4</td>
<td>15-0 13-7 12-10 11-10</td>
<td>12-10 11-10</td>
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<tr>
<td>No.3</td>
<td>11-4 10-4 9-4 8-4</td>
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<td>12-10 11-10</td>
<td>11-10 10-10</td>
<td>10-10 9-10</td>
</tr>
</tbody>
</table>

| **Douglas Fir**  | Sel. Struc. | | |
| No.1 & Btr.      | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.2             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.3             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |

| **Hem-Fir**      | Sel. Struc. | | |
| No.1 & Btr.      | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.2             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.3             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |

| **Spruce-Pine-Fir** | Sel. Struc. | | |
| No.1 & Btr. | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.2             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.3             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |

### Table FJ-6

#### 50# Live Load 10# Dead Load L/360

<table>
<thead>
<tr>
<th>Species or Group</th>
<th>Grade</th>
<th>2 x 8</th>
<th>2 x 10</th>
<th>2 x 12</th>
<th>2 x 14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Douglas Fir</strong></td>
<td>Sel. Struc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.1 &amp; Btr.</td>
<td>11-4 10-4 9-4 8-4</td>
<td>15-0 13-7 12-10 11-10</td>
<td>12-10 11-10</td>
<td>11-10 10-10</td>
<td>10-10 9-10</td>
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<tr>
<td>No.2</td>
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<td>15-0 13-7 12-10 11-10</td>
<td>12-10 11-10</td>
<td>11-10 10-10</td>
<td>10-10 9-10</td>
</tr>
<tr>
<td>No.3</td>
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<td>15-0 13-7 12-10 11-10</td>
<td>12-10 11-10</td>
<td>11-10 10-10</td>
<td>10-10 9-10</td>
</tr>
</tbody>
</table>

| **Hem-Fir**      | Sel. Struc. | | |
| No.1 & Btr.      | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.2             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.3             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |

| **Spruce-Pine-Fir** | Sel. Struc. | | |
| No.1 & Btr. | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.2             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
| No.3             | 11-4 10-4 9-4 8-4 | 15-0 13-7 12-10 11-10 | 12-10 11-10 | 11-10 10-10 | 10-10 9-10 |
### FLOOR JOISTS

**Design Criteria:** Strength - 50 lbs. per sq. ft. live load, plus 20 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided by 360 for live load only.

#### Table FJ-7

<table>
<thead>
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### FLOOR JOISTS

#### Design Criteria:
- Strength: 60 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.

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#### Notes:
- Strength: 60 lbs. per sq. ft. live load, plus 20 lbs. per sq. ft. dead load.
- Deflection: Limited in span in inches divided by 360 for live load only.
## FLOOR JOISTS

### Design Criteria:
- **60# Live Load**
  - Strength: 60 lbs. per sq. ft. live load, plus 25 lbs. per sq. ft. dead load.
- **25# Dead Load**
  - Deflection: Limited in spans in divided by 360 for live load only.
- **L/360**

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### FLOOR JOISTS

### Design Criteria:
- **75# Live Load**
  - Strength: 75 lbs. per sq. ft. live load, plus 10 lbs. per sq. ft. dead load.
- **10# Dead Load**
  - Deflection: Limited in spans in divided by 360 for live load only.
- **L/360**

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| No.3 | 7-4 | 6-4 | 5-9 | 5-2 }
**FLOOR JOISTS**

**Design Criteria:** Strength - 80 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.**

### Table FJ-15

#### Strength

- **80# LIVE LOAD 10# DEAD LOAD L/360**

#### Deflection

- Limited in span in inches divided by 360 for live load only.

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### Table FJ-16

#### Strength

- **80# LIVE LOAD 20# DEAD LOAD L/360**

#### Deflection

- Limited in span in inches divided by 360 for live load only.

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### FLOOR JOISTS

**Design Criteria**:
- Strength - 80 lbs. per sq. ft. live load, plus 25 lbs. per sq. ft. dead load.
- Deflection - Limited in span inches divided by 360 for live load only.

