



**BROADSPAN™**

## LVL Design Brochure

Design properties for  
LVL header and beam  
applications in the U.S.  
for residential floor and  
roof systems



# Product Line

You've probably been building with traditional sawn lumber beams and headers for as long as you've been building. Now through advances in technology and design, there is a better choice – Broadspan LVL headers and beams. They are simply a better alternative than traditional sawn lumber.

Work with a stronger, stiffer, more consistent and more predictable building material. Compared with similar size sections, our LVL headers and beams can support heavier loads and allows greater spans than conventional lumber.

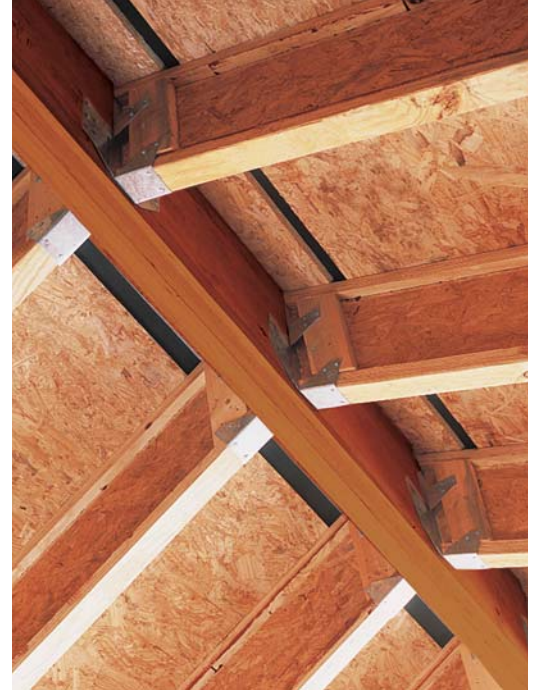
All products have face, back and edges sealed for improved performance under normal construction exposure.

## Broadspan LVL 3100F<sub>b</sub> - 2.0E

- 1¾" and 3½" thick in I-Joist and lumber compatible depths to 24" deep

## Broadspan LVL 2750F<sub>b</sub> - 1.9E

- 1¾" thick in I-Joist and lumber compatible depths to 24" deep



# Storage, Handling and Installation

You're purchasing a premium Broadspan product - protect your investment! Proper product care minimizes problems. Failure to follow good procedures for storage, handling and installation could result in unsatisfactory performance and unsafe structures. Use personal protective equipment for eyes, hands and feet.

- Broadspan LVL should be stored and handled lying flat and protected from the weather (sun and precipitation). Keep covered until installed.
- Keep the LVL above ground to minimize the absorption of ground moisture and allow air circulation.
- Re-cover unused products with bundle wrap. Repair damage to bundle wrap with tape, more bundle wrap, plastic or weatherproof covering.
- Broadspan LVL is only to be used in covered, dry-use conditions, where in-service moisture content will not exceed 16%. When in contact with concrete or masonry, protect LVL per code.
- Broadspan LVL is produced without camber so either edge can be used as the top (edgewise orientation).
- Nails installed in the narrow face of the LVL must be spaced no closer than 3" (8d) and 4" (10-12d).

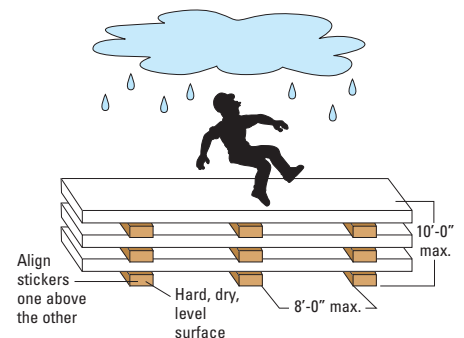
- Do not ship or install any damaged LVL.
- Deeper LVL depths have a greater potential for cupping and damage from improper storage and handling.
- Except for cutting to length, LVL shall not be cut, drilled or notched, except as shown in the design guide. Heel cuts may be possible. Contact your Broadspan representative.
- 1¾" plies that are deeper than 14" require multiple plies, or must be full-depth blocked or full-depth restrained on both sides of the ply at intervals not exceeding 24" o.c.
- Lateral support of LVL compression edge is required at intervals not exceeding 24" o.c. Lateral restraint of LVL is required at bearing locations.
- Do not splice LVL like dimension lumber. LVL ends must butt over a support that provides the bearing required by each end of the LVL.
- Any fasteners, hangers or connectors for LVL into preservative or fire-retardant treated

wood must be hot-dip galvanized, or stainless steel, as required by code and the specific type of treatment.

- Treating Broadspan LVL is not recommended, voids the warranty and could present a safety and performance concern.

