**Wood Beam Calculator**

**Assumptions:** Beams are simple span (no overhangs, etc.). Full length of top of beam is laterally supported. No shear stress modifications. Bending in strong axis only. No wet use or high moisture content. No high temperature use. Dynamic loading not considered. Design values from 1997 National Design Specification for Wood Construction.

**Disclaimer:** All users of this software shall comply with State Engineering Law, which specifies who may perform engineering, and defines the practice of engineering.

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**General Information**

- **Span, L:** 8.00 ft
- **Max. Allowed Live Deflection, L / 360:** 0.27 in
- **Max. Allowed Total Deflection, L / 240:** 0.40 in
- **Load Duration:** Ten Years (Live)
- **Add Self Wt.?:** Yes
- **Loads Other Than Uniform Loads?** Yes

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**Uniform Loads Over Full Length of Member**

<table>
<thead>
<tr>
<th>Load Description</th>
<th>Uniform Live Load, psf</th>
<th>Reduced Live Load, psf</th>
<th>Unif. Dead Load, psf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof Loads (not including snow)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Roof Snow (only)</td>
<td>0.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Floor 3 Loads</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Floor 2 Loads</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Floor Loads</td>
<td>125</td>
<td>15</td>
<td>4.00</td>
</tr>
<tr>
<td>Wall Dead Load</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other 'psf' load and trib. width</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Additional 'plf' Unif. Live Loads. Descrip'n. opt'l:</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Additional 'plf' Unif. Dead Loads. Descrip'n. opt'l:</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Load Subtotals</td>
<td>500.0 lbs/ft</td>
<td>500.0 lbs/ft</td>
<td>60.0 lbs/ft</td>
</tr>
<tr>
<td>Total Uniform Loads wL</td>
<td>500.0 lbs/ft</td>
<td>500.0 lbs/ft</td>
<td>60.0 lbs/ft</td>
</tr>
<tr>
<td>Combined Total Uniform Load wU</td>
<td>560.0 lbs/ft</td>
<td>560.0 lbs/ft</td>
<td>60.0 lbs/ft</td>
</tr>
</tbody>
</table>

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**4x And Smaller (Lumber)**

- **Lumber Material:** Hem-Fir
- **Lumber Grade:** No. 2
- **Repetitive Member Use?** Yes
  - (2) 2 x 14
  - (3) 2 x 10

**5x And Larger (Timbers)**

- **Timber Material:** Hem - Fir
- **Timber Grade:** WWPA - No. 2
- **Repetitive Member Use?** No
  - 6 x 12
  - 8 x 10

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**Glued Laminated Members**

- **Glulam Grade:** 24F/HV
- **(Applies Only To Western Species Glued-Laminated Beams)**
  - 2.5 x 9
  - 3 x 7.5
  - 3.125 x 7.5
  - 5 x 7.5

**2.0E Parallam PSL**

- **1-3/4" x 9-5/8"**
- **5-1/4" x 9-1/4"**
- **2-11/16" x 9-1/4"**
- **7" x 9-1/4"**
- **9-1/2" x 9-1/4"**

**Truss-Joist MacMillan I-Joists**

- **Reactions - Not Incl. Self Wt.**
  - \( R_L = 4,480 \text{ ft-lb} \)
  - \( R_D = 2,240 \text{ lb} \)

**Add'l Detail - Not Incl. Self Wt.**

- **Max Moment:** 4,480 ft-lb
- **Member Design Shear:** 1.715 lb
- **Total Deflection:** 0.096 in
- **Live Deflection:** 0.085 in
- **Req'd El. no self-weight added 1.728E+08**
- **(in^2-lb):**
- **Approx. Self Weight 0.040 lb**
- **Min. Calc'd Bearing Length 1.58 in**

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**Final Member Selected:** 4 x 12, Hem-Fir, No. 2

- **Efficiency of Member:**
  - Bending Overdesign: 28.4%
  - Shear Overdesign: 14.8%
  - Deflection Overdesign: 212.4%

- **This member makes it by:** 14.8%
  - Controlling criteria is: Shear

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**Beam Calculator.xls**