#### 80# LIVE LOAD  25# DEAD LOAD  L/360

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<td>19.2”</td>
<td>24”</td>
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<tr>
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<td>No.1  &amp; Btr.</td>
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</table>

| South            | No.1  & Btr. | 9-9-9 | 9-2 | 8-2 | 7-2 |     |     |     |     |     |     |     |     |
| No.1             | 8-8-9 | 8-2 | 7-2 | 6-2 | 5-2 |     |     |     |     |     |     |     |     |
| No.2             | 9-8-9 | 8-2 | 7-2 | 6-2 | 5-2 |     |     |     |     |     |     |     |     |
| No.3             | 7-8-9 | 8-2 | 7-2 | 6-2 | 5-2 |     |     |     |     |     |     |     |     |

| Hem-Fir          |       |     |     |     |     | 14-4 | 13-0 | 12-5 | 11-0 | 16-5 | 17-1 | 15-1 | 13-5 |
| No.1  & Btr.     | 9-9-9 | 9-2 | 8-2 | 7-2 | 6-2 |     |     |     |     |     |     |     |     |
| No.1             | 8-8-9 | 8-2 | 7-2 | 6-2 | 5-2 |     |     |     |     |     |     |     |     |
| No.2             | 9-8-9 | 8-2 | 7-2 | 6-2 | 5-2 |     |     |     |     |     |     |     |     |
| No.3             | 7-8-9 | 8-2 | 7-2 | 6-2 | 5-2 |     |     |     |     |     |     |     |     |

| Spruce-          |       |     |     |     |     | 12-3 | 11-7 | 10-2 | 9-6 | 16-7 | 18-2 | 16-7 | 15-1 |
| Pine-Fir        | No.1  & Btr. | 8-10 | 7-10 | 7-0 | 6-0 | 5-0 | 4-0 | 9-8 | 8-4 | 14-1 | 15-6 | 14-1 | 12-6 |
| No.1             | 7-10 | 6-10 | 5-10 | 4-10 | 3-10 | 2-10 | 1-10 |     |     |     |     |     |     |
| No.2             | 7-10 | 6-10 | 5-10 | 4-10 | 3-10 | 2-10 | 1-10 |     |     |     |     |     |     |
| No.3             | 7-10 | 6-10 | 5-10 | 4-10 | 3-10 | 2-10 | 1-10 |     |     |     |     |     |     |

### FLOOR JOISTS

**Design Criteria**:
- Strength - 100 lbs. per sq. ft. live load, plus 10 lbs. per sq. ft. dead load.
- Deflection - Limited in span inches divided by 360 for live load only.

#### 100# LIVE LOAD  10# DEAD LOAD  L/360

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<td>24”</td>
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| Douglas Fir-     |       |     |     |     |     | 13-1 | 11-9 | 11-9 | 10-1 | 16-7 | 15-3 | 14-1 | 12-6 |
| South            | No.1  & Btr. | 8-10 | 8-0 | 8-0 | 7-0 |     |     |     |     |     |     |     |     |
| No.1             | 8-10 | 8-0 | 8-0 | 7-0 | 6-0 |     |     |     |     |     |     |     |     |
| No.2             | 8-10 | 8-0 | 8-0 | 7-0 | 6-0 |     |     |     |     |     |     |     |     |
| No.3             | 8-10 | 8-0 | 8-0 | 7-0 | 6-0 |     |     |     |     |     |     |     |     |

| Hem-Fir          |       |     |     |     |     | 12-2 | 11-0 | 10-2 | 9-1 | 16-7 | 15-3 | 14-1 | 12-6 |
| Pine-Fir        | No.1  & Btr. | 7-10 | 6-10 | 6-0 | 5-0 | 4-0 | 3-0 | 9-7 | 8-4 | 14-1 | 15-1 | 14-1 | 12-6 |
| No.1             | 7-10 | 6-10 | 6-0 | 5-0 | 4-0 | 3-0 |     |     |     |     |     |     |     |
| No.2             | 7-10 | 6-10 | 6-0 | 5-0 | 4-0 | 3-0 |     |     |     |     |     |     |     |
| No.3             | 7-10 | 6-10 | 6-0 | 5-0 | 4-0 | 3-0 |     |     |     |     |     |     |     |

| Spruce-          |       |     |     |     |     | 12-1 | 11-2 | 10-3 | 9-4 | 16-8 | 15-4 | 14-1 | 12-6 |
| Pine-Fir        | No.1  & Btr. | 6-10 | 6-0 | 6-0 | 5-0 | 4-0 | 3-0 | 9-7 | 8-4 | 14-1 | 15-1 | 14-1 | 12-6 |
| No.1             | 6-10 | 6-0 | 6-0 | 5-0 | 4-0 | 3-0 |     |     |     |     |     |     |     |
| No.2             | 6-10 | 6-0 | 6-0 | 5-0 | 4-0 | 3-0 |     |     |     |     |     |     |     |
| No.3             | 6-10 | 6-0 | 6-0 | 5-0 | 4-0 | 3-0 |     |     |     |     |     |     |     |

---

Table FJ-17

Table FJ-18
# Design Criteria

**FLOOR JOISTS**

- **100# LIVE LOAD**
- **20# DEAD LOAD**
- **L/360**

**Table FJ-19**

**Design Criteria:** Strength - 100 lbs. per sq. ft. live load, plus 20 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided by 360 for live load only.

