CANADA (LSD) TECHNICAL GUIDE

TECH GUIDE

2.0E 2900Fb

PWT LVL

LIMIT STATES DESIGN
HEADER & BEAM

PWT FOCUSED ON EWP

PWT™ LVL

Designed to Outperform Traditional Lumber

PWT™ 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.

Strength in Engineering

PWT 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. PWT LVL beams are exceptionally strong, solid and straight, making them excellent for most primary load-carrying beam applications.

PWT LVL Available Grades and Sizes

PWT LVL is available in a range of depths and lengths, and is available in a standard thicknesses of 1-3/4". The 2.0E LVL is also available in a thickness of 1-1/2" in some markets. In addition, a water-resistant coating is applied for extra weather protection during construction. Please verify availability with the PWT distributor in your area before specifying these products.

Lifetime Limited Warranty

PWT products are backed by a lifetime limited warranty. Visit pwtewp.com or call (800) 515-7570 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 PWT products.

Code Evaluation

PWT Laminated Veneer Lumber has been evaluated by CCMC for compliance with the National Building Code of Canada, 2020. Contact your local PWT distributor or visit pwtewp.com for the most current code reports.

- CCMC Evaluation Reports *13006-R* and *11518-R*
- APA Product Report® *PR-L233C*

Important Notes

1. PWT LVL shall be designed for dry-use conditions only. PWT LVL must be used under dry, covered and well-ventilated interior conditions in which the average equilibrium moisture content (MC) of lumber is 15% or less over a year and does not exceed 19% at any time.
2. This guide is valid only for PWT LVL members supporting loads applied parallel to the face of the veneer ("edge" orientation).
3. The tables in this guide meet the design requirements of the National Building Code of Canada for Limit States Design and assume a normal importance category. Ensure that the specified 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 Uniform Load Resistance (PLF) 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 PWT distributor.
5. Beam spans in this guide are typically measured from center-to-center of supports except for door and window headers. A structurally adequate bearing surface under the full width (thickness) of the member 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 Factored Reaction Resistance chart 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. Vibration has not been considered in this guide. If PWT LVL is used as a floor joist, the designer shall perform the required vibration control checks.
9. PWT LVL is not cambered.
10. Higher grades of PWT LVL can be substituted for the indicated grade.
11. PWT 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 PWT distributor. Caution: Failure to provide adequate lateral restraint could result in an unstable member and reduce its load capacity.
12. Lateral restraint shall also be provided at all supports to prevent rotation or twisting.
13. 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.

2.0E 2900F_b PWT LVL

Standard Thickness of 1-3/4" (also available in 1-1/2")

Standard Depths of 7-1/4", 9-1/4", 9-1/2", 11-1/4", 11-7/8", 14", 16", 18", 20", and 24"

Lengths up to 60 feet

Specific sizes may not be available in all locations, contact your local distributor for availability.
A water-resistant coating is applied to PWT LVL for extra weather protection during construction.

Code Evaluation Reports:

- CCMC Evaluation Reports *13006-R* and *11518-R*
- APA Product Report® *PR-L233C*

or contact your local PWT distributor or visit pwtewp.com for the most current code reports.

2.0E 2900F$_b$ PWT LVL
Product Specifications & Design Values

SPECIFIED STRENGTHS & STIFFNESS (PSI)

Grade	2.0E 2900F$_b$
Bending, F$_b$[4]	5359
Modulus of Elasticity, E[5] (x 10^6 ps)	2.0
Shear F$_v$	530
Compression Stress Parallel to Grain, F$_c$	5107
Compression Stress Perpendicular to Grain, F$_{cp}$	1365

Notes:

1. PWT™ 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 average moisture content in lumber will not exceed a yearly average of 15% and does not exceed 19% at any time.
2. The specified strengths and stiffness are for standard load duration. Specified strengths shall be adjusted according to code. Stiffness shall not be adjusted.
3. The specified strengths and stiffness are for members supporting loads applied parallel to the wide face ("edge" or "beam" orientation).
4. The specified Bending strength, f_b, is tabulated for 12" depth. For depths greater than 12", multiply f_b by $(12/depth)^{0.20}$. 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.
5. 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: Δ = deflection (in), w = uniform load (plf), L = design span (ft), E = modulus of elasticity (from table), b = width of beam (in), d = depth of beam (in)

Equations for other conditions can be found in engineering references.

SECTION PROPERTIES AND FACTORED RESISTANCES

Depth	Weight (lb/ft)				Factored Moment[2] (lb/ft)				Factored 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	6516	13032	19548	26065	4035	8069	12104	16139	56	111	167	222
9-1/4"	4.6	9.3	13.9	18.5	10324	20648	30973	41297	5148	10295	15443	20591	115	231	346	462
9-1/2"	4.8	9.5	14.3	19.0	10857	21715	32573	43431	5287	10574	15860	21147	125	250	375	500
11-1/4"	5.6	11.3	16.9	22.5	14943	29886	44830	59773	6261	12521	18782	25043	208	415	623	831
11-7/8"	5.9	11.9	17.8	23.8	16550	33100	49650	66200	6608	13217	19825	26434	244	488	733	977
14"	7.0	14.0	21.0	28.0	22279	44558	66837	89116	7791	15582	23373	31164	400	800	1201	1601
16"	8.0	16.0	24.0	32.0	28332	56664	84997	113329	8904	17808	26712	35616	597	1195	1792	2389
18"	9.0	18.0	27.0	36.1	35023	70046	105070	140093	10017	20034	30051	40068	851	1701	2552	3402
20"	10.0	20.0	30.0	40.1	42337	84674	127011	169348	11130	22260	33390	44520	1167	2333	3500	4667
24"	12.0	24.0	36.1	48.1	58782	117565	176347	235130	13356	26712	40068	53424	2016	4032	6048	8064

Notes:

1. The Factored Moment and Shear are for standard load duration and shall be adjusted according to code.
2. The tabulated Factored Moment Resistance assumes continuous lateral support of the compression edge. For other conditions, multiply the Factored Moment Resistance by the beam lateral stability factor, K$_L$.
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 PWT 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.

FACTORED REACTION RESISTANCE (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"	2866	3822	4777	5733	6688	7644	8599	9555	10510	11466	12421	13377	14332	15288	16243	17199	18154	19110	20065	21021	21976	22932
3-1/2"	5733	7644	9555	11466	13377	15288	17199	19110	21021	22932	24843	26754	28665	30576	32487	34398	36309	38220	40131	42042	43953	45864
5-1/4"	8599	11466	14332	17199	20065	22932	25798	28665	31531	34398	37264	40131	42997	45864	48730	51597	54463	57330	60196	63063	65929	68796
7"	11466	15288	19110	22932	26754	30576	34398	38220	42042	45864	49686	53508	57330	61152	64974	68796	72618	76440	80262	84084	87906	91728

Notes:

1. Tabulated values are based on the factored compression resistance, 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 resistance, 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 resistance (compression perpendicular-to-grain) of the species and grade used for the plate material.
4. Verify local code requirements concerning minimum bearing.

