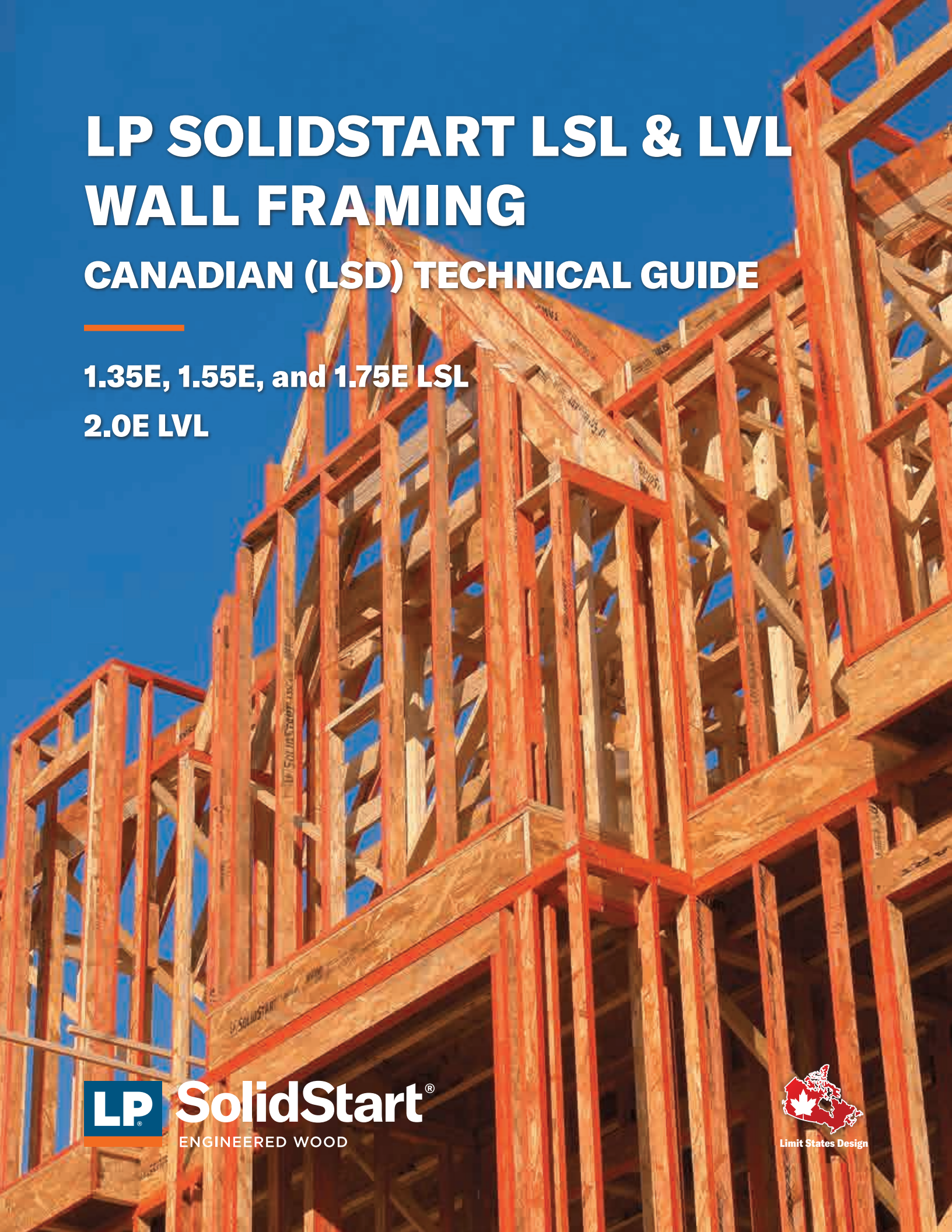
# LP SOLIDSTART LSL & LVL WALL FRAMING

## CANADIAN (LSD) TECHNICAL GUIDE

**1.35E, 1.55E, and 1.75E LSL**

**2.0E LVL**



LP SolidStart® ENGINEERED WOOD

Limit States Design

# A Word About Wall Framing

Architects are raising the roof and stretching walls beyond the reach of conventional lumber. LP® SolidStart® LSL and LVL studs redefine the standard for wall framing by providing structural walls that can be straighter, taller and stronger for both conventional and challenging engineered applications. Because LP manufactures its LSL and LVL to high standards, builders know that they'll get fewer callbacks and save themselves time and money compared to dimension lumber products.

Where traditional lumber studs warp, bow and twist as they dry, LP SolidStart LSL and LVL won't because they start dry from the mill. Having straight walls gives homeowners the peace of mind that their cabinets will stay flush to the wall, their tile and drywall will be less likely to crack and their windows and doors will function properly. That's performance you can count on. Using this technical guide, LP SolidStart LSL and LVL can be specified for use in conventional (prescriptive) and engineered wood-frame wall construction.

## PRESCRIPTIVE CONSTRUCTION

Prescriptive construction provisions for wood-framed walls are included in Part 9 - Housing and Small Buildings of the 2015 National Building Code of Canada (NBC). Section 9.23 on Wood-Frame Construction covers buildings that are less than 3 stories in height and 6460 square feet [600 square meters] in area. Wall construction under this method is:

- Generally framed with lumber usually repetitive, spaced not more than 24 in [600 mm] on centers
- Wall planes are cladded, sheathed, braced at least on one side
- Specified floor live loads do not exceed 50 psf [2.4kPa]
- Spans of wood members do not exceed 40 feet [12.2 meters]

In prescriptive method, wall members and their connections are selected from tables in the NBC rather than being calculated such as the table below for exterior wall studs. LP SolidStart LSL and LVL can be substituted for lumber studs if the requirements for prescriptive construction are met. Wall studs under this method may be notched or drilled with holes up to 1/3 of the depth of the stud in accordance with Section 9.23.5.3 of the NBC. Refer to Drilling & Notching on page 20.

**EXTERIOR WALL STUDS FOR PRESCRIPTIVE CONSTRUCTION (NBC TABLE 9.23.10.1)**

| Supported Loads (Dead Load Included) | Minimum Stud Size | Maximum Stud Spacing | Maximum Unsupported Height |
|---|---|---|---|
| Roof with or without attic storage | 1-1/2" x 2-1/2" | 16" | 7'-10" |
| | 1-1/2" x 3-1/2" | 24" | 9'-10" |
| Roof with or without attic storage plus 1 floor | 1-1/2" x 3-1/2" | 16" | 9'-10" |
| | 1-1/2" x 5-1/2" | 24" | 9'-10" |
| Roof with or without attic storage plus 2 floors | 1-1/2" x 3-1/2" | 12" | 9'-10" |
| | 2-1/2" x 3-1/2" | 16" | 9'-10" |
| | 1-1/2" x 5-1/2" | 16" | 11'-10" |
| Roof with or without attic storage plus 3 floors | 1-1/2" x 5-1/2" | 12" | 5'-11" |

## ENGINEERED DESIGN CONSTRUCTION

Wall construction beyond the prescriptive method is designed in accordance with Part 4 of the NBC. For most design provisions related to wood, the NBC refers to CSA Standard O86 – Engineering Design in Wood. This guide follows the Limit States Design Method and relevant provisions for wind load design in the NBC and User's Guide.

In this guide, the user needs only to select the appropriate wind pressure and terrain condition of the locality. With known wall framing design dimensions, factored vertical resistance and deflection limit are calculated using Ultimate Limit States Design (ULS) and Serviceability Limit States Design (SLS) respectively. They are shown in the tables for extensive LP SolidStart LSL and LVL grades and sizes. Design examples are provided on pages 16–19 to aid in using the tables.

Notches and holes in LP SolidStart LSL and LVL wall framing with some restrictions, are permitted when designed in accordance with the provisions of CSA Standard O86, with additional adjustments as prescribed herein. The wall stud and exterior wall column tables in this guide include the effects of a hole on their capacity. Refer to Drilling & Notching on page 20 for the limitations of hole size and location.

## 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.

## DEFLECTION LIMITS

Deflections are calculated due to lateral wind loads and include eccentric axial Live and Snow Loads (excluding Dead Load). This deflection is amplified to account for PΔ effect.

Like floor and roof systems, walls are subject to code-prescribed deflection limits as well as industry recommendations. Always verify the deflection requirements. They are commonly prescribed by codes, design professionals or manufacturer of wall finishes. The table below shows the common deflection limits.

**COMMON DEFLECTION LIMITS**

| Condition | Deflection |
|---|---|
| Masonry veneer | L/360[1], [2] |
| All other wall members | L/180[1] |

[1] Table D-1 of the NBC User's Guide
[2] Clause A.5.4.2 of CSA Standard O86-14

## FIRE-RATED WALL CONSTRUCTION

For engineered wall construction, LP SolidStart LSL and LVL (1.5E and higher) can be used for fire-rated wall assemblies. Contact your LP SolidStart Products distributor for assistance in designing wall studs and exterior columns for fire-rated walls.

# Table of Contents

# Product Specifications and Design Values

## SPECIFIED STRENGTH AND STIFFNESS (PSI)

| Material | Grade | Beam Orientation | | | | Plank Orientation | | | | Axial | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bending ($f_b$) | Modulus of Elasticity (MOE) ($x10^6$ psi) | Shear ($f_v$) | Compression perpendicular to the grain ($f_{cp}$) | Bending ($f_b$) | Modulus of Elasticity (MOE) ($x10^6$ psi) | Shear ($f_v$) | Compression perpendicular to the grain ($f_{cp}$) | Tension ($f_t$) | Compression ($f_c$) |
| LP® SolidStart® LSL | 1.35E | 3195 | 1.35 | 760 | 1365 | 3530 | 1.35 | 290 | 1240 | 2020 | 2635 |
| | 1.55E | 4360 | 1.55 | 760 | 1595 | 4820 | 1.55 | 290 | 1405 | 2715 | 3470 |
| | 1.75E | 4620 | 1.75 | 760 | 1730 | 5170 | 1.75 | 290 | 1610 | 3350 | 3910 |
| LP SolidStart LVL | $2900F_b$-2.0E | 5359 | 2.0 | 530 | 1365 | 5452 | 2.0 | 260 | 1001 | 2694 | 5107 |

**NOTES:**

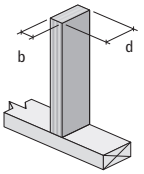
1. LP SolidStart LSL and LVL shall be designed for dry-use conditions only. Dry-use applies to products installed in dry, covered and well ventilated interior conditions in which the equivalent moisture content in lumber will not exceed 15% nor a maximum of 19%.
2. The specified strengths and stiffness are for standard load duration. Bending, shear and axial tension and both compression parallel-to-grain and perpendicular-to-grain shall be adjusted according to code. Modulus of elasticity shall not be adjusted for load duration.
3. The specified bending strength, $f_b$, for LP SolidStart LSL in the Beam orientation is tabulated for a standard 12" depth. For depths other than 12", multiply $f_b$ by $(12/depth)^{0.120}$. For depths less than 3-1/2", adjust $f_b$ by 1.159.
4. The specified bending, $f_b$, for LP SolidStart LVL in the Beam orientation is tabulated for a standard 12" depth. 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. For depths greater than 12", multiply $f_b$ by $(12/depth)^{0.143}$.
5. The specified Bending, $f_b$, in the Plank orientation shall not be adjusted for depth (thickness).
6. The specified edgewise bending shall also be multiplied by the system factor, $K_H$ = 1.04, when 3 or more pieces are properly connected in direct contact or are used as wall studs spaced no more than 24" oc and properly connected together by an adequate wall sheathing.
7. The specified tension strength, $f_t$, for LP SolidStart LSL is assigned for a standard length of 20 feet. For other lengths, multiply $f_t$ by $(20/length)^{0.092}$. For lengths less than 3 feet, use the design tensile stresses adjusted to 3 feet.
8. The specified tension strength, $f_t$, for LP SolidStart LVL is assigned for a standard length of 20 feet. For lengths other than 20 feet, multiply $f_t$ by $(20/length)^{0.111}$. For lengths less than 3 feet, use the value adjusted for 3 feet.
9. Deflection calculations for LP SolidStart LSL and LVL shall include both bending and shear deformations.

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

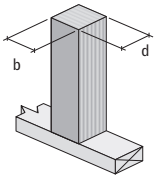
Where: $\Delta$ = deflection (in), E = modulus of elasticity (from table), w = uniform load (plf), b = width (in), L = design span (ft), d = depth (in direction of bending) (in)

Equations for other conditions can be found in engineering references.

**PRODUCT ORIENTATION**




Beam (Edgewise)




Plank (Flatwise)

## FACTORED BEARING RESISTANCE

| Stud or Column Size | Column Bearing (lbs) | | | | Stud Bearing (plf) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.0E LP LVL (1001 psi) | 1.35E LP LSL (1240 psi) | 1.55E LP LSL (1405 psi) | 1.75E LP LSL (1610 psi) | 2.0E LP LVL (1001 psi) | | 1.35E LP LSL (1240 psi) | | 1.55E LP LSL (1405 psi) | | 1.75E LP LSL (1610 psi) | |
| | | | | | 12" oc | 16" oc | 12" oc | 16" oc | 12" oc | 16" oc | 12" oc | 16" oc |
| 1-1/2" x 3-1/2" | 4204 | 5208 | 5901 | 6762 | 4204 | 3153 | 5208 | 3906 | 5901 | 4425 | 6762 | 5071 |
| 1-1/2" x 5-1/2" | 6606 | 8184 | 9273 | 10626 | 6606 | 4954 | 8184 | 6138 | 9273 | 6954 | 10626 | 7969 |
| 1-1/2" x 7-1/4" | 8708 | 10788 | 12223 | 14007 | 8708 | 6531 | 10788 | 8091 | 12223 | 9167 | 14007 | 10505 |
| 1-3/4" x 5-1/2" | 7707 | 9548 | 10818 | 12397 | 7707 | 5780 | 9548 | 7161 | 10818 | 8113 | 12397 | 9297 |
| 1-3/4" x 7-1/4" | 10160 | 12586 | 14260 | 16341 | 10160 | 7620 | 12586 | 9439 | 14260 | 10695 | 16341 | 12255 |
| 3-1/2" x 3-1/2" | 9809 | 12152 | 13769 | 15778 | | | | | | | | |
| 3-1/2" x 5-1/2" | 15415 | 19096 | 21637 | 24794 | | | | | | | | |
| 3-1/2" x 7-1/4" | 20320 | 25172 | 28521 | 32683 | | | | | | | | |
| 5-1/4" x 5-1/4" | 22072 | 27342 | 30980 | 35500 | | | | | | | | |
| 5-1/4" x 5-1/2" | 23123 | 28644 | 32455 | 37191 | | | | | | | | |
| 5-1/4" x 7-1/4" | 30480 | 37758 | 42782 | 49024 | | | | | | | | |
| 7" x 7" | 39239 | 48608 | 55076 | 63112 | | | | | | | | |

**NOTES:**

1. The resistance for wood bearing is based on the compression strength, perpendicular to grain, of the bearing plate based on standard term load duration and dry service conditions in accordance with CSA Standard O86.
2. To determine the bearing resistance of a multiple-ply member (such as a double 2x4 stud), multiply the bearing resistance from the table by the number of plies. The resistance is additive and may be increased for wood bearing on wood plates as per note 3.
3. When a stud or column is located at least 3" from the end of a wall plate, the bearing resistance above are permitted to be increased by the length of bearing factor $K_B$ per Clause 6.5.7.5 of CSA Standard O86-14.

# Code Provisions for Wind Loads

Using Static Procedure excluding any adjustments for speed-up over hills and escarpments, all wind loads for walls in this guide are calculated based on the following:

$$p = I_w * q_{1/50} * C_e * (C_pC_g - C_{pi} * C_{gi})$$

Where:

- p = Design wind pressure (kPa)
- $I_w$ = Importance factor for wind loads
- $q_{1/50}$ = Hourly wind pressure (kPa) based on Table C-2 of Appendix C of the NBC
- $C_e$ = Exposure factor based on Exposure categories below
- $C_pC_g$ = External peak composite pressure-gust coefficient based on the NBC User's Guide
- $C_{pi}$ = Internal pressure coefficient
- $C_{gi}$ = Internal gust effect factor

**DEFINITIONS**

**Mean roof height -** is the mean height of the roof or 6 m [19.7 ft], whichever is greater. The height of the eaves may be substituted for the mean height if the slope of the roof is less than 7° (NBC User's Guide Commentary).

Exposure Categories:

**Open terrain -** is level terrain with only scattered buildings, trees and other obstructions, open water or shorelines (NBC Section 4.1.7).

**Rough terrain -** is suburban, urban or wooded terrain extending upwind from the building uninterrupted for at least 1 km [0.62 mi] or 20 times the building height, whichever is greater (NBC Section 4.1.7).

For more relevant code provisions refer to:

1. Section 4.1.7 (Wind Load) of the NBC, and
2. Commentary I (Wind Loads and Effects) of the NBC User's Guide.

# Factored Free-Standing Interior Column Resistance (lbs)

**TO USE:**

1. Determine the height of the column. If not listed, select the next tallest height in the table.
2. Select the LP® SolidStart® LSL or LVL grade and size where the factored axial resistance meets or exceeds the applied factored vertical load.
3. Verify the bearing resistance of the support for the selected column. See Design Assumption 6 below.