### FLOOR JOISTS

#### Species or Group

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**Table  FJ-20**

**Design Criteria:** Strength - 100 lbs. per sq. ft. live load, plus 25 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided by 360 for live load only.

### FLOOR JOISTS

#### Species or Group

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**Table FJ-19**

**Table FJ-20**
### FLOOR JOISTS

**Design Criteria:** Strength - 125 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.

#### Table FJ-21

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</table>
### CEILING JOISTS

**20# LIVE LOAD 10# DEAD LOAD L/360**

**Table CJ-1**

**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 360 for live load only.

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### CEILING JOISTS

**20# LIVE LOAD 10# DEAD LOAD L/240**

**Table CJ-2**

**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.

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| Western Pine-Fir | Sel. Struc. | 9-5 | 8-7 | 8-1 | 7-6 |
|                  | No.1 & Btr. | 9-2 | 8-4 | 8-7 | 7-3 |
| No.2             | 8-11 | 8-1 | 7-8 | 7-1 |
| No.3             | 7-8 | 6-8 | 6-1 | 5-5 |

| Western Spruce- | Sel. Struc. | 9-10 | 8-11 | 8-5 | 7-10 |
|                 | No.1 & Btr. | 9-8 | 8-9 | 8-3 | 7-8 |
| No.2             | 9-8 | 8-9 | 8-3 | 7-7 |
| No.3             | 9-2 | 8-4 | 8-1 | 7-1 |
| No.4             | 7-8 | 6-8 | 6-1 | 5-5 |

| Hem-Fir | Sel. Struc. | 9-10 | 8-11 | 8-5 | 7-10 |
|         | No.1 & Btr. | 9-8 | 8-9 | 8-3 | 7-8 |
| No.2   | 9-8 | 8-9 | 8-3 | 7-7 |
| No.3   | 9-2 | 8-4 | 8-1 | 7-1 |
| No.4   | 7-8 | 6-8 | 6-1 | 5-5 |

| Western Spruce- | Sel. Struc. | 9-2 | 8-4 | 8-7 | 10-3 |
|                 | No.1 & Btr. | 8-11 | 8-1 | 7-8 | 7-1 |
| No.2   | 8-8 | 7-11 | 7-5 | 6-9 |
| No.3   | 7-3 | 6-4 | 5-9 | 5-2 |

| Western Woods | Sel. Struc. | 8-11 | 8-1 | 7-8 | 7-1 |
|              | No.1 | 8-8 | 7-9 | 7-0 | 6-4 |
|              | No.2 | 8-5 | 7-8 | 7-0 | 6-4 |
|              | No.3 | 6-8 | 5-9 | 5-3 | 4-8 |
### CEILING JOISTS

**10# LIVE LOAD  10# DEAD LOAD  L/360**

**Design Criteria:**
- **Strength:** 10 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.

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### CEILING JOISTS

**10# LIVE LOAD  5# DEAD LOAD  L/240**

**Design Criteria:**
- **Strength:** 10 lbs. per sq. ft. live load, plus 5 lbs. per sq. ft. dead load.
- **Deflection:** Limited in span in inches divided by 240 for live load only.

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Table CJ-3

Table CJ-4
### 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
- **Douglas Fir-Larch**: No.1 & Btr.
- **No.1**: 15-5 13-4 11-12 12-10 20-10 18-11 17-10 15-9 13-7 11-7 9-5 19-8 17-7 15-5 13-3 11-5 9-3 18-6 16-5 14-4 12-3 10-2 8-1 17-2 15-1 13-0 11-9 9-7 18-0 16-9 14-8 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4 18-3 16-2 14-1 12-0 9-8 17-5 15-4 13-2 11-0 9-6 18-1 16-0 14-8 12-6 10-4 8-2 17-3 15-2 13-0 11-8 9-6 18-2 16-1 14-9 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4
- **No.2**: 15-2 13-1 11-0 9-9 16-10 14-9 12-8 10-7 8-5 17-2 15-1 13-0 11-8 9-6 18-2 16-1 14-9 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4
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#### Strength
- **20# Live Load**: 15-6 13-5 11-4 9-3 17-9 15-8 13-7 11-6 9-5 18-4 16-3 14-2 12-1 10-0 8-9 17-3 15-2 13-1 11-0 9-9 18-2 16-1 14-9 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4