To review PWT LVL products, please visit pwtewp.com.

Quick Reference Tables
Beam with Floor Loading

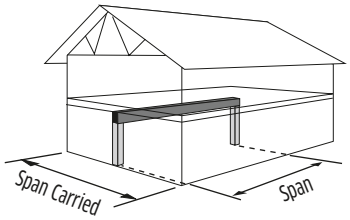


Table Usage:

1. Select the correct table for the supported floor joist condition (simple or continuous).
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' 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 16"** or **5-1/4" x 14".**
Note: The 3-1/2" x 16" requires 7-1/2" intermediate bearing if a multiple span beam.

CONTINUOUS FLOOR JOISTS (SPECIFIED FLOOR LOADS: 40 PSF LIVE LOAD, 15 PSF DEAD LOAD)

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"	9-1/2"	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"**	**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"	14"	16"	**16"**	**16"**	**16"**	-	-	-	-	-	-
	5-1/4"	11-7/8"	14"	14"	14"	14"	14"	14"	14"	16"	**16"**	**16"**
18'-0"	3-1/2"	16"	**16"**	**18"**	-	-	-	-	-	-	-	-
	5-1/4"	14"	14"	16"	16"	16"	16"	16"	**16"**	**16"**	**16"**	**18"**
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"	18"	18"	18"	18"	**18"**	**18"**	-	-	-	-	-
24'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	18"	18"	-	-	-	-	-	-	-	-	-

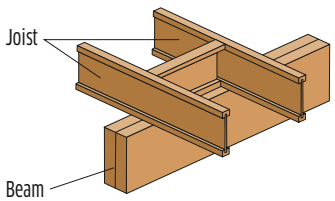
SIMPLE-SPAN FLOOR JOISTS (SPECIFIED FLOOR LOADS: 40 PSF LIVE LOAD, 15 PSF DEAD LOAD)

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"	11-1/4"	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"	11-7/8"	11-7/8"	11-7/8"	**14"**
	5-1/4"	9-1/4"	9-1/4"	9-1/4"	9-1/4"	9-1/2"	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"	11-7/8"	11-7/8"	11-7/8"	11-7/8"	11-7/8"
16'-0"	3-1/2"	14"	14"	14"	14"	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'-0"	3-1/2"	16"	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"	18"	**18"**	**18"**	**18"**	**18"**	-	-	-	-	-
	5-1/4"	14"	16"	16"	16"	16"	16"	16"	16"	16"	18"	**18"**
22'-0"	3-1/2"	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:

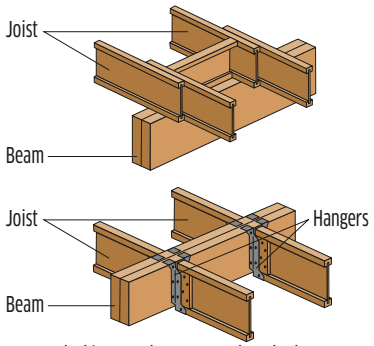
1. Use the Continuous Floor Joists table where the floor joists are continuous (multiple span) over the beam. Use the Simple-Span Floor Joists table where the floor joists frame into the side of or end on top of the beam.
2. Span is center-to-center of supports and is valid for simple and equal, continuous 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 compressive resistance, perpendicular-to-grain, of the LVL. See the Factored Reaction Resistance 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, or use the Exacte by PWT software for multiple-ply member connections.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. A floor live load reduction factor for tributary area has been applied where applicable.
9. Do not use where marked "-".

CONTINUOUS FLOOR JOISTS



Blocking optional

SIMPLE-SPAN FLOOR JOISTS



Blocking or other approved method of restraint required

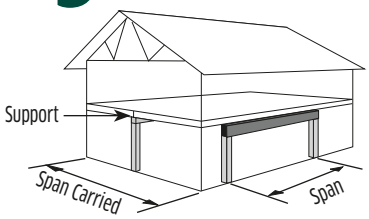
Quick Reference Tables

Beam with Combined Loading

Table Usage:

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"**.



Specified Loads

ROOF – 20 PSF SNOW OR LIVE, 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"	**16"**	**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"**	**18"**	**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"**	-	-	-	-	-
	5-1/4"	14"	16"	16"	16"	16"	16"	16"	16"	18"	**18"**	**18"**
18'-6"	3-1/2"	18"	18"	-	-	-	-	-	-	-	-	-
	5-1/4"	16"	16"	16"	16"	16"	16"	18"	18"	18"	-	-
20'-0"	3-1/2"	18"	-	-	-	-	-	-	-	-	-	-
	5-1/4"	16"	16"	18"	18"	18"	18"	18"	**18"**	-	-	-
22'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	18"	18"	18"	-	-	-	-	-	-	-	-
24'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	-	-	-	-	-	-	-	-	-	-	-

ROOF – 30 PSF SNOW, 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"	18"	18"	18"	18"	**18"**	**18"**	-	-	-	-	-
22'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	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" are limited to 3" (two trimmers) on each end. The bearing length is based on the compressive resistance, perpendicular-to-grain, of the LVL. See the Factored Reaction Resistance table on page 4 for additional information.
3. Deflections are limited to L/360 live/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, or use the Exacte by PWT software for multiple-ply member connections.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. A floor live load reduction factor for tributary area has been applied where applicable.
9. Do not use where marked "-".

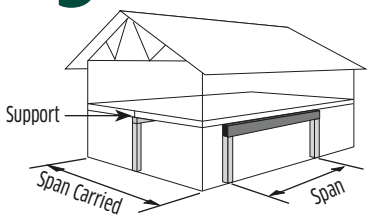
Quick Reference Tables

Beam with Combined Loading

Table Usage:

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"**.



