



**Boise Cascade®**  
ENGINEERED WOOD PRODUCTS

**WESTERN UNITED STATES**



# **VERSA-LAM® LVL DESIGN GUIDE**

**Western US** | For Products Manufactured in White City, Oregon

**FLOORS | ROOFS | WALLS**

[www.BC.com/ewp](http://www.BC.com/ewp)



| Design Property                                                                               | Versa-Lam® LVL Beams |             | Versa-Lam® LVL Columns | Versa-Stud® LVL | Versa-Lam® LVL |
|-----------------------------------------------------------------------------------------------|----------------------|-------------|------------------------|-----------------|----------------|
|                                                                                               | 1¾"                  | 3½" & Wider |                        |                 |                |
| Grade                                                                                         | 2.1E 2800            | 2.1E 3100   | 1.8E 2650              | 1.8E 2400       | 1.5E 1800      |
| Modulus of Elasticity <b>True</b><br>(Shear-Free) $E$ ( $\times 10^6$ psi) <sup>(1) (7)</sup> | 2.1                  | 2.1         | 1.8                    | 1.8             | 1.5            |
| Modulus of Elasticity <b>Apparent</b><br>$E$ ( $\times 10^6$ psi) <sup>(1)</sup>              | 2.0                  | 2.0         | 1.7                    | 1.7             | 1.4            |
| Modulus of Elasticity<br>for Stability $E_{min}$ ( $\times 10^6$ psi) <sup>(1) (8)</sup>      | 1.1                  | 1.1         | 0.9                    | 0.9             | 0.7            |
| Bending<br>$F_b$ (psi) <sup>(2) (3)</sup>                                                     | 2800                 | 3100        | 2650                   | 2400            | 1800           |
| Horizontal Shear<br>$F_v$ (psi) <sup>(2) (4)</sup>                                            | 285                  | 285         | 285                    | 285             | 225            |
| Tension Parallel to Grain<br>$F_t$ (psi) <sup>(2) (5)</sup>                                   | 1950                 | 1950        | 1500                   | 1500            | 1100           |
| Compression Parallel to Grain<br>$F_{cl}$ (psi) <sup>(2)</sup>                                | 3000                 | 3000        | 3000                   | 3000            | 2500           |
| Compression Perpendicular to Grain<br>$F_c$ (psi) <sup>(2) (6)</sup>                          | 750                  | 750         | 750                    | 750             | 525            |
| Equivalent Specific Gravity for<br>Fastener Design (SG)                                       | 0.5                  | 0.5         | 0.5                    | 0.5             | 0.5            |

1. This value cannot be adjusted for load duration.
2. This value is based upon a load duration of 100% and may be adjusted for other load durations.
3. Fiber stress bending value shall be multiplied by the depth factor,  $(12/d)^{1/9}$  where  $d$  = member depth [in].
4. Stress applied perpendicular to the gluelines.
5. Tension value shall be multiplied by a length factor,  $(4/L)^{1/8}$  where  $L$  = member length [ft]. Use  $L = 4$  for members less than four feet long.

6. Stress applied parallel to the gluelines.
  7. True or shear-free modulus of elasticity does not account for shear deformation.
  8.  $E_{min}$  is the reference modulus of elasticity for beam and column stability calculations. It is calculated using  $E_{apparent}$  in accordance with Appendix D of the 2018 NDS. When calculating  $E_{min}$ , the coefficient of modulus of elasticity,  $COV_E$ , may be taken as 0.10, and the adjustment factor to convert  $E$  to a pure bending basis may be taken as 1.05.
- \* Design properties are limited to dry conditions of use where the maximum moisture content of the material will not exceed 16%.

## VERSA-LAM® LVL DESIGN VALUES

| Grade                | Width [in]                     | Depth [in] | Weight [lb/ft] | Allowable Shear [lb] | Allowable Moment [ft-lb] | Moment of Inertia [in <sup>4</sup> ] |
|----------------------|--------------------------------|------------|----------------|----------------------|--------------------------|--------------------------------------|
| Versa-Lam® 1.5E 1800 | 1 <sup>5</sup> / <sub>16</sub> | 9½         | 3.2            | 1,870                | 3,039                    | 93.8                                 |
|                      |                                | 11⅞        | 4.0            | 2,338                | 4,632                    | 183.2                                |
|                      |                                | 14         | 4.7            | 2,756                | 6,322                    | 300.1                                |
|                      |                                | 16         | 5.4            | 3,150                | 8,136                    | 448.0                                |
|                      |                                | 18         | 6.1            | 3,544                | 10,163                   | 637.9                                |
|                      |                                | 20         | 6.7            | 3,938                | 12,401                   | 875.0                                |
| Versa-Lam® 1.8E 2400 | 1½                             | 3½         | 1.3            | 998                  | 702                      | 5.4                                  |
|                      |                                | 5½         | 2.1            | 1,568                | 1,649                    | 20.8                                 |
|                      |                                | 7¼         | 2.8            | 2,066                | 2,779                    | 47.6                                 |
|                      |                                | 9¼         | 3.6            | 2,636                | 4,404                    | 98.9                                 |
|                      |                                | 9½         | 3.7            | 2,708                | 4,631                    | 107.2                                |
|                      |                                | 11¼        | 4.3            | 3,206                | 6,374                    | 178.0                                |
|                      |                                | 11⅞        | 4.6            | 3,384                | 7,059                    | 209.3                                |
|                      |                                | 14         | 5.4            | 3,990                | 9,634                    | 343.0                                |
| Versa-Lam® 2.1E 2800 | 1¾                             | 5½         | 2.5            | 1,829                | 2,245                    | 24.3                                 |
|                      |                                | 7¼         | 3.3            | 2,411                | 3,783                    | 55.6                                 |
|                      |                                | 9¼         | 4.2            | 3,076                | 5,994                    | 115.4                                |
|                      |                                | 9½         | 4.3            | 3,159                | 6,304                    | 125.0                                |
|                      |                                | 11¼        | 5.1            | 3,741                | 8,675                    | 207.6                                |
|                      |                                | 11⅞        | 5.3            | 3,948                | 9,608                    | 244.2                                |
|                      |                                | 14         | 6.3            | 4,655                | 13,112                   | 400.2                                |
|                      |                                | 16         | 7.2            | 5,320                | 16,874                   | 597.3                                |
|                      |                                | 18         | 8.1            | 5,985                | 21,079                   | 850.5                                |
| Versa-Lam® 2.1E 3100 | 3½                             | 5½         | 4.9            | 3,658                | 4,971                    | 48.5                                 |
|                      |                                | 7¼         | 6.5            | 4,821                | 8,377                    | 111.1                                |
|                      |                                | 9¼         | 8.3            | 6,151                | 13,272                   | 230.8                                |
|                      |                                | 9½         | 8.5            | 6,318                | 13,958                   | 250.1                                |
|                      |                                | 11¼        | 10.1           | 7,481                | 19,210                   | 415.3                                |
|                      |                                | 11⅞        | 10.7           | 7,897                | 21,275                   | 488.4                                |
|                      |                                | 14         | 12.6           | 9,310                | 29,035                   | 800.3                                |
|                      |                                | 16         | 14.4           | 10,640               | 37,364                   | 1194.7                               |
|                      |                                | 18         | 16.2           | 11,970               | 46,674                   | 1701.0                               |
|                      |                                | 20         | 18.0           | 13,300               | 56,952                   | 2333.3                               |
|                      | 5¼                             | 5¼         | 7.1            | 5,237                | 6,830                    | 63.3                                 |
|                      |                                | 5½         | 7.4            | 5,486                | 7,457                    | 72.8                                 |
|                      |                                | 7¼         | 9.8            | 7,232                | 12,566                   | 166.7                                |
|                      |                                | 9¼         | 12.5           | 9,227                | 19,908                   | 346.3                                |
|                      |                                | 9½         | 12.8           | 9,476                | 20,937                   | 375.1                                |
|                      |                                | 11¼        | 15.2           | 11,222               | 28,814                   | 622.9                                |
|                      |                                | 11⅞        | 16.0           | 11,845               | 31,913                   | 732.6                                |
|                      |                                | 14         | 18.9           | 13,965               | 43,552                   | 1200.5                               |
|                      |                                | 16         | 21.6           | 15,960               | 56,046                   | 1792.0                               |
|                      |                                | 18         | 24.3           | 17,955               | 70,011                   | 2551.5                               |
|                      | 7                              | 20         | 27.0           | 19,950               | 85,428                   | 3500.0                               |
|                      |                                | 24         | 32.4           | 23,940               | 120,549                  | 6048.0                               |
|                      |                                | 9¼         | 16.6           | 12,303               | 26,544                   | 461.7                                |
|                      |                                | 9½         | 17.1           | 12,635               | 27,916                   | 500.1                                |
|                      |                                | 11¼        | 20.2           | 14,963               | 38,419                   | 830.6                                |
|                      |                                | 11⅞        | 21.4           | 15,794               | 42,550                   | 976.8                                |
|                      |                                | 14         | 25.2           | 18,620               | 58,069                   | 1600.7                               |
|                      |                                | 16         | 28.8           | 21,280               | 74,728                   | 2389.3                               |
|                      |                                | 18         | 32.4           | 23,940               | 93,348                   | 3402.0                               |
|                      |                                | 20         | 36.0           | 26,600               | 113,904                  | 4666.7                               |
|                      |                                | 24         | 43.2           | 31,920               | 160,732                  | 8064.0                               |

# VERSA-LAM® 1.8E 2650 COLUMN TABLES

| Column Length [ft] | 3½" Allowable Axial Load (lb) |        |        |           |        |        |          |        |        |
|--------------------|-------------------------------|--------|--------|-----------|--------|--------|----------|--------|--------|
|                    | 3½" x 3½"                     |        |        | 3½" x 5¼" |        |        | 3½" x 7" |        |        |
|                    | 100%                          | 115%   | 125%   | 100%      | 115%   | 125%   | 100%     | 115%   | 125%   |
| 4                  | 14,700                        | 16,090 | 16,930 | 22,070    | 24,165 | 25,430 | 29,450   | 32,240 | 33,920 |
| 5                  | 12,270                        | 13,150 | 13,660 | 18,425    | 19,740 | 20,515 | 24,580   | 26,330 | 27,365 |
| 6                  | 10,080                        | 10,650 | 10,980 | 15,140    | 15,995 | 16,495 | 20,195   | 21,335 | 22,000 |
| 7                  | 8,310                         | 8,705  | 8,930  | 12,480    | 13,075 | 13,415 | 16,650   | 17,435 | 17,890 |
| 8                  | 6,930                         | 7,205  | 7,370  | 10,405    | 10,825 | 11,070 | 13,880   | 14,440 | 14,760 |
| 9                  | 5,840                         | 6,050  | 6,160  | 8,770     | 9,080  | 9,260  | 11,700   | 12,115 | 12,350 |
| 10                 | 4,980                         | 5,135  | 5,225  | 7,480     | 7,715  | 7,850  | 9,975    | 10,290 | 10,470 |
| 11                 | 4,290                         | 4,410  | 4,480  | 6,445     | 6,625  | 6,730  | 8,595    | 8,835  | 8,975  |
| 12                 | 3,730                         | 3,825  | 3,880  | 5,600     | 5,745  | 5,830  | 7,475    | 7,665  | 7,775  |
| 13                 | 3,270                         | 3,350  | 3,390  | 4,915     | 5,030  | 5,095  | 6,555    | 6,710  | 6,795  |
| 14                 | 2,890                         | 2,950  | 2,990  | 4,340     | 4,435  | 4,490  | 5,790    | 5,915  | 5,990  |