### CAUTION:

Wrap and LVL may be slippery when wet



**NOTE: These are general recommendations and in some cases, additional precautions may be required.**

# Design Properties

## 3100F<sub>b</sub>-2.0E 1<sup>3</sup>/<sub>4</sub>" Broadspan LVL Allowable Design Values

Design Property	Depth								
	7 <sup>1</sup> / <sub>4</sub> "	9 <sup>1</sup> / <sub>4</sub> "	9 <sup>1</sup> / <sub>2</sub> "	11 <sup>1</sup> / <sub>4</sub> "	11 <sup>7</sup> / <sub>8</sub> "	14"	16"	18"	24"
Moment (ft.-lbs.)	4280	6710	7049	9631	10642	14422	18454	22936	39010
Shear (lbs.)	2538	3238	3325	3938	4156	4900	5600	6300	8400
Moment of Inertia (in <sup>4</sup> )	56	115	125	208	244	400	597	851	2016
Weight (lbs./lin. ft.)	3.4	4.4	4.5	5.3	5.6	6.6	7.6	8.5	11.4

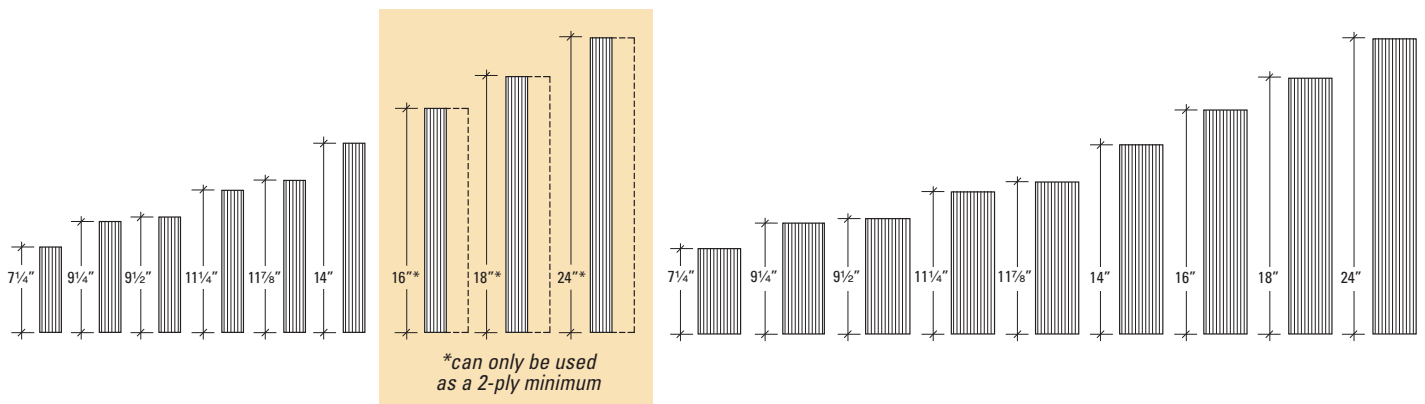
- Lateral support of beam compression edge is required at intervals of 24" o.c. or closer.
- Lateral restraint of beam is required at bearing locations.
- Values are based on 100% load duration.
- Weight shown is for design. Shipping weights differ.
- All plies deeper than 14" require multiple plies, or must be full-depth blocked or full-depth restrained at intervals not exceeding 24" o.c.

## 3100F<sub>b</sub>-2.0E 3<sup>1</sup>/<sub>2</sub>" Broadspan LVL Allowable Design Values

Design Property	Depth								
	7 <sup>1</sup> / <sub>4</sub> "	9 <sup>1</sup> / <sub>4</sub> "	9 <sup>1</sup> / <sub>2</sub> "	11 <sup>1</sup> / <sub>4</sub> "	11 <sup>7</sup> / <sub>8</sub> "	14"	16"	18"	24"
Moment (ft.-lbs.)	8560	13420	14098	19262	21284	28844	36908	45872	78020
Shear (lbs.)	5075	6475	6650	7875	8313	9800	11200	12600	16800
Moment of Inertia (in <sup>4</sup> )	112	230	250	416	488	800	1194	1702	4032
Weight (lbs./lin. ft.)	6.9	8.8	9.0	10.7	11.3	13.3	15.2	17.1	22.8

- Lateral support of beam compression edge is required at intervals of 24" o.c. or closer.
- Lateral restraint of beam is required at bearing locations.
- Values are based on 100% load duration.
- Weight shown is for design. Shipping weights differ.

