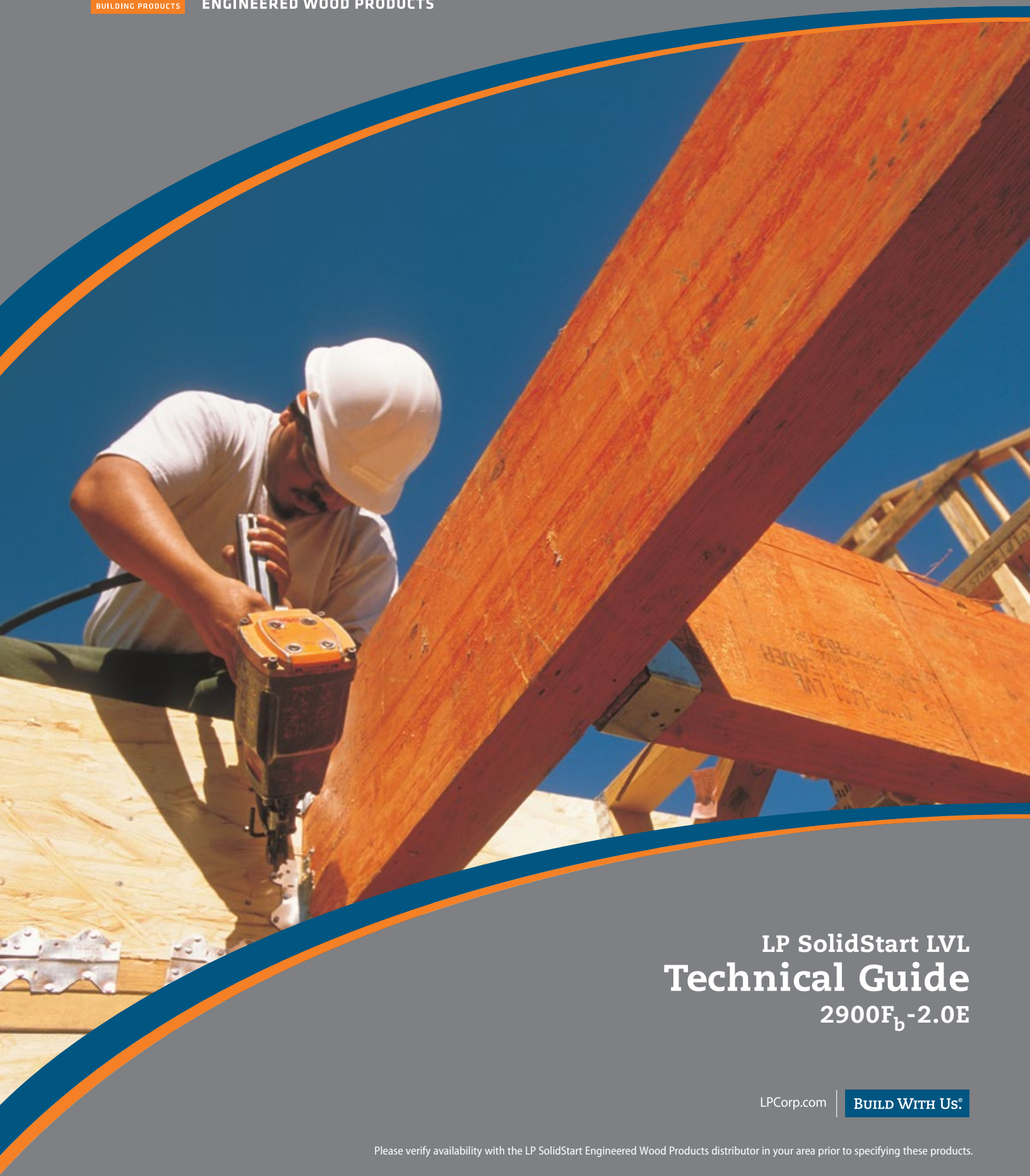
LP SolidStart®
ENGINEERED WOOD PRODUCTS

U.S. Technical Guide



# LP SolidStart LVL
# Technical Guide
## 2900$F_b$-2.0E

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Please verify availability with the LP SolidStart Engineered Wood Products distributor in your area prior to specifying these products.

# Designed to Outperform Traditional Lumber

LP® SolidStart® Laminated Veneer Lumber (LVL) is a vast improvement over traditional lumber. Problems that naturally occur as sawn lumber dries – twisting, splitting, checking, crowning and warping – are greatly reduced.

## THE STRENGTH IS IN THE ENGINEERING

LP SolidStart LVL is made from ultrasonically and visually graded veneers arranged in a specific pattern to maximize the strength and stiffness of the veneers and to disperse the naturally occurring characteristics of wood, such as knots, that can weaken a sawn lumber beam. The veneers are then bonded with waterproof adhesives under pressure and heat. LP SolidStart LVL beams are exceptionally strong, solid and straight, making them excellent for most primary load-carrying beam applications.

## LP SolidStart LVL 2900F$_b$-2.0E: AVAILABLE SIZES

LP SolidStart LVL 2900F$_b$-2.0E is available in a range of depths and lengths, and is available in standard thicknesses of 1-3/4" and 3-1/2". The 2900F$_b$-2.0E LVL is also available in factory-laminated thicknesses (known as "billet beam") of 5-1/4" and 7" to eliminate the need for field nailing and/or bolting of multiple plies. In addition, a water-resistant coating called SiteCote™ is available for extra weather protection during construction. LP also offers other grades that are not covered under this technical guide. Please verify availability with the LP SolidStart Engineered Wood Products distributor in your area before specifying these products.

## LIFETIME LIMITED WARRANTY

LP SolidStart Engineered Wood Products are backed by a lifetime limited warranty. Visit LPCorp.com or call 1.888.820.0325 for a copy of the warranty.

## SOFTWARE FOR EASY, RELIABLE DESIGN

Our design/specification software enhances your in-house design capabilities. It offers accurate designs for a wide variety of applications with interfaces for printed output or plotted drawings. Through our distributors, we offer component design review services for designs using LP SolidStart Engineered Wood Products.

## CODE EVALUATION

LP SolidStart Laminated Veneer Lumber has been evaluated for compliance with major US building codes. For the most current code reports, contact your LP SolidStart Engineered Wood Products distributor, visit LPCorp.com or for:

- ICC-ES evaluation report ESR-2403 visit www.icc-es.org
- APA product report PR-L280 visit www.apawood.org

## FRIEND TO THE ENVIRONMENT

LP SolidStart LVL is a building material with built-in environmental benefits. It is made of engineered wood substrate, a renewable resource with a reduced environmental impact. LP uses SFI® certified forest management and procurement systems, which help ensure wood comes from well managed forests. Raw material procurement targets small, fast growing trees. In LP's manufacturing process, no part of the log goes to waste. And only safe, low formaldehyde-emitting resins are used.

SUSTAINABLE FORESTRY INITIATIVE

*Good for you. Good for our forests.®*

www.sfiprogram.org

SFI-00003

## IMPORTANT NOTES

1. LP SolidStart LVL shall be designed for dry-use conditions only. Dry-use applies to products installed in dry, covered and well ventilated interior conditions in which the equivalent moisture content in lumber will not exceed 16%.
2. This guide is valid only for LP SolidStart LVL members supporting loads applied parallel to the face of the veneers ("edge" orientation).
3. Ensure that the design loads, duration of load increases and deflection limits that you use to select products from this guide are appropriate for your application and comply with local code requirements. If you do not know the correct design criteria and all the loads imposed on the component from all parts of the structure, seek qualified help from the architect, engineer or designer of the structure. Additional reference data on wood construction is available in the form of building codes, code evaluation reports and other design references.
4. The Quick Reference and Allowable Load tables in this guide are only for uniform loads on simple (single) or equal, continuous (multiple) span members as noted in each table. For other conditions such as concentrated loads, unequal spans, etc., contact your LP SolidStart Engineered Wood Products distributor.
5. Spans are measured from center-to-center of supports. A structurally adequate bearing surface under the full width (thickness) of the beam must be provided at each support.
6. Minimum bearing length is 1-1/2" (at least one jack stud or cripple is required) unless otherwise noted for a specific table. Refer to the Reaction Capacity charts and the notes for each table. Verify local code requirements for minimum bearing.
7. Total load deflections are based on instantaneous loading. Long term deflection (creep) under sustained load has not been considered.
8. LP SolidStart LVL is not cambered.
9. Higher grades of LP SolidStart LVL can be substituted for the indicated grade.
10. LP SolidStart LVL sized with the tables and design values in this guide requires continuous lateral restraint of the compression edge. Continuous restraint is defined as a maximum unbraced length of 24". This restraint is normally provided by sheathing and/or other framing members, which shall be adequately anchored to the LVL and the supporting structure. Framing conditions that do not provide continuous lateral restraint require special design. Contact your LP SolidStart Engineered Wood Products distributor. Caution: Failure to provide adequate lateral restraint could result in an unstable member and reduce its load capacity.
11. Lateral restraint shall also be provided at all supports to prevent rotation or twisting.
12. Refer to the Connection Details page for information on designing nailed and bolted connections, minimum nail spacing and end distances and for properly connecting multiple plies of LVL to form a built-up member.

# Table of Contents

**LVL 2900F$_b$-2.0E**



**GENERAL INFORMATION**



# LVL 2900$F_b$-2.0E Product Specifications & Design Values

## ALLOWABLE STRESS DESIGN VALUES (PSI)

| Grade | Bending Stress[3] $F_b$ | Modulus of Elasticity[4] E (x $10^6$) | Shear Stress $F_v$ | Compression Stress | |
|---|---|---|---|---|---|
| | | | | $F_c$ (Parallel To Grain) | $F_{c\perp}$ (Perpendicular To Grain) |
| 2900$F_b$-2.0E | 2900 | 2.0 | 285 | 3200 | 750 |

**NOTES:**

1. LP® SolidStart® LVL shall be designed for dry-use conditions only. Dry-use applies to products installed in dry, covered and well ventilated interior conditions in which the equivalent moisture content in lumber will not exceed 16%.
2. The allowable strengths and stiffness are for normal load duration. Bending, Shear and Compression parallel-to-grain shall be adjusted according to code. Modulus of Elasticity and Compression perpendicular-to-grain shall not be adjusted.
3. The allowable Bending Stress is tabulated for a standard 12" depth. For depths greater than 12," multiply $F_b$ by $(12/depth)^{0.143}$. For depths less than 12," multiply $F_b$ by $(12/depth)^{0.111}$. For depths less than 3-1/2," multiply $F_b$ by 1.147.
4. Deflection calculations shall include both bending and shear deformations.

Deflection for a simple span, uniform load: $\Delta = \frac{270wL^4}{Ebd^3} + \frac{28.8wL^2}{Ebd}$

Where: $\Delta$ = deflection (in), w = uniform load (plf), L = design span (ft), E = modulus of elasticity (psi), b = width of beam (in), d = depth of beam (in)

Equations for other conditions can be found in engineering references.

