

## Allowable Shear Wall Design Values for Trus Joist® TimberStrand® LSL and Microllam® LVL Wall Framing

International Code Council Evaluation Service (ICC-ES) acceptance criterion for structural composite lumber requires manufacturers conduct full-scale shear wall testing to qualify products for shear wall applications. Per ICC-ES report ESR-1387 section 4.5, TimberStrand LSL and Microllam LVL may be used as wall framing material, with TimberStrand LSL the preferred product. The allowable shear values for nailed wood structural panel shear walls are determined using Table 4.3A of the ANSI/AWC 2021 Special Design Provisions for Wind and Seismic (SDPWS) subjected to limitations in ESR-1387, Table 5. Table 1 on page 2 of this bulletin replicates the format of Table 4.3A and provides allowable (ASD) unit shear values for TimberStrand LSL and Microllam LVL wall framing based on the limitations of ESR-1387.

### AVAILABLE PRODUCTS

Below is a summary of Weyerhaeuser products suitable for shear wall applications in the NW and SW regions. **Not all sizes and grades are available in all markets.** Consult your local [Weyerhaeuser Territory Manager](#) for availability.

Product	Grade <sup>(2)</sup>	Width (Thickness)	Depth	Equivalent Specific Gravity for Shear Wall Framing <sup>(4)</sup>	General Availability <sup>(1)</sup>
TimberStrand LSL	1.3E	1½"	3½", 5½"	0.42	NW Region
	1.5E	1½"	7¼"	0.42	NW Region
	1.6E	1½"	3½", 5½", 7¼"	0.50	SW Region
Microllam LVL	2.0E	1¾"	5½", 7¼"	0.45 <sup>(3)</sup>	SW Region, NW Region

(1) Use the [Specification Center](#) to locate local stocking lists or [Weyerhaeuser Territory Managers](#) to check product availability.

(2) [StrandGuard® TimberStrand LSL](#) is available in 1.3E and 1.5E grades in sizes noted.

(3) When using 6d or 8d common nails for shear wall fastening, equivalent specific gravity is 0.50.

(4) See ICC ESR-1387, Table 5, for nail size and spacing limitations.

### CONSTRUCTION CONSIDERATIONS

Construction of shear walls utilizing wood structural panels shall conform to sections 4.3.6 and 4.3.7.1 of SDPWS. Note that Trus Joist products evaluated for shear walls are available in a 2" nominal thickness. Trus Joist products used for shear wall boundary elements and common framing members required to be a minimum 3" nominal or greater thickness need to be multiple 2" nominal members as allowed in SDPWS. Consult ESR-1387 Table 2 for equivalent specific gravity of TimberStrand LSL and Microllam LVL for fastener design.

When treated sill (bottom) plate is required due to contact with concrete *and* StrandGuard TimberStrand LSL is installed, use the specific gravity of the wall stud when determining the allowable shear wall capacities for 4" on center or wider panel edge nailing. When 1.5E StrandGuard TimberStrand LSL is installed as the sill plate *and* panel edge nailing is less than 4" on center, use a specific gravity of 0.42 to determine the allowable shear wall capacity.

Top plate(s) shall be the same specific gravity as the stud material. If using 1¾" thick material for plates, adjust stud length accordingly.

TRUS JOIST® PRODUCT TECHNICAL INFORMER

(SW-N138)

**Table 1 – Allowable (ASD) Unit Shear Values (PLF) for Sheathed Wood-Framed Shear Walls with Wood-based Panels for Seismic Loading<sup>1,3,4</sup>**