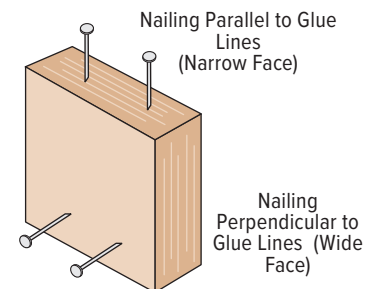
  

| Column Length [ft] | 5¼" Allowable Axial Load (lb) |        |        |           |        |        |          |        |        | 7" Allowable Axial Load (lb) |        |        |         |        |        |
|--------------------|-------------------------------|--------|--------|-----------|--------|--------|----------|--------|--------|------------------------------|--------|--------|---------|--------|--------|
|                    | 5¼" x 5¼"                     |        |        | 5¼" x 5½" |        |        | 5¼" x 7" |        |        | 5¼" x 7¼"                    |        |        | 7" x 7" |        |        |
|                    | 100%                          | 115%   | 125%   | 100%      | 115%   | 125%   | 100%     | 115%   | 125%   | 100%                         | 115%   | 125%   | 100%    | 115%   | 125%   |
| 6                  | 33,070                        | 36,220 | 38,110 | 34,670    | 37,950 | 39,930 |          |        |        |                              |        |        |         |        |        |
| 7                  | 29,420                        | 31,730 | 33,085 | 30,830    | 33,240 | 34,660 |          |        |        |                              |        |        |         |        |        |
| 8                  | 25,875                        | 27,570 | 28,565 | 27,110    | 28,880 | 29,930 | 34,525   | 36,790 | 38,115 | 35,760                       | 38,090 | 39,480 |         |        |        |
| 9                  | 22,690                        | 23,970 | 24,715 | 23,770    | 25,110 | 25,900 | 30,275   | 31,985 | 32,980 | 31,360                       | 33,130 | 34,160 |         |        |        |
| 10                 | 19,930                        | 20,920 | 21,495 | 20,880    | 21,920 | 22,520 | 26,600   | 27,920 | 28,685 | 27,550                       | 28,920 | 29,710 |         |        |        |
| 11                 | 17,585                        | 18,375 | 18,820 | 18,420    | 19,250 | 19,720 | 23,465   | 24,510 | 25,125 | 24,310                       | 25,400 | 26,010 |         |        |        |
| 12                 | 15,590                        | 16,220 | 16,585 | 16,340    | 16,990 | 17,380 | 20,805   | 21,650 | 22,130 | 21,550                       | 22,420 | 22,930 |         |        |        |
| 13                 | 13,895                        | 14,410 | 14,700 | 14,560    | 15,100 | 15,400 | 18,545   | 19,225 | 19,620 | 19,210                       | 19,920 | 20,320 |         |        |        |
| 14                 | 12,450                        | 12,870 | 13,115 | 13,040    | 13,480 | 13,740 | 16,615   | 17,180 | 17,500 | 17,210                       | 17,790 | 18,130 | 33,260  | 34,825 | 35,740 |
| 15                 | 11,210                        | 11,560 | 11,760 | 11,740    | 12,110 | 12,320 | 14,960   | 15,425 | 15,695 | 15,490                       | 15,980 | 16,260 | 30,325  | 31,645 | 32,395 |
| 16                 | 10,135                        | 10,430 | 10,600 | 10,620    | 10,930 | 11,110 | 13,525   | 13,920 | 14,150 | 14,010                       | 14,420 | 14,650 | 27,720  | 28,835 | 29,490 |
| 17                 | 9,205                         | 9,455  | 9,600  | 9,650     | 9,910  | 10,060 | 12,285   | 12,620 | 12,810 | 12,730                       | 13,070 | 13,270 | 25,415  | 26,375 | 26,920 |
| 18                 | 8,395                         | 8,610  | 8,735  | 8,800     | 9,020  | 9,150  | 11,205   | 11,495 | 11,655 | 11,610                       | 11,900 | 12,070 | 23,370  | 24,195 | 24,665 |
| 19                 | 7,685                         | 7,870  | 7,975  | 8,050     | 8,250  | 8,360  | 10,260   | 10,505 | 10,645 | 10,620                       | 10,880 | 11,030 | 21,550  | 22,270 | 22,670 |
| 20                 | 7,060                         | 7,220  | 7,310  | 7,400     | 7,560  | 7,660  | 9,420    | 9,635  | 9,760  | 9,760                        | 9,980  | 10,110 | 19,925  | 20,550 | 20,910 |
| 21                 | 6,505                         | 6,645  | 6,725  | 6,820     | 6,960  | 7,050  | 8,680    | 8,870  | 8,980  | 8,990                        | 9,190  | 9,300  | 18,475  | 19,020 | 19,330 |
| 22                 |                               |        |        |           |        |        |          |        |        |                              |        |        | 17,165  | 17,650 | 17,925 |
| 23                 |                               |        |        |           |        |        |          |        |        |                              |        |        | 15,990  | 16,420 | 16,660 |
| 24                 |                               |        |        |           |        |        |          |        |        |                              |        |        | 14,930  | 15,310 | 15,525 |

- Table assumes that the column is braced at column ends only. Effective column length is equal to actual column length.
- Allowable loads are based upon one-piece (solid) column members used in dry service conditions. BC Calc® sizing software ([www.BCCalc.com](http://www.BCCalc.com)) may be used for multi-piece column design.
- Allowable loads are based on an eccentricity value equal to 0.167 multiplied by either the column thickness or width (worst case).
- Allowable loads are based on axial loaded columns using the design provisions of the 2018 National Design Specification (NDS) for Wood Construction. Table capacity values based upon a buckling length coefficient,  $K_{ce}$ , equal to 1.0 (rotation free, translation fixed at each column end per NDS Appendix G). A  $K_{ce}$  coefficient of 1.0 conservatively models typical wood column applications. For other end fixity conditions, contact Boise Cascade EWP Engineering. For side or other combined bending and axial loads, see provisions in 2018 NDS.
- Load values are not shown for short lengths due to loads exceeding common connector capacities. Load values are not shown for longer lengths if the controlling slenderness ratio exceeds 50 (per NDS).
- Lateral loads (wind loading) are not considered in this table. BC Calc® sizing software ([www.BCCalc.com](http://www.BCCalc.com)) may be used for out of plane lateral load column application design.

## CLOSEST ALLOWABLE NAIL SPACING

| Versa-Lam® Products<br>Nail Size                    |  | Nailing Parallel to Glue Lines (Narrow Face) <sup>1)</sup> |          |                |          |                        |          | Nailing Perpendicular to Glue Lines (Wide Face) |          |
|-----------------------------------------------------|--|------------------------------------------------------------|----------|----------------|----------|------------------------|----------|-------------------------------------------------|----------|
|                                                     |  | Versa-Lam® 1.5E 1800 1½"                                   |          | Versa-Lam® 1¾" |          | Versa-Lam® 3½" & Wider |          | All Products                                    |          |
|                                                     |  | O.C. [in]                                                  | End [in] | O.C. [in]      | End [in] | O.C. [in]              | End [in] | O.C. [in]                                       | End [in] |
| 8d Box (0.113"ø x 2.5")                             |  | 3                                                          | 1½       | 2              | 1        | 2                      | ½        | 2                                               | ½        |
| 8d Common (0.131"ø x 2.5")                          |  | 3                                                          | 2        | 3              | 2        | 2                      | 1        | 2                                               | 1        |
| 10d & 12d Box (0.128"ø x 3", 3.25")                 |  | 3                                                          | 2        | 3              | 2        | 2                      | 1        | 2                                               | 1        |
| 16d Box (0.135"ø x 3.5")                            |  | 3                                                          | 2        | 3              | 2        | 2                      | 1        | 2                                               | 1        |
| 10d & 12d Common & 16d Sinker (0.148"ø x 3", 3.25") |  | 4                                                          | 3        | 4              | 3        | 2                      | 2        | 2                                               | 2        |
| 16d Common (0.162"ø x 3.5")                         |  | 6                                                          | 4        | 6              | 3        | 2                      | 2        | 2                                               | 2        |



- For 1¾" thickness and greater, 2 rows of nails (such as for a metal strap) are allowed (use ½" minimum offset between rows and stagger nails).



KEY TO TABLE:

Top Figure

Middle Figure

Bottom Figure

- Allowable Total Load [plf]

- Allowable Live Load [plf]

- Minimum Required Bearing Length at End / Intermediate Supports [inches]