Specified Loads

ROOF – 40 PSF SNOW, 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"	9-1/2"	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"	11-7/8"	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'-6"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	16"	16"	18"	18"	-	-	-	-	-	-	-
20'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	18"	18"	**18"**	-	-	-	-	**-**	-	-	-
22'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	-	-	-	-	-	-	-	-	-	-	-
24'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	-	-	-	-	-	-	-	-	-	-	-

ROOF – 50 PSF SNOW, 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"	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"
8'-0"	3-1/2"	9-1/4"	9-1/4"	9-1/4"	9-1/4"	9-1/4"	9-1/4"	9-1/2"	11-1/4"	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"
9'-6"	3-1/2"	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"	9-1/2"	11-1/4"	11-1/4"	11-1/4"	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"	**11-7/8"**	**11-7/8"**	**14"**	**14"**	**14"**	**14"**
	5-1/4"	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"	11-1/4"
12'-0"	3-1/2"	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"**
14'-0"	3-1/2"	**16"**	**16"**	**16"**	**16"**	**16"**	**18"**	-	-	-	-	-
	5-1/4"	14"	14"	14"	14"	14"	14"	**16"**	**16"**	**16"**	**16"**	**16"**
16'-0"	3-1/2"	**18"**	**18"**	**18"**	**18"**	-	-	-	-	-	-	-
	5-1/4"	14"	16"	16"	16"	**16"**	**16"**	**18"**	**18"**	**18"**	**18"**	**18"**
16'-6"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	16"	16"	16"	16"	-	-	-	-	-	-	-
18'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	16"	18"	**18"**	**18"**	**18"**	**18"**	-	-	-	-	-
18'-6"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	18"	18"	-	-	-	-	-	-	-	-	-
20'-0"	3-1/2"	-	-	-	-	-	-	-	-	-	-	-
	5-1/4"	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" are limited to 3" (two trimmers) on each end. The bearing length is based on the compressive resistance, perpendicular-to-grain, of the LVL. See the Factored Reaction Resistance table on page 4 for additional information.
3. Deflections are limited to L/360 live/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, or use the Exacte by PWT software for multiple-ply member connections.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. A floor live load reduction factor for tributary area has been applied where applicable.
9. Do not use where marked "-".

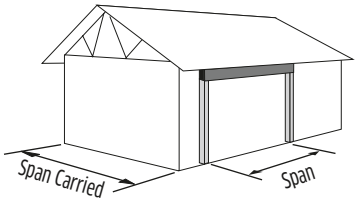
Quick Reference Tables

Beam with Roof Loading

Table Usage:

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 36'-0" span carried for a 30 psf Roof Snow load.
Solution: Using the correct table for the roof load with 36'-0" span carried, select either **3-1/2" x 16"** or **5-1/4" x 14".**



Specified Loads

ROOF – 20 PSF SNOW OR 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"	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"	-

ROOF – 30 PSF SNOW, 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"	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"	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"	-	-	-	-	-	-

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" are limited to 3" (two trimmers) on each end. The bearing length is based on the compressive resistance, perpendicular-to-grain, of the LVL. See the Factored Reaction Resistance table on page 4 for additional information.
3. Deflections are limited to L/360 live/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, or use the Exacte by PWT software for multiple-ply member connections.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. Pitch adjusted roof dead load shall not exceed 15 psf.
9. Do not use where marked "-".

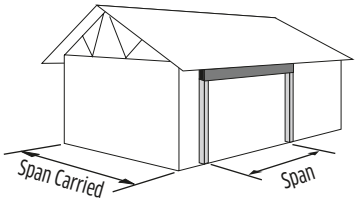
Quick Reference Tables

Beam with Roof Loading

Table Usage:

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 36'-0" span carried for a 50 psf Roof Snow load.
Solution: Using the correct table for the roof load with 36'-0" span carried, select a **5-1/4" x 16"**.
Note: A 3-1/2" beam does not work.



Specified Loads

ROOF – 40 PSF SNOW, 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"	-	-	-	-	-	-	-	-	-	-

ROOF – 50 PSF SNOW, 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"	11-1/4"	11-7/8"	11-7/8"	14"	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"	11-7/8"	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"**	**18"**	-
	5-1/4"	14"	14"	14"	14"	14"	16"	16"	16"	16"	16"	16"
16'-6"	3-1/2"	16"	16"	16"	-	-	-	-	-	-	-	-
	5-1/4"	14"	14"	14"	16"	16"	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"	18"	-	-	-	-	-	-	-	-	-	-
	5-1/4"	16"	16"	16"	16"	18"	18"	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"	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" are limited to 3" (two trimmers) on each end. The bearing length is based on the compressive resistance, perpendicular-to-grain, of the LVL. See the Factored Reaction Resistance table on page 4 for additional information.
3. Deflections are limited to L/360 live/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, or use the Exacte by PWT software for multiple-ply member connections.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. Pitch adjusted roof dead load shall not exceed 15 psf.
9. Do not use where marked "-".

Uniform Loads (PLF)
1¾" Floor Load Table

Table Usage:

1. Select the span required.
2. Divide the design loads by the number of plies to verify each ply of the member. Divide the design loads by 2 to verify a 3-1/2" width or by 3 to verify a 5-1/4" width.
3. Compare the factored design total load to the Factored Total Resistance column.
4. Compare the unfactored design total load to the Total Load Deflection Resistance.
5. Compare the unfactored design live load to the Live Load Deflection Resistance for the appropriate deflection limit.
6. Select a product that satisfies all three conditions.

Example:

For a 16' beam span, select a 2- and 3-ply beam that satisfies an L/360 Live Load deflection limit for the following specified loads:
Live Load = 480 plf; Dead Load = 180 plf

Calculate Design Loads:

Factored Total Load = (1.5 x 480) + (1.25 x 180) = 945 plf
Unfactored Total Load = 480 + 180 = 660 plf

Solution for a 2-ply beam:

Factored Total Load per ply = 945/2 = 473 plf
Unfactored Total Load per ply = 660/2 = 330 plf
Unfactored Live Load per ply = 480/2 = 240 plf
Use 2 plies 1-3/4" x 14"

Solution for a 3-ply beam:

Factored Total Load per ply = 945/3 = 315 plf
Unfactored Total Load per ply = 660/3 = 220 plf
Unfactored Live Load per ply = 480/3 = 160 plf
Use 3 plies 1-3/4" x 11-7/8"