## SOLID SECTIONS

| Height | 3-1/2" 1.35E LP LSL | | | 3-1/2" 1.75E LP LSL | | | 3-1/2" 2.0E LP LVL | | 5-1/4" 2.0E LP LVL | | | 7" 2.0E LP LVL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | x 3-1/2" | x 5-1/2" | x 7-1/4" | x 3-1/2" | x 5-1/2" | x 7-1/4" | x 5-1/2" | x 7-1/4" | x 5-1/4" | x 5-1/2" | x 7-1/4" | x 7" |
| 4' | 15225 | 23925 | 31535 | 21875 | 34362 | 45313 | 40489 | 53368 | 67697 | 70914 | 93437 | 126560 |
| 5' | 13347 | 20977 | 27643 | 18903 | 29703 | 39157 | 34666 | 45698 | 63191 | 66195 | 87272 | 122098 |
| 6' | 11433 | 17964 | 23681 | 15962 | 25089 | 33072 | 29082 | 38344 | 57971 | 60729 | 80059 | 116553 |
| 7' | 9651 | 15164 | 19995 | 13316 | 20930 | 27589 | 24162 | 31848 | 52420 | 54892 | 72391 | 110074 |
| 8' | 8088 | 12712 | 16757 | 11056 | 17374 | 22910 | 20005 | 26370 | 46894 | 49126 | 64756 | 103062 |
| 9' | 6763 | 10632 | 14007 | 9170 | 14409 | 19002 | 16572 | 21844 | 41661 | 43640 | 57503 | 95678 |
| 10' | 5655 | 8885 | 11716 | 7615 | 11971 | 15774 | 13754 | 18134 | 36828 | 38588 | 50839 | 88248 |
| 12' | 3967 | 6238 | 8219 | 5289 | 8308 | 10955 | 9549 | 12588 | 28641 | 29995 | 39555 | 74041 |
| 14' | 2815 | 4423 | 5831 | 3720 | 5846 | 7705 | 6715 | 8851 | 22292 | 23363 | 30785 | 61499 |
| 16' | – | – | – | – | – | – | – | – | 17418 | 18249 | 24055 | 50910 |
| 18' | – | – | – | – | – | – | – | – | 13672 | 14323 | 18884 | 42180 |
| 20' | – | – | – | – | – | – | – | – | 10796 | 11311 | 14904 | 35018 |

## BUILT-UP SECTIONS

| Height | 1-1/2" 1.35E LP LSL | | | | | | 1-1/2" 1.55E LP LSL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Double (2) | | | Triple (3) | | Quad (4) | Double (2) | | | Triple (3) | | Quad (4) |
| | x 3-1/2" | x 5-1/2" | x 7-1/4" | x 5-1/2" | x 7-1/4" | x 7-1/4" | x 3-1/2" | x 5-1/2" | x 7-1/4" | x 5-1/2" | x 7-1/4" | x 7-1/4" |
| 4' | 7195 | 11306 | 14903 | 20198 | 26624 | 37517 | 9238 | 14515 | 19143 | 26510 | 34945 | 49647 |
| 5' | 6041 | 9492 | 12513 | 18684 | 24628 | 36060 | 7620 | 11980 | 15787 | 24293 | 32018 | 47460 |
| 6' | 4961 | 7799 | 10282 | 16955 | 22357 | 34235 | 6168 | 9691 | 12774 | 21785 | 28714 | 44340 |
| 7' | 4038 | 6347 | 8363 | 15139 | 19958 | 32116 | 4954 | 7784 | 10261 | 19217 | 25318 | 39807 |
| 8' | 3276 | 5149 | 6787 | 13357 | 17609 | 29191 | 3976 | 6251 | 8236 | 16766 | 22108 | 35626 |
| 9' | 2660 | 4179 | 5510 | 11701 | 15418 | 26243 | 3202 | 5031 | 6632 | 14535 | 19160 | 31802 |
| 10' | 2164 | 3400 | 4482 | 10204 | 13446 | 23541 | 2585 | 4063 | 5356 | 12565 | 16505 | 28342 |
| 12' | 1448 | 2275 | 2998 | 7722 | 10178 | 18880 | 1709 | 2686 | 3521 | 9377 | 12069 | 22527 |
| 14' | 989 | 1554 | 2029 | 5852 | 7554 | 15150 | 1158 | 1815 | 2356 | 6963 | 8882 | 17940 |
| 16' | – | – | – | 4414 | 5660 | 12186 | – | – | – | 5163 | 6620 | 14353 |
| 18' | – | – | – | 3338 | 4298 | 9839 | – | – | – | 3890 | 5007 | 11547 |
| 20' | – | – | – | 2566 | 3313 | 7993 | – | – | – | 2981 | 3849 | 9343 |

| Height | 1-1/2" 2.0E LP LVL | | | | | 1-3/4" 2.0E LP LVL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Double (2) | | Triple (3) | | Quad (4) | Double (2) | | Triple (3) | | Quad (4) |
| | x 5-1/2" | x 7-1/4" | x 5-1/4" | x 7-1/4" | x 7-1/4" | x5-1/2" | x 7-1/4" | x 5-1/2" | x 7-1/4" | x 7-1/4" |
| 4' | 18828 | 24819 | 34903 | 46018 | 65892 | 24293 | 32019 | 42558 | 56076 | 78617 |
| 5' | 15414 | 20324 | 31718 | 41814 | 62608 | 20801 | 27412 | 39723 | 52362 | 75847 |
| 6' | 12426 | 16378 | 28242 | 37229 | 58654 | 17451 | 23007 | 36440 | 48035 | 72406 |
| 7' | 9972 | 13141 | 24780 | 32664 | 54228 | 14496 | 19113 | 32940 | 43438 | 68413 |
| 8' | 8005 | 10554 | 21553 | 28395 | 48306 | 12007 | 15822 | 29473 | 38856 | 64036 |
| 9' | 6451 | 8502 | 18640 | 24569 | 42833 | 9946 | 13107 | 26175 | 34505 | 59452 |
| 10' | 5214 | 6873 | 16094 | 21215 | 37953 | 8249 | 10878 | 23150 | 30497 | 54473 |
| 12' | 3453 | 4551 | 12010 | 15832 | 29901 | 5730 | 7549 | 18008 | 23740 | 44044 |
| 14' | – | – | 9009 | 11643 | 23668 | 4028 | 5311 | 14009 | 18476 | 35679 |
| 16' | – | – | 6733 | 8631 | 18835 | – | – | 10947 | 14430 | 29069 |
| 18' | – | – | 5054 | 6507 | 15098 | – | – | 8590 | 11129 | 23805 |
| 20' | – | – | – | – | 12183 | – | – | 6683 | 8670 | 19605 |

Built-up columns shall be designed in accordance with CSA Standard O86 using the following recommended nailing and bolt patterns:

**2-Ply 1-1/2" x 3-1/2":** One row of 3" x 0.131" nails spaced 9" oc from both faces. Stagger rows on each face and from front to back.

**2-Ply 1-1/2" x 5-1/2" and wider:** Two rows of 3" x 0.131" nails spaced 9" oc from both faces. Stagger rows on each face and from front to back.

**3-Ply 1-1/2" x 3-1/2":** Two rows of 3" x 0.131" nails spaced 8" oc from both faces. Stagger rows on each face and from front to back.

**3-Ply 1-1/2" x 5-1/2" and wider:** Three rows of 3" x 0.131" nails spaced 6" oc from both faces. Stagger rows on each face and from front to back.

**4-Ply 1-1/2" x 5-1/2" and wider:** Two rows of 1/2" bolts spaced 8" oc. Maintain a 2" minimum edge distance and 4" minimum end distance.

For Multi-Ply Connections using 3rd Party Screws consult 3rd Party Manufacturer's Literature.

**DESIGN ASSUMPTIONS:**

1. Height is the clear height of the column between the top and bottom supports.
2. The axial resistance is the total factored vertical load applied to the column, including all dead loads. No lateral loads have been applied.
3. The factored axial resistance is for a full cross-section only. Notching and drilling are not allowed without further analysis by a design professional except as required for the proper installation of column caps, bases and other hold-downs. Bolts, lag screws and self-tapping screws shall only be inserted through the face of the column, perpendicular to the face of the strands in LP LSL and the veneers in LP LVL.
4. The factored axial resistance assumes an eccentricity of 1/6 of the column width or depth, whichever controls.
5. Interior columns are assumed to be braced in both directions at the top and bottom supports.
6. For bearing on a wood plate, concrete, or any material other than steel the designer shall check the factored vertical load against the factored bearing resistance of the plate material and increase the column size accordingly.
7. The factored axial resistance in these tables are valid only for when $(L + 0.5S) / 4 \leq D \leq L + 0.5S$ or $(S + 0.5L) / 4 \leq D \leq S + 0.5L$ where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.

Refer to the Factored Bearing Resistance table on page 4 for column bearing on different LP plate material.
The lower of the Factored Bearing Resistance or the Factored Column Resistance must be used.

**ADDITIONAL NOTES:**

1. The value in each cell represents the factored axial compressive resistance of the column, in pounds (lbs).
2. Refer to the "Connection of Built-Up Columns" section on page 23 for connection design of built-up sections.
3. For columns embedded in interior walls where drilling or notching may be required use the Factored Exterior Wall Column Resistance table for 0.45 kPa.

# Factored Wall Stud Resistance (plf): $q_{1/50}$*$C_e$=0.45 kPa (9.4 psf)

**HOURLY WIND PRESSURE: ≤0.45 KPA (9.4 PSF) FOR OPEN TERRAIN; ≤0.64 KPA (13.4 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall stud. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the wall based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected stud. See Design Assumption 9 below.

**LP LSL**

| Height | Stud Spacing | 1-1/2" 1.35E LP LSL | | | 1-1/2" 1.55E LP LSL | | |
|---|---|---|---|---|---|---|---|
| | | 1-1/2" x 3-1/2" | 1-1/2" x 5-1/2" | 1-1/2" x 7-1/4" | 1-1/2" x 3-1/2" | 1-1/2" x 5-1/2" | 1-1/2" x 7-1/4" |
| 8' | 12" | 3947 L/281 | 7562 L/759 | 10163 L/999 | 5047 L/303 | 9246 L/738 | 12188 L/999 |
| | 16" | 2860 L/222 | 5671 L/694 | 7622 L/999 | 3710 L/241 | 6934 L/692 | 9141 L/999 |
| 9' | 12" | 3375 L/208 | 7210 L/647 | 9903 L/965 | 4329 L/226 | 9243 L/608 | 12184 L/926 |
| | 16" | 2067 L/169 | 5407 L/531 | 7427 L/911 | 3141 L/179 | 6932 L/562 | 9138 L/882 |
| 10' | 12" | 2837 L/157 | 6986 L/504 | 9720 L/843 | 3884 L/170 | 9022 L/511 | 12180 L/800 |
| | 16" | 1495 L/130 | 5239 L/410 | 7290 L/788 | 2671 L/135 | 6766 L/437 | 9135 L/756 |
| 11' | 12" | 2206 L/123 | 6734 L/398 | 9514 L/738 | 3281 L/132 | 8649 L/423 | 12175 L/691 |
| | 16" | - | 5003 L/322 | 7135 L/646 | - | 6487 L/345 | 9131 L/648 |
| 12' | 12" | - | 6439 L/319 | 9296 L/638 | - | 8241 L/342 | 12110 L/600 |
| | 16" | - | 4681 L/257 | 6972 L/527 | - | 6133 L/277 | 9083 L/554 |
| 13' | 12" | - | 6017 L/260 | 9052 L/530 | - | 7782 L/280 | 11742 L/533 |
| | 16" | - | 4232 L/209 | 6789 L/433 | - | 5688 L/226 | 8807 L/460 |
| 14' | 12" | - | 5595 L/214 | 8789 L/443 | - | 7205 L/232 | 11348 L/469 |
| | 16" | - | 3612 L/175 | 6592 L/359 | - | 5248 L/186 | 8511 L/385 |
| 15' | 12" | - | 5179 L/178 | 8509 L/373 | - | 6589 L/194 | 10924 L/398 |
| | 16" | - | 3051 L/147 | 6323 L/301 | - | 4826 L/154 | 8193 L/324 |
| 16' | 12" | - | 4628 L/150 | 8216 L/316 | - | 5946 L/165 | 10495 L/340 |
| | 16" | - | 2543 L/125 | 6003 L/254 | - | 4368 L/130 | 7861 L/274 |
| 18' | 12" | - | - | 7415 L/233 | - | 4659 L/122 | 9562 L/252 |
| | 16" | - | - | 5276 L/186 | - | - | 6991 L/202 |
| 20' | 12" | - | - | 6615 L/176 | - | - | 8471 L/192 |
| | 16" | - | - | 4236 L/142 | - | - | 6169 L/152 |
| 22' | 12" | - | - | 5325 L/138 | - | - | 7254 L/150 |
| | 16" | - | - | - | - | - | 4912 L/120 |
| 24' | 12" | - | - | - | - | - | 5945 L/121 |
| | 16" | - | - | - | - | - | - |

**ADDITIONAL NOTES:**

1. Height is the clear height of the wall stud between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the studs in pounds per lineal foot (plf) of wall length. These factored vertical resistances are the resistances of the stud based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. Install full-width blocking per local code requirements, normally not more than every 8' along the height of the stud.

**LP LVL**

| Height | Stud Spacing | 1-1/2" 2.0E LP LVL | | | 1-3/4" 2.0E LP LVL | |
|---|---|---|---|---|---|---|
| | | 1-1/2" x 3-1/2" | 1-1/2" x 5-1/2" | 1-1/2" x 7-1/4" | 1-3/4" x 5-1/2" | 1-3/4" x 7-1/4" |
| 8' | 12" | 4189 L/428 | 6582 L/999 | 8677 L/999 | 7680 L/999 | 10123 L/999 |
| | 16" | 3141 L/336 | 4937 L/999 | 6508 L/999 | 5760 L/999 | 7592 L/999 |
| 9' | 12" | 4187 L/306 | 6580 L/999 | 8673 L/999 | 7676 L/999 | 10119 L/999 |
| | 16" | 3140 L/240 | 4935 L/830 | 6505 L/999 | 5757 L/930 | 7589 L/999 |
| 10' | 12" | 4185 L/224 | 6577 L/786 | 8669 L/999 | 7673 L/878 | 10114 L/999 |
| | 16" | 3139 L/175 | 4932 L/637 | 6502 L/999 | 5754 L/718 | 7586 L/999 |
| 11' | 12" | 4183 L/167 | 6574 L/616 | 8665 L/999 | 7669 L/692 | 10110 L/999 |
| | 16" | 3055 L/131 | 4930 L/496 | 6499 L/999 | 5752 L/562 | 7582 L/999 |
| 12' | 12" | 3587 L/132 | 6571 L/489 | 8662 L/995 | 7666 L/553 | 10105 L/999 |
| | 16" | - | 4928 L/392 | 6496 L/817 | 5749 L/445 | 7579 L/916 |
| 13' | 12" | - | 6568 L/394 | 8658 L/821 | 7662 L/446 | 10101 L/916 |
| | 16" | - | 4926 L/313 | 6493 L/669 | 5747 L/357 | 7575 L/753 |
| 14' | 12" | - | 6565 L/320 | 8654 L/682 | 7659 L/364 | 10096 L/765 |
| | 16" | - | 4923 L/253 | 6490 L/552 | 5744 L/289 | 7572 L/623 |
| 15' | 12" | - | 6562 L/262 | 8650 L/571 | 7656 L/299 | 10092 L/643 |
| | 16" | - | 4921 L/206 | 6487 L/459 | 5742 L/236 | 7569 L/520 |
| 16' | 12" | - | 6559 L/216 | 8646 L/481 | 7652 L/247 | 10087 L/543 |
| | 16" | - | 4919 L/170 | 6484 L/385 | 5739 L/195 | 7565 L/438 |
| 18' | 12" | - | 6246 L/153 | 8638 L/348 | 7356 L/175 | 10078 L/395 |
| | 16" | - | 4420 L/121 | 6479 L/276 | 5379 L/138 | 7558 L/315 |
| 20' | 12" | - | - | 8630 L/257 | 5783 L/134 | 10069 L/293 |
| | 16" | - | - | 6473 L/202 | - | 7552 L/232 |
| 22' | 12" | - | - | 8623 L/193 | - | 10060 L/221 |
| | 16" | - | - | 6467 L/151 | - | 7545 L/174 |
| 24' | 12" | - | - | 7983 L/151 | - | 9449 L/172 |
| | 16" | - | - | 5518 L/120 | - | 6872 L/136 |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the stud. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the stud depth.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for rough terrain; $C_e$ = 1.0 for open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. A system factor of 1.04 has been applied for bending resistance for three or more studs spaced no more than 24" o.c, properly connected by a suitable exterior sheathing. No increase in stiffness has been assumed for the wall sheathing.
7. Gypsum wall board is assumed attached to the interior side of the studs.
8. The tabulated values assume the plates are the same material and grade as the stud. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the stud size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the wall stud.

# Factored Wall Stud Resistance (plf): $q_{1/50}$*$C_e$=0.60 kPa (12.5 psf)

**HOURLY WIND PRESSURE: ≤0.60 KPA (12.5 PSF) FOR OPEN TERRAIN; ≤0.85 KPA (17.8 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall stud. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the wall based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected stud. See Design Assumption 9 below.

## LP LSL

| Height | Stud Spacing | 1-1/2" 1.35E LP LSL | | | 1-1/2" 1.55E LP LSL | | |
|---|---|---|---|---|---|---|---|
| | | 1-1/2" x 3-1/2" | 1-1/2" x 5-1/2" | 1-1/2" x 7-1/4" | 1-1/2" x 3-1/2" | 1-1/2" x 5-1/2" | 1-1/2" x 7-1/4" |
| 8' | 12" | 3814 L/222 | 7562 L/694 | 10163 L/999 | 4947 L/241 | 9246 L/692 | 12188 L/999 |
| | 16" | 2216 L/182 | 5671 L/566 | 7622 L/984 | 3584 L/191 | 6934 L/611 | 9141 L/977 |
| 9' | 12" | 2736 L/168 | 7210 L/529 | 9903 L/910 | 4185 L/178 | 9243 L/560 | 12184 L/881 |
| | 16" | 1227 L/139 | 5407 L/427 | 7427 L/831 | 2597 L/145 | 6932 L/458 | 9138 L/828 |
| 10' | 12" | 1950 L/129 | 6986 L/406 | 9720 L/785 | 3522 L/134 | 9022 L/433 | 12180 L/754 |
| | 16" | - | 5143 L/327 | 7290 L/656 | - | 6766 L/351 | 9135 L/699 |
| 11' | 12" | - | 6658 L/318 | 9514 L/639 | - | 8649 L/341 | 12175 L/645 |
| | 16" | - | 4523 L/259 | 7135 L/524 | - | 6388 L/276 | 9131 L/559 |
| 12' | 12" | - | 6227 L/254 | 9296 L/520 | - | 8164 L/273 | 12110 L/548 |
| | 16" | - | 3730 L/210 | 6972 L/423 | - | 5933 L/220 | 9083 L/451 |
| 13' | 12" | - | 5561 L/207 | 9052 L/427 | - | 7569 L/223 | 11742 L/455 |
| | 16" | - | 3002 L/173 | 6738 L/345 | - | 5373 L/179 | 8807 L/371 |
| 14' | 12" | - | 4732 L/173 | 8789 L/354 | - | 6983 L/183 | 11348 L/380 |
| | 16" | - | 2337 L/144 | 6413 L/285 | - | 4573 L/149 | 8511 L/307 |
| 15' | 12" | - | 3980 L/145 | 8414 L/297 | - | 6419 L/152 | 10924 L/319 |
| | 16" | - | 1743 L/121 | 5768 L/241 | - | 3854 L/125 | 8073 L/257 |
| 16' | 12" | - | 3302 L/123 | 7987 L/251 | - | 5766 L/128 | 10465 L/271 |
| | 16" | - | - | 5072 L/205 | - | - | 7621 L/217 |
| 18' | 12" | - | - | 6936 L/184 | - | - | 9305 L/199 |
| | 16" | - | - | 3802 L/153 | - | - | 6696 L/159 |
| 20' | 12" | - | - | 5544 L/141 | - | - | 8208 L/150 |
| | 16" | - | - | - | - | - | 5318 L/122 |
| 22' | 12" | - | - | - | - | - | - |
| | 16" | - | - | - | - | - | - |
| 24' | 12" | - | - | - | - | - | - |
| | 16" | - | - | - | - | - | - |

**ADDITIONAL NOTES:**

1. Height is the clear height of the wall stud between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the studs in pounds per lineal foot (plf) of wall length. These factored vertical resistances are the resistances of the stud based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. Install full-width blocking per local code requirements, normally not more than every 8' along the height of the stud.