| SPAN<br>(ft) | 1¾" Versa-Lam® 2.1E 2800 |           |           |            |                    |                    | 3½" Versa-Lam® 2.1E 3100 |           |           |            |            |            | 5¼" Versa-Lam® 2.1E 3100 |           |            |            |            |            | 7" Versa-Lam® 2.1E 3100 |            |            |            |            |            |
|--------------|--------------------------|-----------|-----------|------------|--------------------|--------------------|--------------------------|-----------|-----------|------------|------------|------------|--------------------------|-----------|------------|------------|------------|------------|-------------------------|------------|------------|------------|------------|------------|
|              | 7¼"                      | 9½"       | 11⅞"      | 14"        | 16" <sup>(1)</sup> | 18" <sup>(1)</sup> | 7¼"                      | 9½"       | 11⅞"      | 14"        | 16"        | 18"        | 9½"                      | 11⅞"      | 14"        | 16"        | 18"        | 20"        | 11⅞"                    | 14"        | 16"        | 18"        | 20"        | 24"        |
| 6            | 763                      | 1063      | 1425      | 1796       | 2194               | 2398               | 1526                     | 2127      | 2850      | 3591       | 4388       | 4796       | 3190                     | 4275      | 5387       | 6583       | 7194       | 7192       | 5700                    | 7183       | 8777       | 9593       | 9589       | 9582       |
|              | 693                      | -         | -         | -          | -                  | -                  | 1385                     | -         | -         | -          | -          | -          | -                        | -         | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.8 / 4.4                | 2.4 / 6.1 | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6           | 5.5 / 13.8         | 1.8 / 4.4                | 2.4 / 6.1 | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6   | 5.5 / 13.8 | 2.4 / 6.1                | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6   | 5.5 / 13.8 | 5.5 / 13.8 | 3.3 / 8.2               | 4.1 / 10.3 | 5 / 12.6   | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 7            | 614                      | 877       | 1161      | 1445       | 1742               | 2054               | 1272                     | 1754      | 2322      | 2889       | 3484       | 4109       | 2632                     | 3483      | 4334       | 5226       | 6163       | 6161       | 4644                    | 5778       | 6967       | 8218       | 8214       | 8207       |
|              | 452                      | -         | -         | -          | -                  | -                  | 905                      | -         | -         | -          | -          | -          | -                        | -         | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.6 / 4.1                | 2.4 / 5.9 | 3.1 / 7.8 | 3.9 / 9.7  | 4.7 / 11.7         | 5.5 / 13.8         | 1.7 / 4.3                | 2.4 / 5.9 | 3.1 / 7.8 | 3.9 / 9.7  | 4.7 / 11.7 | 5.5 / 13.8 | 2.4 / 5.9                | 3.1 / 7.8 | 3.9 / 9.7  | 4.7 / 11.7 | 5.5 / 13.8 | 5.5 / 13.8 | 3.1 / 7.8               | 3.9 / 9.7  | 4.7 / 11.7 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 8            | 462                      | 746       | 979       | 1208       | 1444               | 1702               | 925                      | 1493      | 1958      | 2416       | 2887       | 3404       | 2239                     | 2938      | 3624       | 4331       | 5106       | 5387       | 3917                    | 4832       | 5775       | 6808       | 7183       | 7176       |
|              | 310                      | 660       | -         | -          | -                  | -                  | 621                      | 1321      | -         | -          | -          | -          | 1981                     | -         | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.5 / 3.5                | 2.3 / 5.7 | 3 / 7.5   | 3.7 / 9.3  | 4.4 / 11.1         | 5.2 / 13           | 1.5 / 3.5                | 2.3 / 5.7 | 3 / 7.5   | 3.7 / 9.3  | 4.4 / 11.1 | 5.2 / 13   | 2.3 / 5.7                | 3 / 7.5   | 3.7 / 9.3  | 4.4 / 11.1 | 5.2 / 13   | 5.5 / 13.8 | 3 / 7.5                 | 3.7 / 9.3  | 4.4 / 11.1 | 5.2 / 13   | 5.5 / 13.8 | 5.5 / 13.8 |
| 9            | 329                      | 618       | 846       | 1038       | 1232               | 1443               | 659                      | 1299      | 1693      | 2076       | 2465       | 2886       | 1948                     | 2539      | 3113       | 3697       | 4328       | 4786       | 3386                    | 4151       | 4930       | 5771       | 6381       | 6374       |
|              | 222                      | 477       | -         | -          | -                  | -                  | 444                      | 954       | -         | -          | -          | -          | 1431                     | -         | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.5 / 3                  | 2.1 / 5.3 | 2.9 / 7.3 | 3.6 / 8.9  | 4.3 / 10.6         | 5 / 12.4           | 1.5 / 3                  | 2.2 / 5.6 | 2.9 / 7.3 | 3.6 / 8.9  | 4.3 / 10.6 | 5 / 12.4   | 2.2 / 5.6                | 2.9 / 7.3 | 3.6 / 8.9  | 4.3 / 10.6 | 5 / 12.4   | 5.5 / 13.8 | 2.9 / 7.3               | 3.6 / 8.9  | 4.3 / 10.6 | 5 / 12.4   | 5.5 / 13.8 | 5.5 / 13.8 |
| 10           | 242                      | 500       | 745       | 909        | 1075               | 1252               | 485                      | 1056      | 1491      | 1819       | 2150       | 2504       | 1584                     | 2236      | 2728       | 3225       | 3756       | 4304       | 2981                    | 3638       | 4299       | 5008       | 5739       | 5732       |
|              | 164                      | 355       | 660       | -          | -                  | -                  | 327                      | 710       | 1321      | -          | -          | -          | 1065                     | 1981      | -          | -          | -          | -          | 2642                    | -          | -          | -          | -          | -          |
|              | 1.5 / 3                  | 1.9 / 4.8 | 2.9 / 7.1 | 3.5 / 8.7  | 4.1 / 10.3         | 4.8 / 12           | 1.5 / 3                  | 2 / 5.1   | 2.9 / 7.1 | 3.5 / 8.7  | 4.1 / 10.3 | 4.8 / 12   | 2 / 5.1                  | 2.9 / 7.1 | 3.5 / 8.7  | 4.1 / 10.3 | 4.8 / 12   | 5.5 / 13.8 | 2.9 / 7.1               | 3.5 / 8.7  | 4.1 / 10.3 | 4.8 / 12   | 5.5 / 13.8 | 5.5 / 13.8 |
| 11           | 183                      | 402       | 630       | 809        | 953                | 1105               | 366                      | 804       | 1331      | 1618       | 1906       | 2211       | 1205                     | 1997      | 2428       | 2858       | 3316       | 3803       | 2662                    | 3237       | 3811       | 4422       | 5071       | 5207       |
|              | 124                      | 271       | 508       | 798        | -                  | -                  | 248                      | 541       | 1015      | 1595       | -          | -          | 812                      | 1523      | 2393       | -          | -          | -          | 2031                    | 3190       | -          | -          | -          | -          |
|              | 1.5 / 3                  | 1.7 / 4.3 | 2.7 / 6.7 | 3.4 / 8.5  | 4 / 10.1           | 4.7 / 11.7         | 1.5 / 3                  | 1.7 / 4.3 | 2.8 / 7.4 | 3.4 / 8.5  | 4 / 10.1   | 4.7 / 11.7 | 1.7 / 4.3                | 2.8 / 7.4 | 3.4 / 8.5  | 4 / 10.1   | 4.7 / 11.7 | 5.4 / 13.4 | 2.8 / 7.4               | 3.4 / 8.5  | 4 / 10.1   | 4.7 / 11.7 | 5.4 / 13.4 | 5.5 / 13.8 |
| 12           | 141                      | 312       | 528       | 722        | 856                | 989                | 282                      | 624       | 1171      | 1457       | 1711       | 1979       | 937                      | 1757      | 2186       | 2567       | 2968       | 3393       | 2343                    | 2915       | 3422       | 3958       | 4524       | 4769       |
|              | 96                       | 211       | 398       | 629        | -                  | -                  | 193                      | 422       | 796       | 1258       | -          | -          | 633                      | 1194      | 1887       | -          | -          | -          | 1592                    | 2517       | -          | -          | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3.6 | 2.4 / 6.1 | 3.3 / 8.3  | 3.9 / 9.9          | 4.6 / 11.4         | 1.5 / 3                  | 1.5 / 3.6 | 2.7 / 6.8 | 3.4 / 8.4  | 3.9 / 9.9  | 4.6 / 11.4 | 1.5 / 3.6                | 2.7 / 6.8 | 3.4 / 8.4  | 3.9 / 9.9  | 4.6 / 11.4 | 5.2 / 13   | 2.7 / 6.8               | 3.4 / 8.4  | 3.9 / 9.9  | 4.6 / 11.4 | 5.2 / 13   | 5.5 / 13.8 |