#### Deflection
- **Limited in span in inches divided by 240 for live load only.
- **20 lbs. per sq. ft. live load, plus 10 lbs. per sq. ft. dead load.

#### Table RR-1

### Design Criteria:
- **Strength**: 20 lbs. per sq. ft. live load, plus 15 lbs. per sq. ft. dead load.
- **Deflection**: Limited in span in inches divided by 180 for live load only.

#### Species or Group
- **Douglas Fir-Larch**: No.1 & Btr.
- **No.1**: 15-5 13-4 11-12 12-10 20-10 18-11 17-10 15-9 13-7 11-7 9-5 19-8 17-7 15-5 13-3 11-5 9-3 18-6 16-5 14-4 12-3 10-2 8-1 17-2 15-1 13-0 11-9 9-7 18-0 16-9 14-8 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4
- **No.2**: 15-2 13-1 11-0 9-9 16-10 14-9 12-8 10-7 8-5 17-2 15-1 13-0 11-8 9-6 18-2 16-1 14-9 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4
- **No.3**: 14-9 13-8 12-7 11-6 10-5 9-4 8-3 17-2 15-1 13-0 11-8 9-6 18-2 16-1 14-9 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4

#### Strength
- **20# Live Load**: 15-6 13-5 11-4 9-3 17-9 15-8 13-7 11-6 9-5 18-4 16-3 14-2 12-1 10-0 8-9 17-3 15-2 13-1 11-0 9-9 18-2 16-1 14-9 12-7 10-5 8-3 17-1 15-0 13-8 11-6 9-4

#### Deflection
- **Limited in span in inches divided by 180 for live load only.
- **20 lbs. per sq. ft. live load, plus 15 lbs. per sq. ft. dead load.

#### Table RR-2

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1. A 1.25 Duration of Load adjustment has been applied. See page 5.
### Design Criteria

**ROOF RAFTERS**

#### 20# LIVE LOAD

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1 A 1.25 Duration of Load adjustment has been applied. See page 5.
### ROOF RAFTERS

#### Design Criteria:
- **Strength**: 20 lbs. per sq. ft., live load, plus 25 lbs. per sq. ft., dead load.
- **Deflection**: Limited in span in inches divided by 240 for live load only.

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1 A 1.25 Duration of Load adjustment has been applied. See page 5.
### ROOF RAFTERS

#### Design Criteria:
- **20# Snow Load**
- **10# Dead Load**
- **L/240**

#### Deflection - Limited in span in inches divided by 240 for live load only.

#### Species or Group

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### ROOF RAFTERS

#### Design Criteria:
- **25# Snow Load**
- **10# Dead Load**
- **L/180**

#### Deflection - Limited in span in inches divided by 180 for live load only.

#### Species or Group

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**Table RR-7**

**Table RR-8**
### ROOF RAFTERS

**25# SNOW LOAD  10# DEAD LOAD  L/240**

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#### Design Criteria
- **Strength:** 25 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 and Grades

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### ROOF RAFTERS

**30# SNOW LOAD  10# DEAD LOAD  L/240**

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#### 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.
### ROOF RAFTERS

#### 40# SNOW LOAD 10# DEAD LOAD L/240

**Design Criteria:**
- Strength: 40 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.

#### 60# SNOW LOAD 10# DEAD LOAD L/240

**Design Criteria:**
- Strength: 60 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.

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**Note:**
- Span (feet and inches)
- Limited in span in inches divided by 240 for live load only.
### ROOF RAFTERS

**20# Snow Load**  
7# Dead Load  
L/180

#### Design Criteria:
- Strength: 20 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.  
- Deflection: Limited in span in inches divided by 180 for live load only.

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#### ROOF RAFTERS

**25# Snow Load**  
7# Dead Load  
L/180

#### Design Criteria:
- Strength: 25 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.  
- Deflection: Limited in span in inches divided by 180 for live load only.