## LP LVL

| Height | Stud Spacing | 1-1/2" 2.0E LP LVL | | | 1-3/4" 2.0E LP LVL | |
|---|---|---|---|---|---|---|
| | | 1-1/2" x 3-1/2" | 1-1/2" x 5-1/2" | 1-1/2" x 7-1/4" | 1-3/4" x 5-1/2" | 1-3/4" x 7-1/4" |
| 8' | 12" | 4189 L/336 | 6582 L/999 | 8677 L/999 | 7680 L/999 | 10123 L/999 |
| | 16" | 3141 L/262 | 4937 L/892 | 6508 L/999 | 5760 L/999 | 7592 L/999 |
| 9' | 12" | 4187 L/238 | 6580 L/827 | 8673 L/999 | 7676 L/926 | 10119 L/999 |
| | 16" | 3140 L/185 | 4935 L/664 | 6505 L/999 | 5757 L/750 | 7589 L/999 |
| 10' | 12" | 4185 L/173 | 6577 L/631 | 8669 L/999 | 7673 L/711 | 10114 L/999 |
| | 16" | 2913 L/137 | 4932 L/504 | 6502 L/999 | 5754 L/573 | 7586 L/999 |
| 11' | 12" | 4013 L/130 | 6574 L/489 | 8665 L/997 | 7669 L/554 | 10110 L/999 |
| | 16" | - | 4930 L/390 | 6499 L/814 | 5752 L/444 | 7582 L/915 |
| 12' | 12" | - | 6571 L/386 | 8662 L/807 | 7666 L/439 | 10105 L/905 |
| | 16" | - | 4928 L/306 | 6496 L/654 | 5749 L/350 | 7579 L/738 |
| 13' | 12" | - | 6568 L/309 | 8658 L/660 | 7662 L/352 | 10101 L/743 |
| | 16" | - | 4926 L/243 | 6493 L/531 | 5747 L/279 | 7575 L/602 |
| 14' | 12" | - | 6565 L/249 | 8654 L/544 | 7659 L/285 | 10096 L/615 |
| | 16" | - | 4923 L/196 | 6490 L/435 | 5744 L/225 | 7572 L/495 |
| 15' | 12" | - | 6562 L/203 | 8650 L/453 | 7656 L/233 | 10092 L/513 |
| | 16" | - | 4921 L/159 | 6487 L/360 | 5742 L/183 | 7569 L/411 |
| 16' | 12" | - | 6559 L/167 | 8646 L/379 | 7652 L/192 | 10087 L/431 |
| | 16" | - | 4848 L/131 | 6484 L/300 | 5739 L/150 | 7565 L/343 |
| 18' | 12" | - | - | 8638 L/272 | 7154 L/136 | 10078 L/311 |
| | 16" | - | - | 6479 L/214 | - | 7558 L/245 |
| 20' | 12" | - | - | 8630 L/199 | - | 10069 L/229 |
| | 16" | - | - | 6473 L/156 | - | 7552 L/179 |
| 22' | 12" | - | - | 8623 L/149 | - | 10060 L/171 |
| | 16" | - | - | - | - | 7545 L/134 |
| 24' | 12" | - | - | - | - | 9139 L/134 |
| | 16" | - | - | - | - | - |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the stud. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the stud depth.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for rough terrain; $C_e$ = 1.0 for open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. A system factor of 1.04 has been applied for bending resistance for three or more studs spaced no more than 24" o.c, properly connected by a suitable exterior sheathing. No increase in stiffness has been assumed for the wall sheathing.
7. Gypsum wall board is assumed attached to the interior side of the studs.
8. The tabulated values assume the plates are the same material and grade as the stud. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the stud size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the wall stud.

# Factored Exterior Wall Column Resistance (lbs): 2x4 Walls for $q_{1/50}$*$C_e$=0.45 kPa (9.4 psf)

**HOURLY WIND PRESSURE: ≤0.45 KPA (9.4 PSF) FOR OPEN TERRAIN; ≤0.64 KPA (13.4 PSF) FOR ROUGH TERRAIN**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

## 2X4 WALLS – LP LSL

| Height | Tributary Width | 1.35E LP LSL | | | 1.55E LP LSL | 1.75E LP LSL | |
|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x 3-1/2" | 3-1/2" x 3-1/2" Beam or Plank | 5-1/2" x 3-1/2" Plank | Double 1-1/2" x 3-1/2" | 3-1/2" x 3-1/2" Beam or Plank | 5-1/2" x 3-1/2" Plank |
| 8' | 16" | 4964 L/448 | 8467 L/450 | 13733 L/546 | 6044 L/494 | 12314 L/474 | 20037 L/509 |
| | 24" | 4836 L/324 | 8350 L/335 | 13733 L/468 | 6038 L/359 | 12314 L/392 | 20037 L/466 |
| | 36" | 3802 L/238 | 7361 L/251 | 13733 L/349 | 5694 L/259 | 12064 L/293 | 20037 L/407 |
| | 48" | 1970 L/195 | 5030 L/210 | 13376 L/282 | 4045 L/212 | 11670 L/236 | 20037 L/332 |
| 9' | 16" | 4252 L/333 | 7512 L/340 | 12305 L/472 | 5249 L/370 | 10931 L/398 | 17742 L/454 |
| | 24" | 3913 L/240 | 7184 L/250 | 12305 L/354 | 5056 L/266 | 10729 L/297 | 17742 L/405 |
| | 36" | 2006 L/179 | 4753 L/193 | 11871 L/262 | 3714 L/196 | 10273 L/219 | 17644 L/310 |
| | 48" | - | 1995 L/162 | 10957 L/211 | 1667 L/160 | 8292 L/181 | 17220 L/250 |
| 10' | 16" | 4069 L/248 | 6861 L/258 | 11565 L/363 | 5029 L/276 | 9841 L/308 | 15821 L/402 |
| | 24" | 3096 L/182 | 5879 L/192 | 11275 L/270 | 4612 L/199 | 9674 L/226 | 15821 L/323 |
| | 36" | 702 L/138 | 3017 L/149 | 10773 L/197 | 2507 L/149 | 8487 L/168 | 15821 L/237 |
| | 48" | - | - | 8470 L/163 | - | 5954 L/140 | 15473 L/189 |
| 11' | 16" | 3615 L/191 | 6194 L/200 | 9980 L/292 | 4394 L/214 | 8420 L/246 | 13497 L/353 |
| | 24" | 2281 L/141 | 4553 L/152 | 9980 L/211 | 3743 L/154 | 8420 L/177 | 13497 L/260 |
| | 36" | - | - | 8933 L/154 | - | 6597 L/132 | 13497 L/187 |
| | 48" | - | - | 6269 L/129 | - | - | 13336 L/147 |
| 12' | 16" | 2853 L/152 | 5256 L/160 | 8573 L/237 | 3574 L/171 | 7210 L/199 | 11537 L/291 |
| | 24" | - | 3403 L/122 | 8524 L/169 | 2690 L/124 | 6967 L/142 | 11537 L/210 |
| | 36" | - | - | 7114 L/124 | - | - | 11339 L/150 |
| | 48" | - | - | - | - | - | - |
| 14' | 16" | - | - | 6182 L/161 | - | 5042 L/135 | 8461 L/201 |
| | 24" | - | - | - | - | - | 8161 L/143 |
| | 36" | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - |

## 2X4 WALLS – LP LVL

| Height | Tributary Width | 2.0E LP LVL | | |
|---|---|---|---|---|
| | | Double 1-1/2" x 3-1/2" | Double 1-3/4" x 3-1/2" | 5-1/2" x 3-1/2" Plank |
| 8' | 16" | 7964 L/599 | 11101 L/624 | 19040 L/642 |
| | 24" | 7878 L/444 | 11101 L/474 | 19040 L/585 |
| | 36" | 7600 L/323 | 11101 L/349 | 19040 L/484 |
| | 48" | 6692 L/260 | 11040 L/278 | 19040 L/394 |
| 9' | 16" | 6793 L/458 | 9818 L/483 | 19034 L/505 |
| | 24" | 6586 L/333 | 9818 L/357 | 19034 L/453 |
| | 36" | 5954 L/241 | 9670 L/259 | 19034 L/352 |
| | 48" | 4016 L/197 | 9380 L/205 | 19034 L/283 |
| 10' | 16" | 6521 L/344 | 8405 L/380 | 18204 L/416 |
| | 24" | 6275 L/248 | 8405 L/275 | 18204 L/357 |
| | 36" | 4660 L/183 | 8405 L/196 | 17731 L/267 |
| | 48" | 2321 L/150 | 8205 L/153 | 17228 L/214 |
| 11' | 16" | 5864 L/267 | 7007 L/304 | 15521 L/390 |
| | 24" | 5702 L/190 | 7007 L/217 | 15521 L/289 |
| | 36" | 3390 L/143 | 6840 L/153 | 15521 L/210 |
| | 48" | - | 6488 L/120 | 15323 L/166 |
| 12' | 16" | 4820 L/215 | 5844 L/246 | 13255 L/324 |
| | 24" | 4558 L/152 | 5751 L/173 | 13255 L/236 |
| | 36" | - | 5515 L/122 | 13186 L/169 |
| | 48" | - | - | 12686 L/133 |
| 14' | 16" | 3229 L/144 | 3990 L/166 | 9725 L/226 |
| | 24" | - | - | 9473 L/162 |
| | 36" | - | - | - |
| | 48" | - | - | - |

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation except for the 3-1/2" x 3-1/2" and 5-1/2" x 3-1/2" column sizes as noted in the table. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for Rough terrain; $C_e$ = 1.0 for Open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

# Factored Exterior Wall Column Resistance (lbs): 2x4 Walls for $q_{1/50}$*$C_e$=0.60 kPa (12.5 psf)

**HOURLY WIND PRESSURE: ≤0.60 KPA (12.5 PSF) FOR OPEN TERRAIN; ≤0.85 KPA (17.8 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

## 2X4 WALLS –LP LSL

| Height | Tributary Width | 1.35E LP LSL | | | 1.55E LP LSL | 1.75E LP LSL | |
|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x 3-1/2" | 3-1/2" x 3-1/2" Beam or Plank | 5-1/2" x 3-1/2" Plank | Double 1-1/2" x 3-1/2" | 3-1/2" x 3-1/2" Beam or Plank | 5-1/2" x 3-1/2" Plank |
| 8' | 16" | 4884 L/352 | 8430 L/361 | 13733 L/501 | 6044 L/389 | 12314 L/421 | 20037 L/477 |
| | 24" | 4277 L/255 | 8012 L/266 | 13733 L/376 | 5852 L/281 | 12179 L/315 | 20037 L/428 |
| | 36" | 1816 L/192 | 4853 L/207 | 13348 L/278 | 3909 L/209 | 11641 L/232 | 20037 L/328 |
| | 48" | - | 1403 L/175 | 11862 L/227 | 1201 L/173 | 8874 L/194 | 19602 L/266 |
| 9' | 16" | 4116 L/259 | 7279 L/270 | 12305 L/381 | 5111 L/289 | 10819 L/320 | 17742 L/418 |
| | 24" | 2589 L/192 | 5502 L/205 | 11996 L/283 | 4237 L/210 | 10403 L/236 | 17742 L/333 |
| | 36" | - | 1774 L/160 | 10789 L/209 | 1501 L/158 | 8116 L/179 | 17189 L/247 |
| | 48" | - | - | 7618 L/174 | - | 4856 L/150 | 16632 L/198 |
| 10' | 16" | 3489 L/195 | 6419 L/205 | 11373 L/291 | 4861 L/214 | 9772 L/244 | 15821 L/347 |
| | 24" | 1470 L/147 | 3840 L/159 | 10914 L/213 | 3139 L/160 | 9220 L/178 | 15821 L/256 |
| | 36" | - | - | 8281 L/161 | - | 5766 L/138 | 15439 L/186 |
| | 48" | - | - | 4801 L/134 | - | - | 13778 L/151 |
| 11' | 16" | 2736 L/152 | 5118 L/162 | 9980 L/229 | 4175 L/166 | 8420 L/192 | 13497 L/281 |
| | 24" | - | 2395 L/125 | 9694 L/165 | 2060 L/125 | 7349 L/141 | 13497 L/203 |
| | 36" | - | - | 6069 L/127 | - | - | 13302 L/145 |
| | 48" | - | - | - | - | - | - |
| 12' | 16" | 1938 L/121 | 3987 L/130 | 8573 L/184 | 3039 L/134 | 7063 L/154 | 11537 L/228 |
| | 24" | - | - | 7888 L/132 | - | - | 11472 L/163 |
| | 36" | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - |
| 14' | 16" | - | - | 5947 L/124 | - | - | 8249 L/156 |
| | 24" | - | - | - | - | - | - |
| | 36" | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - |

## 2X4 WALLS – LP LVL

| Height | Tributary Width | 2.0E LP LVL | | |
|---|---|---|---|---|
| | | Double 1-1/2" x 3-1/2" | Double 1-3/4" x 3-1/2" | 5-1/2" x 3-1/2" Plank |
| 8' | 16" | 7932 L/479 | 11101 L/509 | 19040 L/600 |
| | 24" | 7679 L/350 | 11101 L/377 | 19040 L/518 |
| | 36" | 6556 L/257 | 11022 L/274 | 19040 L/388 |
| | 48" | 4065 L/210 | 10680 L/217 | 19040 L/312 |
| 9' | 16" | 6645 L/361 | 9818 L/385 | 19034 L/467 |
| | 24" | 6366 L/260 | 9754 L/280 | 19034 L/378 |
| | 36" | 3866 L/194 | 9358 L/202 | 19034 L/279 |
| | 48" | 577 L/161 | 7635 L/163 | 18521 L/224 |
| 10' | 16" | 6345 L/269 | 8405 L/299 | 18204 L/378 |
| | 24" | 5273 L/196 | 8405 L/213 | 17878 L/287 |
| | 36" | 2128 L/149 | 8068 L/151 | 17190 L/211 |
| | 48" | - | 5543 L/124 | 15377 L/171 |
| 11' | 16" | 5766 L/207 | 7007 L/236 | 15521 L/312 |
| | 24" | 4090 L/153 | 6909 L/167 | 15521 L/227 |
| | 36" | - | - | 15284 L/163 |
| | 48" | - | - | 11963 L/136 |
| 12' | 16" | 4660 L/166 | 5797 L/189 | 13255 L/255 |
| | 24" | 2963 L/122 | 5581 L/133 | 13255 L/183 |
| | 36" | - | - | 12634 L/131 |
| | 48" | - | - | - |
| 14' | 16" | - | 3887 L/126 | 9570 L/176 |
| | 24" | - | - | 9120 L/125 |
| | 36" | - | - | - |
| | 48" | - | - | - |

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation except for the 3-1/2" x 3-1/2" and 5-1/2" x 3-1/2" column sizes as noted in the table. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for Rough terrain; $C_e$ = 1.0 for Open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

# Factored Exterior Wall Column Resistance (lbs): 2x6 Walls for $q_{1/50}$*$C_e$=0.45 kPa (9.4 psf)

**HOURLY WIND PRESSURE: ≤0.45 KPA (9.4 PSF) FOR OPEN TERRAIN; ≤0.64 KPA (13.4 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