| 13           | 111                      | 247       | 449       | 614        | 776                | 895                | 222                      | 494       | 942       | 1325       | 1552       | 1791       | 741                      | 1413      | 1988       | 2328       | 2686       | 3062       | 1884                    | 2651       | 3104       | 3581       | 4083       | 4399       |
|              | 76                       | 168       | 318       | 504        | 728                | -                  | 152                      | 335       | 635       | 1009       | 1456       | -          | 503                      | 953       | 1513       | 2185       | -          | -          | 1270                    | 2017       | 2913       | -          | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3.1 | 2.3 / 5.6 | 3.1 / 7.7  | 3.9 / 9.7          | 4.5 / 11.2         | 1.5 / 3                  | 1.5 / 3.1 | 2.4 / 5.9 | 3.3 / 8.3  | 3.9 / 9.7  | 4.5 / 11.2 | 1.5 / 3.1                | 2.4 / 5.9 | 3.3 / 8.3  | 3.9 / 9.7  | 4.5 / 11.2 | 5.1 / 12.7 | 2.4 / 5.9               | 3.3 / 8.3  | 3.9 / 9.7  | 4.5 / 11.2 | 5.1 / 12.7 | 5.5 / 13.8 |
| 14           | 89                       | 198       | 380       | 529        | 682                | 817                | 177                      | 397       | 761       | 1172       | 1420       | 1635       | 595                      | 1141      | 1759       | 2130       | 2452       | 2789       | 1522                    | 2345       | 2840       | 3270       | 3719       | 4082       |
|              | 61                       | 135       | 257       | 410        | 594                | -                  | 123                      | 270       | 514       | 820        | 1189       | -          | 405                      | 771       | 1230       | 1783       | -          | -          | 1029                    | 1640       | 2378       | -          | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 2.1 / 5.1 | 2.9 / 7.1  | 3.7 / 9.2          | 4.4 / 11           | 1.5 / 3                  | 1.5 / 3   | 2.1 / 5.1 | 3.2 / 7.9  | 3.8 / 9.6  | 4.4 / 11   | 1.5 / 3                  | 2.1 / 5.1 | 3.2 / 7.9  | 3.8 / 9.6  | 4.4 / 11   | 5 / 12.5   | 2.1 / 5.1               | 3.2 / 7.9  | 3.8 / 9.6  | 4.4 / 11   | 5 / 12.5   | 5.5 / 13.8 |
| 15           | 72                       | 162       | 311       | 460        | 593                | 741                | 143                      | 323       | 622       | 1000       | 1309       | 1504       | 485                      | 934       | 1500       | 1963       | 2256       | 2561       | 1245                    | 2000       | 2617       | 3008       | 3415       | 3807       |
|              | 50                       | 111       | 211       | 338        | 491                | 680                | 100                      | 221       | 422       | 675        | 982        | 1359       | 332                      | 633       | 1013       | 1473       | 2039       | -          | 844                     | 1350       | 1964       | 2718       | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.8 / 4.5 | 2.7 / 6.7  | 3.4 / 8.6          | 4.3 / 10.7         | 1.5 / 3                  | 1.5 / 3   | 1.8 / 4.5 | 2.9 / 7.2  | 3.8 / 9.5  | 4.3 / 10.9 | 1.5 / 3                  | 1.8 / 4.5 | 2.9 / 7.2  | 3.8 / 9.5  | 4.3 / 10.9 | 4.9 / 12.3 | 1.8 / 4.5               | 2.9 / 7.2  | 3.8 / 9.5  | 4.3 / 10.9 | 4.9 / 12.3 | 5.5 / 13.8 |
| 16           | 59                       | 133       | 257       | 403        | 520                | 651                | 117                      | 266       | 515       | 830        | 1153       | 1392       | 399                      | 772       | 1246       | 1730       | 2088       | 2367       | 1030                    | 1661       | 2306       | 2784       | 3156       | 3566       |
|              | 41                       | 92        | 175       | 281        | 410                | 569                | 83                       | 183       | 350       | 562        | 820        | 1138       | 275                      | 526       | 843        | 1230       | 1707       | 2279       | 701                     | 1124       | 1640       | 2277       | 3038       | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.6 / 4   | 2.5 / 6.2  | 3.2 / 8            | 4 / 10             | 1.5 / 3                  | 1.5 / 3   | 1.6 / 4   | 2.6 / 6.4  | 3.6 / 8.9  | 4.3 / 10.7 | 1.5 / 3                  | 1.6 / 4   | 2.6 / 6.4  | 3.6 / 8.9  | 4.3 / 10.7 | 4.9 / 12.2 | 1.6 / 4                 | 2.6 / 6.4  | 3.6 / 8.9  | 4.3 / 10.7 | 4.9 / 12.2 | 5.5 / 13.8 |
| 17           | 111                      | 215       | 348       | 460        | 575                | 97                 | 221                      | 430       | 696       | 1020       | 1276       | 176        | 332                      | 645       | 1044       | 1530       | 1914       | 2200       | 861                     | 1393       | 2040       | 2552       | 2933       | 3354       |
|              | 77                       | 147       | 236       | 346        | 481                | 69                 | 153                      | 294       | 473       | 691        | 962        | 1230       | 230                      | 441       | 709        | 1037       | 1443       | 1931       | 588                     | 945        | 1382       | 1924       | 2575       | -          |
|              | 1.5 / 3                  | 1.5 / 3.6 | 2.3 / 5.7 | 3 / 7.6    | 3.8 / 9.4          | 1.5 / 3            | 1.5 / 3                  | 1.5 / 3.6 | 2.3 / 5.7 | 3.3 / 8.4  | 4.2 / 10.5 | 1.5 / 3    | 1.5 / 3.6                | 2.3 / 5.7 | 3.3 / 8.4  | 4.2 / 10.5 | 4.8 / 12   | 1.5 / 3.6  | 2.3 / 5.7               | 3.3 / 8.4  | 4.2 / 10.5 | 4.8 / 12   | 5.5 / 13.8 | -          |
| 18           | 93                       | 181       | 295       | 409        | 512                | 81                 | 186                      | 363       | 589       | 867        | 1136       | 136        | 279                      | 544       | 884        | 1301       | 1704       | 2055       | 726                     | 1178       | 1735       | 2273       | 2740       | 3165       |
|              | 65                       | 124       | 201       | 294        | 410                | 58                 | 130                      | 249       | 401       | 588        | 820        | 104        | 194                      | 373       | 602        | 882        | 1230       | 1650       | 498                     | 802        | 1176       | 1640       | 2200       | -          |
|              | 1.5 / 3                  | 1.5 / 3.2 | 2.1 / 5.2 | 2.9 / 7.1  | 3.6 / 8.9          | 1.5 / 3            | 1.5 / 3                  | 1.5 / 3.2 | 2.1 / 5.2 | 3 / 7.6    | 4 / 9.9    | 1.5 / 3    | 1.5 / 3.2                | 2.1 / 5.2 | 3 / 7.6    | 4 / 9.9    | 4.8 / 11.9 | 1.5 / 3.2  | 2.1 / 5.2               | 3 / 7.6    | 4 / 9.9    | 4.8 / 11.9 | 5.5 / 13.8 | -          |
| 19           | 79                       | 154       | 251       | 367        | 459                | 68                 | 157                      | 308       | 502       | 741        | 1018       | 123        | 236                      | 462       | 753        | 1112       | 1527       | 1866       | 617                     | 1004       | 1483       | 2036       | 2488       | 2996       |
|              | 55                       | 106       | 172       | 252        | 352                | 50                 | 110                      | 213       | 343       | 504        | 704        | 86         | 166                      | 319       | 515        | 756        | 1056       | 1420       | 425                     | 686        | 1008       | 1408       | 1893       | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.9 / 4.7 | 2.7 / 6.8  | 3.4 / 8.5          | 1.5 / 3            | 1.5 / 3                  | 1.5 / 3   | 1.9 / 4.7 | 2.7 / 6.8  | 3.7 / 9.4  | 1.5 / 3    | 1.5 / 3                  | 1.9 / 4.7 | 2.7 / 6.8  | 3.7 / 9.4  | 4.6 / 11.4 | 1.5 / 3    | 1.9 / 4.7               | 2.7 / 6.8  | 3.7 / 9.4  | 4.6 / 11.4 | 5.5 / 13.8 | -          |
| 20           | 67                       | 132       | 216       | 319        | 413                | 57                 | 134                      | 264       | 431       | 638        | 897        | 107        | 201                      | 396       | 647        | 957        | 1346       | 1682       | 528                     | 862        | 1276       | 1794       | 2242       | 2844       |
|              | 47                       | 92        | 148       | 217        | 304                | 43                 | 95                       | 183       | 296       | 435        | 609        | 74         | 142                      | 275       | 444        | 652        | 913        | 1230       | 366                     | 592        | 870        | 1218       | 1640       | 2718       |
|              | 1.5 / 3                  | 1.5 / 3   | 1.7 / 4.2 | 2.5 / 6.2  | 3.2 / 8            | 1.5 / 3            | 1.5 / 3                  | 1.5 / 3   | 1.7 / 4.2 | 2.5 / 6.2  | 3.5 / 8.7  | 1.5 / 3    | 1.5 / 3                  | 1.7 / 4.2 | 2.5 / 6.2  | 3.         |            |            |                         |            |            |            |            |            |