## 3100F<sub>b</sub>-2.0E 1<sup>3</sup>/<sub>4</sub>" and 3<sup>1</sup>/<sub>2</sub>" Broadspan LVL Available Sizes



## 3100F<sub>b</sub>-2.0E Broadspan LVL Allowable Design Stresses

Modulus of Elasticity	$E = 2.0 \times 10^6$ psi
Bending Stress	$F_b = 3100$ psi
Shear (joist)	$F_v = 300$ psi
Compression Perpendicular to Grain (joist)	$F_{c\perp} = 750$ psi
Compression Parallel to Grain	$F_{c\parallel} = 3000$ psi

- $F_b$  based on 12" depths. For other depths, multiply by  $(12/d)^{0.85}$ . For depths less than 3<sup>1</sup>/<sub>2</sub>", use  $d=3.5$ ".
- Design stresses are based on 100% load duration.
- $F_{c\perp}$  and  $E$  shall not be increased for duration of load.

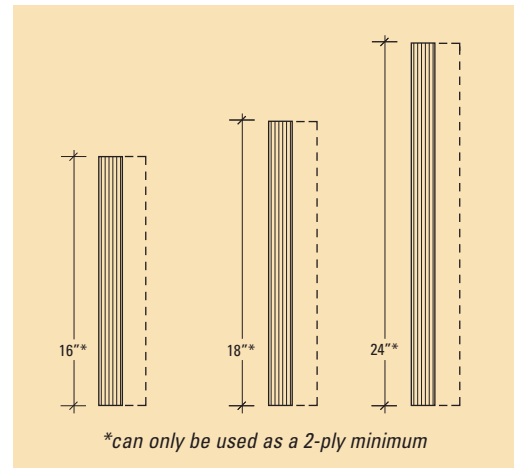
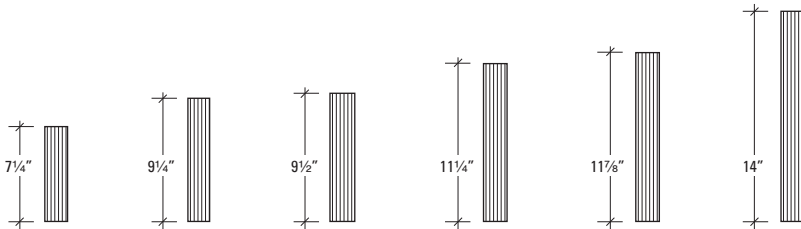
# Design Properties

## 2750F<sub>b</sub>-1.9E 1¾" Broadspan LVL Allowable Design Values

Design Property	Depth								
	7¼"	9¼"	9½"	11¼"	11⅞"	14"	16"	18"	24"
<b>Moment (ft.-lbs.)</b>	3796	5953	6253	8544	9441	12794	16370	20347	34606
<b>Shear (lbs.)</b>	2538	3238	3325	3938	4156	4900	5600	6300	8400
<b>Moment of Inertia (in<sup>4</sup>)</b>	56	115	125	208	244	400	597	851	2016
<b>Weight (lbs./lin. ft.)</b>	3.4	4.4	4.5	5.3	5.6	6.6	7.6	8.5	11.4

1. Lateral support of beam compression edge is required at intervals of 24" o.c. or closer.
2. Lateral restraint of beam is required at bearing locations.
3. Values are based on 100% load duration.
4. Weight shown is for design. Shipping weights differ.
5. All plies deeper than 14" require multiple plies, or must be full-depth blocked or full-depth restrained at intervals not exceeding 24" o.c.

## 2750F<sub>b</sub>-1.9E 1¾" Broadspan LVL Available Sizes



## 2750F<sub>b</sub>-1.9E Broadspan LVL Allowable Design Stresses

Modulus of Elasticity	$E = 1.9 \times 10^6$ psi
Bending Stress	$F_b = 2750$ psi
Shear (joist)	$F_v = 300$ psi
Compression Perpendicular to Grain (joist)	$F_{c\perp} = 750$ psi
Compression Parallel to Grain	$F_{c\parallel} = 2500$ psi

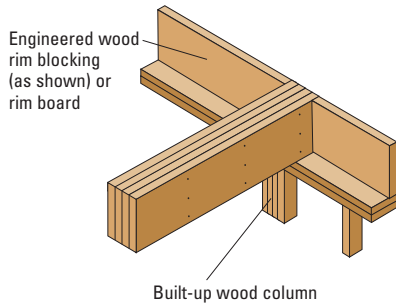
1.  $F_b$  based on 12" depths. For other depths, multiply by  $(12/d)^{1/6.5}$ . For depths less than 3½", use  $d=3.5$ ".
2. Design stresses are based on 100% load duration.
3.  $F_{c\perp}$  and  $E$  shall not be increased for duration of load.



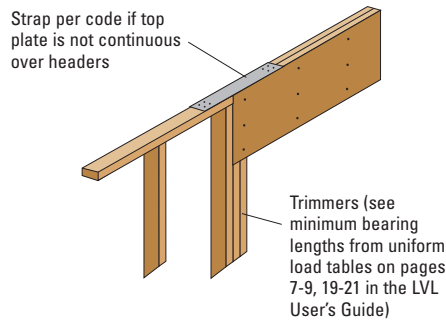
# Bearing Details

Confirm the required bearing area is provided by a support that has adequate strength to carry the load.