**2X6 WALLS**

| Height | Tributary Width | 1.35E LP LSL | | | 1.55E LP LSL | | 1.75E LP LSL | 2.0E LP LVL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x 5-1/2" | Triple 1-1/2" x 5-1/2" | 3-1/2" x 5-1/2" | Double 1-1/2" x 5-1/2" | Triple 1-1/2" x 5-1/2" | 3-1/2" x 5-1/2" | Double 1-1/2" x 5-1/2" | Triple 1-1/2" x 5-1/2" | Double 1-3/4" x 5-1/2" | Triple 1-3/4" x 5-1/2" | 3-1/2" x 5-1/2" | 5-1/4" x 5-1/2" |
| 8' | 16" | 7045 L/999 | 13155 L/999 | 15181 L/976 | 8536 L/999 | 16075 L/999 | 21550 L/928 | 11260 L/999 | 21597 L/999 | 16277 L/999 | 28561 L/999 | 19040 L/999 | 28561 L/999 |
| | 24" | 7045 L/999 | 13155 L/999 | 15181 L/904 | 8536 L/999 | 16075 L/999 | 21550 L/876 | 11260 L/999 | 21597 L/999 | 16277 L/999 | 28561 L/999 | 19040 L/999 | 28561 L/999 |
| | 36" | 7005 L/821 | 13155 L/999 | 15181 L/777 | 8536 L/907 | 16075 L/999 | 21550 L/810 | 11260 L/999 | 21597 L/999 | 16277 L/999 | 28561 L/999 | 19040 L/999 | 28561 L/999 |
| | 48" | 6057 L/668 | 13155 L/868 | 15181 L/640 | 8312 L/730 | 16075 L/946 | 21550 L/745 | 11260 L/891 | 21597 L/999 | 16277 L/945 | 28561 L/999 | 19040 L/898 | 28561 L/999 |
| 9' | 16" | 6275 L/999 | 12483 L/999 | 13874 L/889 | 7563 L/999 | 15205 L/999 | 19542 L/864 | 9888 L/999 | 20334 L/999 | 14642 L/999 | 27780 L/999 | 19034 L/999 | 28551 L/999 |
| | 24" | 6271 L/850 | 12483 L/999 | 13874 L/792 | 7563 L/940 | 15205 L/999 | 19542 L/801 | 9888 L/999 | 20334 L/999 | 14642 L/999 | 27780 L/999 | 19034 L/955 | 28551 L/999 |
| | 36" | 5670 L/625 | 12483 L/810 | 13874 L/603 | 7335 L/691 | 15205 L/883 | 19542 L/705 | 9841 L/848 | 20334 L/999 | 14642 L/897 | 27780 L/984 | 19034 L/821 | 28551 L/961 |
| | 48" | 3585 L/513 | 12404 L/654 | 13874 L/488 | 5620 L/566 | 15205 L/719 | 19542 L/582 | 9572 L/680 | 20334 L/863 | 14642 L/729 | 27780 L/910 | 19034 L/677 | 28551 L/897 |
| 10' | 16" | 6227 L/885 | 12297 L/999 | 13609 L/759 | 7498 L/974 | 14943 L/999 | 19124 L/746 | 9803 L/999 | 19961 L/999 | 14483 L/999 | 27235 L/987 | 19027 L/877 | 28540 L/941 |
| | 24" | 6118 L/648 | 12297 L/835 | 13609 L/618 | 7434 L/720 | 14943 L/906 | 19124 L/682 | 9803 L/879 | 19961 L/999 | 14483 L/919 | 27235 L/922 | 19027 L/802 | 28540 L/882 |
| | 36" | 4531 L/482 | 12297 L/621 | 13609 L/463 | 6470 L/531 | 14943 L/683 | 19124 L/549 | 9591 L/647 | 19961 L/818 | 14483 L/691 | 27235 L/841 | 19027 L/636 | 28540 L/807 |
| | 48" | 1758 L/397 | 10762 L/509 | 13418 L/372 | 3922 L/437 | 14623 L/553 | 19124 L/448 | 8578 L/522 | 19961 L/668 | 14483 L/556 | 27235 L/713 | 19027 L/518 | 28540 L/701 |
| 12' | 16" | 6051 L/550 | 11860 L/710 | 12946 L/523 | 7325 L/611 | 14321 L/772 | 18086 L/564 | 9595 L/747 | 19076 L/859 | 14083 L/779 | 25913 L/770 | 19013 L/635 | 28520 L/698 |
| | 24" | 5205 L/403 | 11860 L/527 | 12946 L/391 | 7030 L/445 | 14321 L/580 | 18086 L/465 | 9458 L/549 | 19076 L/696 | 14083 L/585 | 25913 L/701 | 19013 L/529 | 28520 L/639 |
| | 36" | 1970 L/305 | 10288 L/394 | 12603 L/287 | 3964 L/336 | 13878 L/429 | 18086 L/346 | 8371 L/403 | 19076 L/520 | 14042 L/430 | 25913 L/558 | 19013 L/395 | 28520 L/539 |
| | 48" | - | 6620 L/328 | 11168 L/233 | - | 10156 L/359 | 17690 L/279 | 5372 L/330 | 18492 L/420 | 13640 L/343 | 25913 L/454 | 19013 L/317 | 28520 L/440 |
| 14' | 16" | 5724 L/362 | 11317 L/479 | 12108 L/354 | 6935 L/405 | 13568 L/528 | 16775 L/421 | 9286 L/499 | 18013 L/633 | 13577 L/530 | 22787 L/651 | 18999 L/458 | 28499 L/515 |
| | 24" | 3575 L/271 | 10983 L/351 | 11842 L/260 | 5330 L/300 | 13319 L/390 | 16775 L/313 | 8924 L/362 | 18013 L/473 | 13577 L/389 | 22787 L/519 | 18999 L/350 | 28499 L/462 |
| | 36" | - | 7102 L/269 | 10739 L/190 | 1274 L/228 | 10334 L/295 | 16265 L/230 | 5905 L/271 | 17390 L/349 | 13100 L/283 | 22787 L/385 | 18674 L/258 | 28499 L/357 |
| | 48" | - | 2634 L/224 | 7654 L/157 | - | 5936 L/245 | 15716 L/183 | 1927 L/223 | 13860 L/289 | 11107 L/228 | 22787 L/307 | 18108 L/206 | 28499 L/287 |
| 16' | 16" | 4708 L/254 | 9376 L/346 | 10932 L/249 | 6341 L/281 | 11144 L/387 | 15249 L/301 | 8748 L/347 | 14990 L/471 | 12189 L/378 | 18303 L/524 | 17329 L/335 | 26899 L/402 |
| | 24" | 1925 L/191 | 8846 L/250 | 10494 L/181 | 3611 L/212 | 11144 L/278 | 14876 L/221 | 7509 L/254 | 14990 L/343 | 12189 L/273 | 18303 L/386 | 17031 L/247 | 26899 L/336 |
| | 36" | - | 4189 L/192 | 7938 L/135 | - | 7089 L/211 | 14262 L/160 | 3450 L/192 | 14177 L/249 | 11351 L/196 | 18303 L/279 | 16392 L/180 | 26899 L/248 |
| | 48" | - | - | - | - | 2154 L/175 | 12071 L/130 | - | 9584 L/206 | 7964 L/161 | 18303 L/219 | 14987 L/144 | 26686 L/198 |
| 18' | 16" | 3248 L/188 | 7657 L/257 | 9305 L/183 | 4744 L/208 | 9074 L/289 | 12526 L/227 | 7986 L/251 | 12110 L/359 | 9761 L/285 | 14653 L/405 | 14613 L/253 | 21925 L/351 |
| | 24" | - | 5491 L/190 | 8350 L/133 | 1253 L/159 | 7730 L/210 | 12499 L/162 | 5764 L/186 | 12110 L/256 | 9604 L/202 | 14653 L/291 | 14613 L/182 | 21925 L/258 |
| | 36" | - | - | - | - | 3093 L/159 | - | 701 L/143 | 9624 L/187 | 7801 L/147 | 14542 L/207 | 14061 L/130 | 21925 L/186 |
| | 48" | - | - | - | - | - | - | - | 5454 L/154 | - | 13991 L/162 | - | 21533 L/147 |
| 20' | 16" | 1271 L/147 | 5557 L/198 | 7368 L/140 | 2589 L/162 | 7124 L/221 | 10231 L/175 | 5802 L/194 | 9754 L/277 | 7701 L/219 | 11745 L/315 | 11952 L/196 | 17930 L/278 |
| | 24" | - | 2646 L/148 | - | - | 4539 L/164 | 9741 L/125 | 2936 L/145 | 9244 L/196 | 7363 L/154 | 11641 L/224 | 11546 L/140 | 17930 L/200 |
| | 36" | - | - | - | - | - | - | - | 5351 L/146 | - | 11163 L/158 | - | 17375 L/143 |
| | 48" | - | - | - | - | - | - | - | - | - | 8985 L/126 | - | - |
| 22' | 16" | - | 3559 L/157 | - | 766 L/130 | 4972 L/176 | 8091 L/138 | 3734 L/154 | 7621 L/218 | 6001 L/171 | 9382 L/249 | 9536 L/155 | 14702 L/222 |
| | 24" | - | - | - | - | 1970 L/131 | - | - | 6148 L/156 | 4942 L/122 | 9077 L/175 | - | 14340 L/158 |
| | 36" | - | - | - | - | - | - | - | - | - | 7986 L/124 | - | - |
| | 48" | - | - | - | - | - | - | - | - | - | - | - | - |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for Rough terrain; $C_e$ = 1.0 for Open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

# Factored Exterior Wall Column Resistance (lbs): 2x6 Walls for $q_{1/50}$*$C_e$=0.60 kPa (12.5 psf)

**HOURLY WIND PRESSURE: ≤0.06 KPA (12.5 PSF) FOR OPEN TERRAIN; ≤0.85 KPA (17.8 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

**2X6 WALLS**

| Height | Tributary Width | 1.35E LP LSL | | | 1.55E LP LSL | | 1.75E LP LSL | 2.0E LP LVL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x 5-1/2" | Triple 1-1/2" x 5-1/2" | 3-1/2" x 5-1/2" | Double 1-1/2" x 5-1/2" | Triple 1-1/2" x 5-1/2" | 3-1/2" x 5-1/2" | Double 1-1/2" x 5-1/2" | Triple 1-1/2" x 5-1/2" | Double 1-3/4" x 5-1/2" | Triple 1-3/4" x 5-1/2" | 3-1/2" x 5-1/2" | 5-1/4" x 5-1/2" |
| 8' | 16" | 7045 L/999 | 13155 L/999 | 15181 L/924 | 8536 L/999 | 16075 L/999 | 21550 L/890 | 11260 L/999 | 21597 L/999 | 16277 L/999 | 28561 L/999 | 19040 L/999 | 28561 L/999 |
| | 24" | 7045 L/885 | 13155 L/999 | 15181 L/828 | 8536 L/976 | 16075 L/999 | 21550 L/828 | 11260 L/999 | 21597 L/999 | 16277 L/999 | 28561 L/999 | 19040 L/999 | 28561 L/999 |
| | 36" | 5927 L/660 | 13155 L/856 | 15181 L/632 | 8185 L/722 | 16075 L/934 | 21550 L/736 | 11260 L/878 | 21597 L/999 | 16277 L/933 | 28561 L/999 | 19040 L/887 | 28561 L/999 |
| | 48" | 3275 L/546 | 12913 L/693 | 15181 L/513 | 5623 L/600 | 16075 L/760 | 21550 L/609 | 10896 L/708 | 21597 L/912 | 16277 L/760 | 28561 L/973 | 19040 L/728 | 28561 L/973 |
| 9' | 16" | 6275 L/918 | 12483 L/999 | 13874 L/828 | 7563 L/999 | 15205 L/999 | 19542 L/818 | 9888 L/999 | 20334 L/999 | 14642 L/999 | 27780 L/999 | 19034 L/976 | 28551 L/999 |
| | 24" | 6084 L/671 | 12483 L/870 | 13874 L/646 | 7414 L/746 | 15205 L/946 | 19542 L/745 | 9888 L/913 | 20334 L/999 | 14642 L/961 | 27780 L/999 | 19034 L/875 | 28551 L/981 |
| | 36" | 3412 L/507 | 12376 L/645 | 13874 L/482 | 5458 L/559 | 15205 L/709 | 19542 L/574 | 9552 L/671 | 20334 L/853 | 14642 L/719 | 27780 L/899 | 19034 L/668 | 28551 L/890 |
| | 48" | - | 9202 L/540 | 13549 L/387 | 2032 L/462 | 13159 L/587 | 19542 L/467 | 7293 L/549 | 20334 L/694 | 14557 L/577 | 27780 L/744 | 19034 L/542 | 28551 L/738 |
| 10' | 16" | 6178 L/701 | 12297 L/895 | 13609 L/661 | 7498 L/776 | 14943 L/967 | 19124 L/699 | 9803 L/946 | 19961 L/999 | 14483 L/982 | 27235 L/939 | 19027 L/822 | 28540 L/898 |
| | 24" | 5196 L/516 | 12297 L/669 | 13609 L/498 | 7130 L/568 | 14943 L/734 | 19124 L/588 | 9682 L/699 | 19961 L/875 | 14483 L/743 | 27235 L/862 | 19027 L/680 | 28540 L/827 |
| | 36" | 1513 L/392 | 10532 L/504 | 13391 L/367 | 3711 L/432 | 14401 L/547 | 19124 L/442 | 8409 L/515 | 19961 L/659 | 14483 L/548 | 27235 L/704 | 19027 L/511 | 28540 L/692 |
| | 48" | - | 6396 L/421 | 11773 L/299 | - | 10247 L/460 | 18911 L/356 | 5069 L/424 | 19334 L/535 | 14094 L/438 | 27235 L/576 | 19027 L/411 | 28540 L/567 |
| 12' | 16" | 5738 L/432 | 11860 L/569 | 12946 L/421 | 7114 L/482 | 14321 L/624 | 18086 L/498 | 9539 L/593 | 19076 L/745 | 14083 L/630 | 25913 L/719 | 19013 L/566 | 28520 L/655 |
| | 24" | 2998 L/326 | 11284 L/420 | 12739 L/310 | 4900 L/360 | 14084 L/462 | 18086 L/373 | 9151 L/431 | 19076 L/560 | 14083 L/464 | 25913 L/598 | 19013 L/426 | 28520 L/576 |
| | 36" | - | 6329 L/324 | 10962 L/230 | - | 9864 L/355 | 17656 L/275 | 5125 L/326 | 18288 L/415 | 13609 L/337 | 25913 L/447 | 19013 L/312 | 28520 L/434 |
| | 48" | - | 548 L/271 | 7173 L/190 | - | 4386 L/297 | 16596 L/220 | - | 13307 L/348 | 10713 L/275 | 25913 L/359 | 19013 L/248 | 28520 L/350 |
| 14' | 16" | 4262 L/290 | 11118 L/379 | 11953 L/281 | 6006 L/321 | 13462 L/420 | 16775 L/338 | 9027 L/392 | 18013 L/510 | 13577 L/421 | 22787 L/556 | 18999 L/376 | 28499 L/476 |
| | 24" | 541 L/220 | 8304 L/287 | 11431 L/204 | 2541 L/243 | 11546 L/314 | 16422 L/249 | 6897 L/290 | 17597 L/377 | 13243 L/306 | 22787 L/415 | 18838 L/278 | 28499 L/383 |
| | 36" | - | 2277 L/221 | 7413 L/156 | - | 5557 L/242 | 15675 L/180 | 1584 L/220 | 13536 L/285 | 10876 L/225 | 22787 L/302 | 18065 L/203 | 28499 L/283 |
| | 48" | - | - | 2975 L/129 | - | - | 11825 L/149 | - | 7668 L/238 | 6594 L/185 | 22491 L/240 | 15047 L/166 | 28499 L/225 |
| 16' | 16" | 2762 L/205 | 9376 L/269 | 10617 L/196 | 4417 L/227 | 11144 L/302 | 14996 L/238 | 8230 L/272 | 14990 L/372 | 12189 L/296 | 18303 L/417 | 17156 L/267 | 26899 L/361 |
| | 24" | - | 5541 L/204 | 8870 L/144 | - | 8443 L/225 | 14432 L/173 | 4658 L/205 | 14990 L/267 | 12184 L/211 | 18303 L/302 | 16570 L/195 | 26899 L/268 |
| | 36" | - | - | - | - | 1757 L/173 | 11840 L/128 | - | 9224 L/204 | 7695 L/159 | 18303 L/215 | 14744 L/142 | 26624 L/195 |
| | 48" | - | - | - | - | - | - | - | 2723 L/170 | 2690 L/131 | 16855 L/171 | - | 25755 L/155 |
| 18' | 16" | 548 L/154 | 6277 L/203 | 9014 L/142 | 2382 L/169 | 8503 L/225 | 12526 L/176 | 6562 L/199 | 12110 L/278 | 9705 L/220 | 14653 L/316 | 14613 L/197 | 21925 L/279 |
| | 24" | - | 2030 L/154 | - | - | 4548 L/170 | 11809 L/127 | 2437 L/151 | 10712 L/201 | 8632 L/158 | 14653 L/225 | 14265 L/141 | 21925 L/202 |
| | 36" | - | - | - | - | - | - | - | 5091 L/152 | - | 13779 L/160 | - | 21477 L/144 |
| | 48" | - | - | - | - | - | - | - | - | - | 9970 L/129 | - | - |
| 20' | 16" | - | 3551 L/158 | - | - | 5362 L/176 | 9877 L/135 | 3805 L/155 | 9440 L/214 | 7457 L/168 | 11733 L/243 | 11687 L/152 | 17930 L/217 |
| | 24" | - | - | - | - | - | - | - | 6505 L/157 | 5301 L/122 | 11296 L/172 | - | 17582 L/155 |
| | 36" | - | - | - | - | - | - | - | - | - | 8776 L/124 | - | - |
| | 48" | - | - | - | - | - | - | - | - | - | - | - | - |
| 22' | 16" | - | 1277 L/126 | - | - | 2931 L/140 | - | 1542 L/124 | 6838 L/169 | 5473 L/132 | 9162 L/191 | - | 14479 L/172 |
| | 24" | - | - | - | - | - | - | - | 3250 L/125 | - | 8712 L/134 | - | 13831 L/122 |
| | 36" | - | - | - | - | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - | - | - | - | - |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for Rough terrain; $C_e$ = 1.0 for Open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

# Factored Exterior Wall Column Resistance (lbs): 2x8 Walls for $q_{1/50}$*$C_e$=0.45 kPa (9.4 psf)

**HOURLY WIND PRESSURE: ≤0.45 KPA (9.4 PSF) FOR OPEN TERRAIN; ≤0.64 KPA (13.4 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