Span (ft)	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"				1-3/4" x 11-7/8"				1-3/4" x 14"				1-3/4" x 16"				1-3/4" x 18"			
	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance
	Live Load		Total Load		Live Load		Total Load		Live Load		Total Load		Live Load		Total Load		Live Load		Total Load		Live Load		Total Load		Live Load		Total Load		Live Load		Total Load	
	L/480	L/360	L/240		L/480	L/360	L/240		L/480	L/360	L/240		L/480	L/360	L/240		L/480	L/360	L/240		L/480	L/360	L/240		L/480	L/360	L/240		L/480	L/360	L/240	
6	494	659	985	1071	947	1263		1366	1014	1353		1403	1553			1662																
7	323	430	642	917	630	840		1170	677	902		1202	1054	1406		1423																
8	221	295	439	802	438	584	872	1023	471	628	938	1051	744	992		1245																
9	158	211	313	639	316	421	627	909	340	454	676	933	542	723	1079	1105																
10	116	155	230	516	235	313	465	817	253	337	502	839	406	542	807	994	471	628	937	1049	735	980		1237	1042	1390		1414	1404			1591
11	88	118	173	426	179	238	353	676	193	257	381	711	311	415	618	903	362	483	719	953	569	759		1124	813	1084		1285	1104			1445
12	68	91	133	357	139	186	274	567	150	200	296	597	244	325	482	823	284	379	562	873	449	599	891	1030	645	860		1177	882	1176		1324
13	54	72	105	303	110	147	216	482	119	159	234	508	194	259	383	700	226	302	447	776	360	480	713	950	520	693	1032	1085	714	952		1221
14	43	58	83	261	89	119	173	415	96	128	188	437	157	209	309	602	183	244	361	668	292	390	578	881	424	566	841	1007	585	780		1133
15	35	47	67	227	73	97	141	361	78	105	153	380	128	171	252	524	150	200	295	581	241	321	475	783	350	467	693	939	485	647	961	1057
16	-	-	-	-	60	80	116	316	65	87	125	333	107	142	208	459	125	166	244	509	200	267	394	687	292	390	577	875	406	542	804	990
17	-	-	-	-	50	67	96	280	54	72	104	294	89	119	173	406	104	139	204	450	168	225	330	607	246	329	485	774	343	458	678	931
18	-	-	-	-	42	57	80	249	46	61	87	262	75	101	146	361	88	118	171	401	143	190	279	541	209	279	411	689	292	390	576	853
19	-	-	-	-	36	48	68	223	39	52	74	234	64	86	124	324	75	101	145	359	122	163	238	484	179	239	351	617	251	335	493	764
20	-	-	-	-	31	41	58	200	33	45	63	211	55	74	105	291	65	87	124	323	105	140	204	436	155	207	302	556	217	289	425	689
21	-	-	-	-	-	-	-	-	-	-	-	-	48	64	91	264	56	75	107	292	91	122	176	395	134	179	261	503	189	252	369	624
22	-	-	-	-	-	-	-	-	-	-	-	-	42	56	78	239	49	65	92	266	80	106	153	359	118	157	227	458	165	220	322	567
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	57	80	242	70	93	133	328	103	138	199	418	145	194	282	518
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	51	70	222	62	82	117	300	91	122	175	383	128	171	248	475
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	45	61	204	55	73	103	276	81	108	154	352	114	152	220	437
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	40	54	188	49	65	91	254	72	96	137	325	102	136	195	403
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	58	80	235	65	86	121	300	91	122	174	373
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	52	71	218	58	77	108	279	82	109	155	346
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	47	64	203	52	70	97	259	74	99	139	321
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	42	57	189	47	63	87	241	67	89	125	300

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. Factored Total Resistance is for standard (100%) duration and is adjusted to account for the self-weight of the member. The specified dead load shall not exceed the specified live load.
4. Live Load Deflection Resistance is limited to L/360 or L/480 as noted in the table. Vibration has not been considered.
5. Total Deflection Resistance is limited to L/240. Long term deflection (creep) has not been considered.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. Proper bearing must be provided. Bearing length must be checked for support reactions with the table on page 4.

Additional Notes:

1. The tabulated resistances represent the capacity of the member in pounds per lineal foot (plf) of length.
2. The designer shall check the Factored Total Resistance, the Total Deflection Resistance and the appropriate Live Load Deflection Resistance columns.
3. Where the Deflection Resistance is blank, the Factored Total Resistance governs the design.
4. For 1-3/4" thick LVL, 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 tabulated resistances in the tables are for a single ply of 1-3/4" LVL. For a 3-1/2" wide member, divide the design loads by 2 to verify the resistance of each ply. For a 5-1/4" wide member, divide the design loads by 3.
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, or use the Exacte by PWT software for multiple-ply member connections.
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"	1⅛"	1-3/16"	1-5/16"	1-3/8"	1-1/2"

* Deflections rounded to the nearest 1/16".

To review PWT LVL products, please visit pwtewp.com.

Uniform Loads (PLF)
1¾" Roof Load Table

Table Usage:

1. Select the span required. For beams with a pitch of 2:12 or greater, the horizontal span shall be multiplied by the appropriate roof pitch adjustment factor from the table at the bottom of this page.
2. Divide the design loads by the number of plies to verify each ply of the member. Divide the design loads by 2 to verify a 3-1/2" width or by 3 to verify a 5-1/4" width.
3. Compare the factored design total load to the Factored Total Resistance column.
4. Compare the unfactored design total load to the Total Load Deflection Resistance.
5. Compare the unfactored design live load to the Live Load Deflection Resistance for the appropriate deflection limit. For a live load deflection limit of L/480, compare the unfactored design live load to the L/480 Live Load Deflection Resistance from the Uniform Floor Load Resistance Tables.
6. Select a product that satisfies all three conditions.

Note: The serviceability limit states Importance Factor for Snow Load, Is, of 0.9 can be applied to the specified snow loads for evaluation of the deflection resistance. See the example to the right.

Example:

For an 10' horizontal beam span with a pitch of 4:12, select a 2- and 3-ply beam that satisfies an L/240 Snow Load deflection limit for the following specified loads: Snow Load = 720 plf; Dead Load = 400 plf.

Calculate Beam Span: 10' x 1.054 = 10.54' **–> Use Span = 11'**

Factored Total Load = (1.5 x 720) + (1.25 x 400) = 1580 plf
Unfactored Total Load = (0.9 x 720) + 400 = 1048 plf
Unfactored Snow Load = 0.9 x 720 = 648 plf

Solution for a 2-ply beam:

Factored Total Load per ply = 1580/2 = 790 plf
Unfactored Total Load per ply = 1048/2 = 524 plf
Unfactored Snow Load per ply = 648/2 = 324 plf
Use 2 plies 1-3/4" x 11-1/4"

Solution for a 3-ply beam:

Factored Total Load per ply = 1580/3 = 527 plf
Unfactored Total Load per ply = 1048/3 = 350 plf
Unfactored Snow Load per ply = 648/3 = 216 plf
Use 3 plies 1-3/4" x 9-1/4"