## SECTION PROPERTIES AND ALLOWABLE CAPACITIES

| Depth | Weight (lb/ft) | | | | Allowable Moment (lb-ft) | | | | Allowable Shear (lb) | | | | Moment of Inertia ($in^4$) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-3/4" | 3-1/2" | 5-1/4" | 7" | 1-3/4" | 3-1/2" | 5-1/4" | 7" | 1-3/4" | 3-1/2" | 5-1/4" | 7" | 1-3/4" | 3-1/2" | 5-1/4" | 7" |
| **7-1/4"** | 3.6 | 7.3 | 10.9 | 14.5 | 3918 | 7837 | 11755 | 15673 | 2411 | 4821 | 7232 | 9643 | 56 | 111 | 167 | 222 |
| **9-1/4"** | 4.6 | 9.3 | 13.9 | 18.5 | 6208 | 12416 | 18624 | 24832 | 3076 | 6151 | 9227 | 12303 | 115 | 231 | 346 | 462 |
| **9-1/2"** | 4.8 | 9.5 | 14.3 | 19.0 | 6529 | 13057 | 19586 | 26115 | 3159 | 6318 | 9476 | 12635 | 125 | 250 | 375 | 500 |
| **11-1/4"** | 5.6 | 11.3 | 16.9 | 22.5 | 8985 | 17970 | 26955 | 35940 | 3741 | 7481 | 11222 | 14963 | 208 | 415 | 623 | 831 |
| **11-7/8"** | 5.9 | 11.9 | 17.8 | 23.8 | 9951 | 19902 | 29854 | 39805 | 3948 | 7897 | 11845 | 15794 | 244 | 488 | 733 | 977 |
| **14"** | 7.0 | 14.0 | 21.0 | 28.0 | 13514 | 27029 | 40543 | 54057 | 4655 | 9310 | 13965 | 18620 | 400 | 800 | 1201 | 1601 |
| **16"** | 8.0 | 16.0 | 24.0 | 32.0 | 17318 | 34636 | 51954 | 69272 | 5320 | 10640 | 15960 | 21280 | 597 | 1195 | 1792 | 2389 |
| **18"** | 9.0 | 18.0 | 27.0 | 36.1 | 21552 | 43105 | 64657 | 86209 | 5985 | 11970 | 17955 | 23940 | 851 | 1701 | 2552 | 3402 |

**NOTES:**

1. The Allowable Moment and Shear capacities are for normal load duration and shall be adjusted according to code.
2. The tabulated Allowable Moment capacities assume continuous lateral support of the compression edge. For other conditions, multiply the Allowable Moment by the beam stability factor, $C_L$, as defined in the NDS.
3. The 3-1/2," 5-1/4" and 7" beam widths listed above can be either a single piece or a combination of widths. For example, a 7" wide beam may be a single billet beam of 7," two plies of 3-1/2," a single 1-3/4" attached to a 5-1/4" billet beam, a 3-1/2" with a 1-3/4" ply attached to each face, or four plies of 1-3/4." Refer to the Connection Assemblies details on page 14 for additional information.
4. The tabulated weight is an estimate and shall only be used for design purposes. Contact LP for actual shipping weights.

**FASTENERS:**
Refer to pages 14-15 for information on connecting multiple plies and for the equivalent specific gravity for design of nailed and bolted connections.

## REACTION CAPACITY (LBS)

| | Bearing Length | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Width | 1-1/2" | 2" | 2-1/2" | 3" | 3-1/2" | 4" | 4-1/2" | 5" | 5-1/2" | 6" | 6-1/2" | 7" | 7-1/2" | 8" | 8-1/2" | 9" | 9-1/2" | 10" | 10-1/2" | 11" | 11-1/2" | 12" |
| **1-3/4"** | 1968 | 2625 | 3281 | 3937 | 4593 | 5250 | 5906 | 6562 | 7218 | 7875 | 8531 | 9187 | 9843 | 10500 | 11156 | 11812 | 12468 | 13125 | 13781 | 14437 | 15093 | 15750 |
| **3-1/2"** | 3937 | 5250 | 6562 | 7875 | 9187 | 10500 | 11812 | 13125 | 14437 | 15750 | 17062 | 18375 | 19687 | 21000 | 22312 | 23625 | 24937 | 26250 | 27562 | 28875 | 30187 | 31500 |
| **5-1/4"** | 5906 | 7875 | 9843 | 11812 | 13781 | 15750 | 17718 | 19687 | 21656 | 23625 | 25593 | 27562 | 29531 | 31500 | 33468 | 35437 | 37406 | 39375 | 41343 | 43312 | 45281 | 47250 |
| **7"** | 7875 | 10500 | 13125 | 15750 | 18375 | 21000 | 23625 | 26250 | 28875 | 31500 | 34125 | 36750 | 39375 | 42000 | 44625 | 47250 | 49875 | 52500 | 55125 | 57750 | 60375 | 63000 |

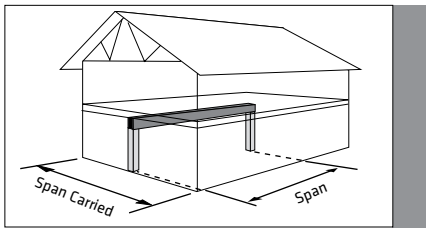
**NOTES:**

1. The Reaction Capacity values are based on the compression strength, perpendicular-to-grain, of the LVL. This is suitable for beams bearing on steel or the end-grain of studs.
2. Verify that the support for the beam is structurally adequate to carry the reaction. The compressive strength, parallel-to-grain, of studs may require more studs than the bearing length above indicates.
3. For beams bearing on wood plates, the required bearing length will increase based on the bearing strength (compression perpendicular-to-grain) of the species and grade used for the plate material.
4. Verify local code requirements concerning minimum bearing.

**TO USE:**

1. Select the correct table for the supported floor joist condition (simple or continuous – see notes below).
2. Choose the required center-to-center span for the beam in the Span column.
3. Select the span carried by the beam across the top of the table.
4. Read the beam size or choice of beam sizes from the table.

**EXAMPLE:** A beam with a 10' span carries 15'-0" simple span joists on each side.
**SOLUTION:** Using the Simple-Span Floor Joists table with 30'-0" span carried, select either **3-1/2" x 11-1/4"** or **5-1/4" x 9-1/4".**




**CONTINUOUS FLOOR JOISTS**
**DESIGN FLOOR LOADS:** 40 PSF LIVE, 15 PSF DEAD

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | **11-1/4"** | **11-1/4"** |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" |
| 12'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | **14"** | **14"** | **14"** | **14"** | - |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 14'-0" | 3-1/2" | 14" | 14" | 14" | **14"** | **14"** | **14"** | **14"** | - | - | - | - |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" |
| 16'-0" | 3-1/2" | 14" | 16" | **16"** | **16"** | **16"** | - | - | - | - | - | - |
| | 5-1/4" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | **16"** | **16"** |
| 18'-0" | 3-1/2" | 16" | **16"** | **18"** | **18"** | - | - | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | **16"** | **16"** | **16"** |
| 20'-0" | 3-1/2" | **18"** | **18"** | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 18" | **18"** | **18"** | **18"** | **18"** | **18"** | - |
| 22'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 18" | 18" | 18" | **18"** | **18"** | - | - | - | - | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | - | - | - | - | - | - | - | - | - |

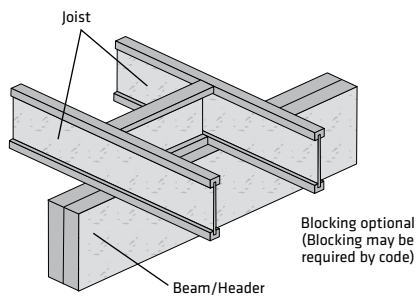
**SIMPLE-SPAN FLOOR JOISTS**
**DESIGN FLOOR LOADS:** 40 PSF LIVE, 15 PSF DEAD

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 12'-0" | 3-1/2" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | **14"** |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 14'-0" | 3-1/2" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | **14"** | **14"** | **14"** | **14"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 11-7/8" |
| 16'-0" | 3-1/2" | 14" | 14" | 14" | 14" | 14" | **16"** | **16"** | **16"** | **16"** | **16"** | - |
| | 5-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| 18'-0" | 3-1/2" | 16" | 16" | 16" | **16"** | **16"** | **16"** | **18"** | **18"** | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" |
| 20'-0" | 3-1/2" | 16" | 18" | **18"** | **18"** | **18"** | **18"** | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | **18"** |
| 22'-0" | 3-1/2" | 18" | **18"** | **18"** | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | **18"** | **18"** | **18"** |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | 18" | 18" | 18" | 18" | - | - | - | - | - |

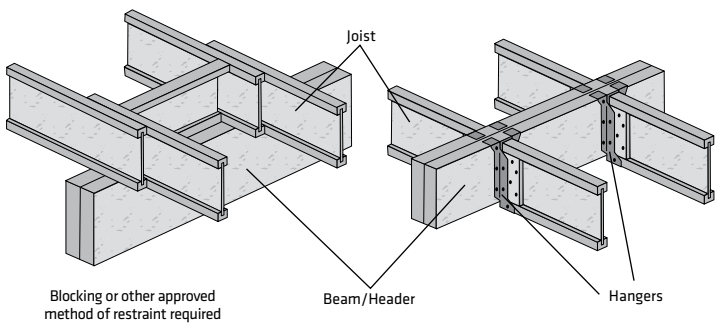
**NOTES:**

1. Use the Continuous Floor Joists table where the floor joists are continuous (multiple span) over the beam.
   Use the Simple-Span Floor Joists table where the floor joists frame into the side of or end on top of the beam.
2. Span is center-to-center of supports and is valid for simple and equal, continuous beam spans.
3. End supports require 3" bearing. Interior supports require 6" bearing except 7-1/2" is required where **bold**. The bearing length is based on the compression strength, perpendicular-to-grain, of the LVL. See the Reaction Capacity table on page 4 for additional information.
4. Deflections are limited to L/360 live load and L/240 total load.
5. Beam width can be either a single piece of LVL or built up from multiple plies that are nailed, bolted or connected with other approved fasteners. Refer to pages 14-15 for connection details.
6. Do not use where marked "-".

**CONTINUOUS FLOOR JOISTS**




**SIMPLE-SPAN FLOOR JOISTS**

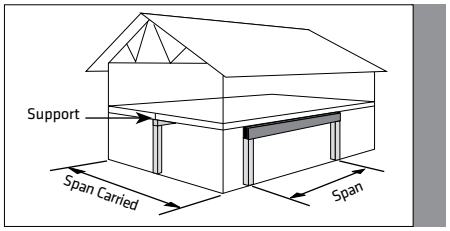


# LVL 2900$F_b$-2.0E Combined Beam Quick Reference Tables

**TO USE:**

1. Select the correct table for the roof loads needed.
2. Choose the required center-to-center span for the beam in the Span column.
3. Select the span carried by the beam across the top of the table.
4. Read the beam size or choice of beam sizes from the table.