**2X8 WALLS – LP LSL**

| Height | Tributary Width | 1.35E LP LSL | | | | 1.55E LP LSL | | | 1.75E LP LSL |
|---|---|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x 7-1/4" | Triple 1-1/2" x 7-1/4" | Quadruple 1-1/2" x 7-1/4" | 3-1/2" x 7-1/4" | Double 1-1/2" x 7-1/4" | Triple 1-1/2" x 7-1/4" | Quadruple 1-1/2" x 7-1/4" | 3-1/2" x 7-1/4" |
| 8' | 16" | 8210 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9859 L/999 | 17972 L/999 | 27073 L/999 | 27802 L/999 |
| | 24" | 8210 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9859 L/999 | 17972 L/999 | 27073 L/999 | 27802 L/999 |
| | 36" | 8210 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9859 L/999 | 17972 L/999 | 27073 L/999 | 27802 L/999 |
| | 48" | 8011 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9807 L/999 | 17972 L/999 | 27073 L/999 | 27802 L/999 |
| 9' | 16" | 7432 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/999 | 8901 L/999 | 17235 L/999 | 26427 L/999 | 25411 L/999 |
| | 24" | 7432 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/999 | 8901 L/999 | 17235 L/999 | 26427 L/999 | 25411 L/999 |
| | 36" | 7285 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/999 | 8828 L/999 | 17235 L/999 | 26427 L/999 | 25411 L/999 |
| | 48" | 5550 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/974 | 7858 L/999 | 17235 L/999 | 26427 L/999 | 25411 L/999 |
| 10' | 16" | 7394 L/999 | 14174 L/999 | 20076 L/999 | 17816 L/999 | 8851 L/999 | 17059 L/999 | 26055 L/999 | 25118 L/999 |
| | 24" | 7397 L/999 | 14174 L/999 | 20076 L/999 | 17816 L/999 | 8851 L/999 | 17059 L/999 | 26055 L/999 | 25118 L/999 |
| | 36" | 6479 L/999 | 14174 L/999 | 20076 L/999 | 17816 L/927 | 8613 L/999 | 17059 L/999 | 26055 L/999 | 25118 L/983 |
| | 48" | 3931 L/846 | 14099 L/999 | 20076 L/999 | 17816 L/764 | 6283 L/928 | 17059 L/999 | 26055 L/999 | 25118 L/892 |
| 12' | 16" | 7306 L/999 | 13876 L/999 | 19581 L/999 | 17362 L/919 | 8732 L/999 | 16651 L/999 | 25150 L/999 | 24406 L/897 |
| | 24" | 7114 L/862 | 13876 L/999 | 19581 L/999 | 17362 L/795 | 8609 L/957 | 16651 L/999 | 25150 L/999 | 24406 L/829 |
| | 36" | 4116 L/658 | 13770 L/834 | 19581 L/999 | 17362 L/602 | 6384 L/724 | 16651 L/918 | 25150 L/999 | 24406 L/709 |
| | 48" | - | 10349 L/701 | 19522 L/833 | 17362 L/487 | 2777 L/601 | 14501 L/763 | 25150 L/898 | 24406 L/583 |
| 14' | 16" | 7135 L/792 | 13521 L/999 | 18998 L/999 | 16797 L/723 | 8589 L/877 | 16170 L/999 | 24136 L/999 | 23536 L/722 |
| | 24" | 5681 L/590 | 13521 L/765 | 18998 L/939 | 16797 L/549 | 7833 L/649 | 16170 L/842 | 24136 L/999 | 23536 L/644 |
| | 36" | 1448 L/449 | 11005 L/581 | 18983 L/701 | 16797 L/407 | 3835 L/495 | 15002 L/633 | 24136 L/759 | 23536 L/488 |
| | 48" | - | 6438 L/485 | 15555 L/584 | 16363 L/326 | - | 10400 L/531 | 21951 L/629 | 23536 L/395 |
| 16' | 16" | 6839 L/557 | 13110 L/737 | 18334 L/900 | 16114 L/525 | 8252 L/622 | 15621 L/810 | 23036 L/950 | 22474 L/587 |
| | 24" | 4059 L/420 | 12863 L/544 | 18334 L/676 | 16114 L/391 | 6158 L/465 | 15523 L/602 | 23036 L/731 | 22474 L/467 |
| | 36" | - | 8024 L/419 | 16620 L/506 | 15726 L/286 | 1104 L/353 | 11793 L/459 | 22466 L/547 | 22474 L/346 |
| | 48" | - | 2604 L/347 | 11411 L/422 | 14275 L/230 | - | 6448 L/382 | 17092 L/460 | 22001 L/278 |
| 18' | 16" | 5817 L/411 | 12645 L/544 | 17598 L/676 | 15318 L/390 | 7806 L/454 | 15010 L/603 | 21857 L/730 | 21244 L/463 |
| | 24" | 2397 L/310 | 10891 L/406 | 17458 L/499 | 15158 L/286 | 4458 L/343 | 14460 L/444 | 21794 L/546 | 21244 L/346 |
| | 36" | - | 5186 L/311 | 13314 L/379 | 14508 L/207 | - | 8718 L/342 | 18748 L/413 | 20833 L/253 |
| | 48" | - | - | 7506 L/314 | 11200 L/170 | - | 2729 L/284 | 12619 L/345 | 20209 L/202 |
| 20' | 16" | 4696 L/312 | 11897 L/413 | 16716 L/518 | 14424 L/295 | 6590 L/346 | 14218 L/459 | 20634 L/565 | 19858 L/356 |
| | 24" | - | 8790 L/311 | 16256 L/379 | 13944 L/215 | 2796 L/261 | 12115 L/342 | 20118 L/418 | 19706 L/262 |
| | 36" | - | 1713 L/240 | 10254 L/290 | 12165 L/157 | - | 5915 L/262 | 15116 L/318 | 19021 L/190 |
| | 48" | - | - | 3060 L/242 | 8380 L/129 | - | - | 8579 L/264 | 17975 L/151 |
| 22' | 16" | 3076 L/246 | 10801 L/321 | 14524 L/412 | 13222 L/229 | 5412 L/269 | 12881 L/359 | 19328 L/444 | 18395 L/278 |
| | 24" | - | 5853 L/247 | 13093 L/301 | 12707 L/165 | - | 9267 L/271 | 18489 L/325 | 17920 L/203 |
| | 36" | - | - | 5403 L/233 | 8936 L/124 | - | - | 11146 L/252 | 17204 L/146 |
| | 48" | - | - | - | - | - | - | - | - |
| 24' | 16" | - | 7595 L/265 | 12565 L/331 | 11906 L/181 | 2577 L/223 | 10389 L/292 | 17121 L/359 | 16007 L/225 |
| | 24" | - | 1918 L/204 | 8746 L/248 | 10016 L/133 | - | 5182 L/223 | 14041 L/268 | 15841 L/161 |
| | 36" | - | - | - | - | - | - | 4612 L/210 | - |
| | 48" | - | - | - | - | - | - | - | - |
| 26' | 16" | - | 4943 L/221 | 10048 L/273 | 9928 L/148 | 1790 L/183 | 7340 L/244 | 14892 L/294 | 13783 L/184 |
| | 24" | - | - | 5073 L/207 | - | - | 1407 L/187 | 9328 L/225 | 13104 L/132 |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 28' | 16" | - | 2650 L/186 | 7286 L/230 | 7881 L/124 | - | 4828 L/205 | 11340 L/250 | 11524 L/153 |
| | 24" | - | - | 1700 L/175 | - | - | - | 5375 L/191 | - |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 30' | 16" | - | - | 4996 L/195 | - | - | 2663 L/175 | 8295 L/214 | 9668 L/129 |
| | 24" | - | - | - | - | - | - | 1785 L/164 | - |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for rough terrain; $C_e$ = 1.0 for open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

# Factored Exterior Wall Column Resistance (lbs): 2x8 Wall for $q_{1/50}$*$C_e$=0.45 kPa (9.4 psf)

**HOURLY WIND PRESSURE: ≤0.45 KPA (9.4 PSF) FOR OPEN TERRAIN; ≤0.64 KPA (13.4 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

**2X8 WALLS – LP LVL**

| Height | Tributary Width | 1-1/2" 2.0E LP LVL | | | 1-3/4" 2.0E LP LVL | | | 2.0E LP LVL | |
|---|---|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x -7-1/4" | Triple 1-1/2" x 7-1/4" | Quadruple 1-1/2" x 7-1/4" | Double 1-3/4" x 7-1/4" | Triple 1-3/4" x 7-1/4" | Quadruple 1-3/4" x 7-1/4" | 3-1/2" x 7-1/4" | 5-1/4" x 7-1/4" |
| 8' | 16" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| | 24" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| | 36" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| | 48" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| 9' | 16" | 11676 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| | 24" | 11676 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| | 36" | 11676 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| | 48" | 11564 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| 10' | 16" | 11609 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| | 24" | 11609 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| | 36" | 11609 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| | 48" | 11288 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| 12' | 16" | 11453 L/999 | 22227 L/999 | 31508 L/999 | 17057 L/999 | 31455 L/999 | 44030 L/999 | 25063 L/999 | 37594 L/999 |
| | 24" | 11453 L/999 | 22227 L/999 | 31508 L/999 | 17057 L/999 | 31455 L/999 | 44030 L/999 | 25063 L/943 | 37594 L/999 |
| | 36" | 11133 L/861 | 22227 L/999 | 31508 L/999 | 17057 L/915 | 31455 L/999 | 44030 L/999 | 25063 L/809 | 37594 L/948 |
| | 48" | 8596 L/710 | 22227 L/899 | 31508 L/999 | 17042 L/739 | 31455 L/948 | 44030 L/999 | 25063 L/666 | 37594 L/885 |
| 14' | 16" | 11264 L/999 | 21548 L/999 | 30383 L/999 | 16702 L/999 | 30393 L/999 | 42341 L/999 | 25044 L/798 | 37567 L/861 |
| | 24" | 11139 L/790 | 21548 L/999 | 30383 L/999 | 16702 L/837 | 30393 L/976 | 42341 L/999 | 25044 L/723 | 37567 L/802 |
| | 36" | 9228 L/589 | 21548 L/757 | 30383 L/923 | 16702 L/620 | 30393 L/801 | 42341 L/916 | 25044 L/553 | 37567 L/729 |
| | 48" | 5318 L/485 | 20210 L/619 | 30383 L/756 | 16220 L/497 | 30393 L/656 | 42341 L/798 | 25044 L/449 | 37567 L/612 |
| 16' | 16" | 11040 L/761 | 20789 L/962 | 29123 L/999 | 16278 L/802 | 29167 L/883 | 40423 L/904 | 25026 L/625 | 37540 L/687 |
| | 24" | 10664 L/557 | 20789 L/729 | 29123 L/885 | 16278 L/597 | 29167 L/766 | 40423 L/832 | 25026 L/520 | 37540 L/629 |
| | 36" | 6799 L/420 | 20347 L/541 | 29123 L/669 | 15911 L/437 | 29167 L/579 | 40423 L/707 | 25026 L/389 | 37540 L/530 |
| | 48" | 1872 L/346 | 15965 L/450 | 28578 L/542 | 13417 L/354 | 29167 L/467 | 40423 L/579 | 25026 L/312 | 37540 L/433 |
| 18' | 16" | 10649 L/560 | 19934 L/727 | 27744 L/873 | 15783 L/597 | 27797 L/741 | 38316 L/774 | 24159 L/506 | 37512 L/546 |
| | 24" | 9320 L/411 | 19928 L/541 | 27744 L/669 | 15720 L/437 | 27797 L/577 | 38316 L/698 | 24159 L/385 | 37512 L/492 |
| | 36" | 4343 L/310 | 17521 L/404 | 27458 L/497 | 14555 L/319 | 27797 L/428 | 38316 L/532 | 23857 L/284 | 37512 L/387 |
| | 48" | - | 11933 L/335 | 24505 L/406 | 10320 L/262 | 27081 L/343 | 38316 L/430 | 23211 L/227 | 37512 L/313 |
| 20' | 16" | 10161 L/421 | 19011 L/559 | 26311 L/687 | 15218 L/452 | 25158 L/603 | 33552 L/716 | 22565 L/396 | 36938 L/439 |
| | 24" | 7622 L/313 | 18594 L/411 | 26311 L/513 | 14848 L/329 | 25158 L/449 | 33552 L/562 | 22518 L/293 | 36938 L/389 |
| | 36" | 1919 L/236 | 14265 L/310 | 25406 L/378 | 12048 L/243 | 25158 L/327 | 33552 L/416 | 21792 L/214 | 36938 L/289 |
| | 48" | - | 8190 L/256 | 19935 L/313 | 7328 L/199 | 24073 L/260 | 33552 L/332 | 21096 L/170 | 36296 L/233 |
| 22' | 16" | 9637 L/324 | 17314 L/442 | 23086 L/558 | 14190 L/352 | 21432 L/492 | 28572 L/616 | 20869 L/311 | 32846 L/396 |
| | 24" | 5972 L/243 | 17240 L/319 | 23086 L/408 | 13914 L/253 | 21432 L/359 | 28572 L/457 | 20475 L/228 | 32846 L/311 |
| | 36" | - | 11264 L/243 | 22173 L/296 | 9386 L/189 | 21432 L/257 | 28572 L/331 | 19733 L/165 | 32846 L/228 |
| | 48" | - | 2913 L/204 | 15587 L/245 | 2964 L/158 | 18276 L/207 | 28572 L/261 | 18246 L/131 | 32296 L/181 |
| 24' | 16" | 8057 L/259 | 14849 L/358 | 19801 L/458 | 12077 L/284 | 18219 L/404 | 24292 L/513 | 18672 L/250 | 28153 L/348 |
| | 24" | 2522 L/200 | 13099 L/261 | 19801 L/330 | 10630 L/205 | 18219 L/290 | 24292 L/373 | 18512 L/180 | 28153 L/255 |
| | 36" | - | 5738 L/200 | 15578 L/244 | 4959 L/155 | 17032 L/208 | 24292 L/267 | 17176 L/130 | 28153 L/184 |
| | 48" | - | - | 8193 L/202 | - | 11988 L/169 | 23006 L/210 | - | 27507 L/145 |
| 26' | 16" | 5317 L/216 | 12622 L/294 | 16964 L/379 | 10025 L/232 | 15488 L/333 | 20656 L/428 | 16047 L/206 | 24182 L/292 |
| | 24" | - | 9009 L/218 | 16617 L/271 | 7365 L/170 | 15190 L/237 | 20656 L/307 | 15548 L/148 | 24182 L/210 |
| | 36" | - | - | 10035 L/204 | - | 12123 L/172 | 20025 L/218 | - | 23603 L/151 |
| | 48" | - | - | - | - | 6785 L/140 | 16488 L/174 | - | - |
| 28' | 16" | 3014 L/182 | 10212 L/245 | 14442 L/316 | 8191 L/193 | 13079 L/278 | 17586 L/359 | 13585 L/172 | 20804 L/245 |
| | 24" | - | 5639 L/183 | 12430 L/228 | 4704 L/143 | 12532 L/197 | 17287 L/255 | 12913 L/122 | 20578 L/175 |
| | 36" | - | - | 5309 L/172 | - | 8184 L/144 | 16020 L/181 | - | 19616 L/125 |
| | 48" | - | - | - | - | 2051 L/118 | 11249 L/146 | - | - |
| 30' | 16" | - | 7607 L/208 | 12050 L/266 | 6125 L/163 | 10907 L/234 | 14911 L/303 | 11406 L/145 | 17932 L/208 |
| | 24" | - | 2704 L/156 | 8933 L/194 | 2412 L/121 | 9846 L/165 | 14398 L/214 | - | 17277 L/148 |
| | 36" | - | - | - | - | 4883 L/122 | 11847 L/153 | - | - |
| | 48" | - | - | - | - | - | 6871 L/123 | - | - |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for rough terrain; $C_e$ = 1.0 for open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

# Factored Exterior Wall Column Resistance (lbs): 2x8 Walls for $q_{1/50}$*$C_e$=0.60 kPa (12.5 psf)

**HOURLY WIND PRESSURE: ≤0.60 KPA (12.5 PSF) FOR OPEN TERRAIN; ≤0.85 KPA (17.8 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

**2X8 WALLS – LP LSL**

| Height | Tributary Width | 1.35E LP LSL | | | | 1.55E LP LSL | | | 1.75E LP LSL |
|---|---|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x 7-1/4" | Triple 1-1/2" x 7-1/4" | Quadruple 1-1/2" x 7-1/4" | 3-1/2" x 7-1/4" | Double 1-1/2" x 7-1/4" | Triple 1-1/2" x 7-1/4" | Quadruple 1-1/2" x 7-1/4" | 3-1/2" x 7-1/4" |
| 8' | 16" | 8210 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9859 L/999 | 17972 L/999 | 25067 L/999 | 27802 L/999 |
| | 24" | 8210 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9859 L/999 | 17972 L/999 | 25067 L/999 | 27802 L/999 |
| | 36" | 7883 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 9787 L/999 | 17972 L/999 | 25067 L/999 | 27802 L/999 |
| | 48" | 5393 L/999 | 14887 L/999 | 20769 L/999 | 19549 L/999 | 7976 L/999 | 17972 L/999 | 25067 L/999 | 27802 L/999 |
| 9' | 16" | 7432 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/999 | 8901 L/999 | 17235 L/999 | 24454 L/999 | 25411 L/999 |
| | 24" | 7364 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/999 | 8901 L/999 | 17235 L/999 | 24454 L/999 | 25411 L/999 |
| | 36" | 5388 L/999 | 14302 L/999 | 20290 L/999 | 18004 L/962 | 7701 L/999 | 17235 L/999 | 24454 L/999 | 25411 L/999 |
| | 48" | 2020 L/893 | 12577 L/999 | 20290 L/999 | 18004 L/790 | 4586 L/977 | 17042 L/999 | 24454 L/999 | 25411 L/927 |
| 10' | 16" | 7394 L/999 | 14174 L/999 | 20076 L/999 | 17816 L/999 | 8851 L/999 | 17059 L/999 | 24159 L/999 | 25118 L/999 |
| | 24" | 7138 L/999 | 14174 L/999 | 20076 L/999 | 17816 L/987 | 8712 L/999 | 17059 L/999 | 24159 L/999 | 25118 L/999 |
| | 36" | 3720 L/836 | 13990 L/999 | 20076 L/999 | 17816 L/754 | 6085 L/917 | 17059 L/999 | 24159 L/999 | 25118 L/881 |
| | 48" | - | 9996 L/888 | 19873 L/999 | 17816 L/612 | 2010 L/767 | 14329 L/961 | 24159 L/999 | 25118 L/729 |
| 12' | 16" | 7196 L/930 | 13876 L/999 | 19581 L/999 | 17362 L/847 | 8695 L/999 | 16651 L/999 | 23477 L/999 | 24406 L/848 |
| | 24" | 5067 L/703 | 13876 L/896 | 19581 L/999 | 17362 L/646 | 7296 L/772 | 16651 L/985 | 23477 L/999 | 24406 L/756 |
| | 36" | - | 10060 L/693 | 19475 L/822 | 17362 L/480 | 2466 L/593 | 14215 L/754 | 23477 L/904 | 24406 L/575 |
| | 48" | - | 4588 L/582 | 14294 L/697 | 16889 L/386 | - | 8839 L/636 | 20151 L/756 | 24406 L/466 |
| 14' | 16" | 6377 L/631 | 13521 L/823 | 18998 L/999 | 16797 L/589 | 8330 L/696 | 16170 L/904 | 22687 L/999 | 23536 L/670 |
| | 24" | 2785 L/479 | 12236 L/617 | 18998 L/754 | 16797 L/439 | 5047 L/529 | 15935 L/674 | 22687 L/830 | 23536 L/524 |
| | 36" | - | 6091 L/479 | 15203 L/577 | 16327 L/321 | - | 10063 L/525 | 20762 L/627 | 23536 L/389 |
| | 48" | - | - | 8779 L/484 | 13390 L/262 | - | 3335 L/439 | 14290 L/529 | 22980 L/313 |
| 16' | 16" | 4921 L/450 | 13020 L/586 | 18334 L/727 | 16114 L/421 | 6988 L/497 | 15621 L/648 | 21818 L/798 | 22474 L/500 |
| | 24" | - | 9490 L/446 | 18000 L/538 | 15886 L/309 | 2681 L/377 | 13245 L/489 | 21680 L/595 | 22474 L/373 |
| | 36" | - | 2136 L/343 | 11017 L/417 | 14023 L/227 | - | 6033 L/378 | 16187 L/457 | 21958 L/274 |
| | 48" | - | - | 3486 L/347 | 9506 L/187 | - | - | 8744 L/382 | 20978 L/218 |
| 18' | 16" | 3433 L/332 | 11912 L/433 | 17598 L/538 | 15284 L/308 | 5452 L/368 | 14713 L/479 | 20852 L/596 | 21244 L/372 |
| | 24" | - | 6840 L/332 | 14938 L/404 | 14690 L/224 | 235 L/279 | 10376 L/365 | 19874 L/441 | 21013 L/274 |
| | 36" | - | - | 7042 L/310 | 10920 L/168 | - | 2218 L/280 | 11896 L/342 | 20160 L/199 |
| | 48" | - | - | - | 5917 L/138 | - | - | 3647 L/284 | 16754 L/161 |
| 20' | 16" | 1752 L/253 | 9924 L/332 | 16461 L/409 | 14080 L/232 | 3925 L/279 | 13277 L/365 | 19651 L/455 | 19839 L/282 |
| | 24" | - | 4363 L/253 | 11992 L/310 | 13245 L/168 | - | 7676 L/279 | 16556 L/340 | 19215 L/206 |
| | 36" | - | - | 2277 L/240 | 8087 L/127 | - | - | 7976 L/261 | 17706 L/149 |
| | 48" | - | - | - | - | - | - | - | 12893 L/123 |
| 22' | 16" | - | 7331 L/263 | 14387 L/321 | 12845 L/179 | - | 10688 L/289 | 17177 L/359 | 18059 L/220 |
| | 24" | - | - | 7783 L/247 | 10294 L/132 | - | 3017 L/225 | 12348 L/271 | 17406 L/158 |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 24' | 16" | - | 3770 L/217 | 10126 L/265 | 10930 L/142 | - | 6754 L/238 | 13850 L/292 | 16007 L/174 |
| | 24" | - | - | 2559 L/204 | - | - | - | 6900 L/223 | 14185 L/127 |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 26' | 16" | - | - | 6586 L/221 | - | - | 3401 L/199 | 9782 L/244 | 13291 L/143 |
| | 24" | - | - | - | - | - | - | 1872 L/187 | - |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 28' | 16" | - | - | 3544 L/186 | - | - | - | 6434 L/205 | - |
| | 24" | - | - | - | - | - | - | - | - |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 30' | 16" | - | - | - | - | - | - | 3562 L/175 | - |
| | 24" | - | - | - | - | - | - | - | - |
| | 36" | - | - | - | - | - | - | - | - |
| | 48" | - | - | - | - | - | - | - | - |

**DESIGN ASSUMPTIONS:**

1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for rough terrain; $C_e$ = 1.0 for open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

**ADDITIONAL NOTES:**

1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

# Factored Exterior Wall Column Resistance (lbs): 2x8 Walls for $q_{1/50}$*$C_e$=0.60 kPa (12.5 psf)

**HOURLY WIND PRESSURE: ≤0.60 KPA (12.5 PSF) FOR OPEN TERRAIN; ≤0.85 KPA (17.8 PSF) FOR ROUGH TERRAIN**

**TO USE:**

1. Determine the height of the wall column. If not listed, select the next tallest height in the table.
2. Select the row for the desired spacing.
3. Calculate factored vertical load applied to the top of the column based on the greater of 1.25D+1.5L+1.0S or 1.25D+1.5S+1.0L. Note that the tables are valid only for (L + 0.5S) / 4 ≤ D ≤ L + 0.5S or (S + 0.5L) / 4 ≤ D ≤ S + 0.5L where D = unfactored Dead Load, L = unfactored Live Load due to use and occupancy, and S = unfactored Snow Load.
4. Select the LP® SolidStart® LSL or LVL grade and size where the factored vertical resistance and deflection ratio meet or exceed the applied factored vertical load and the required deflection limit.
5. Verify the plate bearing capacity for the selected column. See Design Assumption 9 below.