Span (ft)	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"				1-3/4" x 11-7/8"				1-3/4" x 14"				1-3/4" x 16"				1-3/4" x 18"			
	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance	Unfactored Defl. Resistance			Factored Total Resistance
	Snow/Live Load		Total Load		Snow/Live Load		Total Load		Snow/Live Load		Total Load		Snow/Live Load		Total Load		Snow/Live Load		Total Load		Snow/Live Load		Total Load		Snow/Live Load		Total Load		Snow/Live Load		Total Load	
	L/360	L/240	L/180		L/360	L/240	L/180		L/360	L/240	L/180		L/360	L/240	L/180		L/360	L/240	L/180		L/360	L/240	L/180		L/360	L/240	L/180		L/360	L/240	L/180	
6	659	989		1071	1263			1366	1353			1403				1662																
7	430	646	857	917	840			1170	902			1202	1406			1423																
8	295	443	587	802	584	876		1023	628	943		1051	992			1245																
9	211	316	418	639	421	632	838	909	454	681	903	933	723	1085		1105																
10	155	233	308	516	313	470	622	817	337	506	671	839	542	813		994	628	943		1049	980			1237	1390			1414				1591
11	118	177	232	426	238	358	473	676	257	386	510	711	415	623	826	903	483	725		953	759			1124	1084			1285				1445
12	91	137	179	357	186	279	367	567	200	301	397	597	325	488	645	823	379	568	752	873	599	898		1030	860			1177	1176			1324
13	72	108	141	303	147	221	290	482	159	239	314	508	259	388	513	700	302	453	598	776	480	720		950	693	1040		1085	952			1221
14	58	87	113	261	119	178	233	415	128	193	252	437	209	314	413	602	244	367	483	668	390	585	773	881	566	849		1007	780			1133
15	47	71	91	227	97	146	190	361	105	157	205	380	171	257	338	524	200	301	395	581	321	482	635	783	467	701	927	939	647	970		1057
16	39	59	75	199	80	120	156	316	87	130	169	333	142	214	279	459	166	250	327	509	267	401	528	687	390	585	772	875	542	813		990
17	32	49	62	175	67	101	130	280	72	109	141	294	119	179	233	406	139	209	274	450	225	337	443	607	329	493	650	774	458	687	907	931
18	-	-	-	-	57	85	109	249	61	92	118	262	101	151	196	361	118	177	231	401	190	286	374	541	279	419	551	689	390	585	771	853
19	-	-	-	-	48	72	92	223	52	78	100	234	86	129	167	324	101	151	196	359	163	245	319	484	239	359	471	617	335	502	661	764
20	-	-	-	-	41	62	78	200	45	67	85	211	74	111	143	291	87	130	168	323	140	211	274	436	207	310	406	556	289	434	570	689
21	-	-	-	-	36	54	67	181	39	58	73	191	64	96	123	264	75	113	145	292	122	183	237	395	179	269	351	503	252	378	495	624
22	-	-	-	-	31	47	58	164	34	51	63	173	56	84	106	239	65	98	125	266	106	160	206	359	157	236	306	458	220	331	432	567
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	86	109	242	93	140	180	328	138	207	268	418	194	291	379	518
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	76	96	222	82	124	158	300	122	183	236	383	171	257	334	475
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	67	84	204	73	110	139	276	108	162	209	352	152	229	296	437
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	60	74	188	65	98	123	254	96	145	185	325	136	204	263	403
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	54	66	174	58	87	110	235	86	130	165	300	122	183	235	373
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	48	58	161	52	78	98	218	77	116	147	279	109	164	210	346
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	71	87	203	70	105	132	259	99	148	189	321
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	64	78	189	63	95	119	241	89	134	170	300

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. Factored Total Resistance is for standard (100%) duration and is adjusted to account for the self-weight of the member. The specified dead load shall not exceed the specified live load.
4. Live Load Deflection Resistance is limited to L/360 or L/240 as noted in the table.
5. Total Deflection Resistance is limited to L/180. Long term deflection (creep) has not been considered.
6. These tables assume full lateral support of the compression edge. Other conditions require further analysis by a design professional.
7. Provide support to prevent lateral movement and rotation at the end bearings. Lateral support may also be required at the interior bearings by the building code.
8. Proper bearing must be provided. Bearing length must be checked for support reactions with the table on page 4.

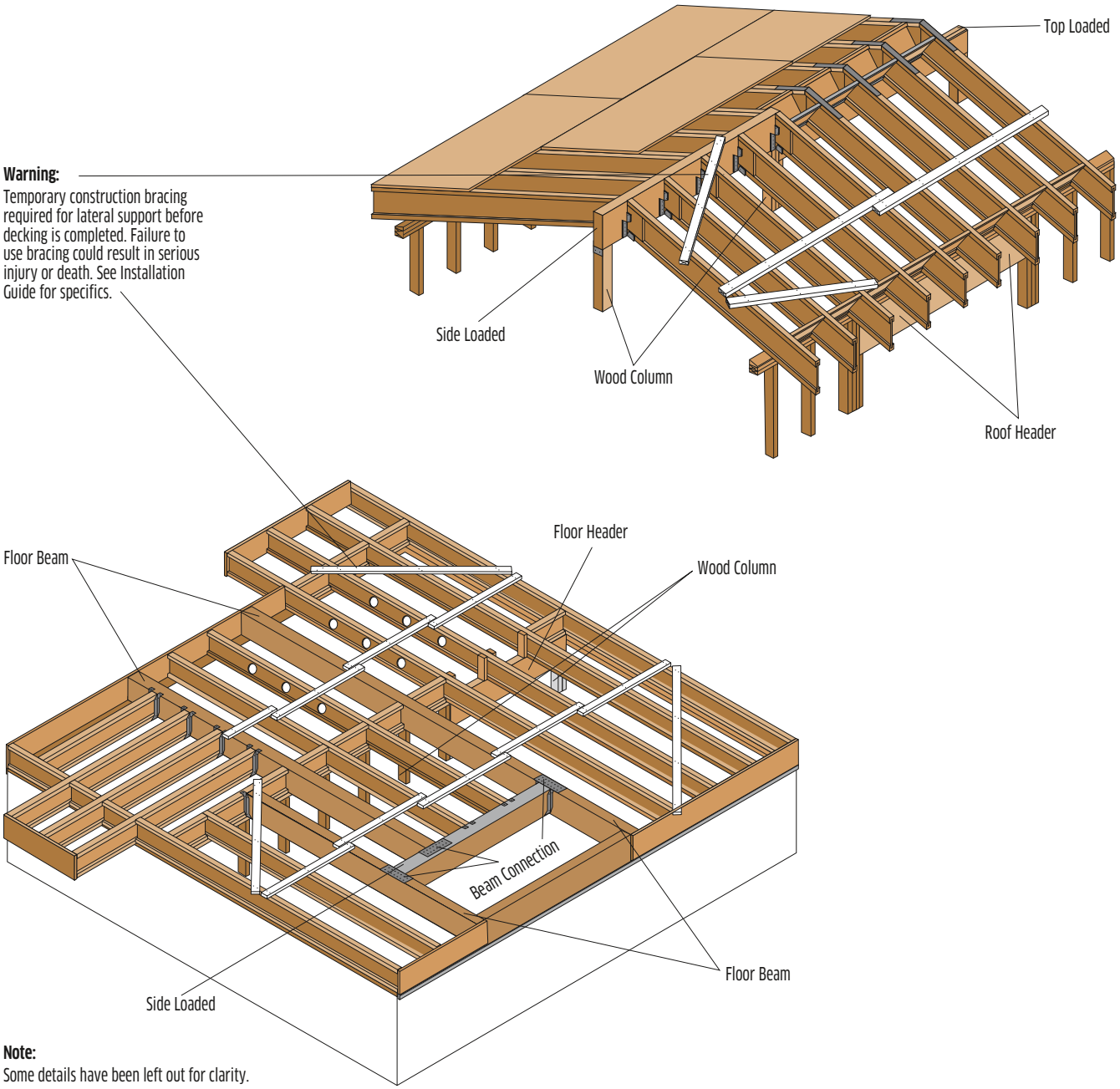
Additional Notes:

1. The tabulated resistances represent the capacity of the member in pounds per lineal foot (plf) of length.
2. The designer shall check the Factored Total Resistance, the Total Deflection Resistance and the appropriate Live Load Deflection Resistance columns.
3. For beams with a pitch of 2:12 or greater, the horizontal span shall be multiplied by the appropriate pitch adjustment factor from the table above.
4. Where the Deflection Resistance is blank, the Factored Total Resistance governs the design.
5. For 1-3/4" thick LVL, 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 tabulated resistances in the tables are for a single ply of 1-3/4" LVL. For a 3-1/2" wide member, divide the design loads by 2 to verify the resistance of each ply. For a 5-1/4" wide member, divide the design loads by 3.
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, or use the Exacte by PWT software for multiple-ply member connections.
8. Do not use a product where designated "-" without further analysis by a design professional.

PITCH ADJUSTMENT

Pitch	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	1.25	1.302	1.357	1.414

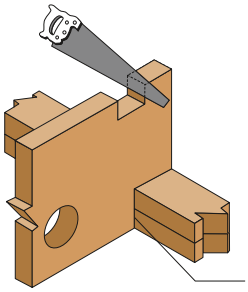
Temporary Bracing & Warnings



Note:
Some details have been left out for clarity.

Warning The following conditions are NOT permitted!

Do not use visually damaged products without first checking with your local PWT Engineered Wood Products distributor or sales office.



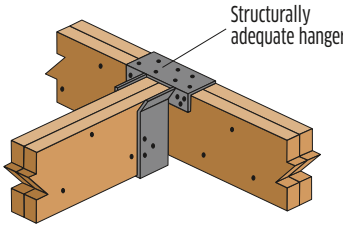
All notched or drilled beams must be reviewed by a professional engineer. See hole detail on page 13 for allowable hole sizes and locations.

Do not notch beam at support.

To review PWT LVL products, please visit pwtewp.com.

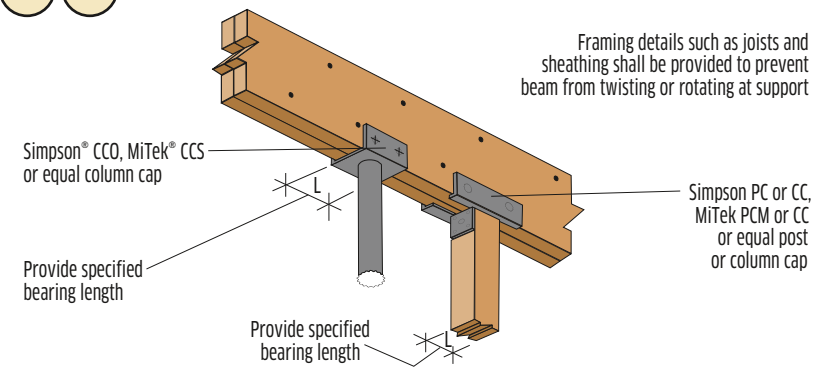
Installation Details

P3 BEAM CONNECTION

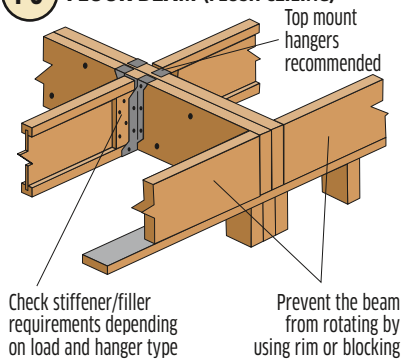


Hanger shall apply load equally to each ply or special design required

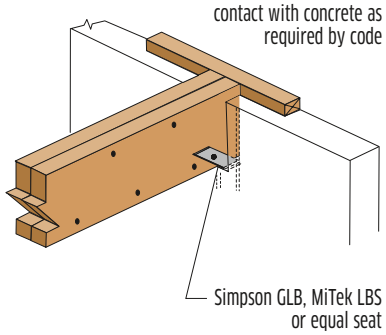
P4 P5 STEEL COLUMN & WOOD COLUMN



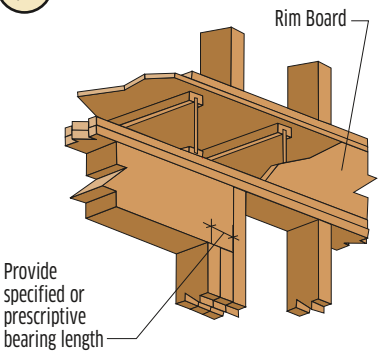
P6 FLOOR BEAM (FLUSH CEILING)



