20″, 22″, and 24″ Deep Depth Beam Design Guide for 2.0E Microllam® LVL.

Microllam® LVL beams manufactured by Weyerhaeuser® are a cost-effective solution for supporting the loads and spans common in residential structures. Today's homes present demanding structural requirements including supporting longer spans, heavier loads, and the more stringent deflection criteria required for brick veneer applications. Often, deep beam depths are required. 20″, 22″, and 24″ deep Microllam® LVL beams provide the exceptional strength and stiffness that meet these demands.

Forte™ Software Design Settings

Sizing 20″, 22″, and 24″ deep beams with Forte™ Web couldn't be easier. Once you've entered span length, support, and load information, simply click on the "Products" tab; choose 2.0E Microllam® LVL under "Product" list. The available depths for this product include 20″, 22″, and 24″.

Bracing Considerations

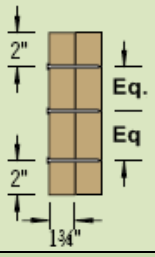
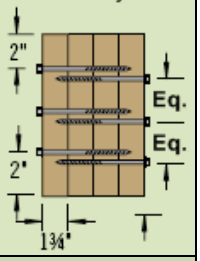
Deep beams require special installation attention and multiple plies. Lateral stability *must* be provided to ensure full design capacity. Lateral bracing is essential to prevent buckling of a beam. Buckling is the tendency for a beam to rotate out-of-plane as it is loaded. Bracing must adequately support the compression edge of the beam to prevent this rotation at 24'' o.c. maximum, unless specifically designed for. See page 3.

ALLOWABLE DESIGN STRESS (100% LOAD DURATION)

Design Stress (psi)	Grade
	2.0E LVL
Modulus of Elasticity, E	2.0 x 10^6
Flexural Stress[1], F_b	2,600
Compression Parallel to Grain, $F_{c\|\|}$	2,510
Compression Perpendicular to the Grain[2], $F_{c\perp}$	750
Horizontal Shear, F_v	285

[1] For 12″ depth; for other depths, multiply F_b by $(12/d)^{0.136}$
[2] $F_{c\perp}$ shall not be increased for duration of load.

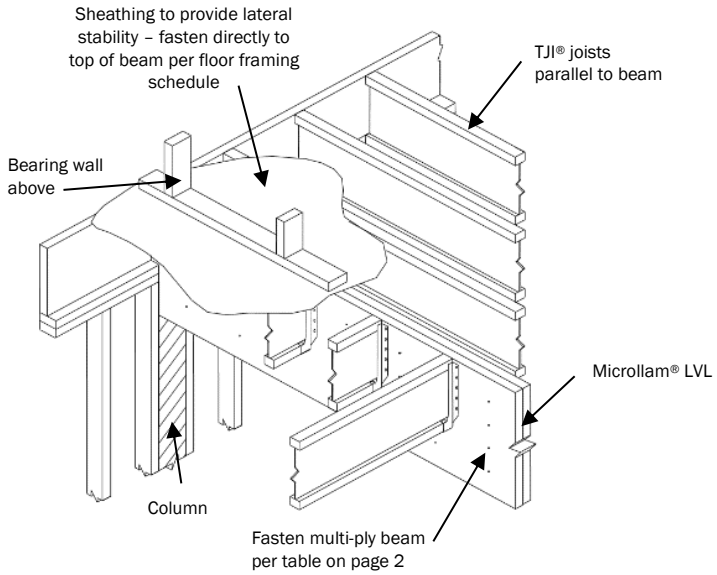
MAXIMUM UNIFORM LOAD APPLIED TO EITHER OUTSIDE MEMBER (PLF)