**2X8 WALLS – LP LVL**

| Height | Tributary Width | 1-1/2" 2.0E LP LVL | | | 1-3/4" 2.0E LP LVL | | | 2.0E LP LVL | |
|---|---|---|---|---|---|---|---|---|---|
| | | Double 1-1/2" x -7-1/4" | Triple 1-1/2" x 7-1/4" | Quadruple 1-1/2" x 7-1/4" | Double 1-3/4" x 7-1/4" | Triple 1-3/4" x 7-1/4" | Quadruple 1-3/4" x 7-1/4" | 3-1/2" x 7-1/4" | 5-1/4" x 7-1/4" |
| 8' | 16" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| | 24" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| | 36" | 13036 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| | 48" | 12929 L/999 | 24129 L/999 | 33793 L/999 | 19133 L/999 | 34028 L/999 | 47195 L/999 | 25099 L/999 | 37649 L/999 |
| 9' | 16" | 11676 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| | 24" | 11676 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| | 36" | 11543 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| | 48" | 10290 L/999 | 23054 L/999 | 32904 L/999 | 17470 L/999 | 32727 L/999 | 46055 L/999 | 25090 L/999 | 37635 L/999 |
| 10' | 16" | 11609 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| | 24" | 11609 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| | 36" | 11263 L/999 | 22805 L/999 | 32480 L/999 | 17347 L/999 | 32346 L/999 | 45464 L/999 | 25081 L/999 | 37621 L/999 |
| | 48" | 8229 L/900 | 22805 L/999 | 32480 L/999 | 17332 L/926 | 32346 L/999 | 45464 L/999 | 25081 L/838 | 37621 L/999 |
| 12' | 16" | 11453 L/999 | 22227 L/999 | 31508 L/999 | 17057 L/999 | 31455 L/999 | 44030 L/999 | 25063 L/963 | 37594 L/999 |
| | 24" | 11256 L/929 | 22227 L/999 | 31508 L/999 | 17057 L/982 | 31455 L/999 | 44030 L/999 | 25063 L/862 | 37594 L/968 |
| | 36" | 8357 L/702 | 22227 L/886 | 31508 L/999 | 17011 L/729 | 31455 L/936 | 44030 L/999 | 25063 L/657 | 37594 L/876 |
| | 48" | 3626 L/582 | 19269 L/737 | 31508 L/883 | 15854 L/590 | 31455 L/768 | 44030 L/932 | 25063 L/534 | 37594 L/726 |
| 14' | 16" | 11241 L/851 | 21548 L/999 | 30383 L/999 | 16702 L/898 | 30393 L/998 | 42341 L/999 | 25044 L/743 | 37567 L/818 |
| | 24" | 10246 L/629 | 21548 L/814 | 30383 L/986 | 16702 L/669 | 30393 L/855 | 42341 L/938 | 25044 L/593 | 37567 L/748 |
| | 36" | 4999 L/479 | 19871 L/612 | 30383 L/745 | 16181 L/490 | 30393 L/647 | 42341 L/788 | 25044 L/442 | 37567 L/604 |
| | 48" | - | 13761 L/514 | 28057 L/613 | 11819 L/404 | 30276 L/523 | 42341 L/647 | 25044 L/354 | 37567 L/492 |
| 16' | 16" | 10787 L/603 | 20789 L/782 | 29123 L/944 | 16278 L/643 | 29167 L/817 | 40423 L/851 | 25026 L/557 | 37540 L/644 |
| | 24" | 8050 L/450 | 20587 L/582 | 29123 L/718 | 16081 L/472 | 29167 L/621 | 40423 L/754 | 25026 L/418 | 37540 L/566 |
| | 36" | 1417 L/342 | 15570 L/444 | 28509 L/534 | 13102 L/350 | 29136 L/460 | 40423 L/571 | 25026 L/307 | 37540 L/427 |
| | 48" | - | 8462 L/370 | 21957 L/447 | 7692 L/288 | 27181 L/373 | 40423 L/462 | 24424 L/245 | 37540 L/344 |
| 18' | 16" | 10198 L/440 | 19934 L/583 | 27744 L/717 | 15783 L/473 | 27797 L/619 | 38316 L/718 | 24159 L/414 | 37512 L/506 |
| | 24" | 5838 L/332 | 19078 L/430 | 27743 L/534 | 15215 L/344 | 27797 L/461 | 38316 L/570 | 24043 L/306 | 37512 L/416 |
| | 36" | - | 11490 L/331 | 24064 L/401 | 9977 L/258 | 27017 L/338 | 38316 L/423 | 23162 L/223 | 37512 L/308 |
| | 48" | - | 3521 L/275 | 16240 L/335 | 3651 L/213 | 21848 L/278 | 37311 L/341 | 20933 L/179 | 37512 L/246 |
| 20' | 16" | 8608 L/335 | 18796 L/444 | 26311 L/553 | 14999 L/356 | 25158 L/483 | 33552 L/603 | 22565 L/316 | 36938 L/402 |
| | 24" | 3640 L/253 | 15948 L/331 | 25718 L/408 | 13342 L/260 | 25158 L/353 | 33552 L/449 | 21991 L/231 | 36938 L/312 |
| | 36" | - | 7722 L/253 | 19467 L/309 | 6958 L/196 | 23699 L/257 | 33552 L/327 | 21044 L/167 | 36240 L/229 |
| | 48" | - | - | 11120 L/256 | - | 16915 L/212 | 32792 L/259 | 16646 L/136 | 35269 L/183 |
| 22' | 16" | 7047 L/261 | 17314 L/346 | 23086 L/442 | 14086 L/274 | 21432 L/388 | 28572 L/492 | 20619 L/246 | 32846 L/335 |
| | 24" | - | 13027 L/259 | 23086 L/319 | 10947 L/202 | 21432 L/279 | 28572 L/359 | 19939 L/178 | 32846 L/246 |
| | 36" | - | 2173 L/202 | 15072 L/243 | 2433 L/156 | 17941 L/204 | 28572 L/257 | 17974 L/129 | 32242 L/178 |
| | 48" | - | - | 3936 L/204 | - | 10762 L/168 | 24400 L/207 | 12316 L/107 | 31248 L/141 |
| 24' | 16" | 4272 L/212 | 14355 L/279 | 19801 L/358 | 11598 L/220 | 18219 L/315 | 24292 L/404 | 18655 L/195 | 28153 L/276 |
| | 24" | - | 7982 L/213 | 17468 L/261 | 6679 L/166 | 17855 L/224 | 24292 L/290 | 17972 L/140 | 28153 L/199 |
| | 36" | - | - | 7605 L/200 | - | 11632 L/167 | 22688 L/208 | - | 27442 L/143 |
| | 48" | - | - | - | - | 3298 L/138 | 15991 L/169 | - | - |
| 26' | 16" | - | 10310 L/234 | 16826 L/294 | 8356 L/183 | 15349 L/258 | 20656 L/333 | 15743 L/160 | 24182 L/228 |
| | 24" | - | 3341 L/178 | 12010 L/218 | 3026 L/138 | 13501 L/185 | 20257 L/237 | - | 23879 L/163 |
| | 36" | - | - | - | - | 6397 L/139 | 16171 L/172 | - | - |
| | 48" | - | - | - | - | - | 9057 L/140 | - | - |
| 28' | 16" | - | 7026 L/197 | 13617 L/245 | 5755 L/153 | 12685 L/214 | 17440 L/278 | 13099 L/133 | 20769 L/190 |
| | 24" | - | - | 7537 L/183 | - | 9596 L/155 | 16708 L/197 | - | 19880 L/136 |
| | 36" | - | - | - | - | - | 10916 L/144 | - | - |
| | 48" | - | - | - | - | - | - | - | - |
| 30' | 16" | - | 4280 L/167 | 10142 L/208 | 3590 L/130 | 10538 L/179 | 14541 L/234 | - | 17457 L/161 |
| | 24" | - | - | 3614 L/156 | - | 6420 L/131 | 13136 L/165 | - | - |
| | 36" | - | - | - | - | - | 6507 L/122 | - | - |
| | 48" | - | - | - | - | - | - | - | - |

**DESIGN ASSUMPTIONS:**

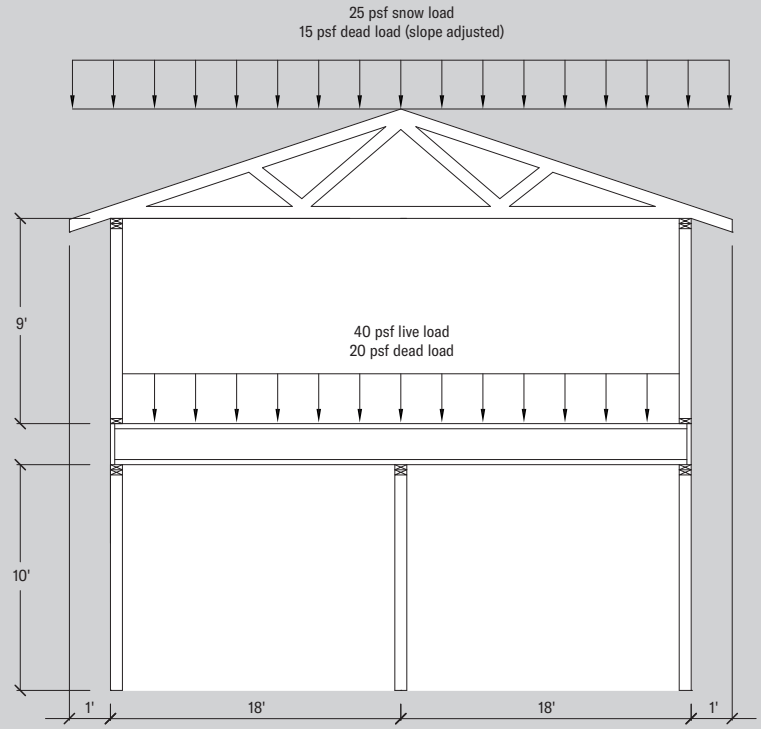
1. The tables are limited to structures with a mean roof height of 39'-4" (12 m) for rough terrain, and 32'-9" (10 m) for open terrain.
2. The factored resistance has been reduced to allow for one hole up to 25% of the stud depth located in the upper or lower 1/3 of the stud height or 3 feet, whichever is less. The hole shall not be placed within 6" of either end of the column. Refer to Drilling & Notching guidelines on page 20 for more information.
3. The vertical resistance assumes an eccentricity of 1/6 of the column depth or width.
4. The following assumptions have been used in the calculation of design wind pressure:
   - $I_w$ = 1.0 for ULS; $I_w$ = 0.75 for SLS
   - $C_e$ = 0.7 for rough terrain; $C_e$ = 1.0 for open terrain. Refer to page 4 for terrain definitions and note 1 for building height restrictions
   - $C_{pi}$ is based on Category 2
   - $C_{gi}$ = 2.0
5. A duration of load adjustment, $K_D$ = 1.15 has been applied for wind.
6. No system factor has been applied for bending resistance or stiffness.
7. Full-width blocking is assumed to be installed at every 8' on centre or less.
8. The tabulated values assume the plates are the same material and grade as the column except the 1.35E LSL plate value is used with LVL columns. For other plate material or grade, the designer shall check the factored load against the factored compressive resistance for the plate and adjust the column size and/or the spacing accordingly. Refer to the Bearing Capacity table on page 4 for other common species. No increase is allowed without a complete analysis of the vertical resistance of the column.

**ADDITIONAL NOTES:**

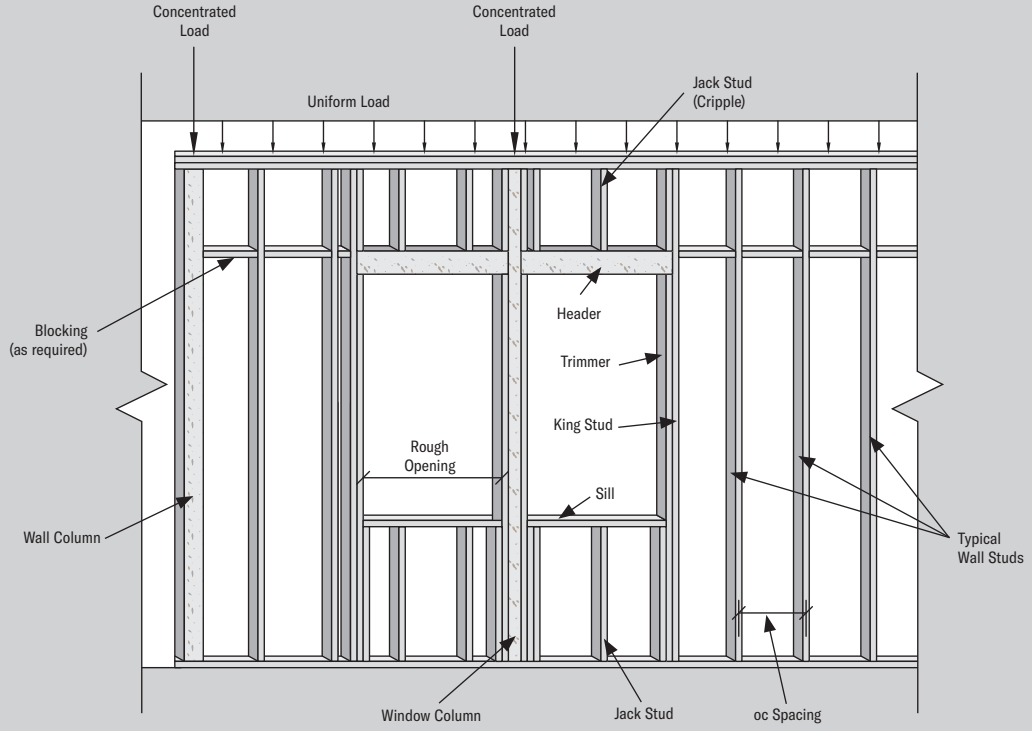
1. Height is the clear height of the column between the bottom plate and the lower top plate.
2. The first value in each cell represents the factored vertical resistance of the column in pounds (lbs). These factored vertical resistances are the resistance of the column based on Load Combinations cases 1 to 4 of Table 4.1.3.2.A of the NBC or horizontal wind pressure acting alone (no gravity loads except Dead Load), whichever control.
3. The second value in each cell represents the deflection ratio (L/x). The designer shall verify the correct deflection ratio limit for the intended application. For brick or stone veneer, a maximum deflection of L/360 is required in accordance with CSA Standard O86 and the Canadian Wood Council's Wood Frame Construction Guide.
4. These tables are for members in the Beam orientation. Refer to the Product Orientation detail on page 4.
5. All members shall be solid, one-piece sections except for the built-up columns. See page 23 for built-up connections.
6. Columns supporting a Tributary Width greater than 48" are beyond the scope of this table.

# Typical Wall Framing Examples

## ENGINEERED WALL FRAMING EXAMPLE

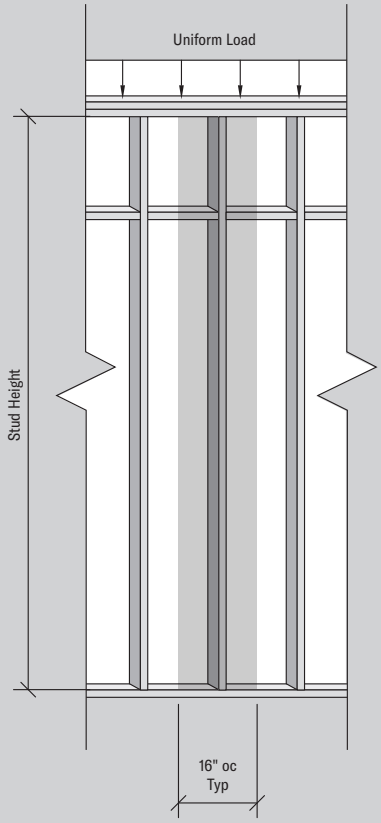



## TYPICAL WALL FRAMING



# Typical Wall Framing: Wall Stud & Wall Column Examples

## TYPICAL WALL STUD EXAMPLE




### EXAMPLE 1.
### TYPICAL WALL STUD

**HOW TO SIZE:**

1. Determine Hourly Wind Pressure ($q_{1/50}$) based on location from Appendix C of the NBC and Exposure Category based on the terrain conditions.
2. Determine the appropriate snow load based on Appendix C of NBC.
3. Determine the clear height of the wall stud.
4. Determine the total factored vertical load (plf) applied to wall studs from roof and floor including wall weight.
5. Determine the allowable deflection ratio based on the wall construction.
6. Select the required grade and size from the appropriate chart for the desired wall stud spacing.