**EXAMPLE:** A beam with a 9'-6" span supports a 32'-0" span carried for a 20 psf roof live load.
**SOLUTION:** Using the correct table for the roof load with 32'-0" span carried, select either **3-1/2" x 11-1/4"** or **5-1/4" x 9-1/4".**




**DESIGN LOADS**
**ROOF: 20 PSF SNOW OR LIVE (115% or 125%), 15 PSF DEAD**
**FLOOR: 40 PSF LIVE, 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" |
| 9'-6" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" |
| 12'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | **14"** | **14"** |
| | 5-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 14'-0" | 3-1/2" | 14" | 14" | 14" | 14" | 14" | 14" | **14"** | **16"** | **16"** | **16"** | **16"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" |
| 16'-0" | 3-1/2" | 16" | 16" | 16" | **16"** | **16"** | **16"** | **16"** | **18"** | **18"** | **18"** | **18"** |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" |
| 16'-6" | 3-1/2" | 16" | 16" | 16" | - | - | - | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" |
| 18'-0" | 3-1/2" | 16" | 18" | **18"** | **18"** | **18"** | **18"** | **18"** | **-** | - | - | - |
| | 5-1/4" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | **18"** | **18"** |
| 18'-6" | 3-1/2" | 18" | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | - | - |
| 20'-0" | 3-1/2" | **18"** | **18"** | **-** | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | **18"** | **18"** | **-** | **-** |
| 22'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | 18" | 18" | - | - | - | - | - | - | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | - | - | - | - | - | - | - | - | - | - | - |

**DESIGN LOADS**
**ROOF: 25 PSF SNOW (115%), 15 PSF DEAD**
**FLOOR: 40 PSF LIVE, 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 9'-6" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" |
| 12'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | **14"** | **14"** | **14"** | **14"** |
| | 5-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" |
| 14'-0" | 3-1/2" | 14" | 14" | 14" | 14" | **14"** | **16"** | **16"** | **16"** | **16"** | **16"** | **16"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| 16'-0" | 3-1/2" | 16" | 16" | **16"** | **16"** | **16"** | **18"** | **18"** | **18"** | **18"** | **18"** | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | **16"** |
| 16'-6" | 3-1/2" | 16" | 16" | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | - | - |
| 18'-0" | 3-1/2" | 18" | **18"** | **18"** | **18"** | **18"** | **-** | **-** | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | **18"** | **18"** | **18"** |
| 18'-6" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | - | - | - | - |
| 20'-0" | 3-1/2" | **18"** | **-** | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 18" | 18" | 18" | 18" | **18"** | **18"** | **18"** | **-** | - | - |
| 22'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | - | - | - | - | - | - | - | - | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | - | - | - | - | - | - | - | - | - | - | - |

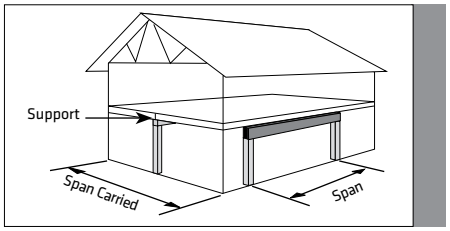
**NOTES:**

1. Span is center-to-center of supports and is valid for simple beam spans only.
2. End supports require 3" bearing except 4-1/2" is required where **bold**. The end supports for the standard garage door spans of 9'-6", 16'-6" and 18'-6" have been limited to 3" (two trimmers) on each end. The bearing length is based on the compression strength, perpendicular-to-grain, of the LVL. See the Reaction Capacity table on page 4 for additional information.
3. Deflections are limited to L/360 live or snow load and L/240 total load.
4. Loads include 100 plf for an exterior wall and assume a 2' maximum overhang on the roof and an interior support at mid-span of the floor joists.
5. Beam width can be either a single piece of LVL or built up from multiple plies that are nailed, bolted or connected with other approved fasteners. Refer to pages 14-15 for connection details.
6. Do not use where marked "-".

**TO USE:**

1. Select the correct table for the roof loads needed.
2. Choose the required center-to-center span for the beam in the Span column.
3. Select the span carried by the beam across the top of the table.
4. Read the beam size or choice of beam sizes from the table.

**EXAMPLE:** A beam with a 9'-6" span supports a 32'-0" span carried for a 40 psf roof snow load.
**SOLUTION:** Using the correct table for the roof load with 32'-0" span carried, select either **3-1/2" x 11-1/4"** or **5-1/4" x 9-1/4".**




**DESIGN LOADS**
**ROOF: 30 PSF SNOW (115%), 15 PSF DEAD**
**FLOOR: 40 PSF LIVE, 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 9'-6" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | **11-7/8"** |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" | 11-1/4" | 11-1/4" |
| 12'-0" | 3-1/2" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | **14"** | **14"** | **14"** | **14"** | **14"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" |
| 14'-0" | 3-1/2" | 14" | 14" | 14" | **14"** | **16"** | **16"** | **16"** | **16"** | **16"** | **16"** | **16"** |
| | 5-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| 16'-0" | 3-1/2" | 16" | **16"** | **16"** | **16"** | **18"** | **18"** | **18"** | **18"** | **18"** | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | **16"** | **16"** | **16"** |
| 16'-6" | 3-1/2" | 16" | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | - | - | - |
| 18'-0" | 3-1/2" | **18"** | **18"** | **18"** | **18"** | **-** | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 16" | 18" | **18"** | **18"** | **18"** | **18"** | **18"** |
| 18'-6" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 18" | 18" | - | - | - | - | - |
| 20'-0" | 3-1/2" | **-** | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 18" | 18" | 18" | **18"** | **18"** | **-** | **-** | - | - | - |
| 22'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | - | - | - | - | - | - | - | - | - | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | - | - | - | - | - | - | - | - | - | - | - |

**DESIGN LOADS**
**ROOF: 40 PSF SNOW (115%), 15 PSF DEAD**
**FLOOR: 40 PSF LIVE, 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 9'-6" | 3-1/2" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | - | - | - |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" | 11-1/4" | 11-1/4" |
| 10'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | **11-7/8"** | **11-7/8"** | **11-7/8"** | **14"** |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 12'-0" | 3-1/2" | 11-7/8" | 11-7/8" | 14" | 14" | **14"** | **14"** | **14"** | **14"** | **14"** | **16"** | **16"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" |
| 14'-0" | 3-1/2" | 14" | **14"** | **16"** | **16"** | **16"** | **16"** | **16"** | **16"** | **18"** | - | - |
| | 5-1/4" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | **14"** | **16"** | **16"** |
| 16'-0" | 3-1/2" | **16"** | **16"** | **18"** | **18"** | **18"** | **18"** | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 16" | 16" | 16" | 16" | **16"** | **16"** | **16"** | **18"** | **18"** |
| 16'-6" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 14" | 16" | 16" | 16" | 16" | - | - | - | - | - | - |
| 18'-0" | 3-1/2" | **18"** | **18"** | **-** | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 18" | **18"** | **18"** | **18"** | **18"** | **18"** | **18"** | **-** |
| 18'-6" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 18" | - | - | - | - | - | - | - | - |
| 20'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | **18"** | **18"** | **-** | - | - | - | - | - | - |
| 22'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | - | - | - | - | - | - | - | - | - | - | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | - | - | - | - | - | - | - | - | - | - | - |

**NOTES:**

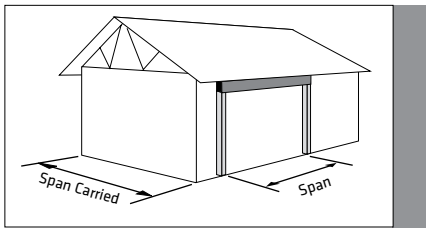
1. Span is center-to-center of supports and is valid for simple beam spans only.
2. End supports require 3" bearing except 4-1/2" is required where **bold**. The end supports for the standard garage door spans of 9'-6", 16'-6" and 18'-6" have been limited to 3" (two trimmers) on each end. The bearing length is based on the compression strength, perpendicular-to-grain, of the LVL. See the Reaction Capacity table on page 4 for additional information.
3. Deflections are limited to L/360 live or snow load and L/240 total load.
4. Loads include 100 plf for an exterior wall and assume a 2' maximum overhang on the roof and an interior support at mid-span of the floor joists.
5. Beam width can be either a single piece of LVL or built up from multiple plies that are nailed, bolted or connected with other approved fasteners. Refer to pages 14-15 for connection details.
6. Do not use where marked "-".

# LVL 2900F$_b$-2.0E Roof Beam Quick Reference Tables

**TO USE:**

1. Select the correct table for the roof loads needed.
2. Choose the required center-to-center span for the beam in the Span column.
3. Select the span carried by the beam across the top of the table.
4. Read the beam size or choice of beam sizes from the table.

**EXAMPLE:** A beam with a 16'-6" span supports a 38'-0" span carried for a 25 psf roof snow load.
**SOLUTION:** Using the correct table for the roof load with 38'-0" span carried, select either **3-1/2" x 16"** or **5-1/4" x 14"**




**DESIGN LOADS**
**ROOF: 20 PSF SNOW OR LIVE (115% or 125%), 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 9'-6" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 10'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 12'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 14'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 16'-0" | 3-1/2" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" |
| 16'-6" | 3-1/2" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" |
| 18'-0" | 3-1/2" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" |
| | 5-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| 18'-6" | 3-1/2" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" |
| | 5-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| 20'-0" | 3-1/2" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | **18"** |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" |
| 22'-0" | 3-1/2" | 16" | 16" | 18" | 18" | 18" | 18" | 18" | - | - | - | - |
| | 5-1/4" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | 18" |
| 24'-0" | 3-1/2" | 18" | 18" | 18" | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | 18" | 18" | - |

**DESIGN LOADS**
**ROOF: 25 PSF SNOW (115%), 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 9'-6" | 3-1/2" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 12'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" |
| 14'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 16'-0" | 3-1/2" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" |
| 16'-6" | 3-1/2" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" |
| 18'-0" | 3-1/2" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | **18"** |
| | 5-1/4" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" |
| 18'-6" | 3-1/2" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" |
| 20'-0" | 3-1/2" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | **18"** | **18"** | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" |
| 22'-0" | 3-1/2" | 18" | 18" | 18" | 18" | 18" | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | 18" |
| 24'-0" | 3-1/2" | 18" | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 18" | 18" | 18" | 18" | 18" | - | - | - | - |

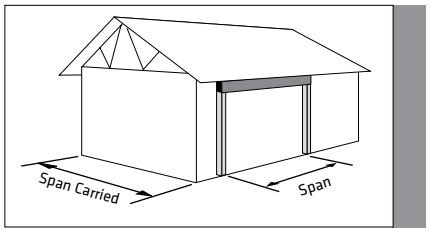
**NOTES:**

1. Span is center-to-center of supports and is valid for simple beam spans only.
2. End supports require 3" bearing except 4-1/2" is required where **bold**. The end supports for the standard garage door spans of 9'-6", 16'-6" and 18'-6" have been limited to 3" (two trimmers) on each end. The bearing length is based on the compression strength, perpendicular-to-grain, of the LVL. See the Reaction Capacity table on page 4 for additional information.
3. Deflections are limited to L/360 live or snow load and L/240 total load.
4. Loads assume a 2' maximum overhang on the roof.
5. Beam width can be either a single piece of LVL or built up from multiple plies that are nailed, bolted or connected with other approved fasteners. Refer to pages 14-15 for connection details.
6. Do not use where marked "-".

**TO USE:**

1. Select the correct table for the roof loads needed.
2. Choose the required center-to-center span for the beam in the Span column.
3. Select the span carried by the beam across the top of the table.
4. Read the beam size or choice of beam sizes from the table.