Connector Type	Location	Number of Rows	Connector On-Center Spacing	Fastener Pattern		
				Assembly A 	Assembly B 	Assembly F 
				3 ½" 2-Ply	5 ¼" 3-Ply	7" 4-Ply
10d (0.128" x 3") Nail[1]	As Shown	3	12"	555	***415***	
		4	12"	740	***555***	
½" A307 Through Bolt[2]	-	3	24"	760	570	505
			12"	1,520	1,140	1,015
		4	24"	1,015	760	675
			12"	2,030	1,520	1,355
			Screw Length	**3 ½"**	**3 ½"**	**6"**
SDS	As Shown	3	24"	1,020	***765***	***835***
			12"	2,040	***1,530***	***1,670***
		4	24"	1,360	***1,020***	***1,110***
			12"	2,720	***2,040***	***2,225***
USP WS	As Shown	3	24"	955	***720***	***715***
			12"	1,915	***1,435***	***1,430***
		4	24"	1,275	***955***	***955***
			12"	2,550	***1,915***	***1,910***
			Screw Length	**3 ⅜"**	**5"**	**6 ¾"**
TrussLOK®	One Side Only	3	24"	870	675	620
			12"	1,740	1,350	1,240
		4	24"	1,160	900	825
			12"	2,320	1,800	1,655

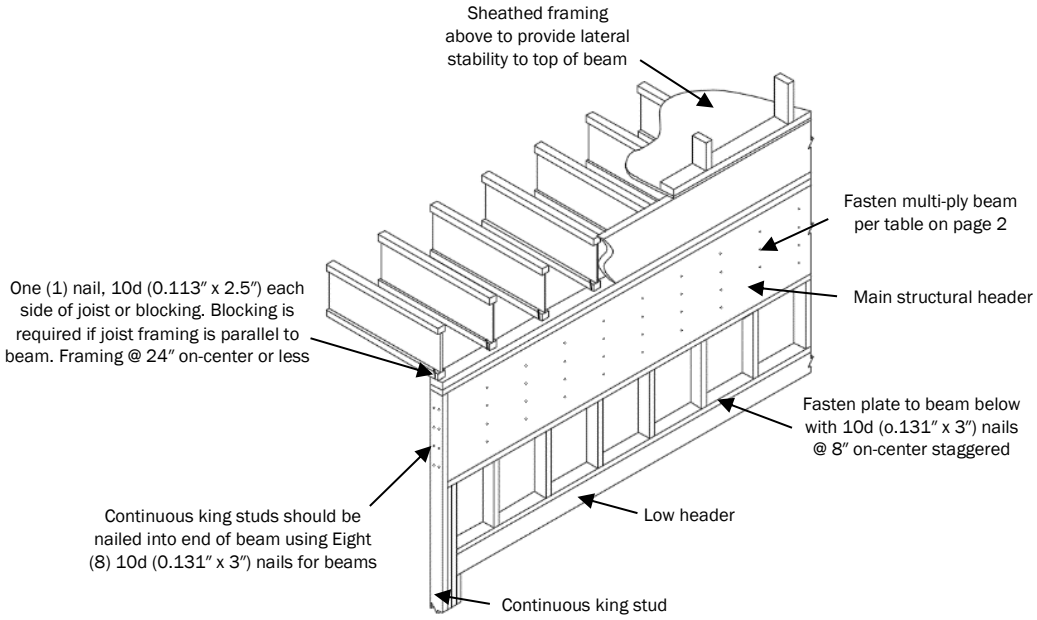
[1] Nailed connection values may be doubled for 6" on-center or tripled for 4" on-center spacing.
[2] Washers required. Bolt holes to be $^{9}/_{16}$" maximum.

General Notes

- Connections are based on NDS® or manufactures' code report.
- Use specific gravity of 0.5 when designing lateral connections.
- Values listed are for 100% stress level. Increase 15% for snow-load roof conditions and 25% for non-snow roof conditions, where code allows.
- Minimum end distance for bolts and screws is 6".
- ***Bold italic*** cells indicate connector pattern must be installed on both sides. Stagger fasteners on opposite side of beam by half (½) the required connector spacing.
- 7" wide beams should be side-loaded only when loads are applied to both sides of the members (to minimize rotation).
- Beams wider than 7" require special considerations by a design professional.



Detail 1: Fully Braced Flush Beam



Detail 2: Fully Braced Alternative to Dropped Header Applications

If you have any questions, feel free to contact your Weyerhaeuser representative.