# US WEST ROOF SNOW LOAD TABLES

VERSA-LAM® 2.1E 2800 & 2.1E 3100  
(115% Load Duration)

**KEY TO TABLE:**

- Top Figure** - Allowable Total Load [plf]
- Middle Figure** - Allowable Live Load [plf]
- Bottom Figure** - Minimum Required Bearing Length at End / Intermediate Supports [inches]

| SPAN<br>(ft) | 1¾" Versa-Lam® 2.1E 2800 |         |         |          |                    |                    | 3½" Versa-Lam® 2.1E 3100 |         |         |          |          |          | 5¼" Versa-Lam® 2.1E 3100 |         |          |          |          |          | 7" Versa-Lam® 2.1E 3100 |          |          |          |          |          |
|--------------|--------------------------|---------|---------|----------|--------------------|--------------------|--------------------------|---------|---------|----------|----------|----------|--------------------------|---------|----------|----------|----------|----------|-------------------------|----------|----------|----------|----------|----------|
|              | 7¼"                      | 9½"     | 11⅞"    | 14"      | 16" <sup>(1)</sup> | 18" <sup>(1)</sup> | 7¼"                      | 9½"     | 11⅞"    | 14"      | 16"      | 18"      | 9½"                      | 11⅞"    | 14"      | 16"      | 18"      | 20"      | 11⅞"                    | 14"      | 16"      | 18"      | 20"      | 24"      |
| 6            | 878                      | 1224    | 1640    | 2066     | 2399               | 2398               | 1756                     | 2447    | 3279    | 4132     | 4798     | 4796     | 3671                     | 4919    | 6198     | 7197     | 7194     | 7192     | 6558                    | 8264     | 9596     | 9593     | 9589     | 9582     |
|              | -                        | -       | -       | -        | -                  | -                  | -                        | -       | -       | -        | -        | -        | -                        | -       | -        | -        | -        | -        | -                       | -        | -        | -        | -        | -        |
|              | 2/5                      | 2.8/7   | 3.8/9.4 | 4.7/11.8 | 5.5/13.8           | 5.5/13.8           | 2/5                      | 2.8/7   | 3.8/9.4 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 2.8/7                    | 3.8/9.4 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 3.8/9.4                 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 7            | 707                      | 1009    | 1336    | 1662     | 2004               | 2054               | 1464                     | 2019    | 2672    | 3325     | 4008     | 4109     | 3028                     | 4008    | 4987     | 6013     | 6163     | 6161     | 5344                    | 6649     | 8017     | 8218     | 8214     | 8207     |
|              | 678                      | -       | -       | -        | -                  | -                  | 1357                     | -       | -       | -        | -        | -        | -                        | -       | -        | -        | -        | -        | -                       | -        | -        | -        | -        | -        |
|              | 1.9/4.7                  | 2.7/6.8 | 3.6/8.9 | 4.4/11.1 | 5.4/13.4           | 5.5/13.8           | 2/4.9                    | 2.7/6.8 | 3.6/8.9 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 2.7/6.8                  | 3.6/8.9 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 | 3.6/8.9                 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 8            | 541                      | 859     | 1127    | 1390     | 1661               | 1797               | 1198                     | 1718    | 2254    | 2780     | 3323     | 3593     | 2577                     | 3381    | 4171     | 4984     | 5390     | 5387     | 4508                    | 5561     | 6645     | 7186     | 7183     | 7176     |
|              | 466                      | -       | -       | -        | -                  | -                  | 931                      | -       | -       | -        | -        | -        | -                        | -       | -        | -        | -        | -        | -                       | -        | -        | -        | -        | -        |
|              | 1.7/4.1                  | 2.6/6.6 | 3.5/8.6 | 4.3/10.6 | 5.1/12.7           | 5.5/13.8           | 1.8/4.6                  | 2.6/6.6 | 3.5/8.6 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 2.6/6.6                  | 3.5/8.6 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 5.5/13.8 | 3.5/8.6                 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 9            | 426                      | 712     | 974     | 1194     | 1418               | 1596               | 881                      | 1495    | 1948    | 2389     | 2837     | 3192     | 2242                     | 2923    | 3583     | 4255     | 4788     | 4786     | 3897                    | 4778     | 5673     | 6384     | 6381     | 6374     |
|              | 333                      | -       | -       | -        | -                  | -                  | 665                      | 1431    | -       | -        | -        | -        | 2146                     | -       | -        | -        | -        | -        | -                       | -        | -        | -        | -        | -        |
|              | 1.5/3.7                  | 2.5/6.1 | 3.4/8.4 | 4.1/10.3 | 4.9/12.2           | 5.5/13.8           | 1.5/3.8                  | 2.6/6.4 | 3.4/8.4 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 2.6/6.4                  | 3.4/8.4 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 5.5/13.8 | 3.4/8.4                 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 10           | 324                      | 576     | 858     | 1047     | 1237               | 1436               | 648                      | 1276    | 1716    | 2094     | 2474     | 2871     | 1913                     | 2574    | 3140     | 3711     | 4307     | 4304     | 3431                    | 4187     | 4949     | 5743     | 5739     | 5732     |
|              | 246                      | 532     | -       | -        | -                  | -                  | 491                      | 1065    | -       | -        | -        | -        | 1597                     | -       | -        | -        | -        | -        | -                       | -        | -        | -        | -        | -        |
|              | 1.5/3.1                  | 2.2/5.5 | 3.3/8.2 | 4/10     | 4.7/11.9           | 5.5/13.8           | 1.5/3.1                  | 2.4/6.1 | 3.3/8.2 | 4/10     | 4.7/11.9 | 5.5/13.8 | 2.4/6.1                  | 3.3/8.2 | 4/10     | 4.7/11.9 | 5.5/13.8 | 5.5/13.8 | 3.3/8.2                 | 4/10     | 4.7/11.9 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 11           | 245                      | 475     | 725     | 932      | 1097               | 1272               | 490                      | 1053    | 1532    | 1863     | 2194     | 2545     | 1579                     | 2299    | 2795     | 3290     | 3817     | 3911     | 3065                    | 3726     | 4387     | 5090     | 5214     | 5207     |
|              | 186                      | 406     | -       | -        | -                  | -                  | 372                      | 812     | 1523    | -        | -        | -        | 1218                     | 2285    | -        | -        | -        | -        | 3046                    | -        | -        | -        | -        | -        |
|              | 1.5/3                    | 2/5     | 3.1/7.7 | 3.9/9.8  | 4.6/11.6           | 5.4/13.4           | 1.5/3                    | 2.2/5.6 | 3.2/8.1 | 3.9/9.8  | 4.6/11.6 | 5.4/13.4 | 2.2/5.6                  | 3.2/8.1 | 3.9/9.8  | 4.6/11.6 | 5.4/13.4 | 5.5/13.8 | 3.2/8.1                 | 3.9/9.8  | 4.6/11.6 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 |
| 12           | 189                      | 398     | 609     | 831      | 985                | 1139               | 379                      | 835     | 1349    | 1678     | 1970     | 2278     | 1253                     | 2023    | 2517     | 2955     | 3417     | 3582     | 2697                    | 3356     | 3940     | 4556     | 4777     | 4769     |
|              | 144                      | 317     | 597     | -        | -                  | -                  | 289                      | 633     | 1194    | -        | -        | -        | 950                      | 1791    | -        | -        | -        | -        | 2389                    | -        | -        | -        | -        | -        |
|              | 1.5/3                    | 1.8/4.6 | 2.8/7   | 3.8/9.6  | 4.5/11.3           | 5.2/13.1           | 1.5/3                    | 1.9/4.8 | 3.1/7.8 | 3.9/9.7  | 4.5/11.3 | 5.2/13.1 | 1.9/4.8                  | 3.1/7.8 | 3.9/9.7  | 4.5/11.3 | 5.2/13.1 | 5.5/13.8 | 3.1/7.8                 | 3.9/9.7  | 4.5/11.3 | 5.2/13.1 | 5.5/13.8 | 5.5/13.8 |
| 13           | 149                      | 331     | 518     | 708      | 894                | 1031               | 298                      | 662     | 1147    | 1526     | 1787     | 2062     | 992                      | 1721    | 2289     | 2681     | 3092     | 3305     | 2295                    | 3052     | 3574     | 4123     | 4406     | 4399     |
|              | 114                      | 251     | 476     | -        | -                  | -                  | 229                      | 503     | 953     | 1513     | -        | -        | 754                      | 1429    | 2269     | -        | -        | -        | 1905                    | 3026     | -        | -        | -        | -        |
|              | 1.5/3                    | 1.7/4.1 | 2.6/6.5 | 3.5/8.8  | 4.5/11.2           | 5.1/12.9           | 1.5/3                    | 1.7/4.1 | 2.9/7.2 | 3.8/9.5  | 4.5/11.2 | 5.1/12.9 | 1.7/4.1                  | 2.9/7.2 | 3.8/9.5  | 4.5/11.2 | 5.1/12.9 | 5.5/13.8 | 2.9/7.2                 | 3.8/9.5  | 4.5/11.2 | 5.1/12.9 | 5.5/13.8 | 5.5/13.8 |
| 14           | 119                      | 266     | 446     | 609      | 785                | 941                | 239                      | 532     | 988     | 1350     | 1635     | 1883     | 798                      | 1482    | 2025     | 2453     | 2824     | 3067     | 1976                    | 2701     | 3271     | 3765     | 4089     | 4082     |
|              | 92                       | 203     | 386     | -        | -                  | -                  | 184                      | 405     | 771     | 1230     | -        | -        | 608                      | 1157    | 1845     | -        | -        | -        | 1543                    | 2460     | -        | -        | -        | -        |
|              | 1.5/3                    | 1.5/3.6 | 2.4/6   | 3.3/8.2  | 4.2/10.6           | 5.1/12.7           | 1.5/3                    | 1.5/3.6 | 2.7/6.7 | 3.6/9.1  | 4.4/11   | 5.1/12.7 | 1.5/3.6                  | 2.7/6.7 | 3.6/9.1  | 4.4/11   | 5.1/12.7 | 5.5/13.8 | 2.7/6.7                 | 3.6/9.1  | 4.4/11   | 5.1/12.7 | 5.5/13.8 | 5.5/13.8 |
| 15           | 97                       | 217     | 388     | 530      | 683                | 854                | 193                      | 434     | 833     | 1175     | 1507     | 1732     | 650                      | 1250    | 1762     | 2261     | 2598     | 2861     | 1667                    | 2349     | 3014     | 3464     | 3814     | 3807     |
|              | 75                       | 166     | 317     | 506      | -                  | -                  | 150                      | 332     | 633     | 1013     | 1473     | -        | 497                      | 950     | 1519     | 2210     | -        | -        | 1266                    | 2025     | 2946     | -        | -        | -        |
|              | 1.5/3                    | 1.5/3.2 | 2.2/5.6 | 3.1/7.7  | 3.9/9.9            | 4.9/12.3           | 1.5/3                    | 1.5/3.2 | 2.4/6   | 3.4/8.5  | 4.3/10.9 | 5/12.5   | 1.5/3.2                  | 2.4/6   | 3.4/8.5  | 4.3/10.9 | 5/12.5   | 5.5/13.8 | 2.4/6                   | 3.4/8.5  | 4.3/10.9 | 5/12.5   | 5.5/13.8 | 5.5/13.8 |
| 16           | 79                       | 179     | 340     | 465      | 599                | 749                | 159                      | 358     | 690     | 1031     | 1328     | 1603     | 536                      | 1035    | 1546     | 1993     | 2405     | 2680     | 1380                    | 2062     | 2657     | 3207     | 3573     | 3566     |
|              | 62                       | 137     | 263     | 421      | -                  | -                  | 124                      | 275     | 526     | 843      | 1230     | -        | 412                      | 788     | 1264     | 1845     | -        | -        | 1051                    | 1686     | 2460     | -        | -        | -        |
|              | 1.5/3                    | 1.5/3   | 2.1/5.3 | 2.9/7.2  | 3.7/9.2            | 4.6/11.5           | 1.5/3                    | 1.5/3   | 2.1/5.3 | 3.2/7.9  | 4.1/10.2 | 4.9/12.3 | 1.5/3                    | 2.1/5.3 | 3.2/7.9  | 4.1/10.2 | 4.9/12.3 | 5.5/13.8 | 2.1/5.3                 | 3.2/7.9  | 4.1/10.2 | 4.9/12.3 | 5.5/13.8 | 5.5/13.8 |
| 17           | 66                       | 149     | 289     | 411      | 530                | 663                | 132                      | 298     | 577     | 912      | 1175     | 1470     | 447                      | 866     | 1368     | 1763     | 2204     | 2521     | 1155                    | 1823     | 2350     | 2939     | 3361     | 3354     |
|              | 52                       | 115     | 220     | 354      | 518                | -                  | 104                      | 230     | 441     | 709      | 1037     | 1443     | 345                      | 661     | 1063     | 1555     | 2165     | -        | 882                     | 1418     | 2074     | 2886     | -        | -        |
|              | 1.5/3                    | 1.5/3   | 1.9/4.8 | 2.7/6.8  | 3.5/8.7            | 4.3/10.9           | 1.5/3                    | 1.5/3   | 1.9/4.8 | 3/7.5    | 3.9/9.6  | 4.8/12   | 1.5/3                    | 1.9/4.8 | 3/7.5    | 3.9/9.6  | 4.8/12   | 5.5/13.8 | 1.9/4.8                 | 3/7.5    | 3.9/9.6  | 4.8/12   | 5.5/13.8 | 5.5/13.8 |
| 18           | 55                       | 125     | 244     | 366      | 472                | 590                | 110                      | 251     | 487     | 790      | 1047     | 1309     | 376                      | 731     | 1184     | 1570     | 1964     | 2367     | 975                     | 1579     | 2093     | 2618     | 3156     | 3165     |
|              | 44                       | 97      | 187     | 301      | 441                | -                  | 87                       | 194     | 373     | 602      | 882      | 1230     | 291                      | 560     | 902      | 1322     | 1845     | -        | 747                     | 1203     | 1763     | 2460     | -        | -        |
|              | 1.5/3                    | 1.5/3   | 1.7/4.3 | 2.6/6.4  | 3.3/8.2            | 4.1/10.3           | 1.5/3                    | 1.5/3   | 1.7/4.3 | 2.8/6.9  | 3.6/9.1  | 4.5/11.4 | 1.5/3                    | 1.7/4.3 | 2.8/6.9  | 3.6/9.1  | 4.5/11.4 | 5.5/13.7 | 1.7/4.3                 | 2.8/6.9  | 3.6/9.1  | 4.5/11.4 | 5.5/13.7 | 5.5/13.8 |
| 19           | 46                       | 106     | 207     | 328      | 423                | 529                | 93                       | 212     | 415     | 674      | 938      | 1173     | 319                      | 622     | 1011     | 1407     | 1760     | 2150     | 829                     | 1347     | 1876     | 2347     | 2867     | 2996     |
|              | 37                       | 83      | 160     | 257      | 378                | 528                | 74                       | 166     | 319     | 515      | 756      | 1056     | 249                      | 479     | 772      | 1133     | 1584     | 2130     | 638                     | 1029     | 1511     | 2112     | 2839     | -        |
|              | 1.5/3                    | 1.5/3   | 1.5/3.8 | 2.4/6    | 3.1/7.8            | 3.9/9.7            | 1.5/3                    | 1.5/3   | 1.5/3.8 | 2.5/6.2  | 3.4/8.6  | 4.3/10.8 | 1.5/3                    | 1.5/3.8 | 2.5/6.2  | 3.4/8.6  | 4.3/10.8 | 5.3/13.1 | 1.5/3.8                 | 2.5/6.2  | 3.4/8.6  | 4.3/10.8 | 5.3/13.1 | 5.5/13.8 |
| 20           | 91                       | 178     | 289     | 381      | 477                | 79                 | 181                      | 355     | 579     | 845      | 1057     | 1572     | 272                      | 533     | 868      | 1267     | 1586     | 1938     | 711                     | 1158     | 1690     | 2115     | 2584     | 2844     |
|              | 71                       | 137     | 222     | 326      | 457                | 64                 | 142                      | 275     | 444     | 652      | 913      | 1214     | 214                      | 412     | 666      | 979      | 1370     | 1845     | 549                     | 887      | 1305     | 1827     | 2460     | -        |
|              | 1.5/3                    | 1.5/3.5 | 2.3/5.6 | 3/7.4    | 3.7/9.2            | 1.5/3              | 1.5/3                    | 1.5/3.5 | 2.3/5.6 | 3.3/8.2  | 4.1/10.2 | 1.5/3    | 1.5/3.5                  | 2.3/5.6 | 3.3/8.2  | 4.1/10.2 | 5/12.5   | 1.5/3.5  | 2.3/5.6                 | 3.3/8.2  | 4.1/10.2 | 5/12.5   | 5.5/13.8 | -        |
| 22           | 67                       | 133     | 218     | 314      | 393                | 58                 | 135                      | 266     | 436     | 646      | 871      | 102      | 202                      | 399     | 654      | 970      | 1307     | 1597     | 532                     | 871      | 1293     | 1742     | 2129     | 2582     |
|              | 54                       | 104     |         |          |                    |                    |                          |         |         |          |          |          |                          |         |          |          |          |          |                         |          |          |          |          |          |