**EXAMPLE:**

Select a suitable wall stud for a 10' first story wall for a residential structure as shown above located in Victoria, British Columbia, in an open (and level) terrain condition.

- Wall supports second floor and roof of a 36' wide home
- Second floor is supported at midspan and roof trusses have a 1' overhang
- Floor loads are 40 psf Live and 20 psf Dead Load
- Snow load is 25 psf Snow as calculated and 15 psf Roof Dead Load
- Assume 100 plf for the weight of the second story wall
- The exterior wall finish is stucco

**SOLUTION:**

1. For a structure located in Victoria, British Columbia with open and level terrain condition $q_{1/50}$ = 0.57 kPa and $C_e$ = 1.0.
2. Use the height of the wall (10') as an approximation of the stud height.
3. The vertical load applied to each wall stud is:

   Snow: S = 25 psf * (36' / 2 + 1') = 475 plf

   Live: L = 40 psf * (18' / 2) = 360 plf

   Dead: D = 15psf * (36' / 2 + 1') + 100 plf + 20 psf * (18' / 2) = 565 plf

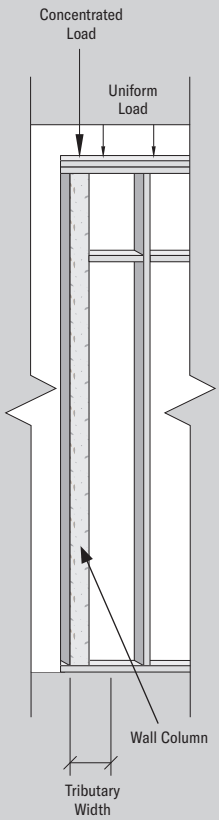
   Total Factored Vertical Load

   $P_f$ = 1.25D + 1.5L + S = 1722 plf

   $P_f$ = 1.25D + 1.5S + L = 1780 plf ← govern
4. With a stucco finish, the deflection ratio shall be L/360 or better.
5. Using the 0.60 kPa chart from the Factored Wall Stud Resistance table on page 7, for a standard wall stud of 16" oc spacing, select:

**1-1/2" x 5-1/2" 1.35E LP® SolidStart® LSL at 16" oc can support a factored vertical load of 5143 plf with a deflection ratio of L/442.**

## WALL COLUMN EXAMPLE




### EXAMPLE 2. WALL COLUMN

**HOW TO SIZE**

1. Determine the clear height of the column.
2. Determine the tributary width for the lateral wind pressure.
3. Determine the total vertical load (lbs) applied to the column.
4. Determine the allowable deflection ratio based on the wall construction.
5. Select the required grade and size from the appropriate chart.

**EXAMPLE:**

Based on the conditions from the typical wall stud example, select the corner wall column in the same first story wall to support a girder truss spaced 8' on centers. The design must include the weight of the second story wall and the load from the second floor being carried by the wall header beam.

**SOLUTION:**

1. The column will be the same height as the typical wall stud - 10' in this example.
2. The tributary width for the wind pressure will be half as that from the typical stud example: 8". Use 16" as next largest tributary width.
3. The applied vertical load on the column will be the girder truss load transferred through the second story wall column, the tributary area of the second floor and the tributary weight of the second story wall (both the same as in the typical wall stud).

   Snow: S = 25 psf * (36' / 2 + 1') * (8' / 2 + 1') = 2375 lbs

   Dead: Roof = 15 psf * (36' / 2 + 1') * (8' / 2 + 1') = 1425 lbs

   Wall = 100 plf * 8" oc / 12 + 100 plf* (18' / 2) = 967 lbs

   Floor = 20 psf * (18' / 2) * 8" oc / 12 = 120 lbs

   D = 1425 lbs + 967 lbs + 120 lbs = 1739 lbs

   Live: L = 360 plf * 8" oc / 12 = 240 lbs

   Total Factored Vertical Load

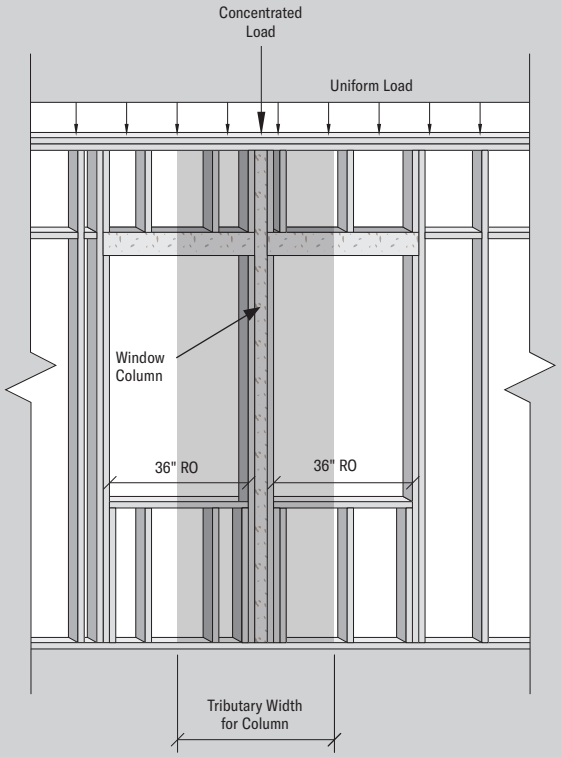
   $P_f$ = 1.25D + 1.5L + S = 5875 plf

   $P_f$ = 1.25D + 1.5S + L = 6942 plf ← govern
4. As in the typical wall stud example, use a minimum deflection ratio of L/360 for stucco.
5. Using the table for Factored Exterior Wall Column Resistance: 2x6 for 0.60 kPa on page 11 for a 16" oc spacing, select:

**3-1/2" x 5-1/2" 1.35E LP SolidStart LSL column can support a factored vertical load of 13609 lbs with a deflection ratio of L/661.**

# Typical Wall Framing: Window Column Examples

**WINDOW COLUMN EXAMPLE**




### EXAMPLE 3. WINDOW COLUMN

#### HOW TO SIZE

1. Determine the clear height of the column.
2. Determine the tributary width for the lateral wind pressure.
3. Determine the total vertical load (lbs) applied to the column.
4. Determine the allowable deflection ratio based on the wall construction.
5. Select the required grade and size from the appropriate chart.

#### EXAMPLE:

This column sits between two windows, both 36" rough openings, in the wall from the following example. For this example, there is no additional concentrated load applied.
The only vertical loads will be the uniform load from the roof trusses, second story wall and the second floor.

#### SOLUTION:

1. The column will be the same height as the typical wall stud – 10'.
2. The tributary width for the wind pressure will be half the rough opening to both sides plus the width of the column and the trimmers. Since the width of the column is not known but the only vertical loads are the uniform loads from the common trusses, try a double 1-1/2" x 5-1/2" column.

   Tributary Width =
   2 * (36" / 2) + 2 * 1-1/2" (trimmers) + 2 * 1-1/2" (double 1-1/2" column) = 42"

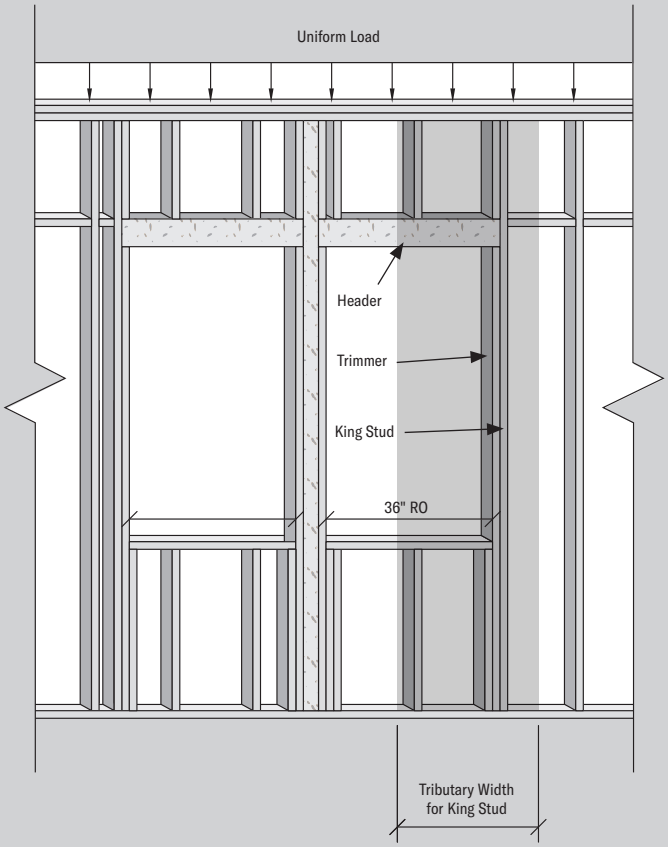
   Use 48" as next largest Tributary Width.
3. The applied vertical load on the column will only be the uniform load from the common roof trusses between the trimmers – assume a typical stud spacing of 16" for simplicity. The trimmers will support the vertical load from the window headers.

   Total Factored Vertical Load =
   1600 plf (from Typical Wall Stud example) * 16" oc / 12 = 2133 lbs
4. Again, use a deflection ratio of L/360 for stucco.
5. Using the table for Factored Exterior Wall Columns Resistance: 2x6 for 0.60 kPa on page 11 for a 48" oc spacing, select:

   **3-1/2" x 5-1/2" 1.35E LP® SolidStart® LSL column can support a factored vertical load of 11773 lbs with a deflection ratio of L/299.**

# Typical Wall Framing: Trimmer & King Stud Examples

## TRIMMER AND KING STUD EXAMPLES




## EXAMPLE 4. TRIMMER

### HOW TO SIZE:

**NOTE:** Trimmers are designed only for the vertical load applied by the header. The king stud will be designed for the lateral wind pressures

1. Determine the clear height of the trimmer.
2. Determine the tributary width associated with the trimmer.
3. Determine the vertical load applied to the trimmer from the window header.
4. Select the required grade and size from the appropriate chart.

Hint: To size a trimmer, use the 12" oc row for the required height from the appropriate Wall Stud Capacity table. At 12" oc, the vertical capacity in plf is equivalent to the vertical capacity in lbs. Ignore the deflection for the trimmer.

### EXAMPLE:

Select a suitable trimmer for a 3' (36") rough opening (RO) located in the first story wall of the Typical Wall Stud example. Assume the bottom of the window header is at a height of 7'-6".

### SOLUTION:

1. With a header height of 7'-6", use 8' for the trimmer height in the tables.
2. Add 3" to the rough opening to approximate the overall length of the header, assuming single trimmers.
   Tributary Width = (36" RO + 3") / 2 = 19.5"
3. The vertical load applied to the trimmer from the header is:

From Typical Wall Stud example:

Snow: S = 475 plf
Live: L = 360 plf
Dead: D = 15psf * (36' / 2 + 1') + 100 plf * (2.5' / 10') + 20 psf * (18' / 2) = 490 plf
Wall Dead Load is adjusted to the wall height supported by the header, approximately 2.5'

Total Factored Vertical Load

$P_f$ = 1.25D + 1.5L + S = 1628 plf
$P_f$ = 1.25D + 1.5S + L = 1685 plf ← govern

Total Factored Vertical Load on Trimmer = 1685 plf * 19.5" / 12 = 2738 lbs

4. Using the 0.60 kPa chart from the Factored Wall Stud Resistance table on page 7, for a 12" oc spacing, select:

**1-1/2" x 5-1/2" 1.35E LP® SolidStart® LSL trimmer can support a factored vertical load of 7562 lbs.**

**NOTE:** The factored bearing resistance of the header should always be verified. Based on a 768 psi specified bearing stress for S-P-F lumber, the factored bearing resistance of 5820 lbs (5820 plf * 1') is adequate compared to a reaction of 2738 lbs.

## EXAMPLE 5. KING STUD

### HOW TO SIZE:

**NOTE:** Design the king stud like an exterior wall column. The king stud must be attached to the adjacent wall stud by an exterior wall sheathing and interior gypsum wall board (or similar).

1. Determine the clear height of the king stud.
2. Determine the tributary width for the lateral wind pressure.
3. Determine the total vertical load (lbs) applied to the king stud.
4. Determine the allowable deflection ratio based on the wall construction.
5. Select the required grade and size from the appropriate chart.

### EXAMPLE:

Select a suitable king stud for the same rough opening from the Trimmer example.

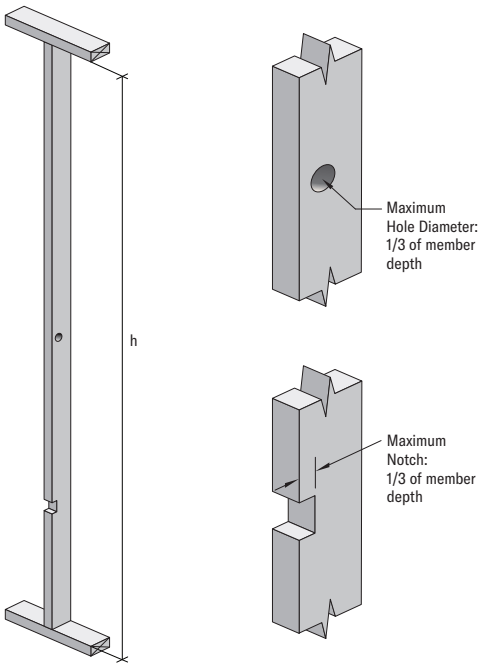
### SOLUTION:

1. The king stud will be the same height as the typical wall stud – 10' in this example.
2. The tributary width for the wind pressure on the king stud is from the middle of the rough opening to half the clear distance from the king stud to the adjacent typical wall stud. Check the distance from the king stud to adjacent wall stud on both sides of the window. If not known, and for this example, assume a full wall stud spacing.
   Tributary Width =
   19.5" (from Trimmer example) + 16" / 2 (to next stud) + 3" = 30.5"
   Use 36" as next largest Tributary Width.
3. The applied factored vertical load on the king stud is based on half the spacing to the next adjacent wall stud. Again, check the distance on both sides of the opening. If not known, and for this example, assume a full wall stud spacing.
   Total Factored Vertical Load = 1495 plf * (16" / 12) / 2 = 997 lbs
4. As in the typical wall stud example, use a deflection ratio of L/360 for stucco.
5. Using the table for 0.60 kPa, 2x6 chart from the Factored Exterior Wall Column Resistance on page 11 for a 36" oc spacing, select:

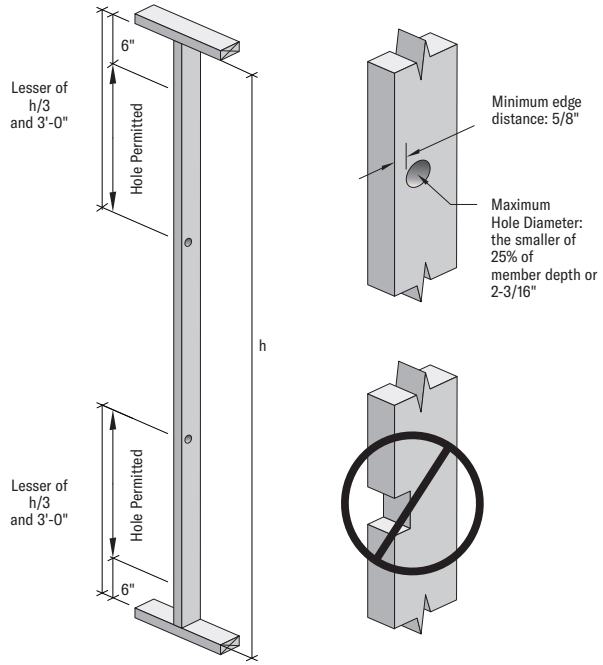
**Double 1-1/2" x 5-1/2" 1.35E LP SolidStart LSL column can support a factored vertical load of 1530 lbs with a deflection ratio of L/392.**

# Drilling and Notching

**PRESCRIPTIVE CONSTRUCTION (NBC PART 9)**




**FOR TABLES IN THIS GUIDE**




**NOTES:**

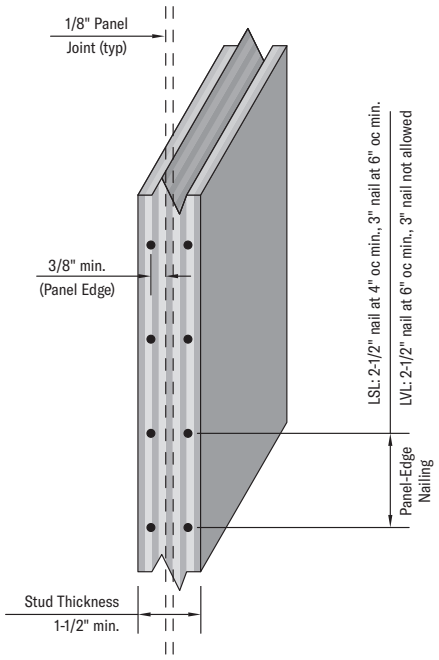
1. For prescriptive wall framing, cutting and notching of LP LSL and LP LVL wall studs is permitted in accordance with Section 9.23.5 of 2015 NBC. Refer to page 2 on Prescriptive Construction.
2. For all wall stud and exterior column tables in this guide, the rule for holes and notches are as follows:
   - One hole up to 25% of the stud depth is allowed only in the upper or lower 1/3 of the member height or 3 feet, whichever is less. In addition, a hole shall not be placed within 6" of either end of the stud. The edge distance of the hole shall not be less than 25% of the stud depth.
   - Notching is NOT allowed.
3. Free-standing columns shall not be drilled or notched except as required for proper installation of column caps, bases or other hold-downs without further analysis by a design professional. Bolts, lag screws and self-tapping screws shall only be inserted through the face of the column, perpendicular to the face of the strands in LP LSL and the veneers in LP LVL.
4. For engineered wall applications beyond the scope of this guide, design for notching and drilling shall be based on a net section analysis in accordance with the provisions of CSA Standard O86 and as follows:
   - The factored resistance for bending and axial compression and tension shall be reduced by the Strength Reduction Factors (tabulated below) to account for stress concentrations.
   - Hole size shall not exceed 2-3/16" diameter with a minimum clear distance of 5/8" from the edge of the stud.
   - Notch depth shall not exceed 2-3/16" deep by 8" long.
   - Do NOT place a hole or notch within 6" of either end of the stud.
   - Do NOT cut a hole and a notch in the same cross-section. Maintain a clear vertical separation of at least twice the length of the notch or twice the diameter of the hole.