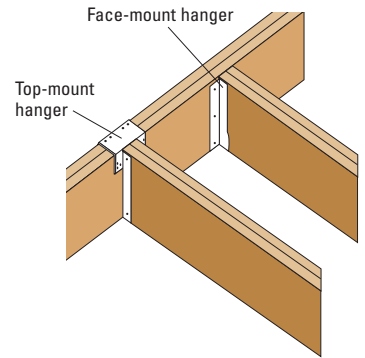
**B1** Bearing at Wall



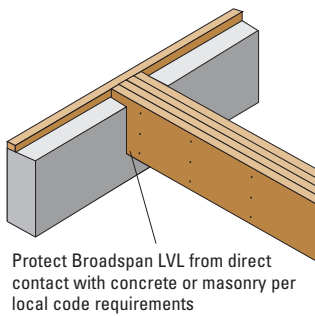
**B2** Bearing for Door or Window Header



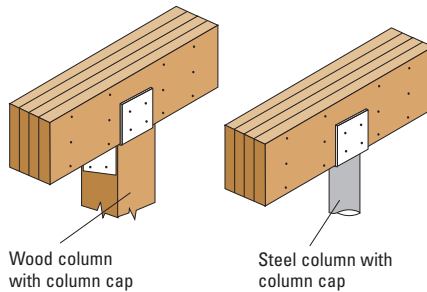
**B3** Beam-to-Beam Connection



**B4** Bearing at Concrete Wall



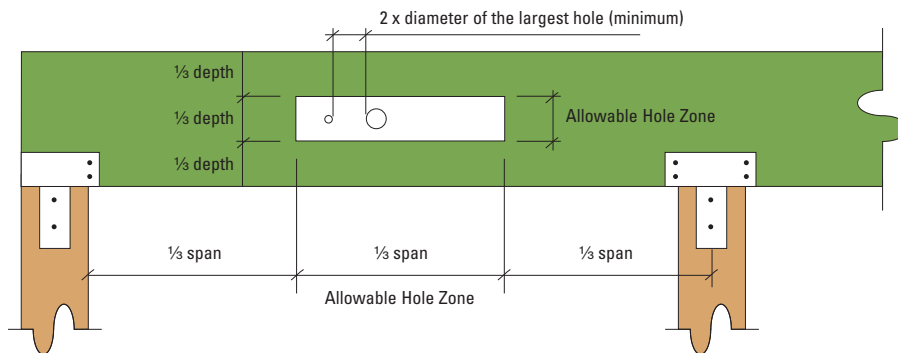
**B5** Bearing at Wood or Steel Column



**Bearing area is extremely critical and must be considered for each application.**

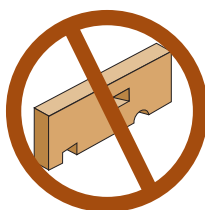
Multiple plies of Broadspan LVL can be fastened together to form a beam or header of the required size, up to a maximum width of 7" for 1¼" and 3½" thick plies. See pages 15 and 27 of the LVL User's Guide for details.

# Allowable Holes



**GENERAL NOTES**

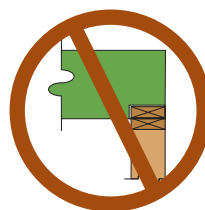
- The Allowable Hole Zone is suitable for uniformly loaded beams using maximum loads for any tables in the LVL User's Guide. For other load conditions or hole configurations, please contact your Broadspan representative.
- If more than one hole is to be cut in the beam, the length of the uncut beam between holes must be a minimum of twice the diameter of the largest hole. No more than three holes are allowed per span.
- Rectangular holes are not allowed.
- Holes in cantilevers require additional analysis.
- Required hole clearance and the effects of beam deflection must be considered to prevent problems with lines that penetrate the holes.
- Maximum hole diameter is:
  - 1" for beam depths of 7¼" to 9½"
  - 2" for beam depths greater than 9½"



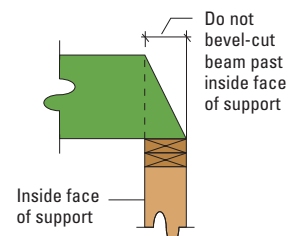
Do not cut, notch or drill holes in Broadspan LVL except as indicated in illustration for allowable holes



Do not overhang seat cuts on Broadspan LVL beams from inside face of support member



Do not notch underside of beam at bearing location



## OUR WORD ON WOOD

Georgia-Pacific is committed to increasing our value as your partner in profit and production: By listening to you, we make wood products that deliver to your needs for strength, beauty and workability. Broadspan LVL is covered by a Lifetime Limited Warranty. Please call the toll-free number listed below for a copy, to place an order, or to find out more information.

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