**EXAMPLE:** A beam with a 16'-6" span supports a 38'-0" span carried for a 40 psf roof snow load.
**SOLUTION:** Using the correct table for the roof load with 38'-0" span carried, select a **5-1/4" x 16"**
**NOTE:** A 3-1/2" beam does not work.




**DESIGN LOADS**
**ROOF: 30 PSF SNOW (115%), 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 9'-6" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 12'-0" | 3-1/2" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" |
| 14'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" |
| | 5-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" |
| 16'-0" | 3-1/2" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | **16"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" |
| 16'-6" | 3-1/2" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | - | - |
| | 5-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" |
| 18'-0" | 3-1/2" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | **18"** | **18"** | **18"** |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" |
| 18'-6" | 3-1/2" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | - | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" |
| 20'-0" | 3-1/2" | 16" | 16" | 18" | 18" | 18" | 18" | **18"** | **-** | **-** | - | - |
| | 5-1/4" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" |
| 22'-0" | 3-1/2" | 18" | 18" | 18" | - | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | 18" | 18" | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | 18" | 18" | 18" | - | - | - | - | - | - |

**DESIGN LOADS**
**ROOF: 40 PSF SNOW (115%), 15 PSF DEAD**

| Span | Beam Width | Span Carried By Beam | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20' | 22' | 24' | 26' | 28' | 30' | 32' | 34' | 36' | 38' | 40' |
| 6'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 8'-0" | 3-1/2" | 7-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" | 7-1/4" |
| 9'-6" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 7-1/4" | 7-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 10'-0" | 3-1/2" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" | 9-1/4" |
| 12'-0" | 3-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" |
| | 5-1/4" | 9-1/4" | 9-1/4" | 9-1/2" | 9-1/2" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" |
| 14'-0" | 3-1/2" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | **16"** | **16"** |
| | 5-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-1/4" | 11-7/8" | 11-7/8" | 11-7/8" | 14" | 14" | 14" | 14" |
| 16'-0" | 3-1/2" | 14" | 14" | 16" | 16" | 16" | 16" | **16"** | **16"** | **18"** | **18"** | **18"** |
| | 5-1/4" | 11-7/8" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" |
| 16'-6" | 3-1/2" | 14" | 16" | 16" | 16" | 16" | 16" | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 14" | 14" | 14" | 14" | 14" | 16" | 16" | 16" | 16" |
| 18'-0" | 3-1/2" | 16" | 16" | 18" | 18" | **18"** | **18"** | **18"** | **18"** | **-** | **-** | - |
| | 5-1/4" | 14" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" |
| 18'-6" | 3-1/2" | 16" | 18" | 18" | 18" | - | - | - | - | - | - | - |
| | 5-1/4" | 14" | 14" | 16" | 16" | 16" | 16" | 16" | 16" | 18" | 18" | 18" |
| 20'-0" | 3-1/2" | 18" | 18" | **18"** | **-** | - | - | - | - | - | - | - |
| | 5-1/4" | 16" | 16" | 16" | 16" | 18" | 18" | 18" | 18" | 18" | **18"** | **-** |
| 22'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | 18" | 18" | 18" | 18" | - | - | - | - | - | - |
| 24'-0" | 3-1/2" | - | - | - | - | - | - | - | - | - | - | - |
| | 5-1/4" | 18" | - | - | - | - | - | - | - | - | - | - |

**NOTES:**

1. Span is center-to-center of supports and is valid for simple beam spans only.
2. End supports require 3" bearing except 4-1/2" is required where **bold**. The end supports for the standard garage door spans of 9'-6", 16'-6" and 18'-6" have been limited to 3" (two trimmers) on each end. The bearing length is based on the compression strength, perpendicular-to-grain, of the LVL. See the Reaction Capacity table on page 4 for additional information.
3. Deflections are limited to L/360 live or snow load and L/240 total load.
4. Loads assume a 2' maximum overhang on the roof.
5. Beam width can be either a single piece of LVL or built up from multiple plies that are nailed, bolted or connected with other approved fasteners. Refer to pages 14-15 for connection details.
6. Do not use where marked "-".

# LVL 2900F$_b$-2.0E Uniform Floor Load (PLF) Tables

**TO USE:**

1. Select the required Span.
2. Divide the design loads by the desired number of plies to verify each ply of the beam.
3. Select a beam that exceeds the Total Load and the appropriate Live Load.
4. Check the bearing requirements.

**EXAMPLE:**

For a 16'-6" span, select a 2- and 3-ply beam that satisfies an L/360 Live Load deflection limit for the following design loads: Live Load = 440 plf, Total Load = 605 plf

**SOLUTION FOR A 2-PLY BEAM:**

Design Total Load per ply = 605 / 2 = 303 plf
Design Live Load per ply = 440 / 2 = 220 plf
**Use 2 plies 1-3/4" x 14"**
(Total Load = 360 plf, Live Load L/360 = 245 plf)

**SOLUTION FOR A 3-PLY BEAM:**

Design Total Load per ply = 605 / 3 = 202 plf
Desgn Live Load per ply = 440 / 3 = 147 plf
**Use 3 plies 1-3/4" x 11-7/8"**
(Total Load = 223 plf, Live Load L/360 = 152 plf)

| Span | 1-3/4" x 7-1/4" | | | 1-3/4" x 9-1/4" | | | 1-3/4" x 9-1/2" | | | 1-3/4" x 11-1/4" | | | Span |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Live Load | | Total Load | Live Load | | Total Load | Live Load | | Total Load | Live Load | | Total Load | |
| | L/480 | L/360 | | L/480 | L/360 | | L/480 | L/360 | | L/480 | L/360 | | |
| 5' | | | 767 | | | 979 | | | 1006 | | | 1191 | 5' |
| 6' | 494 | | 639 | | | 815 | | | 837 | | | 991 | 6' |
| 7' | 323 | 430 | 547 | 630 | | 698 | 677 | | 717 | | | 849 | 7' |
| 8' | 221 | 295 | 439 | 438 | 584 | 610 | 471 | | 626 | | | 742 | 8' |
| 9' | 158 | 211 | 313 | 316 | 421 | 542 | 340 | 454 | 556 | 542 | | 659 | 9' |
| 9'-6" | 135 | 180 | 267 | 271 | 362 | 513 | 292 | 390 | 527 | 468 | | 624 | 9'-6" |
| 10' | 116 | 155 | 230 | 235 | 313 | 465 | 253 | 337 | 500 | 406 | 542 | 592 | 10' |
| 11' | 88 | 118 | 173 | 179 | 238 | 353 | 193 | 257 | 381 | 311 | 415 | 538 | 11' |
| 12' | 68 | 91 | 133 | 139 | 186 | 274 | 150 | 200 | 296 | 244 | 325 | 482 | 12' |
| 13' | 54 | 72 | 105 | 110 | 147 | 216 | 119 | 159 | 234 | 194 | 259 | 383 | 13' |
| 14' | 43 | 58 | 83 | 89 | 119 | 173 | 96 | 128 | 188 | 157 | 209 | 309 | 14' |
| 15' | 35 | 47 | 67 | 73 | 97 | 141 | 78 | 105 | 153 | 128 | 171 | 252 | 15' |
| 16' | - | - | - | 60 | 80 | 116 | 65 | 87 | 125 | 107 | 142 | 208 | 16' |
| 16'-6" | - | - | - | 55 | 73 | 105 | 59 | 79 | 114 | 97 | 130 | 190 | 16'-6" |
| 17' | - | - | - | 50 | 67 | 96 | 54 | 72 | 104 | 89 | 119 | 173 | 17' |
| 18' | - | - | - | 42 | 57 | 80 | 46 | 61 | 87 | 75 | 101 | 146 | 18' |
| 18'-6" | - | - | - | 39 | 52 | 74 | 42 | 56 | 80 | 70 | 93 | 134 | 18'-6" |
| 19' | - | - | - | 36 | 48 | 68 | 39 | 52 | 74 | 64 | 86 | 124 | 19' |
| 20' | - | - | - | 31 | 41 | 58 | 33 | 45 | 63 | 55 | 74 | 105 | 20' |
| 21' | - | - | - | - | - | - | - | - | - | 48 | 64 | 91 | 21' |
| 22' | - | - | - | - | - | - | - | - | - | 42 | 56 | 78 | 22' |

| Span | 1-3/4" x 11-7/8" | | | 1-3/4" x 14" | | | 1-3/4" x 16" | | | 1-3/4" x 18" | | | Span |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Live Load | | Total Load | Live Load | | Total Load | Live Load | | Total Load | Live Load | | Total Load | |
| | L/480 | L/360 | | L/480 | L/360 | | L/480 | L/360 | | L/480 | L/360 | | |
| 5' | | | 1257 | | | 1482 | | | 1694 | | | 1906 | 5' |
| 6' | | | 1046 | | | 1234 | | | 1410 | | | 1586 | 6' |
| 7' | | | 896 | | | 1056 | | | 1207 | | | 1358 | 7' |
| 8' | | | 783 | | | 923 | | | 1055 | | | 1187 | 8' |
| 9' | 627 | | 695 | | | 820 | | | 937 | | | 1054 | 9' |
| 9'-6" | 542 | | 659 | | | 776 | | | 887 | | | 998 | 9'-6" |
| 10' | 471 | | 625 | 735 | | 737 | | | 843 | | | 948 | 10' |
| 11' | 362 | 483 | 568 | 569 | | 670 | | | 765 | | | 861 | 11' |
| 12' | 284 | 379 | 520 | 449 | 599 | 613 | 645 | | 701 | | | 788 | 12' |
| 13' | 226 | 302 | 447 | 360 | 480 | 565 | 520 | | 646 | 714 | | 727 | 13' |
| 14' | 183 | 244 | 361 | 292 | 390 | 524 | 424 | 566 | 599 | 585 | | 674 | 14' |
| 15' | 150 | 200 | 295 | 241 | 321 | 473 | 350 | 467 | 559 | 485 | | 629 | 15' |
| 16' | 125 | 166 | 244 | 200 | 267 | 394 | 292 | 390 | 523 | 406 | 542 | 589 | 16' |
| 16'-6" | 114 | 152 | 223 | 183 | 245 | 360 | 268 | 358 | 500 | 373 | 497 | 571 | 16'-6" |
| 17' | 104 | 139 | 204 | 168 | 225 | 330 | 246 | 329 | 471 | 343 | 458 | 554 | 17' |
| 18' | 88 | 118 | 171 | 143 | 190 | 279 | 209 | 279 | 411 | 292 | 390 | 522 | 18' |
| 18'-6" | 82 | 109 | 158 | 132 | 176 | 257 | 194 | 258 | 380 | 271 | 361 | 494 | 18'-6" |
| 19' | 75 | 101 | 145 | 122 | 163 | 238 | 179 | 239 | 351 | 251 | 335 | 468 | 19' |
| 20' | 65 | 87 | 124 | 105 | 140 | 204 | 155 | 207 | 302 | 217 | 289 | 422 | 20' |
| 21' | 56 | 75 | 107 | 91 | 122 | 176 | 134 | 179 | 261 | 189 | 252 | 369 | 21' |
| 22' | 49 | 65 | 92 | 80 | 106 | 153 | 118 | 157 | 227 | 165 | 220 | 322 | 22' |
| 23' | 43 | 57 | 80 | 70 | 93 | 133 | 103 | 138 | 199 | 145 | 194 | 282 | 23' |
| 24' | 38 | 51 | 70 | 62 | 82 | 117 | 91 | 122 | 175 | 128 | 171 | 248 | 24' |
| 25' | 33 | 45 | 61 | 55 | 73 | 103 | 81 | 108 | 154 | 114 | 152 | 220 | 25' |
| 26' | 30 | 40 | 54 | 49 | 65 | 91 | 72 | 96 | 137 | 102 | 136 | 195 | 26' |
| 27' | - | - | - | 43 | 58 | 80 | 65 | 86 | 121 | 91 | 122 | 174 | 27' |
| 28' | - | - | - | 39 | 52 | 71 | 58 | 77 | 108 | 82 | 109 | 155 | 28' |
| 29' | - | - | - | 35 | 47 | 64 | 52 | 70 | 97 | 74 | 99 | 139 | 29' |
| 30' | - | - | - | 32 | 42 | 57 | 47 | 63 | 87 | 67 | 89 | 125 | 30' |