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### ROOF RAFTERS

**30# SNOW LOAD  7# DEAD LOAD  L/180**

**Design Criteria:**
- Strength - 30 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 180 for live load only.

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#### Strength

- 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.

#### Species or Group

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#### Strength

- 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.

#### Species or Group

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#### Strength

- 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.

#### Species or Group

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#### Strength

- 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.

#### Species or Group

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### ROOF RAFTERS

**40# SNOW LOAD  7# DEAD LOAD  L/180**

**Design Criteria:**
- Strength - 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 180 for live load only.

#### Species or Group

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#### Span (feet and inches)

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#### Strength

- 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.

#### Species or Group

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#### Strength

- 40 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.
ROOF RAFTERS

### ROOF RAFTERS

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**Deflection**

- Pine-Fir
- No.2 12-0 10-5 9-6 8-6 14-8 12-8 11-7 10-4 17-0 14-9 13-5 12-0 19-0 16-5 15-0 13-5
- No.3 7-9 6-8 5-1 3-6 9-5 8-2 7-6 6-8 11-0 9-6 8-7 7-3 12-3 10-7 9-8 8-1
### ROOF RAFTERS

#### Design Criteria:
- **Strength**: 100 lbs. per sq. ft. snow load, plus 7 lbs. per sq. ft. dead load.
- **Deflection**: Limited in span in inches divided by 180 for live load only.

#### Table RR-19

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#### Table RR-19

**Strength limit in span in inches divided by 180 for live load only.**
### ROOF RAFTERS 25# SNOW LOAD 15# DEAD LOAD L/180

**Table RR-21**

#### Design Criteria:
- Strength - 25 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 180 for live load only.

#### Table of Species and Span (feet and inches)

<table>
<thead>
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<th>Species or Group</th>
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#### Table of Western and Woods Species and Span (feet and inches)

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### ROOF RAFTERS 30# SNOW LOAD 15# DEAD LOAD L/180

**Table RR-22**

#### Design Criteria:
- Strength - 30 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 180 for live load only.

#### Table of Species and Span (feet and inches)

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#### Table of Western and Woods Species and Span (feet and inches)

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### ROOF RAFTERS

**40# SNOW LOAD 15# DEAD LOAD L/180**

**Table RR-23**

**Design Criteria:**
- Strength - 40 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 180 for live load only.

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### ROOF RAFTERS

**60# SNOW LOAD 15# DEAD LOAD L/180**

**Table RR-24**

**Design Criteria:**
- Strength - 60 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 180 for live load only.

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</table>

Note: Strength - 40 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.

- **Selection Struc.**
  - Limited in span in inches divided by 180 for live load only.

---

**Table  RR-24**
### ROOF RAFTERS

**80# SNOW LOAD 15# DEAD LOAD L/180**

**Table RR-25**

**Design Criteria:** Strength - 80 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.

**Deflection - Limited in span in inches divided by 180 for live load only.**

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### ROOF RAFTERS

**100# SNOW LOAD 15# DEAD LOAD L/180**

**Table RR-26**

**Design Criteria:** Strength - 100 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.

**Deflection - Limited in span in inches divided by 180 for live load only.**

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<tr>
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### Additional Table Data

- Dimensions and specifications for various species and grades of rafters, including snow and dead load ratings, and deflection limits.
## ROOF RAFTERS
### 20# SNOW LOAD  15# DEAD LOAD  L/240

**Design Criteria:**
- Strength - 20 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 240 for live load only.

### Species or Group  Grade

<table>
<thead>
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### ROOF RAFTERS
### 25# SNOW LOAD  15# DEAD LOAD  L/240

**Design Criteria:**
- Strength - 25 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- Deflection - Limited in span in inches divided by 240 for live load only.

### Species or Group  Grade

<table>
<thead>
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</table>
**ROOF RAFTERS**

### Design Criteria:
- **30# Snow Load**: 30 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- **15# Dead Load**: Limited in span in inches divided by 240 for live load only.