# US WEST ROOF NON-SNOW LOAD TABLES

VERSA-LAM® 2.1E 2800 & 2.1E 3100  
(125% Load Duration)

**KEY TO TABLE:**

**Top Figure** - Allowable Total Load [plf]  
**Middle Figure** - Allowable Live Load [plf]  
**Bottom Figure** - Minimum Required Bearing Length at End / Intermediate Supports [inches]

| SPAN<br>(ft) | 1¾" Versa-Lam® 2.1E 2800 |           |            |            |                    |                    | 3½" Versa-Lam® 2.1E 3100 |           |            |            |            |            | 5¼" Versa-Lam® 2.1E 3100 |            |            |            |            |            | 7" Versa-Lam® 2.1E 3100 |            |            |            |            |            |
|--------------|--------------------------|-----------|------------|------------|--------------------|--------------------|--------------------------|-----------|------------|------------|------------|------------|--------------------------|------------|------------|------------|------------|------------|-------------------------|------------|------------|------------|------------|------------|
|              | 7¼"                      | 9½"       | 11⅞"       | 14"        | 16" <sup>(1)</sup> | 18" <sup>(1)</sup> | 7¼"                      | 9½"       | 11⅞"       | 14"        | 16"        | 18"        | 9½"                      | 11⅞"       | 14"        | 16"        | 18"        | 20"        | 11⅞"                    | 14"        | 16"        | 18"        | 20"        | 24"        |
| 6            | 955                      | 1330      | 1783       | 2246       | 2399               | 2398               | 1909                     | 2661      | 3565       | 4492       | 4798       | 4796       | 3991                     | 5348       | 6738       | 7197       | 7194       | 7192       | 7131                    | 8984       | 9596       | 9593       | 9589       | 9582       |
|              | -                        | -         | -          | -          | -                  | -                  | -                        | -         | -          | -          | -          | -          | -                        | -          | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 2.2 / 5.5                | 3.1 / 7.6 | 4.1 / 10.2 | 5.1 / 12.9 | 5.5 / 13.8         | 5.5 / 13.8         | 2.2 / 5.5                | 3.1 / 7.6 | 4.1 / 10.2 | 5.1 / 12.9 | 5.5 / 13.8 | 5.5 / 13.8 | 3.1 / 7.6                | 4.1 / 10.2 | 5.1 / 12.9 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 | 4.1 / 10.2              | 5.1 / 12.9 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 7            | 769                      | 1098      | 1453       | 1807       | 2055               | 2054               | 1592                     | 2195      | 2905       | 3615       | 4111       | 4109       | 3293                     | 4358       | 5422       | 6166       | 6163       | 6161       | 5810                    | 7229       | 8221       | 8218       | 8214       | 8207       |
|              | 678                      | -         | -          | -          | -                  | -                  | 1357                     | -         | -          | -          | -          | -          | -                        | -          | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 2.1 / 5.1                | 2.9 / 7.3 | 3.9 / 9.7  | 4.8 / 12.1 | 5.5 / 13.8         | 5.5 / 13.8         | 2.1 / 5.3                | 2.9 / 7.3 | 3.9 / 9.7  | 4.8 / 12.1 | 5.5 / 13.8 | 5.5 / 13.8 | 2.9 / 7.3                | 3.9 / 9.7  | 4.8 / 12.1 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 | 3.9 / 9.7               | 4.8 / 12.1 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 8            | 588                      | 934       | 1225       | 1512       | 1797               | 1797               | 1235                     | 1868      | 2451       | 3023       | 3595       | 3593       | 2802                     | 3676       | 4535       | 5392       | 5390       | 5387       | 4901                    | 6047       | 7190       | 7186       | 7183       | 7176       |
|              | 466                      | -         | -          | -          | -                  | -                  | 931                      | -         | -          | -          | -          | -          | -                        | -          | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.8 / 4.5                | 2.9 / 7.1 | 3.8 / 9.4  | 4.6 / 11.6 | 5.5 / 13.8         | 5.5 / 13.8         | 1.9 / 4.7                | 2.9 / 7.1 | 3.8 / 9.4  | 4.6 / 11.6 | 5.5 / 13.8 | 5.5 / 13.8 | 2.9 / 7.1                | 3.8 / 9.4  | 4.6 / 11.6 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 | 3.8 / 9.4               | 4.6 / 11.6 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 9            | 440                      | 774       | 1059       | 1299       | 1542               | 1596               | 881                      | 1625      | 2119       | 2598       | 3085       | 3192       | 2438                     | 3178       | 3897       | 4627       | 4788       | 4786       | 4238                    | 5195       | 6169       | 6384       | 6381       | 6374       |
|              | 333                      | 715       | -          | -          | -                  | -                  | 665                      | 1431      | -          | -          | -          | -          | 2146                     | -          | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.5 / 3.8                | 2.7 / 6.7 | 3.7 / 9.1  | 4.5 / 11.2 | 5.3 / 13.3         | 5.5 / 13.8         | 1.5 / 3.8                | 2.8 / 7   | 3.7 / 9.1  | 4.5 / 11.2 | 5.3 / 13.3 | 5.5 / 13.8 | 2.8 / 7                  | 3.7 / 9.1  | 4.5 / 11.2 | 5.3 / 13.3 | 5.5 / 13.8 | 5.5 / 13.8 | 3.7 / 9.1               | 4.5 / 11.2 | 5.3 / 13.3 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 10           | 324                      | 626       | 933        | 1138       | 1345               | 1436               | 648                      | 1387      | 1866       | 2277       | 2691       | 2871       | 2081                     | 2799       | 3415       | 4036       | 4307       | 4304       | 3732                    | 4554       | 5381       | 5743       | 5739       | 5732       |
|              | 246                      | 532       | -          | -          | -                  | -                  | 491                      | 1065      | -          | -          | -          | -          | 1597                     | -          | -          | -          | -          | -          | -                       | -          | -          | -          | -          | -          |
|              | 1.5 / 3.1                | 2.4 / 6   | 3.6 / 8.9  | 4.4 / 10.9 | 5.2 / 12.9         | 5.5 / 13.8         | 1.5 / 3.1                | 2.7 / 6.6 | 3.6 / 8.9  | 4.4 / 10.9 | 5.2 / 12.9 | 5.5 / 13.8 | 2.7 / 6.6                | 3.6 / 8.9  | 4.4 / 10.9 | 5.2 / 12.9 | 5.5 / 13.8 | 5.5 / 13.8 | 3.6 / 8.9               | 4.4 / 10.9 | 5.2 / 12.9 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 11           | 245                      | 517       | 789        | 1013       | 1193               | 1304               | 490                      | 1074      | 1667       | 2026       | 2386       | 2609       | 1611                     | 2500       | 3039       | 3578       | 3913       | 3911       | 3333                    | 4052       | 4771       | 5218       | 5214       | 5207       |
|              | 186                      | 406       | 762        | -          | -                  | -                  | 372                      | 812       | 1523       | -          | -          | -          | 1218                     | 2285       | -          | -          | -          | -          | 3046                    | -          | -          | -          | -          | -          |
|              | 1.5 / 3                  | 2.2 / 5.5 | 3.3 / 8.3  | 4.3 / 10.7 | 5 / 12.6           | 5.5 / 13.8         | 1.5 / 3                  | 2.3 / 5.7 | 3.5 / 8.8  | 4.3 / 10.7 | 5 / 12.6   | 5.5 / 13.8 | 2.3 / 5.7                | 3.5 / 8.8  | 4.3 / 10.7 | 5 / 12.6   | 5.5 / 13.8 | 5.5 / 13.8 | 3.5 / 8.8               | 4.3 / 10.7 | 5 / 12.6   | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 12           | 189                      | 418       | 662        | 904        | 1071               | 1195               | 379                      | 835       | 1467       | 1825       | 2142       | 2390       | 1253                     | 2200       | 2737       | 3214       | 3585       | 3582       | 2934                    | 3650       | 4285       | 4780       | 4777       | 4769       |
|              | 144                      | 317       | 597        | -          | -                  | -                  | 289                      | 633       | 1194       | -          | -          | -          | 950                      | 1791       | -          | -          | -          | -          | 2389                    | -          | -          | -          | -          | -          |
|              | 1.5 / 3                  | 1.9 / 4.8 | 3.1 / 7.6  | 4.2 / 10.4 | 4.9 / 12.3         | 5.5 / 13.8         | 1.5 / 3                  | 1.9 / 4.8 | 3.4 / 8.4  | 4.2 / 10.5 | 4.9 / 12.3 | 5.5 / 13.8 | 1.9 / 4.8                | 3.4 / 8.4  | 4.2 / 10.5 | 4.9 / 12.3 | 5.5 / 13.8 | 5.5 / 13.8 | 3.4 / 8.4               | 4.2 / 10.5 | 4.9 / 12.3 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 13           | 149                      | 331       | 563        | 770        | 972                | 1102               | 298                      | 662       | 1248       | 1660       | 1944       | 2205       | 992                      | 1872       | 2490       | 2916       | 3307       | 3305       | 2496                    | 3320       | 3888       | 4410       | 4406       | 4399       |
|              | 114                      | 251       | 476        | 756        | -                  | -                  | 229                      | 503       | 953        | 1513       | -          | -          | 754                      | 1429       | 2269       | -          | -          | -          | 1905                    | 3026       | -          | -          | -          | -          |
|              | 1.5 / 3                  | 1.7 / 4.1 | 2.8 / 7    | 3.8 / 9.6  | 4.8 / 12.1         | 5.5 / 13.8         | 1.5 / 3                  | 1.7 / 4.1 | 3.1 / 7.8  | 4.1 / 10.4 | 4.8 / 12.1 | 5.5 / 13.8 | 1.7 / 4.1                | 3.1 / 7.8  | 4.1 / 10.4 | 4.8 / 12.1 | 5.5 / 13.8 | 5.5 / 13.8 | 3.1 / 7.8               | 4.1 / 10.4 | 4.8 / 12.1 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 14           | 119                      | 266       | 485        | 663        | 854                | 1023               | 239                      | 532       | 1018       | 1469       | 1779       | 2046       | 798                      | 1527       | 2203       | 2668       | 3069       | 3067       | 2036                    | 2938       | 3558       | 4093       | 4089       | 4082       |
|              | 92                       | 203       | 386        | 615        | -                  | -                  | 184                      | 405       | 771        | 1230       | -          | -          | 608                      | 1157       | 1845       | -          | -          | -          | 1543                    | 2460       | -          | -          | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3.6 | 2.6 / 6.5  | 3.6 / 8.9  | 4.6 / 11.5         | 5.5 / 13.8         | 1.5 / 3                  | 1.5 / 3.6 | 2.7 / 6.9  | 4 / 9.9    | 4.8 / 12   | 5.5 / 13.8 | 1.5 / 3.6                | 2.7 / 6.9  | 4 / 9.9    | 4.8 / 12   | 5.5 / 13.8 | 5.5 / 13.8 | 2.7 / 6.9               | 4 / 9.9    | 4.8 / 12   | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 15           | 97                       | 217       | 417        | 576        | 743                | 929                | 193                      | 434       | 833        | 1278       | 1639       | 1884       | 650                      | 1250       | 1917       | 2459       | 2826       | 2861       | 1667                    | 2556       | 3279       | 3768       | 3814       | 3807       |
|              | 75                       | 166       | 317        | 506        | 737                | -                  | 150                      | 332       | 633        | 1013       | 1473       | -          | 497                      | 950        | 1519       | 2210       | -          | -          | 1266                    | 2025       | 2946       | -          | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3.2 | 2.4 / 6    | 3.3 / 8.3  | 4.3 / 10.7         | 5.4 / 13.4         | 1.5 / 3                  | 1.5 / 3.2 | 2.4 / 6    | 3.7 / 9.2  | 4.7 / 11.8 | 5.4 / 13.6 | 1.5 / 3.2                | 2.4 / 6    | 3.7 / 9.2  | 4.7 / 11.8 | 5.4 / 13.6 | 5.5 / 13.8 | 2.4 / 6                 | 3.7 / 9.2  | 4.7 / 11.8 | 5.4 / 13.6 | 5.5 / 13.8 | 5.5 / 13.8 |
| 16           | 79                       | 179       | 345        | 506        | 652                | 815                | 159                      | 358       | 690        | 1111       | 1445       | 1744       | 536                      | 1035       | 1667       | 2168       | 2616       | 2680       | 1380                    | 2223       | 2890       | 3488       | 3573       | 3566       |
|              | 62                       | 137       | 263        | 421        | 615                | -                  | 124                      | 275       | 526        | 843        | 1230       | 1707       | 412                      | 788        | 1264       | 1845       | 2561       | -          | 1051                    | 1686       | 2460       | 3415       | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 2.1 / 5.3  | 3.1 / 7.8  | 4 / 10             | 5 / 12.5           | 1.5 / 3                  | 1.5 / 3   | 2.1 / 5.3  | 3.4 / 8.6  | 4.4 / 11.1 | 5.4 / 13.4 | 1.5 / 3                  | 2.1 / 5.3  | 3.4 / 8.6  | 4.4 / 11.1 | 5.4 / 13.4 | 5.5 / 13.8 | 2.1 / 5.3               | 3.4 / 8.6  | 4.4 / 11.1 | 5.4 / 13.4 | 5.5 / 13.8 | 5.5 / 13.8 |
| 17           | 66                       | 149       | 289        | 447        | 577                | 721                | 132                      | 298       | 577        | 933        | 1278       | 1599       | 447                      | 866        | 1399       | 1918       | 2398       | 2521       | 1155                    | 1865       | 2557       | 3198       | 3361       | 3354       |
|              | 52                       | 115       | 220        | 354        | 518                | -                  | 104                      | 230       | 441        | 709        | 1037       | 1443       | 345                      | 661        | 1063       | 1555       | 2165       | -          | 882                     | 1418       | 2074       | 2886       | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.9 / 4.8  | 2.9 / 7.3  | 3.8 / 9.5          | 4.7 / 11.8         | 1.5 / 3                  | 1.5 / 3   | 1.9 / 4.8  | 3.1 / 7.7  | 4.2 / 10.5 | 5.2 / 13.1 | 1.5 / 3                  | 1.9 / 4.8  | 3.1 / 7.7  | 4.2 / 10.5 | 5.2 / 13.1 | 5.5 / 13.8 | 1.9 / 4.8               | 3.1 / 7.7  | 4.2 / 10.5 | 5.2 / 13.1 | 5.5 / 13.8 | 5.5 / 13.8 |
| 18           | 55                       | 125       | 244        | 395        | 514                | 642                | 110                      | 251       | 487        | 790        | 1139       | 1424       | 376                      | 731        | 1184       | 1708       | 2137       | 2379       | 975                     | 1579       | 2278       | 2849       | 3172       | 3165       |
|              | 44                       | 97        | 187        | 301        | 441                | 615                | 87                       | 194       | 373        | 602        | 882        | 1230       | 291                      | 560        | 902        | 1322       | 1845       | -          | 747                     | 1203       | 1763       | 2460       | -          | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.7 / 4.3  | 2.8 / 6.9  | 3.6 / 8.9          | 4.5 / 11.2         | 1.5 / 3                  | 1.5 / 3   | 1.7 / 4.3  | 2.8 / 6.9  | 4 / 9.9    | 4.9 / 12.3 | 1.5 / 3                  | 1.7 / 4.3  | 2.8 / 6.9  | 4 / 9.9    | 4.9 / 12.3 | 5.5 / 13.8 | 1.7 / 4.3               | 2.8 / 6.9  | 4 / 9.9    | 4.9 / 12.3 | 5.5 / 13.8 | 5.5 / 13.8 |
| 19           | 46                       | 106       | 207        | 337        | 460                | 576                | 93                       | 212       | 415        | 674        | 993        | 1277       | 319                      | 622        | 1011       | 1490       | 1915       | 2253       | 829                     | 1347       | 1986       | 2553       | 3004       | 2996       |
|              | 37                       | 83        | 160        | 257        | 378                | 528                | 74                       | 166       | 319        | 515        | 756        | 1056       | 249                      | 479        | 772        | 1133       | 1584       | 2130       | 638                     | 1029       | 1511       | 2112       | 2839       | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.5 / 3.8  | 2.5 / 6.2  | 3.4 / 8.5          | 4.2 / 10.6         | 1.5 / 3                  | 1.5 / 3   | 1.5 / 3.8  | 2.5 / 6.2  | 3.6 / 9.1  | 4.7 / 11.7 | 1.5 / 3                  | 1.5 / 3.8  | 2.5 / 6.2  | 3.6 / 9.1  | 4.7 / 11.7 | 5.5 / 13.8 | 1.5 / 3.8               | 2.5 / 6.2  | 3.6 / 9.1  | 4.7 / 11.7 | 5.5 / 13.8 | 5.5 / 13.8 |
| 20           | 39                       | 91        | 178        | 289        | 415                | 519                | 79                       | 181       | 355        | 579        | 855        | 1151       | 272                      | 533        | 868        | 1283       | 1726       | 2109       | 711                     | 1158       | 1711       | 2301       | 2812       | 2844       |
|              | 32                       | 71        | 137        | 222        | 326                | 457                | 64                       | 142       | 275        | 444        | 652        | 913        | 214                      | 412        | 666        | 979        | 1370       | 1845       | 549                     | 887        | 1305       | 1827       | 2460       | -          |
|              | 1.5 / 3                  | 1.5 / 3   | 1.5 / 3.5  | 2.3 / 5.6  | 3.2 / 8            | 4 / 10</           |                          |           |            |            |            |            |                          |            |            |            |            |            |                         |            |            |            |            |            |