**DESIGN ASSUMPTIONS:**

1. Span is the center-to-center distance of the supports and is valid for simple or equal, continuous span applications.
2. The values in the tables are for uniform loads only.
3. Total Load is for normal (100%) duration and has been adjusted to account for the self-weight of the member.
4. Live Load deflection has been limited to L/360 or L/480 as noted in the table.
5. Total deflection has been limited to L/240. Long term deflection (creep) has not been considered.
6. These tables assume full lateral support of the compression edge. Full support is considered to be a maximum unbraced length of 24".
7. Proper bearing must be provided. Bearing length must be checked for support reactions with the table on page 4.

**ADDITIONAL NOTES:**

1. The allowable loads represent the capacity of the member in pounds per lineal foot (plf) of length.
2. The designer shall check both the Total Load and the appropriate Live Load column.
3. Where the Live Load is blank, the Total Load governs the design.
4. Depths of 16" and greater shall be used with a minimum of two plies unless designed specifically as a single ply with proper lateral bracing, such as a marriage beam for each half of a manufactured home before the units are joined.
5. The allowable loads in the table are for a single ply of LVL. Multiply the values by the number of plies of equal thickness to size a built-up member or divide the required loads by the number of equal thickness plies to directly verify the capacity of each individual ply. Example: double the allowable loads in the table for a 2-ply member or divide the required uniform loads by 2 to verify each ply of a 2-ply member.
6. The member width shall be properly built up by connecting plies of the same grade of LVL. Refer to the multiple-ply connections on pages 14-15.
7. Do not use a product where designated "-" without further analysis by a design professional.

**ACTUAL DEFLECTION BASED ON SPAN AND LIMIT**

| Span (ft) | 10' | 12' | 14' | 16' | 18' | 20' | 22' | 24' | 26' | 28' | 30' |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L/480 | 1/4" | 5/16" | 3/8" | 3/8" | 7/16" | 1/2" | 9/16" | 5/8" | 5/8" | 11/16" | 3/4" |
| L/360 | 5/16" | 3/8" | 7/16" | 9/16" | 5/8" | 11/16" | 3/4" | 13/16" | 7/8" | 15/16" | 1" |
| L/240 | 1/2" | 5/8" | 11/16" | 13/16" | 7/8" | 1" | 1-1/8" | 1-3/16" | 1-5/16" | 1-3/8" | 1-1/2" |

# LVL 2900$F_b$-2.0E Uniform Roof Load (PLF) Tables

**TO USE:**

1. Select the required Span. For beams with a pitch greater than 1:12, multiply the horizontal span by the slope adjustment factor from the table below.
2. Divide the design loads by the desired number of plies to verify each ply of the beam.
3. Select a beam that exceeds the appropriate Total Load (Snow 115% or Non-Snow 125%) and the appropriate Snow/Live Load (L/360 or L/240).
4. Check the bearing requirements.

**EXAMPLE:**

For a 16' horizontal span with a pitch of 4:12, select a 2- and 3-ply beam that satisfies an L/360 Snow Load deflection limit for the following design loads: Snow Load = 720 plf, Total Load = 1128 plf

**CALCULATE BEAM SPAN:** 16' * 1.054 = 16.9' ⟶ **Use Span = 17'**

**SOLUTION FOR A 2-PLY BEAM:**

Design Total Load per ply = 1128 / 2 = 564 plf
Design Snow Load per ply = 720 / 2 = 360 plf
**Use 2 plies 1-3/4" x 18"**
(Total Load = 638 plf, Snow Load L/360 = 458 plf)

**SOLUTION FOR A 3-PLY BEAM:**

Design Total Load per ply = 1128 / 3 = 376 plf
Design Snow Load per ply = 720 / 3 = 240 plf
**Use 3 plies 1-3/4" x 16"**
(Total Load = 543 plf, Snow Load L/360 = 329 plf)

| Span | 1-3/4" x 7-1/4" | | | | 1-3/4" x 9-1/4" | | | | 1-3/4" x 9-1/2" | | | | 1-3/4" x 11-1/4" | | | | Span |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Snow/Live Load | | Total Load | | Snow/Live Load | | Total Load | | Snow/Live Load | | Total Load | | Snow/Live Load | | Total Load | | |
| | L/360 | L/240 | Snow 115% | Non-Snow 125% | L/360 | L/240 | Snow 115% | Non-Snow 125% | L/360 | L/240 | Snow 115% | Non-Snow 125% | L/360 | L/240 | Snow 115% | Non-Snow 125% | |
| 5' | | | 883 | 960 | | | 1127 | 1225 | | | 1157 | 1258 | | | 1370 | 1490 | 5' |
| 6' | 659 | | 735 | 799 | | | 938 | 1020 | | | 963 | 1048 | | | 1141 | 1241 | 6' |
| 7' | 430 | 646 | 630 | 685 | 840 | | 803 | 874 | | | 825 | 897 | | | 977 | 1063 | 7' |
| 8' | 295 | 443 | 550 | 587 | 584 | | 702 | 764 | 628 | | 721 | 784 | | | 854 | 929 | 8' |
| 9' | 211 | 316 | 418 | 418 | 421 | 632 | 624 | 678 | 454 | 681 | 641 | 697 | 723 | | 759 | 825 | 9' |
| 9'-6" | 180 | 271 | 358 | 358 | 362 | 543 | 591 | 642 | 390 | 585 | 607 | 660 | 624 | | 718 | 781 | 9'-6" |
| 10' | 155 | 233 | 308 | 308 | 313 | 470 | 561 | 610 | 337 | 506 | 576 | 626 | 542 | | 682 | 742 | 10' |
| 11' | 118 | 177 | 232 | 232 | 238 | 358 | 467 | 473 | 257 | 386 | 491 | 510 | 415 | 623 | 620 | 674 | 11' |
| 12' | 91 | 137 | 179 | 179 | 186 | 279 | 367 | 367 | 200 | 301 | 397 | 397 | 325 | 488 | 567 | 617 | 12' |
| 13' | 72 | 108 | 141 | 141 | 147 | 221 | 290 | 290 | 159 | 239 | 314 | 314 | 259 | 388 | 483 | 513 | 13' |
| 14' | 58 | 87 | 113 | 113 | 119 | 178 | 233 | 233 | 128 | 193 | 252 | 252 | 209 | 314 | 413 | 413 | 14' |
| 15' | 47 | 71 | 91 | 91 | 97 | 146 | 190 | 190 | 105 | 157 | 205 | 205 | 171 | 257 | 338 | 338 | 15' |
| 16' | 39 | 59 | 75 | 75 | 80 | 120 | 156 | 156 | 87 | 130 | 169 | 169 | 142 | 214 | 279 | 279 | 16' |
| 16'-6" | 35 | 53 | 68 | 68 | 73 | 110 | 142 | 142 | 79 | 119 | 154 | 154 | 130 | 195 | 255 | 255 | 16'-6" |
| 17' | 32 | 49 | 62 | 62 | 67 | 101 | 130 | 130 | 72 | 109 | 141 | 141 | 119 | 179 | 233 | 233 | 17' |
| 18' | - | - | - | - | 57 | 85 | 109 | 109 | 61 | 92 | 118 | 118 | 101 | 151 | 196 | 196 | 18' |
| 18'-6" | - | - | - | - | 52 | 78 | 100 | 100 | 56 | 85 | 109 | 109 | 93 | 140 | 181 | 181 | 18'-6" |
| 19' | - | - | - | - | 48 | 72 | 92 | 92 | 52 | 78 | 100 | 100 | 86 | 129 | 167 | 167 | 19' |
| 20' | - | - | - | - | 41 | 62 | 78 | 78 | 45 | 67 | 85 | 85 | 74 | 111 | 143 | 143 | 20' |
| 21' | - | - | - | - | 36 | 54 | 67 | 67 | 39 | 58 | 73 | 73 | 64 | 96 | 123 | 123 | 21' |
| 22' | - | - | - | - | 31 | 47 | 58 | 58 | 34 | 51 | 63 | 63 | 56 | 84 | 106 | 106 | 22' |