**STRENGTH REDUCTION FACTORS**

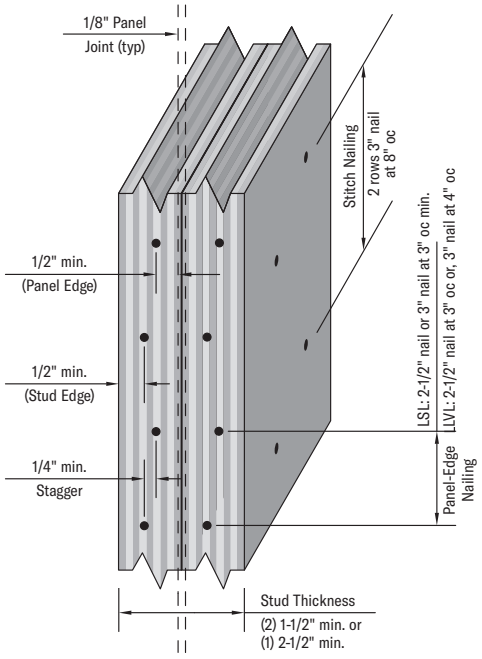
| Material | Notch | | | Hole | | |
|---|---|---|---|---|---|---|
| | Bending | Compression | Tension | Bending | Compression | Tension |
| LP® SolidStart® LSL | 0.95 | 0.90 | 0.75 | 1.00 | 1.00 | 1.00 |
| LP SolidStart LVL | 0.80 | 0.90 | 0.60 | 0.95 | 0.95 | 0.95 |

## WALL SHEATHING PANEL EDGE NAILING

### SINGLE STUD AT ADJOINING PANELS




### DOUBLE STUD AT ADJOINING PANELS




**NOTES:**

1. Minimum LP® SolidStart® LSL or LVL thickness for a single stud is 1-1/2".
2. A double stud (or a minimum 2-1/2" single stud) is required at adjoining panel edges as follows:
   a. For LP SolidStart LSL when using 2-1/2" common wire nails spaced closer than 4" oc or 3" common wire nails spaced closer than 6" oc.
   b. For LP SolidStart LVL when using 2-1/2" common wire nails spaced closer than 6" oc. 3" common wire nails are not allowed for a single stud.
3. The panel-edge nailing at a double stud shall be installed a minimum 1/2" from both the panel edge and the edge of the stud, and shall be installed with every other nail staggered a minimum 1/4" horizontally.
4. The minimum nail spacing into the edge of the stud shall not be less than:
   a. For LP SolidStart LSL: 3" oc for both 2-1/2" and 3" common wire nails.
   b. For LP SolidStart LVL: 3" oc for 2-1/2" common wire nails or 4" oc for 3" common wire nails.
5. Do not use nails larger than 3" common wire nails for wall sheathing nailing.
6. In lieu of engineering analysis for prescriptive wall framing, the double studs shall be stitch-nailed together with 2 staggered rows of 3" common wire nails spaced 8" oc in each row. For engineered walls, the stitch nailing shall be designed to transfer the required lateral shear.

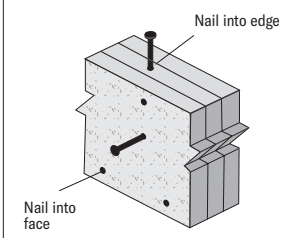
## FASTENER DESIGN

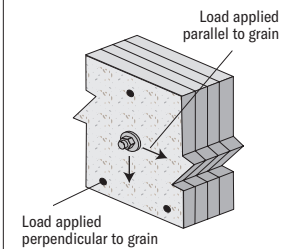
| Material | Equivalent Specific Gravity | | | | | |
|---|---|---|---|---|---|---|
| | Nails and Wood Screws | | | | Bolts and Lag Screws | |
| | Withdrawal | | Dowel Bearing | | Dowel Bearing (into the face only) | |
| | Edge | Face | Edge | Face | Load Applied Parallel to Grain | Load Applied Perpendicular to Grain |
| LP SolidStart LSL | 0.46 | 0.50 | 0.50 | 0.55 | 0.50 | 0.58 |
| LP SolidStart LVL | 0.46 | 0.50 | 0.50 | 0.50 | 0.46 | 0.50 |

**NOTES:**

1. Connection design using 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 at right for fastener and applied load orientation.

## FASTENER & LOAD ORIENTATION




## NAIL SPACING REQUIREMENTS

| Material | LVL Ply Thickness | Fastener Orientation[4] | Nail Size[1] (common or spiral) | Minimum End Distance[2,5] | Minimum Nail Spacing per Row[5] | |
|---|---|---|---|---|---|---|
| | | | | | Single Row | Multiple Rows[3] |
| LP SolidStart LSL | ≥ 1-1/2" | Edge | 2-1/2" | 2" | 3" | 3" |
| | | | 3" & 3-1/4" | 2" | 3" | 4" |
| | | | 3-1/2" | 2-1/2" | 4" | 6" |
| | | Face | 2-1/2" | 7/8" | 1" | 1" |
| | | | 3" & 3-1/4" | 7/8" | 1" | 1" |
| | | | 3-1/2" | 7/8" | 1-1/2"" | 1-1/2" |
| LP SolidStart LVL | ≥ 1-1/2" | Edge | 2-1/2" | 2-1/2" | 3" | 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 in accordance with CSA O86.
2. Edge distance shall be sufficient to prevent splitting, but not less than permitted in CSA O86.
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: parallel to the face of the strands for LP LSL or the face of the veneer for LP LVL.
   Face orientation refers to nails driven into the wide face: perpendicular to the face of the strands for LP LSL or the face of the veneer for LP LVL. (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.

# Typical Connections

**TO USE:**

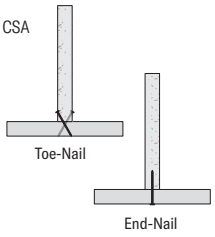
1. Factored horizontal reaction due to horizontal wind, $R_h$ on stud or column is calculated as follows:
   $R_h = 3.29 * (q_{1/50}*C_e) * h * s$
   where:
   $R_h$ = factored top or bottom horizontal reaction (lb)
   $(q_{1/50}*C_e)$ = product of hourly wind pressure and exposure factor from table, 0.45 (kPa) or 0.60 (kPa)
   h = stud or column height (feet)
   s = stud or column spacing (inches)
2. Determine the required number of nails by dividing the factored horizontal reaction by the factored resistance per nail from the table below. Do not exceed 2 nails for 3 1/2" studs, 3 nails for 5-1/2" studs and 4 nails for 7 1/4" studs.
3. If the required number of nails exceed the maximum permitted, use Simpson® Strong-Tie or USP® connectors. Refer to the manufacturer's catalog for design values.

## NAILED PLATE CONNECTIONS

| Nail Type | Length | Diameter (mm) | Diameter (in) | Lateral Capacity (lbs) | |
|---|---|---|---|---|---|
| | | | | Toe-Nail | End-Nail |
| Common | 2-1/2" | 3.25 | 0.128 | 137 | 111 |
| | 3" | 3.66 | 0.144 | 171 | 138 |
| | 3-1/4" | 3.66 | 0.144 | 171 | 138 |
| | 3-1/2" | 4.06 | 0.160 | 207 | 167 |
| Power-driven | 3" | 3.05 | 0.120 | 122 | 98 |
| | 3" | 3.33 | 0.131 | 143 | 116 |
| | 3-1/4" | 3.05 | 0.120 | 122 | 98 |
| Spiral | 2-1/2" | 2.77 | 0.109 | 102 | 82 |
| | 3" | 3.10 | 0.122 | 126 | 102 |
| | 3-1/4" | 3.10 | 0.122 | 126 | 102 |
| | 3-1/2" | 3.86 | 0.152 | 188 | 152 |

**NOTE:**

1. The lateral resistance has been calculated in accordance with CSA Standard O86 for short term loading ($K_D$=1.15) and dry service conditions.
2. Connections assume an equivalent specific gravity (G) of 0.50 for both the side member and main member, and a side member thickness of 1-1/2". For a dry SPF plate (G=0.42), multiply the tabulated values by 0.94 For a dry Hem-Fir plate (G=0.46), multiply the tabulated values by 0.97.
3. Toe-nail connections include a toe-nailing factor ($J_A$) of 0.83.
4. End-nail connections include an end-grain factor ($J_E$) of 0.67.

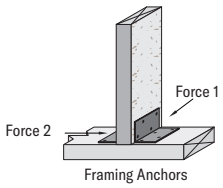



## TYPICAL FRAMING ANCHORS

| Anchor Type | Nails | Factored Resistance (lbs) | | Factored Resistance (lbs) | |
|---|---|---|---|---|---|
| | | D. Fir-L (G=0.49) | | S-P-F (G=0.42) | |
| | | Force 1 | Force 2 | Force 1 | Force 2 |
| **Simpson Strong-Tie** | | | | | |
| A21 | 4 - 0.148" x 1-1/2" | 260 | 405 | 185 | 335 |
| A23 | 8 - 0.148" x 1-1/2" | 715 | 815 | 510 | 725 |
| A33 | 8 - 0.148" x 3" | 570 | 1175 | 405 | 930 |
| A44 | 8 - 0.148" x 3" | 485 | 1175 | 345 | 930 |
| **USP Structural Connectors** | | | | | |
| A3 | 8 - 0.148" x 1-1/2" | 1115 | 1130 | 792 | 802 |
| AC5 | 6 - 0.148" x 3" | 1145 | 1070 | 815 | 760 |
| AC7 | 8 - 0.148" x 3" | 1285 | 1535 | 910 | 1090 |
| AC9 | 10 - 0.148" x 3" | 2135 | 1535 | 1515 | 1090 |

**NOTE:**

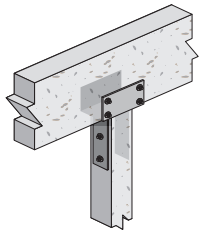
1. Refer to the manufacturers' current catalogs for complete information.
2. Capacities assume both members being equivalent to Doug Fir-Larch or Spruce-Pine-Fir, with an equivalent specific gravity of 0.42 or better.
3. Capacities are for a load duration adjustment for wind, $K_D$ = 1.15.
4. Capacities are for a single anchor and may be doubled when installed in pairs.



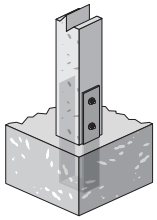
Framing Anchors

## TYPICAL CONNECTIONS

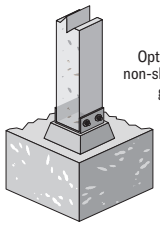
**BEAM ON COLUMN CAP**



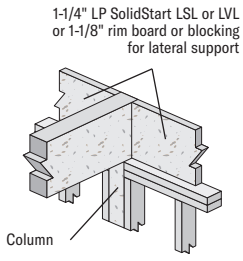
**COLUMN BASE**

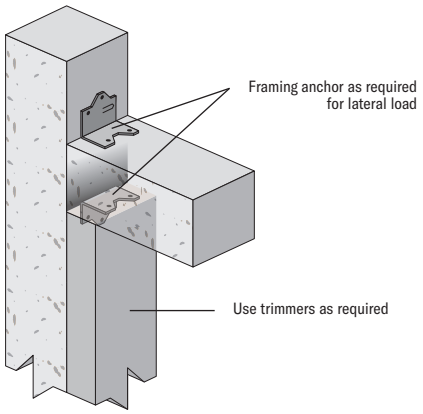


**ELEVATED COLUMN BASE**

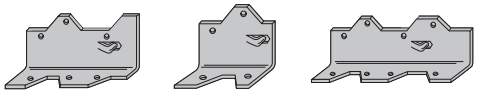



**BEAM ON COLUMN**

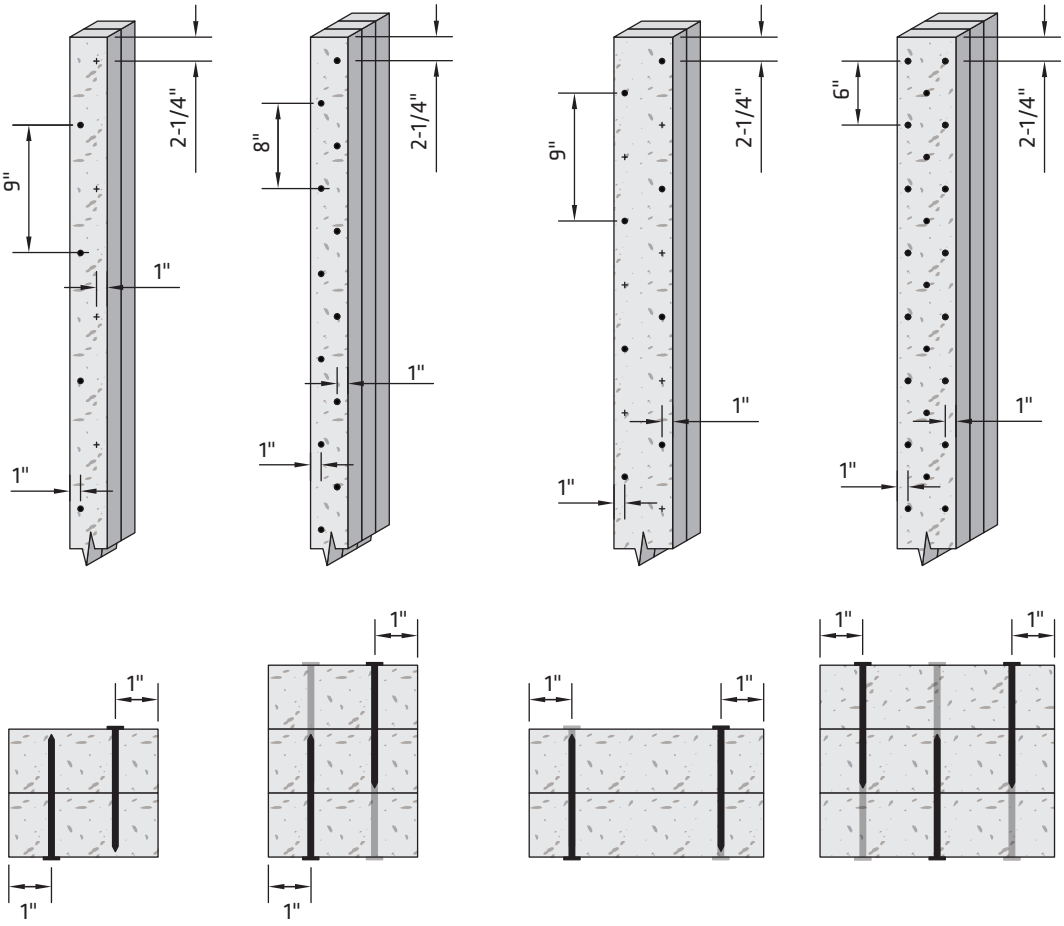



**EXAMPLES OF FRAMING ANCHORS**



## CONNECTION OF BUILT-UP COLUMNS




2-Ply 1-1/2" x 3-1/2" | 3-Ply 1-1/2" x 3-1/2" | 2-Ply 1-1/2" x 5-1/2" and wider | 3-Ply 1-1/2" x 5-1/2" and wider

Built-up columns shall be designed in accordance with CSA Standard O86 using the following recommended nailing and bolt patterns.

**2-Ply 1-1/2" x 3-1/2"**
- One row of 3" x 0.131" nails spaced 9" oc from both faces.
- Stagger rows from front to back.

**3-Ply 1-1/2" x 3-1/2"**
- Two rows of 3" x 0.131" nails spaced 8" oc from both faces.
- Stagger rows on each face and from front to back.

**2-Ply 1-1/2" x 5-1/2" and wider**
- Two rows of 3" x 0.131" nails spaced 9" oc from both faces.
- Stagger rows on each face and from front to back.

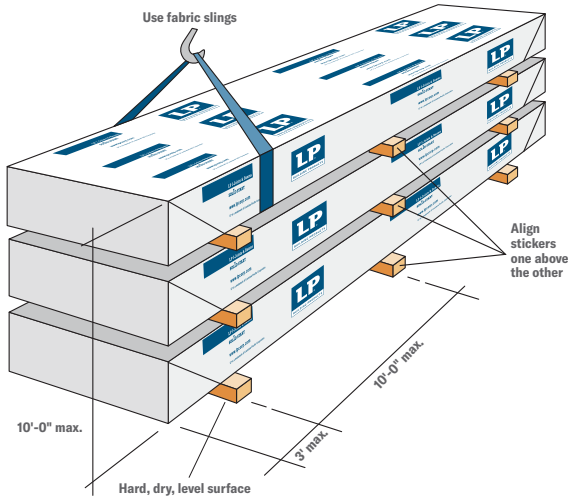
**3-Ply 1-1/2" x 5-1/2" and wider**
- Three rows of 3" x 0.131" nails spaced 6" oc from both faces.
- Stagger rows on each face and from front to back.

**4-Ply 1-1/2" x 5-1/2" and wider (not shown)**
- Two rows of 1/2" bolts spaced 8" oc.
- Maintain a 2" minimum edge distance and 4" minimum end distance.

**NOTES:**
1. Larger nails may be used. Do not exceed a 3-1/2" x 0.135" nail.
2. Except as specified above, nail spacing, row spacing, edge distance and end distance shall be in accordance with the CSA Standard O86-09.
3. Do not exceed three plies for 1-1/2" x 3-1/2" wide members.
4. For 1-3/4" thick members use 3-1/2" long nails.

# 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® Engineered Wood Products 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 LSL and LVL must be used under dry, covered and well-ventilated interior conditions in which the equilibrated moisture content does not exceed a yearly average of 15% and does not exceed 19% at any time.
- For built-up members, LP SolidStart I-Joists, LSL and LVL shall be dry before nailing or bolting to avoid trapping moisture.
- LP SolidStart I-Joists, LSL and LVL shall not be used for unintended purposes such as ramps and planks.

## LP SolidStart LSL 1.35E, 1.55E and 1.75E

Standard Thicknesses of 1-1/2" and 3-1/2" (also 1-3/4")

Standard Depths of 3-1/2", 5-1/2", and 7-1/4" (other depths are available)

Lengths up to 60'

## LP SolidStart LVL 2.0E

Standard Thicknesses of 1-1/2", 1-3/4", and 3-1/2"
Billet thicknesses of 5-1/4"and 7"

Standard Depths of 3-1/2", 5-1/2", and 7-1/4" (other depths are available, including 7")

Lengths up to 60'

## CODE EVALUATION

Code evaluation reports can be obtained at www.lpcorp.com
LP LSL: CCMC 13319-R
LP LVL: CCMC 11518-R
LP LSL and LVL: APA PR-L280C

A water-resistant coating called SiteCote™ is applied to LP LSL and LVL for extra weather protection during construction. Contact your local distributor for cost and availability

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.

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**For product catalog & complete warranty details, visit LPCorp.com**



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