### L/240

#### Species or Group

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#### Hem-Fir

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### Table RR-29

- **Span (feet and inches)**
- **Spacing on center**
- **Deflection**
- **Strength**
- **Limited in span in inches divided by 240 for live load only.**

### Table RR-30

- **Span (feet and inches)**
- **Spacing on center**
- **Deflection**
- **Strength**
- **Limited in span in inches divided by 240 for live load only.**

---

**ROOF RAFTERS**

### Design Criteria:
- **40# Snow Load**: 40 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
- **15# Dead Load**: Limited in span in inches divided by 240 for live load only.
### ROOF RAFTERS 60# SNOW LOAD 15# DEAD LOAD L/240

**Table RR-31**

**Design Criteria:** Strength - 60 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided for 240 for live load only.

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### ROOF RAFTERS 80# SNOW LOAD 15# DEAD LOAD L/240

**Table RR-32**

**Design Criteria:** Strength - 80 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided for 240 for live load only.

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36
### ROOF RAFTERS

#### 100# SNOW LOAD

**Design Criteria:** Strength - 100 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided by 240 for live load only.

**Table RR-33**

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#### 20# SNOW LOAD

**Design Criteria:** Strength - 20 lbs. per sq. ft. snow load, plus 25 lbs. per sq. ft. dead load.

**Deflection:** Limited in span in inches divided by 240 for live load only.

**Table RR-34**

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## ROOF RAFTERS

### Design Criteria:
- **Strength:** 25 lbs. per sq. ft. snow load, plus 25 lbs. per sq. ft. dead load.
- **Deflection:** Limited in span in inches divided by 240 for live load only.

#### Table RR-35

**25# SNOW LOAD  25# DEAD LOAD  L/240**

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#### Table RR-36

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### Notes:
- **Species spacing on center:**
  - Western Spruce - Sel. Struc.
  - Douglas Fir - Sel. Struc.
  - Larch
  - No.1 & Btr.
  - Pine-Fir (South)
- **Deflection Strength:**
  - 25 lbs. per sq. ft. snow load, plus 25 lbs. per sq. ft. dead load.
  - Limited in span in inches divided by 240 for live load only.
### ROOF RAFTERS

#### 40# SNOW LOAD  25# DEAD LOAD  L/240

**Table RR-37**

**Design Criteria:** Strength - 40 lbs. per sq. ft. snow load, plus 25 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)

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**Hem-Fir**

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**Spruce**

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**Western Woods**

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### ROOF RAFTERS

#### 60# SNOW LOAD  25# DEAD LOAD  L/240

**Table RR-38**

**Design Criteria:** Strength - 60 lbs. per sq. ft. snow load, plus 25 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)

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</table>

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**Deflection** - Limited in span in inches divided by 240 for live load only.

**Strength** - 40 lbs. per sq. ft. snow load, plus 25 lbs. per sq. ft. dead load.

**Span (feet and inches)**

- Limited in span in inches divided by 240 for live load only.
### ROOF RAFTERS

#### 80# SNOW LOAD 25# DEAD LOAD L/240

**Table RR-39**

**Design Criteria:** Strength - 80 lbs. per sq. ft. snow load, plus 25 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 240 for live load only.

<table>
<thead>
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### ROOF RAFTERS

#### 100# SNOW LOAD 25# DEAD LOAD L/240

**Table RR-40**

**Design Criteria:** Strength - 100 lbs. per sq. ft. snow load, plus 25 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 240 for live load only.

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## ROOF RAFTERS

### 20# SNOW LOAD 15# DEAD LOAD L/360

**Design Criteria:** Strength - 20 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.  
Deflection - Limited in span inches divided by 360 for live load only.

#### Species or Group  
- **Douglas Fir-Larch**  
- **Douglas Fir-South**  
- **Hem-Fir**  
- **Spruce**  
- **Pine-Fir (South)**  
- **Western Woods**  
- **No.1 & Btr.**  
- **No.2**  
- **No.3**

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### 25# SNOW LOAD 15# DEAD LOAD L/360

**Design Criteria:** Strength - 25 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.  
Deflection - Limited in span inches divided by 360 for live load only.

#### Species or Group  
- **Douglas Fir-Larch**  
- **Douglas Fir-South**  
- **Hem-Fir**  
- **Spruce**  
- **Pine-Fir (South)**  
- **Western Woods**  
- **No.1 & Btr.**  
- **No.2**  
- **No.3**

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### ROOF RAFTERS

**30# SNOW LOAD  15# DEAD LOAD  L/360**

Table RR-43

**Design Criteria:** Strength - 30 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 360 for live load only.

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### ROOF RAFTERS

#### 60# SNOW LOAD 15# DEAD LOAD L/360

**Design Criteria:** Strength - 60 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 360 for live load only.

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#### 80# SNOW LOAD 15# DEAD LOAD L/360

**Design Criteria:** Strength - 80 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 360 for live load only.

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43
### ROOF RAFTERS

**100# SNOW LOAD  15# DEAD LOAD  L/360**  
*Table RR-47*

**Design Criteria:** Strength - 100 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 360 for live load only.

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<td>13-10 12-7 11-8</td>
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<td>7-9</td>
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<td>9-9 8-5 7-8</td>
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</table>

### ROOF RAFTERS

**20# SNOW LOAD  30# DEAD LOAD  L/360**  
*Table RR-48*

**Design Criteria:** Strength - 20 lbs. per sq. ft. snow load, plus 30 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 360 for live load only.