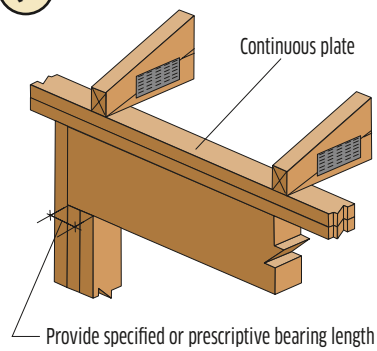
P7 CONCRETE WALL



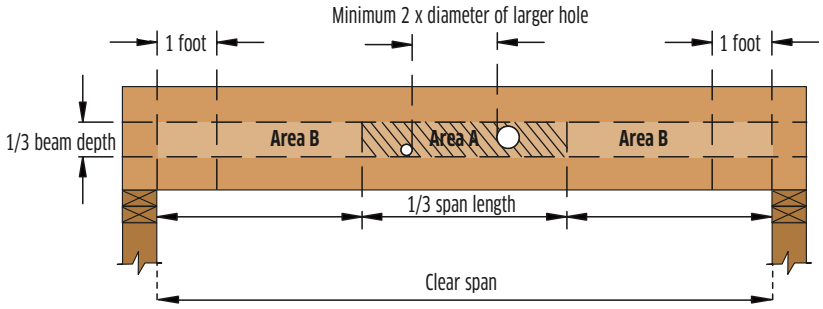
Q1 WINDOW/DOOR HEADER



Q2 WINDOW/DOOR HEADER



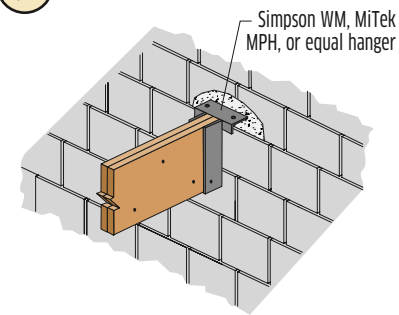
Q3 BEAM HOLE DETAILS



Notes:

1. These guidelines apply to uniformly loaded beams selected from the Quick Reference Tables or the Uniform Load Tables or designed with PWT's design/specification software only. For all other applications, such as beams with concentrated loads, please contact your Pacific Woodtech 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 Pacific Woodtech 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.

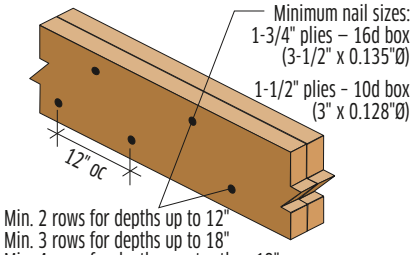
Q4 MASONRY HANGER



Note: Protect wood from contact with concrete as required by code.

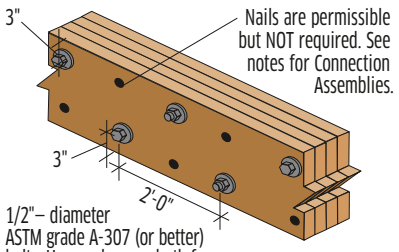
Connection of Multiple Ply Beams

P1 TOP-LOADED BEAM – NAILED CONNECTION
(SEE CONNECTION ASSEMBLIES FOR MORE DETAILS)



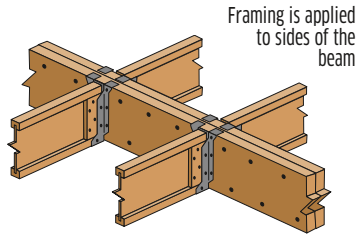
Framing is applied to top of the beam so that each ply carries an equal load

P2 TOP-LOADED BEAM – BOLTED CONNECTION
(SEE CONNECTION ASSEMBLIES FOR MORE DETAILS)



Framing is applied to top of the beam so that each ply carries an equal load

Q3 SIDE-LOADED BEAM
(SEE CONNECTION ASSEMBLIES FOR MORE DETAILS)

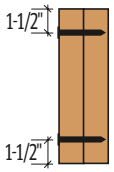


SIDE LOADS ARE NOT RECOMMENDED FOR BEAMS OVER 5-1/2" WIDE UNLESS EQUALLY APPLIED TO BOTH FACES

See Connection Assemblies for more information

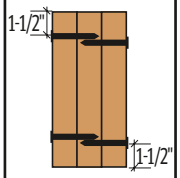
Connection Assemblies

DETAIL A
Maximum 3-1/2" Wide 2-Ply Beams



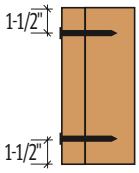
1-3/4" max. ply thickness

DETAIL B
Maximum 5-1/4" Wide 3-Ply Beams



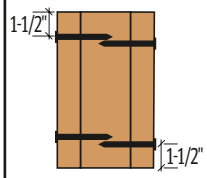
1-3/4" max. ply thickness

DETAIL C/E
Maximum 7" Wide 2-Ply Beams



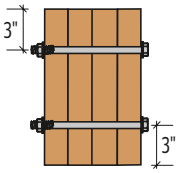
1-3/4" maximum side member
3-1/2" main member for C
5-1/4" main member for E

DETAIL D
Maximum 7" Wide 3-Ply Beams

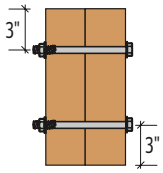


1-3/4" maximum side members
5-1/4" main member

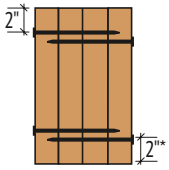
DETAIL F
Maximum 7" Wide 3- or 4-Ply Beams



DETAIL G
Maximum 7" Wide 2-Ply Beams



DETAIL H
Maximum 7" Wide 2-, 3- or 4-Ply Beams



Simpson SDS 1/4" x 6"
Simpson SDW 6-3/4"or equal
Simpson SDW may be driven from one side.

* Minimum of 2" or the screw mfg.'s edge distance.

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	788	1182	780	1560
B	591	887	585	1170
C	591	887	878	1755
D	525	788	780	1560
E	525	788	868	1736
F	na	na	520	1040
G	na	na	1560	3120
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"	0.160	216	1.10	common wire
	0.152	197	1.00	spiral
3-1/4"	0.144	178	0.90	common wire
	0.122	131	0.66	spiral
	0.120	127	0.64	power-driven[13]
3"	0.144	178	0.90	common wire
	0.122	131	0.66	spiral
	0.120	127	0.64	power-driven[13]

Notes:

1. When driving nails from each face, alternate every other nail in each row.
2. Unless specifically designed, use 3-1/2" nails for 1-3/4" thick plies. If the nails do not fully penetrate the second ply (main member), then the nails shall be driven from both faces.
3. Use 2 rows of nails for depths to 12". Use 3 rows of nails for depths greater than 12", up to 18". Use 4 rows of nails for depths greater than 18", up to 24".
4. Factored resistances are for standard load duration and shall be adjusted according to code. If the dead load exceeds the live load, the appropriate load duration factor (<1) shall be applied.
5. The Factored Uniform Side-Load Resistance values are the maximum factored 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 15. 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 side-load connection from this table. The beam shall be designed to support all applied loads.
6. The Factored Uniform Side-Load Resistance for nails is based on 3-1/2" spiral nails for 1-3/4" LVL. For other nail sizes, multiply the Factored Uniform Side-Load Resistance by the Nail Size Factor from the Nail Schedule.
7. The Factored Uniform Side-Load Resistance for bolts is based on ASTM grade A-307, 1/2"Ø bolts, for loads applied perpendicular-to-grain (see Fastener Design on page 15).
8. For nails at 8" oc, multiply resistance by 1.5. For nails at 6" oc, multiply resistance by 2. For four rows of nails, double the two-row resistance.
9. 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.
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 have a yield strength equivalent to common wire nails of the same shank diameter.
14. Other nail, screw or bolt configurations are possible. Refer to the Fastener Design table on page 15 or contact your Pacific Woodtech distributor.