| Span | 1-3/4" x 11-7/8" | | | | 1-3/4" x 14" | | | | 1-3/4" x 16" | | | | 1-3/4" x 18" | | | | Span |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Snow/Live Load | | Total Load | | Snow/Live Load | | Total Load | | Snow/Live Load | | Total Load | | Snow/Live Load | | Total Load | | |
| | L/360 | L/240 | Snow 115% | Non-Snow 125% | L/360 | L/240 | Snow 115% | Non-Snow 125% | L/360 | L/240 | Snow 115% | Non-Snow 125% | L/360 | L/240 | Snow 115% | Non-Snow 125% | |
| 5' | | | 1447 | 1573 | | | 1706 | 1854 | | | 1949 | 2119 | | | 2193 | 2281 | 5' |
| 6' | | | 1204 | 1310 | | | 1420 | 1544 | | | 1623 | 1765 | | | 1826 | 1929 | 6' |
| 7' | | | 1031 | 1122 | | | 1216 | 1322 | | | 1390 | 1511 | | | 1564 | 1670 | 7' |
| 8' | | | 902 | 981 | | | 1063 | 1156 | | | 1215 | 1321 | | | 1367 | 1487 | 8' |
| 9' | 837 | | 801 | 871 | | | 944 | 1027 | | | 1079 | 1174 | | | 1214 | 1320 | 9' |
| 9'-6" | 723 | | 758 | 825 | | | 894 | 972 | | | 1022 | 1111 | | | 1150 | 1250 | 9'-6" |
| 10' | 628 | | 720 | 783 | | | 849 | 923 | | | 970 | 1055 | | | 1092 | 1187 | 10' |
| 11' | 483 | | 654 | 711 | 759 | | 771 | 839 | | | 881 | 959 | | | 992 | 1079 | 11' |
| 12' | 379 | 568 | 599 | 652 | 599 | | 706 | 768 | 860 | | 807 | 878 | | | 908 | 988 | 12' |
| 13' | 302 | 453 | 535 | 582 | 480 | | 651 | 709 | 693 | | 744 | 810 | | | 838 | 911 | 13' |
| 14' | 244 | 367 | 461 | 483 | 390 | 585 | 604 | 657 | 566 | | 691 | 751 | 780 | | 777 | 845 | 14' |
| 15' | 200 | 301 | 395 | 395 | 321 | 482 | 545 | 593 | 467 | | 644 | 701 | 647 | | 725 | 788 | 15' |
| 16' | 166 | 250 | 327 | 327 | 267 | 401 | 478 | 520 | 390 | 585 | 603 | 656 | 542 | | 679 | 739 | 16' |
| 16'-6" | 152 | 228 | 299 | 299 | 245 | 367 | 449 | 483 | 358 | 537 | 577 | 628 | 497 | | 658 | 716 | 16'-6" |
| 17' | 139 | 209 | 274 | 274 | 225 | 337 | 423 | 443 | 329 | 493 | 543 | 591 | 458 | 687 | 638 | 695 | 17' |
| 18' | 118 | 177 | 231 | 231 | 190 | 286 | 374 | 374 | 279 | 419 | 483 | 526 | 390 | 585 | 602 | 655 | 18' |
| 18'-6" | 109 | 164 | 212 | 212 | 176 | 264 | 345 | 345 | 258 | 388 | 457 | 497 | 361 | 542 | 570 | 620 | 18'-6" |
| 19' | 101 | 151 | 196 | 196 | 163 | 245 | 319 | 319 | 239 | 359 | 433 | 471 | 335 | 502 | 540 | 588 | 19' |
| 20' | 87 | 130 | 168 | 168 | 140 | 211 | 274 | 274 | 207 | 310 | 390 | 406 | 289 | 434 | 486 | 529 | 20' |
| 21' | 75 | 113 | 145 | 145 | 122 | 183 | 237 | 237 | 179 | 269 | 351 | 351 | 252 | 378 | 440 | 479 | 21' |
| 22' | 65 | 98 | 125 | 125 | 106 | 160 | 206 | 206 | 157 | 236 | 306 | 306 | 220 | 331 | 400 | 432 | 22' |
| 23' | 57 | 86 | 109 | 109 | 93 | 140 | 180 | 180 | 138 | 207 | 268 | 268 | 194 | 291 | 365 | 379 | 23' |
| 24' | 51 | 76 | 96 | 96 | 82 | 124 | 158 | 158 | 122 | 183 | 236 | 236 | 171 | 257 | 334 | 334 | 24' |
| 25' | 45 | 67 | 84 | 84 | 73 | 110 | 139 | 139 | 108 | 162 | 209 | 209 | 152 | 229 | 296 | 296 | 25' |
| 26' | 40 | 60 | 74 | 74 | 65 | 98 | 123 | 123 | 96 | 145 | 185 | 185 | 136 | 204 | 263 | 263 | 26' |
| 27' | 36 | 54 | 66 | 66 | 58 | 87 | 110 | 110 | 86 | 130 | 165 | 165 | 122 | 183 | 235 | 235 | 27' |
| 28' | 32 | 48 | 58 | 58 | 52 | 78 | 98 | 98 | 77 | 116 | 147 | 147 | 109 | 164 | 210 | 210 | 28' |
| 29' | - | - | - | - | 47 | 71 | 87 | 87 | 70 | 105 | 132 | 132 | 99 | 148 | 189 | 189 | 29' |
| 30' | - | - | - | - | 42 | 64 | 78 | 78 | 63 | 95 | 119 | 119 | 89 | 134 | 170 | 170 | 30' |

**DESIGN ASSUMPTIONS:**

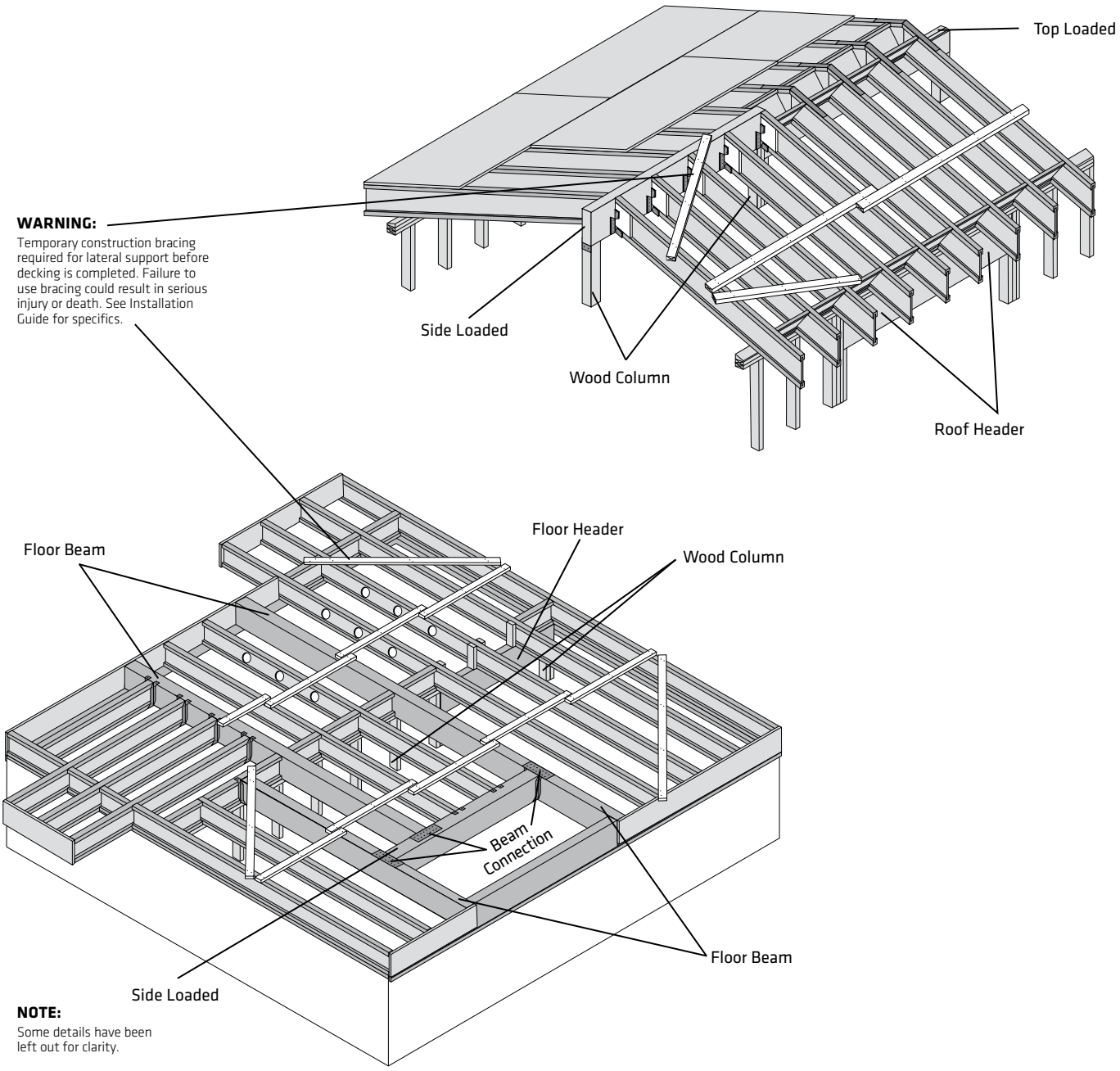
1. Span is the center-to-center distance of the supports, along the sloped length of the member and is valid for simple or equal, continuous span applications.
2. The values in the tables are for uniform loads only.
3. Total Load is for Snow (115%) or Non-Snow (125%) duration, as noted in the table, and has been adjusted to account for the self-weight of the member.
4. Snow/Live Load deflection has been limited to L/360 or L/240 as noted in the table. To design for a Snow or Roof Live Load deflection of L/480, use the Uniform Floor Load tables on page 10.
5. Total deflection has been limited to L/180. Long term deflection (creep) has not been considered.
6. These tables assume full lateral support of the compression edge. Full support is considered to be a maximum unbraced length of 24".
7. Proper bearing must be provided. Bearing length must be checked for support reactions with the table on page 4.

**ADDITIONAL NOTES:**

1. The allowable loads represent the capacity of the member in pounds per lineal foot (plf) of length.
2. The designer shall check both the appropriate Total Load and the appropriate Live Load column.
3. For roofs with a slope of 2:12 or greater, the horizontal span shall be multiplied by the appropriate slope adjustment factor from the table below.
4. Where the Live Load is blank, the Total Load governs the design.
5. Depths of 16" and greater shall be used with a minimum of two plies unless designed specifically as a single ply with proper lateral bracing, such as a marriage beam for each half of a manufactured home before the units are joined.
6. The allowable loads in the table are for a single ply of LVL. Multiply the values by the number of plies of equal thickness to size a built-up member or divide the required loads by the number of equal thickness plies to directly verify the capacity of each individual ply. Example: double the allowable loads in the table for a 2-ply member or divide the required uniform loads by 2 to verify each ply of a 2-ply member.
7. The member width shall be properly built up by connecting plies of the same grade of LVL. Refer to the multiple-ply connections on pages 14-15.
8. Do not use a product where designated "-" without further analysis by a design professional.

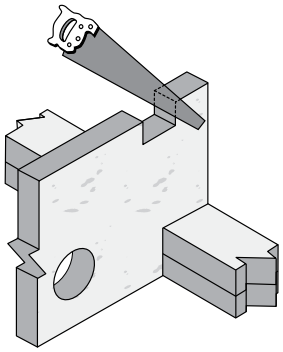
**SLOPE ADJUSTMENT FACTOR**

| Slope | 2:12 | 3:12 | 4:12 | 5:12 | 6:12 | 7:12 | 8:12 | 9:12 | 10:12 | 11:12 | 12:12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Factor | 1.014 | 1.031 | 1.054 | 1.083 | 1.118 | 1.158 | 1.202 | 1.250 | 1.302 | 1.357 | 1.414 |



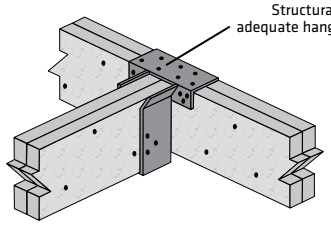

# WARNING

***DON'T*** **USE VISUALLY DAMAGED PRODUCTS WITHOUT FIRST CHECKING WITH YOUR LOCAL LP® SolidStart® ENGINEERED WOOD PRODUCTS DISTRIBUTOR OR SALES OFFICE. (SEE BACK COVER FOR DETAILS.)**



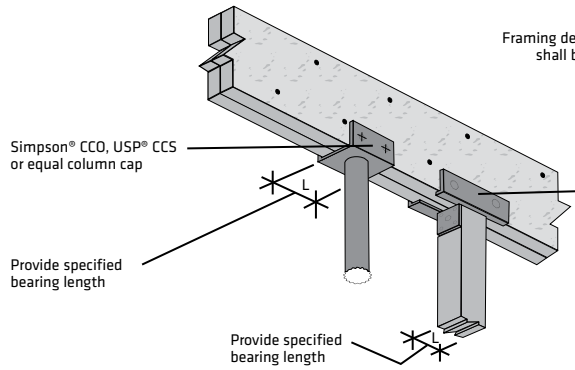
***DON'T*** **BORE HOLES OR NOTCH UNLESS REVIEWED BY A DESIGN PROFESSIONAL. EXCEPTION: SMALL HOLES MAY BE DRILLED IN ACCORDANCE WITH THE BEAM HOLE DETAILS ON PAGE 13.**