Sheathing Material	Minimum Nominal Panel Thickness (in.)	Minimum Nail Bearing Length in Framing Member or Blocking, $\ell_m$ (in.)	Nail Type & Size Length (in.) x Shank diameter (in.) x Head diameter (in.)	TimberStand Grade (unless noted otherwise)	Panel Edge nail Spacing (in.)			
					6	4	3	2
Wood Structural Panels - Structural 1	5/16	1-1/4	6d common nail (2 x 0.113 x 0.266) <sup>5</sup>	1.3E	184	NP	NP	NP
				1.5E	184	276	358	470
				1.6E	200	300	389	511
				2.0E Microllam LVL <sup>(7)</sup>	200	NP	NP	NP
	3/8 <sup>2</sup>	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) <sup>5</sup>	1.3E	212	NP	NP	NP
				1.5E	212	332	424	562
				1.6E	230	361	461	611
				2.0E Microllam LVL <sup>(7)</sup>	230	NP	NP	NP
	7/16 <sup>2</sup>	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) <sup>5</sup>	1.3E	235	NP	NP	NP
				1.5E	235	363	465	616
				1.6E	255	395	505	670
				2.0E Microllam LVL <sup>(7)</sup>	255	NP	NP	NP
	15/32	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) <sup>5</sup>	1.3E	258	NP	NP	NP
				1.5E	258	396	506	672
				1.6E	280	430	550	730
				2.0E Microllam LVL <sup>(7)</sup>	280	NP	NP	NP
15/32	1-1/2	10d common nail (3 x 0.148 x 0.312) <sup>5,6</sup>	1.3E	312	NP	NP	NP	
			1.5E	312	470	611	800	
			1.6E	339	511	664	870	
			2.0E Microllam LVL <sup>(7)</sup>	322	NP	NP	NP	
Wood Structural Panels - Sheathing	5/16	1-1/4	6d common nail (2 x 0.113 x 0.266) <sup>5</sup>	1.3E	166	NP	NP	NP
				1.5E	166	248	322	414
				1.6E	180	270	350	450
				2.0E Microllam LVL <sup>(7)</sup>	180	NP	NP	NP
	3/8	1-1/4	6d common nail (2 x 0.113 x 0.266) <sup>5</sup>	1.3E	184	NP	NP	NP
				1.5E	184	276	358	470
				1.6E	200	300	389	511
				2.0E Microllam LVL <sup>(7)</sup>	200	NP	NP	NP
	3/8 <sup>2</sup>	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) <sup>5</sup>	1.3E	202	NP	NP	NP
				1.5E	202	294	378	488
				1.6E	220	320	411	530
				2.0E Microllam LVL <sup>(7)</sup>	220	NP	NP	NP
	7/16 <sup>2</sup>	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) <sup>5</sup>	1.3E	220	NP	NP	NP
				1.5E	220	322	414	539
				1.6E	239	350	450	586
				2.0E Microllam LVL <sup>(7)</sup>	239	NP	NP	NP
	15/32	1-3/8	8d common nail (2-1/2 x 0.131 x 0.281) <sup>5</sup>	1.3E	240	NP	NP	NP
				1.5E	240	350	450	588
				1.6E	261	380	489	639
				2.0E Microllam LVL <sup>(7)</sup>	261	NP	NP	NP
	15/32	1-1/2	10d common nail (3 x 0.148 x 0.312) <sup>5,6</sup>	1.3E	286	NP	NP	NP
				1.5E	286	424	552	708
				1.6E	311	461	600	770
				2.0E Microllam LVL <sup>(7)</sup>	295	NP	NP	NP
19/32	1-1/2	10d common nail (3 x 0.148 x 0.312) <sup>5,6</sup>	1.3E	312	NP	NP	NP	
			1.5E	312	470	611	800	
			1.6E	339	511	664	870	
			2.0E Microllam LVL <sup>(7)</sup>	322	NP	NP	NP	

NP = Not Permitted

- For general construction requirements see ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS) section 4.3.6.
- Allowable shear capacities are permitted to be increased to values shown for 15/32 (nominal) sheathing with the same nailing provided (a) studs are spaced a maximum of 16 inches on center, or (b) panels are applied with long dimension across studs.
- For wind applications, the values in the table above may be increased by a factor of 1.4.
- See SDPWS Table 4.3A and ICC-ES ESR-1387 section 4.5 for additional information.
- Galvanized box nails shall be permitted per SDPWS Table 4.3A, footnote 8.
- Where tension force induced by shear wall overturning is resisted by a hold-down attached to the inside face of the end post, nominal unit shear capacity for shear walls using 10d common nails shall be multiplied by 0.92.
- Microllam LVL has a width of 1.75".