# MULTIPLE MEMBER CONNECTORS

## Side-Loaded Applications

| Number of Members                       | Maximum Uniform Side Load [plf] |                             |                                     |                             |                            |                                     |                             |                            |
|-----------------------------------------|---------------------------------|-----------------------------|-------------------------------------|-----------------------------|----------------------------|-------------------------------------|-----------------------------|----------------------------|
|                                         | Nailed <sup>(3)</sup>           |                             | ½" Dia. Through Bolt <sup>(1)</sup> |                             |                            | ⅝" Dia. Through Bolt <sup>(1)</sup> |                             |                            |
|                                         | 2 rows 16d Sinks @ 12" o.c.     | 3 rows 16d Sinks @ 12" o.c. | 2 rows @ 24" o.c. staggered         | 2 rows @ 12" o.c. staggered | 2 rows @ 6" o.c. staggered | 2 rows @ 24" o.c. staggered         | 2 rows @ 12" o.c. staggered | 2 rows @ 6" o.c. staggered |
| 1¾" Versa-Lam® (Depths of 18" and less) |                                 |                             |                                     |                             |                            |                                     |                             |                            |
| 2                                       | 470                             | 705                         | 505                                 | 1010                        | 2020                       | 560                                 | 1120                        | 2245                       |
| 3 <sup>(2)</sup>                        | 350                             | 525                         | 375                                 | 755                         | 1515                       | 420                                 | 840                         | 1685                       |
| 4 <sup>(3)</sup>                        | use bolt schedule               |                             | 335                                 | 670                         | 1345                       | 370                                 | 745                         | 1495                       |
| 3½" Versa-Lam®                          |                                 |                             |                                     |                             |                            |                                     |                             |                            |
| 2 <sup>(3)</sup>                        | use bolt schedule               |                             | 855                                 | 1715                        | N/A                        | 1125                                | 2250                        | N/A                        |

- Design values apply to common bolts that conform to ANSI/ASME standard B18.21-1981 (ASTM A307 Grades A&B, SAE J429 Grades 1 or 2, or higher). A washer not less than a standard cut washer shall be between the wood and the bolt head and between the wood and the nut. The distance from the edge of the beam to the bolt holes must be at least 2" for 1/2" bolts and 2 1/2" for 5/8" bolts. Bolt holes shall be the same diameter as the bolt.
- The nail schedules shown apply to both sides of a 3-member beam.
- 16d box nails = 0.135" diameter x 3.5" length, 16d sinker nails = 0.148" diameter x 3.25" length.
- 7" wide beams must be top-loaded or loaded from both sides (lesser side shall be no less than 25% of opposite side).