## P3 BEAM CONNECTION



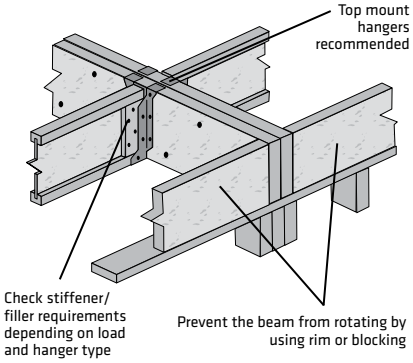

Hanger shall apply load equally to each ply or special design required

## P4 STEEL COLUMN & WOOD COLUMN

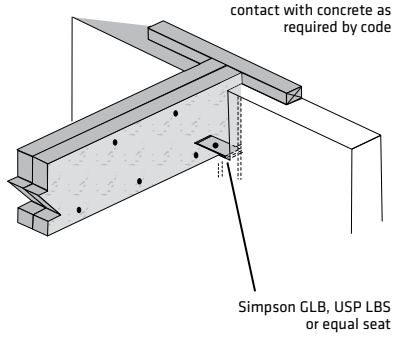



## P5

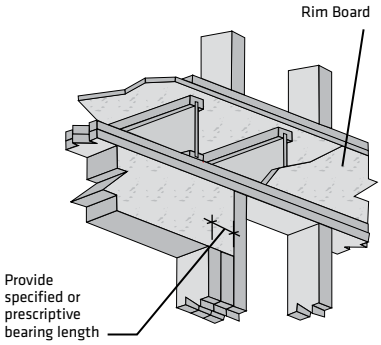
## P6 FLOOR BEAM (Flush ceiling)



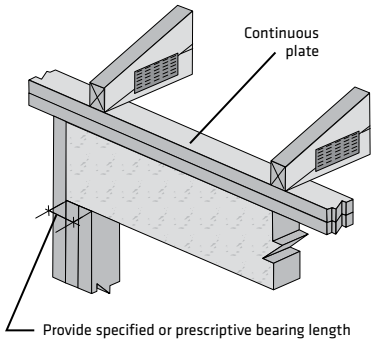

## P7 CONCRETE WALL



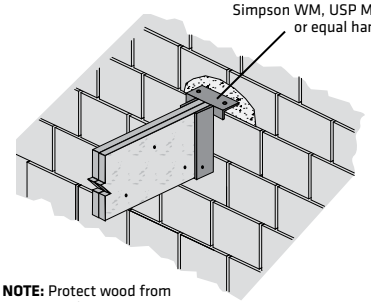

## Q1 WINDOW/DOOR HEADER




## Q2 WINDOW/DOOR HEADER

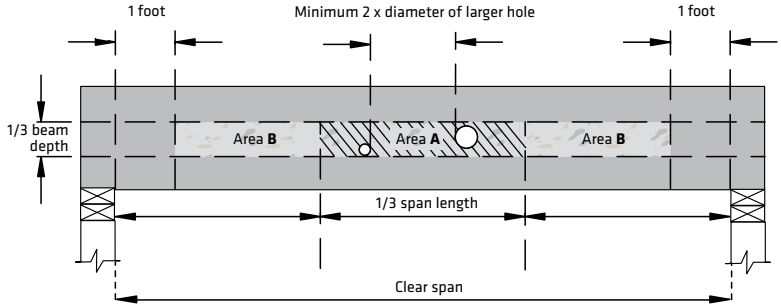



## Q4 MASONRY HANGER




**NOTE:** Protect wood from contact with concrete as required by code

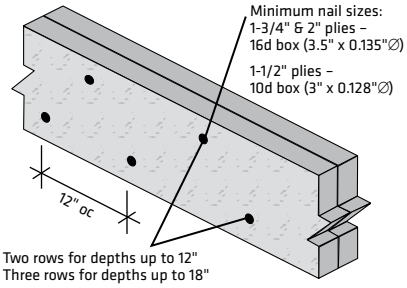
## BEAM HOLE DETAILS




**NOTES:**

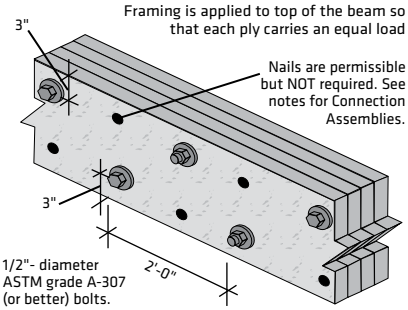
1. These guidelines apply to uniformly loaded beams selected from the Quick Reference Tables or the Uniform Load Tables or designed with LP's design/specification software only. For all other applications, such as beams with concentrated loads, please contact your LP® SolidStart® Engineered Wood Products distributor for assistance.
2. Round holes can be drilled anywhere in "Area **A**" provided that: no more than four holes are cut, with the minimum spacing described in the diagram. The maximum hole size is 1-1/2" for depths up to 9-1/4," and 2" for depths greater than 9-1/4."
3. Rectangular holes are NOT allowed.
4. DO NOT drill holes in cantilevers without prior approval from the project designer.
5. Other hole sizes and configurations MAY be possible with further engineering analysis. For more information, contact your LP SolidStart Engineered Wood Products distributor.
6. Up to three 3/4" holes may be drilled in "Area **B**" to accommodate wiring and/or water lines. These holes shall be at least 12" apart. The holes shall be located in the middle third of the depth, or a minimum of 3" from the bottom and top of the beam. For beams shallower than 9-1/4," locate holes at mid-depth.
7. Protect plumbing holes from moisture.

**P1** **TOP-LOADED BEAM – NAILED CONNECTION**
(See Connection Assemblies for more details)



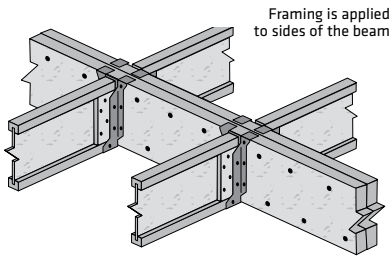

Two rows for depths up to 12"
Three rows for depths up to 18"
Framing is applied to top of the beam so that each ply carries an equal load

**P2** **TOP-LOADED BEAM – BOLTED CONNECTION**
(See Connection Assemblies for more details)

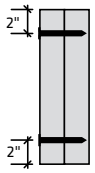
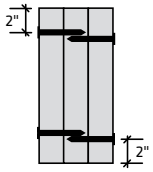
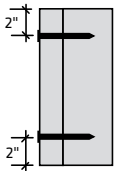
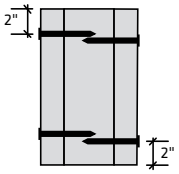
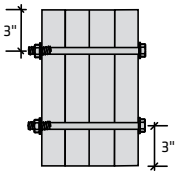
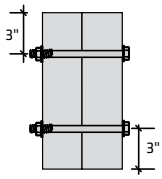
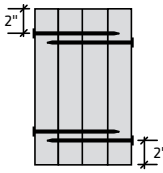



1/2"- diameter ASTM grade A-307 (or better) bolts.
Use washers on both faces.

**Q3** **SIDE-LOADED BEAM**
(See Connection Assemblies for more details)




SIDE LOADS ARE NOT RECOMMENDED FOR BEAMS OVER 5-1/2" WIDE UNLESS EQUALLY APPLIED TO BOTH FACES
See Connection Assemblies for more information

| DETAIL A | DETAIL B | DETAIL C/E | DETAIL D | DETAIL F | DETAIL G | DETAIL H |
|---|---|---|---|---|---|---|
| **MAXIMUM 4" WIDE 2-PLY BEAMS** | **MAXIMUM 6" WIDE 3-PLY BEAMS** | **MAXIMUM 7-1/4" WIDE 2-PLY BEAMS** | **MAXIMUM 9-1/4" WIDE 3-PLY BEAMS** | **MAXIMUM 7" WIDE 3- OR 4-PLY BEAMS** | **MAXIMUM 7" WIDE 2-PLY BEAMS** | **MAXIMUM 7" WIDE 2-, 3- OR 4-PLY BEAMS** |
|  |  |  |  |  |  |  |
| 2" max. ply thickness | 2" max. ply thickness | 2" maximum side member<br>3-1/2" main member for C<br>5-1/4" main member for E | 2" maximum side members<br>5-1/4" maximum main member | | | Simpson SDS 1/4" x 6" Simpson SDW 6-3/4" or equal<br>Simpson SDW may be driven from one side. |

CONNECTION ASSEMBLIES

## UNIFORM SIDE-LOAD CAPACITY (PLF)

| Connection Detail | 2 Rows of Nails at 12" oc | 3 Rows of Nails at 12" oc | 2 Rows of 1/2" Bolts at 24" oc | 2 Rows of 1/2" Bolts at 12" oc |
|---|---|---|---|---|
| A | 412 | 618 | 506 | 1012 |
| B | 309 | 464 | 380 | 760 |
| C | 309 | 464 | 522 | 1044 |
| D | 275 | 412 | 464 | 928 |
| E | 275 | 412 | 464 | 928 |
| F | na | na | 337 | 674 |
| G | na | na | 858 | 1716 |
| H | Refer to Simpson Strong-Tie® catalog for SDS & SDW installation requirements & capacities. | | | |

## NAIL SCHEDULE

| Nail Length (in) | Nail Diameter (in) | Lateral Load Capacity (lbs) | Nail Size Factor | Nail Type |
|---|---|---|---|---|
| 3-1/2" | 0.162 | 141 | 1.37 | 16d common |
| | 0.135 | 103 | 1.00 | 16d box |
| 3-1/4" | 0.148 | 118 | 1.15 | 16d sinker/12d common |
| | 0.128 | 93 | 0.90 | 12d box |
| | 0.120 | 81 | 0.79 | Power-driven nail[13] |
| 3" | 0.148 | 99 | 0.96 | 10d common |
| | 0.128 | 91 | 0.88 | 10d box |
| | 0.120 | 81 | 0.79 | Power-driven nail[13] |