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<td>10-2</td>
<td>18-3 15-10 14-5</td>
<td>12-11</td>
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<td>No.1 &amp; Btr.</td>
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<td>16-8 14-5 13-2</td>
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<td>12-1 10-6 9-7</td>
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### Strength

100 lbs. per sq. ft. snow load, plus 15 lbs. per sq. ft. dead load.
**ROOF RAFTERS**

**25# SNOW LOAD  30# DEAD LOAD  L/360**

**Design Criteria:** Strength - 25 lbs. per sq. ft. snow load, plus 30 lbs. per sq. ft. dead load.  
Deflection - Limited in span in inches divided by 360 for live load only.

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<td>16'</td>
<td>19.2'</td>
<td>24'</td>
</tr>
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<td>24'</td>
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<td>12'</td>
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</table>

**ROOF RAFTERS**

**30# SNOW LOAD  30# DEAD LOAD  L/360**

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

---

**Table RR-49**

**Table RR-50**
**ROOF RAFTERS**

### Design Criteria
- **40# SNOW LOAD 30# DEAD LOAD** L/360
  - Table RR-51
- **60# SNOW LOAD 30# DEAD LOAD** L/360
  - Table RR-52

#### Table  RR-51

**Species or Group** | **Grade** | **2 x 6** | **2 x 8** | **2 x 10** | **2 x 12** | **Span (feet and inches)** | **Deflection**
--- | --- | --- | --- | --- | --- | --- | ---
**Douglas Fir** | Sel. Struc. | 11-4 10-4 9-8 8-9 9-0 | 15-0 13-7 12-10 11-11 | 19-1 17-4 16-4 14-11 | 23-3 21-1 19-4 17-3 | 10-3 8-10 8-1 8-8 | **2 x 6** spacing on center |
**No.1 & Btr.** | 11-2 10-2 9-6 8-7 | 14-8 13-4 12-2 10-11 | 18-9 16-4 14-11 13-4 | 21-10 18-11 17-3 15-6 | 17-3 14-11 13-7 12-2 | 10-3 8-10 8-10 8-10 | **2 x 8**
**No.2** | 10-7 9-2 8-4 7-6 | 13-4 11-7 10-7 9-6 | 16-4 14-2 12-11 11-7 | 18-11 16-5 15-0 13-6 | 12-6 10-10 9-10 8-10 | 12-6 10-10 9-10 8-10 | **2 x 10**
**No.3** | 8-1 7-0 6-4 5-8 | 10-3 8-10 8-1 8-8 | 12-6 10-10 9-10 8-10 | 14-6 12-6 11-5 10-3 | 8-1 7-0 6-4 5-8 | 8-1 7-0 6-4 5-8 | **2 x 12**

#### Table  RR-52

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

**Design Criteria**
- Strength: 40 lbs. per sq. ft. snow load, plus 30 lbs. per sq. ft. dead load.
- Deflection: Limited in span in inches divided by 360 for live load only.
- Limit on span in inches divided by 360 for live load only.
- Limit on span in inches divided by 360 for live load only.
### ROOF RAFTERS

**80# SNOW LOAD 30# DEAD LOAD L/360**  
Table RR-53

**Design Criteria:** Strength - 80 lbs. per sq. ft. snow load, plus 30 lbs. per sq. ft. dead load.  
**Deflection - Limited in span in inches divided by 360 for live load only.**

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### ROOF RAFTERS

**100# SNOW LOAD 30# DEAD LOAD L/360**  
Table RR-54

**Design Criteria:** Strength - 100 lbs. per sq. ft. snow load, plus 30 lbs. per sq. ft. dead load.  
**Deflection - Limited in span in inches divided by 360 for live load only.**

#### Species or Group

<table>
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<th>Species or Group</th>
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