## Top-Loaded Applications

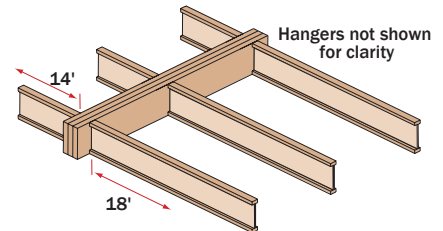
| For top-loaded beams and beams with side loads less than shown in Side-Loaded Applications table above: |                       |                                                  |                                    |
|---------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------|------------------------------------|
| Plies                                                                                                   | Depth                 | Nailing <sup>(2)</sup>                           | Maximum Uniform Load From One Side |
| (2) 1 3/4" plies                                                                                        | Depths 11 5/8" & less | 2 rows 16d box/sinker nails @ 12" o.c.           | 400 plf                            |
|                                                                                                         | Depths 14" - 18"      | 3 rows 16d box/sinker nails @ 12" o.c.           | 600 plf                            |
| (3) 1 3/4" plies <sup>(1)</sup>                                                                         | Depths 11 5/8" & less | 2 rows 16d box/sinker nails @ 12" o.c.           | 300 plf                            |
|                                                                                                         | Depths 14" - 18"      | 3 rows 16d box/sinker nails @ 12" o.c.           | 450 plf                            |
| (4) 1 3/4" plies                                                                                        | Depths 18" & less     | 2 rows 1/2" bolts @ 24" o.c., staggered          | 335 plf                            |
| (2) 3 1/2" plies                                                                                        | Depths 18" & less     | 2 rows 1/2" bolts @ 24" o.c., staggered          | 855 plf                            |
|                                                                                                         | Depth 20" - 24"       | 3 rows 1/2" bolts @ 24" o.c., staggered every 8" | 1285 plf                           |

- The nail schedules shown apply to both sides of a 3-member beam.
- 16d box nails = 0.135" diameter x 3.5" length, 16d sinker nails = 0.148" diameter x 3.25" length.
- Beams wider than 7" must be designed by the engineer of record.
- All values in these tables may be increased by 15% for snow-load roofs and by 25% for non-snow load roofs where the building code allows.
- Use allowable load tables or BC Calc® software to size beams.
- An equivalent specific gravity of 0.5 may be used when designing specific connections with Versa-Lam®.
- Connection values are based upon the 2018 NDS.
- FastenMaster TrussLOK®, Simpson Strong-Tie SDW or SDS, and USP WS screws may also be used to connect multiple member Versa-Lam® beams, contact Boise Cascade EWP Engineering for further information.

## DESIGNING CONNECTIONS FOR MULTIPLE VERSA-LAM® MEMBERS

When using multiple ply Versa-Lam® beams to create a wider member, the connection of the plies is as critical as determining the beam size. When side loaded beams are not connected properly, the inside plies do not support their share of the load and thus the load-carrying capacity of the full member decreases significantly. The following is an example of how to size and connect a multiple-ply Versa-Lam® floor beam.

Given: Beam shown below is supporting residential floor load (40 psf live load, 10 psf dead load) and is spanning 16'-0". Beam depth is limited to 14".



Find: A multiple 1 3/4" ply Versa-Lam® that is adequate to support the design loads and the member's proper connection schedule.

- Calculate the tributary width that beam is supporting:  
 $14' / 2 + 18' / 2 = 16'$
- Use PLF tables on pages 3-5 of this guide or BC Calc® to size beam.  
A Triple Versa-Lam® 2.1 2800 1 3/4" x 14" is found to adequately support the design loads
- Calculate the maximum plf load from one side (the right side in this case).  
Max. Side Load =  $(18' / 2) \times (40 + 10 \text{ psf}) = 450 \text{ plf}$
- Go to the **Multiple Member Connection Table, Side-Loaded Applications, 1 3/4" Versa-Lam®, 3 members.**
- The proper connection schedule must have a capacity greater than the max. side load:  
Nailed: 3 rows 16d sinkers @ 12" o.c.  
525 plf is greater than 450 plf OK  
Bolts: 1/2" diameter 2 rows @ 12" staggered:  
755 plf is greater than 450 plf OK

## VERSA-STUD® 1.8E 2400

### Reference Design Values

| Product                                      | Bending $F_b$ [psi] | Compression Parallel to Grain $F_c$ [psi] | Compression Perp to Grain $F_{c\perp}$ [psi] | Modulus of Elasticity - Apparent $E$ [psi] | Horizontal Shear $F_v$ [psi] |
|----------------------------------------------|---------------------|-------------------------------------------|----------------------------------------------|--------------------------------------------|------------------------------|
| <b>Versa-Stud® 1.8E 2400 1 1/2" x 5 1/2"</b> | <b>2617</b>         | <b>3000</b>                               | <b>450</b>                                   | <b>1,700,000</b>                           | <b>285</b>                   |
| Douglas-Fir # 2 Grade 2 x 6                  | 1170                | 1350                                      | 625                                          | 1,600,000                                  | 180                          |
| Spruce Pine Fir (North) # 1 / 2 Grade 2 x 6  | 1138                | 1150                                      | 425                                          | 1,400,000                                  | 135                          |
| Hem-Fir # 2 Grade 2 x 6                      | 1105                | 1300                                      | 405                                          | 1,300,000                                  | 150                          |
| Western Woods # 2 Grade 2 x 6                | 878                 | 900                                       | 335                                          | 1,000,000                                  | 135                          |

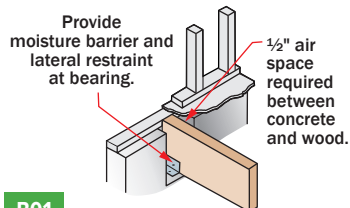
- Design values are for loads applied to the narrow face of the studs.
- Dimension lumber values taken from 2018 NDS Supplement: Design Values for Wood Construction (per 2018 IBC/IRC).
- Repetitive member factors have not been applied to the bending values. Depth (size) factors per ICC-ES ESR-1040 and 2018 NDS have been applied to the corresponding bending values.

For further design information, please see Versa-Stud 1.8E 2400 Western Tall Wall Guide.



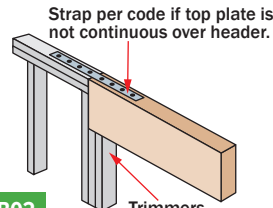
# VERSA-LAM® LVL BEAM DETAILS

## BEARING AT CONCRETE/MASONRY WALLS



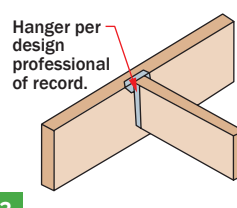
B01

## BEARING FOR DOOR OR WINDOW HEADER



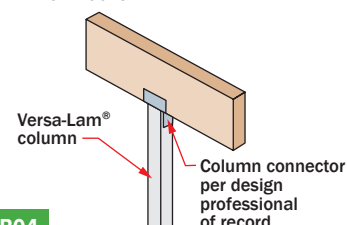
B02

## BEAM TO BEAM CONNECTOR



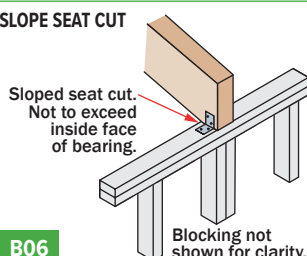
B03

## BEARING AT COLUMN



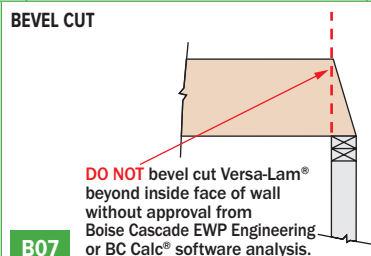
B04

## SLOPE SEAT CUT



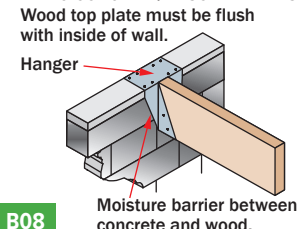
B06

## BEVEL CUT



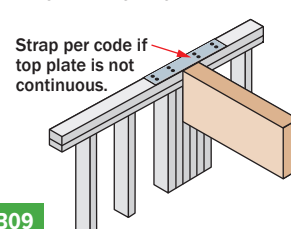
B07

## BEAM TO CONCRETE/MASONRY WALLS



B08

## BEARING FRAMING INTO WALL



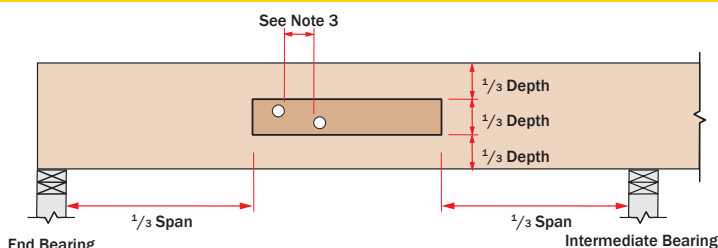
B09

## INSTALLATION NOTES

- Minimum of 1/2" air space between beam and wall pocket or adequate barrier must be provided between beam and concrete/masonry.
- Adequate bearing shall be provided. If not shown on plans, please refer to load tables on pages 3-5 of this guide.

- Versa-Lam® beams are intended for interior applications only and should be kept as dry as possible during construction.
- Continuous lateral support of top of beam shall be provided (side or top bearing framing).

# ALLOWABLE HOLES IN VERSA-LAM® LVL BEAMS



1. Square and rectangular holes are not permitted.
2. Round holes may be drilled or cut with a hole saw anywhere within the shaded area of the beam.
3. The horizontal distance between adjacent holes must be at least two times the size of the larger hole.
4. Do not drill more than three access holes in any four foot long section of beam.

5. The maximum round hole diameter permitted is:

| Beam Depth         | Max. Hole Diameter |
|--------------------|--------------------|
| 5 1/2"             | 3/4"               |
| 7 1/4"             | 1"                 |
| 9 1/4" and greater | 2"                 |

6. These limitations apply to holes drilled for plumbing or wiring access only. The size and location of holes drilled for fasteners are governed by the provisions of the *National Design Specification® for Wood Construction*.
7. Beams deflect under load. Size holes to provide clearance where required.
8. This hole chart is valid for beams supporting uniform load only. For beams supporting concentrated loads or for beams with larger holes, use BC Calc® sizing software ([www.BCCalc.com](http://www.BCCalc.com)) or contact Boise Cascade EWP Engineering.



**Boise Cascade®**  
ENGINEERED WOOD PRODUCTS

## WESTERN UNITED STATES DESIGN GUIDE

Rev 06.20.19