**NOTES:**

1. The Uniform Side-Load Capacity values are the maximum load that can be applied to either side of the beam, based on the selected connection detail, and represent loads applied uniformly such as joists supported by hangers spaced 24" oc or less. Connections for discrete point loads may be determined with this table by calculating the equivalent fastener schedule within a 2' length centered about the point load. Details **B** and **D** shall have the back ply connected with a number of nails equal to half that used to connect the front ply – see the Side-Load Connection Example and detail on page 23. All nail and bolt spacing requirements shall be verified. The full length of the beam shall be connected with the standard connection or with the appropriate uniform side-load connection from this table. The beam shall be designed to support all applied loads.
2. Values are for normal load duration and shall be adjusted according to code.
3. The values for Uniform Side-Load Capacity for nails and Lateral Load Capacity (from Nail Schedule) are based on Douglas Fir lumber equivalence (SG = 0.50) for a 16d box (3-1/2" x 0.135"Ø) nails for 1-3/4" LVL. For other nail sizes, multiply the Uniform Side-Load Capacity by the Nail Size Factor from the Nail Schedule. For 1-1/2" LVL, multiply by the Nail Size Factor for the appropriate 3" nail. Higher capacities may be calculated using the equivalent specific gravities tabulated in the Fastener Design table on page 23.
4. The values for the Uniform Side-Load Capacity for bolts are based on Douglas Fir lumber equivalence (SG = 0.50) for ASTM grade A-307, 1/2"Ø bolts, for loads applied perpendicular-to-grain. For 1-1/2" LVL, multiply these values by 0.86 or calculate for the needed detail. Higher bolt capacities may be calculated using the equivalent specific gravities tabulated in the Fastener Design table on page 23.
5. For nails at 8" oc, multiply the capacity by 1.5. For nails at 6" oc, multiply the capacity by 2. For four rows of nails, double the two-row capacity.
6. Use 2 rows of nails for depths to 12". Use 3 rows of nails for depths greater than 12", up to 18".
7. Unless specifically designed, use 3-1/2" nails for 1-3/4" and 2" thick plies and use 3" nails for 1-1/2" thick plies. If the nails do not fully penetrate the second ply (main member), then the nails shall be driven from both faces.
8. For detail **A**, or when attaching the first two plies for detail **B** (and optionally for details **F** and **H** – see note 11), the nails may be driven all from one face or alternating from both faces. If the nails do not fully penetrate the second ply, then the nails shall be driven from both faces.
9. When driving nails from each face, alternate every other nail in each row.
10. For details **C** and **E**, when side-loaded, the larger side-load shall be applied to the thicker ply (main member).
11. For details **F** and **H**, it is permissible to nail the plies together before bolting or driving Simpson SDS or SDW (or equal) screws. Nail two plies together (see note 8) then nail one additional ply to each side.
12. Beams wider than 5-1/2" shall be top-loaded or side-loaded from both sides to prevent rotation. For side loads applied to one side of a beam only, the project designer shall verify torsional capacity or detail the beam to prevent rotation due to any side loads. Consult a design professional for other options.
13. Power-driven nails shall conform to ICC-ES report ESR-1539 (International Staple, Nail and Tool Association) for power-driven staples and nails.
14. Other nail, screw or bolt configurations are possible. Refer to the Fastener Design table on page 23 or contact your LP® SolidStart® Engineered Wood Products distributor.

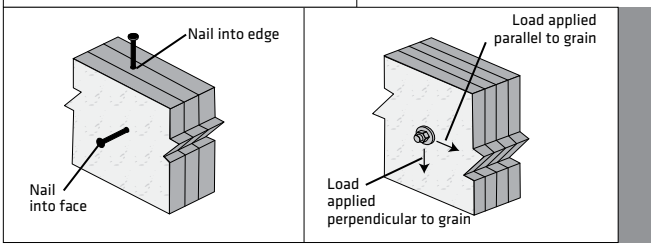
## FASTENER DESIGN

| Equivalent Specific Gravity | | | | | |
|---|---|---|---|---|---|
| Nails Only | | Nails and Wood Screws | | Bolts and Lag Screws | |
| Withdrawal | | Dowel Bearing | | Dowel Bearing (into the face only) | |
| Edge | Face | Edge | Face | Load Applied Parallel to Grain | Load Applied Perpendicular to Grain |
| 0.46 | 0.50 | 0.50 | 0.50 | 0.46 | 0.50 |

**NOTES:**

1. The equivalent specific gravity for each connection type listed above is for normal load duration and shall be adjusted according to code.
2. Fastener spacing, end and edge distance shall be as specified by code except for nail spacing as specified below.
3. See details to right for fastener and applied load orientation.

## FASTENER & LOAD ORIENTATION



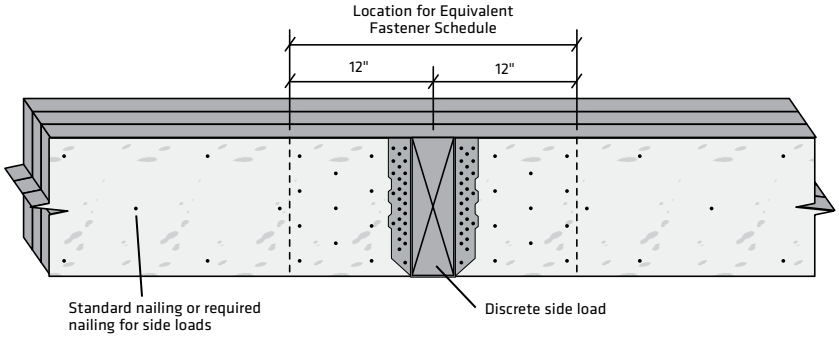

## NAIL SPACING REQUIREMENTS

| LVL Ply Thickness | Fastener Orientation[3] | Common Nail Size[4] | Minimum End Distance | Minimum Nail Spacing |
|---|---|---|---|---|
| ≥ 1-1/2" | Edge | 8d & smaller | 2-1/2" | 4" |
| | | 10d & 12d | 2-1/2" | 4" |
| | | 16d[5] | 3-1/2" | 5" |
| | Face | 8d & smaller | 1-1/2" | 3" |
| | | 10d & 12d | 1-1/2" | 3" |
| | | 16d[5] | 1-1/2" | 5" |

**NOTES:**

1. Edge distance shall be such that does not cause splitting.
2. Multiple rows of nails shall be offset at least 1/2" and staggered.
3. Edge orientation refers to nails driven into the narrow edge of the LVL, parallel to the face of the veneers. Face orientation refers to nails driven into the wide face of the LVL, perpendicular to the face of the veneers. (See Fastener & Load Orientation details above.)
4. For box nails, the end distance and minimum spacing of the next shorter nail may be used.
5. 16d sinkers (3-1/4" x 0.148"Ø) can be spaced the same as the 10d & 12d nails.

## SIDE-LOAD CONNECTION EXAMPLE



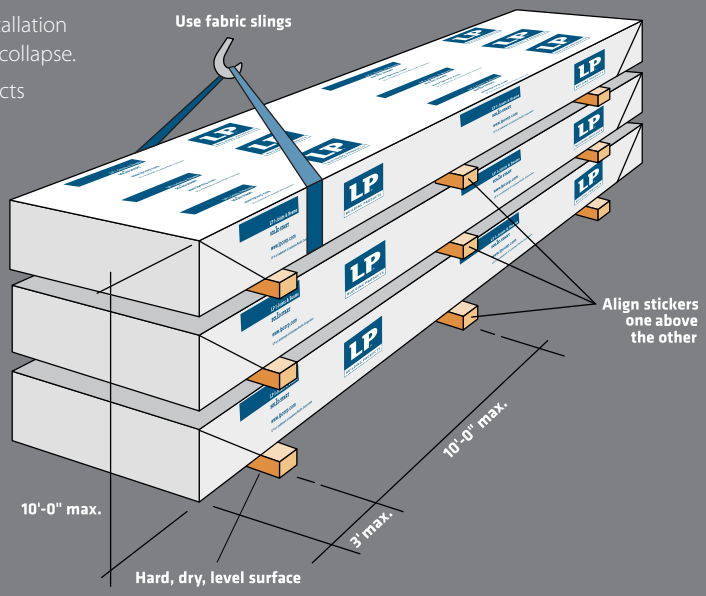

**EXAMPLE:** Assuming a properly designed 3-ply 14" beam, determine the equivalent connection to support a 3300 lb point load applied to the side of the beam.

**SOLUTION:**

1. Determine the equivalent PLF load over the 2' length by dividing the applied load by 2: 3300 lb / 2' = 1650 plf
2. Divide the equivalent PLF load by the capacity for the appropriate detail. For a 14" depth, 3 rows of nails are required. For Detail **B** with 3 rows of nails at 12" oc: 1650 plf / 464 plf = 3.6
3. The required total number of nails is: 3.6 * 3 rows of nails @ 12" oc = 10.8 nails per foot
4. Connect the front (loaded) ply with the nailing determined in step 3: drive 11 16d box nails within 12" to each side of the point load (a total of 22 nails). Verify nail spacing.
5. Connect the back ply with half the number of nails determined in step 4: drive 6 16d box nails, from the back, within 12" to each side of the point load (a total of 12 nails). Verify nail spacing.
6. Connect full length of member with the standard nailing or as required for side loads.
7. Project designer shall detail to prevent rotation of the beam due to the applied side load.

# Handling & Storage Guidelines

- Warning: Failure to follow proper procedures for handling, storage and installation could result in unsatisfactory performance, unsafe structures and possible collapse.
- Keep LP® SolidStart® LVL dry. These products are intended to resist the effects of moisture on structural performance from normal construction delays but are not intended for permanent exposure to the weather.
- Unload products carefully, by lifting. Support the bundles to reduce excessive bowing. Individual products should be handled in a manner which prevents physical damage during measuring, cutting, erection, etc.
- Keep products stored in wrapped and strapped bundles, stacked no more than 10' high. Support and separate bundles with 2 x 4 (or larger) stickers spaced no more than 10' apart. Keep stickers in line vertically.
- Product must not be stored in contact with the ground, or have prolonged exposure to the weather.
- Use forklifts and cranes carefully to avoid damaging product.
- Do not use a visually damaged product. Call your local LP SolidStart Engineered Wood Products distributor for assistance when damaged products are encountered.




- For satisfactory performance, LP SolidStart LVL must be used under dry, covered and well-ventilated interior conditions in which the equivalent moisture content in lumber will not exceed 16%.
- For built-up members, LP SolidStart LVL shall be dry before nailing or bolting to avoid trapping moisture.
- LP SolidStart LVL shall not be used for unintended purposes such as ramps and planks.

## LP SolidStart LVL 2900$F_b$-2.0E

LP SolidStart LVL 2900$F_b$-2.0E is available in:

- lengths up to 60'
- thicknesses of 1-1/2" and 1-3/4"
- billet thicknesses of 3-1/2", 5-1/4" and 7"
- standard depths of 7-1/4", 9-1/4", 9-1/2", 11-1/4", 11-7/8", 14", 16", 18", 20", 22", and 23-7/8"

## CODE EVALUATION

ICC-ES evaluation report ESR-2403 can be obtained at www.icc-es.org.
APA product report PR-L280 can be obtained at www.apawood.org.

In addition to the standard natural finish, a water-resistant coating called SiteCote™ is available for extra weather protection during construction. Contact your local distributor for availability.

LP SolidStart® ENGINEERED WOOD PRODUCTS

For more information on the full line of LP® SolidStart® Engineered Wood Products or the nearest distributor, visit our web site at LPCorp.com.

Phone: 1-888-820-0325
E-mail: customer.support@LPCorp.com.

LP SolidStart Engineered Wood Products are manufactured at different locations in the United States and Canada. Please verify availability with the LP SolidStart Engineered Wood Products distributor in your area before specifying these products.

Cal. Prop 65 Warning: Use of this product may result in exposure to wood dust, known to the State of California to cause cancer.

PEFC™ PEFC/29-31-102

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LPEW0300 5/14 7M OS/HMH