Fastener Design and Fastener & Load Orientation

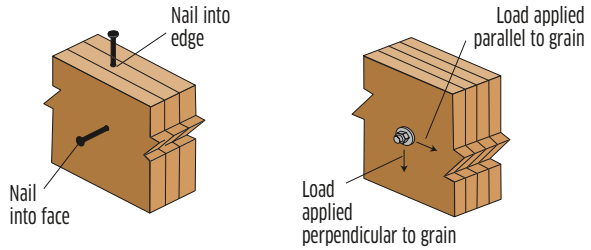
FASTENER DESIGN

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 standard 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



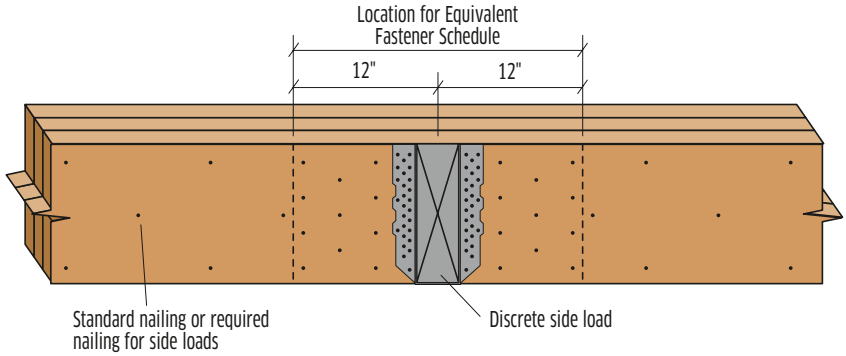
NAIL SPACING REQUIREMENTS

PWT LVL Ply Thickness	Fastener Orientation[4]	Nail Size[1] (common wire or spiral)	Minimum End Distance[5]	Minimum Nail Spacing per Row[5]	
				Single Row	Multiple Rows
≥ 1-1/2"	Edge	2-1/2"	2-1/2"	4"	4"[6]
		3" & 3-1/4"	2-1/2"	4"	5"[6]
		3-1/2"	3-1/2"	5"	6"[6,7]
	Face	2-1/2"	1-1/2"	3"	3"
		3" & 3-1/4"	1-1/2"	3"	3"
		3-1/2"	1-1/2"	5"	5"

Notes:

1. Nails are common wire or spiral nails.
2. Edge distance shall be such that does not cause splitting.
3. Multiple rows of nails shall be offset at least 1/2" and staggered.
4. 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.)
5. Minimum End Distance and Minimum Nail Spacing are tabulated based on common wire nails. For nails with smaller diameters, the spacing and end distance of the common wire nail with the next larger diameter may be used.
6. Minimum nail spacing is tabulated for LVL stamped with plant number 1089. The minimum spacing may be reduced 1" for LVL stamped with plant numbers 1066 and 1071.
7. Minimum nail spacing may be reduced 1" for LVL stamped with plant number 1089, for thickness of 1-3/4" or greater.

SIDE-LOAD CONNECTION EXAMPLE



Example: Assuming a properly designed 3-ply 14" beam, determine the equivalent connection to support a factored point load of 6970 lb applied to the side of the beam.

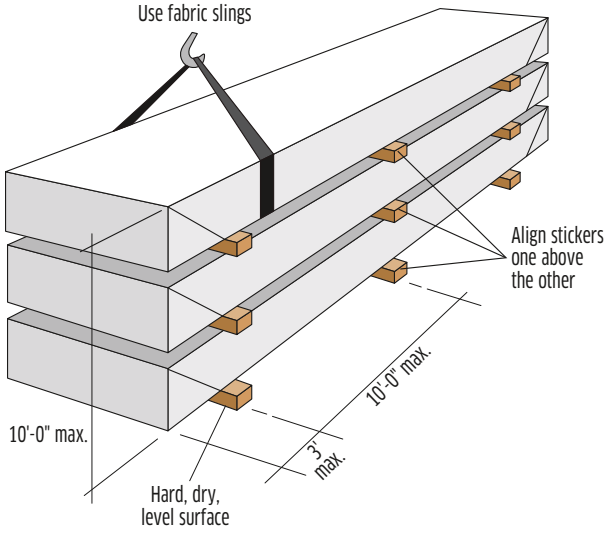
Solution:

1. Determine the equivalent PLF load over the 2' length by dividing the applied factored load by 2: 6970 lb / 2' = 3485 plf.
2. Divide the equivalent PLF load by the factored uniform side-load resistance for the appropriate detail. For a 14" depth, 3 rows of nails are required. For detail **B** with 3 rows of 3-1/2" spiral nails at 12" oc: 3485 plf / 887 = 3.9.
3. The required total number of nails is: 3.9 * 3 rows of nails @ 12" oc = 11.7 nails per foot.
4. Connect the front (loaded) ply with the nailing determined in step 3: drive 12 3-1/2" spiral nails within 12" to each side of the point load (a total of 24 nails). Verify nail spacing.
5. Connect the back ply with half the number of nails determined in step 4: drive 6, 3-1/2 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.

Code Evaluation Reports: CCMC *13006-R* & *11518-R*, APA® *PR-L233C* & *PR-L280C*, or visit pwtewp.com.

HANDLING AND STORAGE GUIDELINES

- WARNING: Failure to follow proper procedures for handling, storage and installation could result in unsatisfactory performance, unsafe structures and possible collapse.
- Keep PWT™ 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 PWT distributor for assistance when damaged products are encountered.
- For satisfactory performance, PWT LVL must be used under dry, covered and well-ventilated interior conditions in which the average equilibrium moisture content (MC) of lumber is 15% or less over a year and does not exceed 19% at any time. For built-up members, PWT LVL shall be dry before nailing or bolting to avoid trapping moisture.
- PWT LVL shall not be used for unintended purposes such as ramps and planks.



PWT™
FOCUSED ON EWP

1850 Park Lane Burlington, WA 98233
TF 888.707.2285
pwtewp.com

For product catalog and complete warranty details or for more information on the full line of PWT products or the nearest distributor, visit pwtewp.com.

PWT products are manufactured at different locations in the United States and Canada.

PWT™ LVL